



## Florida Department of Transportation

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GOVERNOR

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SECRETARY

October 7, 2021

### **ADDENDUM NO. 3**

To: **ALL DESIGN BUILD FIRMS**

**FINANCIAL ITEM NUMBER: 415474-2-52-01, 415474-2-52-02, and 415474-2-56-01**  
**CONTRACT NUMBER: E3U76**  
**DESCRIPTION: Design Build for SR 30 (US 98) Brooks Bridge No. 570034**

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PROPOSALS TO BE RECEIVED: April 21, 2022

This is your authorization to make the following changes to the Request for Proposal package you now have for the subject project:

**Attached for your use is a redline revision to the RFP document previously distributed. The following is a summary of the revisions:**

#### **Cover**

- Document denoted as Final RFP, Addendum 3

#### **Attachments**

- Added a pavement design for SR 30 resurfacing travel lanes on the eastern end of the project
- Included additional notes to provide clarity

#### **Reference Documents**

- Removed website link to Okaloosa County Water and Sewer Specifications and Design Manual. A PDF version of the Specifications and Design Manual have been added to the Reference Documents included with the RFP.

#### **Section I. Introduction, under "Roadway Widening, Milling, and Resurfacing on SR 30"**

- Defined limits of milling and resurfacing at the Begin and End Project

#### **Section I. Introduction, under "Roadway widening on Santa Rosa Boulevard"**

- Updated design speed to 35 mph

#### **Section I. Introduction, under "Intelligent Transportation Systems (ITS)"**

- Clarified requirements

#### **Section I. Introduction, under "Utilities"**

- Removed website link to Okaloosa County Water and Sewer Specifications and Design Manual.
- Specified requirements for stainless steel conduit
- Changed language for communication between Design-Build Firm and the specified utility companies to only prohibit communication regarding work specified within their respective Utility Work by Highway Contractor Agreement.

- Identified location preference for utilities along side streets
- Clarified intent for local government utility permits

**Section V. Project Requirements and Provisions for Work, Subsection A. Governing Regulations**

- Added FDOT Traffic Engineering and Operations Bulletins and Memos
- Added FDOT Construction Bulletins

**Section VI. Design and Construction Criteria, Subsection R. Signalization and Intelligent Transportation System Plans, Subsection 1. General**

- Removed requirement for internally illuminated street name signs to support Okaloosa County preference
- Removed requirement for painted mast arms to support Okaloosa County preference.

**Section VI. Design and Construction Criteria, Subsection R. Signalization and Intelligent Transportation System Plans, Subsection 2. Design and Engineering Services, under “Smart Work Zone (SWZ)”**

- Removed requirement for Department monitoring.

**Section VI. Design and Construction Criteria, Subsection R. Signalization and Intelligent Transportation System Plans, Subsection 3. Construction and Integration Services**

- Clarified requirements

**Section VI. Design and Construction Criteria, Subsection R. Signalization and Intelligent Transportation System Plans, Subsection 4. Material, Equipment, and Subsystem Requirements, Subsection c. Fiber Optic Cable**

- Modified language to include 24 count single mode FOC drops
- Removed language to reduce redundancy and provide consistency within the RFP

**Section VI. Design and Construction Criteria, Subsection R. Signalization and Intelligent Transportation System Plans, Subsection 4. Material, Equipment, and Subsystem Requirements, Subsection d. Fiber Optic Conduit and Locate System**

- Removed language to reduce redundancy and provide consistency within the RFP

Please use this information when preparing your proposal.

All PROPOSAL HOLDERS please acknowledge receipt of the addendum on the Design Build Proposal of form (form no. 375-020-12), in the space provided.

Sincerely,

Ranae Dodson  
Procurement Manager

cc: Kerrie Harrell, Alaina Webb, File

Please sign below to acknowledge receipt of Addendum No. 3.

**Acknowledged by:** \_\_\_\_\_

*Florida Department of Transportation*  
*District 3*

**FINAL**

**DESIGN-BUILD**

**REQUEST FOR PROPOSAL**  
**for**

**SR 30 (US 98) Brooks Bridge No. 570034**

**Roadway Section No. 57030000**

**Bridge Replacement and Roadway Improvement Design and  
Construction**

**Okaloosa County**

**Financial Projects Number(s): 415474-2-52-01,  
415474-2-52-02, 415474-2-56-01**  
**Federal Aid Project Number(s): N/A**  
**Contract Number: E3U76**

**[Addendum No. 1 – 09/13/2021](#)**

**[Addendum No. 2 – 09/16/2021](#)**

**[Addendum 3 – 10/07/2021](#)**

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## ATTACHMENTS

The Attachments listed below are hereby incorporated into and made a part of this Request for Proposal (RFP) as though fully set forth herein.

### Project Advertisement

#### Division I Design-Build Specifications

Award and Execution of Contract – Public Records (SP0030900DX)

Legal Requirements and Responsibility to the Public – Laws to be Observed – Compliance with Federal Endangered Species Act and Other Wildlife Regulations (Manatee) (SP0070104-4)

Legal Requirements and Responsibility to the Public – Laws to be Observed – Compliance with Federal Endangered Species Act and Other Wildlife Regulations (Sawfish) (SP0070104-5)

Legal Requirements and Responsibility to the Public – Laws to be Observed – Compliance with Federal Endangered Species Act and Other Wildlife Regulations (Sea Turtle) (SP0070104-6)

Legal Requirements and Responsibility to the Public – Laws to be Observed – Compliance with Federal Endangered Species Act and Other Wildlife Regulations (Sturgeon) (SP0070104-8)

Legal Requirements and Responsibility to the Public – Laws to be Observed – Compliance with Federal Endangered Species Act and Other Wildlife Regulations (Seagrass Beds) (SP0070104-9)

Legal Requirements and Responsibility to the Public – Equal Opportunity Requirements (SP0072700)

Legal Requirements and Responsibility to the Public – Preference to State Residents (SP0072800)

Legal Requirements and Responsibility to the Public – E-Verify (SP0072900)

Legal Requirements and Responsibilities to the Public-Scrutinized Companies (SP0073000)

Prosecution and Progress – Prosecution of Work – Partnering (SP0080306)

Prosecution and Progress – Limitations of Operations – Night Work Along Coastal Road (SP0080401)

Prosecution and Progress – Limitation of Operations – Contaminated Material (Mercury-Containing Devices and Lamps) (SP0080409)

**Prosecution and Progress - Damage Recovery**

**Incentive-Disincentive (SP0081300ID)**

Divisions II and III Special Provisions identified by the Department to be used on the Project:

Mobilization (SP1010000DB)

Contractor Quality Control General Requirements (SP1050813DB)

Structures Foundations (SP4550000DB)

Value Added Bridge Component (SP4750000DB)

Landscaping (SP5800000)

**Road Weather Information System (RWIS) (DEV 688)**

General

- A01 **Revised** Pavement Design (~~Approved April 2021~~ **October 2021**)
- A02 Right of Way Maps with CADD files
- A03 Approved Design Speed Variation (January 2020)
- A04 2021 FDM Section 121 BrProjDev-Calculations

Permit Applications

- A05 FDEP ERP and State 404 Application

PD&E Documents

- A06 FONSI and Environmental Assessment (April 2019)
- A07 Endangered Species Biological Assessment and Biological Opinion (October 2017)
- A08 Contamination Screening Evaluation Report (May 2016)

Reevaluation

- A09 Reevaluation

Utilities

- A10 UWHC Executed Agreement – Cox Communications
- A11 UWHC Executed Agreement – AT&T Florida
- A12 UWHC Executed Agreement – Uniti Fiber
- A13 UWHC Executed Agreement – Centurylink
- A14 UWHC Executed Agreement – Okaloosa County Water and Sewer
- A15 96<sup>th</sup> Communications Squadron Cyber Infrastructure Design Guide (February 2020)
- A16 96TW-2019-00302-00006 Brooks Bridge Cyber Infrastructure Relocation FDOT RFI with Addition 1

Species Protection

- A17 NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions (March 2006)
- A18 NMFS and FWS Construction Special Provisions, Sturgeon Protection Guidelines (September 2012)
- A19 FWC Manatee and Sea Turtle Construction Conditions for In-Water Work Associated with FDOT Projects [2012]

Bid Price Proposal Forms:

1. Design Build Proposal of Proposer (375-020-12)
2. **Revised** Design Build Bid Blank (375-020-17)
3. Design Build Bid or Proposal Bond (375-020-34)
4. Vendor Certification Regarding Scrutinized Companies List (No. 375-030-60)
5. Design Build Bid Proposal (700-010-65)

Other Contract Forms:

1. Design Build Contract Bond (No. 375-020-14)
2. Contract Affidavit (No. 375-020-30)
3. Design Build Contract (No. 375-020-13)
4. Stipend Agreement

**REFERENCE DOCUMENTS**

The following documents are being provided with this RFP. Except as specifically set forth in the body of this RFP, these documents are being provided for reference and general information only. They are not being incorporated into and are not being made part of the RFP, the contract documents or any other document that is connected or related to this Project except as otherwise specifically stated herein. No information contained in these documents shall be construed as a representation of any field condition or any statement of facts upon which the Design-Build Firm can rely upon in performance of this contract. All information contained in these reference documents must be verified by a proper factual investigation. The bidder agrees that by accepting copies of the documents, any and all claims for damages, time or any other impacts based on the documents are expressly waived.

Concept Plans and Design Documentation

- R01 Brooks Bridge Concept Plans (December 2020)
- R02 Brooks Concept CADD Files (Brooks Concept CADD.zip)
- R03 Typical Section Package (Approved February 2021)
- R04 Pond Siting Report Technical Memorandum (December 2020)
- R05 Drainage Design Documentation (December 2020)
- R06 Drainage Models (Brooks Drainage Models.zip)
- R07 Okaloosa County Water and Sewer Relocation Plans (April 2021)
- R08 Coastal Hydraulics Memorandum (September 2020)
- R09 Report of Geotechnical Exploration (BDR) (October 2018)
- R10 Report of Geotechnical Exploration (Ponds) (October 2018)
- R11 Report of Geotechnical Exploration (Pond 1) (July 2020)
- R12 Bridge Technical Memorandum (Single Alternative BDR) – Vol. I (January 2021)
- R13 Bridge Technical Memorandum (Single Alternative BDR) – Vol. II (January 2021)
- R14 Brooks Bridge BDR – Plans (January 2021)
- R15 Brooks Traffic Models (Brooks Traffic Models PDE.zip)

General

- R16 Okaloosa County Water and Sewer Standard Specifications and Design Manual ([link only](http://www.co.okaloosa.fl.us/sites/default/files/doc/dept/ws/Spec_Manual.pdf))  
([http://www.co.okaloosa.fl.us/sites/default/files/doc/dept/ws/Spec\\_Manual.pdf](http://www.co.okaloosa.fl.us/sites/default/files/doc/dept/ws/Spec_Manual.pdf))
- R17 Preliminary Utility Information Package
- R18 Draft Submerged Aquatic Vegetation Report Addendum (November 2019)
- R19 Okaloosa County's Artificial Reef Permit Information
- R20 Project Traffic Forecasting Report (January 2021)
- R21 Brooks Bridge Utility Mapping Report (3/10/21)
- R22 Brooks Bridge Utility Mapping CADD (UTEXRD01.dgn)
- R23 Irrigation Plan for Conference Center
- R24 E2N80 Final As-Built Plans (Sidewalk)
- R25 SR 30 (US 98) Emergency Operations Plans Katrina

Aesthetics

- R26 Brooks Bridge Aesthetics Online Meeting Results (April 2021)
- R27 Brooks Bridge Sample Aesthetics Interpretation and Views (July 2021)

Existing Bridge Plans & Inspection Report

- R28 Bridge Inspection Report (October 2020)
- R29 Existing Bridge As-Built Plans (1965)
- R30 Existing Bridge Plans (Black and White Copy)



R31 Existing Crutch Bent Plans  
R32 Existing Pile Driving Records  
R33 Existing Dolphins and Fender System Plans  
R34 Old Swing Bridge Plans

Reference PD&E Documents

R35 Location Hydraulic Report (February 2018)  
R36 Pond Siting Report (October 2018)  
R37 Public Involvement Summary Report (December 2018)  
R38 Design Traffic Report (December 2016)  
R39 Preliminary Engineering Report (December 2018)  
R40 Wetlands Evaluation Report (October 2017)  
R41 Noise Study Report (January 2018)  
R42 Navigation Study (August 2015)  
R43 Essential Fish Habitat Report (July 2016)  
R44 Cultural Resources Assessment Survey (May 2016)  
R45 Conceptual Stage Relocation Plan (December 2018)  
R46 Air Screening Report (October 2017)

Reference Reevaluation Documents

R47 Contamination Technical Memorandum (January 2021)  
R48 Cultural Resource Assessment Survey Technical Memorandum  
R49 SHPO Concurrence to Cultural Resource Assessment Survey Technical Memorandum  
(1/14/21)

## I. Introduction.

The Florida Department of Transportation (Department) has issued this Request for Proposal (RFP) to solicit competitive bids and proposals from Proposers for the replacement of Brooks Bridge (Bridge No. 570034) over Santa Rosa Sound in Okaloosa County, Florida. This project will also include roadway widening, new roadway connections, and milling and resurfacing within the limits of SR 30 (US 98) from west of SR 145 (Perry Avenue) to Pier Road, side street reconstruction, intersection reconstruction, signalization, Intelligent Transportation Systems, stormwater ponds, storm-drainage, signing and pavement marking, and replacement of the fender system.

It is the Department's intent to promote the use of innovative design concepts, components, details, and construction techniques for bridge structures as discussed in Part 1, Chapter 121 of the FDOT Design Manual (FDM). The Design-Build Firm may submit a Technical Proposal that includes innovative concepts if they are discussed with the Department and approved in accordance with Part 1, Chapter 121 of the FDM using the Alternative Technical Concept (ATC) process.

The Design-Build Firm shall include a Landscape Architect duly authorized to practice Landscape Architecture in the State of Florida consistent with State Statute 481 part II. The Design-Build Firm's Landscape Architect (DBLA) shall review and identify future unencumbered landscape areas for this Project. This Project shall reserve landscape opportunities and implement the FDOT Highway Beautification Policy. Landscape construction will be performed by others and not included with this Project with the exception of required landscaping to be installed within the limits of the proposed roundabouts. Landscape opportunity areas shall be identified in the Design-Build Firm's Plans as "future landscape areas to be constructed by others". Coordination will be required by the Design-Build Firm and the District Landscape Architect. Coordination between Design-Build Firm's Landscape Architect, the District Landscape Architect and Engineer will be required during the Design-Build plans development process to ensure landscape opportunities are accommodated within the project limits. The DBLA shall be included in the project kick-off meeting and subsequent progress meetings.

Right-of-way acquisition is currently ongoing to acquire the needed right-of-way for the project as depicted by the latest right-of-way maps. The anticipated right-of-way clear date for the Project is October 22, 2022. This right-of-way clear date has been utilized to determine the maximum contract duration established in this RFP by the Department. The Design-Build Firm shall utilize this date in determining their schedule for the Project that will be submitted in accordance with the Design-Build Division I Specifications. The Design-Build Firm will be required to obtain a right-of-way certification from the Department for ANY construction activities prior to commencing work.

### **Description of Work**

The Design-Build Firm will be required to design and construct roadway widening on SR 30 from west of SR 145 to west of Pier Road and two new bridges spanning Santa Rosa Sound. Except as allowed by Section I.A. of this RFP, design and construction shall be consistent with the approved Environmental Assessment (EA) with Finding of No Significant Impact (FONSI) and Reevaluation. The project includes bridge replacement, roadway widening, milling and resurfacing, new roadway connections, side street reconstruction, intersection reconstruction, signalization, stormwater ponds, storm drain, and replacement of the fender system.

On the west (Fort Walton Beach) side of the bridge, side street work includes reconstruction/widening/milling and resurfacing of SR 145 (Perry Avenue) and Perry Avenue South,

realignment of Brooks Street, realignment of Florida Blanca Place, and construction of Pond 1. *See Figure 1.*



Figure 1: Fort Walton Beach Side Overview of Work

On the east (Okaloosa Island) side of the bridge, side street work includes reconstruction of Santa Rosa Boulevard, a new North Connection between SR 30 and Santa Rosa Boulevard on new alignment, reconstruction of the roundabout at the intersection of the North Connection and Santa Rosa Boulevard, a new Eastbound Connection between SR 30 and Santa Rosa Boulevard on new alignment, roundabout construction at the Eastbound Connection intersection with the Hotel Entrance Road, reconstruction of the Hotel Entrance Road, reconstruction of Business Access Road, and Ponds 2, 4, 7A and 8. *See Figure 2.*



Figure 2: Okaloosa Island Side Overview of Work

**Roadway Widening, Milling and Resurfacing on SR 30**

The required design speeds for SR 30 are 40 mph from west of SR 145 to the east end of the new bridges, and 45 mph from the east end of the new bridges to End Project. The maximum grade allowed on SR 30 shall not exceed 5%.

SR 30 will be widened and reconstructed from west of SR 145 to west of Pier Road. The typical section for the west bridge approach along SR 30 from SR 145 to the Begin Bridge will consist of six-11 ft travel lanes, a 10 ft median with 4 inch concrete cap, 10 ft inside shoulders, 10 ft outside shoulders, 38 in single-slope shoulder barrier on the inside and outside, 12 ft shared use paths on both sides of the roadway, 3.5 ft bridge ped./bicycle railing (aluminum) with 6 inch curb on both sides, and retaining wall. Some variation in the median width, inside shoulder width, and median barrier location will be allowed to accommodate transition from the existing roadway to the bridge typical section. At the intersection of SR 30 and SR 145, provide one 11 ft eastbound dedicated left turn lane and one 11 ft westbound right turn lane.

The typical section for the east road way approach along SR 30 from End Bridge to the new connections to Santa Rosa Boulevard will consist of six-11 ft travel lanes, a 22 ft curbed median, 10 ft outside shoulders, 38 in single-slope shoulder barrier on the outside, 12 ft shared use paths on both sides of the roadway, 3.5 ft bridge ped./bicycle railing (aluminum) with 6 inch curb on both sides, and retaining wall. Transition from the bridge typical section, including the transition of median width and transition from the bridge traffic railing to Type E curb shall occur within this typical section. At the intersection of SR 30 and New North Connection, provide one 11 ft westbound right turn lane. At the intersection of SR 30 and the Eastbound Connection, provide one 11 ft eastbound right turn lane and one 11 ft westbound dedicated left turn lane.

The typical section for SR 30 from the new connections to Santa Rosa Boulevard to west of Pier Road will consist of four 11 ft travel lanes, a 22 ft curbed median, a 10 ft shoulder (5 ft paved) in the eastbound direction, a 10 ft shoulder (5 ft paved) in the westbound direction, and a right turn lane in the eastbound direction serving business access roads. In addition, a left turn lane shall be provided in the westbound direction serving the commercial driveway at Station 143+00. Bicycles will be accommodated on a dedicated 5 ft bicycle lane/keyhole in the eastbound direction and on the 5' paved shoulder in the westbound direction. Pedestrians will be accommodated on the existing 5 ft sidewalk in the eastbound direction and 8 ft sidewalk in the westbound direction.

The typical section for SR 30 from west of Pier Road to Pier Road will consist of four 11 ft travel lanes, a raised 4 ft to 8 ft concrete traffic separator, a 10 ft shoulder (5 ft paved) in the eastbound direction, a 10 ft shoulder (5 ft paved) in the westbound direction, a 11 ft eastbound right turn lane serving Pier Road, and two 11 ft eastbound left turn lanes serving Pier Road with a minimum length to match the existing turn lanes. Bicycles will be accommodated on a dedicated 5 ft bicycle lane/keyhole in the eastbound direction and on the 5' paved shoulder in the westbound direction. Pedestrians will be accommodated on the existing 5 ft sidewalk in both the eastbound and westbound directions.

The Design Build Firm will be required to mill and resurface SR 30 from STA 100+00 west of SR 145 to the beginning of reconstruction west of SR 145, and to facilitate pavement marking transitions and match the project limit for the adjacent resurfacing project later defined in this RFP. The Design-Build Firm shall also mill and resurface SR 30 from the end of reconstruction west of Pier Road to east of Pier Road to facilitate pavement marking transitions to the existing roadway.

### **SR 30 Bridge Replacement over Santa Rosa Sound**

The existing SR 30 bridge spanning Santa Rosa Sound shall be replaced with two three-lane parallel bridges on independent foundations. Each bridge shall consist of three 11 ft travel lanes, 10 ft inside shoulders, 10 ft outside shoulders, 36 in single-slope traffic railing on the inside and outside, 12 ft shared use paths, and 3.5 ft ped./bridge railing (aluminum) with 6 inch curb on both sides.

The bridges shall begin west of Pond 1 in Fort Walton Beach and end east of Santa Rosa Blvd on Okaloosa Island.

A minimum of 10 feet of space shall be provided between the bridges for maintenance inspection purposes with the only exception being at the Begin Bridge first span where a minimum of 8-ft is required between the bridges. Greater horizontal separation between the bridges is preferred to facilitate maintenance activities.

The minimum vertical clearance of the main span over the navigation channel shall be 65 feet above the mean high-water elevation of Santa Rosa Sound at the main channel crossing.

A fender system shall be constructed parallel to the channel, and symmetrically around the centerline of the channel. A minimum 150-foot horizontal clearance in the main channel between the fenders is required. There are subaqueous utilities located within the limits of construction of the fender system. Design and construction of the fender system must be coordinated with subaqueous utility owners. Gulf Power (to remain in place and energized), AT&T Corporate (to remain in place) and Okaloosa Gas District (to remain in place and in service) have subaqueous facilities within the anticipated footprint of the new fender system and are to remain in place. The Design-Build firm's fender design shall avoid impacts to these subaqueous facilities.

**Roadway Widening on SR 145**

SR 145 (Perry Avenue SE) shall be milled, resurfaced, and widened from SR 30 to the Publix Entrance. The typical section will consist of milling and resurfacing the existing 12 ft lanes and widening adjacent to the northbound lanes to add a dedicated right turn lane into Publix, curb and gutter, and a ~~5 ft to~~ 6 ft concrete sidewalk adjacent to the northbound lanes. The existing sidewalk adjacent to the southbound lanes will remain. At the intersection with SR 30, lane requirements include a southbound shared left, right, thru lane and a southbound left turn lane. The required design speed for SR 145 is 30 mph.

**Roadway Widening on Perry Avenue South**

Perry Avenue South will be widened and reconstructed from Brooks Street to SR 30. The typical section will consist of reconstruction, widening and milling/resurfacing to provide five 11 ft lanes, a 7 ft buffered bicycle lane, 8 ft concrete sidewalk adjacent to the northbound lanes, curb and gutter, and 14 ft of pavement adjacent to the southbound lanes for replacement of existing on street parking. The existing sidewalk adjacent to the southbound lanes will remain. At the intersection with Brooks Street, lane requirements include a southbound right turn lane and a southbound left turn lane. At the intersection with SR 30, lane requirements include a northbound left turn lane, a northbound thru lane and a northbound right turn lane. The required design speed for Perry Avenue South is 30 mph.

The Design Build Firm will be required to mill and resurface portions of the existing on street parking area along Perry Avenue South.

**Brooks Street Realignment**

Brooks Street shall be realigned to accommodate the roadway widening on SR 30 and the bridge replacement. The typical section shall consist of two 11 ft travel lanes, curb and gutter, and an 8 ft sidewalk along the left side of the typical section adjacent to the curb. The required design speed for Brooks Street is 20 mph.

**Florida Blanca Realignment**

Florida Blanca Place shall be realigned to accommodate the roadway widening of SR 30 and the bridge replacement. The typical section shall consist of two 11 ft travel lanes, curb and gutter, and 6 ft sidewalk along the right side of the typical section adjacent to the curb. The required design speed for Florida Blanca Place is 20 mph.

**Business Access Road Reconstruction**

The Business Access Road that connects businesses adjacent to SR 30 to Santa Rosa Boulevard near the east bridge landing shall be reconstructed and realigned to preserve access for businesses, accommodate the construction of Pond 8, and allow replacement of the bridges. The typical section shall consist of two 12 ft travel lanes with curb and gutter. The required design speed for Business Access Road is 15 mph.

**Roadway Widening on Santa Rosa Boulevard**

Santa Rosa Boulevard will be widened to five lanes from west of the new Eastbound Connection to its intersection with the new North Connection. The typical section shall consist of four 11 ft travel lanes, a 15 ft two way left turn lane, curb and gutter, 7 ft buffered bike ~~lines~~ lanes on both sides, and 6 ft concrete sidewalk on both sides. Traffic signals shall be constructed at the intersection of Santa Rosa Boulevard and the Eastbound Connection. At the intersection with the new Eastbound Connection, lane requirements include a northbound left turn lane, a northbound thru/right lane, and a southbound left turn lane. The required design speed for Santa Rosa Boulevard is ~~30~~ 35 mph.

### **New North Connection Roadway Construction**

A new North Connection will be constructed to connect SR 30 to Santa Rosa Boulevard. The typical section will consist of two 11 ft travel lanes, 7 ft buffered bike lanes on both sides, 6 ft sidewalk on both sides, and curb and gutter. A northbound right turn lane will be required to serve the loading dock at Emerald Coast Convention Center. A traffic channelization island will be constructed at the intersection of New North Connection and SR 30 to facilitate right in, right out traffic movements. The required design speed for North Connection is 30 mph.

### **Santa Rosa Boulevard Roundabout**

A roundabout shall be constructed at the intersection of Santa Rosa Boulevard and the New North Connection. The roundabout shall have a minimum inscribed circle diameter (ICD) of 130 ft. The roundabout typical section will consist of one 20 ft lane and 10 ft sidewalk within the limits of the roundabout. The center of the roundabout will consist of a 90 ft diameter truck apron and a 60 ft diameter central island. The minimum design vehicle for this roundabout is a WB-62FL. Landscaping is required in the central island in conformity with FDOT Design Manual 213.9 and 213.12. Landscaping shall be designed and installed in a similar style and quality as the landscaping at the existing Hilton Garden Inn and Holiday Inn Resort entrance roundabout. Irrigation shall be installed. Okaloosa County Convention Center has an existing irrigation system that includes elements within and adjacent to the existing roundabout on Santa Rosa Boulevard. In coordination with Okaloosa County, the Design-Build Firm will be allowed to modify the system to accommodate proposed irrigation for landscaping within the Santa Rosa Boulevard roundabout. Any proposed modification to the Convention Center irrigation system must be submitted to Okaloosa County for approval. Vertical obstructions shall be in place prior to opening roundabout to traffic.

### **Eastbound Connection Roadway Construction**

A new Eastbound Connection shall be constructed to connect Santa Rosa Boulevard and SR 30. The typical section shall consist of two to four 11 ft lanes in a similar configuration as shown in the Concept Plans, curb and gutter, a 7 ft minimum **e width** raised median with traffic separator, a 12 ft shared use path along the left side of the typical section, and a 6 ft concrete sidewalk along the right side of the typical section. At the intersection with SR 30, lane requirements include dual northbound right turn lanes. Left turns will be restricted. At the intersection with Santa Rosa Boulevard, lane requirements include a westbound left turn lane with a minimum length of 410 ft, and a shared westbound left/right turn lane. The required design speed for the Eastbound Connection is 20 mph.

### **Eastbound Connection Roundabout**

A roundabout shall be constructed to provide access to the Hotel Entrance Road. The roundabout shall have a minimum inscribed circle diameter (ICD) of 130 ft for westbound traffic and a 154 ft ICD for eastbound traffic. The roundabout typical section will consist of one 12 ft lane and 12 ft sidewalk in the westbound direction and two 12 ft lanes and 6 ft sidewalk in the eastbound direction. The center of the roundabout will consist of a 106 ft diameter truck apron and a 60 ft diameter central island. The minimum design vehicle for this roundabout is a WB-40. Landscaping and/or community aesthetic features are required in the central island in conformity with FDOT Design Manual 213.9 and 213.12. Landscaping shall be designed and installed in a similar style and quality as the landscaping at the existing Hilton Garden Inn and Holiday Inn Resort entrance roundabout. Irrigation shall be installed. Vertical obstructions shall be in place prior to opening roundabout to traffic.

### **Hotel Entrance Roadway Construction**

A Hotel Entrance Road shall be constructed on the southern end of the Eastbound Connection roundabout to tie into access at the Holiday Inn Resort off SR 30. The typical section will consist of two 12 ft travel lanes, raised median varying in width from 0 to 7 feet adjacent to the roundabout, curb and gutter, and a 6

ft sidewalk adjacent to the northbound lane. The required design speed for the Hotel Entrance Road is 15 mph. The existing roundabout at the south end of the proposed Hotel Entrance Road shall be removed.

**Turn Lanes**

**A summary of required turn lanes are listed below. Turn lane widths and lengths shall be determined via applicable criteria, but shall at a minimum meet the requirements below.**

| <u>Mainline</u>        | <u>Direction</u> | <u>Cross Street</u>                   | <u>Width (Ft.)</u> | <u>Total Length including Taper (Ft.)</u> |
|------------------------|------------------|---------------------------------------|--------------------|---|
| <u>SR 30</u>           | <u>EBL</u>       | <u>Perry Ave.</u>                     | <u>11</u>          | <u>220</u>                                |
| <u>SR 30</u>           | <u>WBR</u>       | <u>Perry Ave.</u>                     | <u>12</u>          | <u>460</u>                                |
| <u>SR 30</u>           | <u>WBR</u>       | <u>North Connector</u>                | <u>11</u>          | <u>428</u>                                |
| <u>SR 30</u>           | <u>WBL</u>       | <u>EB Connector</u>                   | <u>11</u>          | <u>365</u>                                |
| <u>SR 30</u>           | <u>EBR</u>       | <u>EB Connector</u>                   | <u>11</u>          | <u>560</u>                                |
| <u>SR 30</u>           | <u>EBR</u>       | <u>Hotel Entrances/Pier Road</u>      | <u>11</u>          | <u>956</u>                                |
| <u>SR 30</u>           | <u>WBL</u>       | <u>Hotel Entrances (Sta. 143+00)</u>  | <u>11</u>          | <u>245</u>                                |
| <u>SR 30</u>           | <u>EBL</u>       | <u>Pier Road</u>                      | <u>11 (2)</u>      | <u>412</u>                                |
| <u>N. Perry</u>        | <u>NBR</u>       | <u>Publix</u>                         | <u>12</u>          | <u>200</u>                                |
| <u>N. Perry</u>        | <u>SBL</u>       | <u>SR 30</u>                          | <u>12</u>          | <u>440</u>                                |
| <u>S. Perry</u>        | <u>NBL</u>       | <u>SR 30</u>                          | <u>11</u>          | <u>170</u>                                |
| <u>S. Perry</u>        | <u>NBR</u>       | <u>SR 30</u>                          | <u>11</u>          | <u>140</u>                                |
| <u>S. Perry</u>        | <u>SBL</u>       | <u>Brooks St.</u>                     | <u>11</u>          | <u>173</u>                                |
| <u>Santa Rosa Blvd</u> | <u>SBL</u>       | <u>EB Connector</u>                   | <u>15</u>          | <u>228</u>                                |
| <u>Santa Rosa Blvd</u> | <u>NBL</u>       | <u>EB Connector</u>                   | <u>15</u>          | <u>116</u>                                |
| <u>North Connector</u> | <u>NBR</u>       | <u>Convention Center Loading Dock</u> | <u>11</u>          | <u>198</u>                                |
| <u>EB Connector</u>    | <u>WBR/L</u>     | <u>Santa Rosa Blvd</u>                | <u>11</u>          | <u>410</u>                                |

**Drainage**

The Design-Build Firm will develop a drainage system to convey, treat, and attenuate runoff from the project. The Design-Build Firm will provide stormwater treatment and attenuation. Five stormwater management ponds are anticipated within the project limits: Ponds 1, 2, 4, 7A, and 8. Pond 1 is located in Fort Walton Beach. Ponds 2, 4, 7A, and 8 are located on Okaloosa Island.

The Design-Build Firm shall provide maintenance access to the stormwater ponds as follows:

- Pond 1 - Access shall be provided via one 15-foot minimum-width curb cut **concrete** driveway adjacent to the pond and located along the west side of Brooks St. so as to provide safe ingress and egress by maintenance vehicles and equipment.
- Pond 2 - Access shall be provided via one 15-foot minimum width curb cut **concrete** driveway adjacent to the pond and located along the east side of the west Business Access Rd. so as to provide safe ingress and egress by maintenance vehicles and equipment.



- Pond 8 - Access shall be provided via one 15-foot minimum width curb cut **concrete** driveway adjacent to the pond and located along the north side of the Eastbound Connection roadway so as to provide safe ingress and egress by maintenance vehicles and equipment.
- Pond 4 - Access shall be via the WB SR 30 (US 98) roadway shoulder adjacent to south side of the pond. A paved maintenance access turnout is not required for this pond.
- Pond 7A - Access shall be provided via one 15-foot minimum width curb cut **concrete** driveway adjacent to the pond and located along the south side of Santa Rosa Blvd. so as to provide safe ingress and egress by maintenance vehicles and equipment.

**Access to all ponds shall be appropriately designed and stabilized to withstand maintenance equipment and vehicles.**

Stormwater has been observed to stage on the south side of SR 30 west of Pier Road. Design-Build Firm's drainage design should address this issue.

**Signing and Pavement Marking**

The Design-Build Firm shall evaluate and provide guide signs, regulatory signs, warning signs, and pavement markings for all roads and driveways within the project limits. Pavement subject to temporary striping for maintenance of traffic beyond the limits of construction or widening shall be milled and resurfaced. All signs shall be new in conformance with MUTCD, TEM and Standard Plans and all applicable design bulletins.

**Signalization and Intelligent Transportation Systems**

Three signalized intersections will be constructed, including full signalization at SR 30 and SR 145 (Perry Avenue), SR 30 and Eastbound Connection, and Santa Rosa Boulevard and Eastbound Connection. The existing traffic signals at the intersection of SR 30 and Santa Rosa Boulevard will be removed.

The signalized intersection at SR 30 and SR 145 shall incorporate pedestrian signals and crosswalks on the north, south, east and west sides of the intersection to facilitate the movement of pedestrians.

The signalized intersection at SR 30 and the Eastbound Connection shall incorporate pedestrian signals and crosswalks on the south side of SR 30 to facilitate the movement of pedestrians across the Eastbound Connection.

The signalized intersection at Santa Rosa Boulevard and the Eastbound Connection shall incorporate pedestrian signals and crosswalks on the south, north and east side of the intersection to facilitate movement of pedestrians across Santa Rosa Boulevard and the Eastbound Connection, respectively.

All new signalized intersections in this project shall be constructed with new mast arm pole, high-definition IP addressable CCTV camera, NEMA TS2 Type 1 Controller Cabinets and Advance Traffic Controllers compatible with the current operating software at the Okaloosa County Traffic Operations Center. Standalone CCTV camera with Camera Lowering Device (CLD) on both sides of the bridge on the roadway approach-departure portion to monitor traffic conditions on the bridge is required for this project.

A fully autonomous Road Weather Information System (RWIS) near the bridge is required in this project and shall be connected via fiber optic-based communication to the Okaloosa County Traffic Management Center with Center-to-Center connectivity to the D-3 RTMC in Chipley to receive all transmitted data for

operations and maintenance. The standalone CCTV cameras with CLD and the RWIS sites will be monitored and maintained by the Department from the District RTMC in Chipley.

Induction loop detection shall be used for design of permanent vehicular detection at all signalized intersections.

The Design-Build firm shall design, construct, operate, and maintain a smart work zone (SWZ) to include CCTV cameras maintaining full coverage through the duration of construction.

### **Lighting**

The Design-Build Firm shall design and construct lighting along SR 30 within the limits of the new bridges and approaches within limits of retaining wall. Lighting constructed by Design Build Firm shall meet aesthetic requirements defined in the RFP. The Design-Build Firm shall design and construct the underdeck lighting for the portions of the project where US 98 is elevated at Santa Rosa Blvd. and at Brooks Street.

The Design-Build Firm shall design all remaining lighting which will be constructed by Gulf Power. See Figures 3 and 4 below depicting the approximate limits of lighting design and construction west and east of the proposed bridges. There is existing lighting on SR 30, Brooks Street, Florida Blanca Place, and Santa Rosa Boulevard. The Design-Build Firm will be required to coordinate and complete the design/replacement/relocation of any lighting on these streets disturbed during construction. The Design-Build Firm shall coordinate design of the lighting to be installed by others with Gulf Power. The Design Build Firm shall also coordinate with the City of Fort Walton Beach and Okaloosa County, as appropriate.

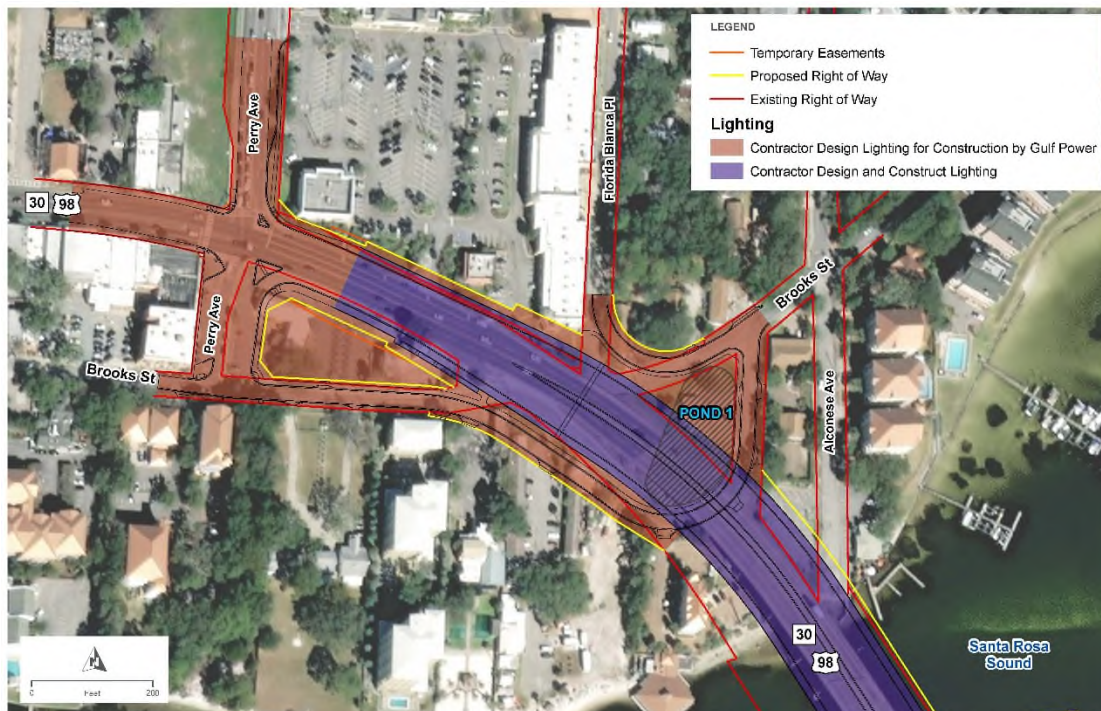


Figure 3: Lighting Design and Construction – West of Bridges

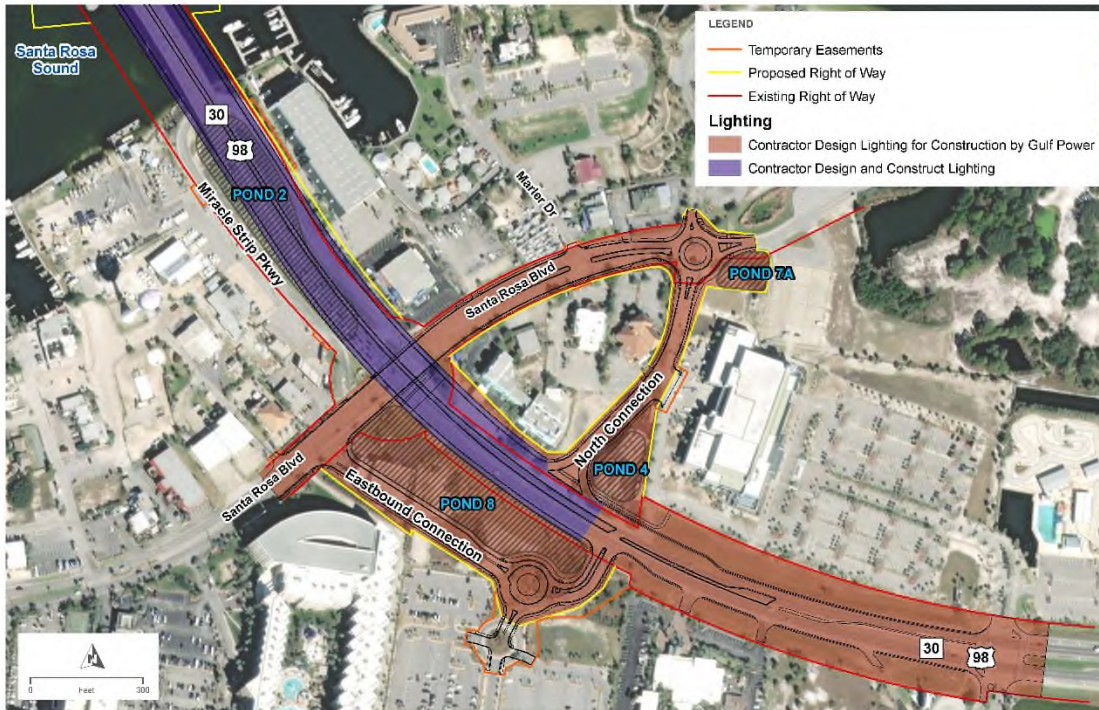


Figure 4: Lighting Design and Construction - East of Bridges

The proposed lighting is to be **typical** FDOT Conventional Lighting of the Light Emitting Diode (LED) type with full cutoff distribution to reduce sky glow as much as possible. High mast lighting is not allowed on this project.

The existing lighting in conflict with the proposed design shall be removed. **Temporary lighting shall be provided if existing lighting is removed prior to installation of proposed lighting.** The Design-Build Firm shall remove lighting in conflict and stockpile on site for the Department's contamination contractor to remove from the project. Contact the District Contamination Coordinator at (850) 330-1511.

#### Lighting Requirements:

- Lighting Design Analysis Report (LDAR)
- Power Design Analysis Report (PDAR)
- All new LED highway lighting system on SR 30, North Connection, and Eastbound Connection
- Navigational lighting
- Underdeck lighting at all overpass locations
- All signalized intersections
- Roundabout Lighting
- Side Street Lighting
- Shared use path on bridges
- Replace impacted lighting at Brooks Bridge Waterfront Park/ Brooks Bridge Fishing Park
- Aesthetic lighting

#### **Brooks Bridge Waterfront Park / Brooks Bridge Fishing Park**

The Design-Build Firm shall provide all needed design and construction services to restore the Brooks Bridge Waterfront Park and the Brooks Bridge Fishing Park. During construction, the Brooks Bridge Waterfront Park and the Brooks Bridge Fishing Park will be temporarily closed to public use for safety reasons. Following construction, the Design-Build Firm shall restore both of these park facilities including all current amenities to at least pre-construction conditions in coordination with the City of Fort Walton Beach. The Brooks Bridge Waterfront Park currently includes 44 public parking spaces, including handicap, motorcycle and bicycle parking; sidewalk as part of the Fort Walton Beach Boardwalk; pavers, shoreline stabilization, benches, picnic tables, lighting, landscaping, fencing, and a kayak/canoe launch. The Brooks Bridge Fishing Park (aka: City of Fort Walton Beach Fishing Park; currently includes lighting, bench, trash can, and shoreline stabilization. All park features impacted by construction shall be replaced with new amenities incorporating maintainable materials. The location, type, and configuration of the post-construction amenities shall be similar in scope and quality to the pre-construction amenities.

**Ongoing Right-of-Way Acquisition Process**

The Department's Right-of-Way Office is acquiring the necessary right-of-way for the project either by negotiated settlement or by the exercise of eminent domain (condemnation). The anticipated right-of-way clear date for the Project is included in the RFP. The right-of-way requirements for the Project are based on the maps as developed from the requirements of the conceptual plans included as a Reference Document in this RFP. Right-of-way maps provided are for informational purposes only. Design-Build Firm's verification with the public records is advised to confirm the accuracy of the maps. Construction activities cannot occur on acquired property until it has been certified as "clear" by the Department's Right-of-Way Office and a right-of-way certification has been issued by the Department. During the right-of-way acquisition process there are often instances where design commitments are made based on agreements with owners during settlement negotiations or as part of final negotiated settlements.

Such agreements are required to enable successful negotiations with property owners. Oftentimes, these agreements are of benefit to both the property owner and the Department. These agreements include, but are not limited to profile grade, driveway connections, culverts, ditch profiles, median openings, etc. Any design commitments made in settlement must be incorporated in the design and construction of the Project to not only function as a safe and efficient roadway, but for it to also consider the desires and needs of adjoining property owners. Any Right-of-way Commitments for these specific items are included as attachments to this RFP.

There will likely be agreements with property owners made during remaining right-of-way acquisition negotiations. As the right-of-way process progresses there may be commitments that will be forthcoming. Any right-of-way commitments made by the Department and subsequently issued to the awarded Design-Build Firm after contract execution shall be incorporated into the plans and design documents for the Project and be constructed as part of the Project. After Contract execution, if additional installations/modifications are required, the Department will negotiate with the Design-Build Firm on an appropriate supplemental agreement for the required work or in the Department's discretion pay for such work pursuant to Subarticle 4-3.2, Division I, Design-Build Specifications for this contract.

As the negotiation phase of any right-of-way parcel acquisition comes to a close there will likely be a need for one or more parcels that have not been acquired by negotiation to be condemned. Any such condemnation action will be initiated by the Department and will immediately require assistance and court testimony from the Engineer of Record for the Design-Build Firm regarding both public purpose and the reasonable necessity of specific parcels for the project. The Design-Build Firm will be required to provide any and all documentation immediately as may be requested by the Department to aid in the Right-of-Way acquisition process. The Design-Build Firm's Engineer of Record is required to be available as needed by the Department to assist in the Right-of-Way acquisition process. If the Design-Build Firm's Engineer of

Record is required to act as an expert witness (i.e. for deposition or court testimony) the Department will enter into a separate contract with the Design-Build Firm's Engineer of Record for this effort.

After right-of-way acquisitions are complete, the Department will have its demolition contractor (under a separate contract) remove all building, concrete slabs, concrete driveways, signs, septic tanks, and wells during its clearing activities. The Design- Build Firm will be responsible for any remaining clearing and grubbing including but not limited to existing fencing, trees, concrete removal, etc.

All design and construction activities for the project will be required to remain within the Department's right-of-way. The Department Right-of-Way Maps are available on the internet. These maps are the controlling document in reference to right-of-way line location. The concept plans may or may not accurately depict the right-of-way being acquired by the Department.

During the right-of-way acquisition negotiation process, the Department may obtain rights-of-entry or easements from property owners and document this specific access right in the Right-of-Way Commitments. For this reason, the Right-of-Way Commitments that include property access rights shall overrule the Right-of-Way Maps and the concepts plans.

***Portions of the right-of-way being acquired by the Department are owned by Eglin Air Force Base. The Department will not consider proposed design changes which require additional Eglin Air Force Base property.***

**Right of Way Acquisition Process for Unique Proposals by Design-Build Firms**

It is the Department's intent that all Project construction activities be conducted within the Right of Way. The Design-Build Firm may submit a Technical Proposal that requires the acquisition of additional Right of Way if the subject acquisition was approved during the Alternative Technical Concept (ATC) process. Any Technical Proposal that requires the acquisition of additional Right of Way will not extend the contract duration as set forth in the Request for Proposal under any circumstances. The Department will have sole authority to determine whether the acquisition of additional Right of Way on the Project is in the Department's best interest, and the Department reserves the right to reject the acquisition of additional Right of Way.

If a Design-Build Firm intends to submit a Technical Proposal that requires the acquisition of additional Right of Way, the Design-Build Firm shall discuss such a proposal with the Department as part of the ATC process. If a Design-Build Firm submits a Technical Proposal that requires the acquisition of additional Right of Way and the Design-Build Firm fails to obtain Department approval as part of the ATC process, then the Department will not consider such aspects of the Proposal during the Evaluation process. If the Design-Build Firm's Technical Proposal requires additional Right of Way approved by the ATC process, the additional Right of Way will be required to be directly acquired by the Department. The Design-Build Firm shall submit, along with the Technical Proposal, Right of Way maps and legal descriptions including area in square feet of any proposed additional Right of Way parcels in the Technical Proposal. The additional Right of Way will be acquired by the Department in accordance with all applicable state and federal laws, specifically including but not limited to the Uniform Relocation Assistance and Real Property Acquisition Policies for Federal and Federally Assisted Programs (42 USC Chapter 61) and its implementing regulations. This includes completing a State Environmental Impact Report (SEIR) or National Environmental Policy Act (NEPA) evaluation as appropriate. All costs concerning the acquisition of additional Right of Way will be borne solely by the Design-Build Firm. These costs include, but are not limited to consultant acquisition, appraisal services, court fees, attorney and any expert fees, property cost, etc. The Department will have sole discretion with respect to the entire acquisition process of the additional Right of Way.

If the Design-Build Firm's Technical Proposal requires additional Right of Way, the acquisition of any such Right of Way shall be at no cost to the Department, and all costs associated with securing and making ready for use such Right of Way for the Project shall be borne solely by the Design-Build Firm as a part of the Design-Build Firm's Lump Sum Price Bid. The Department will not advance any funds for any such Right of Way acquisition and the Design-Build Firm shall bear all risk of delays in the acquisition of the additional property, regardless of cause or source. No additional contract time will be granted.

The Design Build Firm shall provide to the Department an estimate of the purchase price of the land from the property owner and any conditions related to the purchase. The Department will provide to the successful Design-Build Firm an estimate of all costs related to the acquisition and use of the additional Right-of-Way for the project. At the time the Design-Build Firm returns the executed contract to the Department, the Design-Build Firm will provide the Department funds equal to the amount of the Department's estimate along with a Letter of Credit approved by the Department in an amount equal to 100% of the Department's estimate. If additional funds beyond the Department's estimate are anticipated, the Design-Build Firm shall be solely responsible for all such costs and provide the same to the Department upon ten (10) days written notice from the Department. The Letter of Credit is for the purpose of securing the obligations of the Design-Build Firm with respect to the acquisition and use of additional Right-of-Way. The Letter of Credit will be released upon the Department's determination that all costs related to the acquisition of and making ready for use of the additional Right-of-Way have been satisfied. Any remaining funds provided will be returned to the Design-Build Firm.

Any additional Right of Way must be acquired prior to the commencement of any construction on or affecting the subject property. The Design-Build Firm waives any and all rights or claims for information, compensation, or reimbursement of expenses with respect to the Design-Build Firm's payment to the Department for costs associated with the acquisition of the additional Right of Way. The additional Right-of-Way cannot be used for any construction activity or other purpose until the Department has issued an applicable parcel clear letter or a Right of Way Certification for Construction.

If the Department's attempt to acquire the additional Right of Way is unsuccessful, then the Design-Build Firm shall provide a design of the Project within existing Right of Way and be required to complete the Project solely for the Lump Sum Price Bid, with no further monetary or time adjustments arising therefrom. Under no circumstances will the Department be liable for any increase in either time or money impacts the Design-Build Firm suffers due to the Design-Build Firm's proposed acquisition of additional Right of Way, whether or not the acquisition is successful.

**Intelligent Transportation Systems (ITS)**

The Design-Build Firm shall provide a fiber optic-based communication trunk line connecting the signalized intersections and tie to the existing communication network of the Okaloosa County traffic management center. The conduits for the ITS shall be comprised of two 2-inch HDPE and shall be provided along SR 30 and inside the bridge railings to support the field-to-center connectivity of the signalized intersection Advance Traffic Controllers. The Design-Build Firm shall provide conduit for all lighting and ITS requirements included in this document for the full project limits. For the waterway crossing, the Design-Build Firm shall install three – 2" conduit in each traffic railing on each bridge. All conduits available in the traffic railings are anticipated to be needed for lighting and ITS elements. The Design-Build Firm shall provide a design that also considers future conduit locations feasible for private utility companies that would be hidden from an exterior profile view of the bridges and be located between the beam bays with hangers designed to support the conduits.

**ITS subsystems are later defined in this RFP document.** The ITS subsystems for this project shall include **at a minimum** Advance Traffic Controllers for traffic signals, High Definition IP addressable CCTV cameras at each signalized intersection, two (2) high definition IP addressable CCTV camera to cover full viewing of the bridge over the waterways, fully autonomous Road Weather Information System (RWIS), Induction loop vehicular detection for signalized intersections, and ~~96-144~~ counts of single mode fiber optic cables for communication with lateral connection to the Local Area Network inside the cabinets for traffic signal controllers and CCTV cameras. The ITS subsystems constructed as part of this project will be operated and maintained from Okaloosa County Traffic Operations Center with the exception of the two standalone CCTV with CLD and RWIS sites. The ITS ~~field devices, supporting infrastructure and equipment within the~~ scope of this Project shall include, **but not be limited to: field devices, supporting infrastructure,** communications design, **hardware power** design, technical specifications, design plans, fiber optic cable splicing plan(s), test plans, **Systems Engineering documents such as** Project Systems Engineering Management Plan (PSEMP), Requirements Traceability Verification Matrix (RTVM), utility coordination, design documentation report, **Intelligent Transportation Systems Facility Management (ITSFM), development of system test and acceptance procedures,** and incidental items as applicable to this Project. **Develop and submit each ITS test plans to the Department for review and approval. Use only equipment and components that meet the requirements of the RFP, which are listed on the Department's Approved Products List (APL).**

### **Aesthetics**

**General Approach** - The approach to an aesthetically pleasing Brooks Bridge shall start from a holistic understanding of the site context and differing conditions. The aesthetic approach shall work at the global scale of the project. FDOT conducted an online workshop to solicit public input on aesthetic elements and community values. The results are documented in the Brooks Bridge Aesthetic Workshop Survey Report (the "Aesthetic Survey Report") included as a Reference Document. The community overwhelmingly selected a "clean and contemporary" style over a historical or purely functional design. A contemporary design shall transition super structure depths in a gradual manner, provide consistent overhang cantilevers, and conceal conduits and drainage between girder lines. In addition, the Design Build Firm shall consider enhancements to piers, overlooks, railing, retaining walls, roadway lighting, aesthetic lighting, and pedestrian connectivity to provide a cohesive design that reflects community preferences as guided by the Aesthetic Survey Report. All aesthetic enhancements shall consider long term maintainability.

Sample aesthetic images are included as Reference Documents (Sample Aesthetic Interpretation and Views). These graphics provide examples of the visual quality of aesthetic elements required for this contract. The graphics represent one interpretation of the results of public involvement as documented in the Aesthetic Survey Report. The Design Build Firm is encouraged to develop its own interpretation of elements consistent with the Online Meeting Results. The Design-Build Firm may also propose a concept similar to the sample images provided.

**Piers** - The Contractor shall provide a contemporary pier form that is recognized to be representative of Fort Walton Beach and avoids typical highway pier forms. The pier geometry shall achieve shade and shadow differentiations by forming the pier to create surface variations. Considering the skewed alignment of the bridge over the navigational channel, the water and land piers shall be developed as a 'family of forms'. In order to address the urban design conditions of the low land piers, the design of the lowland piers can be a modification of the water pier form.

**Overlooks** - The Contractor shall provide a minimum of four (4) overlooks, including two on the eastbound bridge and two on the westbound bridge. Two overlooks (one on each bridge) shall be at the main span. The other two shall be located as near as practical to the shoreline to provide easy access for pedestrians while preserving the privacy of structures on the land. Overlooks should be located to provide pleasing

views of the waterway and surrounding area. Each overlook shall be a minimum of 300 SF not to include the 12 foot shared use path area. The overlook shape shall be curvilinear to avoid angular corners at the transition from the shared use path to the overlook. Each overlook shall have a canopy that is equal to or greater than the overlook surface area and include the majority of the adjacent shared use path area. Material selection shall be low maintenance and have a high resistance to wind induced damage or deformation. Illumination of the areas under the canopies shall be consistent with illumination along adjacent areas of the shared use path.

Railing - The Contractor shall provide a contemporary railing system using low maintenance materials for a marine environment. The railing shall reduce the opportunities for birds to land. The railings shall be designed to FDOT Standards.

Retaining Walls - The Contractor shall design retaining walls finishes that have a contemporary design utilizing shallow (less than 4") relief and reflect public input documented in the Aesthetic Survey Report.

Roadway Lighting - The Contractor shall locate the roadway lighting poles at the barrier between the shared use path and roadway in a boulevard arrangement. The **lighting standards** should align transversely in plan rather than be staggered. The Contractor shall present concept plans with low height poles (in the 35' high range) that utilize LED light source with cut offs to avoid light spill into the water and neighborhoods. If needed to achieve the required foot candles on the path, secondary shared use path lighting shall be provided by luminaries embedded in the railing posts. Roadway lighting posts shall be of contemporary design with simple arms and without ornamentation. The same light posts shall be used throughout the corridor in locations where the Design Build Firm has responsibility for lighting construction.

Aesthetic Lighting -The Contractor shall provide aesthetic girder lighting on the bridge from abutment to abutment as well as aesthetic pier lighting. Aesthetic lighting shall include only white and/or blue lights along the girders and illuminating the piers. Lighting design and placement shall provide holistic aesthetic lighting; however, our preference is to reduce the total number of light fixtures to reduce maintenance efforts. The aesthetic lighting shall be located at the edge of the deck cantilever and focus lighting on the exterior girder on the north and south side only (not in between the two roadways). The fixtures shall be located in a chase designed to reduce the impacts of high wind and debris damaging the system. The color of the chase shall match the color of the deck material. Conduit boxes shall be placed behind the exterior girder unless the boxes can be located near the source without disrupting the light spread and out of causal viewing. The LED light spread shall be designed to be even across the face of the girder and not spill past the girder.

Pedestrian Connectivity -Connecting pedestrians to the bridge and providing pedestrian amenities was a desire of the public as described in the Aesthetic Survey Report. The Design Build Firm shall include a focus on connecting pedestrians and bicyclists to the bridge and enhancing opportunities for pedestrians and bicyclists to interact with the bridge, surrounding parks, and surrounding infrastructure.

### Utilities

The Design-Build Firm will be responsible for providing utility adjustment plans and coordinating utility relocations. The Design-Build Firm shall be responsible for determining, through the use of non-destructive means, both the horizontal and vertical location of all existing utilities above and below ground within the project limits, and for coordinating with the Utility owner(s) for any necessary relocation and/or adjustment of their utilities through the development of a comprehensive utility work schedule. Existing utility location information is provided in the RFP and Reference Documents. The Design-Build Firm shall avoid utility impacts as much as possible. Avoidance techniques, such as utility conflict structures, should be used to avoid impacts.



Along with coordinating utility relocations for the project, the Design-Build Firm is required to perform Utility Work by Highway Contractor (UWHC) for the following UA/O's.

1. Okaloosa County Water & Sewer (OCWS) – All Relocations – Conceptual UWHC Relocation Plans are provided based on the Concept Plans
2. Eglin AFB Communications – All Relocations – UWHC Relocation Plans to be coordinated
3. Cox Communications, Century Link, AT&T Florida, Okaloosa County Traffic and Utility – Partial Relocations - Six (6) four-inch (4") communications ducts to be placed under the bridge for use for relocation.

The Design-Build Firm shall design, permit, and relocate/adjust OCWS water and sewer facilities as required for the construction of the project. The approximate limits shown in the concept plans are the required begin and end limits for the new utility lines. The concept plans depict the required tie-in locations for each utility relocation, and item (i) describes the delineation of work between OCWS and the Design-Build firm as it relates to utility connections and tie-ins. The concept plans indicate where casing will be required. All concept plan callouts labeled "proposed" and any additional conceptual line locations in the concept plans are the responsibility of the Design-Build Firm to design and construct. The Design-Build Firm shall utilize new materials in compliance with OCWS Standard Specifications and Design Manual. Re-use of existing piping, appurtenances, and other equipment is not allowed unless specifically indicated in conceptual plans. All valves, ARVs, sampling locations, and related appurtenances that may be required for permitting, testing, and clearing the utility relocations shall be designed and installed by the Design-Build Firm. This work will be funded under FPID 415474-2-56-01 and shall be bid accordingly under the FPID.

#### Design of OCWS Utility Work

- a) The Design-Build Firm shall prepare a final engineering design, plans, technical special provisions, permit applications (including, but not limited to, OCWS, FDEP and the FDOT) for the utility work for Okaloosa County Water and Sewer in accordance with the OCWS Standard Specifications and Design Manual.  
[http://www.co.okaloosa.fl.us/sites/default/files/doc/dept/ws/Spec\\_Manual.pdf](http://www.co.okaloosa.fl.us/sites/default/files/doc/dept/ws/Spec_Manual.pdf). In the event of a conflict between the OCWS requirements and any FDOT Governing Regulations, the Department shall determine which provisions apply based on the intent and purpose of the OCWS Utility Work.
- b) The Plans Package shall be in the same format as the Department's contract documents for the Project and shall be suitable for reproduction.
- c) Unless otherwise specifically directed in writing, the Plans Package shall include any and all activities and work effort required to perform the utility work, including, but not limited to, all clearing and grubbing, permitting, survey, subsurface engineering (as required), utility coordination (telephone, fiber, cable, electrical, gas, etc.) and shall include traffic and erosion control plans.
- d) Construction costs for mobilization, clearing and grubbing and maintenance of traffic for this utility work are to be included in the main project and not in the utility relocations cost.
- e) The Plans Package shall be prepared in compliance with the FDOT Utility Accommodation Manual and the FDOT Design Manual, and the Department's contract documents for the Project.

If the FDOT Design Manual conflicts with the FDOT Utility Accommodation Manual, the Utility Accommodation Manual shall apply where such conflicts exist.

- f) The Design-Build Firm shall prepare the Utility Work's technical special provisions, which are a part of the Plans Package, in accordance with the Department's guidelines on preparation of technical special provisions and shall not duplicate or change the general contracting provisions of the FDOT Standard Specifications for Road and Bridge Construction and any Supplemental Specifications for the Project.
- g) The Design-Build Firm shall provide a copy of the proposed Plans Package to the Department and OCWS for review at the following stages: 60%, 90% and 100% plans.
- h) The Design Build Firm shall at all times be and remain solely responsible for proper preparation of the Plans Package and for verifying all information necessary to properly prepare the Plans Package, including survey information as to the location (both vertical and horizontal) of the Utility Facilities.
- i) The utility work will include all utility facilities of OCWS which are located within the limits of the Project, except those facilities agreed to by OCWS to be performed by their forces, of which shall only include installing the final utility tie-ins to the existing system, for both water and sewer. All materials and labor related to the final utility tie-ins will be provided by OCWS, and shall include fittings, valves, tees, tapping sleeves, linestops, restraints and thrust blocking as required to complete the tie-in work. These exceptions shall be handled by the Design-Build Firm through utility coordination efforts. The Design-Build Firm shall coordinate the timing and scheduling of the tie-ins directly with OCWS.
- j) All new and existing residential and/or commercial service connections will be required to be designed and installed by the Design-Build Firm. It will be the Design-Build Firm's responsibility to determine the number and location of service connections required. Coordination of existing and proposed service connections will be confirmed with OCWS. The Design-Build Firm will be responsible for running the service to the meter and provide all testing. OCWS will be responsible for the connections to the meters.
- k) Utility facilities of OCWS shall not be mounted to the exterior faces of structures and must be hidden from view.
- l) The Design-Build Firm shall fully cooperate and coordinate the utility work with all other right of way users in the preparation of the Plans Package.
- m) Upon completion of the utility work, the facilities shall be deemed to be located on the Department's right-of-way under and pursuant to the Utility Permit to be issued by the Department. The Design-Build Firm shall facilitate and comply with all permit conditions, and provide all disinfection, pressure testing, laboratory tests, permit certifications, record drawings, etc. to obtain regulatory approval and clearance to place the utilities in service.

#### Utilities Protected in Place

- a) It is the intent of OCWS to protect-in-place the existing 16" HDPE directionally bored force main crossing on the southern side of the proposed bridge work (Sta.111-Sta.206). Upon completion of the new navigational channel barrier system OCWS shall conduct a pressure test of the existing 16" HDPE directionally bored force main (OCWS) crossing to verify that the force main was not

damaged during construction. OCWS shall cap the existing 16" HDPE force main on both ends of the existing bore as shown on the plans, and the force main shall be left in place for future use by OCWS.

Performance of OCWS Utility Work

- a) The Department shall perform all engineering inspection, and monitoring of the Utility Work to ensure that it is properly performed in accordance with the Plans Package. OCWS shall have representation on site periodically for consultation as necessary.
- b) Testing, monitoring and reporting shall be performed by the Design-Build Firm in accordance with standard industry practices for water and wastewater and in accordance with the OCWS Standard Specifications and Design Manual.
- c) All out of service OCWS mains, services, and appurtenances that are in conflict with the Design-Build Firm's Project design shall be removed and cost of removal be covered under FPID 415474-2-56-01. Should out of service facilities not require removal, then Design-Build Firm shall **fill the facilities with flowable fill and** cap them **and place them out of service** with costs being covered under FPID 415474-2-56-01.

Sequence of Construction

The Design-Build Firm shall follow the following proposed sequence of construction for all proposed OCWS water and sewer work:

**OCWS Utility Relocations - Sewer**

- a) Remove and relocate 6" force main (Sta.132 – Sta.138); OCWS to self-perform utility tie-ins to the existing system.
- b) Construct new 16" aerial flanged force main across newly constructed northern bridge span. Construct new 16" (underground) force main on both the east and west ends of the new bridge as required to connect to the existing force main system. OCWS to self-perform utility tie-ins to the existing force main system. Once the new 16" aerial force main on the northern bridge span is in service, Design-Build Firm shall disassemble and remove the existing 16" aerial force main across the existing bridge span.
- c) OCWS will cut and cap the existing 16" HDPE directionally bored force main crossing, and once all bridge work is completed OCWS will pressure test the bored force main to verify if any damage occurred during construction.
- d) Construct new 16" aerial flanged force main across newly constructed southern bridge span. Construct new 16" (underground) force main on both the east and west ends of the new bridge as required to connect to the existing force main system.

**OCWS Utility Relocations - Water**

- a) Remove and relocate 12" water main along SR30 (Sta.132 – Sta.148); OCWS to self-perform utility tie-ins to the existing system.
- b) Remove and relocate 6" water main along SR30 (Sta.135 – Sta.139); OCWS to self-perform utility tie-ins to the existing system.

- c) Remove, relocate, and adjust 6” and 12” water mains along Santa Rosa Blvd (Sta.46 – Sta.51); OCWS to self-perform utility tie-ins to the existing system.
- d) Remove, relocate, and adjust 6” water main along New North Connection Road (Sta.404 – Sta.406); OCWS to self-perform utility tie-ins to the existing system.
- e) Construct new 16” aerial flanged water main across newly constructed northern bridge span. Construct new 16” (underground) water main on both the east and west ends of the new bridge as required to connect to the existing water main system. OCWS to self-perform utility tie-ins to the existing water main system. Once the new 16” aerial water main on the northern bridge span is in service, Design-Build Firm shall disassemble and remove the existing 16” aerial water main across the existing bridge span.

The Design-Build Firm shall comply with the Utility Work by Highway Contractor Agreement that the Department executed with Okaloosa County Water & Sewer (see RFP Attachment Documents).

During the Design-Build procurement process for this contract, the Design-Build Firm shall not coordinate directly with Okaloosa County Water & Sewer due to their work being a requirement of this RFP. All questions related to their utility work requirements will be required to go through the FDOT Bid Question website.

The Design-Build Firm shall design, permit, and relocate/adjust Eglin AFB Communications facilities as required for the construction of the project. The Design-Build Firm shall coordinate this work directly with Eglin AFB Communications in determining the appropriate relocation plan, materials, specifications, and guidelines required by Eglin AFB Communications. During the Design-Build procurement process for this contract, the Design-Build Firm shall not coordinate directly with Eglin AFB due to their work being a requirement of this RFP. All questions related to their utility work requirements will be required to go through the FDOT Bid Question website. See RFP Reference Documents for 96 CS Design Guide.

The Design-Build Firm shall design, furnish, and install conduit under the bridge for Cox Communications, Century Link, AT&T Florida, Okaloosa County Traffic and Uniti Fiber. Conduit shall be 4” stainless steel and shall include all appurtenances necessary for bridge attachment. Stainless steel rigid conduits are to be Type 316 stainless steel with standard NPT threads. All elbows, nipples, couplings, connectors, hubs, clamps, u-bolts, plates, strut accessories and hardware are to be in kind with the stainless steel conduits. All components shall meet UL 6A and NEMA 4X standards, and be fully compliant with NEC. Aerial junction boxes or communication pull boxes are to be made with 316 stainless steel, double gang hub configuration, UL listed for US (Standard 514A), and sized for the conduits and quantities of conduits used. Spacing for the aerial junction boxes or communication pull boxes are to be determined by the Design-Build Firm based on the alignment of the bridge. Conduit placement shall meet contract aesthetic requirements and shall terminate on the roadway side of each abutment at a location accessible by standard vehicle for each UA/O. During the Design-Build procurement process for this contract, the Design-Build Firm shall not coordinate directly with ~~with~~ Cox Communications, Century Link, AT&T Florida, Okaloosa County Traffic and Uniti Fiber regarding work described within their respective Utility Work by Highway Contractor Agreement due to their work being a requirement of this RFP. All questions related to ~~the their~~ utility work described within their respective Utility Work by Highway Contractor Agreement requirements will be required to go through the FDOT Bid Question website. This work will be funded under FPID 415474-2-52-02 and shall be bid accordingly under this FPID.

**AT&T services will require a temporary crossing to be installed within one of the conduits described above. The AT&T subaqueous service will have to be relocated by AT&T to the temporary crossing prior to working within 10 ft of the limits of the subaqueous line.**

**During utility coordination on side roads requiring utility relocations, location preference shall be given to utilities belonging to the roadway owner. Utilities impacted along side streets and requiring relocation are subject to utility permits required by the local government. The Design-Build Firm shall be responsible for obtaining utility permits for Okaloosa County Water and Sewer relocations and coordinating other utility relocation permits.**

### **Permitting**

FDOT will submit FDEP ERP and FDEP State 404 Permit applications based on the concept plans. The Design-Build Firm will be responsible for submitting and obtaining the USCG Bridge Permit and completing, modifying and obtaining the FDEP ERP and FDEP State 404 Permits based on the final design plans. All other permitting activities are the responsibility of the Design-Build Firm.

### **Demolition of the Existing Bridge Superstructure and Substructure**

The Design-Build Firm shall demolish and remove the existing bridge, fender system and dolphins. **The existing bridge substructure was not designed to resist vessel collision. The existing bridge substructure level of protection against vessel collision (dolphins and fender system) that is currently in place must be maintained throughout all phases of construction prior to demolition.**

The Design-Build Firm shall be responsible for development of demolition plans outlining details for the work. Demolition plans must include at a minimum, but are not limited to the following: specific requirements pertaining to the demolition work, specific requirements and notes for the relocation (disposal) of the superstructure and substructure, miscellaneous shoreline and approach work, utility identification, maintenance of traffic (MOT) that will ensure all existing lanes remain open, storm water control, sedimentation control, and notes pertaining to the protection of endangered species

The original bridge at the project location was a swing bridge that was removed to construct the existing bridge. Foundational elements may be encountered.

The Design-Build Firm will be required to remove any debris that may still be located under water (i.e. old pile, footings, etc.) that are in conflict with the new bridge and fender construction. Within the limits of the main span and fender system, any existing foundations must be removed to 24 inches below the mudline, taking into account long term scour depths when determining the elevation of the mudline.

Okaloosa County currently has permitted artificial reef sites in the area. The Department's preference is to dispose of any feasible bridge debris in these permitted artificial reef sites. The Okaloosa County artificial reef information is included in the Reference Documents of this RFP.

The concrete debris from the existing bridge will become the responsibility of the Design-Build Firm.

### **Existing Vegetation Preservation and Exotic Vegetation Removal**

It is the intent to always preserve existing vegetation including trees and palms that do not conflict with proposed improvements. Tree and palm protection shall comply with FDOT Standard Plans for Road and Bridge Construction (Standard Plans), Index 110-100. Within the Project limits and within the Project Right of Way, it will be the responsibility of the Design-Build Firm to identify and remove all Category 1 invasive exotics as defined by the Florida Exotic Pest Plant Council ([www.fleppc.org](http://www.fleppc.org)) and as identified in the Landscape Opportunity Plan.

## **Miscellaneous**

The intent of this Project is to replace, repair or rehabilitate all deficiencies noted in the RFP within the Project limits such that maintenance work required upon Final Acceptance is limited to routine work.

### **A. Design-Build Responsibility**

The Design-Build Firm shall be responsible for survey, geotechnical investigation, design, preparation of all documentation and acquisition of all permits, maintenance of traffic, demolition, and construction on or before the Project completion date indicated in the Proposal. The Design-Build Firm shall coordinate all utility relocations.

The Design-Build Firm shall be responsible for compliance with Design and Construction Criteria (Section VI) which sets forth requirements regarding survey, design, construction, and maintenance of traffic during construction, requirements relative to Project management, scheduling, and coordination with other agencies and entities such as state and local government, utilities and the public.

The Design-Build Firm shall be responsible for reviewing the approved EA with FONSI and Reevaluation. The Design-Build Firm is responsible for coordinating with the District Environmental Office any engineering or other information related to Environmental Reevaluations. The Design-Build Firm will not be compensated for any additional costs or time associated with Reevaluation(s) resulting from proposed design changes.

The Design-Build Firm may propose changes which differ from the approved EA with FONSI and Reevaluation. Proposed changes must be coordinated through the Department. If changes are proposed to the configuration, the Design-Build Firm shall be responsible for preparing the necessary documentation required for the Department to analyze and satisfy requirements to obtain approval of the Department, and if applicable, the Office of Environmental Management (OEM) for the NEPA document. The Design-Build Firm shall provide the required documentation for review and processing. Approved revisions to the configuration may also be required to be included in the Reevaluation of the NEPA document or SEIR Reevaluations, per Section O (Environmental Services/Permits/Mitigation) of the RFP. The Design-Build Firm will not be compensated for any additional costs or time resulting from proposed changes.

The Design-Build Firm shall examine the Contract Documents and the site of the proposed work carefully before submitting a Proposal for the work contemplated and shall investigate the conditions to be encountered, as to the character, quality, and quantities of work to be performed and materials to be furnished and as to the requirements of all Contract Documents. Written notification of differing site conditions discovered during the design or construction phase of the Project will be given to the Department's Project Manager.

The Design-Build Firm shall examine boring data, where available, and make their own interpretation of the subsoil investigations and other preliminary data, and shall base their bid on their own opinion of the conditions likely to be encountered. The submission of a proposal is prima facie evidence that the Design-Build Firm has made an examination as described in this provision.

The Design-Build Firm shall demonstrate good Project management practices while working on this Project. These include communication with the Department and others as necessary, management of time and resources, and documentation.

The Design-Build Firm will provide litter removal and mowing within the project limits in accordance with Specification Section 107 with a 30-day mowing frequency and a bi-weekly litter removal. This includes

debris on bridge deck which shall be removed within 30 minutes of notification. Monthly bridge sweeping is required.

## B. Department Responsibility

The Department will provide contract administration, management services, construction engineering inspection services, environmental oversight, and quality acceptance reviews of all work associated with the development and preparation of the contract plans, and construction of the improvements. The Department will provide Project specific information and/or functions as outlined in this document.

In accordance with 23 CFR 636.109 of the FHWA, in a Federal Aid project, the Department shall have oversight, review, and approval authority of the permitting process.

The Department will determine the environmental impacts and coordinate with the appropriate agencies during the preparation of NEPA or SEIR Reevaluations. For federal projects, NEPA Reevaluations will be processed by the Department's EMO Office for approval by OEM pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated December 14, 2016 and executed by the FHWA and the Department.

## II. Schedule of Events.

Below is the current schedule of the events that will take place in the procurement process. The Department reserves the right to make changes or alterations to the schedule as the Department determines is in the best interests of the public. Proposers will be notified sufficiently in advance of any changes or alterations in the schedule. Unless otherwise notified in writing by the Department, the dates indicated below for submission of items or for other actions on the part of a Proposer shall constitute absolute deadlines for those activities and failure to fully comply by the time stated shall cause a Proposer to be disqualified.

| Date             | Event   |
|------------------|---|
| <u>2/28/2020</u> | Planned Advertisement   |
| <u>7/12/2021</u> | Current Advertisement   |
| <u>8/2/2021</u>  | Letters of Interest for Phase I of the procurement process due in District Office by 4:00 PM local time.  |
| <u>8/30/2021</u> | Proposal Evaluators submit Letter of Interest Scores to Contracting Unit 8:00 AM local time   |
| <u>9/2/2021</u>  | Contracting Unit provides Letter of Interest scores and Proposal Evaluators comments to Selection Committee 12:00 PM local time   |
| <u>9/7/2021</u>  | Public Meeting of Selection Committee to review and confirm Letter of Interest scores 9:00 AM local time  |
| <u>9/7/2021</u>  | Shortlist Posting Date  |
|                  |   |
| 9/13/2021        | Final RFP provided to Design-Build Firms continuing to Phase II of the procurement process 4:00 PM local time   |
| 9/21/2021        | Mandatory Pre-Proposal meeting at 1:30 PM local time <a href="#">in Florida Department of Transportation, 1074 Highway 90, Chipley, FL 32428</a> . All Utility Agency/Owners that the Department contemplates an adjustment, protection, or relocation is possible are to be invited to the Mandatory Pre-Proposal Meeting. |

|                   |  |
|-------------------|--|
|                   | <p><b><u>Please join my meeting from your computer, tablet or smartphone.</u></b><br/> <a href="https://global.gotomeeting.com/join/160016029">https://global.gotomeeting.com/join/160016029</a></p> <p><b><u>You can also dial in using your phone.</u></b><br/> <b><u>United States: +1 (786) 535-3211</u></b></p> <p><b><u>Access Code: 160-016-029</u></b></p> <p><b><u>Join from a video-conferencing room or system.</u></b><br/> <b><u>Dial in or type: 67.217.95.2 or inroomlink.goto.com</u></b><br/> <b><u>Meeting ID: 160 016 029</u></b><br/> <b><u>Or dial directly: 160016029@67.217.95.2 or 67.217.95.2##160016029</u></b></p>  |
| <u>9/21/2021</u>  | <p>Utility Pre-Proposal Meeting facilitated by the District Utility Administrator at 1:30 PM local time <b><u>at Florida Department of Transportation, 1074 Highway 90, Chipley, FL 32428.</u></b></p> <p><b><u>Please join my meeting from your computer, tablet or smartphone.</u></b><br/> <a href="https://global.gotomeeting.com/join/160016029">https://global.gotomeeting.com/join/160016029</a></p> <p><b><u>You can also dial in using your phone.</u></b><br/> <b><u>United States: +1 (786) 535-3211</u></b></p> <p><b><u>Access Code: 160-016-029</u></b></p> <p><b><u>Join from a video-conferencing room or system.</u></b><br/> <b><u>Dial in or type: 67.217.95.2 or inroomlink.goto.com</u></b><br/> <b><u>Meeting ID: 160 016 029</u></b><br/> <b><u>Or dial directly: 160016029@67.217.95.2 or 67.217.95.2##160016029</u></b></p> |
| <u>10/1/2021</u>  | <p>Deadline for Design-Build Firm to request participation in One-on-One Alternative Technical Concept Discussion Meeting No. 1 4:00 PM local time</p>   |
| <u>10/8/2021</u>  | <p>Deadline for Design-Build Firm to submit preliminary list of Alternative Technical Concepts prior to One-on-One Alternative Technical Concept Discussion Meeting No. 1 4:00 PM local time</p>   |
| <u>10/14/2021</u> | <p>One-on-One Alternative Technical Concept Discussion Meeting No. 1. 90 Minutes will be allotted for this Meeting.</p>  |
| <u>10/14/2021</u> | <p>Deadline for Design-Build Firm to request participation in One-on-One Alternative Technical Concept Discussion Meeting No. 2, 4:00 PM local time</p>  |
| <u>10/22/2021</u> | <p>Deadline for Design-Build Firm to submit preliminary list of Alternative Technical Concepts prior to One-on-One Alternative Technical Concept Discussion Meeting No. 2. 4:00 PM local time</p>  |
| <u>11/2/2021</u>  | <p>One-on-One Alternative Technical Concept Discussion Meeting No. 2. 90 Minutes will be allotted for this Meeting.</p>  |
| <u>11/16/2021</u> | <p>Deadline for submittal of Alternative Technical Concept Proposals 4:00 PM local time.</p>   |



|                   |   |
|-------------------|---|
| <u>11/16/2021</u> | Final deadline for submission of requests for Design Exceptions or Design Variations. 4:00 PM local time.   |
| <u>12/21/2021</u> | Addendum issued for approved Design Exceptions. 4:00 PM local time  |
| <u>2/8/2022</u>   | Deadline for submittal of questions, for which a response is assured, prior to the submission of the Technical Proposal. All questions shall be submitted to the Pre-Bid Q&A website.                   |
| <u>2/15/2022</u>  | Deadline for the Department to post responses to the Pre-Bid Q&A website for questions submitted by the Design-Build Firms prior to the submittal of the Technical Proposal.                            |
| <u>2/17/2022</u>  | Technical Proposals due in District Office by 2:00 PM local time.   |
| <u>2/17/2022</u>  | Deadline for Design-Build Firm to “opt out” of Technical Proposal Page Turn meeting.  |
| <u>2/24/2022</u>  | Technical Proposal Page Turn Meeting. Times will be assigned during the Pre-Proposal Meeting. 30 Minutes will be allotted for this Meeting.   |
| <u>3/23/2022</u>  | Question and Answer Written Responses. Deadline for the Department to provide a list of questions/clarifications for the Design-Build Firm to answer.   |
| <u>3/31/2022</u>  | Deadline for submittal of Question and Answer Written Responses to the Department’s questions/clarifications from the Design-Build Firm. 4:00 PM local time   |
| <u>4/7/2022</u>   | Deadline for submittal of follow up questions to previously submitted Question and Answer Written Responses to the Department’s questions/clarifications from the Design-Build Firm. 4:00 PM local time |
| <u>4/14/2022</u>  | Deadline for submittal of Question and Answer Written Responses to the Department’s follow up questions. 4:00 PM local time.  |
| <u>4/14/2022</u>  | Deadline for submittal of questions, for which a response is assured, prior to the submission of the Price Proposal. All questions shall be submitted to the Pre-Bid Q&A website.                       |
| <u>4/19/2022</u>  | Deadline for the Department to post responses to the Pre-Bid Q&A website for questions submitted by the Design-Build Firms prior to the submittal of the Price Proposal.                                |
| <u>4/19/2022</u>  | Deadline for the Design-Build Firm to submit a written statement per Section III. Threshold Requirements, F. Question and Answer Written Responses  |
| <u>4/21/2022</u>  | Price Proposals due in District Office by 10:00 AM local time.  |
| <u>4/21/2022</u>  | Public announcing of Technical Scores and opening of Price Proposals at 10:30 AM local time in 1074 Highway 90, Chipley, FL 32428   |
| <u>4/25/2022</u>  | Public Meeting Date of Selection Committee to determine intended Award  |
| <u>4/25/2022</u>  | Final Selection Posting Date  |
| <u>4/29/2022</u>  | Anticipated Award Date  |
| <u>5/20/22</u>    | Anticipated Execution Date  |

**III. Threshold Requirements.**

**A. Qualifications**

Proposers are required to be pre-qualified in all work types required for the Project. The technical qualification requirements of Florida Administrative Code (F.A.C.) Chapter 14-75 and all qualification requirements of F.A.C. Chapter 14-22, based on the applicable category of the Project, must be satisfied.

**B. Joint Venture Firm**

Two or more Firms submitting as a Joint Venture must meet the Joint Venture requirements of Section 14-22.007, F.A.C. Parties to a Joint Venture must submit a Declaration of Joint Venture and Power of Attorney Form No. 375-020-18, prior to the deadline for receipt of Letters of Interest.

If the Proposer is a Joint Venture, the individual empowered by a properly executed Declaration of Joint Venture and Power of Attorney Form shall execute the proposal. The proposal shall clearly identify who will be responsible for the engineering, quality control, and geotechnical and construction portions of the Work. The Joint Venture shall provide an Affirmative Action Plan specifically for the Joint Venture.

**C. Price Proposal Guarantee**

A Price Proposal guaranty in an amount of not less than five percent (5%) of the total bid amount shall accompany each Proposer's Price Proposal. The Price Proposal guaranty may, at the discretion of the Proposer, be in the form of a cashier's check, bank money order, bank draft of any national or state bank, certified check, or surety bond, payable to the Department. The surety on any bid bond shall be a company recognized to execute bid bonds for contracts of the State of Florida. The Price Proposal guaranty shall stand for the Proposer's obligation to timely and properly execute the contract and supply all other submittals due therewith. The amount of the Price Proposal guaranty shall be a liquidated sum, which shall be due in full in the event of default, regardless of the actual damages suffered. The Price Proposal guaranty of all Proposers' shall be released pursuant to 3-4 of the Division I Design-Build Specifications.

**D. Pre-Proposal Meeting**

Attendance at the pre-proposal meeting is mandatory. Any Short-Listed Design-Build Firm failing to attend will be deemed non-responsive and eliminated from further consideration. The purpose of this meeting is to provide a forum for the Department to discuss with all concerned parties the proposed Project, the design and construction criteria, Critical Path Method (CPM) schedule, and method of compensation, instructions for submitting proposals, Design Exceptions, Design Variations, and other relevant issues. In the event that any discussions at the pre-proposal meeting require official additions, deletions, or clarifications of the Request for Proposal, the Design and Construction Criteria, or any other document, the Department will issue a written addendum to this Request for Proposals as the Department determines is appropriate. No oral representations or discussions, which take place at the pre-proposal meeting, will be binding on the Department. FHWA will be invited on Projects of Division Involvement (PoDIs), in order to discuss the Project in detail and to clarify any concerns. Proposers shall direct all questions to the Departments Question and Answer website:

<https://fdotwp1.dot.state.fl.us/BidQuestionsAndAnswers/>

Failure by a Proposer to attend or be represented at the pre-proposal meeting will constitute a non-responsive determination of their bid package. Bids found to be non-responsive will not be considered. All Proposers must be present and signed in prior to the start of the mandatory pre-proposal meeting. The convener of the meeting will circulate the attendee sign in sheet at the time the meeting was advertised to begin. Once all Proposers have signed, the sign in sheet will be taken and the meeting will "officially" begin. Any Proposer

not signed in at the “official” start of the meeting will be considered late and will not be allowed to propose on the Project.

#### **E. Technical Proposal Page-Turn Meeting**

The Department will meet with each Proposer, formally for thirty (30) minutes, for a page-turn meeting. FHWA will be invited on Projects of Division Interest (PoDIs). The purpose of the page-turn meeting is for the Design-Build Firm to guide the Technical Review Committee through the Technical Proposal, highlighting sections within the Technical Proposal that the Design-Build Firm wishes to emphasize. The page-turn meeting will occur between the date the Technical Proposal is due and the Question and Answer Written Response occurs, per the Schedule of Events section of this RFP. The Department will terminate the page-turn meeting promptly at the end of the allotted time. The Department will record all of the page-turn meeting. All recordings will become part of the Contract Documents. The page-turn meeting will not constitute discussions or negotiations. The Design-Build Firm will not be permitted to ask questions of the Technical Review Committee during the page-turn meeting. Roll plots submitted with the Technical Proposal and an unmodified aerial or map of the project limits provided by the Design-Build Firm is acceptable for reference during the page-turn meeting. The unmodified aerial or map may not be left with the Department upon conclusion of the page turn meeting. The use of the electronic screen will be permitted for display of the Technical Proposal, roll plots, and unmodified aerial or map of the project limits. Upon conclusion of the thirty (30) minutes, the Technical Review Committee is allowed five (5) minutes to ask questions pertaining to information highlighted by Design-Build Firm. Participation in the page-turn meeting by the Design-Build Firm shall be limited to eight (8) representatives from the Design-Build Firm. Design-Build Firms desiring to opt out of the page-turn meeting may do so by submitting a request to the Department.

#### **F. Question and Answer Written Responses**

The Department will provide all proposed questions to each Design-Build Firm as it relates to their Technical Proposal approximately 1 (one) week before the written Q & A letter is due.

The Design-Build Firm shall submit to the Department a written letter answering the questions provided by the Department. The questions and written answers/clarifications will become part of the Contract Documents and will be considered by the Department as part of the Technical Proposal. In the event the Design-Build Firm includes additional information in the written response which was not discussed as part of the Department’s questions and is otherwise not included in the Technical Proposal, such additional information will not be considered by the Department during the evaluation of the Technical Proposal.

One (1) week prior to the Price Proposal due date the Design-Build Firm shall submit to the Department a written statement as follows: “[insert name of the Design-Build Firm] confirms that, despite any provision in the Design-Build Firm’s Technical Proposal or any Q&A written response letter that may be inconsistent with the other requirements of the Contract Documents, [insert name of the Design-Build Firm] intends to comply fully with the requirements otherwise provided for in the Contract Documents, except for, pursuant to Subsection 5-2 Coordination of Contract Documents of the Design-Build Division I Specifications, any [insert name of Design-Build Firm]’s statements, terms, concepts or designs that can reasonably be interpreted as offers to provide higher quality items than otherwise required by the other Contract Documents or to perform services or meet standards in addition to or better than those otherwise required which such statements, terms, concepts and designs are the obligations of [insert name of the Design-Build Firm].” In

case of the failure of the Design-Build Firm to timely provide such a written statement, the Department may determine the Design-Build Firm to be deemed non-responsive.

### **G. Protest Rights**

Any person who is adversely affected by the specifications contained in this Request for Proposal must file a notice of intent to protest in writing within seventy-two hours of the posting of this Request for Proposal. Pursuant to Sections 120.57(3) and 337.11, Florida Statutes, and Rule Chapter 28-110, F.A.C., any person adversely affected by the agency decision or intended decision shall file with the agency both a notice of protest in writing and bond within 72 hours after the posting of the notice of decision or intended decision, or posting of the solicitation with respect to a protest of the terms, conditions, and specifications contained in a solicitation and will file a formal written protest within 10 days after the filing of the notice of protest. The formal written protest shall be filed within 10 days after the date of the notice of protest if filed. The person filing the Protest must send the notice of intent and the formal written protest to:

Clerk of Agency Proceedings  
Department of Transportation  
605 Suwannee Street, MS 58  
Tallahassee, Florida 32399-0458

Failure to file a notice of protest or formal written protest within the time prescribed in section 120.57(3), Florida Statutes, or failure to post the bond or other security required by law within the time allowed for filing a bond shall constitute a waiver of proceedings under Chapter 120 Florida Statutes.

### **H. Non-Responsive Proposals**

Proposals found to be non-responsive shall not be considered. Proposals may be rejected if found to be in nonconformance with the requirements and instructions herein contained. A proposal may be found to be non-responsive by reasons, including, but not limited to, failure to utilize or complete prescribed forms, conditional proposals, incomplete proposals, indefinite or ambiguous proposals, failure to meet deadlines and improper and/or undated signatures.

Other conditions which may cause rejection of proposals include evidence of collusion among Proposers, obvious lack of experience or expertise to perform the required work, submission of more than one proposal for the same work from an individual, firm, joint venture, or corporation under the same or a different name (also included for Design-Build Projects are those proposals wherein the same Engineer is identified in more than one proposal), failure to perform or meet financial obligations on previous contracts, employment of unauthorized aliens in violation of Section 274A (e) of the Immigration and Nationalization Act, or in the event an individual, firm, partnership, or corporation is on the United States Department of Labor's System for Award Management (SAM) list.

The Department will not give consideration to tentative or qualified commitments in the proposals. For example, the Department will not give consideration to phrases as "we may" or "we are considering" in the evaluation process for the reason that they do not indicate a firm commitment.

Proposals will also be rejected if not delivered or received on or before the date and time specified as the due date for submission.

Any proposal submitted by a Proposer that did not sign-in at the mandatory pre-proposal meeting will be non-responsive.

### **I. Waiver of Irregularities**

The Department may waive minor informalities or irregularities in proposals received where such is merely a matter of form and not substance, and the correction or waiver of which is not prejudicial to other Proposers. Minor irregularities are defined as those that will not have an adverse effect on the Department's interest and will not affect the price of the Proposals by giving a Proposer an advantage or benefit not enjoyed by other Proposers.

1. Any design submittals that are part of a proposal shall be deemed preliminary only.
2. Preliminary design submittals may vary from the requirements of the Design and Construction Criteria. The Department, at their discretion, may elect to consider those variations in awarding points to the proposal rather than rejecting the entire proposal.
3. In no event will any such elections by the Department be deemed to be a waiving of the Design and Construction Criteria.
4. The Proposer who is selected for the Project will be required to fully comply with the Design and Construction Criteria for the price bid, regardless that the proposal may have been based on a variation from the Design and Construction Criteria.
5. Proposers shall identify separately all innovative aspects as such in the Technical Proposal. An innovative aspect does not include revisions to specifications or established Department policies. Innovation should be limited to Design-Build Firm's means and methods, roadway alignments, approach to Project, use of new products, new uses for established products, etc.
6. The Proposer shall obtain any necessary permits or permit modifications not already provided.
7. Those changes to the Design Concept may be considered together with innovative construction techniques, as well as other areas, as the basis for grading the Technical Proposals in the area of innovative measures.

### **J. Modification or Withdrawal of Technical Proposal**

Proposers may modify or withdraw previously submitted Technical Proposals at any time prior to the Technical Proposal due date. Requests for modification or withdrawal of a submitted Technical Proposal shall be in writing and shall be signed in the same manner as the Technical Proposal. Upon receipt and acceptance of such a request, the entire Technical Proposal will be returned to the Proposer and not considered unless resubmitted by the due date and time. Proposers may also send a change in sealed envelope to be opened at the same time as the Technical Proposal provided the change is submitted prior to the Technical Proposal due date.

### **K. Department's Responsibilities**

This Request for Proposal does not commit the Department to make studies or designs for the preparation of any proposal, nor to procure or contract for any articles or services.

The Department does not guarantee the details pertaining to borings, as shown on any documents supplied by the Department, to be more than a general indication of the materials likely to be found adjacent to holes bored at the site of the work, approximately at the locations indicated.

### **L. Design-Build Contract**

The Department will enter into a Lump Sum contract with the successful Design-Build Firm. In accordance with Section V, the Design-Build Firm will provide a schedule of values to the Department for their approval. The total of the Schedule of Values will be the lump sum contract amount.

The terms and conditions of this contract are fixed price and fixed time. The Design-Build Firm's submitted bid (time and cost) is to be a lump sum bid for completing the scope of work detailed in the Request for Proposal.

## **IV. Disadvantaged Business Enterprise (DBE) Program.**

### **A. DBE Availability Goal Percentage:**

The Department of Transportation has an overall, race-neutral DBE goal. This means that the State's goal is to spend a portion of the highway dollars with Certified DBE's as prime Design-Build Firms or as subcontractors. Race-neutral means that the Department believes that the overall goal can be achieved through the normal competitive procurement process. The Department has reviewed this Project and assigned a DBE availability goal shown in the Project Advertisement and on the bid blank/contract front page under "% DBE Availability Goal". The Department has determined that this DBE percentage can be achieved on this Project based on the number of DBE's associated with the different types of work that will be required.

Under 49 Code of Federal Regulations Part 26, if the overall goal is not achieved, the Department may be required to return to a race-conscious program where goals are imposed on individual contracts. The Department encourages Design-Build Firms to actively pursue obtaining bids and quotes from Certified DBE's.

The Department is reporting to the Federal Highway Administration the planned commitments to use DBE's, as well as actual dollars paid to DBE's. This information is being collected through the Department's Equal Opportunity Compliance (EOC) system. Additional requirements of the Design-Build Firm may be found in Chapter 2 of the FDOT Equal Opportunity Construction Contract Compliance Manual.

### **B. DBE Supportive Services Providers:**

The Department has contracted with consultants, one is referred to as DBE Supportive Services provider (DBE/SS), to provide managerial and technical assistance to DBE's. This consultant works with potential DBEs, certified DBEs and prime contractors and consultants in an effort to increase DBE utilization. The other consultant is referred to as the Specialized Development Program provider (SDP). This consultant works with short-listed Design Build firms prior to award, on projects over \$50 million dollars in an effort to identify DBE's with capacity to perform on the Project. The successful Design-Build Firm should meet with the DBE

DBE/SS or SDP to discuss the DBE's that are available to work on this Project. The current Providers for the State of Florida can be found on the Equal Opportunity website at: <http://www.fdot.gov/equalopportunity/serviceproviders.shtm>

### **C. Bidders Opportunity List:**

The Federal DBE Program requires States to maintain a database of all Firms that are participating, or attempting to participate, on DOT-assisted contracts. The list must include all Firms that bid on prime contracts or bid or quote subcontracts on DOT-assisted Projects, including both DBEs and Non-DBEs.

All Contractors must enter their bid opportunity information in the Equal Opportunity Compliance (EOC) system within three business days of submission of the bid or proposal. The link to the EOC system is located in Chapter 1 Section 1.4, Directory of Compliance Websites & Addresses. Failure of bidders to enter Bid Opportunity List information is a violation of 49 C.F.R. 26.11 and grounds for compliance actions up to and including withholding of progress payments. Note: All registered primes submitting a bid will need to apply for EOC User ID and Password to gain access to the EOC system.

## **V. Project Requirements and Provisions for Work.**

### **A. Governing Regulations:**

The services performed by the Design-Build Firm shall be in compliance with all applicable Manuals and Guidelines including the Department, FHWA, AASHTO, and additional requirements specified in this document. Except to the extent inconsistent with the specific provisions in this document, the current edition, including updates, of the following Manuals and Guidelines shall be used in the performance of this work. Current edition is defined as the edition in place and adopted by the Department at the date of advertisement of this contract with the exception of the Standard Specifications for Road and Bridge Construction (Divisions II & III), Special Provisions and Supplemental Specifications, Manual on Uniform Traffic Control Devices (MUTCD), and FDOT Standard Plans with applicable Interim Revisions. The Design-Build Firm shall use the edition of the Standard Specifications for Road and Bridge Construction (Divisions II & III), Special Provisions and Supplemental Specifications, FDOT Standard Plans and applicable Interim Revisions in effect at the time the bid price proposals are due in the District Office. The Design-Build Firm shall use the 2009 edition of the MUTCD (as amended in 2012). It shall be the Design-Build Firm's responsibility to acquire and utilize the necessary manuals and guidelines that apply to the work required to complete this Project. The services will include preparation of all documents necessary to complete the Project as described in Section I of this document.

1. Florida Department of Transportation Design Manual (FDM)  
<http://www.fdot.gov/roadway/FDM/>  
Note: the use of FDM Part 9 requires approval by the District Design Engineer
2. Florida Department of Transportation Specifications Package Preparation Procedure  
<http://www.fdot.gov/programmanagement/PackagePreparation/Handbooks/630-010-005.pdf>
3. Florida Department of Transportation Standard Plans for Road and Bridge Construction  
<http://www.fdot.gov/design/standardplans/>
4. Standard Plans Instructions (Refer to Part I, Chapter 115, FDM)  
<http://www.fdot.gov/roadway/FDM/>

5. Florida Department of Transportation Standard Specifications for Road and Bridge Construction (Divisions II & III), Special Provisions and Supplemental Specifications  
<https://www.fdot.gov/programmanagement/Implemented/SpecBooks/default.shtm>
6. Florida Department of Transportation Surveying Procedure 550-030-101  
<http://fdotwp1.dot.state.fl.us/ProceduresInformationManagementSystemInternet/FormsAndProcedures/ViewDocument?topicNum=550-030-101>
7. Florida Department of Transportation EFB User Handbook (Electronic Field Book)  
[http://www.fdot.gov/geospatial/doc\\_pubs.shtm](http://www.fdot.gov/geospatial/doc_pubs.shtm)
8. Florida Department of Transportation Drainage Manual  
<http://www.fdot.gov/roadway/Drainage/ManualsandHandbooks.shtm>
9. Florida Department of Transportation Soils and Foundations Handbook  
<http://www.fdot.gov/structures/Manuals/SFH.pdf>
10. Florida Department of Transportation Structures Manual  
<http://www.fdot.gov/structures/DocsandPubs.shtm>
11. Florida Department of Transportation Computer Aided Design and Drafting (CADD) Manual  
<http://www.fdot.gov/cadd/downloads/publications/CADDManual/default.shtm>
12. AASHTO – A Policy on Geometric Design of Highways and Streets  
[https://bookstore.transportation.org/collection\\_detail.aspx?ID=110](https://bookstore.transportation.org/collection_detail.aspx?ID=110)
13. MUTCD - 2009  
<http://mutcd.fhwa.dot.gov/>
14. Safe Mobility for Life Program Policy Statement  
<http://www.fdot.gov/traffic/TrafficServices/PDFs/000-750-001.pdf>
15. Traffic Engineering and Operations Safe Mobility for Life Program  
<http://www.fdot.gov/traffic/TrafficServices/SafetyisGolden.shtm/>
16. Florida Department of Transportation American with Disabilities Act (ADA) Compliance – Facilities Access for Persons with Disabilities Procedure 625-020-015  
<https://fdotwp1.dot.state.fl.us/ProceduresInformationManagementSystemInternet/?viewBy=0&procType=pr>
17. Florida Department of Transportation Florida Sampling and Testing Methods  
<http://www.fdot.gov/materials/administration/resources/library/publications/fstm/disclaimer.shtm>
18. Florida Department of Transportation Flexible Pavement Coring and Evaluation Procedure  
<http://www.fdot.gov/materials/administration/resources/library/publications/materialsmanual/documents/v1-section32-clean.pdf>
19. Florida Department of Transportation Design Bulletins and Update Memos  
<http://www.fdot.gov/roadway/Bulletin/Default.shtm>
20. Florida Department of Transportation Utility Accommodation Manual  
[https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/programmanagement/programmanagement/utilities/docs/uam/uam2017.pdf?sfvrsn=d97fd3dd\\_0](https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/programmanagement/programmanagement/utilities/docs/uam/uam2017.pdf?sfvrsn=d97fd3dd_0)



21. AASHTO LRFD Bridge Design Specifications  
[https://bookstore.transportation.org/category\\_item.aspx?id=BR](https://bookstore.transportation.org/category_item.aspx?id=BR)
22. Florida Department of Transportation Flexible Pavement Design Manual  
<http://www.fdot.gov/roadway/PM/publicationS.shtm>
23. Florida Department of Transportation Rigid Pavement Design Manual  
<http://www.fdot.gov/roadway/PM/publicationS.shtm>
24. Florida Department of Transportation Pavement Type Selection Manual  
<http://www.fdot.gov/roadway/PM/publicationS.shtm>
25. Florida Department of Transportation Right of Way Manual  
<http://www.fdot.gov/rightofway/Documents.shtm>
26. Florida Department of Transportation Traffic Engineering Manual  
<http://www.fdot.gov/traffic/TrafficServices/Studies/TEM/tem.shtm>
27. Florida Department of Transportation Intelligent Transportation System Guide Book  
[http://www.fdot.gov/traffic/Doc\\_Library/Doc\\_Library.shtm](http://www.fdot.gov/traffic/Doc_Library/Doc_Library.shtm)
28. Federal Highway Administration Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specifications  
<http://www.fhwa.dot.gov/engineering/geotech/pubs/reviewguide/checklist.cfm>
29. AASHTO Guide for the Development of Bicycle Facilities  
[https://bookstore.transportation.org/collection\\_detail.aspx?ID=116](https://bookstore.transportation.org/collection_detail.aspx?ID=116)
30. Federal Highway Administration Hydraulic Engineering Circular Number 18 (HEC 18).  
[http://www.fhwa.dot.gov/engineering/hydraulics/library\\_arc.cfm?pub\\_number=17](http://www.fhwa.dot.gov/engineering/hydraulics/library_arc.cfm?pub_number=17)
31. Florida Department of Transportation Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways  
<http://www.fdot.gov/roadway/FloridaGreenbook/FGB.shtm>
32. Florida Department of Transportation Project Development and Environment Manual, Parts 1 and 2  
<http://www.fdot.gov/environment/pubs/pdeman/pdeman1.shtm>
33. Florida Department of Transportation Driveway Information Guide  
<http://www.fdot.gov/planning/systems/programs/sm/accman/pdfs/driveway2008.pdf>
34. AASHTO Highway Safety Manual  
<http://www.highwaysafetymanual.org/>
35. Florida Statutes  
<http://www.leg.state.fl.us/Statutes/index.cfm?Mode=View%20Statutes&Submenu=1&Tab=statutes&CFID=14677574&CFTOKEN=80981948>
36. Florida Department of Transportation Equal Opportunity Construction Contract Compliance Manual  
<http://www.fdot.gov/equalopportunity/contractcomplianceworkbook.shtm>
37. **Florida Department of Transportation Traffic Engineering and Operations Bulletins & Memos**  
<https://www.fdot.gov/traffic/trafficops-bulletins.shtm>

**38. [Florida Department of Transportation Construction Bulletins](https://www.fdot.gov/construction/memos/bulletins/bulletins.shtm)**  
**<https://www.fdot.gov/construction/memos/bulletins/bulletins.shtm>**

**B. Innovative Aspects:**

All innovative aspects shall be identified separately as such in the Technical Proposal.

An innovative aspect does not include revisions to specifications, standards or established Department policies. Innovation should be limited to Design-Build Firm's means and methods, roadway alignments, approach to Project, etc.

**1. Alternative Technical Concept (ATC) Proposals**

The Department has chosen to incorporate in the Design-Build method of project delivery the process whereby Design-Build Firms may propose innovative technical solutions for the Department's approval which meet or exceed the goals of the project. The process involves the submission of an Alternative Technical Concept (ATC) as outlined below. This process has shown to be very cost effective in providing the best-value solution which often times is a result of the collaborative approach of the contractor and their designer which is made possible with the Design Build project delivery method and the ATC process.

The ATC process allows innovation, flexibility, time and cost savings on the design and construction of Design-Build Projects while providing the best value for the public. Any deviation from the RFP that the Design-Build Firm seeks to obtain approval to utilize prior to Technical Proposal submission is, by definition, an ATC and therefore must be discussed and submitted to the Department for consideration through the ATC process. ATCs also include items defined in FDM, Part 1, Chapter 121.3.2. The proposed ATC shall provide an approach that is equal to or better than the requirements of the RFP, as determined by the Department. ATC Proposals which reduce scope, quality, performance, or reliability should not be proposed. A proposed concept does not meet the definition of an ATC if the concept is contemplated by the RFP.

The following are not permitted to be changed by the Design-Build Firms except where specifically allowed for in the RFP. The list below is not all-inclusive. ATC's not listed below may be rejected by the Department.

- Items that require Design Exceptions as defined in FDM 122
- Submittal and review duration requirements of RFP Sections V.I. and V.K.
- Requirements of the FDOT Structures Manual
- Project specific post-tensioning (PT) system approvals. PT systems must comply with the Specifications and be listed on the FDOT Approved Post-Tensioning System List
- Shallow foundations in areas that are prone to sinkhole development. Bridges in areas of the State that are known for being high-recharge zones (groundwater is feeding the aquifer), or that have historically developed sinkholes at a frequent rate, will not be considered for shallow foundation design.
- Deck girders with longitudinal deck joints for bridges with two or more spans;
- Pier mounted fender systems
- Struts between Eastbound and Westbound SR 30 footings
- Modification of past point vessel group traffic data
- Full-depth precast deck panels

Note: ATC proposals for full-depth precast deck panels may be considered, but must include detailed connection details, step-by-step construction sequences, grout/UHPC material requirements, connection mock-up requirements including mock-up acceptance criteria.

- Partial-depth precast deck panels;
- Reinforcing steels other than allowed by SDG 1.4.1.B except in drilled shafts and auger-cast piles. This is not intended to include non-corrosive materials that are allowed for by the RFP.
- Elimination of deck grooving;
- Replacing transverse bridge deck grooving with longitudinal bridge deck grooving;
- Elimination of deck planing;
- The elimination of cross frames in bays of steel bridges that are phase constructed;
- Non-framed, non-integral straddle pier caps that are not permanently anchored or stabilized on one end (e.g. pinned bolsters, sole plate and anchor bolts, pot or disc bearings etc.).
- Full height MSE Wall panels (piano walls).
- Auger-Cast piles for bridges

Changes resulting in the need for additional Right-of-Way from Eglin will not be considered.

The Department will keep all ATC submissions confidential prior to the Final Selection of the Proposer to the fullest extent allowed by law, with few exceptions. Although the Department will issue an addendum for all ATC Proposals contained in the list below, the Department will endeavor to maintain confidentiality of the Design-Build Firms specific ATC proposal. Prior to approving ATC's which would result in the issuance of an Addendum as a result of the item being listed below, the Design-Build Firm will be given the option to withdraw previously submitted ATC proposals. Any approved ATC Proposal related to following requirements described by this RFP shall result in the issuance of an Addendum to the RFP:

- Horizontal or vertical clearance of structure at channel
- Design speeds
- Lane, shoulder, and shared use widths
- Pavement Design
- Department's Aesthetic Requirements
- Utility avoidance requirements at fender system
- New Design Exceptions required or modifications to Department approved Design Exceptions already provided in the Attachments.
- Significant changes in scope as determined by the Department.

The following requirements described by this RFP may be modified by the Design-Build Firm provided they are presented in the One-on-One ATC discussion meeting, as defined below, and submitted to the Department for review and approval through the ATC process described herein. The Department may deem a Proposal Non-Responsive should the Design-Build Firm include but fail to present and obtain Department approval of the proposed alternates through the ATC process. Department approval of an ATC proposal that is related to the items listed below will NOT result in the issuance of an Addendum to the RFP.

- RFP requirement other than the items in the previous paragraph's bulleted list.

## **2. One-on-One ATC Proposal Discussion Meetings**

One-on-One ATC discussion meetings may be held in order for the Design-Build Firm to describe proposed changes to supplied basic configurations, Project scope, design criteria, and/or construction criteria. Each

Design-Build Firm with proposed changes may request a One-on-One ATC discussion meeting to describe the proposed changes. The Design-Build Firm shall provide, by the deadline shown in the Schedule of Events of this RFP, a preliminary list of ATC proposals to be reviewed and discussed during the One-on-One ATC discussion meetings. This list may not be inclusive of all ATC's to be discussed but it should be sufficiently comprehensive to allow the Department to identify appropriate personnel to participate in the One-on-One ATC discussion meetings.

The purpose of the One-on-One ATC discussion meeting is to discuss the ATC proposals, answer questions that the Department may have related to the ATC proposal, review other relevant information and when possible establish whether the proposal meets the definition of an ATC thereby requiring the submittal of a formal ATC submittal. The meeting should be between representatives of the Design-Build Firm and/or the Design-Build Engineer of Record and District/Central Office staff as needed to provide feedback on the ATC proposal. FHWA should be invited to ATC meetings for all PoDI projects. Immediately prior to the conclusion of the One-on-One ATC discussion meeting, the Department will advise the Design-Build Firm as to the following related to the ATC proposals which were discussed:

- The Proposal meets the criteria established herein as a qualifying ATC Proposal; therefore, an ATC Proposal submission IS required, or
- The Proposal does not meet the criteria established herein as a qualifying ATC proposal since the Proposal is already allowed or contemplated by the original RFP; therefore, an ATC Proposal submission is NOT required.

The Department will return all handouts back to the Design-Build Firm except one copy to remain in the secure procurement file.

### **3. Submittal of ATC Proposals**

All ATC submittals must be in writing and may be submitted at any time following the Shortlist Posting but shall be discussed and submitted prior to the deadline shown in the Schedule of Events of this RFP.

All ATC submittals are required to be on plan sheets, on roll plots no wider than 36", or on 8.5" x 11" sheets and shall be sequentially numbered and include the following information and discussions:

- a) Description: A description and conceptual drawings of the configuration of the ATC or other appropriate descriptive information, including, if appropriate, product details and a traffic operational analysis as applicable;
- b) Usage: The locations where and an explanation of how the ATC would be used on the Project.
- c) Deviations: References to requirements of the RFP which are inconsistent with the proposed ATC, an explanation of the nature of the deviations from the requirements and a request for approval of such deviations along with suggested changes to the requirements of the RFP which would allow the alternative proposal.
- d) Analysis: An analysis justifying use of the ATC and why the deviation, if any, from the requirements of the RFP should be allowed.
- e) Impacts: A preliminary analysis of potential impacts on vehicular traffic (during construction), environmental impacts, community impacts, safety, and life-cycle Project and infrastructure costs, including impacts on the cost of repair, maintenance, and operation.

- f) Risks: A description of added risks to the Department or third parties associated with implementation of the ATC.
- g) Quality: A description of how the ATC is equal or better in quality and performance than the requirements of the RFP including the traffic operational analysis if requested by the Department.
- h) Operations: Any changes in operation requirements associated with the ATC, including ease of operations.
- i) Maintenance: Any changes in maintenance requirements associated with the ATC, including ease of maintenance.
- j) Anticipated Life: Any changes in the anticipated life of the item comprising the ATC.

#### **4. Review and Approval of ATC Submittals**

After receipt of the ATC submittal, the District Design Engineer (DDE), or designee, will communicate with the appropriate staff (i.e. District Structures Design Engineer, District Construction Engineer, District Maintenance Engineer, State Structures Design Engineer, State Roadway Design Engineer, FHWA, as applicable) as necessary, and respond to the Design-Build Firm in writing within 14 calendar days of receipt of the ATC submittal as to whether the ATC is acceptable, not acceptable, or requires additional information. If the DDE, or designee, determines that more information is required for the review of an ATC, questions should be prepared by the DDE, or designee, to request and receive responses from the Design-Build Firm. The review should be completed within 14 calendar days of the receipt of the ATC submittal. If the review will require additional time, the Design-Build Firm should be notified in advance of the 14 day deadline with an estimated timeframe for completion.

Approved Design Exceptions required as part of an approved ATC submittal will result in the issuance of an addendum to the RFP notifying all Shortlisted Design-Build Firms of the approved Design Exception(s). Such a change will be approved by FHWA, as applicable. Prior to approving ATC's which would result in the issuance of an Addendum as a result of a Design Exception, the Design-Build Firm will be given the option to withdraw previously submitted ATC Proposals.

The Department reserves the right to disclose to all Design-Build Firms, via an Addendum to the RFP, any errors of the RFP that are identified during the One-on-One ATC meetings, except to the extent that the Department determines, in its sole discretion, such disclosure would reveal confidential or proprietary information of the ATC.

Through the ATC process, the Design-Build Firm may submit, and the Department may consider, geometric modifications to the Concept Plans or other contract requirements that will provide an engineering solution that is better overall in terms of traffic flow and reduced congestion. The approval of ATCs related to improvements of traffic flow and reduced congestion is at the sole discretion of the Department. It is the Design-Build Firm's responsibility to clearly establish in the ATC process how the engineering solution provides a benefit to the Department and identify areas of conflict outlined in the RFP.

ATC's are accepted by the Department at the Department's discretion and the Department reserves the right to reject any ATC submitted. The Department reserves the right to issue an Addendum to the RFP based upon a previously denied ATC Proposal, without regard to the confidentiality of the denied ATC Proposal. All Department approvals of ATC submissions are based upon the known impacts on the Project at the time

of submission. The Department reserves the right to require a modification or amendment to a previously approved ATC as a result of a contract change which is issued by an addendum subsequent to the Department's initial approval of the ATC.

## **5. Incorporation of Approved ATC's into the Technical Proposal**

The Design-Build Firm will have the option to include any Department Approved ATC's in the Technical Proposal. The Proposal Price should reflect any incorporated ATC's. All approved ATC's that are incorporated into the Technical Proposal must be clearly identified in the Technical Proposal Plans and/or Roll Plots. The Technical Proposal shall also include a listing of the incorporated, approved ATCs.

By submitting a Proposal, the Design-Build Firm agrees, if it is not selected, to disclosure of its work product to the successful Design-Build Firm, only after receipt of the designated stipend (if applicable) or after award of the contract whichever occurs first.

### **C. Geotechnical Services:**

#### **1. General Conditions:**

The Design-Build Firm shall be responsible for identifying and performing any geotechnical investigation, analysis and design of foundations, foundation construction, foundation load and integrity testing, and inspection dictated by the Project needs in accordance with Department guidelines, procedures and specifications. All geotechnical work necessary shall be performed in accordance with the Governing Regulations. The Design-Build Firm shall be solely responsible for all geotechnical aspects of the Project.

### **D. Department Commitments:**

The Design-Build Firm will be responsible for adhering to the project commitments identified below:

1. Any right-of-way commitments, agreements and stipulated final judgements provided as an Attachment to the RFP.
2. Environmental Commitments from the EA with FONSI and Reevaluation as described in Section VI.O. ~~of~~ of this RFP.

### **E. Environmental Permits:**

#### **1. Storm Water and Surface Water:**

Plans shall be prepared in accordance with Chapters 373 and 403 (F.S.) and Chapters 40 and 62 (F.A.C.).

#### **2. Permits:**

The Department will submit FDEP ERP and FDEP State 404 Permit applications based on the concept plans. The Design-Build Firm will be responsible for submitting and obtaining the USCG Bridge Permit and completing, modifying and obtaining the FDEP ERP and FDEP State 404 Permits based on the final design plans.

The Design-Build Firm shall be responsible for obtaining all permits as necessary to complete the project. The Design-Build Firm shall be responsible for any necessary permit time extensions or re-permitting in order to keep the environmental permits valid throughout the construction period. The Design-Build Firm

shall provide the Department with draft copies of any and all permit applications, including responses to agency Requests for Additional Information, requests to modify the permits and/or requests for permit time extensions, for review and approval by the Department prior to submittal to the agencies. The Department will have up to 15 calendar days (excluding weekends and Department observed holidays) to review and comment on the draft permit application package, including modified permit applications. The Design-Build Firm will address all comments by the Department and obtain Department approval, prior to submittal of the draft permit application package. The Design-Build Firm shall be solely responsible for all time and costs associated with providing the required information to the Department, as well as the time required by the Department to perform its review of the permit application package, prior to submittal of the permit application(s) by the Design-Build Firm to the regulatory agency(ies). The Design-Build Firm shall be solely responsible for all cost associated with permitting activities and shall include all necessary permitting activities in their schedule.

All applicable data shall be prepared in accordance with Chapter 373 and 403, Florida Statutes, Chapters 40 and 62, F.A.C.; Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, 23 CFR 771, 23 CFR 636, and parts 114 and 115, Title 33, Code of Federal Regulations. Preparation of all documentation related to the acquisition of all applicable permits will be the responsibility of the Design-Build Firm. Preparation of complete permit packages will be the responsibility of the Design-Build Firm. The Design-Build Firm is responsible for the accuracy of all information included in permit application packages. As the permittee, the Department is responsible for reviewing, approving, and signing, the permit application package including all permit modifications, or subsequent permit applications. This applies whether the Project is Federal or state funded. Once the Department has approved the permit applications, the Design-Build Firm is responsible for submitting the permit applications to the environmental permitting agencies. A copy (electronic and hard copy) of any and all correspondence with any of the environmental permitting agencies shall be sent to the District Environmental Permits Office. If any agency rejects or denies the permit applications, it is the Design-Build Firm's responsibility to make whatever changes necessary to ensure the permit applications are approved. The Design-Build Firm shall be responsible for any necessary permit extensions or re-permitting in order to keep the environmental permits valid throughout the construction period. The Design-Build Firm shall provide the Department with draft copies of any and all permit applications, including responses to agency Requests for Additional Information, requests to modify the permits and/or requests for permit extensions, for review and approval by the Department prior to submittal to the agencies.

The Design-Build Firm will be required to pay all permit and public notice fees. Any fines levied by permitting agencies shall be the responsibility of the Design-Build Firm. The Design-Build Firm shall be responsible for complying with all permit conditions.

The Department is responsible for providing mitigation of all wetland impacts required for the conceptual design as shown in the Concept Plans. If any design modifications by the Design-Build Firm propose to increase the amount of wetland impacts such that additional mitigation is required, the Design-Build Firm shall be responsible for providing the Department information on the amount and type of wetland impacts as soon as the impacts are identified (including temporary impacts and/or any anticipated impacts due to construction staging or construction methods).

Any cost associated with additional mitigation required due to design modifications proposed by the Design-Build Firm shall be the responsibility of the Design-Build Firm. The Department anticipates satisfying mitigation requirements as depicted in the Concept Plans via an In-Lieu Fee Mitigation Project. Additional mitigation required due to a design modification proposed by the Design-Build Firm shall be coordinated with the Department as soon as possible for possible modification to the In-Lieu Fee Mitigation Project. In the event that modifying the Mitigation Plan is not viable, The Design-Build Firm will be

responsible for providing the additional mitigation consistent with the provisions of section 373.4137, Florida Statutes, and acceptable to the permitting agency(ies).

However, notwithstanding anything above to the contrary, upon the Design-Build Firm's preliminary request for extension of Contract Time, pursuant to 8-7.3, being made directly to the District Construction Engineer, the Department reserves unto the District Construction Engineer, in their sole and absolute discretion, according to the parameters set forth below, the authority to make a determination to grant a non-compensable time extension for any impacts beyond the reasonable control of the Design-Build Firm in securing permits. Furthermore, as to any such impact, no modification provision will be considered by the District Construction Engineer unless the Design-Build Firm clearly establishes that it has continuously from the beginning of the Project aggressively, efficiently and effectively pursued the securing of the permits including the utilization of any and all reasonably available means and methods to overcome all impacts. There shall be no right of any kind on behalf of the Design-Build Firm to challenge or otherwise seek review or appeal in any forum of any determination made by the District Construction Engineer under this provision.

**F. Railroad Coordination: N/A**

**G. Survey:**

The Design-Build Firm shall perform all surveying (Terrestrial, Mobile and/or Aerial) and mapping services necessary to complete the Project. Survey services must also comply with all pertinent Florida Statutes (Chapters 177 and 472, F.S.) and applicable rules in the Florida Administrative Code (Rule Chapter 5J-17, F.A.C.). All field survey data will be furnished to the District Surveyor in a Department approved digital format, readily available for input and use in CADD Design files. All surveying and mapping work must be accomplished in accordance with the Department's Surveying and Mapping Procedure, Topic Nos. 550-030-101, and the Surveying and Mapping Handbook.

**H. Verification of Existing Conditions:**

The Design-Build Firm shall be responsible for verification of existing conditions, including research of all existing Department records and other information.

By execution of the contract, the Design-Build Firm specifically acknowledges and agrees that the Design-Build Firm is contracting and being compensated for performing adequate investigations of existing site conditions sufficient to support the design developed by the Design-Build Firm and that any information is being provided merely to assist the Design-Build Firm in completing adequate site investigations. Notwithstanding any other provision in the contract documents to the contrary, no additional compensation will be paid in the event of any inaccuracies in the preliminary information.

**I. Submittals:**

The Department will perform an Independent Department Review (IDR) of all Category 2 bridge structures. The Design Build Firm shall submit 60% structures plans for the Department to begin developing the modeling for the design review. The 60% Structures Plans shall contain sufficient information for each structure to begin developing the model for the Category 2 element(s) under consideration. For Category 2 bridges, each structure submission (60%, 90%, Final) can be broken down into "units" (defined as a stand-



alone set of **combined** foundation, substructure and superstructure sheets based on the ultimate structural condition if phased construction is proposed) with each unit containing sufficient information to develop the models for the Category 2 element under consideration. The 60% Structures Plans submittal is not intended to be an ERC design review by the Department and formal review comments will not be provided at this stage. Lack of formal review comments at this stage should not be construed as acceptance or approval. When 90% plans are submitted, the Department's reviewer will verify that the information contained in the 90% plans is consistent with the models that were developed based upon 60% plans and the model will be updated, as required, and the actual design review performed. The results of the review will be forwarded to the Design Build Firm for review and response. The Department will resolve all conflicts arising between the Design Build Firm and Department's IDR reviewer during the Independent Department Review process. The Department's disposition of any such conflicts will be final.

### **1. Component Submittals:**

The Design-Build Firm may submit components of the contract plans set instead of submitting the entire contract plan set; however, sufficient information from other components must be provided to allow for a complete review. In accordance with the FDOT Design Manual, components of the contract plans set are roadway, signing and pavement marking, signalization, ITS, lighting, landscape, architectural, structural, and toll facilities. The Department will designate in the review comments if the next submittal will be a resubmittal of the 90% phase submittal or if the plans and supporting calculations are significantly developed to proceed to the Final Submittal.

The Design-Build Firm may divide the Project into separate areas and submit components for each area; however, sufficient information on adjoining areas must be provided to allow for a complete review. Submittals for Category 1 bridges are limited to foundation, substructure, and superstructure. For Category 2 structures, submittals for bridges are limited to "units" as previously described, or a complete bridge submittal.

For projects involving Category 2 structures, the Design-Build Firm shall submit a Category 2 Submittal Report summarizing the Category 2 elements included in the project as part of the Technical Proposal. Within fifteen (15) calendar days following Notice to Proceed, submit a prioritized preliminary submittal schedule for the plans including Category 2 structure elements. This submittal shall take place prior to the Independent Design Review Kickoff Meeting.

Category 1 and 2 bridge submittals shall contain the following:

- Plan sheets for the submittal under review developed to the specified level of detail (i.e. 90% plans, Final plans, etc.) as outlined in the FDM. Note for the 60% submittal on Category 2 Structures, provide the relevant sheets in accordance with the "60% Structures Plans" column of FDM Table 121.14.1. For the 90% and Final Submittals on Category 2 Structures, combine the required sheets for Foundation, Substructure, and Superstructure listed in FDM Table 121.14.3 to form the "unit" submittal.
- A complete set of the most developed plan sheets for all other major elements of the bridge. These sheets shall be marked "For Information Only" on the index sheet. In no case shall a plan sheet be less than 30% complete.
- Design documentation including a complete set of calculations, geotechnical reports, pertinent correspondence, etc. in support of the 90% and final component submittals.

## 2. Phase Submittals:

The Design-Build Firm shall provide the documents for each phase submittal listed below to the Department's Project Manager. The particular phase shall be clearly indicated on the documents. The Department's Project Manager will send the documents to the appropriate office for review and comment. Once all comments requiring a response from the Design-Build Firm have been satisfactorily resolved as determined by the Department, the Department's Project Manager will initial, date and stamp the signed and sealed plans and specifications as "Released for Construction".

All comments shall be resolved to the Department's satisfaction prior to making the next phase submittal. The Department will designate in the review comments if the next submittal will be a resubmittal of the 90% phase submittal or if the plans and supporting calculations are significantly developed to proceed to the Final Submittal.

The Design-Build Firm shall coordinate with the Department's Project Manager to allow for a 90% Phase Submittal to the local government. Each comment or request by the local government shall be evaluated by the Design-Build Firm and discussed with the Department's Project Manager. Responses will be prepared by the Design-Build Firm for District Consultant Project Management Engineer signature. All comments or requests shall be responded to in writing within 30 days of receipt of comment.

### **60% Phase Submittal (Required for Category 2 structures)**

- 1 copy of 11" x 17" Structures plans meeting the requirements of FDM Tables 121.14.1 and 121.14.2 for 60% Structures Plans
- 1 copy of draft geotechnical report
- 1 copy of draft Bridge Hydraulic Report
- 1 copy of design documentation (calculations not required)
- 1 copy of draft Technical Special Provisions
- 1 copy of Roadway Project Layout and TTCP plans
- Any other information required for the Department to perform an Independent Department Review as discussed in the Independent Design Review Kickoff Meeting

### **90% Phase Submittal**

- 1 copy of 11" X 17" plans (all required components)
- 1 copy of signed and sealed geotechnical report
- 1 copy of Settlement and Vibration Monitoring Plan (SVMP) for Department acceptance and update throughout the construction period
- 1 copy of signed and sealed Bridge Hydraulic Report
- 1 copy of design documentation
- 1 copy of Technical Special Provisions
- 1 copy of Landscape Opportunity Plans
- 1 copy of Bridge Load Rating Calculations
- 1 copy of Completed Bridge Load Rating Summary Detail Sheet
- 1 copy of Load Rating Summary Form
- 1 copy of all design changes introduced since the 60% plan submittal that affect the modeling or component design of various bridge components
- 1 copy of Concept of Operations (ITS)

- 1 copy of Maintenance of communication (MOC) plans
- 1 copy of Project System Engineering Management Plan (ITS)
- 1 copy of Requirement Traceability Verification Matrix (ITS)
- 1 copy existing Signalization and Intelligent Transportation System equipment report
- 1 copy of power design analysis report (PDAR)
- 1 copy of Utility Conflict Matrix

All QC plans and documentation for each component submittal shall be electronic in .pdf format

The Department will designate in the review comments if the next submittal will be a resubmittal of the 90% phase submittal or if the plans and supporting calculations are significantly developed to proceed to the Final Submittal. If the Department requires more than 2 resubmittals a submittal workshop between the Department and the Design-Build Firm must be held to resolve any outstanding issues or comments.

### **Final Submittal**

- 1 set of signed and sealed 11" X 17" plans (all required documents)
- 1 copy of signed and sealed 11" X 17" plans
- 1 set of signed and sealed design documentation
- 1 copy of signed and sealed design documentation
- 1 copy of Settlement and Vibration Monitoring Plan (SVMP)
- 1 copy of Landscape Opportunity Plans
- 1 set of final documentation
- 1 signed and sealed copy of the Bridge Load Rating Summary Detail Sheet
- 1 signed and sealed copy of the Load Rating Summary Form
- 1 signed and sealed Construction Specifications Package or Supplemental Specifications Package
- 1 copy of signed and sealed copy of Construction Specifications Package or Supplemental Specifications Package
- 1 of electronic copy of Technical Special Provisions in .pdf format
- 1 copy of all major design changes introduced since the 90% plan submittal that affect the modeling or component design of various bridge components
- 1 copy of all the Independent Department Review comments and the EOR's response
- 1 copy of Concept of Operations (ITS)
- 1 copy of Maintenance of Communication (MOC) plans
- 1 copy of Project System Engineering Management Plan (ITS)
- 1 copy of Requirement Traceability Verification Matrix (ITS)
- 1 copy existing Signalization and Intelligent Transportation System equipment report
- 1 copy Power Design Analysis Report (PDAR)

All of the information above shall be submitted electronically in .pdf format.

All QC plans and documentation for each component submittal shall be electronic in .pdf format

The Design-Build Firm shall provide a list of all changes made to the plans or specifications that were not directly related to the 90% plans review comments. Significant changes (as determined by the Department) made as a part of the Final submittal, that were not reviewed or provided in response to the 90% submittal comments, may require an additional review phase prior to stamping the plans or specifications "Released for

Construction.” The Design-Build Firm shall provide a signed certification that all Electronic Review Comments (ERC) and/or ProjectSolve comments have been resolved to the Department’s satisfaction as a requirement before obtaining “Released for Construction” plans.

### **3. Requirements to Begin Construction:**

The Department’s indication that the signed and sealed plans and specifications are “Released for Construction” authorizes the Design Build Firm to proceed with construction based on the contract plans and specifications. The Department’s review of submittals and subsequent Release for Construction is to assure that the Design-Build Firm’s EOR has approved and signed the submittal, the submittal has been independently reviewed and is in general conformance with the contract documents. The Department’s review is not meant to be a complete and detailed review. No failure by the Department in discovering details in the submittal that are released for construction and subsequently found not to be in compliance with the requirements of the contract shall constitute a basis for the Design-Build Firm’s entitlement to additional monetary compensation, time, or other adjustments to the contract. The Design-Build Firm shall cause the Engineer of Record to resolve the items not in compliance with the contract, errors or omissions at no additional cost to the Department and all revisions are subject to the Department’s approval.

The Design-Build Firm may choose to begin construction prior to completion of the Phase Submittals and the Department stamping the plans and specifications Released for Construction except for bridge construction. No permanent structures work, including fabrication of bridge members, may begin without signed and sealed plans or shop drawings (whichever controls the design and details utilized to construct/erect the specific structural component) that have been Released for construction. To begin construction the Design-Build Firm shall submit signed and sealed plans for the specific activity; submit a signed and sealed Construction Specifications Package or Supplemental Specifications Package; obtain regulatory permits as required for the specific activity; obtain utility agreements and permits, if applicable; and provide five (5) days notice before starting the specific activity. The plans to begin construction may be in any format including report with details, 8 1/2” X 11” sheets, or 11” X 17” sheets, and only the information needed by the Design-Build Firm to construct the specific activity needs to be shown. Beginning construction prior to the Department stamping the plans and specifications Released for Construction does not reduce or eliminate the Phase Submittal requirements. **NO BRIDGE CONSTRUCTION WILL BE ALLOWED TO COMMENCE UNTIL THE U.S. COAST GUARD PERMIT IS OBTAINED. BRIDGE CONSTRUCTION IS DEFINED AS FROM BEGIN BRIDGE TO END BRIDGE.**

#### **As-Built Set:**

The Design-Build Firm's Professional Engineer in responsible charge of the Project’s design shall professionally endorse (sign, seal, and certify) the As-Built Plans, the special provisions and all reference and support documents. The professional endorsement shall be performed in accordance with the FDOT Design Manual.

Design-Build Firm shall complete the As-Built Plans as the Project is being constructed. All changes made subsequent to the “Released for Construction” Plans shall be signed/sealed by the EOR. The As-Built Plans shall reflect all changes initiated by the Design-Build Firm or the Department in the form of revisions. The As-Built Plans shall be submitted prior to Project completion for Department review and acceptance as a condition precedent to the Departments issuance of Final Acceptance.

The Department shall review, certify, and accept the As-Built Plans prior to issuing Final Acceptance of the project in order to complete the As-Built Plans.

The Department shall accept the As-Built Plans and related documents when in compliance with Design Build Division I Specification 7-2.3, As-Built Drawings and Certified Surveys, and the As-Built Requirements.

The Design-Build Firm shall furnish to the Department, upon Project completion, the following:

- 1 set of 11" X 17" signed and sealed As-Built plans, drawings and Certified Surveys
- 2 sets of 11 "X 17" copies of the signed and sealed As-Built plans, drawings and Certified Surveys (including as-built channel survey)
- 1 copy of Landscape Opportunity Plans
- 1 signed and sealed copy of the Bridge Load Rating Summary Form and Calculations based on as-built conditions
- 2 sets of final documentation (if different from final component submittal)
- 1 sets of survey information, including electronic files and field books
- Deliver the final CADD.zip in accordance with the CADD Manual
- 1 Final Project submittal containing the information above shall be electronic in .pdf format

**4. Milestones:**

Component submittals, in addition to the plan submittals listed in the previous section will be required. In addition to various submittals mentioned throughout this document the following milestone submittals will be required.

- Typical Section package
- Utility Clearance Certification
- Permit applications for Department review
- Responses to RAIs from permitting agencies for Department review
- Approved permits package
- Pavement Design Package, if different than the minimum pavement design included as an Attachment to the RFP
- **Re-Evaluation, if needed due to design changes**
- **Endangered Species Act (ESA) Section 7 Re-Initiation of consultation if needed due to design changes or time.**

**5. Railroad Submittals: N/A**

**J. Contract Duration:**

The Department has established a Contract Duration of 1,720 calendar days for the subject Project. **An Incentive-Disincentive is available for this project and can be found in the Design-Build Division I Specifications included in the Attachments section of the RFP. The achievable incentive is \$5,000,000 as detailed in the specification.**

**K. Project Schedule:**

The Design-Build Firm shall submit a Schedule, in accordance with Subarticle 8-3.2 (Design-Build Division I Specifications). The Design-Build Firm's Schedule shall allow for up to fifteen (15) calendar days (excluding weekends and Department observed Holidays) review time for the Department's review of all submittals with the exception of Category 2 structures submittals. The review of Category 2 structures submittals requires Central Office Structures Design Office involvement and **Independent Department Reviews. the schedule shall allow for up to 20 calendar days (excluding weekends and Department observed Holidays) for these reviews.** The Design-Build Firm shall allow at least the following durations:

- (30) calendar days (excluding weekends and Department observed Holidays) between the 60% phase submittal and the 90% phase submittal for any Category 2 structures Submittals to allow for the initial development of the IDR.
- (60) calendar days (excluding weekends and Department observed Holidays) between the 90% phase submittal and the Final phase submittal for any Category 2 structures Submittals for the IDR.
- (20) calendar days (excluding weekends and Department observed Holidays) for the Final phase submittal for any Category 2 structures Submittals.
- (20) calendar days (excluding weekends and Department observed Holidays) for the review of all additional Category 2 structures resubmittals. Category 2 structure resubmittals must include all required submittal documentation per Section V.I (Submittals)

IDR durations are subject to change based on the Design Build Firm's Technical Proposal submittal. Upon review of each Firm's Technical Proposal, new IDR review times may be provided to each Firm as part of the Question and Answer Written response session. The Independent Department Review of Category 2 structures will be performed concurrently, and of similar duration, with the normal Department review of submittals. Review will not begin until submittals are deemed complete by the Department.

The Department will perform the review of Foundation Construction submittals in accordance with Section 455.

The following Special Events have been identified in accordance with Specification 8-6.4:

- Billy Bowlegs Pirate Festival
- Mardi Gras on the Island
- ~~Red Cross Run~~
- Greek Festival
- ~~Downtown Fort Walton Beach Street Fest~~
- ~~Earth Day Fort Walton Beach~~
- **Spring Break**

| <b><u>Year</u></b> | <b><u>Dates</u></b>       |
|--------------------|---------------------------|
| <b><u>2023</u></b> | <b><u>March 10-26</u></b> |
| <b><u>2024</u></b> | <b><u>March 08-24</u></b> |
| <b><u>2025</u></b> | <b><u>March 07-23</u></b> |
| <b><u>2026</u></b> | <b><u>March 13-29</u></b> |
| <b><u>2027</u></b> | <b><u>March 12-28</u></b> |
| <b><u>2028</u></b> | <b><u>March 10-26</u></b> |

The minimum number of activities included in the Schedule shall be those listed in the Schedule of Values and those listed below:

- Anticipated Award Date
- Anticipated Contract Execution Date
- Anticipated Notice to Proceed Date
- Department Right-of-Way Clear Date
- Kickoff meeting with the Department's Independent Review consultant
- Design Submittals
- Completed Category 2 bridge design for Independent Department review
- Shop Drawing Submittals
- Other Contractor-Initiated Submittals including RFI's, RFM's, RFC's, and NCR's
- Design Survey
- Submittal Reviews by the Department and FHWA
- Design Review / Acceptance Milestones
- Materials Quality Tracking
- Geotechnical Investigation
- Start of Construction
- Clearing and Grubbing
- Construction Mobilization
- Embankment/Excavation
- Environmental Permit Acquisition
- Foundation Design (60%, 90%, Final,)
- Foundation Construction
- Fender System Design
- Fender System Construction
- Substructure Design (60%, 90%, Final, RFC)
- Substructure Construction
- Superstructure Design (60%, 90%, Final, RFC)
- Superstructure Construction
- Walls Design
- Walls Construction
- Roadway Design
- Roadway Construction
- Signing and Pavement Marking Design
- Signing and Pavement Marking Construction
- Signalization and Intelligent Transportation System Design
- Signalization and Intelligent Transportation System Construction
- Maintenance of Communication (MOC) Plan
- Existing Signalization and Intelligent Transportation System equipment report
- Equipment Testing and Commissioning; System Testing, Standalone
- Equipment Testing and Commissioning; System Testing, Network Communication
- Equipment Testing and Commissioning; System Testing, Central Test End-User
- Equipment Submittals (Prior to Start of Construction)
- Test Plan Submittal to FDOT
- Field Device Deployment
- System Integration (District Coordination, County Coordination, Meetings, Field Work, Acceptance)
- As-Built Plan Preparation and Submittal
- RTVM Updates Lighting Design

- Lighting Design
- Lighting Construction
- Maintenance of Traffic Design
- Landscape Opportunity Plans
- Permit Submittals
- Demolition of Existing Bridge
- Landscape/Irrigation Design (inside roundabouts only)
- Landscape/Irrigation Construction (inside roundabouts only)
- Maintenance of Traffic Set-Up (per duration)
- Erosion Control
- Holidays and Special Events (shown as non-work days)
- Additional Construction Milestones as determined by the Design-Build Firm
- Final Completion Date for All Work

**L. Key Personnel/Staffing:**

The Design-Build Firm's work shall be performed and directed by key personnel identified in the Letter of Interest and/or Technical Proposal by the Design-Build Firm. In the event a change in key personnel is requested, the Design-Build Firm shall submit the qualifications of the proposed key personnel and include the reason for the proposed change. Any changes in the indicated personnel shall be subject to review and approval by the District Construction Engineer. The Department shall have sole discretion in determining whether or not the proposed substitutions in key personnel are comparable to the key personnel identified in the Letter of Interest and/or Technical Proposal. The Design-Build Firm shall have available professional staff meeting the minimum training and experience set forth in Florida Statute Chapter 455.

**M. Partner/Teaming Arrangement:**

Partner/Teaming Arrangements of the Design-Build Firm (i.e., Prime Contractor or Lead Design Firm) cannot be changed after submittal of the Letter of Interest without written consent of the Department. In the event a change in the Partner/Teaming Arrangement is requested, the Design-Build Firm shall submit the reason for the proposed change. Any changes in the Partner/Teaming Arrangement shall be subject to review and approval by the Department's Chief Engineer. The Department shall have sole discretion in determining whether or not the proposed substitutions in Partner/Teaming Arrangements are comparable to the Partner/Teaming Arrangements identified in the Letter of Interest and/or Technical Proposal.

**N. Meetings and Progress Reporting:**

The Design-Build Firm shall anticipate periodic meetings with Department personnel and other agencies as required for resolution of design and/or construction issues. These meetings may include:

- Department technical issue resolution
- Local government agency coordination
- Maintenance of Traffic Workshop
- Pavement Design Meeting
- Permit agency coordination
- Scoping Meetings
- System Integration Meetings
- Drainage Pre-submittal Meetings



- Post Submittal Design Review Meetings

During design, the Design-Build Firm shall meet with the Department's Project Manager on a monthly basis at a minimum and provide a one month look ahead of the activities to be completed during the upcoming month.

During construction, the Design-Build Firm shall meet with the Department's Project Manager on a weekly basis and provide a one-week look ahead for activities to be performed during the coming week.

The Design-Build Firm shall meet with the Department's Project Manager at least thirty (30) calendar days before beginning system integration activities. The purpose of these meetings shall be to verify the Design-Build Firm's ITS and signalization integration plans by reviewing site survey information, proposed splicing diagrams, IP addressing schemes, troubleshooting issues, and other design issues. In addition, at these meetings the Design-Build Firm shall identify any concerns regarding the Integration and provide detailed information on how such concerns will be addressed and/or minimized.

The Design-Build Firm shall provide all documentation required to support system integration meetings, including detailed functional narrative text, system and subsystem drawings and schematics. Also included shall be the documentation to demonstrate all elements of the proposed design which includes, but is not limited to: technical, functional, and operational requirements; ITS/communications; equipment; termination/patch panels; performance criteria; and details relating to interfaces to other ITS subsystems. If, for any reason, planned network or signal operation outages are to occur, the Design-Build Firm shall submit to the Department for approval a Maintenance of Communication (MOC) Plan in advance of the planned network and/or signal operation outage detailing work to be performed and a strategy for minimizing the outage. The existing fiber backbone cut over shall be coordinated District Three Transportation System Management Operations (TSM&O) manager, Okaloosa County Traffic Engineer and designated representatives before beginning of roadway construction.

The project location currently has Okaloosa County fiber on the Brooks bridge and the project corridor.

System Integration Meetings will be held on mutually agreeable dates.

All action items resulting from the System Integration Meeting shall be satisfactorily addressed by the Design-Build Firm and reviewed and approved by the Department.

The Design-Build Firm shall, on a monthly basis, provide written progress reports that describe the items of concern and the work performed on each task.

## **O. Public Involvement:**

### **1. General:**

Public involvement is an important aspect of the Project. Public involvement includes communicating to all interested persons, groups, and government organizations information regarding the development of the Project. The Department, or its designated representative, will serve as the Public Involvement Consultant (PIC) to carry out an exhaustive Public Involvement Campaign and a marketing effort. The Design-Build Firm will assist the Department in the Public Involvement effort as described below.

2. **Community Awareness:**

The Design-Build Firm will cooperate with the PIC in development and delivery of a project Community Awareness Program.

3. **Public Meetings:**

The Design-Build Firm shall provide all supporting materials necessary for various public meetings, which may include:

- Kick-off or introductory meeting
- Metropolitan Planning Organization (MPO) Citizens Advisory Committee Meetings
- MPO Transportation Technical Committee Meetings
- MPO Meetings
- Public Information Meetings
- Elected and appointed officials
- Special interest groups (private groups, homeowners associations, environmental groups, minority groups and individuals)
- Open Houses
- Virtual Public Hearings

The Design-Build Firm shall include attendance at two meetings per month for the term of the contract to support the public involvement program.

For any of the above type meetings the Design-Build Firm shall provide all technical assistance, data and information, display boards, printed material, video graphics, computerized graphics, etc., and information necessary for the day-to-day exchange of information with the public, all agencies and elected officials in order to keep them informed as to the progress and impacts that the proposed Project will create. This includes workshops, information meetings, open houses, and public hearings.

The Design-Build Firm shall, as determined by the Department, attend the meetings with an appropriate number of personnel to assist the CEI/Department. The Design-Build Firm shall forward all requests for group meetings to the CEI/Department. The Design-Build Firm shall inform the CEI/Department of any meetings with individuals that occur without prior notice.

4. **Public Workshops, Information Meetings:**

The Design-Build Firm shall provide all the support services listed in No. 3 above.

All legal/display advertisements announcing workshops, information meetings, and public meetings will be prepared and paid for by the Department.

The Department will be responsible for the legal/display advertisements for design concept acceptance. The Department will be responsible for preparing and mailing (includes postage) for all letters announcing the associated workshops and information meetings.

5. **Public Involvement Data:**

The Design-Build Firm is responsible for the following:

- Coordinating with the Department's PIC and the District Public Information Office.
- Identifying possible permit and review agencies and providing names and contact information for these agencies to the Department.
- Providing required expertise (staff members) to assist the Department on an as-needed basis.
- Preparing color graphic renderings and/or computer generated graphics to depict the proposed improvements for coordination with the Department, local governments, and other agencies.
- Providing information to the Department to keep the Department website current.

The Design-Build Firm shall provide records of all public correspondence, written or verbal, to the Department throughout the life of the Project.

The Design-Build Firm may be asked by the CEI/Department to prepare draft responses to any public inquiries as a result of the public involvement process. The Department shall review all responses prior to the Design-Build Firm mailing.

**P. Quality Management Plan (QMP):**

**1. Design:**

The Design-Build Firm shall be responsible for the professional quality, technical accuracy and coordination of all surveys, designs, drawings, specifications, geotechnical and other services furnished by the Design-Build Firm under this contract.

The Design-Build Firm shall provide a Design Quality Management Plan, which describes the Quality Control (QC) procedures to be utilized to verify, independently check, and review all design drawings, specifications, and other documentation prepared as a part of the contract. In addition the QMP shall establish a Quality Assurance (QA) program to confirm that the Quality Control procedures are followed. The Design-Build Firm shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The QMP may be one utilized by the Design-Build Firm, as part of their normal operation or it may be one specifically designed for this Project. The Design-Build Firm shall submit a QMP within fifteen (15) working days following issuance of the written Notice to Proceed. A marked up set of prints from the Quality Control review will be sent in with each review submittal. The responsible Professional Engineers or Professional Surveyor that performed the Quality Control review, as well as the QA manager will sign a statement certifying that the review was conducted.

The Design-Build Firm shall, without additional compensation, correct all errors or deficiencies in the surveys, designs, drawings, specifications and/or other services.

**2. Construction:**

The Design-Build Firm shall be responsible for developing and maintaining a Construction Quality Control Plan in accordance with Section 105 of Standard Specifications which describes their Quality Control procedures to verify, check, and maintain control of key construction processes and materials.

The sampling, testing and reporting of all materials used shall be in compliance with the Sampling, Testing and Reporting Guide (STRG) provided by the Department. The Design-Build Firm will use the

Department's database(s) to allow audits of materials used to assure compliance with the STRG. The Department has listed the most commonly used materials and details in the Department's database. When materials being used are not in the Department's database list, the Design-Build Firm shall use appropriate material details from the STRG to report sampling and testing. Refer to the State Materials Office website for instructions on gaining access to the Department's databases: <http://www.fdot.gov/materials/quality/programs/qualitycontrol/contractor.shtm>

Prepare and submit to the Engineer a Job Guide Schedule (JGS) using the Department database in accordance with Section 105 of Standard Specifications.

The Department, and FHWA, as necessary, shall maintain its rights to inspect construction activities and request any documentation from the Design-Build Firm to ensure quality products and services are being provided in accordance with the Department's Materials Acceptance Program.

**Q. Liaison Office:**

The Department and the Design-Build Firm will designate a Liaison Office and a Project Manager who shall be the representative of their respective organizations for the Project.

**R. Engineers Field Office: N/A**

**S. Schedule of Values:**

The Design-Build Firm is responsible for submitting estimates requesting payment. Estimates requesting payment will be based on the completion or percentage of completion of tasks as defined in the schedule of values. Final payment will be made upon final acceptance by the Department of the Design-Build Project. Tracking DBE participation will be required under normal procedures according to the Construction Project Administration Manual. The Design-Build Firm must submit the schedule of values to the Department for approval. No estimates requesting payment shall be submitted prior to Department approval of the schedule of values.

Upon receipt of the estimate requesting payment, the Department's Project Manager will make judgment on whether or not work of sufficient quality and quantity has been accomplished by comparing the reported percent complete against actual work accomplished.

**T. Computer Automation:**

The Project shall be developed utilizing computer automation systems in order to facilitate the development of the contract plans. Various software and operating systems were developed to aid in assuring quality and conformance with Department policies and procedures. The Department supports OpenRoads Designer with FDOT Connect Software as its standard graphics and roadway design platform as well as Autodesk's AutoCAD Civil 3D as an alternate platform. Seed Files, Cell Libraries, User Commands, MDL Applications and related programs developed for roadway design and drafting are in the FDOT CADD Software Suite. Furnish As-Built documents for all building related components of the Project in AutoCAD

format. It is the responsibility of the Design-Build Firm to obtain and utilize current Department releases of all CADD applications.

The Design-Build Firm will be required to furnish the Project's CADD files after the plans have been Released for Construction. The Design-Build Firm's role and responsibilities are defined in the Department's CADD Manual. The Design-Build Firm will be required to submit final documents and files which shall include complete CADD design and coordinate geometry files in OpenRoads Designer and/or AutoCAD design files format.

As part of the As-Built Set deliverables, field conditions shall be incorporated into OpenRoads Designer and/or AutoCAD design files. Use the cloud revision utility as well as an "AB" revision triangle to denote field conditions on plan sheets.

**U. Construction Engineering and Inspection:**

The Department is responsible for providing Construction Engineering and Inspection (CEI) and Quality Assurance Engineering.

The Design-Build Firm is subject to the Department's Independent Assurance (IA) Procedures.

**V. Testing:**

The Department or its representative will perform verification and resolution sampling and testing activities at both on site, as well as, off site locations such as pre-stress plants, batch plants, structural steel , fabrication plants, etc. in accordance with the latest Specifications.

**W. Value Added:**

The Design-Build Firm may provide Value Added Project Features, in accordance with Article 5-14 of the Specifications for the following features:

- Roadway features
- Roadway drainage systems,
- Approach slabs
- Superstructure
- Substructure
- Concrete defects
- Structural steel defects (if applicable)
- Post-tensioning systems (if applicable)
- ITS Elements
- Landscaping

And any other products or features the Design-Build Firm desires. The Design-Build Firm shall develop the Value Added criteria, measurable standards, and remedial work plans in the Design-Build Firm's Technical Proposal for features proposed by the Design-Build Firm.

The Design-Build Firm shall provide at a minimum the three (3) year warranty period as defined by Article 338, Value Added Asphalt Pavement, Division II, Standard Specifications. The Design-Build Firm may provide a longer warranty period than the three (3) year minimum.

The Design-Build Firm shall provide at a minimum the five (5) year warranty period as defined by Article 475, Value Added Bridge Components, Division II, Value Added Specifications. The Design-Build Firm may provide a longer warranty period than the five (5) year minimum.

The Department will NOT consider self-imposed monetary penalties/deductions proposed by Design-Build Firm's as Value Added items.

#### **X. Adjoining Construction Projects:**

The Design-Build Firm shall be responsible for coordinating all design, permitting, and construction activities with other construction Projects that are impacted by or impact this Project. This includes Projects under the jurisdiction of local governments, the Department, other regional and state agencies, or private entities. Adjoining construction projects include, but are not limited to:

- FPID 437366-1 SR 30 (US 98) from West of Josie Road to West of Brooks Bridge—Resurfacing; The project is scheduled to Let in FY 2023. The Department's Project Manager is Ray Kirkland.
- FPID 442261-1 Santa Rosa Blvd from Military Bound Entrance to SR 30 (US 98) Miracle Strip—Local Agency Program (LAP) Project for sidewalk construction. The Department's Project Manager is Craig Gavin.

The Design-Build Firm shall consider and include in the Construction Plans and Bid Price Proposal, any and all temporary detours or diversions required to facilitate traffic movements into and out of the project limits; notwithstanding the alignment, lane positioning and/or grade differences of traffic conditions on those adjacent projects.

#### **Y. Issue Escalation:**

In the event issues arise during prosecution of the work, the resolution of those issues will be processed as described below unless revised by a Project specific Partnering Agreement:

The escalation process begins with the Construction Project Manager. All issues are to be directed to the Construction Project Manager. If the issue cannot be resolved by the Construction Project Manager in coordination with the Resident Engineer and Design Project Manager as applicable, the Construction Project Manager shall forward the issue to the District Construction Engineer who will coordinate with the District Design Engineer, and the District Utility Administrator, as applicable. Each level shall have a maximum of five (5) calendar days (excluding weekends and Department observed holidays) to answer, resolve, or address the issue. The Design-Build Firm shall provide all supporting documentation relative to the issue being escalated. The five (5) calendar day period (excluding weekends and Department observed holidays) begins when each level in the issue escalation process has received all required supporting documentation necessary to arrive at an informed and complete decision. The five (5) calendar day period (excluding weekends and Department observed holidays) is a response time and does not infer resolution.

Questions asked by the Department may be expressed verbally and followed up in writing within one (1) calendar day (excluding weekends and Department observed holidays). Responses provided by the Design-Build Firm may be expressed verbally and followed up in writing within one (1) working day. Once a response is received from the District Construction Engineer, the Construction Project Manager will respond to the Design-Build Firm in a timely manner but not to exceed three (3) calendar days (excluding weekends and Department observed holidays).

The Design-Build Firm shall provide a similar issue escalation process for their organization with personnel of similar levels of responsibility.

Should an impasse develop, the Dispute Review Board shall assist in the resolution of disputes and claims arising out of the work on the Contract.

## **VI. Design and Construction Criteria.**

### **A. General:**

All design and construction work completed under the Contract shall be in accordance with the United States Standard Measures.

### **B. Vibration and Settlement Monitoring:**

The Design-Build Firm shall be responsible for the identification of and coordination with vibration sensitive sites impacted by the Work for the duration of the construction period.

The Design-Build Firm is responsible for evaluating the need for, design of, and the provision of any necessary precautionary features to protect existing structures from damage, including, at a minimum, selecting construction methods and procedures that will prevent damage. The Design-Build Firm shall submit for Department acceptance a Settlement and Vibration Monitoring Plan (SVMP) as part of the 90% plans submittal and update the SVMP throughout the Construction Period. The Design-Build Firm is responsible for establishing maximum settlement and vibration thresholds equivalent to or lower than the Department Specification requirements for all construction activities, including vibratory compaction operations and excavations.

Submittals for Settlement and Vibration Monitoring Plan (SVMP) shall include the following as a minimum:

- Identify any existing structures that will be monitored for vibrations during the construction period.
- Establish the maximum vibration levels for the existing structures that shall not be exceeded.
- Identify any existing structures that will be monitored for settlement during the construction period.
- Establish the maximum settlement levels for the existing structures that must not be exceeded.

- Identify any existing structures that require pre-construction and post-construction surveys.

The Department will perform the review of Vibration and Settlement submittals in accordance with Department Specifications.

### **C. Geotechnical Services:**

#### **Driven Pile Foundations for Bridges and Major Structures**

The Design-Build Firm shall determine whether the resistance factors used for pile design will be based on static, statnamic, and/or dynamic load testing. If static/statnamic load testing is proposed, prepare a Technical Special Provision (TSP) for tests other than the Modified Quick Test, such as Bidirectional (Osterberg Cell) Load Test or Statnamic Load Test. For Bidirectional Load Tests use the same loading and unloading intervals, as well as the same loading times specified for the Modified Quick Test. Comply with the instrumentation requirements of 455-2.4. Before the resistance factors for static/statnamic load testing may be used for pile foundations in any of the following areas of the Project, a minimum number of successful load tests must be performed in representative locations of that area:

- Station 109+05 to Station 115+00 (CL of Survey), minimum of 1 test)
- Station 115+00 to Station 120+00 (CL of Survey), minimum of 1 tests)
- Station 120+00 to Station 131+96 (CL of Survey), minimum of 1 test)

The Design-Build Firm shall be responsible for the following:

1. Selection of pile type and size.
2. Selection of test pile lengths, locations and quantity of test piles.
3. Selection of pile testing methods.
4. Determining the frequency of such testing unless otherwise stated herein.
5. Performance of the selected test pile program, including dynamic load test personnel and equipment. The Department may observe the installation of test piles and all pile testing.
6. Preparing and submitting a Pile Installation Plan for the Department's acceptance.
7. Selection of production pile lengths.
8. Development of the driving criteria.
9. Driving piles to the required capacity and minimum penetration depth.
10. Inspecting and Recording the pile driving information. Provide a pile inspection device that displays and stores electronically for every hammer blow along with a timestamp: stroke for open-ended diesel hammers and blows per foot and blows per minute for all hammers. The device must auto-generate the Department's Pile Driving Record form and export the non-editable electronic data in a format compatible with the Pile Driving Record form. Use this device during the inspection of test piles and production piles.
11. Submitting Foundation Certification Packages.
12. Providing safe access and cooperating with the Department in verification of the piles, both during construction and after submittal of the certification package.



## Drilled Shaft Foundations for Bridges and Miscellaneous Structures

The Design-Build Firm shall determine whether the resistance factors used for drilled shaft design will be based on static/statnamic load testing. Prepare a Technical Special Provision (TSP) for tests other than the Modified Quick Test, such as Bidirectional (Osterberg Cell) Load Test or Statnamic Load Test. For Bidirectional Load Tests use the same loading and unloading intervals, as well as the same loading times specified for the Modified Quick Test. Comply with the instrumentation requirements of 455-2.4. Before the resistance factors for static/statnamic load testing may be used for drilled shafts in any of the following areas of the Project, a minimum number of successful load tests must be performed in representative locations of that area:

- Station 109+05 to Station 115+00 (CL of Survey), (minimum of 1 test)
- Station 115+00 to Station 120+00 (CL of Survey), (minimum of 1 test)
- Station 120+00 to Station 131+96 (CL of Survey), (minimum of 1 test)

Limits of these areas may be modified by the Design-Build Firm if the modifications are justified by additional subsurface information and concurred with by the Department. Furthermore, resistance factors for static/statnamic load testing may only be used for production shafts which have the same tip elevations in the same material as the representative static/statnamic load test shaft. Deviations in tip elevations or bearing material will require additional static/statnamic testing if the static/statnamic load test resistance factors will be used.

The Design-Build Firm shall be responsible for the following:

1. Evaluating geotechnical conditions to determine the drilled shaft diameter and length and construction methods to be used.
2. Performing the subsurface investigation and drilling pilot holes prior to establishing the drilled shaft tip elevations and socket requirements. For redundant drilled shaft bridge foundations, perform at least one test boring in accordance with the Soils and Foundations Handbook at each bent/pier.
3. Determining the locations of the load test shafts and the types of tests that will be performed.
4. Performing pilot borings for test holes (also known as test shafts or method shafts) and load test shafts and providing the results to the Department at least one (1) working day before beginning construction of these shafts.
5. Preparing and submitting a Drilled Shaft Installation Plan for the Department's acceptance.
6. Constructing the method shaft (test hole) and load test shafts successfully and conducting thermal integrity tests on these shafts.
7. Providing all personnel and equipment to perform a load test program on the load test shafts.
8. Determining the production shaft lengths.
9. Documenting and providing a report that includes all load test shaft data, analysis, and recommendations to the Department.
10. Constructing all drilled shafts to the required tip elevation and socket requirement in accordance with the specifications.
11. Inspecting and documenting the construction of all drilled shafts in accordance with the specifications.
12. Performing Non-Destructive Drilled Shaft Integrity Testing in accordance with 455-17.6.

13. Repairing all detected defects and conducting post repair integrity testing using 3D tomographic imaging and gamma-gamma density logging.
14. Submitting Foundation Certification Packages in accordance with the specifications.
15. Providing safe access and cooperating with the Department in verification of the drilled shafts, both during construction and after submittal of the certification package.

### **Spread Footings Foundations For Miscellaneous Structures**

The Design-Build Firm shall be responsible for the following:

1. Evaluating geotechnical conditions and designing the spread footing.
2. Constructing the spread footing to the required footing elevation, at the required soil or rock material, and at the required compaction levels, in accordance with the specifications.
3. Inspecting and documenting the spread footing construction.
4. Submitting Foundation Certification Packages in accordance with the specifications.
5. Providing safe access and cooperating with the Department in verification of the spread footing, both during construction and after submittal of the certification package.

### **Auger Cast Piles for Miscellaneous Structures**

The Design-Build Firm shall be responsible for the following:

1. Evaluating geotechnical conditions and designing the foundations, including diameter and lengths.
2. Constructing all auger cast piles to the required tip elevation and socket requirements, in accordance with the specifications.
3. Preparing and submitting an Auger Cast Pile Installation Plan for the Department's acceptance.
4. Inspecting and documenting the auger cast pile installation.
5. Submitting Foundation Certification Packages in accordance with the specifications.
6. Providing safe access and cooperating with the Department in verification of the auger cast piles, both during construction and after submittal of the certification package.

### **Specialty Geotechnical Services Requirements**

Specialty geotechnical work is any alternative geotechnical work not covered by Department Specifications and requires the development of a Technical Special Provision (TSP). Any TSP for geotechnical work shall include the following:

- Criteria of measurable parameters to be met in order to accept the specialty geotechnical work,
- A field testing and instrumentation program to verify design assumptions and performance,
- A quality control program to be performed by the Design-Build Firm that includes sampling and testing to ensure the material quality, products, and installation procedures meet requirements,
- A verification testing program to be performed by the Geotechnical Foundation Design Engineer of Record (GFDEOR) that includes inspection, sampling, and testing to verify the material, products, and procedures meet requirements. The TSP shall include language providing separate lab samples to be used for the Department's independent verification.
- A certification process.

After construction of the specialty geotechnical work, the Design-Build Firm shall submit a certification package for Department's review within 15 business days. The certification package shall include the results of all the field testing, instrumentation and lab testing performed and a signed and sealed letter by

the GFDEOR certifying that the specialty geotechnical work meets the requirements. The Department may issue comments and require additional verification testing.

**D. Utility Coordination:**

The Design-Build Firm shall utilize a single dedicated person responsible for managing all utility coordination. This person shall be contractually referred to as the Utility Coordination Manager (UCM) and shall be identified in the Design-Build Firm's proposal. The Design-Build Firm shall notify the Department in writing of any change in the identity of the Utility Coordination Manager. The Utility Coordination Manager shall have the following knowledge, skills, and abilities:

1. A minimum of 4 years of experience performing utility coordination in accordance with Department standards, policies, and procedures.
2. Knowledge of the Department plans production process and utility coordination practices,
3. Knowledge of Department agreements, standards, policies, and procedures.
4. Ability to physically reach the project site within three (3) hours.

The Design-Build Firm's Utility Coordination Manager shall be responsible for managing all utility coordination, including, but not limited to, the following:

1. Ensuring that all utility coordination and activities are conducted in accordance with the requirements of the Contract Documents.
2. Identifying all existing utilities and coordinating any new installations
3. Reviewing proposed utility permit application packages and providing comments based on the compatibility of the permit as related to the Design-Build Firm's plans.
4. Scheduling and conducting utility meetings, preparing and distributing minutes of all utility meetings, and ensuring expedient follow-up on all unresolved issues.
5. Distributing all plans, conflict matrices and changes to affected Utility Agency/Owners and making sure this information is properly coordinated.
6. Identifying, preparing, reviewing and facilitating any agreement required for any utility work needed through final approval and execution. The UCM shall also be responsible for monitoring and reporting the performance of all involved parties under said agreement.
7. Preparing, reviewing, approving, signing, and coordinating the implementation of and submitting to the Department for review, all Utility Work Schedules.
8. Resolving utility conflicts.
9. Obtaining and maintaining all appropriate "Sunshine 811" tickets as they apply to utility relocation work.
10. Performing Constructability Reviews of plans prior to construction activities with regard to the installation, removal, temporary removal, de-energizing, deactivation, relocation, or adjustment of utilities.
11. Providing periodic Project updates to the Department Project Manager and District Utility Office as requested.
12. Coordination with the Department on any issues that arise concerning reimbursement of utility work costs between the Department and the utility.
- ~~13. **Verifying the electrical and communications requirements for toll facilities provided in the GTR.**~~

14. Prepare utility certifications or statements for all Federal-Aid construction projects per 23 CFR 635.309(p)(1)(v)

The following Utility Agency/Owners (UA/O's) have been identified by the Department as having facilities within the Project corridor for which the Department contemplates an adjustment, protection, or relocation is possible. Also provided below is a determination made by the Department as to the eligibility of reimbursement for each UA/O identified herein along with an identification of whether the UA/O or the Design-Build Firm will be responsible for performing the utility work

**Table A – Summary of Department Contemplated Adjustment, Protection, or Relocation**

| <u>UA/O</u>                            | <u>Utility Relocation Type</u>   | <u>Eligible for Reimbursement</u> | <u>Work to be Bid in this D/B Contract</u> |
|--|--|-----------------------------------|--|
| AT&T Corporate                         | UA/O Performing Utility Work   | No                                | No   |
| AT&T Florida                           | UA/O Performing Utility Work;<br>DB Firm Performing partial Utility Work through UWHC <sup>1</sup> | No                                | Partial 1.                                 |
| Centurylink                            | UA/O Performing Utility Work;<br>DB Firm Performing partial Utility Work through UWHC <sup>1</sup> | Partial                           | Partial 1.                                 |
| City of Fort Walton Beach              | UA/O Performing Utility Work   | Partial                           | No   |
| Cox Southeast                          | UA/O Performing Utility Work;<br>DB Firm Performing partial Utility Work through UWHC <sup>1</sup> | Partial                           | Partial 1.                                 |
| Gulf Power Company                     | UA/O Performing Utility Work   | Partial                           | No   |
| Okaloosa County Information Technology | UA/O Performing Utility Work;<br>DB Firm Performing partial Utility Work through UWHC <sup>1</sup> | No                                | Partial 1.                                 |
| Okaloosa County Signal System          | UA/O Performing Utility Work;<br>DB Firm Performing partial Utility Work through UWHC <sup>1</sup> | No                                | Partial 1.                                 |
| Okaloosa County Water & Sewer          | DB Firm Performing Utility Work through UWHC   | Partial                           | Yes  |
| Okaloosa Gas District                  | UA/O Performing Utility Work   | Partial                           | No   |
| Uniti Fiber                            | UA/O Performing Utility Work;<br>DB Firm Performing partial Utility Work through UWHC <sup>1</sup> | No                                | Partial 1.                                 |
| Eglin AFB Communications               | DB Firm Performing Utility Work through UWHC   | No                                | Yes  |

1. DB Firm work to include 4" stainless steel conduit materials, placement, and attachment to bridge. See Description of Work section of the DBRFP.

**Table B - Summary of UAO having facilities within the Proposed Project Limits**

| <u>UAO</u>     | <u>Contact Person</u> | <u>Contact Number</u>    | <u>Email Address</u> |
|----------------|-----------------------|--------------------------|----------------------|
| AT&T Corporate | Steve Hamer           | 813-888-8300<br>EXT. 201 | shamer@sdt-1.com     |
| AT&T Florida   | Tim Edgar             | 850-293-3780             | te1810@att.com       |

|  |                     |              |                               |
|--|---------------------|--------------|-------------------------------|
| CenturyLink                            | Amber Gilson        | 850-815-3131 | amber.gilson@centurylink.com  |
| City of Fort Walton Beach              | Daniel Payne, P.E.  | 850-833-9613 | dpayne@fwb.org                |
| Cox Southeast                          | Roger Dixon         | 850-314-8163 | roger.dixon@cox.com           |
| Gulf Power Company                     | Chad Swails         | 850-244-4747 | chad.swails@nexteraenergy.com |
| Okaloosa County Information Technology | Jason Snyder        | 850-978-0331 | jsnyder@myokaloosa.com        |
| Okaloosa County Signal System          | Randy Showers, P.E. | 850-609-6181 | rshowers@myokaloosa.com       |
| Okaloosa County Water & Sewer          | Jon Kanak           | 850-609-5098 | jkanak@myokaloosa.com         |
| Okaloosa Gas District                  | Ryan Burns          | 850-280-4851 | ryanburns@okaloosagas.com     |
| Uniti Fiber                            | Kyle Hill           | 850-544-1400 | james.hill@uniti.com          |
| Eglin AFB Communications               | Mr. Ken Coleman     | 850-882-4990 | kenneth.coleman.7@us.af.mil   |

Utility information shown in the RFP Concept Plans is limited to existing utility locations. The information is sourced from UA/O markups, UA/O GIS data, UA/O as-builts, and project survey as noted in the plans. Source information provided by UA/O's is included in the Reference Documents. The Description of Work section of the RFP includes specific information on UWHC.

The Design-Build Firm may request the utility to be relocated to accommodate changes from the concept plans; however, these relocations require the Department's approval and the Department will not pay the Utility Agency/Owner (UA/O) or the Design-Build Firm for the utility relocation work regardless of the UA/O's eligibility for reimbursement. Gulf Power (remain in place and energized), Okaloosa Gas District (remain in place and in service), Okaloosa County Water and Sewer (remain in place, and to be placed out of service once new main installed on new bridge) and AT&T Corporate (remain in place and out of service **once temporary crossing is installed on new bridge**) have subaqueous facilities as depicted in the concept plans and as shown in the Reference Documents. These facilities are to be protected, to remain, and not to be relocated.

For a reimbursable utility relocation where the UA/O desires the work to be done by their contractor, the UA/O will perform the work in accordance with the utility work schedule and permit, and bill the Department directly.

**DEVIATION FROM THE CONCEPTUAL UTILITY RELOCATION PLAN:** If the Design-Build Firm chooses to deviate from the concept plans and the scope of the impact to a utility depicted in the Reference Documents, and thereby causes a greater impact to a utility, the Design-Build Firm shall be solely responsible for all increased costs incurred by the utility owner associated with the increase in the scope of the impact to a utility from that depicted in the Reference Documents. The Design-Build Firm shall obtain an agreement from the utility owner being impacted which outlines the changes to the scope of the impact to a utility from that depicted in the Reference Documents. The agreement shall also address the Design-Build Firm's obligation to compensate the utility owner for the additional costs above the costs which would have been incurred without the Design Build Firm's increase in the scope of the impact to a utility from that depicted in the Reference Documents. The Design-Build Firm shall also provide a draft utility permit application acceptable to the Department for the placement of the utility owner's facilities based on the final

design. The Department shall not compensate or reimburse the Design-Build Firm for any cost created by a change in scope of the impact to a utility from that depicted in the Reference Documents, or be liable for any time delays caused by a change in scope of the impact to a utility from that depicted in the Reference Documents.

The relocation agreements, plans, work schedules and permit application are to be forwarded to the Department for review by the District Utility Office (DUO) and the Department's Project Manager. The DUO and Department's Project Manager only review the documents and are not to sign them. Once reviewed, the utility permit application will be forwarded to the District Maintenance office for the permit to be signed and recorded or submitted through the One Stop Permitting (OSP) system.

**E. Roadway Plans:**

**General:**

The Design-Build Firm shall prepare the Roadway Plans Package. This work effort includes the roadway design and drainage analysis needed to prepare a complete set of Roadway Plans, Temporary Traffic Control Plans, Environmental Permits and other necessary documents.

**Design Analysis:**

The Design-Build Firm shall develop and submit a Typical Section Package based on the RFP Requirements. The Design-Build Firm shall develop and submit a signed and sealed Pavement Design Package **(if modified from the minimum pavement design in the RFP)** and Drainage Analysis Report for review and concurrence by the Department and FHWA on Projects of Division Involvement (PoDIs).

Any deviation from the Department's design criteria will require a Design Variation and any deviation from AASHTO will require a Design Exception. All such Design Variations and Design Exceptions must be approved.

These packages shall include the following:

**F. Roadway Design:**

See FDM Part 3; Chapter 301 for Roadway Design sheets, elements and completion level required for each submittal.

**1. Typical Section Package:**

- Transmittal letter
- Location Map
- Roadway Typical Section(s)
  1. Pavement Description (Includes milling depth)
  2. Minimum lane, shoulder, median widths
  3. Slope requirements
  4. Barriers
  5. Right-of-Way
- Data Sheet
- Design Speed

**2. Pavement Design Package:**

The recommended pavement design attached to this document is the minimum required pavement design for the contract. If alternate pavement designs are proposed, the following submittal requirements shall be provided to the Department for review.

- Pavement Design
  1. Minimum design period
  2. Minimum ESAL's
  3. Minimum design reliability factors
  4. Resilient modulus for existing and proposed widening (show assumptions)
  
  5. Roadbed resilient modulus
  6. Minimum structural asphalt thickness
  7. Cross slope
  8. Identify the need for modified binder
  9. Pavement coring and evaluation
  10. Identify if ARMI layer is required
  11. Minimum milling depth

Use of the Mechanistic-Empirical Pavement Design Guide (MEPDG) for pavement design shall not be allowed.

### 3. **Drainage Analysis:**

The Design-Build Firm shall be responsible for designing the drainage and stormwater management systems. All design work shall be in compliance with the Department's Drainage Manual; Florida Administrative Code, Chapter 14-86; Federal Aid Policy Guide 23 CFR 650A; and the requirements of the regulatory agencies. This work will include the engineering analysis necessary to design any or all of the following: cross drains, French drains, underdrains, edge drains, roadway ditches, outfall ditches, storm sewers, retention/detention facilities, interchange drainage and water management, ~~temporary~~ temporary drainage design for all MOT phases, other drainage systems and elements of systems as required for a complete analysis. Full coordination with all permitting agencies, the district Environmental Management section and Drainage Design section will be required from the outset. Full documentation of all meetings and decisions are to be submitted to the District Drainage Design section. These activities and submittals shall be coordinated through the Department's Project Manager.

The exact number of drainage basins, outfalls and water management facilities (retention/detention areas, weirs, etc.) will be the Design-Build Firm's responsibility. The Department has developed a preliminary drainage design as depicted in the concept plans, for which an ERP permit has been submitted. The drainage design in the concept plans may be modified by the Design-Build Firm as necessary for the project.

The objective is to obtain approved stormwater treatment/attenuation design. The Design-Build Firm shall ensure that no adverse impacts occur to the adjacent properties as a result of the drainage design.

Perform design and generate construction plans documenting that the permitted systems function to criteria.

The Design-Build Firm shall verify that all existing cross drains and storm sewers that are to remain have adequate hydraulic capacity and design life. Flood flow requirements will be determined in accordance with the Department's procedures. If any of these existing cross drains or storm sewers are found to be hydraulically inadequate or found to have insufficient design life, they must be replaced or supplemented in accordance with the drainage requirements of this RFP. If any existing cross drains or storm sewers require repairs but otherwise would have sufficient remaining design life, repairs shall be made in accordance with the requirements of this RFP.

The Design-Build Firm shall consider optional culvert materials in accordance with the Department's Drainage Manual Criteria.

Prior to proceeding with the Drainage Design, the Design-Build Firm shall meet with the District Drainage Engineer. The purpose of this meeting is to provide information to the Design-Build Firm that will better coordinate the Preliminary and Final Drainage Design efforts. This meeting is Mandatory and is to occur fifteen (15) calendar days (excluding weekends and Department observed holidays) prior to any submittals containing drainage components.

The Design-Build Firm must employ a Registered Professional Engineer in Florida who specializes in coastal engineering. The coastal engineer must hold a M.S. or Ph.D. in Coastal Engineering or a related engineering field and/or have extensive experience (as demonstrated by technical publications in technical journals with peer review) in coastal hydrodynamics and sediment transport processes. The coastal engineer must sign and seal the final Bridge Hydraulics Report and Bridge Hydraulics Recommendation Sheet.

The Design-Build Firm shall provide the Department's District Drainage Engineer a signed and sealed Drainage Design Report. It shall be an As-Built Plan of all drainage computations, both hydrologic and hydraulic. The engineer shall include all necessary support data.

#### **G. Geometric Design:**

The Design-Build Firm shall prepare the geometric design for the Project using the Standard Plans and criteria that are most appropriate with proper consideration given to the design traffic volumes, adjacent land use, design consistency, aesthetics, ADA requirements, and this document.

The design elements shall include, but not be limited to, the horizontal and vertical alignments, lane widths, shoulder widths, median widths, cross slopes, borders, sight distance, side slopes, front slopes and ditches. The geometric design developed by the Design-Build Firm shall be an engineering solution that is not merely an adherence to the minimum AASHTO and/or Department standards.

For criteria not specifically defined within the RFP, criteria contained in *AASHTO – A Policy on Geometric Design of Highways and Streets* shall be applicable to Perry Road South, Brooks Street, Florida Blanca Place, Santa Rosa Boulevard, Business Access Route, new Northbound Connection, new Eastbound Connection, and Hotel Entrance Roadway. Roundabouts shall be designed in accordance with FDOT Design Manual criteria.

#### **H. Design Documentation, Calculations, and Computations:**

The Design-Build Firm shall submit to the Department design documentation, notes, calculations, and computations to document the design conclusions reached during the development of the construction plans.



The design notes and computation sheets shall be fully titled, numbered, dated, indexed, and signed by the designer and the checker. Computer output forms and other oversized sheets shall be folded to a standard size 8½" x 11". The data shall be in a hard-back folder for submittal to the Department. At the Project completion, a final set of design notes and computations, signed by the Design-Build Firm, shall be submitted with the As-Built Plans and tracings.

The design documentation, notes, calculations and computations shall include, but not be limited to the following data:

1. Standards Plans and criteria used for the Project
2. Geometric design calculations for horizontal alignments
3. Vertical geometry calculations
4. Documentation of decisions reached resulting from meetings, telephone conversations or site visits

**I. Structure Plans:**

**1. Bridge Design Analysis:**

- a. The Design-Build Firm shall submit to the Department final signed and sealed design documentation prepared during the development of the plans.
- b. The Design-Build Firm shall ensure that the final geotechnical and hydraulic recommendations and reports required for bridge design are submitted with the 90% bridge plans.
- c. The Design-Build Firm shall "Load Rate" all bridges in accordance with the Department Procedure 850-010-035 and the Structures Manual. The Bridge Load Rating Calculations, the Completed Bridge Load Rating Summary Detail Sheet, and the Load Rating Summary Form shall be submitted to the Department for review with the 90% superstructure submittal. The final Bridge Load Rating Summary Sheet and Load Rating Summary Form shall be submitted to the Department for review with the Final superstructure submittal. A final, signed and sealed Bridge Load Rating, updated for as-built conditions, shall be submitted to the Department for each phase of the bridge construction prior to placing traffic on the completed phase of the bridge. A final, signed and sealed Bridge Load Rating, updated for the as-built conditions as part of the As-Built Plans submittal shall be submitted to the Department before any traffic is placed on the bridge. The Bridge Load Rating shall be signed and sealed by a Professional Engineer licensed in the State of Florida.
- d. The Design-Build Firm shall evaluate scour on all bridges over water using the procedures described in the FDOT Drainage Manual.
- e. The Engineer of Record for bridges shall analyze the effects of the construction related loads on the permanent structure. These effects include but are not limited to: construction equipment loads, change in segment length, change in construction sequence, etc. The Engineer of Record shall review all specialty engineer submittals (camber curves, falsework systems, etc.) to ensure compliance with the contract plan requirements and intent.

- f. Wall heights, from the top of leveling pad to the top of wall coping, greater than 30' shall not be permitted, unless site specific locations have been approved by the Department through the ATC process.

## 2. Criteria

The Design-Build Firm shall incorporate the following into the design of this facility:

- a. All plans and designs are to be prepared in accordance with the Governing Regulations of Section V. A.
- b. Critical Temporary Retaining Walls: Whenever the construction of a component requires excavation that may endanger the public or an existing structure that is in use the Design-Build Firm must protect the existing facility and the public. If a critical temporary retaining wall is, therefore, required during the construction stage only, it may be removed and reused after completion of the work. Such systems as steel sheet pilings, soldier beams and lagging or other similar systems are commonly used. In such cases, the Design-Build Firm is responsible for designing and detailing the wall in the set of contract plans. These plans must be signed and sealed by the Structural Engineer in responsible charge of the wall design.
- c. For bridges over navigable waterways, establish the required pier strengths using the MathCad program furnished by the Department. The MathCad program furnished by the Department allows for the proposed bridge geometry to be input by the Engineer. Other parameters such as water traffic, waterway characteristics, etc. may not be changed. This assures that all Design-Build Firms are designing on the same assumptions other than the specific bridge layout that each is proposing.

The following parameters shall be utilized by the Design-Build Firm in the Mathcad program for calculating the required pier strengths:

### Section 1 – Navigable Channel Characteristics and Vessel Traffic Past Point Data

#### Channel Characteristics

C = 150 ft

$\Theta$  = 10 degrees

Region = Turn/Bend

$V_c$  = 1.0 knot

$V_{xc}$  = 0.0 knot

$R_D$  = low

#### Vessel Traffic Data

Past Point Number = 27

Vessel Direction = both

$V_{min}$  = 1 knot

### Section 2 – Pier Characteristics

$D_{water}$  =

(-280ft or more from CL channel) = 9 ft

(-115ft from CL channel) = 19 ft

(+115ft from CL channel) = 27 ft  
(+280ft or more from CL channel) = 16 ft

- For the Design Build Firm's specific pier locations, the Firm may interpolate between the limits listed above for the appropriate elevation.
- $D_{\text{water}}$  is defined from centerline of existing channel along Baseline SR 30 (-) downstation, (+) upstation

Section 3 – Vessel Fleet Characteristics

Velocity = 7 knots

Section 11 – Importance Classification

Regular Bridge

- d. Superstructure components shall be located above the splash zone.
- e. The minimum vertical clearance of the main span over the navigation channel shall be 65-feet above the mean high water elevation of Santa Rosa Sound at the main channel crossing. A minimum 150-foot horizontal clearance in the main channel between the fender system shall be provided. At the channel span, the minimum span length shall be 230-ft.
- f. The LRFD Operational Importance Factor shall be 1.0 for all bridges.
- g. Any use of Prefabricated Bridge Elements and Systems shall be in accordance with the design considerations documented in SDM Chapter 25. If the Design Build Team plans to deviate from these requirements, an ATC should be submitted to allow for Department review and concurrence. The following minimum requirements will be required for ATCs:
  - i. General mock-up details for each PBES connection detail
  - ii. General mock-up acceptance criteria required based on connection dissection results
  - iii. General detail of each PBES connection
- h. Existing Structure Removal:
  - i. Within the limits of the main span and fender system, if the existing foundations do not conflict with the proposed foundation locations, the existing foundations must be removed to 24 inches below the mudline, taking into account long term scour depths when determining the elevation of the mudline.
  - ii. All existing dolphins must be completely removed.
  - iii. Disposition of original swing bridge foundations are unknown. Part or all of the original foundation may have been left in place. See Reference Documents for as-built plans.
- i. Pier protection such as dolphins and islands will not be allowed.
- j. Partial height retaining walls (i.e. perched walls or toe walls) will NOT be allowed for this project.

- k. Geosynthetic Reinforced Soil (GRS) Walls and Abutments will NOT be allowed for this project.
- l. Full height cheek walls shall be provided at the following locations:
  - i. Exposed ends of all end bents
  - ii. Exposed ends of piers where the difference in the exterior beam depth in adjacent spans is greater than or equal to 9”.
  - iii. Exposed ends of piers where the ends of exterior beams in adjacent spans are offset in plan.
  - iv. Exposed ends of piers where beams in adjacent spans are of dissimilar material.
- m. Pile bents shall not be permitted, except at bridge abutments when located behind retaining walls.
- n. All bridge foundations shall be deep foundations.
- o. If structural steel is proposed: All structural steel shall be coated in accordance with Developmental Specification 564. The Design-Build Firm shall use the edition in effect at the time the bid price proposals are due in the District Office.
- p. No stiffeners will be allowed on the outside of exterior girders with the exception of bearing and jacking stiffeners.
- q. Steel box girders are not permitted.
- r. All bolts shall be galvanized.
- s. Weathering steel is not permitted.
- t. If continuous post-tensioned concrete superstructure units utilizing flexible filler for tendons within the girder webs are proposed, the following requirements shall apply:
  - i. The design for shear shall account for 1.2 times the outer specified duct diameter as a discount in effective web width for shear design capacity.
  - ii. Confinement reinforcement shall be provided for the transverse splitting forces in the web due to the abrupt void within the web at the duct locations.
  - iii. As an alternative to items (i) and (ii) above, physical testing may be performed by the Design-Build Firm to corroborate the design. All testing procedures and results shall be subject to review and approval by the State Structures Design Office (SSDO).
  - iv. Continuous post-tensioned concrete superstructures shall be submitted through the ATC process for review and approval by the Department.
- u. Concrete segmental box girders beams will require a 6’-6” maintenance access (SDG 4.6.2 requires 6’-0”).
- v. All footings located in the water shall be waterline footings. The following additional footing design criteria shall be used:

- i. Size footing such that the effective depth,  $d_v$ , is sufficient to resist one-way shear without the contribution of shear reinforcement per LRFD [5.12.8.6]. Neglect pile-to-cap interface friction for calculation of two-way punching shear resistance.
- ii. For footings designed to resist vessel collision or other large lateral loads with the full bending capacity of the pile developed per SDG 3.5.1.
  - a. Determine the minimum horizontal dimension from the edge of the exterior pile to the nearest footing edges as the largest of the following (rounded up to the nearest inch):
    - i. Edge distance required for lateral resistance
    - ii. One-half of the width or diameter of the pile (for piles widths or diameters 24-inches or larger
    - iii. 9-inches (LRFD 10.7.1.2 minimum offset) + 3-PBESinches (horizontal driving tolerance) +  $\sum$  diameters of reinforcing bars for punching shear (horizontal and vertical bars) + 2-inches minimum clearance to pile face
  - b. Develop the main top and bottom reinforcing bars into the perimeter edge region of the footing with 90-degree hooks
- w. All permanent retaining walls shall have a concrete facing. MSE walls shall be limited to a height of 30 ft. Any retaining walls where nominal water depths exist to support waves during the 100-yr storm will require scour/erosion countermeasures (i.e., toe protection and splash apron if applicable) or designed to resist the 100-yr scour.
- x. For fill slopes in front of end bents or abutments, the magnitude of the slope shall not exceed 1V: 2H.
- y. Conduits shall not be mounted to the exterior face of retaining walls or exterior face of structures and must be hidden from view.
- z. Any necessary bridge drainage piping shall be hidden from view.
- aa. For superstructures, if the controlling low member elevation of the superstructure is less than 1-foot above the design wave crest elevation, wave forces shall be calculated and applied according to AASHTO Guide Specifications for Bridges Vulnerable to Coastal Storms. For substructures, wave forces shall be calculated and applied according to AASHTO Guide Specifications for Bridges Vulnerable to Coastal Storms. The wave vulnerability classification of the bridges shall be **Extremely Critical "Critical/Essential" per section 5.1 of the AASHTO Guide Specifications for Bridges Vulnerable to Coastal Storms (Equivalent to "Extremely Critical" per SDG 2.5 commentary).** The "Service Immediate" performance level shall be used with applicable Strength Limit State load factors. A Level III analysis is required to develop wave forces from coastal storms.
- bb. The Design-Build Firm shall design for an environmental classification of extremely aggressive marine structure for the superstructure and substructure for the bridge, for seawalls and for the retaining walls.
- cc. Class 5 coatings, tints, stains, and anti-graffiti coatings shall not be used on the project.

- dd. A custom fender system is required, unless span requirement of SDG 3.14.1.B is satisfied, for the navigation channel for channel delineation per the SDG and to redirect errant barge and other vessel collisions. Per Table 3.14.2-1 of the SDG, a minimum energy of 455 k-ft is associated with Past Point #27 for the Minimum Energy Absorption Capacity (EAC) of the fender system. Standard Plans Index 471-030 will not be permitted as its fender system energy capacity is only 38 k-ft. For flared sections of the fender system, use a pile spacing that is not greater than half of the pie spacing used in the tangent section (not to exceed 8 feet). Use the same size of piles in the flared sections of the fender system as used in the tangent sections.
- ee. The Design-Build firm's custom fender system design shall avoid impacts to the subaqueous facilities owned by Gulf Power, AT&T Corporate and Okaloosa Gas District that are to remain in place as depicted in the concept plans and as shown in the Reference Documents.
- ff. SDG 3.14.2.F.1 will be followed when determining the requirements for the design of navigation lighting and clearance gauge details.
- gg. Access ladders will not be required on fender systems. Provide a platform from nearby pier footing to fender system for access. Use hot dip galvanized steel for catwalk structure with polymer decking.
- hh. Pedestrian railing on the bridges shall be aluminum railing only.
- ii. A minimum 10-ft width between parallel bridges will be required to facilitate staged construction as well as for future maintenance and inspection requirements as approved by the FDOT Office of Maintenance. Additional horizontal separation is preferred. The only exception to this is the begin bridge first span where a minimum of 8-ft is required between the bridges.
- jj. All bridge piers and permanent retaining walls must meet clear zone requirements. The Department will not approve the use of permanent barrier wall or guardrail to protect within the clear zone.
- kk. Wildlife connectivity will not be required.
- ll. Lightweight concrete will not be permitted for any structural applications.
- mm. It is not necessary to consider the scour effects on temporary structures.
- nn. Auger-cast piles for bridges are prohibited
- oo. Any channel span unit simple span prestressed girder superstructures made continuous for live load with individual span lengths exceeding 200 ft. must be reviewed by the Department through an ATC.

**Bridge, and MSE wall surface finish requirements:**

The Design-Build Firm shall seal the concrete surfaces of the MSE walls, and exposed bridge elements

(excluding bridge deck) using an opaque Silicone Acrylic Sealer. The Design-Build Firm shall develop a TSP subject to Department approval for the sealer. During the design phase, the Design-Build Firm shall also provide to the Department the specific proposed sealer product to be utilized and the plan for utilizing staff qualified for completing the sealer application. The proposed TSP shall include similar information as detailed below:

- Source Limitations
- Certificates of Compliance
- Material List
- Manufacturer's Information
- Approval of Materials
- Pollution Control Plan
- Delivery and Storage

The TSP shall include the surface preparation and application of the sealer and include the following:

- Examination of Surfaces. Before starting any Work, surfaces to receive sealer finish shall be examined carefully for defects which cannot be corrected by the procedures specified below under "Surface Preparation" and which might prevent satisfactory sealing results. Should such conditions be encountered, the Engineer shall be notified immediately so that the extent of the problem and a solution can be identified. Commencing of work shall be construed as acceptance of the surfaces, and thereafter, the Contractor shall be fully responsible for satisfactory work as required herein.
- Field Area "Sample". Provide a full two (2) coat "sample" at the Field Sample Area using type of sealer proposed for use on this Project.

For MSE wall include a minimum of two (2) panels cast and sealed to represent surfaces.

Final approval of sealer system and color will be from Field Sample Area.

- Protection. Protect from surface preparation operations and contamination by sealing materials all surfaces not to be sealed. Restore surfaces which are contaminated by sealing materials to their original condition.
- Surface Preparation. All surfaces shall be clean, dry and free of grease, oil, paint, sealers, coatings, etc. prior to application of sealant. Surface preparation shall be performed in accordance with manufacturer's recommendations. Concrete surfaces shall be hydro-silica blasted at the direction of the Engineer as follows:
  1. Hydro-silica blasting shall be capable of pressures in excess of 2500 psi in order to effectively remove all existing applied finishes, sealers, curing compounds, and other surface residues. Dry sandblasting shall not be employed without express written approval of the Engineer.
  2. Prior to blasting, use a manufacturer recommended de-greasing agent if required, following label directions, rinse thoroughly and allow the surface to dry. If mold mildew or fungus are present, kill and remove by cleaning with a solution.
  3. If concrete surface feels like 120-grit sandpaper, the pores are open enough for the sealer to properly bond. If concrete does not have this texture, etch surface with a manufacturer recommended concrete etching solution following label instructions.
  4. Prepared concrete shall have a pH between 7 and 10. If a high pH reading (11-13) is detected, neutralize the surface by acid etching the surface with a manufacturer recommended concrete etching solutions, following label instructions. If after the process the surface pH is high, then notify the Engineer before proceeding with the

Work.

- Environmental Conditions. Apply sealer when environmental conditions are within ranges identified by the manufacturer.
- Under no circumstances shall any sealer be applied when the dew point and the temperature are within three (3) degrees C of each other or otherwise when surfaces are wet or contaminated in any way.
- Inspection. Contractor shall arrange to have sealer manufacturer's representative inspect and approve prepared (unsealed) surface and, prior to commencement of initial application and each succeeding coat..
- Application. Two (2) coats of the sealer should be applied on the prepared surfaces following manufacturer's recommendations.
- Cleanup. Clean spills and spatters and tools immediately with a manufacturer recommended solvent. Follow manufacturer's instructions and safety recommendations when using any solvent.

**J. Specifications:**

Department Specifications may not be modified or revised. Technical Special Provisions shall be written only for items not addressed by Department Specifications, and shall not be used as a means of changing Department Specifications.

The Design-Build Firm shall prepare and submit a signed and sealed Construction Specifications Package for the Project, containing all applicable Division II and III Special Provisions and Supplemental Specifications from the Specifications Workbook in effect at the time the Bid Price Proposals were due in the District Office, along with any approved Developmental Specifications and Technical Special Provisions, that are not part of this RFP. Any subsequent modifications to the Construction Specifications Package shall be prepared, signed and sealed as a Supplemental Specifications Package. The Specifications Package(s) shall be prepared, signed and sealed by the Design-Build Firm's Engineer of Record who has successfully completed the mandatory Specifications Package Preparations Training.

The website for completing the training is at the following URL address:

<http://www2.dot.state.fl.us/programmanagement/PackagePreparation/TrainingConsultants.aspx>

Specification Workbooks are posted on the Department's website at the following URL address:

<https://fdotewp1.dot.state.fl.us/SpecificationsPackage/Utilities/Membership/login.aspx>

Upon review and approval by the Department, the Construction Specifications Package will be stamped "Released for Construction" and initialed and dated by the Department.

**K. Shop Drawings:**

The Design-Build Firm shall be responsible for the preparation and approval of Shop Drawings. Shop Drawings shall be in conformance with the FDM. Shop Drawing submittals must be accompanied by sufficient information for adjoining components or areas of work to allow for proper evaluation of the Shop Drawing(s) submitted for review. When required to be submitted to the Department, Shop Drawings shall bear the stamp and signature of the Design-Build Firm's Engineer of Record (EOR), and Specialty Engineer, as appropriate. All "Approved" and "Approved as Noted" Shop Drawings submitted to the



Department for review shall also include Engineer of Record QA/QC Shop Drawing check prints along with the EOR stamped set(s). The Department shall review the Shop Drawing(s) to evaluate compliance with Project requirements and provide any findings to the Design-Build Firm. The Department's procedural review of Shop Drawings is to assure that the Design-Build Firm's EOR has approved and signed the drawing, the drawing has been independently reviewed and is in general conformance with the plans. The Department's review is not meant to be a complete and detailed review, but the Department reserves the right to perform a more detailed review, as necessary. Upon review of the Shop Drawing, the Department will initial, date, and stamp the drawing "Released for Construction" or "Released for Construction as Noted".

**L. Sequence of Construction:**

The Design-Build Firm shall construct the work in a logical manner and with the following objectives as guides:

1. Maintain or improve, to the maximum extent possible, the quality of existing traffic operations, both in terms of flow rate and safety, throughout the duration of the Project.
2. Minimize the number of different Temporary Traffic Control Plan (TTCP) phases, i.e., number of different diversions and detours for a given traffic movement.
3. Take advantage of newly constructed portions of the permanent facility as soon as possible when it is in the best interest of traffic operations and construction activity.
4. Maintain reasonable direct access to adjacent properties at all times, ~~with the exception in areas of limited access Right-of-Way where direct access is not permitted.~~
5. Coordinate with adjacent construction Projects and maintaining agencies.

**M. Stormwater Pollution Prevention Plans (SWPPP):**

The Design-Build Firm shall prepare a Storm Water Pollution Prevention Plan (SWPPP) as required by the National Pollution Discharge Elimination System (NPDES). The Design-Build Firm shall refer to the Department's Project Development and Environment Manual and Florida Department of Environmental Protection (FDEP) Rule 62-621.300(4)(a) for information in regard to the SWPPP. The SWPPP and the Design-Build Firm's Certification (FDEP Form 62-621.300(4)(b) **NOTICE OF INTENT (NOI) TO USE GENERIC PERMIT FOR STORMWATER DISCHARGE FROM LARGE AND SMALL CONSTRUCTION ACTIVITIES**) shall be submitted for Department review and approval. Department approval must be obtained prior to beginning construction activities.

**N. Transportation Management Plan:**

Design-Build Firm must develop and implement a Transportation Management Plan in accordance with the Department's FDOT Design Manual.

**1. Traffic Control Restrictions:**

There will be NO LANE CLOSURES allowed on SR 30 (US 98), SR 145, Perry Avenue South, Brooks St, Florida Blanca Place, Santa Rosa Blvd, the new Business Access Road, the new North Connection, the new Eastbound Connection, and the Hotel Entrance Roadway from 5:30 AM to 9:00 PM Monday through Thursday and from 5:30 AM Friday to 9:00 PM Sunday. If Pacing Operations are proposed, they will not be permitted during the times specified above.

The existing number of lanes and length of all auxiliary and turn lanes, shall be maintained at all times, except during the permissible lane closure times detailed ~~within the RFP. below.~~ During permissible

**lane closure times, a minimum of one lane of traffic in each direction must be maintained along SR 30 (US 98), Santa Rosa Blvd., and SR 145 at all times.** Lane closure restrictions apply to all lanes including auxiliary lanes and turn lanes.

A lane may only be closed during active work periods. All requests for lane closures shall be submitted in writing to the Department 14 calendar days prior to a closure, detour, diversion, or MOT phase change. All lane closures must be reported to the local emergency agencies, the media, and the District 3 Public Information Officer a minimum of 12 calendar days prior to each closure.

No lane closures are allowed on the Project during the Special Events days previously listed in this RFP in order to minimize potential impacts to the events.

It is anticipated that Brooks St. will have to be closed temporarily within the limits of the realignment. The Design-Build Firm must maintain access to all properties at all times via an approved detour route. Closure shall be limited to no more than seven (7) total days. All remaining side roads, business access, and driveways shall remain open at all times. Side roads can NOT be closed unless approval from the District Secretary and approval from any applicable local government is obtained.

All detours shall be included in the Transportation Management Plan and approved by the Department. The Design-Build Firm shall obtain written approval from local agencies for detours that utilize or otherwise impact roadways that are under the jurisdiction of those local agencies.

During all phases and all times of construction, minimum lane widths shall be 10-feet.

Should the Design-Build Firm elect to use the existing roadway shoulders for temporary traffic control on a temporary basis, the Design-Build Firm shall modify the existing cross slope to match the adjacent lane. The Design-Build Firm shall be responsible for providing the required structural integrity and maintenance of the shoulder. When no longer needed for temporary traffic control, the Design-Build Firm shall restore the shoulder to the required width and cross slope.

There will be no pavement marking eradication permitted after the final asphalt course is placed. For any existing asphalt roadways where eradication of temporary or permanent striping is required to accommodate lane shifts or diversions, a full width overlay or full width milling, and resurfacing of the travelled way shall be the only acceptable means of pavement marking eradication.

Temporary detection for all movements at all signalized intersections shall be maintained throughout construction. Temporary detection shall detect only the appropriate approach lane for the associated phase. **Overhead trailer mounted traffic signals shall not be utilized.**

SR 30 (US 98) is a designated Hurricane Evacuation Route. All lanes within the project limits must be open for traffic within 12 hours of a hurricane evacuation notice or other catastrophic event and shall remain open for the duration for the event as directed by the Engineer.

**NO LANE CLOSURES are allowed on the Project during the Special Events listed within the RFP.**

Special consideration shall be given to the drainage system when developing the construction phases. Positive drainage must be maintained at all times and shall NOT adversely impact adjacent properties. Provide temporary facilities to ensure turbid water and silt are not transported to existing drainage systems and/or Santa Rosa Sound.

The Transportation Management Plan shall be prepared by a certified designer who has completed the Department's Advanced Maintenance of Traffic training course, and in accordance with the Department's Standards Plans and the FDOT Design Manual.

The existing bridge has an existing lighting system and requires temporary lighting to be provided during the construction including navigational lighting. The Design-Build Firm is responsible for maintaining the existing navigational lighting until the permanent new navigational lighting is installed and operational.

**Pedestrian and Bicycle Access During Construction:**

If the Design-Build Firm allows work areas to encroach upon a trail, sidewalk, or intersection cross walk, a minimum clear width of 4 feet must be maintained for public use. If the required clear width cannot be met, the Design-Build Firm shall provide an alternative accessible route. Pedestrian and bike facilities shall be maintained and shall conform to ADA requirements. The existing bridge curb shall be maintained for pedestrian access in the temporary traffic control condition. Asphalt millings are not allowed for temporary sidewalk.

**Business Access:**

The Design-Build Firm's Transportation Management Plan shall maintain access to all business.

**Emergency Services:**

The Design-Build Firm shall coordinate with and ensure that the temporary traffic control plans will not adversely impact emergency responder operations.

**Navigation:**

Boating access shall be maintained for marine traffic. The Design-Build Firm shall make use of the USCG Notice to Mariners and all information contained within the USCG Bridge Permit to communicate the location and details for navigating through the project area.

**O. Environmental Services/Permits/Mitigation:**

The Design-Build Firm will be responsible for preparing designs and proposing construction methods that are permissible. The Design-Build Firm will be responsible for any required permit fees including public notice fees. All permits required for a particular construction activity will be acquired prior to commencing the particular construction activity. Delays due to incomplete or erroneous permit application packages, agency rejection, agency denials, agency processing time, or any permit violations, except as provided herein, will be the responsibility of the Design-Build Firm, and will not be considered sufficient reason for a time extension or additional compensation. As the permittee, the Department is responsible for reviewing, approving, and signing the permit application package including all permit modifications, or subsequent permit applications.

The following outlines the commitments from the EA with FONSI and Re-Evaluation and describes the responsibilities of the Design Build Firm (see also Section V.D.) and the Department in order to ensure fulfillment of the commitments.

- 1) A Section 4(f) Determination of Applicability is required for archaeological site 8OK00780. It was unable to be completed in the PD&E phase due to the extent of hardscape and disturbance in the area of the proposed project. Consultation with State Historic Preservation Officer resulted a concurrence determination that the site is not eligible for listing in the National Register of Historic Places. However, due to past

archaeological discoveries in this area, FDOT will conduct appropriate archaeological research in areas where ground disturbance associated with the proposed bridge project will occur once FDOT has identified and purchased these areas. In accordance with the FDOT and SHPO concurrence determination of July 27, 2016, should any discoveries occur which may alter the significance determination made on the Alconese Site in accordance with 36 CFR Part 800.4(c) and which may cause an adverse effect to the site in accordance with 36 CFR Part 800.5(a), FDOT will determine if the site qualifies for protection under Section 4(f) and proceed as appropriate in consultation with the SHPO and, as appropriate, the Seminole Tribal Historic Preservation officer and other Native American tribal officials. *This commitment has been completed by the Department.*

- 2) FDOT owns the 0.58 ac parcel 24-2S-24-1070-0000-0040 as transportation right-of-way, leased by the City of Fort Walton Beach for public parking lot including landscaping, lighting, sidewalk, public boardwalk, and water management. During construction, the lease may be suspended. Access to the park is not required to be maintained during construction. Following construction, FDOT will renegotiate the lease agreement and park amenities with the City of Fort Walton Beach. The park currently includes 44 public parking spaces, including handicap, motorcycle and bicycle parking; sidewalk as part of the Fort Walton Beach Boardwalk; shoreline stabilization; benches and picnic tables; lighting; landscaping; and a kayak/canoe launch. Negotiations will be completed by the Department. *The Design Build Firm will construct park to preexisting conditions following construction activities within the limits of or adjacent to the park.*
- 3) During construction, the City of Fort Walton Beach Fishing Park (Alconese Avenue Pier) would be temporarily closed to public use for safety reasons. Following construction, the park would be returned to public use, and the park amenities (pier, lighting, bench, trash can, and shoreline stabilization) would be returned to at least pre-construction conditions in coordination with the City of Fort Walton Beach. *The Design Build Firm will construct park to at least preexisting conditions following construction activities within the limits of or adjacent to the park.*
- 4) Except as required for safety, access along the Florida Circumnavigational Saltwater Paddling Trail shall be maintained during construction. Temporary closures shall require notification as coordinated with the Florida Department of Environmental Protection, Office of Greenways and Trails. *This commitment to be completed by the Design-Build Firm.*
- 5) A Special Use Permit shall be obtained from the National Park Service for the new Brooks Bridge and S.R. 30 (U.S. 98) right-of-way over the Gulf Islands National Seashore and for new bridge piles within waters of the Gulf Islands National Seashore. *This commitment to be completed by the Department.*
- 6) Coordination by *the Design-Build Firm* is required with the Okaloosa County Public Works Director during the design phase regarding access to Little Ross Marler, Ross Marler and Veteran's Parks.
- 7) Additional archaeological testing is required once the footprint for proposed construction is further defined. A research design must be developed in consultation with the State Historic Preservation Officer and the Seminole Tribe of Florida Tribal Historic Preservation Officer to prepare a testing strategy for 8OK00780. Construction monitoring

by a qualified archaeologist is required. *Testing has been completed. Monitoring to be conducted by Department. The Design Build Firm shall notify the Department at least 14 days prior to ground disturbing activity within 8OK00780, and coordinate times and access for the Department's monitoring.*

- 8) Contractor shall follow the NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions (March 2006).
- 9) Contractor shall follow the Construction Special Provisions, Sturgeon Protection Guidelines (Pursuant to NMFS and FWS), September 2012.
- 10) Nocturnal in-water work is not allowed during the sturgeon migratory period which is from the first of October through the end of May. This measure provides a nightly period without noise-inducing activities and allows fish to move through the area without acoustic disturbance. Nighttime is defined as 30 minutes after sunset to 30 minutes before sunrise. This commitment applies to all pile driving including temporary work trestles. *This commitment to be completed by the Design-Build Firm.*
- 11) A noise monitoring plan shall be developed and submitted *by the Department* to FWS for approval prior to construction to collect hydroacoustical data from a representative set of test piles. Data collected will be used to verify the extent of potential noise impacts and, if necessary, refine the recommended conservation measures. The FDOT Office of Environmental Management is working toward a statewide noise monitoring/data collection study. The contractor shall cooperate with the University of North Florida or other Department approved staff that are collecting data if this bridge is included in the study.
- 12) A noise management plan shall be developed and submitted *by the Design- Build Firm* to FWS for approval prior to construction that demonstrates how underwater pile driving noise will be managed with the goal of minimizing behavioral disturbance and injury threshold to marine species. The noise management plan shall give consideration to use of bubble curtains or other measures of noise attenuation, and use of a ramp-up procedure during pile driving. This gradual increase in noise level gives species time to leave the impact area prior to initiation of full noise levels.
- 13) Mooring work barges or vessels shall maintain at least 1.5-ft clearance above the water body bottom to allow sturgeon passage and to minimize potential disturbance to bottom sediments. No mooring is allowed over areas of submerged aquatic vegetation. *This commitment to be completed by the Design-Build Firm.*
- 14) In order to provide a net conservation benefit to the sturgeon, consistent with the FWS Mitigation Policy, *the Department* will purchase 30 Vemco® sonic transmitters (estimated at \$350 each), 10 Vemco® receivers (estimated at \$1,480 each), one Vemco® omnidirectional hydrophone (estimated at \$6,590), and 20 batteries (estimated at \$50 each), to be used by FWS for a study on the effects of pile driving sound on Gulf sturgeon migratory behavior concurrent with the proposed action.
- 15) An erosion and sediment control plan will be submitted *by the Design-Build Firm* and approved by the Service at least 60 days prior to the start of construction to assure that potential impacts to Gulf Sturgeon habitat from sedimentation and turbidity are avoided

and minimized to the extent practicable. The Service will be contacted immediately if failures occur in erosion and sediment control measures occur. [Biological Opinion, Reasonable and Prudent Measure 1.1]. *The Service is defined as U.S. Fish and Wildlife Service (FWS).*

- 16) The off-site stormwater compensatory treatment area will be coordinated with the Service for review and approval as plans become available. [Biological Opinion, Reasonable and Prudent Measure 1.2] *This commitment to be completed by the Design-Build Firm.*
- 17) Any demolition that involves blasting will be coordinated with the Service for review and approval as plans become available. [Biological Opinion, Reasonable and Prudent Measure 1.3]. If blasting is required for demolition of existing structures, a blast plan and marine species watch plan shall be developed and submitted to FWS, NMFS, and FWC for approval. *This commitment to be completed by the Design-Build Firm.*
- 18) If a need arises to develop off site staging areas for construction, location and erosion control measures for these sites will be coordinated with the Service for review and approval as plans become available. [Biological Opinion, Reasonable and Prudent Measure 1.4] *This commitment to be completed by the Design-Build Firm. Coordination with the Service shall be through the Department.*
- 19) The location of temporary work trestles and barge mooring will be coordinated with the Service for review and approval as plans become available. This is to ensure that in-water structures will not block the narrow channel width at the bridge and allow adequate space for migratory movements. [Biological Opinion, Reasonable and Prudent Measure 1.5] *This commitment to be completed by the Design-Build Firm.*
- 20) Field reviews will be conducted by *the Department* and the Service within 30 days of anticipated project completion, and within 30 days of completing construction to determine if site restoration is needed. [Biological Opinion, Reasonable and Prudent Measure 1.6].
- 21) The zone of impacts from elevated underwater sound levels that cause behavioral disturbance (150 dB RMS) will not extend greater than 1,037-ft from pile driving operations. Given recent exceedance of this sound threshold in test pile monitoring on Pensacola Bay Bridge test piles, adequate demonstration of ability to control sound levels below this threshold using attenuation methods will be necessary. If the zone of impacts is exceeded, then formal consultation should be reinitiated. The underwater sound management plan and in-situ hydroacoustic sound monitoring of test piles (2.2 and 2.3 below) will be required to verify the zone of impacts that is the basis for this BO. [Biological Opinion, Reasonable and Prudent Measure 2.1] *The Design Build Firm will be responsible for developing and abiding by requirements of the Sound Management Plan. The Department will be responsible for monitoring. Any additional formal consultation shall be through the Department.*
- 22) The underwater sound management plan will be submitted to the Service for review at least 60 days prior to the onset of construction. The plan will provide the final design for pile size, installation method, and timing for pile installation. This will include the measures proposed to mitigate underwater noise such as bubble curtains, temporary noise attenuation piles, air filled fabric barriers, isolated piles or cofferdams, or double-walled piles.

[Biological Opinion, Reasonable and Prudent Measure 2.2] *This commitment to be completed by the Design-Build Firm.*

- 23) In-situ hydroacoustic sound monitoring of pile driving will be done during test piling to accurately determine sound levels based on materials, equipment, substrate, and method of pile installation. This assessment will be done on a representative sample of test piles located proximate to the project site, in an area most conducive to sound production, and at 10 meters from the pile. Any change in pile materials and/or installation methodology will require a re-assessment of sound levels. The acoustic monitoring results will be provided to the Service for review. [Biological Opinion, Reasonable and Prudent Measure 2.3] *Acoustic Monitoring to be provided by the Department.*
- 24) The study area will be routinely monitored *by the Department* for the presence of stunned, injured, or dead sturgeons (indicators of take). A plan will be developed to establish the methods, frequency, and reporting requirements for monitoring. The monitoring plan will be coordinated and approved by the Service prior to construction. [Biological Opinion, Reasonable and Prudent Measure 2.4] *This commitment to be completed by the Department.*
- 25) When engineering limits do not require impact driving, piles shall be advanced by vibration, oscillation, rotation, or pressing. [Biological Opinion, Reasonable and Prudent Measure 2.5] A ramp-up procedure is required each day for pile driving operations to give animals an opportunity to leave the area as noise levels increase. *This commitment to be completed by the Design-Build Firm.*
- 26) New technologies to better mitigate underwater sound levels from pile driving will be considered during the design. Specifically, consideration should be given to breakthrough approaches, such as doublewalled piles or mandrel-driven double-walled piles, as an alternative to using less-effective bubble curtains. [Biological Opinion, Reasonable and Prudent Measure 2.6] *This commitment to be completed by the Design-Build Firm.*
- 27) Upon locating a dead, injured, or sick individual of an endangered or threatened species, *the Design-Build Firm shall notify the Fish and Wildlife Service Law Enforcement Office, Groveland, Florida at (352) 429-1037 within 24 hours. The Design Build Firm will provide additional notification to the Fish and Wildlife Service's Field Office at Panama City, Florida at (850) 769-0552 within 48 hours. Care should be taken by the Design-Build Firm in coordination with the CEI, in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury. [Biological Opinion, Reasonable and Prudent Measure 3.1]*
- 28) A report describing the actions taken to implement the terms and conditions of this incidental take statement shall be submitted to the Project Leader, U.S. Fish and Wildlife Service, 1601 Balboa Avenue, Panama City, Florida, 32405, within 60 days of the completion of construction. This report shall include the dates of work, assessment and actions taken to address impacts to the Gulf Sturgeon, if they occurred. [Biological Opinion, Reasonable and Prudent Measure 3.2] *This commitment to be completed by the Department.*
- 29) *The Design Build-Firm shall coordinate with the FWS and FWC during the bridge design phase to incorporate lighting which meets both traffic safety needs and enhanced protection*

for sea turtles. If permanent exterior light fixtures associated with the bridge will be used during marine turtle nesting season (May 1 – October 31), all fixtures should minimize light contribution to urban sky glow which could be visible from the marine turtle nesting beach. Possible recommendations may include the use of downward directed, full-cutoff, well-shielded fixtures with low pressure sodium or warm white ( $\leq 3000\text{K}$ ) light-emitting diode (LED) lamps that allow no emission of light above the horizontal plane of the fixture.

- 30) Contractor shall follow the Florida Fish and Wildlife Conservation Commission's Manatee and Sea Turtle Construction Conditions for In-Water Work Associated with Florida Department of Transportation Projects, [2012].
- 31) Under statute 581.185, the Florida Fish and Wildlife Conservation Commission (FWC), FDACS and Endangered Plant Advisory Council will be notified that FDOT as owner is allowing for salvaging by others of the state-listed Cruise's and Godfrey's goldenaster prior to construction in accordance with state law (Chapter 581.185, Florida Statutes). *This commitment to be completed by the Department. The Design-Build Firm shall provide access for salvage authorized by the Department*
- 32) Submerged Aquatic Vegetation and Essential Fish Habitat mitigation will be developed as part of the permitting process which will be completed in the design phase of the project. When final seagrass and salt marsh impacts are determined, compensatory mitigation for those impacts shall be reviewed and approved by NMFS in order to complete the NMFS Essential Fish Habitat consultation. Follow-up coordination was completed with NMFS on October 24, 2017 regarding mitigation for SAV. Impacts to SAV are anticipated to be minimal (approximately 200-sf). NMFS expressed a willingness to coordinate with the NFWFMD to incorporate SAV impact mitigation into the overall wetland mitigation strategy. In addition, the National Park Service Gulf Islands National Seashore (GUIS) Superintendent requested on November 27, 2018: If submerged aquatic vegetation (SAV) impacts or proposed mitigation change or are to occur within park waters, GUIS requests additional coordination and document review. *The Department will handle the Mitigation for wetland impacts shown in Concept Plans. Additional impacts created by modification to the Concept Plans shall be handled as defined within the RFP.*
- 33) Stormwater and drainage plans shall be reviewed and approved by NMFS and FWS to assess water quality impacts due to stormwater coming off of the new bridges (whether that compensatory mitigation is on-site or off-site). *Coordination and plan submittal by Design-Build Firm.*
- 34) Bridge construction and demolition will require the use of barges and potentially a temporary work trestle. All practicable efforts will be made to avoid barge spudding and temporary work trestle placement over seagrass beds. *The Design-Build Firm will explore ways to avoid and minimize impacts to the maximum extent practicable during final design and permitting through FDEP and USACE. Note to Design-Build Firm: Permits applicable to this commitment are the FDEP ERP and State 404 Permits.*
- 35) The horizontal navigational clearance (clear space between the fendering systems) shall be increased to 150-ft.
- 36) Vertical air draft shall be raised to 65-ft above the MHW elevation to be consistent with Gulf Intracoastal Waterway (GIWW) recommendations.



- 37) A Waterways Management Plan is required to define maintenance of vessel traffic on the Gulf Intracoastal Waterway (GIWW) during construction and demolition. *The Design-Build Firm is responsible for development and implementation of the plan.*
- 38) An archeologist is required to monitor the Alconese Site (8OK00780) and the O'Neal Site (8OK01780) during earth disturbing activities. The Alconese Site is located to the east of Brooks Street from STA. 140+20 to STA. 143+20 and north of US 98 from STA. 112+00 to STA. 114+60. The O'Neal Site is located to the south of Brooks Street from STA. 130+00 to STA. 135+80. The archeologist will be provided by the CEI and will be responsible for stopping work on-site if artifacts or remains are exposed. The Cultural Resource Coordinator will be notified at the DEMO office if work is stopped. The archeologist will provide a monitoring report at the completion of the project to the Cultural Resource Coordinator.

Contamination assessments have been completed for asbestos and paint coatings on the existing bridge. The reports are included as Attachments in this RFP. The Design-Build Firm is responsible for reviewing the results of these reports and complying with the recommended actions. Mercury and/or PCBs may be present in the existing light bulbs and/or light ballasts. Sampling and testing of these items will be conducted by the Department when the Design-Build Firm begins removing the lighting. The Design-Build Firm is responsible for coordinating with the District Contamination Impacts Coordinator to scheduling the sampling activities. This coordination shall begin at a minimum one (1) month prior to removing the existing lighting.

**P. Signing and Pavement Marking Plans:**

The Design-Build Firm shall prepare signing and pavement marking plans in accordance with Department criteria.

A Conceptual Signing and Pavement Marking Plan has been provided by the Department (Reference Document - Concept Plans) identifying sign locations and legends within the Project limits. No structural analysis was performed for the Conceptual Signing Plan.

The Design-Build Firm shall be responsible for the design of all new sign supports (posts, overhead span, overhead cantilever, bridge mount, concrete barrier wall mounted, and any applicable foundations). The Design-Build Firm shall show all details (anchor bolt size, bolt circle, bolt length, etc.) as well as all design assumptions (wind loads, support reactions, etc.) used in the analysis. Mounting types for various signs shall not be changed by the Design-Build Firm (i.e. if the proposed or existing sign is shown as overhead it shall be overhead and not changed to ground mount) unless approved by the Department. Any existing sign structure to be removed shall not be relocated and reused, unless approved by the Department.

The regulatory, warning and roundabout signing shall not encroach into the shoulder space. No part of the assembly (sign panel or mount) shall encroach into the required vertical and horizontal clearances of the respective travel and shoulder areas.

Advance street name signs shall be provided for all approaches to the signalized intersections in conformance with the Traffic Engineering Manual.

All approaches to the roundabouts shall include the signing as required in the MUTCD. Sign cross sections are required for all new guide sign assemblies (overhead truss, single column bridge barrier wall, multi-column roadside ground mounts).

The Design-Build Firm shall include the design and construction of an overhead cantilever sign structure on US 98 eastbound supporting a flashing beacon warning sign alerting the motorists of the occasional formation of queuing created by the traffic signal at the intersection of US 98 and Eastbound Connection. This sign shall be hardwired to the signal controller for activation. Additional vehicular queue detection using induction loops shall be provided on US 98 eastbound travel lanes at the location determined by the Design-Build Firm. The overhead cantilever sign shall be located to provide sufficient warning distance and time equal to the stopping sight distance.

Special emphasis crosswalks shall be provided at the roundabouts, and at signalized intersections. Crosswalks shall be 10-feet wide and stripes shall be positioned so they are parallel to the wheel path.

All existing signing (including regulatory, warning, guide, or other) within the Project Limits, or as affected by the Project, must be similarly maintained in accordance with MUTCD requirements. Any signs that conflict with traffic patterns shall be covered with an opaque material until such a time where the signs are no longer in conflict with the traffic patterns.

The following signage must be retained during all phases of construction, in the general location that it was in prior to the initiation of construction:

- 511 signing
- Emergency management (hurricane) shelter and hurricane evacuation signing

It shall be the Design-Build Firm's responsibility to field inventory and show all existing signs within the Project limits and address all signage within the Project limits. Existing single and multi-post sign assemblies impacted by construction shall be entirely replaced and upgraded to meet current standards. Existing sign assemblies not impacted by construction can remain.

#### **Q. Lighting Plans:**

The Design-Build Firm shall provide a lighting design and a lighting analysis, and prepare lighting plans in accordance with Department criteria.

The Design-Build Firm shall develop and submit for approval, the Lighting Control Panel Board comprised of Main Circuit Breaker, Branch Circuit Breaker /Pole Number identification plan that is compatible with the existing lighting systems maintenance identification scheme for each light control center.

The roadway lighting design shall follow the Lighting Design Criteria outlined in the FDOT Design Manual. The intersection lighting and the proposed roundabout lighting shall follow the FDOT Design Manual.

Where existing roadway lighting system had been installed by the local power company, the Design-Build Firm shall coordinate with the power company for the removal of the existing overhead power fed lighting system when providing the permanent lighting.

Where existing roadway lighting circuit sources (services, load centers, etc.) are being removed, the Design-Build Firm shall:

1. Provide new lighting control center per current National Electrical Code (NEC) and all applicable criteria.

All modified load centers shall comply with all applicable criteria and shall be in like new condition. Existing light poles, luminaire arms, luminaires, and load centers identified for removal shall be coordinated with the Maintaining Agency as to whether these features will become the property of Design-Build Firm or salvaged, transported, and delivered to the Maintaining Agency for future use.

The Design-Build Firm shall perform detailed field reviews. Review and document all lighting (poles/luminaires, sign luminaires, etc.), circuiting, load centers, service points, utility transformers, etc., within the limits of lighting construction. This review includes: conductors, conduit, grounding, enclosures, voltages, mounting heights, pull boxes, etc. This review also includes circuits outside the limits of lighting construction that originate or touch this Project's scope of work, and include the electrical loads in the design of the proposed new lighting control centers in this project limits.

All deficiencies within the limits of lighting construction shall be identified and corrected. Any deficiencies outside the limits of lighting construction shall be brought to the attention of the Department. After the field reviews are completed, a list of all damaged and/or non-functioning equipment shall be documented and forwarded to the Department prior to the start of construction. All damaged and/or non-functioning equipment within the limits of lighting construction are required to be replaced or repaired to meet all applicable criteria and shall be in like-new condition.

Where new electrical services are required, the Design-Build Firm shall coordinate final locations of distribution transformers and service poles to minimize service and branch circuit conductors and conduit lengths. Preliminary electrical service locations shall be coordinated with the local power company, and power service information and letter of available fault current (Kilo Amp Interrupting Current, KAIC rating) at the location where local power company will be supplying the power service shall be obtained and be submitted as part of the PDAR and be included in LDAR. Each service point shall be separately metered.

The Design-Build Firm shall comply with the requirements of each jurisdictional authority within the Project limits. Compliance with the jurisdictional authority includes, but is not limited to, field reviews, technical meetings, special deliverables, etc. It is the Design-build Firm's responsibility to verify and comply with all jurisdictional authority's requirements with respect to the power service points. The Design-Build Firm shall provide separate meter, safety disconnect, and service poles for each maintenance jurisdiction.

Lighting installed by the Design-Build Firm shall be of the full cut-off type, with shields and gooseneck arms provided with a LED lamp, and comply with the Commitments.

The conduit for lighting shall not be used for other purposes such as ITS. The Design-Build Firm shall provide a conduit run consistent with National Electric Code within the bridge parapets on bridge to accommodate lighting conductors. No overhead conductors will be allowed for the final lighting system. Lighting pull boxes will not be permitted in paved roadways. No pull boxes are permitted within the designated roadway shoulder, paved or unpaved. No surface mounted conduits shall be placed on the visible exterior surfaces of any structure. Surface mounted lighting or ITS conduits on bridge between interior beam bays and along the piers are not allowed.

The Design-Build Firm shall design and construct the underdeck lighting for the portions of the project where US 98 is elevated at Santa Rosa Blvd. and at Brooks Street.

### **Navigational Lighting Requirements**

Navigational Lighting for the Channel Margin Navigation Lights shall be designed for use as a marine signal light for marking channel margin, per U.S. Coast Guard Bridge Administration General Construction Requirements, CFR 33 Part 118. The housing shall be in compliance with the FDOT Standard Specifications for Road and Bridge Construction Section 510.

All clearance gauges must indicate the vertical distance between **“low-steel” low member** of the bridge channel span and the level of the water, measured to the bottom of the foot marks, read from top to bottom. Each gauge must be installed on the end of the right channel pier or pier protection structure facing approaching vessels and extend to a reasonable height above high water so as to be meaningful to the viewer.

The Design-Build Firm shall design, furnish and install a new navigational lighting system to replace existing navigational red lights and new gauge lights on the side of the fender system and the center channel navigational green light on the side of the bridges with a complete new navigational lighting system including but not limited to LED navigational lights, power source, service point/load center, raceway system and conductors. The Design-Build Firm shall provide for complete fender system and clearance gauge lighting detail as required per U.S. Coast Guard permit.

Design shall provide ready access for lamp service.

Lens section shall be 180 degrees red. Lamp shall be 120 VAC, medium base LED with a rated life of 100,000 hours (over 11 years of operation when burned 24 hours per day), and shock and vibration resistant.

Overall luminosity of the LED array shall be 840 candelas for both red and green arrays (similar visibility to a 75W incandescent lamp). Beam viewing angle shall be 22 degrees for red and 20 degrees for green.

Lamp color shall match the color of the fixture lens for maximum light output. Red LEDs shall have a wavelength of 630 nm. Green ("marine" green or blue-green) LEDs shall have a wavelength of 510-515 nm.

Lamp mounting shall center the array on the focal plane of the lens. Receptacles shall be mounted on a bracket, which shall be isolated from the navigation light fixture with rubber grommets to minimize shock and vibration. Mounting bracket shall position the center of the lamp at the focal plane of the fixture lens for optimal light transmission.

A manual locking device shall hold the light securely in normal operating and service positions and shall be capable of accepting a padlock.

A cast junction box with gasketed access cover shall be provided where specified in the plans. Junction box shall be of the same material as the fixture assembly and shall match the navigation light base footprint. Orientation of junction box shall be capable of rotation in 90-degree increments.

The Center Channel Navigation Lights shall be designed for use as marine signal lights for marking center of channel, per U.S. Coast Guard Bridge Administration General Construction Requirements and be similar to the Channel Margin Lights described above except that the lens section is 360 degrees green.

The navigational lighting will be maintained by the Department upon final acceptance.

The utilization of solar power for the navigational lighting system is not allowed.

The Design-Build Firm shall be responsible ~~to for maintaining the existing navigational lighting system until the new system is operational and~~ demolish and dispose of the existing navigational lighting system. ~~and maintaining the existing navigational lighting system until the new system is operational.~~

**R. Signalization and Intelligent Transportation System Plans:**

**1. General**

The Design-Build Firm shall prepare Signalization and Intelligent Transportation Plans in accordance with Department criteria.

All signal heads shall be mounted horizontally. Internally illuminated street name signs with LED source of lighting shall be provided for all approaches of the signalized intersections. All mast arm poles shall be painted using the Federal Color Code currently established by the Okaloosa County.

The Design-Build Firm shall prepare design plans and provide necessary documentation for the procurement and installation of the Signalization and Intelligent Transportation System devices as well as overall system construction and integration. The construction plan sheets shall be in accordance with Department requirements and include, but not be limited to:

- Project Layout / Overview sheets outlying the locations of field elements
- Communication Overview outlying the begin and termination of the fiber optic communication cables, proposed splice and pull boxes, local hubs, and devices on the straight line diagram.
- Detail sheets on:
  - CCTV structure, CCTV attachment, CCTV operation/layout
  - Road Weather Information System (RWIS)
  - Fiber optic splice and conduit
  - Power Service Distribution
  - Wiring and connection details
  - Conduit, pull box, and vault installation
  - Directional Bore Details
  - Overall Power Service Distribution diagram
  - Device and Facility Access Plans For All Stage Of Construction and As-Built Condition
  - Communication Hub and Field Cabinets
  - System-level block diagrams
  - Device-level block diagrams
  - Field hub/router cabinet configuration details
  - Fiber optic Splicing Diagrams
  - System configuration/Wiring diagram/Equipment Interface for field equipment at individual locations and communications hubs.
  - Maintenance of Communications (MOC) Plan

Anticipated CCTV cameras and RWIS for the Bridge area:

| ITS Devices | Approximate Location | Direction | Notes |
|-------------|----------------------|-----------|-------|
|-------------|----------------------|-----------|-------|

|              |  |   |  |
|--------------|--|---|--|
| CCTV Cameras | Both sides of the bridge approach and departures including bridge proper coverage  | Both Directions   | Fiber Optic-based communication and connection to Okaloosa TOC                       |
| RWIS         | On one side of the bridge where weather and visibility information can be detected | Suitable Location to be determined and approved by the DEPARTMENT | Fiber Optic-based communication and connection to Okaloosa TOC and FDOT Chipley RTMC |

The Design-Build firm is responsible for ensuring project compliance with the Regional ITS Architecture and FDOT ITS Topic 750-040-003-c, Systems Engineering and ITS Architecture Procedure as applicable. This includes, but is not limited to, the development or update of a concept of operations, the development or update of a system engineering master plan (SEMP), and requirement traceability verification (RTVM) as well as coordination of document review.

The Design-Build Firm shall detail existing Signalization and Intelligent Transportation System equipment and report which devices will be removed, replaced, or impacted by project work.

**2. Design and Engineering Services:**

The Design-Build Firm shall be responsible for all Signalization and ITS design and engineering services relating to the Project. All ITS system components shall be new unless otherwise identified for relocation.

Mounting, or integrating of ITS, traffic and signalization components to existing or new light poles, lighting structures, sign structures, etc. will not be allowed. Do not mix underground, traffic railing conduits for ITS, signalization and lighting infrastructure. The Design-Build Firm shall design and implement the Project to keep the Department’s standard Traffic Signal Maintenance and Compensation Agreement in good standing.

At a minimum, the signal work in this project shall consist of the following major components:

- The Design-Build Firm shall design, furnish, install, integrate and test traffic signals, detection and proposed CCTV cameras.
- The Design-Build Firm shall prepare Signalization Plans in accordance with all applicable standards and Department criteria. In addition, the Design-Build Firm shall incorporate all aspects of the District 3 Signalization General Notes that can be obtained from the District Design Office.
- The Design-Build Firm is required to provide all data collection and analysis for the signalized intersection designs and any specific maintenance of traffic needs.
- Temporary signal(s) shall be designed, installed and maintained at the Design-Build Firm’s discretion and as directed by the Department anytime during the course of the project.
- Detection at existing, and temporary signals shall be established and maintained by the Design-Build Firm throughout the duration of the project with no lapse in operation of the detection greater than District 3 TSM&O manager and/or Okaloosa County Traffic Engineer approved hours. Temporary detection shall be accomplished by use of rigidly mounted video, microwave, and/or induction loops at the Design-Build Firm’s discretion.

- Timing and phasing plans shall be developed and maintained by the Design-Build Firm for maintenance of traffic throughout the duration of the project in consideration of prevailing traffic conditions. It is anticipated that multiple timing plans will need to operate on a time-of-day basis to accommodate differing traffic conditions during AM peak, PM peak, off-peak, night-time, and weekend periods. In addition to interim timing plans developed and maintained during the construction operation, the Design-Build Firm shall establish a permanent set of timing plans, time-of-day settings, and day-of-week settings that are to remain in the traffic signal equipment at the conclusion of the construction project. The permanent timings discussed above are to be summarized and documented in a signed and sealed report to the department for review and approval.
- All traffic signal controllers provided shall be advance traffic controllers inside advance traffic controller cabinets at each intersection. The traffic control cabinet associated peripheral equipment, and electrical power service assembly shall be strategically located in a protected area not vulnerable to damage by vehicular impact. Install Ethernet-based Blue TOAD at each signalized intersection collocated on the proposed mast arm upright and connected to traffic signal controller.

The design of the new system shall integrate with the existing devices. The design shall include the necessary infrastructure and components to ensure proper connection of the new ITS components. This shall include but not be limited to all proposed ITS components of this project as well as existing sub-systems that remain or are re-deployed as the final project.

At a minimum, the ITS work in this project consists of the following major components:

- Replacement of any ITS System components that are impacted by the Design-Build Firm's scope of work as approved by the Department. All equipment shall be new unless otherwise specified.
- CCTV – Includes concrete poles, camera lowering devices and mountings to provide 100% CCTV coverage of the project corridor.
- RWIS shall include the level concrete pad for the entire system inside a type B fence enclosure. It shall include the power service, communication splice box, electrical pull box, concrete strain pole to support the RWIS components, RPU enclosure, ITS cabinet, atmospheric sensor, WIVIS sensor, wind speed and direction sensor, grounding, UPS, RPMU, AC Power, RWIS power supply, and it shall support all Object Identifiers (OIDs) defined by the NTCIP Standard for the RWIS, SNMP framework, Ultra Mobile Technology (UMB) sensor data over Internet Protocol (IP), as well as USB and Ethernet interfaces, attachment brackets, system-wide surge protection devices for a full autonomous RWIS assembly. The RWIS site shall be in a suitable spot without any trees or other objects that could disrupt the functionality of the system.
- Removal of any ITS System components that are impacted by the Design-Build Firms scope of work as approved by the Department.
- Testing of fiber optic backbone and lateral drops furnished and or installed or modified by the Design-Build Firm.
- End-to-End Testing of the installed Intelligent Transportation System.

The Design-Build Firm shall coordinate to avoid conflicts with landscape plans within the Department Right-of-Way. While procedures are being revised to facilitate this increased collaboration and cooperation, the Design-Build Firm is required to ensure that the design and construction of each ITS project and each landscape project is entirely coordinated with existing and proposed ITS facilities and landscapes. Both programs have been determined to be important components of the state transportation system.

## Smart Work Zone (SWZ)

The Design-Build firm shall design, construct, operate, and maintain a smart work zone (SWZ) during all phases of construction requiring lane closures, lane shifts, or diversions. The SWZ shall include CCTV cameras with Pan-Tilt-Zoom (PTZ) at critical locations to monitor the project construction impacts on traffic conditions. The SWZ may use Portable or trailer mounted devices that can be easily adjusted and relocated to improve monitoring. Monitoring will be by the DEPARTMENT at the RTMC in Chipley. The SWZ system shall be integrated with Design-Build Firms Temporary Traffic Control Plans.

The Design-Build Firm shall adjust the CCTV camera locations as needed to maintain full coverage during all phases of construction. The Design-Build Firm shall give the Department the opportunity to review and approve camera placement locations during each phase or construction to achieve desired outcomes. The SWZ systems shall be designed to stream video remotely to the D3 Regional TMC through an internet interface. The cameras shall use wireless communications, such as cellular or wireless broadband. The camera mounting system shall be capable of raising the camera to at least 30 feet above the roadway. When portable CCTV cameras are used, the portable CCTV shall be solar powered and provide sufficient battery backup to ensure continuous operation.

**SWZ Wireless Communications System:** The Design-Build Firm shall provide a wireless communication system for each SWZ component. The Design-Build Firm is responsible to design and provide adequate communications to meet the bandwidth, latency, and reliability requirements of each SWZ device and provide SWZ cloud based Commercial Off The Shelf (COTS) software. Both cellular communications and wireless broadband are acceptable solutions. Wireless broadband shall be designed for optimum line of sight. The Design-Build Firm may provide independent communications to each device or provide communications from each device to a central communications point.

**SWZ cloud-based COTS software:** The Design-Build Firm shall provide a turnkey cloud-based, COTS software solution to operate and maintain the SWZ system. The software shall include the following functionality:

- Monitor and control all SWZ field devices (CCTV Cameras)
- Provide a secure web portal to the D-3 RTMC in Chipley and feed data to SunGuide®, Florida 511, Google, and Waze. The web portal and data feeds shall, as a minimum, provide data about current SWZ locations, current time-stamped work zone speed limits, current work zone operating conditions, current traffic volumes approaching and through the work zone, and locations of delays or queues within the work zone. Data format shall meet FDOT SunGuide®, FDOT FL511, Google and Waze format requirements.

## ITS Analysis

The Design-Build Firm shall review the approved preliminary engineering report, typical section package, as-built plans of the constructed projects in the vicinity of this project, traffic technical memorandum, and proposed geometric design alignment to identify impacts to the proposed ITS field device placements. The Design-Build Firm shall review all related District ITS plans and documentation for the project corridor to ensure all cited ITS elements are included in this project.

The Design-Build Firm shall prepare a PSEMP, RTVM, and other documents as determined necessary for conformance with FHWA requirements. The Design-Build Firm shall use all applicable DEPARTMENT requirements and guidelines, including, but not limited to, the FDM, Standard Plans, and Standard Specifications for Road and Bridge Construction in the design of ITS.



The initial RTVM shall be submitted to the Department for review and approval no later than 30 calendar days after the approval of the PSEMP. At a minimum, the PSEMP and RTVM shall be reviewed every major milestone (such as phase submittals and/or with an equipment/device type change) after the initial approval and updated, as needed. The updated and revised PSEMP and RTVM documents shall be submitted to the Department for review and approval.

### **3. Construction and Integration Services:**

The Design-Build Firm shall be responsible for all Signalization and ITS construction and integration services relating to the Project. The Design-Build Firm shall provide a detailed plan of action, which discusses the process for integrating the new devices into the existing Okaloosa County Traffic Operations Center (TOC).

The Design-Build Firm shall coordinate all integration activities with the Department prior to commencement of any integration activities. Okaloosa County TOC is a secured facility and access to it shall be scheduled at least one week in advance with the County Traffic Operations Manager. All integration within the TOC shall be scheduled at times other than during the normal weekday peak traffic hours (7:00 am to 9:00 am, and 3:30 pm to 7:00 pm).

Remote VPN access shall not be provided to the Design-Build Firm to access the ITS network of the Okaloosa County. The County Traffic Operations Manager, or his designated representative, will perform the Okaloosa County TOC existing infrastructure integration tasks to proposed signalization and ITS infrastructure in the Okaloosa County TOC with the guidance and coordination support of the Design-Build Firm, as necessary. Integration and testing of all proposed field Signalization and ITS infrastructure shall be performed by the Design-Build Firm.

The Design-Build Firm shall provide to the County Traffic Operations Manager all necessary information and data to facilitate subsystem configuration and integration activities.

The Design-Build Firm shall incorporate the as-built CADD plans for all existing and new underground utilities installed under this Project, including but not limited to, FOC, splices schematics, pull boxes, splice boxes, power service and cables, and underground conduit system, in an electronic format that shall be 100 percent compatible with Department's ITSFM forms. The Design-Build Firm shall prepare ITSFM data entry worksheets for each ITS field installation as required by the Department.

The Design-Build Firm shall be responsible for the integration and testing of all signalization and ITS infrastructure and communications subsystems. Once the Design-Build Firm has installed and supplied the power and communications interconnect to each ITS device as stated in the plans and specifications and approved by the Department/CEI, the Design-Build Firm shall integrate each device into the existing passive communications network. The Design-Build Firm shall coordinate with the Department Project Manager and/or Operations Manager a schedule of installation and integration. Once the Design-Build Firm has completed the installation of fiber plant and devices and receives acknowledgement acceptance by the Department's construction services that each device proposed in the field is installed, properly connected, and completely equipped for field integration activity, the Design-Build Firm shall then field integrate the ITS devices/cabinets in accordance with the approved schedule. The Design-Build Firm shall verify that all ITS devices are in the correct locations and are functioning properly at each location at the time of installation and integration.

- The Design-Build Firm shall verify communications between all ITS devices as designed, between each ITS device location, and between all communications hubs and the Okaloosa County TOC. The Design-Build Firm shall install and integrate all active Layer 2 communications components and Layer 2 communications equipment in all communications hubs. This shall include, but be not limited to, field switches, device servers, Uninterruptible Power Supply (UPS), remote power management devices, and all cables and connectors necessary for the successful operation of the communications system. Excluded is modification of any existing or new Core Switches/Routers operating at Layer 3 Core Switches. Such devices shall be configured by the Department or Okaloosa County TOC .
- The Design-Build Firm shall provide a Field Integration Checklist indicating that all integration tasks have been completed and are documented.
- The Design-Build Firm shall provide all equipment, parts, and configuration data necessary to integrate the ITS with the Okaloosa County TOC.
- The Design-Build Firm shall provide complete and comprehensive documentation of all elements of this Project as specified in this RFP.

The project ITS field devices are to be operated from the Okaloosa County TOC. The Design-Build Firm shall integrate the individual ITS field elements (i.e., CCTV cameras, H.264 decoders, and Ethernet communication devices) with the respective vendor-provided subsystem software such that each of the subsystems shall be operated as a stand-alone system. This configuration will form the basis for Part 1 of the Subsystem Tests.

Once Part 1 of the Subsystem Tests are completed and the results are approved by the Department, the Design-Build Firm shall provide all integration and configuration data and settings so the Okaloosa County TOC can integrate the ITS field elements into the existing Core Layer 3 Ethernet Switches.

As soon as possible, after completion of Part 1 of the Subsystem Tests, the Design-Build Firm shall provide to the Okaloosa County TOC Manager all necessary information and data to facilitate the Okaloosa County TOC configuration and integration activities. The Okaloosa County TOC completes Core Layer 3 Ethernet Switch and integration and configuration within 14 calendar days of receipt of the configuration and integration data and related information from the Design-Build Firm. After Okaloosa County TOC integration is completed, the Design-Build Firm shall conduct remaining Part 2 of the Subsystem Tests.

Prior to the Final Acceptance, the Design-Build Firm shall demonstrate to the Department that all of the equipment specified in the RFP that was installed and configured by the Design-Build Firm flawlessly operates from the Okaloosa County client workstation located at the TOC.

The integration of the various subsystems with the Okaloosa County ATMS software will shall be performed by the responsibility of the Department and the Okaloosa County Department of Public Works with guidance, coordination, and support of the Design-Build Firm. The Design-Build Firm shall coordinate with the TOC and provide the following services:

1. Conduct a site survey to prepare the creation of the system database, configuration files, system graphics, and other preparatory work for the integration of the Okaloosa County ATMS software .
2. Troubleshoot any Design-Build Firm-installed field hardware issues that affect the integration work.

3. Furnish and install the field hardware and software required to operate with the Okaloosa County ATMS software.
4. Provide ITS field device information, such as equipment configuration diagrams, IP addresses, protocols, and documentation (e.g., users' manual, troubleshooting guide, etc.).
5. Configure the ITS field devices for integration with the Okaloosa County ATMS software, including link, intersection, and device configurations.
6. Provide post-installation services after testing the Okaloosa County ATMS . The services shall include providing documentation to allow the Okaloosa County TOC personnel to perform ATMS integration tasks, including but not limited to, populating the tables and creating map links.
7. Meet with the Department to validate all required documents.

All of the licenses for the products shall be transferred to the Department and Okaloosa County TOC . The installation media for the above products shall be provided and shall become the property of the Department after installation.

#### **4. Material, Equipment, and Subsystem Requirements**

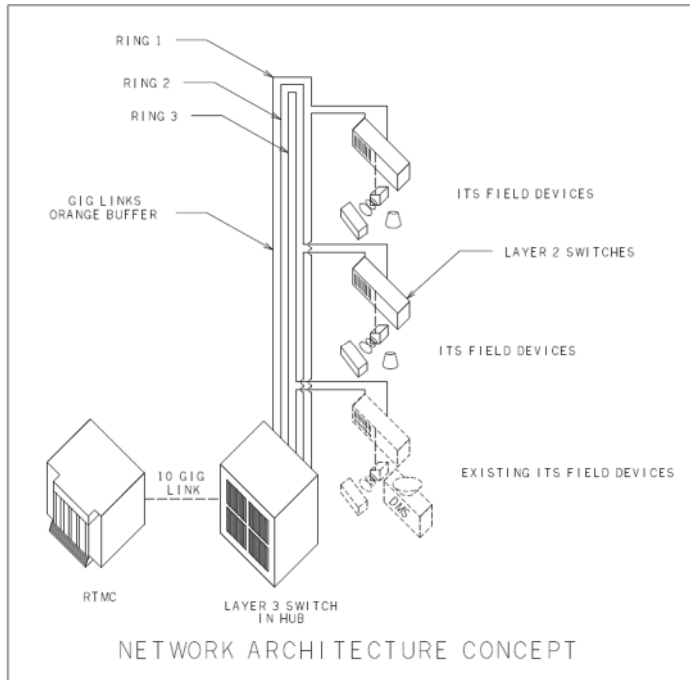
##### **a. Communication Subsystems**

For purposes of the RFP, the term “connectivity” refers to the physical connection between the ITS field devices and the Layer 2 Ethernet switches in the ITS cabinets. The term “interconnectivity” refers to the connection between any two adjacent hubs and the TOC. The Design-Build Firm shall provide full connectivity for ITS field elements installed with the Project.

The Design-Build Firm shall provide a communication subsystem that is an open-architecture, non-proprietary, real-time multimedia communication network, which is fault-tolerant. The Design-Build Firm shall design a hierarchical network design, which includes the following layers:

- The interconnectivity layer: comprised of the Layer 3 Ethernet switches in the TOC and local communication hubs. The Okaloosa County Traffic Operations personnel will perform configuration of these Layer 3 Ethernet switches.
- The connectivity layer: the local-access layer that connects ITS field devices, Layer 2 Ethernet switches, and all necessary encoders, media converters, and device servers in the ITS cabinets.
- The FOC physical layer: the physical media that connects the Layer 2 and Layer 3 Ethernet switches.

The Design-Build Firm shall integrate the ITS field elements into the TOC without disrupting existing functions and ITS field elements. New ITS cabinets and ITS field elements shall be integrated into this network. The Design-Build Firm shall develop and deploy new connectivity 1 gbps Layer 2 MFES in all new ITS cabinets, and traffic signal controller cabinets. The Design-Build Firm shall design and implement a “leap-frog” network architecture such that no adjacent ITS field elements are in the same fiber pair ring as shown in the Network Architecture Concept layout below.



The Design-Build Firm shall work closely with the Okaloosa County Traffic Operations personnel to confirm the network architecture concept. The final network architecture, along with the associated FOC splicing diagrams, shall be included with the 90% plans for review and approval by the Department.

All new underground and directional bored communications conduit shall be HDPE SDR 11 rated or thicker and smooth wall interior. A spare conduit shall be provided for each newly installed conduit. There shall be a separate spare conduit each for communication and power. Open trench and bored communication conduit consist of a 4" gray outer duct, one 1 1/4" white innerduct, one 1 1/4" orange innerduct, and one 1" gray innerduct. Install locate wire inside the outer duct, but outside the innerducts. Open trench and bored power conduit consist of two 2- inch gray conduit. Every drop or laterals, new conduit runs shall have two 2-inch conduit runs. All conduits shall have "jet-line" or equal pull string installed in each spare conduit run for future

use to support the field-to-center connectivity of the signalized intersection Advance Traffic Controllers Each bridge railing shall include separate 2" Schedule 80 conduit runs for ITS electrical power, ITS communication, and lighting electrical power.

#### **b. IP Addressing Scheme**

The Design-Build Firm shall utilize the Okaloosa County Traffic Operations Standard IP Addressing Scheme to create a Project- specific list for all new/existing ITS field elements that are installed as part of the Project. The Department will provide the Design-Build Firm with as many multicast IP addresses required for the CCTV video streams and the remaining needs. The IP address file will be provided in Excel spreadsheet format.

The Design-Build Firm shall be required to submit for approval a current cabinet configuration document listing all IP addresses utilized in the Project in a format easily understood depicting, at a minimum, the following information:

- Page Number (from Plans)
- Mile Marker

- GPS coordinates
- Device Type
- IP Address, etc.

The Design-Build Firm shall not use any IP addressing scheme or IP addresses other than those provided by the Department through Okaloosa County. The Department and Okaloosa County TOC personnel shall review and approve the Design-Build Firm's IP addressing scheme submittal prior to the Design-Build Firm's implementation of the scheme.

The Design-Build Firm shall design and deploy multiple virtual local area networks (VLANs) to segment ITS field elements into logical workgroups. The Design-Build Firm shall ensure that the new ITS field elements are configured in new sets of VLANs. The design of VLANs shall take into consideration the optical network requirements described elsewhere in the RFP.

### c. Fiber Optic Cable

The Design-Build Firm shall provide a 144-count single-mode FOC backbone. ~~The FOC backbone should preferably be installed along the side of the main line and inside the bridge traffic railings. Any deviation to the FOC backbone location shall be approved by the Department. The Design-Build Firm shall tie to existing FOC backbone to ensure continuity.~~

The Design-Build Firm shall provide ~~12-~~ 24 count single-mode FOC drops from the 144-count FOC backbone to ITS cabinets. ~~Individual fibers shall be looped one full turn within the splice tray to avoid micro-bending. Place buffer tubes and bare optical fibers such that there is no discernible tensile force placed upon them. There shall be only one buffer tube per splice tray. All splice trays shall be deep trays and capable of closing without the use of tape or other adhesive devices. Fiber optic strands shall not enter more than one splice tray.~~

~~In no case shall the Design-Build Firm install FOC in the same conduit, pull box, or splice box as electrical cables.~~

~~Any request to access the existing ITS system including, but not limited to, fiber optic cable (hand holes and pull boxes), ITS equipment control cabinet(s), ITS power facilities, traffic signal cabinets, ITS specific equipment (CCTV), and/or the TOC will require a submitted and approved access schedule. This document shall identify access necessities, schedule expectation(s), specific ITS facilities to be accessed, and an action plan for potential failure. This document shall be submitted to the TOC Operations Manager 30 calendar days prior to system access.~~

### d. Fiber Optic Conduit and Locate System

~~The Design-Build Firm shall provide a 96-count single-mode FOC backbone.~~ The FOC backbone should preferably be installed along the side of the main line and inside the bridge traffic railings. Any deviation to the FOC backbone location shall be approved by the Department. The Design-Build Firm shall tie to existing FOC backbone to ensure continuity.

~~The Design-Build Firm shall provide 12-count single-mode FOC drops from the 96-count FOC backbone to ITS cabinets.~~ Individual fibers shall be looped one full turn within the splice tray to avoid micro bending. Place buffer tubes and bare optical fibers such that there is no discernible tensile force placed upon them. There shall be only one buffer tube per splice tray. All splice trays shall be deep trays

and capable of closing without the use of tape or other adhesive devices. Fiber optic strands shall not enter more than one splice tray.

In no case shall the Design-Build Firm install FOC in the same conduit, pull box, or splice box as electrical cables.

Any request to access the existing ITS system including, but not limited to, fiber optic cable (hand holes and pull boxes), ITS equipment control cabinet(s), ITS power facilities, traffic signal cabinets, ITS specific equipment (CCTV), and/or the TOC will require a submitted and approved access schedule. This document shall identify access necessities, schedule expectation(s), specific ITS facilities to be accessed, and an action plan for potential failure. This document shall be submitted to the TOC Operations Manager 30 calendar days prior to system access.

All ITS sites shall be accessible by a maintenance vehicle (typically a ¾ ton pickup truck).

The Design-Build Firm shall install directional bores perpendicular to the roadway when crossing another roadway. Where multiple conduits are required, the directional bore shall place all conduits into a single outer conduit appropriately sized to contain the required number and sizes of conduit.

**e. Managed Field-Hardened Ethernet Switches (MFES)**

Managed field-hardened Ethernet switches shall meet the requirements of the Specifications, or the following minimum technical requirements, depending upon which is more stringent.

The Design-Build Firm shall furnish and install new 1 Gbps Layer 2 MFES in all new ITS cabinets and traffic signal controller cabinets. The Design-Build Firm shall ensure the MFES has a minimum of 14 ports.

The Design-Build Firm shall ensure that the configurations of the MFES are able to be downloaded and stored on a PC and later shall be able to be uploaded to the unit when necessary.

The Design-Build Firm shall ensure that the configuration of the MFES meets or exceeds the following minimum trouble shooting and diagnostic specifications:

1. Displaying the contents of a specified address
2. Displaying information about hardware registers for a specified port
3. Displaying configuration and status of physical and logical ports
4. Displaying detailed information about Spanning Tree (configuration and status)
5. Displaying active status of the unit

The Design-Build Firm shall ensure that each MFES supports, at a minimum, have the following security features:

1. Passwords – Multi-level user passwords secure switch against unauthorized configuration
2. SSH / SSL – Extends capability of password protection to add encryption of passwords and data as they cross the network
3. Enable / Disable Ports – Capability to disable ports so that traffic cannot pass
4. 802.1q VLAN – Provides the ability to logically segregate traffic between predefined ports on switches
5. MAC Based Port Security – The ability to secure ports on a switch so only specific ITS field elements / MAC addresses can communicate through that port

6. 6802.1x Port Based Network Access Control – The ability to lock down ports on a switch so that only authorized clients can communicate via that port
7. RADIUS – Provides centralized password management
8. SNMPv3 – Encrypted authentication and access security

**f. CCTV Subsystem**

The Design-Build Firm shall design the placement of CCTV cameras as follows:

- Provide unobstructed view of both directions of travel on the new bridges including clear zones and on crossroads
- Full CCTV coverage of the project to ensure that all portions of the roadway including the clear zones can be observed at an angle sufficient to discriminate between vehicles, regardless of the distance between the CCTV and the vehicles
- All proposed CCTV cameras shall be high definition and IP addressable, Analog cameras will not be accepted
- CCTV poles and cameras shall not be installed on the bridge proper

The Design-Build Firm shall perform a 360 degree field of view video survey at the proposed camera height for each CCTV camera site utilizing a bucket truck and the Design-Build Firm's proposed camera. The intent of the video survey is to verify 100 percent CCTV coverage of the new bridges and travel lanes, auxiliary lanes, and crossroads. The Design-Build Firm shall record the video survey for the Engineer's review and acceptance.

Any additional CCTV cameras and field elements required to obtain the coverage requirements described above shall be included in the Design-Build Firm's ITS plans and furnished, installed, integrated, and tested at no additional cost to the Department.

The Design-Build Firm shall install camera lowering devices for the CCTV pole covering the new bridges. Any variation to this requirement will not be approved by the Department.

All CCTV camera poles will have 8' blunt tip air terminals with 4' exposed above and opposite the component to be protected. Supports for this air terminal shall be at the base of the air terminal and at the midpoint. Stainless steel straps shall not be used to mount the air terminal to the pole. The air terminal shall be mechanically bonded to the CCTV pole.

CCTV poles shall be constructed of length and stiffness that can meet the vertical placement and camera stability requirements and the following additional requirements:

1. All CCTV poles shall be located outside the clear zone as applicable mainline travel lanes or shielded in accordance with the FDM.
2. Electrical ground: All CCTV poles shall be supplied with an electrical ground meeting the requirements of the Specifications and Standard Plans.

The Camera Lowering Device (CLD) shall be mounted to a specially designed tenon bolted to the top of the pole as required. All poles shall have a minimum inside raceway dimension of four (4) inches at the tip of the pole. All poles shall be provided with a fish wire to facilitate cable installation.

The Design-Build Firm shall design-build the CCTV pole with CLD in such a manner that the personnel operating the CLD lowering mechanism are not standing directly beneath the CCTV assembly and the access to the CLDs is not obstructed in any manner. The lowering arm shall be mounted perpendicular to the roadway unless otherwise approved by the Department. The CCTV sites with CLD are only required at the bridge approach-departures.

The Design-Build Firm shall ensure the camera pole to include the opening for CLDs at 90 degrees from the CCTV camera. The design of the pole shall include the Hand-Hole Frame (HFF) and conduit entry holes for the ITS cabinet without any conflict with the CLD and the HFF. The Design-Build Firm shall submit the details of placement of CLD and CCTV camera assembly as part of the 90% design submittal for the Department's review and approval. The CLD shall include a suspension contact unit for electrically connecting the camera assembly to the power, data, and video cables; divided support arm; and a pole adapter for the assembly's attachment to a pole-top tenon, a pole top junction box, and a camera connection box. The CCTV camera viewing, and poles locations shall not be interfered with or obstructed by other devices or landscaping elements such as trees and shrubbery in the vicinity.

The Design-Build Firm shall also pay for any utility adjustments required for these CCTV field elements at no additional cost to the Department.

**g. Power Subsystem**

The Design-Build Firm shall establish the power service addresses and the necessary commercial electrical power service for all ITS sites. Once power service has been established by the Design-Build Firm, the Department or its designee will inspect the power service for compliance with Department, NFPA, and NEC standards, and all Contract Documents. The Design-Build Firm shall provide a signed and sealed Power Design Analysis Report (PDAR) prepared by a licensed electrical engineer consist of electrical load calculations, voltage drop calculations for each ITS site or combination of sites, and include the service feeder size computations from the power company transformer to each local hub. The Design-Build Firm shall optimize the number of ITS cabinets for economy of construction and maintenance. The Design-Build Firm shall design and install electrical service, meters, conduit, pull boxes, copper conductors, and procure service points from the local power service providers within the project limits to make installation fully functional. All electrical distribution shall be underground, and isolated from the communication network.

In addition, the Design-Build Firm shall apply the following criteria to the design of the power service:

1. Aluminum wound electrical products shall not be installed.
2. All elements shall be new and free of damage.

Electrical power design and plans shall include the following:

1. Electric service panel in the cabinet, based on electrical load of the cabinet and an additional 20A circuit and receptacles shall be provided for miscellaneous electrical loads
2. Electrical power shall be designed based on the load requirements of the ITS field element(s), cabinet, network equipment, UPS, and other miscellaneous electrical equipment at each ITS field element location
3. Step-up or step-down transformers as needed for each location
4. Loads shall be calculated per NEC requirements and maximum 5% allowable voltage drop including the service feeder from the utility transformer
5. Grounding, lightning, and surge protection for all electrical subsystems



6. Plans shall clearly show all electrical ratings requirements, loads, wire sizes, grounding, lightning, surge protection, meters, disconnects, generator plugs, and all elements necessary for a complete and functional design
7. Final electrical plans signed and sealed by a Professional Electrical Engineer licensed with the State of Florida Board of Professional Engineers
8. All electrical cabling shall be new copper cabling. The Design-Build Firm shall use cables that are resistant to saltwater, suitable for direct burial, and spliced with submergible rated splice kits

The Design-Build Firm shall be responsible for contacting and coordination with the local power companies along the Project corridor. The Design-Build Firm shall work with the local power companies to designate locations of electrical sources to provide new and adjusted electrical service as required for the Project.

The Design-Build Firm shall pay all necessary fees and expenses required by the commercial electrical companies to establish new electrical power and for adjustment of existing service. The Design-Build Firm shall work with the Department to establish billing addresses for each new power service location along with the responsible party for future bills. Along with other as-built documentation, the Design-Build Firm shall provide electrical calculations and other details of the implemented power service to the Department including the GPS location of each power source.

For each power distribution system, the Design-Build Firm shall also provide equipment to automatically assume and power the loads in the event of an interruption of commercial power to include emergency generator(s) with automatic start, ATS, transformers, cabinets, power panels, circuit breakers, and all related equipment. The Design-Build Firm shall be responsible for verifying these locations, determining final available power sources and voltages, coordinating with the local power companies, and paying any and all connection and monthly service fees for the power supply until the project has been turned over to the Department on the written date of Final Acceptance.

All ancillary components shall be delivered along with the needed cables and connectors for power and generator/ATS communications. Power conduits shall have smooth walls and be sized adequately, as determined by the overall cable diameter and recommended percentage of fill of conduit area, per requirements in the latest NEC and the Specifications.

The power conductors shall be adequately sized per requirements in the latest NEC and the Specifications. Conductors shall be rated for underground installation in wet locations. The power system design shall include convenience outlets that may be used by the maintenance crew. Within each ITS equipment cabinet, at least two NEMA 5-15R type GFCI protected outdoor rated receptacles for use by maintenance personnel shall be provided.

Power cables shall be marked with 1 tag indicating direction or exit from underground facilities (i.e., vaults, primary junction boxes, service holes, manholes, secondary junction boxes, transformers). This tag shall indicate the general direction of the cable(s) to the next facility where the cable is located. The Department must approve the tags used before the procurement and installation. All tags shall be labeled with the next point of connection (i.e. transformer 1 to transformer 2). All equipment shall be numbered prior to placing the tags on the power cables.

The power subsystem shall contain readily accessible, manually resettable, or replaceable circuit protection devices (such as circuit breakers or fuses) for equipment and power source protection. Power equipment shall be installed in areas to avoid wet locations and easy access by vehicles and maintenance personnel.

All connections and equipment should be outdoor-rated and protected from moisture and water intrusion. No exposed wiring is permitted.

Coordination of protection devices is required to minimize interruption of electrical service to other areas of the power system. The system shall be designed so that the protective device closest to the fault operates first.

All ancillary components shall be delivered along with the needed cables and connectors for power and communication. All installations and wiring shall meet the requirements of the NEC and NESC. Grounding shall be in accordance with the requirements of NEC Article 250 and the Specifications.

Remote Power Management Units (RPMU) – The Design-Build Firm shall provide RPMU for controlling multiple network devices and services. The RPM shall individually control AC power for up to eight connected devices. Once connected to the network, the RPMU shall provide access and control using a standard web browser and password. The Design-Build Firm shall supply remote power management in each cabinet servicing an ITS device within the project. The RPMU shall provide the following minimum functionalities:

1. Eight outlets;
2. Network connections via Ethernet;
3. Network control/support via HTTP server & SNMP agent TCP/IP;
4. Scheduled event control including day of week and specific time start-up and shutdown; and
5. Notifications including pagers and network broadcast messages.

#### 1. **Transformers**

When the commercial power is not supplied with the correct voltage or phasing, the Design-Build Firm shall design, construct, install, and integrate the transformer (Power Feed Transformer) at each commercial power supply location to convert the power supply from the Utility Company (ies) to the appropriate secondary voltage single phase power and with suitable wire sizes that are capable of providing power to the operations of ITS field elements within the Project. The transformer shall be equipped with two 2.5 percent taps above and two 2.5 percent taps below normal voltage. All taps shall be full capacity taps. However, the Design-Build Firm shall not include the plus or minus tap in the voltage drop calculations during the design of the power subsystem. All transformers shall be copper wound.

The Design-Build Firm shall design, construct, install, and integrate the transformer (ITS field element Transformer) at each of the ITS field element location cabinets to step-down from the voltage supplied from the underground distribution wire to the 120/240v power requirement for that location, and neutral conductor from the primary winding shall not be bonded to the secondary winding for isolation purposes.

#### 2. **ITS Electrical Conduit, Pull and Junction (Splice) Boxes**

Electrical conductors shall not be placed in the same conduit, pull box, or splice (junction) box as FOC. The Design-Build Firm shall furnish and install ITS electrical conduit and pull/splice boxes for non-fiber optic wiring needs (power, communication, etc., for ITS). The Design-Build Firm shall meet the following requirements.

1. Detail type, size and quantity of ITS electrical pull/splice boxes on the Plans.
2. Provide installation details including connections with conduit in compliance with the Specifications and Standard PlansStandards.
3. Address site restoration and disposal of excavated materials.

4. Use only equipment and components that meet the requirements of the RFP, which are listed on the Department's Approved Products List (APL).
5. ITS electrical pull/splice boxes shall meet the requirements of the Specifications.
6. ITS electrical pull/splice boxes shall be a minimum of 24 inches long by 18 inches wide by 12 inches deep. Ensure that the pull/splice box is large enough to house non-fiber cables, as required, without subjecting the cables to bend radii less than industry standards for the types and diameters of cables in the box. Ensure there is enough room to provide any necessary cable splicing. Ensure the boxes are large enough for storage of slack cable. Pull boxes shall not be located in ditches where there is a potential for them to be submerged by seasonal high-water.
7. The maximum spacing between ITS electrical pull boxes shall be in conformance with the N.E.C. associated with the size and number of conductors.  
The Design-Build Firm shall develop specifications in accordance with industry standards to address cable placement and spacing in accordance with industry recommendations for the types and sizes of cables used on the Project.
8. Provide supplemental electronic box markers in all ITS pull/splice boxes.
9. Provide locking and security systems on electrical ITS pull/splice boxes to prevent theft of copper cable. The security system shall include, at a minimum, a system for securing the lid that includes hardened metal bars or other cover and locks/bolts with unique keys that are not available in the consumer marketplace. Ten keys shall be provided for the maintenance personnel use. The keys shall be delivered to the Department upon Final Acceptance. The security system shall also include a 12-inch thick concrete mowing apron, supplemental security locking systems, and/or other systems designed and proven to deter theft. The Design-Build Firm shall submit the locking and security systems to the Department for review and approval with other required design submittals.
10. Mowing aprons shall be installed for all shoulder mounted pull and splice boxes.

### 3. Uninterrupted Power Supply (UPS)

The Design-Build Firm shall install a UPS at each device cabinet and traffic signal controller cabinet. Each UPS shall supply all electronic components housed in and associated with ITS field equipment cabinets with uninterrupted power for a minimum of four (4) hours in the event of power loss. Each UPS shall be sized according to the maximum expected load for each cabinet plus 50 additional Watts. The service outlets shall not be connected to the UPS.

The UPS shall provide commercial power pass through during all failures of UPS. The Design-Build Firm shall ensure that the UPS is generator compatible to ensure clean, uninterrupted power to protected equipment when generator power is used. The UPS shall be environmentally rated for the environment that the UPS is installed in. The recharging all of the UPS batteries which may be drained shall be included within the power design calculations.

The Design-Build Firm shall supply a SNMP network management interface to determine operational status of the UPS, the internal UPS temperature, and the external temperature as recorded by a remote sensor mounted elsewhere in the cabinet, and state of the cabinet door switch(es) (open or closed), and SPD failures (open or closed SPD alarm contacts). All UPS shall be designed and integrated to the ITS Ethernet network, such as: power loss, battery levels, and alarms. Any software required to monitor the UPSs shall be furnished, configured, and integrated into the TOC monitoring computer.

#### 4. Grounding, Lightning, and Surge Protection

All Project systems shall be protected from damage caused by lightning strikes, transient voltage surges, and induced current. The Design-Build Firm shall design, install, and test all grounding, lightning protection, and Surge Protection Device (SPD) subsystems in accordance with the Specifications and Underwriters Lab (UL) 96A specifications.

The Design-Build Firm shall furnish and install resettable SPDs for all cables and conductors (power, video, and data). All Project subsystems, devices, and ancillary components with electrical interconnects shall be protected from voltage surges caused by lightning, transient voltage surges, induced current, and external electromagnetic fields at the time of installation of each device, as specified in the Specifications.

The Design-Build Firm shall provide a grounding system that meets the grounding requirements of the N.E.C. (latest edition) and the Specifications.

The Design-Build Firm shall provide a SPD both ahead of and behind (i.e., on the supply side and the load side of) all ITS device electronics. The SPD for the ITS device's power source (supply side) shall be rated at a minimum rating of 80 kiloamps (kA) per phase, or greater. The SPD for the ITS device's point of use (load side) shall be rated at minimum of 20 kiloamps (kA) per phase. The SPD on both sides shall have an operating voltage of 120 VAC single phase and a maximum continuous operating voltage of 150 VAC single phase.

The Design-Build Firm shall ensure that the required lightning protection equipment for each device pole is securely attached on the pole at an elevation higher than the highest attached ITS device and/or component described herein (e.g. CCTV cameras).

#### 5. Device Protocol Compliance

For the ITS devices being installed, the Design-Build Firm shall ensure that the protocol used by those devices, which are to be controlled by the Okaloosa County ATMS software, is compliant with the protocols listed online at the following website to ensure compatibility for integration with ATMS software. The primary control center for all signal and ITS devices is at Okaloosa County Traffic Management Center.

#### CCTV Camera Data Configuration Documentation Requirements:

| Data                 | Description  |
|----------------------|--|
| Camera Name          | The data identifies the unique name of each camera.                              |
| Center ID            | The data identifies the unique name of the center where each camera resides.     |
| Protocol             | The data specifies the protocol (values: SNMP, SNMP [PMPP]) for each camera.     |
| Poll Process         | The data provides the name of the driver for each camera.                        |
| Manufacturer         | The data identifies the manufacturer of each camera.                             |
| Location Description | The data describes where each camera resides.                                    |
| Roadway              | The data identifies the roadway where each camera resides.                       |
| Direction            | The data identifies the direction of the roadway where each camera is installed. |

| <b>Data</b>             | <b>Description</b>  |
|-------------------------|---|
| Latitude                | The data identifies the latitude where each camera resides.   |
| Longitude               | The data identifies the longitude where each camera resides.  |
| Op Status               | The data identifies the operational status (values: Active, Error, Failed, Out Of Service) of each camera.  |
| Address Type1           | The data identifies the address type (values: pmpp Address, comm Address) for each camera. If pmpp Address, then the camera uses SNMP (PMPP); if Comm Address, then the camera uses SNMP. |
| Address Type2           | The data specifies the address type (value: portServerAddress) of Address Type 2.   |
| Address                 | The data identifies the device address of each camera.  |
| Port Server IP          | The data identifies the IP address for the port server where each camera resides.   |
| Port Server Port Number | The data identifies the port number for the port server where each camera resides.  |
| Community Name          | The data identifies the community name for each camera.   |
| Attach to Video Device  | If selected, additional IP video parameters must be supplied.   |

IP Video Data Documentation Requirements:

| <b>Data</b>             | <b>Description</b>   |
|-------------------------|--|
| Video Device IP Address | The data identifies the IP address for the encoder.  |
| Blackout                | The data determines if the camera is restricted.   |
| Video Device Type       | The data identifies the video device type (IP video device) for the encoder.   |
| IP Streaming Driver ID  | The data identifies the unique IP video switch driver name.  |
| Card Number             | The data identifies the card number for the encoder.   |
| Manufacturer            | The data identifies the manufacturer values of the encoder.  |
| Model                   | The data identifies the model of the encoder.  |
| Streaming Type          | The data identifies the streaming type (values: elementary, transport, program) for the encoder.                                 |
| Secondary Interface     | The data identifies the secondary interface for the encoder that enables users to maximize the number of inputs for the encoder. |
| Snapshot Requested      | The data determines if snapshots are generated for the encoder.  |

The Design-Build Firm shall be responsible for providing all data necessary to populate the SunGuide® database. The Design-Build Firm shall provide this data to the Okaloosa County Traffic Operations Manager. The Okaloosa County Traffic Operations Manager, or his designated representative, will enter the appropriate data into the ATMS database at the TOC under the oversight of the Design-Build Firm. At no time shall the Design-Build Firm be granted ATMS administrative rights or access to the Okaloosa County TOC.

#### **5. Testing and Acceptance:**

All equipment furnished by the Design-Build Firm shall be subject to monitoring and testing to determine conformance with all applicable requirements. The Design-Build Firm is responsible for the coordination and performance of material inspection and testing, field acceptance tests, and system acceptance tests. The times and dates of tests must be accepted in writing by the FDOT Project Manager. The Design-Build Firm shall conduct all tests in the presence of the FDOT Project Manager or designated representative.

#### **6. Existing Conditions**

This section is intended to provide a general overview of the existing conditions of the Department's ITS System and its components such as the fiber optic network (FON) communications infrastructure within the project limits. Refer to the concept plan for existing ITS equipment locations. In addition, the Design-Build Firm shall refer to the ITS As-Built Plans provided with this RFP as Reference Documents for additional information and shall be responsible for field verifying all existing site conditions within the project limits.

#### **S. Landscape Opportunity Plans:**

It is the intent of this work item to preserve the opportunity to provide for significant landscape planting areas within the Project limits that meet the intent of FDOT Highway Beautification Policy. The landscape opportunity design shall adhere to the FDOT Highway Beautification Policy with the intent of creating a unified landscape theme for the project.

The Design-Build Firm shall provide the necessary site inventory and site analysis and shall prepare a "Landscape Opportunity Plan" (Opportunity Plan) as part of the roadway plan set. The Landscape Opportunity Plan shall consider the Design-Build Firm's proposed roadway improvements, utilities, setbacks and clear zone dimensions, community commitments and other Project needs in identifying future landscape planting areas. Landscape opportunity areas should be preserved in accordance with the Departments "Bold" initiative.

The Opportunity Plans shall include the following:

1. Proposed improvements and existing elements to remain as associated with the Project.
2. Vegetation disposition depicting existing plant material to be removed, relocated or to remain.
3. Wetland jurisdictional lines.
4. Proposed drainage retention areas and easements.
5. Proposed utilities and existing utilities to remain.
6. Graphically depicted on-site and off-site desired or objectionable views.

7. Locations of landscape opportunity planting areas in a bubble format which identifies various vegetation groupings in a hatched or colorized manner. Examples are: “trees/palms/shrubs”, “shrubs only”, “buffer plantings”, etc.
8. Provided and labeled applicable clear zone, horizontal clearance, setback dimensions on the plans and in chart form which reflect AASHTO, FDOT and Department guidelines for landscape installation and maintenance operations, including those that have been coordinated with other disciplines
9. Identified outdoor advertising locations, owners and contacts and shown 1000 ft. view zone.
10. Indicated potential area(s) for wildflower plantings.

The Opportunity Plan shall match the scale and format used for the proposed roadway sheets. Should this format not convey design intent that is clearly legible, an alternate format may be considered.

Landscape construction documents and landscape installation are not included in this contract and shall be provided by others, **except within the center of the roundabouts as required by the RFP.**

Disciplines that will have greatest impact to preserving landscape opportunities include environmental, drainage, utilities, signing, lighting and ITS. The DBLA shall identify potential conflicts relating to preserving opportunity landscape areas and provide suggested resolutions to preserve them. If conflicts cannot be resolved by the Design-Build Firm and the DBLA, they shall be discussed with the Department’s Project Manager and District Landscape Architect for coordination and resolution.

The DBLA shall research and confirm any legally permitted outdoor advertising billboard (ODA) within 1,000-feet of the Project limits. The ODA sign(s) and 1,000-foot maximum vegetation protection zone limit shall be indicated on the plans. The Design-Build Firm’s Landscape Architect shall provide a copy of all correspondence and attachments to the Department’s District Landscape Architect.

The DBLA shall conduct a visual survey of existing vegetation within and adjacent to the Right of Way of the project. General locations of existing vegetation that will remain after roadway and associated improvements are completed shall be shown with notations of general plant species in each location on the Opportunity Plan. The DBLA shall identify proposed buffer areas as needed.

The DBLA shall meet with the District Landscape Architect prior to the beginning of work for the purposes of coordination and to discuss adherence to the Highway Beautification Policy. No proposed planting areas indicated on the Opportunity Plan can occur in: federal and/or state jurisdictional wetlands or other surface waters; within open water bodies; in the bottom of stormwater management facilities; or use obligate wetlands or facultative wetland species within 25 feet of the seasonal high water of wetlands or other surface waters. Limited plantings may occur on the slopes and bottom of stormwater management facilities once coordinated with the District EMO office, District Drainage Engineer and the District Landscape Architect. Trees may not be planted within 5 feet of storm sewer pipes and utilities.

## **VII. Technical Proposal Requirements:**

### **A. General:**

Each Design-Build Firm being considered for this Project is required to submit a Technical Proposal. The proposal shall include sufficient information to enable the Department to evaluate the capability of the Design-Build Firm to provide the desired services. The data shall be significant to the Project and shall be innovative, when appropriate, and practical.

## **B. Submittal Requirements:**

The Technical Proposal shall be bound with the information, paper size and page limitation requirements as listed herein.

A copy of the written Technical Proposal must also be submitted electronically in PDF format including bookmarks for each section. Bookmarks which provide links to content within the Technical Proposal are allowed. Bookmarks which provide links to information not included within the content of the Technical Proposal shall not be utilized. No macros will be allowed. Minimum font size of ten (10) shall be used. Times New Roman shall be the required font type.

Only upon request by the Department, provide calculations, studies and/or research to support features identified in the Technical Proposal. This only applies during the Technical Proposal Evaluation phase.

Submit one (1) Original hard copy and one (1) CD, DVD or Flash Drive containing the Technical Proposal in .pdf format and six (6) collated, complete sets of hard copies of the Technical Proposal to:

Ranae Dodson  
FDOT Procurement Manager  
1074 Highway 90  
Chipley, Florida 32428

The minimum information to be included:

### Section 1: Project Approach

- Paper size: 8½" x 11". The maximum number of pages shall be 15 single-sided, typed pages including text, graphics, tables, charts, and photographs. Double-sided 8½" x 11" sheets will be counted as 2 pages. 11"x17" sheets are prohibited.
- Describe how the proposed design solutions and construction means and methods meet the project needs described in this Request for Proposal. Provide sufficient information to convey a thorough knowledge and understanding of the project and to provide confidence the design and construction can be completed as proposed.
- Provide the term, measurable standards, and remedial work plan for any proposed Value Added features that are not Value Added features included in this RFP, or for extending the Value Added period of a feature that is included in this RFP. Describe any material requirements that are exceeded.
- Provide a Written Schedule Narrative that describes the Design and Construction phases and illustrates how each phase will be scheduled to meet the Project needs required of this Request for Proposal. Bar or Gantt charts are prohibited.
- Submit a Category 2 Submittal Report summarizing the proposed Category 2 elements for each bridge per FDM 121.3 (maximum 1 page).
- Provide name and background information for your coastal engineer (if not previously provided in your Letter of Interest.)
- Describe aesthetic details and overall approach to project aesthetics.
- Describe the Maintenance of Traffic approach along with construction staging and storing. Address how existing traffic volume, small work areas, and urban area will be accommodated to provide a safe construction work zone.



- **Discuss the approach to provide vessel collision protection on existing bridge substructure during construction of proposed bridge and fender system.**

Section 2: Plans

- Plan and Profile views of the proposed improvements shall be submitted in roll-plot format. The maximum number of roll plots that may be submitted is 10. The maximum width of the roll-plots shall be 36". The maximum length of the roll-plot shall be 6'. All information shall be provided on roll plots, including, but not limited to Plan and Profile views, typical sections, special emphasis details, structure plans, General Notes, etc. All approved ATCs the Design-Build Firm intends to utilize for the project shall be detailed in the proposal plan as appropriate.
- Provide ship design impact forces in the General Notes of the structure plans.
- Right of Way Maps and Legal Descriptions (including area in square feet) of any proposed additional Right of Way parcels if applicable and approved through the ATC process. Provide Technical Proposal Plans in accordance with the requirements of the FDOT Design Manual, except as modified herein.
- The Plans shall complement the Project Approach.
- Provide the mooring and spud locations for barges. Include the bridges, fishing pier, subaqueous utility lines, and temporary and permanent impacts to Submerged Aquatic Vegetation (SAV) in the schematic and total anticipated wetland impacts.
- Provide an Aesthetics Package. Aesthetics Package shall be submitted on 36" x 6' roll plot (maximum 2 roll plots). Aesthetic Package shall include renderings of the proposed structures depicting the details of the proposed aesthetic elements on the rendering viewpoints provided below. The contractor will be allowed to supplement the four required views with additional viewpoints if desired to convey the aesthetic design.
  - **View 1: Land Based View Focused on Main Span.** The purpose of this view is to provide a representation of overall bridge elements from land, showing pier shapes, overlooks, shade structures, highway lighting and aesthetic lighting. Two images are required from View 1 including one daytime and one nighttime image. Coordinates and camera settings should be the same or similar to the following:
    - GPS: 30.399167, -86.601222
    - Elevation from ground (Standing on Dock): 6'
    - Rotation: -29.189° from North, 91.19° Up
    - Film Lens: 35mm
    - Focal Length: 40mm
    - Zoom: 1.0
    - F Stops: 2.5
    - Shutter: 1/1200
    - ISO: 70
  - **View 2: Water Based View of Main Span and Overlook (Low Elevation):** The purpose of this view is to show detail of the pier shapes, overlook, railing and shade structure from an elevation

near the water. Coordinates and camera settings should be the same or similar to the following:

- GPS: 30.401782, -86.600086
- Elevation from water: 38'2"
- Rotation: 138.7° from North, 88.664° Up
- Film Lens: 35mm
- Focal Length: 40mm
- Zoom: 1.0
- F Stops: 2.5
- Shutter: 1/1200
- ISO: 70
- **View 3: Water Based View of Main Span and Overlook (High Elevation):** The purpose of this view is to show detail of the pier shapes, overlook, railing and shade structure from an elevation above the bridge. Coordinates and camera settings should be the same or similar to the following:
  - GPS: 30.401789, -86.600140
  - Elevation from water: 166'9"
  - Rotation: 152° from North, 59.636° Up (0 is looking straight down)
  - Film Lens: 35mm
  - Focal Length: 40mm
  - Zoom: 1.0
  - F Stops: 8
  - Shutter: 1/500
  - ISO: 100
- **View 4: Land Based View of MSE Wall:** The purpose of this view is to show details of the proposed abutment wall and scale of the low-level structure. Coordinates and camera settings should be the same or similar to the following:
  - GPS: 30.403000, -86.601861
  - Elevation from ground: 14'2"
  - Rotation: 116.218° from North, 89.26° Up, Camera tilted -1.088°
  - Film Lens: 35mm
  - Focal Length: 40mm
  - Zoom: 1.0
  - F Stops: 8
  - Shutter: 1/500
  - ISO: 100
- ❖ For the profile view depicting the structure at night, the Design-Build Firm shall show the illumination on the structure. Visual images shall provide overall aesthetic intention and details for the aesthetic elements of the bridge including, but not limited to,

pier shape, roadway and shared use path lighting, aesthetic lighting of retaining walls and substructure, retaining wall finishes/graphics, scenic overlooks and canopies, pedestrian railing, etc.

**C. Evaluation Criteria:**

The Department shall evaluate the written Technical Proposal by each Design-Build Firm. The Design-Build Firm shall not discuss or reveal elements of the price proposal in the written proposals. A technical score for each Design-Build Firm will be based on the following criteria:

| <u>Item</u>          | <u>Value</u> |
|----------------------|--------------|
| 1. Design            | 30           |
| 2. Construction      | 35           |
| 3. Innovation        | 10           |
| 4. Value Added       | 5            |
| <b>Maximum Score</b> | <b>80</b>    |

The following is a description of each of the above referenced items:

1. **Design ( 30 points)**

The Design-Build Firm is to address the quality and suitability of the following elements in the Technical Proposal:

- Structures design
- Roadway design / and safety
- Drainage design
- Environmental Design
- Design coordination plan minimizing design changes
- Geotechnical investigation plan
- Geotechnical load test program
- Minimizing impacts through design to:
  - Environment
  - Public
  - Adjacent Properties
  - Structures
- ~~Temporary Traffic Control Plan~~ Transportation Management Plan
- Incident Management Plan
- Aesthetics
- Utility Coordination and Design, including reducing impacts
- Signalization Design
- Roundabout Design
- ITS System Design
- Maintainability

- Design considerations which improve recycling and reuse opportunities
- Design Innovation

The Design-Build Firm is to address the following in the Technical Proposal: aesthetics features of the design including but not limited to the following: considerations in the geometry, suitability and consistency of structure type, structure finishes, shapes, proportions and form throughout the limits of the project.

Architectural treatments such as tiles, colors, emblems, etc. will not be considered as primary aesthetic treatments.

The Design-Build Firm is to address the following in the Technical Proposal: design and utility coordination efforts that minimize the potential for adverse impacts and project delays due to utility involvement.

The Design-Build Firm is to address the following in the Technical Proposal: development of design approaches which minimize periodic and routine maintenance. The following elements shall be considered: access to provide adequate inspections and maintenance, access to structure's lighting system, and impacts to long term maintenance costs

The Design-Build Firm is to address the following in the Technical Proposal: approach to the proposed aesthetic design, including but not limited to, considerations in the geometry and consistency of overall theme. Discussion shall also include how the proposed aesthetic features relates to the preferences detailed within the Brooks Bridge Aesthetic Online Meeting Results included as a Reference Document in the RFP. Elements provided within the Aesthetic Online Meeting Results represent the minimum level of acceptable aesthetics.

## 2. Construction ( 35 points)

The Design-Build Firm is to address the quality and suitability of the following elements in the Technical Proposal:

- Safety
- Structures construction
  - Include removal of existing structures foundations and constructability of proposed structures
  - **Include plan for protecting existing substructure from vessel collision during construction of proposed structure and fender system**
- Roadway construction
- Drainage construction
- Construction coordination plan minimizing construction changes
- Minimizing impacts through construction to:
  - Environment
  - Public
  - Adjacent Properties
  - Structures
- Implementation of the Environmental design and Erosion/Sediment Control Plan
- Implementation of the Maintenance of Traffic Plan
- Implementation of the Incident Management Plan
- Utility Coordination and Construction

- Materials proposed
- Workmanship

The Design-Build Firm is to address the following in the Technical Proposal: developing and deploying construction techniques that enhance project durability, reduce long term and routine maintenance, and those techniques which enhance public and worker safety. This shall include, but not be limited to, minimization of lane and driveway closures, lane widths, visual obstructions, construction sequencing, and drastic reductions in speed limits.

The Design-Build Firm is to address the following in the Technical Proposal: ensuring all environmental commitments are honored.

The Design-Build Firm is to address the following in the Technical Proposal: construction and utility coordination efforts that minimize the potential for adverse impacts and project delays due to utility conflicts.

The Design-Build Firm is to address the following in the Technical Proposal: approach in the construction of the proposed aesthetic features with heavy consideration in the overall maintainability and suitability. Quality of elements provided within the Aesthetic Online Meeting Results represent the minimum level of acceptable aesthetic detail.

**3. Innovation (10 points)**

The Design-Build Firm is to address introducing and implementing innovative design approaches and construction techniques which address the following elements in the Technical Proposal:

- Minimize or eliminate Utility relocations
- Materials
- Workmanship
- Enhance Design and Construction aspects related to future expansion of the transportation facility
- Construction Innovation
- Design Innovation

**4. Value Added (5 points)**

The Design-Build is to address the following Value Added features in the Technical Proposal:

- Broadening the extent of the Value Added features of this RFP while maintaining existing threshold requirements
- Exceeding minimum material requirements to enhance durability of project components
- Providing additional Value Added project features proposed by the Design-Build Firm

The following Value Added features have been identified by the Department as being applicable to this project. The Design-Build Firm may propose to broaden the extent of these Value Added features.

| Value Added Feature | Minimum Value Added Period |
|---------------------|----------------------------|
|---------------------|----------------------------|

|                               |         |
|-------------------------------|---------|
| Value Added Asphalt           | 3 years |
| Value Added Bridge Components | 5 years |

**D. Final Selection Formula:**

The Department shall publicly open the sealed bid proposals and calculate an adjusted score using the following formula:

$$\frac{BPP}{TS} = \text{Adjusted Score}$$

BPP = Bid Price Proposal

TS = Technical Score (Combined Scores from LOI and Technical Proposal)

The Design-Build Firm selected will be the Design-Build Firm whose adjusted score is lowest. The Department reserves the right to consider any proposal as non-responsive if any part of the Technical Proposal does not meet established codes and criteria.

**E. Final Selection Process:**

After the sealed bids are received, the Department will have a public meeting for the announcement of the Technical Scores and opening of sealed Bid Price Proposals. At this meeting, the Department will announce the score for each member of the Technical Review Committee, by category, for each Proposer and each Proposer's Technical Score. Following announcement of the Technical Scores, the sealed Bid Price Proposals will be opened and the adjusted scores calculated. The Department will document the preliminary bid results as presented in the meeting. The Selection Committee should meet a minimum of two (2) calendar days (excluding weekends and Department observed holidays) after the public opening of the Technical Scores and Bid Price Proposals. The Department's Selection Committee will review the evaluation of the Technical Review Committee and the Bid Price Proposal of each Proposer as to the apparent lowest adjusted score and make a final determination of the lowest adjusted score. The Selection Committee has the right to correct any errors in the evaluation and selection process that may have been made. The Department is not obligated to award the contract and the Selection Committee may decide to reject all proposals. If the Selection Committee decides not to reject all proposals, the contract will be awarded to the Proposer determined by the Selection Committee to have the lowest adjusted score.

**F. Stipend Awards:**

The Department has elected to pay a stipend to all non-selected Short-Listed Design-Build Firms to offset some of the costs of preparing the Proposals. The non-selected Short-Listed Design-Build Firms meeting the stipend eligibility requirements of the Project Advertisement and complying with the requirements contained in this section will ultimately be compensated. The stipend will only be payable under the terms and conditions of the Design-Build Stipend Agreement and Project Advertisement, copies of which are included with this Request for Proposal. This Request for Proposal does not commit the Department or any other public agency to pay any costs incurred by an individual firm, partnership, or corporation in the submission of Proposals except as set forth in the Design-Build Stipend Agreement. The amount of the stipend will be \$ 331,000 per non-selected Short-Listed Design-Build Firm that meets the stipend eligibility requirements contained in the Project Advertisement. The stipend is not intended to compensate

any non-selected Short-Listed Design-Build Firm for the total cost of preparing the Technical and Price Proposals. The Department reserves the right, upon payment of stipend, to use any of the concepts or ideas within the Technical Proposals, as the Department deems appropriate.

In order for a Short-Listed Design-Build Firm to remain eligible for a stipend, the Short-Listed Design-Build Firm must fully execute the stipend agreement within one (1) week after the Short-List protest period for the Design-Build Stipend Agreement, Form No. 700-011-14. The Short-Listed Design-Build Firm shall reproduce the necessary copies. Terms of said agreement are non-negotiable. A fully executed copy of the Design-Build Stipend Agreement will be returned to the Short-Listed Design-Build Firm.

A non-selected Short-Listed Design-Build Firm eligible for stipend compensation must submit an invoice for a lump sum payment of services after the selection/award process is complete. The invoice should include a statement similar to the following: "All work necessary to prepare Technical Proposal and Price Proposals in response to the Department's RFP for the subject Project".

## **VIII. Bid Proposal Requirements.**

### **A. Bid Price Proposal:**

Bid Price Proposals shall be submitted on the Bid Blank form attached hereto and shall include one lump sum price for the Project within which the Proposer will complete the Project. The lump sum price shall include all costs for all design, geotechnical surveys, architectural services, engineering services, Design-Build Firms quality plan, construction of the Project, and all other work necessary to fully and timely complete that portion of the Project in accordance with the Contract Documents, as well as all job site and home office overhead, and profit, it being understood that payment of that amount for that portion of the Project will be full, complete, and final compensation for the work required to complete that portion of the Project. One (1) hard copy of the Bid Price Proposal shall be hand delivered in a separate sealed package to the following:

Ranae Dodson  
FDOT D3 Procurement Manager  
1074 Highway 90  
Chipley, Florida 32428

The package shall indicate clearly that it is the Bid Price Proposal and shall identify clearly the Proposer's name, contract number, project number, and Project description. The Bid Price Proposal shall be secured and unopened until the date specified for opening of Bid Price Proposals.

Forms to be included with the Price Proposal are included in the RFP.

# FLEXIBLE PAVEMENT DESIGN SUMMARY SHEET

Prepared By: Hays Griffin, P.E. 73897  
FPID Number: 415474-2  
Section No.: 57030000  
County: Okaloosa  
Date of Last resurfacing : NA  
Description: SR30 (US98) Brooks Bridge  
Bridge Number 570034

Date: 10/4/2021  
SR/US No.: SR30/US98  
Type of Work: Bridge Replacement  
Begin MP: 11.704  
Ending MP: 12.585  
Design Speed: 45 MPH

## Revision 1

### Design Data:

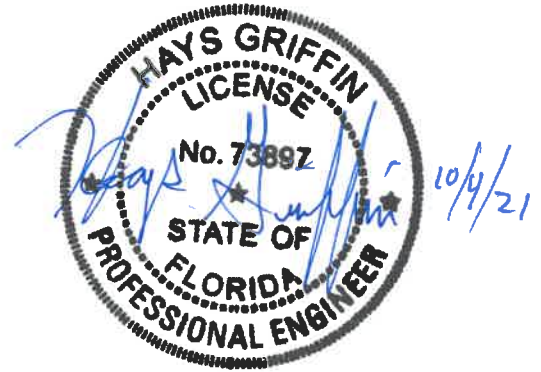
Year of Opening: 2024  
Design Year: 2044  
Loading: 6.5 Million ESALs  
Reliability (%R): 90%  
Resilient Modulus (MR): 11,500 psi  
Change in PSI: 1.7  
SN Required: 4.013

### Existing Pavement:

Preliminary coring data and the corresponding as-built typical sections for SR30 and SR145 are attached.

### Recommended Pavement Design:

Please see attached for backup Calcs



Notes: 1. Static Compaction only

2. Use PG 76-22 asphalt binder in all asphalt mixes except for the shared use path.

Florida DOT Approval By:

Carl Campbell

Date: 10-7-21

Concurrence By:

Date: \_\_\_\_\_

FHWA Approval By:

Date: \_\_\_\_\_



# Recommended Pavement Design

## SR30 (US98)

|  | New Turn Lanes / Key Hole Bike Lanes   | New Shoulder  |
|--|--|---|
| <b>*SR30 Travel Lanes</b><br>12" Stabilized Subgrade<br>OBG-9<br>2.5" Type SP, TL C<br>1.25" FC-9.5, TL C<br><br><b>SR30 High Ground Water</b><br><br>16" GAB<br>3.5" Type SP, TL C<br>1.25" FC-9.5, TL C<br><br><b>SR30 Resurfacing (East End)</b><br>Mill 1.25"<br>Pave 1.25" FC-9.5, TL C | 12" Stabilized Subgrade<br>OBG-6<br>1.5" Type SP, TL C<br>1.25" FC-9.5, TL C<br><br><b>**SR30 Resurfacing travel lanes (West End)</b><br>Mill 3"<br>Pave 1.75" Type SP, TL C<br>1.25" FC-9.5, TL C | 12" Stabilized Subgrade<br>OBG-1<br>1.5" Type SP, TL C<br>1.25" FC-9.5, TL C<br><br><b>**Resurfacing turn lanes (East and West Ends)</b><br>Mill 1.25"<br>Pave 1.25" FC-9.5, TL C |
| <b>Other Areas</b>   |  |   |

**Side Street Reconstruction \*\*\***

12" Stabilized Subgrade  
 OBG-6  
 2" Type SP, TL C  
 1.25" FC-9.5, TL C

**Resurfacing for side streets**

Mill 1.25"  
 Pave 1.25" FC-9.5, TL C

**Shared Use Path**

12" Stabilized Subgrade  
 OBG-1  
 2" Type SP, TL B

**Side Street High Ground Water (If Needed)**

16" GAB  
 2" Type SP, TL C  
 1.25" FC-9.5, TL C

\*For MOT and future widening purposes the SR30 travel lane design should be used for all lanes within the MSE wall limits.

\*\* This is the same design being used on the adjacent resurfacing to the west, 437366-1. It should be used from the beginning of the project to the beginning of the reconstruction.

\*\*\*This is intended for but not limited to SR145, Perry Ave, Business Access Rd, Florida Blanca Rd, New North Connection, Eastbound Connection to/from Santa Rosa Blvd, Santa Rosa Blvd, Hotel Entrance Rdwy and Brooks Street.



Prepared By:

Hays Griffin, P.E. 73897

# FLEXIBLE PAVEMENT DESIGN SUMMARY SHEET (CALCS)

## New Travel Lane (SR30)

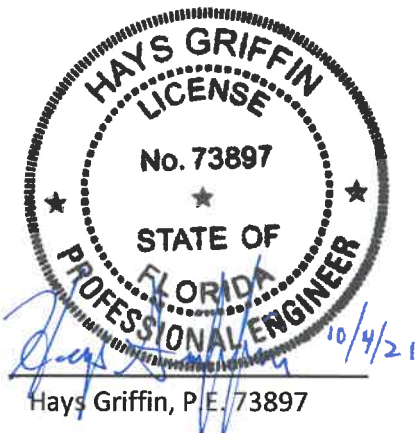
|                         |                                |             |
|-------------------------|--------------------------------|-------------|
| 12" Stabilized Subgrade | @ .08 =                        | 0.96        |
| OBG-9                   |                                | = 1.8       |
| 2.5" Type SP, TL C      | @ .44 =                        | 1.1         |
| 1.25" FC-9.5, TL C      | @ .44 =                        | 0.55        |
|                         | <b>SN<sub>Provided</sub> =</b> | <b>4.41</b> |

## SR30 High Groundwater Areas

|                                     |   |
|-------------------------------------|---|
| <b>RM(11,500psi)*.75 = 8,625psi</b> | <b>SN<sub>Required High Water</sub> = 4.443</b> |
| 16" GAB                             | @ .15 = 2.4                                     |
| 3.5" Type SP, TL C                  | @ .44 = 1.54                                    |
| 1.25" FC-9.5, TL C                  | @ .44 = 0.55                                    |
|                                     | <b>High Water SN<sub>Provided</sub> = 4.49</b>  |

### Narrative:

This is a Bridge replacement project for the Brooks Bridge on SR30 (US98) in Okaloosa County. This bridge currently has two travel lanes in each direction and connects Fort Walton Beach to Okaloosa Island. The preliminary cores and the as built plans from the previous resurfacing projects on SR30 and SR145 are attached. The SR30 new shoulder and new turn lane designs are intended to be used for any new turn lane or new shoulder on this project. A full roadway soil survey to accurately define the limits of the seasonal high water table was not performed for this RFP. Instead the seasonal high water table was conservatively set at EL 4' based on the pond borings. On SR30 the high water design should be used from approximately STA 137+77.55, the end of the retaining wall, to STA 148+00. A seasonal high groundwater study shall be performed to refine the limits the high water design will need to be used.

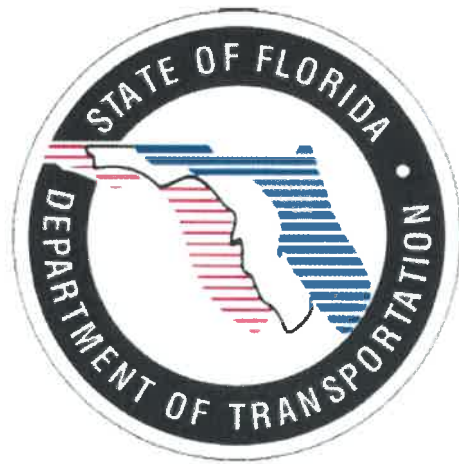


Prepared By:

Hays Griffin, P.E. 73897

# PROJECT TRAFFIC FORECASTING REPORT

SR 30 (US 98) Brooks Bridge from Perry Avenue to Pier Road



ITEM NO: 415474  
SEGMENT NO: 2  
January 13, 2021

**Florida Department of Transportation**  
District Three Planning Office

Prepared By:  
**HSA Consulting Group, Inc.**



## 18 kip EQUIVALENT SINGLE AXLE LOAD ANALYSIS

PROJECT TRAFFIC FOR PD&E and DESIGN ANALYSIS INFO / FACTORS

PIN #: 415474-2  
 COUNTY: Okaloosa  
 ROADWAYID: 57030000  
 PROJECT DESCRIPTION: SR 30 (US 98) Brooks Bridge replacement

**LOCATION DESCRIPTION:** \_\_\_\_\_ **LOCATION #:** 1  
 from Perry Ave to Santa Rosa Blvd

### GROWTH RATE FORMULA

A: Interpolation  
 B: Enter Growth Rate  
 C: Enter All AADTs  
 D: New Facility

Choose A, B, C, or D here: C

Linear Growth Rate \_\_\_\_\_ %  
 Compounded Growth Rate \_\_\_\_\_ %  
 Decaying Growth Rate \_\_\_\_\_ %  
 (select one)

If "A" select an interpolation function  
 If "B" enter rate as decimals (1%=1.01)  
 If "C", or "D" continue to next section

### DESIGN INFORMATION

|                             |              |   |
|-----------------------------|--------------|---|
|                             | AADT         |   |
| Existing Year <u>2019</u>   | <u>65000</u> | Daily Direction Split<br>(50% or 100%) <u>50%</u> |
| Opening Year <u>2024</u>    | <u>66700</u> | Lanes in One Direction <u>3</u>                   |
| Mid-Design Year <u>2034</u> | <u>69300</u> | <b>T24 values</b>                                 |
| Design Year <u>2044</u>     | <u>71900</u> | Existing to Opening Year <u>4.80%</u>             |
|                             |              | Opening to Mid-Year <u>4.80%</u>                  |
|                             |              | Mid-Year to Design-Year <u>4.80%</u>              |



Note: AADT values have been rounded to the nearest 100

### 1995 EQUIVALENCY FACTORS u(1)

|                             |                                   |                                 |
|-----------------------------|-----------------------------------|---------------------------------|
|                             | FLEXIBLE PAVEMENT<br>SN = 5/THICK | RIGID PAVEMENT<br>SN = 12/THICK |
| (selected with an X)        |                                   |                                 |
| RURAL FREEWAY:              | 1.050                             | 1.600                           |
| URBAN FREEWAY:              | 0.900                             | 1.270                           |
| RURAL HIGHWAY:              | 0.960                             | 1.350                           |
| URBAN HIGHWAY:              | 0.890                             | 1.220                           |
| OTHER (Enter Factor and X): | _____                             | _____                           |

(1) Equivalency Factors are based on Updated Pavement Damage Factors Memorandum, dated July 2, 1998.  
 Lane Factors developed by Copes equation

I have reviewed the 18 kip Equivalent Single Axle Loads (ESAL's) to be used for pavement design on this project. I hereby attest that these have been developed in accordance with the FDOT Project Traffic Forecasting Procedure using historical traffic data and other available information.

|   |                          |                            |               |
|---|--------------------------|----------------------------|---------------|
| Prepared by: Michael L. Cleland, AICP   | Trans. Planner           | HSA Consulting Group, Inc. | 1/13/2021     |
| _____<br>Name   | _____<br>Title           | _____<br>Org. Unit or Firm | _____<br>Date |
|  |                          |                            |               |
| Signature   |                          |                            |               |
| Geoff Hynes   | Project Traffic Engineer | FDOT Dist. 3               | 1/13/2021     |
| Reviewed by: Name   | Title                    | Org. Unit or Firm          | Date          |
|  |                          |                            |               |
| Signature   |                          |                            |               |

## **18 kip EQUIVALENT SINGLE AXLE LOAD ANALYSIS - LOCATION 1**

PROJECT TRAFFIC FOR PD&E and DESIGN ANALYSIS INFO / FACTORS

YEARS: 2019 to 2044

SECTION #: 57030000

COUNTY: Okaloosa

PIN #: 415474-2

FLEXIBLE PAVEMENT URBAN HIGHWAY 0.890

SN=5/THICK

SR 30 (US 98) Brooks Bridge replacement

C

| YEAR | AADT  | ESAL<br>(1000S) | ACCUM<br>(1000s) | D   | T     | LF    | EF    |
|------|-------|-----------------|------------------|-----|-------|-------|-------|
| 2019 | 65000 | 297             | 0                | 0.5 | 4.80% | 0.585 | 0.890 |
| 2020 | 65300 | 298             | 0                | 0.5 | 4.80% | 0.585 | 0.890 |
| 2021 | 65600 | 299             | 0                | 0.5 | 4.80% | 0.584 | 0.890 |
| 2022 | 66000 | 301             | 0                | 0.5 | 4.80% | 0.584 | 0.890 |
| 2023 | 66300 | 302             | 0                | 0.5 | 4.80% | 0.584 | 0.890 |
| 2024 | 66700 | 304             | 304              | 0.5 | 4.80% | 0.583 | 0.890 |
| 2025 | 66900 | 304             | 608              | 0.5 | 4.80% | 0.583 | 0.890 |
| 2026 | 67200 | 306             | 914              | 0.5 | 4.80% | 0.582 | 0.890 |
| 2027 | 67400 | 306             | 1220             | 0.5 | 4.80% | 0.582 | 0.890 |
| 2028 | 67700 | 308             | 1528             | 0.5 | 4.80% | 0.582 | 0.890 |
| 2029 | 68000 | 309             | 1837             | 0.5 | 4.80% | 0.581 | 0.890 |
| 2030 | 68200 | 310             | 2147             | 0.5 | 4.80% | 0.581 | 0.890 |
| 2031 | 68500 | 311             | 2458             | 0.5 | 4.80% | 0.581 | 0.890 |
| 2032 | 68700 | 311             | 2769             | 0.5 | 4.80% | 0.581 | 0.890 |
| 2033 | 69000 | 313             | 3082             | 0.5 | 4.80% | 0.580 | 0.890 |
| 2034 | 69300 | 314             | 3396             | 0.5 | 4.80% | 0.580 | 0.890 |
| 2035 | 69500 | 315             | 3711             | 0.5 | 4.80% | 0.580 | 0.890 |
| 2036 | 69800 | 316             | 4027             | 0.5 | 4.80% | 0.579 | 0.890 |
| 2037 | 70000 | 317             | 4344             | 0.5 | 4.80% | 0.579 | 0.890 |
| 2038 | 70300 | 318             | 4662             | 0.5 | 4.80% | 0.579 | 0.890 |
| 2039 | 70600 | 319             | 4981             | 0.5 | 4.80% | 0.578 | 0.890 |
| 2040 | 70800 | 320             | 5301             | 0.5 | 4.80% | 0.578 | 0.890 |
| 2041 | 71100 | 321             | 5622             | 0.5 | 4.80% | 0.578 | 0.890 |
| 2042 | 71300 | 322             | 5944             | 0.5 | 4.80% | 0.578 | 0.890 |
| 2043 | 71600 | 323             | 6267             | 0.5 | 4.80% | 0.577 | 0.890 |
| 2044 | 71900 | 324             | 6591             | 0.5 | 4.80% | 0.577 | 0.890 |

Opening to Mid-Design Year ESAL Accumulation (1000s): 3092

Opening to Design Year ESAL Accumulation (1000s): 6287

I have reviewed the 18 kip Equivalent Single Axle Loads (ESAL's) to be used for pavement design on this project. I hereby attest that these have been developed in accordance with the FDOT Project Traffic Forecasting Procedure using historical traffic data and other available information.

Prepared by: Michael L. Cleland, AICP Trans. Planner HSA Consulting Group, Inc. 1/13/2021  
 Name Title Org.Unit or F Date

*Michael L. Cleland*

Signature

Reviewed By: Geoff Hynes Project Traffic Engineer Dist. 3 1/13/2021  
 Name Title Org.Unit or F Date

*Geoff Hynes*

Signature

# 18 kip EQUIVALENT SINGLE AXLE LOAD ANALYSIS

PROJECT TRAFFIC FOR PD&E and DESIGN ANALYSIS INFO / FACTORS

**PIN #: 415474-2**  
 COUNTY: Okaloosa  
 ROADWAYID: 57030000  
 PROJECT DESCRIPTION: SR 30 (US 98) Brooks Bridge replacement

**LOCATION #:** 2  
**LOCATION DESCRIPTION:** from Santa Rosa Blvd to Pier Rd

### GROWTH RATE FORMULA

A: Interpolation  
 B: Enter Growth Rate  
 C: Enter All AADTs  
 D: New Facility

Choose A, B, C, or D here: C

Linear Growth Rate \_\_\_\_\_ %  
 Compounded Growth Rate \_\_\_\_\_ %  
 Decaying Growth Rate \_\_\_\_\_ %

(select one)

If "A" select an interpolation function  
 If "B" enter rate as decimals (1%=1.01)  
 If "C", or "D" continue to next section

### DESIGN INFORMATION

|                 |             |              |                                       |
|-----------------|-------------|--------------|---------------------------------------|
|                 | AADT        |              | Daily Direction Split                 |
| Existing Year   | <u>2019</u> | <u>52500</u> | (50% or 100%) <u>50%</u>              |
| Opening Year    | <u>2024</u> | <u>54000</u> | Lanes in One Direction <u>2</u>       |
| Mid-Design Year | <u>2034</u> | <u>56600</u> | <b>T24 values</b>                     |
| Design Year     | <u>2044</u> | <u>59100</u> | Existing to Opening Year <u>4.40%</u> |
|                 |             |              | Opening to Mid-Year <u>4.40%</u>      |
|                 |             |              | Mid-Year to Design-Year <u>4.40%</u>  |

Note: AADT values have been rounded to the nearest 100

### 1995 EQUIVALENCY FACTORS *u(1)*

|                             |                                   |                                 |
|-----------------------------|-----------------------------------|---------------------------------|
| (selected with an X)        | FLEXIBLE PAVEMENT<br>SN = 5/THICK | RIGID PAVEMENT<br>SN = 12/THICK |
| RURAL FREEWAY:              | 1.050 <u>    </u>                 | 1.600 <u>    </u>               |
| URBAN FREEWAY:              | 0.900 <u>    </u>                 | 1.270 <u>    </u>               |
| RURAL HIGHWAY:              | 0.960 <u>    </u>                 | 1.350 <u>    </u>               |
| URBAN HIGHWAY:              | 0.890 <u>  X  </u>                | 1.220 <u>    </u>               |
| OTHER (Enter Factor and X): | <u>    </u>                       | <u>    </u>                     |

(1) Equivalency Factors are based on Updated Pavement Damage Factors Memorandum, dated July 2, 1998.  
 Lane Factors developed by Copes equation

I have reviewed the 18 kip Equivalent Single Axle Loads (ESAL's) to be used for pavement design on this project. I hereby attest that these have been developed in accordance with the FDOT Project Traffic Forecasting Procedure using historical traffic data and other available information.

|                                       |                |                            |              |
|---------------------------------------|----------------|----------------------------|--------------|
| Prepared by: Michael L. Cleland, AICP | Trans. Planner | HSA Consulting Group, Inc. | 1/13/2021    |
| Name                                  | Title          | Org. Unit or Firm          | Date         |
|                                       |                |                            |              |
| Signature                             | Geoff Hynes    | Project Traffic Engineer   | FDOT Dist. 3 |
| Reviewed by: Name                     | Title          | Org. Unit or Firm          | Date         |
|                                       |                |                            |              |
| Signature                             |                |                            |              |

# 18 kip EQUIVALENT SINGLE AXLE LOAD ANALYSIS - LOCATION 2

PROJECT TRAFFIC FOR PD&E and DESIGN ANALYSIS INFO / FACTORS

YEARS: 2019 to 2044

SECTION #: 57030000

COUNTY: Okaloosa

PIN #: 415474-2

FLEXIBLE PAVEMENT URBAN HIGHWAY 0.890

SN=5/THICK

SR 30 (US 98) Brooks Bridge replacement

C

| YEAR | AADT  | ESAL<br>(1000S) | ACCUM<br>(1000s) | D   | T     | LF    | EF    |
|------|-------|-----------------|------------------|-----|-------|-------|-------|
| 2019 | 52500 | 273             | 0                | 0.5 | 4.40% | 0.727 | 0.890 |
| 2020 | 52800 | 274             | 0                | 0.5 | 4.40% | 0.726 | 0.890 |
| 2021 | 53100 | 276             | 0                | 0.5 | 4.40% | 0.726 | 0.890 |
| 2022 | 53400 | 277             | 0                | 0.5 | 4.40% | 0.725 | 0.890 |
| 2023 | 53700 | 279             | 0                | 0.5 | 4.40% | 0.725 | 0.890 |
| 2024 | 54000 | 280             | 280              | 0.5 | 4.40% | 0.724 | 0.890 |
| 2025 | 54200 | 281             | 561              | 0.5 | 4.40% | 0.724 | 0.890 |
| 2026 | 54500 | 282             | 843              | 0.5 | 4.40% | 0.723 | 0.890 |
| 2027 | 54700 | 283             | 1126             | 0.5 | 4.40% | 0.723 | 0.890 |
| 2028 | 55000 | 285             | 1411             | 0.5 | 4.40% | 0.723 | 0.890 |
| 2029 | 55300 | 286             | 1697             | 0.5 | 4.40% | 0.722 | 0.890 |
| 2030 | 55500 | 287             | 1984             | 0.5 | 4.40% | 0.722 | 0.890 |
| 2031 | 55800 | 288             | 2272             | 0.5 | 4.40% | 0.721 | 0.890 |
| 2032 | 56000 | 289             | 2561             | 0.5 | 4.40% | 0.721 | 0.890 |
| 2033 | 56300 | 290             | 2851             | 0.5 | 4.40% | 0.721 | 0.890 |
| 2034 | 56600 | 292             | 3143             | 0.5 | 4.40% | 0.720 | 0.890 |
| 2035 | 56800 | 293             | 3436             | 0.5 | 4.40% | 0.720 | 0.890 |
| 2036 | 57100 | 294             | 3730             | 0.5 | 4.40% | 0.720 | 0.890 |
| 2037 | 57300 | 295             | 4025             | 0.5 | 4.40% | 0.719 | 0.890 |
| 2038 | 57600 | 296             | 4321             | 0.5 | 4.40% | 0.719 | 0.890 |
| 2039 | 57800 | 297             | 4618             | 0.5 | 4.40% | 0.719 | 0.890 |
| 2040 | 58100 | 299             | 4917             | 0.5 | 4.40% | 0.718 | 0.890 |
| 2041 | 58300 | 300             | 5217             | 0.5 | 4.40% | 0.718 | 0.890 |
| 2042 | 58600 | 301             | 5518             | 0.5 | 4.40% | 0.717 | 0.890 |
| 2043 | 58800 | 302             | 5820             | 0.5 | 4.40% | 0.717 | 0.890 |
| 2044 | 59100 | 303             | 6123             | 0.5 | 4.40% | 0.717 | 0.890 |

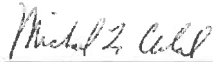
Opening to Mid-Design Year ESAL Accumulation (1000s): 2863

Opening to Design Year ESAL Accumulation (1000s): 5843

I have reviewed the 18 kip Equivalent Single Axle Loads (ESAL's) to be used for pavement design on this project. I hereby attest that these have been developed in accordance with the FDOT Project Traffic Forecasting Procedure using historical traffic data and other available information.

Prepared by: Michael L. Cleland, AICP Trans. Planner HSA Consulting Group, Inc. 1/13/2021

Name Title Org. Unit or F Date



Signature

Geoff Hynes Project Traffic Engineer Dist. 3 1/13/2021

Reviewed By: Name Title Org. Unit or F Date



Signature



*Florida Department of Transportation*

RON DESANTIS  
GOVERNOR

605 Suwannee Street  
Tallahassee, FL 32399-0450

KEVIN J. THIBAUT  
SECRETARY

**MEMORANDUM**

**DATE:** February 25, 2021  
**TO:** Samuel Weede, District Geotechnical Materials Engineer  
**FROM:** David Horhota, State Geotechnical Materials Engineer  
**SUBJECT:** Embankment Resilient Modulus Pavement Design  
District 3, Okaloosa County  
FPN 415474-2: SR-30 (US-98) Brooks Bridge No. 570034

Five (5), 2-bag samples were received by the State Materials Office (SMO) for determination of an embankment (roadbed) resilient modulus for pavement design. After visual observation of the five samples, it was determined that the material from each 2-bag sample looked visually similar and the material from each of the bags were combined to form one sample from each location. After combining materials from the bags, samples from each location were obtained for classification tests (Atterberg limits, particle size analysis, and organic content), Proctor density, and resilient modulus. The classification test results are reported in Tables 1 and 2. Information provided for this project by Tierra, Inc. did not include sample depth.

**Table 1. Summary of Initial Soil Gradation Results**

| <b>Sample ID</b> | <b>Passing 3/4" (%)</b> | <b>Passing 1/2" (%)</b> | <b>Passing 3/8" (%)</b> | <b>Passing No. 4 (%)</b> | <b>Passing No. 10 (%)</b> | <b>Passing No. 40 (%)</b> | <b>Passing No. 60 (%)</b> | <b>Passing No. 100 (%)</b> | <b>Passing No. 200 (%)</b> |
|------------------|-------------------------|-------------------------|-------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|----------------------------|
| S-1              | 100.0                   | 98.8                    | 98.5                    | 97.2                     | 95.7                      | 70.5                      | 26.0                      | 8.5                        | 5.2                        |
| S-2              | 99.6                    | 98.1                    | 97.2                    | 95.5                     | 94.3                      | 81.1                      | 26.8                      | 4.6                        | 2.3                        |
| S-3              | 100.0                   | 99.1                    | 98.9                    | 97.5                     | 95.3                      | 80.3                      | 24.6                      | 2.7                        | 0.9                        |
| S-4              | 100.0                   | 100.0                   | 100.0                   | 100.0                    | 99.9                      | 94.5                      | 35.9                      | 2.9                        | 1.2                        |
| S-5              | 100.0                   | 98.7                    | 98.3                    | 96.0                     | 93.4                      | 79.2                      | 32.3                      | 9.1                        | 5.2                        |



**Table 2. Summary of Soil Classification and Organic Content Results**

| <b>Sample ID</b> | <b>Location</b>      | <b>Soil Class.</b> | <b>Organic Content (%)</b> | <b>LL/PI</b> |
|------------------|----------------------|--------------------|----------------------------|--------------|
| S-1              | 1305906.9, 516237.24 | A-3                | 1.3                        | N.P.         |
| S-2              | 1306573.2, 515114.29 | A-3                | 0.4                        | N.P.         |
| S-3              | 1306933.9, 514757.68 | A-3                | 0.1                        | N.P.         |
| S-4              | 1307438.5, 514115.86 | A-3                | 0.1                        | N.P.         |
| S-5              | 1308341.1, 513725.45 | A-3                | 0.6                        | N.P.         |

In addition to the classification testing, the following test program was conducted:

- (1) Standard Proctor, AASHTO T 99
- (2) Resilient Modulus ( $M_R$ ), AASHTO T 307.

A summary of laboratory test results is included in Table 3. The resilient modulus values listed in this table were obtained using the relationship developed from each individual test (resilient modulus versus bulk stress - with bulk stress,  $\Theta$ , defined as  $\Theta = \sigma_1 + \sigma_2 + \sigma_3$ ), and using a bulk stress of 11 psi, which is the recommendation from Dr. Ping's research work in modeling the embankment in-situ stresses for Florida pavement conditions. Two results are listed for each location because two samples were prepared for each location and they represent the individual test result from each sample tested. The resilient modulus samples were compacted to within 1 pound per cubic foot (pcf) of the maximum density and 0.5 percent of the optimum moisture content as determined by AASHTO T99.

**Table 3. Summary of T-99 and  $M_R$  Test Results**

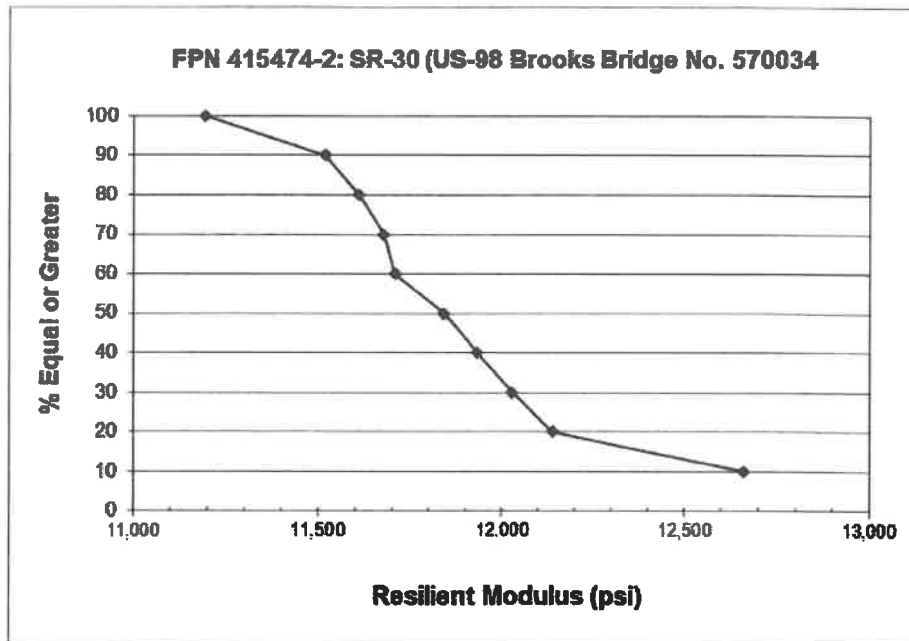
| <b>Sample ID</b> | <b>Passing No. 200, %</b> | <b>Standard Proctor Density, pcf</b> | <b>Optimum Moisture Content, %</b> | <b>Resilient Modulus @ <math>\Theta=11</math>psi (psi)</b> |
|------------------|---------------------------|--------------------------------------|------------------------------------|--|
| S-1              | 5                         | 108.5                                | 11.8                               | 11,708   |
|                  |                           |                                      |                                    | 11,193   |
| S-2              | 2                         | 104.6                                | 13.7                               | 11,518   |
|                  |                           |                                      |                                    | 12,660   |
| S-3              | 1                         | 102.6                                | 13.7                               | 11,608   |
|                  |                           |                                      |                                    | 11,842   |
| S-4              | 1                         | 100.2                                | 14.4                               | 11,677   |
|                  |                           |                                      |                                    | 12,029   |
| S-5              | 5                         | 108.4                                | 11.8                               | 11,931   |
|                  |                           |                                      |                                    | 12,140   |

To obtain a design embankment resilient modulus, a 90 percent method was used as outlined in both the Flexible Pavement Design Manual and Soils and Foundations Handbook. The resilient modulus values were ranked in ascending order and the percentage of values which were greater than or equal to the individual value

were determined. The results of this analysis are recorded in Table 4 and the corresponding graph of these results is included as Figure 1.

**Table 4. Ranked  $M_R$  Test Results for 90 Percent Method**

| Rank | Sample ID | % $\geq$ | $M_R$ (psi) |
|------|-----------|----------|-------------|
| 1    | S-1 (2)   | 100      | 11,193      |
| 2    | S-2 (1)   | 90       | 11,518      |
| 3    | S-3 (1)   | 80       | 11,608      |
| 4    | S-4 (1)   | 70       | 11,677      |
| 5    | S-1 (1)   | 60       | 11,708      |
| 6    | S-3 (2)   | 50       | 11,842      |
| 7    | S-5 (1)   | 40       | 11,931      |
| 8    | S-4 (2)   | 30       | 12,029      |
| 9    | S-5 (2)   | 20       | 12,140      |
| 10   | S-2 (2)   | 10       | 12,660      |



**Figure 1. Ranked  $M_R$  Test Results for 90% Method**

Based on the results shown in Table 4 and Figure 1, the resilient modulus corresponding to a 90<sup>th</sup> percentile is **11,500 psi**, which would represent the design embankment  $M_R$  value.

State Of Florida Department Of Transportation

700-008-12  
CONSTRUCTION  
0103

**Roadway - As-Built Pavement Data**  
Date **8-20-03** Page No. **7** of **7**

Fin. Project ID: **22024515201** Material No.: \_\_\_\_\_ Sample No.: **A0007V** Date Smp: **6-26-03**  
 Station From: **B+12.424** Station To: **B+16+73.511** Rwy Side: **C** Mainline: **Y**  
 Reference Lhs: **N/A** Source: **07** Plant No.: **A0711** Quantity: **1 each**  
 Intended use: **RI-R2, U-L2** Inspec ID (TIN): **A53600567416** Date Recd: **6-26-03**  
 Date Tested: \_\_\_\_\_ Tested by code **3E** Status: **UN** Tester ID (TIN): **A53600567416**

**Pavement Information**  
(Enter Only New Pavement Layers - Start With First Pavement Layer Placed)

|                               | Layer Number            | Subgrade<br>(If new) | Base<br>(If new) | 1                             | 2                             |
|-------------------------------|-------------------------|----------------------|------------------|-------------------------------|-------------------------------|
| Milling Depth                 | Layer Code              |                      |                  | <b>SP125C</b>                 | <b>FC-6</b>                   |
| <b>3.1496"</b><br><b>80mm</b> | Approx. Thickness in/mm |                      |                  | <b>1.5748"</b><br><b>40mm</b> | <b>1.5748"</b><br><b>40mm</b> |

| Layer Number            | 3 | 4 | 5 | 6 | 7 |
|-------------------------|---|---|---|---|---|
| Layer Code              |   |   |   |   |   |
| Approx. Thickness in/mm |   |   |   |   |   |

Remarks:

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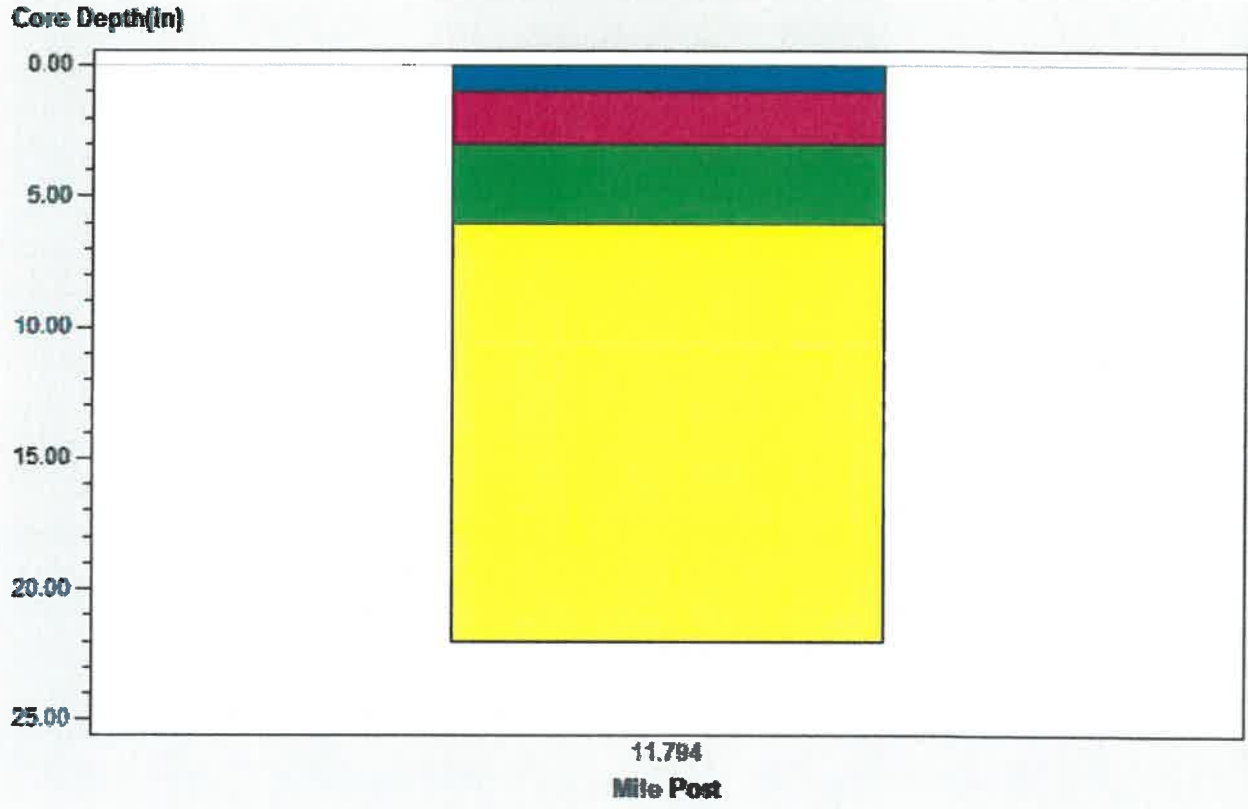
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**Core Makeup**  
**Project # 220245 -1 -31 -01 / Roadway ID # 57030000**  
**Local Name: SR 30 (US 98)**  
**Lane R1**



**Layer Types**

|    |    |   |      |
|----|----|---|------|
| T1 | T2 | S | SAHM |
|----|----|---|------|

Download Graph Data to Excel

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**PAVEMENT EVALUATION CORING AND CONDITION DATA**

**Cored By:** SNELL.CLARK,SMITH      **Date:** 03/02/1998      **Typical Section No.** 03

|                     |                            |                 |
|---------------------|----------------------------|-----------------|
| <b>Item:</b> 220245 | <b>Name:</b> SR 30 (US 98) | <b>Lanes:</b> 4 |
|---------------------|----------------------------|-----------------|

|   |                 |  |                           |
|---|-----------------|--|---------------------------|
| Fin. Proj. ID: 220245 -1 -31 -01              |                 | From:  | Shoulder Type & Condition |
| F.A. Proj. No.:                               |                 | To:  | Inside: 3                 |
| County: 57                                    | SR No.: CR 2378 | Beg MP: 10.891 End MP: 12.314<br>Lgth: 1.423 | Outside: 3                |
| Median Curbed: N Paved:[ ] Lawn:[ ] Other:[ ] |                 |  | Curb & Gutter: N          |

| Core No. | Mile Post or Sta. No. | Lane | W P<br>h a<br>e t<br>e h<br>l | Pavement Layer (in) |      |  |  | Core Lgth (in) | Base<br>SHEL | Crack |                               |                  | P<br>v<br>o<br>n<br>d<br>t | C<br>R<br>D<br>t<br>p<br>t<br>h<br>(in) | C<br>S<br>r<br>l<br>o<br>o<br>s<br>p<br>s<br>e<br>(%) | Comments |                       |                            |
|----------|-----------------------|------|-------------------------------|---------------------|------|--|--|----------------|--------------|-------|-------------------------------|------------------|----------------------------|---|---|----------|-----------------------|----------------------------|
|          |                       |      |                               | T1                  | T2   |  |  |                |              |       | D<br>e<br>p<br>t<br>h<br>(in) | T<br>y<br>p<br>e |                            |   |   |          | C<br>l<br>a<br>s<br>s | E<br>x<br>t<br>e<br>n<br>t |
| 10       | 11.265                | R2   | N                             | 1.00                | 4.00 |  |  | 5.00           | 8.0          |       | C                             | I                | B                          | L                                       | F   | 0.10     | 0.20                  |                            |

**New Layer Makeup Below**

| Core No. | Mile Post or Sta. No. | Lane | W P<br>h a<br>e t<br>e h<br>l | Pavement Layer (in) |      |  |  | Core Lgth (in) | Base | Crack |                               |                  | P<br>v<br>o<br>n<br>d<br>t | C<br>R<br>D<br>t<br>p<br>t<br>h<br>(in) | C<br>S<br>r<br>l<br>o<br>o<br>s<br>p<br>s<br>e<br>(%) | Comments |                       |                            |
|----------|-----------------------|------|-------------------------------|---------------------|------|--|--|----------------|------|-------|-------------------------------|------------------|----------------------------|---|---|----------|-----------------------|----------------------------|
|          |                       |      |                               | T1                  | T2   |  |  |                |      |       | D<br>e<br>p<br>t<br>h<br>(in) | T<br>y<br>p<br>e |                            |   |   |          | C<br>l<br>a<br>s<br>s | E<br>x<br>t<br>e<br>n<br>t |
| 11       | 11.265                | R2   | N                             | 1.00                | 4.00 |  |  | 5.00           |      |       |                               |                  |                            |   |   |          |                       |                            |
| 12       | 11.265                | R2   | Y                             | 1.00                | 4.00 |  |  | 5.00           |      |       |                               |                  |                            |   |   |          |                       |                            |

**New Layer Makeup Below**

| Core No. | Mile Post or Sta. No. | Lane | W P<br>h a<br>e t<br>e h<br>l | Pavement Layer (in) |      |      |      | Core Lgth (in) | Base<br>SAHM | Crack                         |                  |                       | P<br>v<br>o<br>n<br>d<br>t | C<br>R<br>D<br>t<br>p<br>t<br>h<br>(in) | C<br>S<br>r<br>l<br>o<br>o<br>s<br>p<br>s<br>e<br>(%) | Comments |                            |       |
|----------|-----------------------|------|-------------------------------|---------------------|------|------|------|----------------|--------------|-------------------------------|------------------|-----------------------|----------------------------|---|---|----------|----------------------------|-------|
|          |                       |      |                               | T1                  | T2   | S    | SAHM |                |              | D<br>e<br>p<br>t<br>h<br>(in) | T<br>y<br>p<br>e | C<br>l<br>a<br>s<br>s |                            |   |   |          | E<br>x<br>t<br>e<br>n<br>t |       |
| 13       | 11.180                | L2   | N                             | 0.80                | 1.00 | 1.50 | 8.50 | 11.80          | 8.5          |                               | C                | I                     | B                          | L                                       | F   | 0.10     |                            | CURVE |

**New Layer Makeup Below**

| Core No. | Mile Post or Sta. No. | Lane | W P<br>h a<br>e t<br>e h<br>l | Pavement Layer (in) |      |      |      | Core Lgth (in) | Base | Crack                         |                  |                       | P<br>v<br>o<br>n<br>d<br>t | C<br>R<br>D<br>C<br>S<br>u<br>e<br>r<br>l<br>o<br>o<br>p<br>s<br>e | P<br>o<br>o<br>p<br>s<br>e | C<br>o<br>m<br>m<br>e<br>n<br>t<br>s |
|----------|-----------------------|------|-------------------------------|---------------------|------|------|------|----------------|------|-------------------------------|------------------|-----------------------|----------------------------|--|----------------------------|--------------------------------------|
|          |                       |      |                               | T1                  | T2   | S    | SAHM |                |      | D<br>e<br>p<br>t<br>h<br>(in) | T<br>y<br>p<br>e | C<br>l<br>a<br>s<br>s |                            |  |                            |                                      |
| 14       | 11.180                | L2   | N                             | 0.80                | 1.00 | 1.50 | 8.50 | 11.80          |      |                               |                  |                       |                            |  |                            |                                      |
| 15       | 11.180                | L2   | Y                             | 0.80                | 1.00 | 1.50 | 8.50 | 11.80          |      |                               |                  |                       |                            |  |                            |                                      |

New Layer Makeup Below

| Core No. | Mile Post or Sta. No. | Lane | W P<br>h a<br>e t<br>e h<br>l | Pavement Layer (in) |      |      |      | Core Lgth (in) | Base SAHM | Crack                         |                  |                       | P<br>v<br>o<br>n<br>d<br>t | C<br>R<br>D<br>C<br>S<br>u<br>e<br>r<br>l<br>o<br>o<br>p<br>s<br>e | P<br>o<br>o<br>p<br>s<br>e | C<br>o<br>m<br>m<br>e<br>n<br>t<br>s |
|----------|-----------------------|------|-------------------------------|---------------------|------|------|------|----------------|-----------|-------------------------------|------------------|-----------------------|----------------------------|--|----------------------------|--------------------------------------|
|          |                       |      |                               | T1                  | T2   | S    | SAHM |                |           | D<br>e<br>p<br>t<br>h<br>(in) | T<br>y<br>p<br>e | C<br>l<br>a<br>s<br>s |                            |  |                            |                                      |
| 34       | 11.794                | R1   | N                             | 1.00                | 2.00 | 3.00 | 8.00 | 14.00          | 8.0       |                               |                  |                       |                            |  | 0.30                       | 0.17                                 |

New Layer Makeup Below

| Core No. | Mile Post or Sta. No. | Lane | W P<br>h a<br>e t<br>e h<br>l | Pavement Layer (in) |      |      |      | Core Lgth (in) | Base | Crack                         |                  |                       | P<br>v<br>o<br>n<br>d<br>t | C<br>R<br>D<br>C<br>S<br>u<br>e<br>r<br>l<br>o<br>o<br>p<br>s<br>e | P<br>o<br>o<br>p<br>s<br>e | C<br>o<br>m<br>m<br>e<br>n<br>t<br>s |
|----------|-----------------------|------|-------------------------------|---------------------|------|------|------|----------------|------|-------------------------------|------------------|-----------------------|----------------------------|--|----------------------------|--------------------------------------|
|          |                       |      |                               | T1                  | T2   | S    | SAHM |                |      | D<br>e<br>p<br>t<br>h<br>(in) | T<br>y<br>p<br>e | C<br>l<br>a<br>s<br>s |                            |  |                            |                                      |
| 35       | 11.794                | R1   | N                             | 1.00                | 2.00 | 3.00 | 8.00 | 14.00          |      |                               |                  |                       |                            |  |                            |                                      |
| 36       | 11.794                | R1   | Y                             | 1.00                | 2.00 | 3.00 | 8.00 | 14.00          |      |                               |                  |                       |                            |  |                            |                                      |

New Layer Makeup Below

| Core No. | Mile Post or Sta. | Lane | W P<br>h a<br>e t<br>e h | Pavement Layer (in) |  |  |  | Core Lgth | Base SAHM | Crack                      |                  |                       | P<br>v<br>o<br>n<br>d<br>t | C<br>R<br>D<br>C<br>S<br>u<br>e<br>r<br>l<br>o<br>o<br>p<br>s<br>e | P<br>o<br>o<br>p<br>s<br>e | C<br>o<br>m<br>m<br>e<br>n<br>t<br>s |
|----------|-------------------|------|--------------------------|---------------------|--|--|--|-----------|-----------|----------------------------|------------------|-----------------------|----------------------------|--|----------------------------|--------------------------------------|
|          |                   |      |                          |                     |  |  |  |           |           | D<br>e<br>p<br>t<br>h<br>p | T<br>y<br>p<br>e | C<br>l<br>a<br>s<br>s |                            |  |                            |                                      |

|    | No.    | I  | T1 | T2   | S    | SAHM | (in) |       |     | t h p s e t h s e (in) (%) |
|----|--------|----|----|------|------|------|------|-------|-----|----------------------------|
| 37 | 11.794 | L1 | N  | 1.00 | 1.80 | 2.70 | 8.00 | 13.50 | 8.0 | C11MF 0.40 0.18            |

**New Layer Makeup Below**

| Core No. | Mile Post or Sta. No. | Lane | W P h a e t e h l | Pavement Layer (in) |      |      |      | Core Lgth (in) | Base | Crack          |         |           |             | P v o u e r l t p o o t h s e (in) (%) | Comments |
|----------|-----------------------|------|-------------------|---------------------|------|------|------|----------------|------|----------------|---------|-----------|-------------|--|----------|
|          |                       |      |                   | T1                  | T2   | S    | SAHM |                |      | D e p t h (in) | T y p e | C l a s s | E x t e n t |  |          |
| 38       | 11.794                | L1   | N                 | 1.00                | 1.80 | 2.70 | 8.00 | 13.50          |      |                |         |           |             |  |          |
| 39       | 11.794                | L1   | Y                 | 1.00                | 1.80 | 2.70 | 8.00 | 13.50          |      |                |         |           |             |  |          |

**Comments**

MILLING 80MM

Code Descriptions



Output produced by "pccd3.sas" program.

*This request took 1.30 seconds of real time (v9.4 build 1519).*



COMPONENTS OF CONTRACT PLANS SET

- ROADWAY PLANS
- SIGNING AND PAVEMENT MARKING PLANS
- SIGNALIZATION PLANS

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

- SHEET NO. 1
- KEY SHEET
- SUMMARY OF PAY ITEMS (2-20)
- TYPICAL SECTION (10-12)
- SUMMARY OF QUANTITIES (13-14)
- PROJECT LAYOUT (15-16)
- REVISION NOTES (17-18)
- SPECIAL DETAILS (19-24)
- STORM WATER POLLUTION PREVENTION PLAN (25-26)
- TRAFFIC CONTROL (27-30)
- PROJECT CONTROL (31-40)
- CTL-1 - CTL-7

INDEX OF FINAL PLANS:  
 Roadway Computation Book  
 Field Book No. 000001 - Final Measurements

GOVERNING STANDARDS AND SPECIFICATIONS:  
 FLORIDA DEPARTMENT OF TRANSPORTATION,  
 DESIGN STANDARDS DIVISION, 200A,  
 AND STANDARD SPECIFICATIONS FOR ROAD AND  
 BRIDGE CONSTRUCTION DATED 2001,  
 AS AMENDED BY CONTRACT DOCUMENTS.

APPLICABLE DESIGN STANDARDS MODIFICATIONS (DSM/DM)  
 For Design Standards Modifications (DSM) and  
 "Design Standards" at the following web site:  
<http://www.dti.state.fl.us/rdw/rdw/p/>

REVISIONS  
 W/D/WH Δ REVISE SHEETS 6 & 9, ADD SHEET 9A

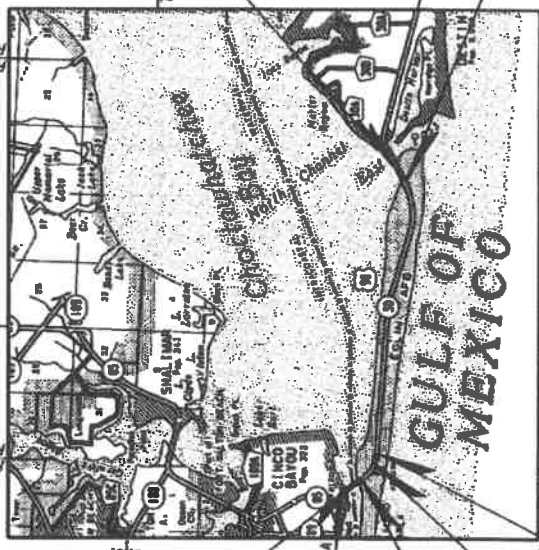
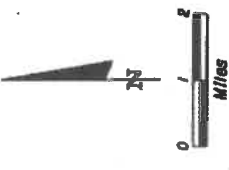
REVISIONS:  
 Sheet No. 16, Roadway Plan, Dated 8/14/12  
 Sheet No. 17, Roadway Plan, Dated 8/14/12  
 Sheet No. 18, Roadway Plan, Dated 8/14/12

STATE OF FLORIDA  
 DEPARTMENT OF TRANSPORTATION  
 FINAL "AS-BUILT" PLANS

FINANCIAL PROJECT ID 416946-1-52-01  
 OKALOOSA COUNTY (57030)  
 STATE ROAD NO. 30 (US 98)



THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THESE PLANS AS PROVIDED BY THE ENGINEER OF RECORD. IF CHANGES WERE MADE, THOSE CHANGES ARE INDICATED BY BLACK INK REVISION AND BEAR THE SEAL, SIGNATURE AND DATE OF THE RESPONSIBLE ENGINEER.  
 CERTIFICATE OF AUTHORIZATION NO. 2294  
 RESIDENT ENGINEER: *Michael D. Bivalitz, P.E.* DATE: 8/14/2012



PROJECT LENGTH IS BASED ON E SURVEY

| LENGTH OF PROJECT |       |
|-------------------|-------|
| LINEAR FEET       | MILES |
| 25,065.77         | 4.747 |
| 0.00              | 0.00  |
| 25,065.77         | 4.747 |
| 0.00              | 0.00  |
| 25,065.77         | 4.747 |

FOOT PROJECT MANAGER: SANDRA B. LAMB, PE (PSS&U)

ROADWAY SHOP DRAWINGS TO BE SUBMITTED TO:  
 GRESHAM SMITH AND PARTNERS  
 220 LAMAR BLVD. SUITE 400  
 ALPHARETTA, GA 30201  
 CERTIFICATE OF AUTHORIZATION 0000  
 ATT: MICHAEL D. BIVALITZ, P.E.

PLANS PREPARED BY:



GRESHAM SMITH AND PARTNERS  
 220 LAMAR BLVD. SUITE 400  
 ALPHARETTA, GA 30201  
 PHONE No. (770) 284-0700  
 FAX No. (770) 284-0700  
 CERTIFICATE OF AUTHORIZATION 0000  
 VENDOR No. 02-070028  
 CONTRACT No. C-0857

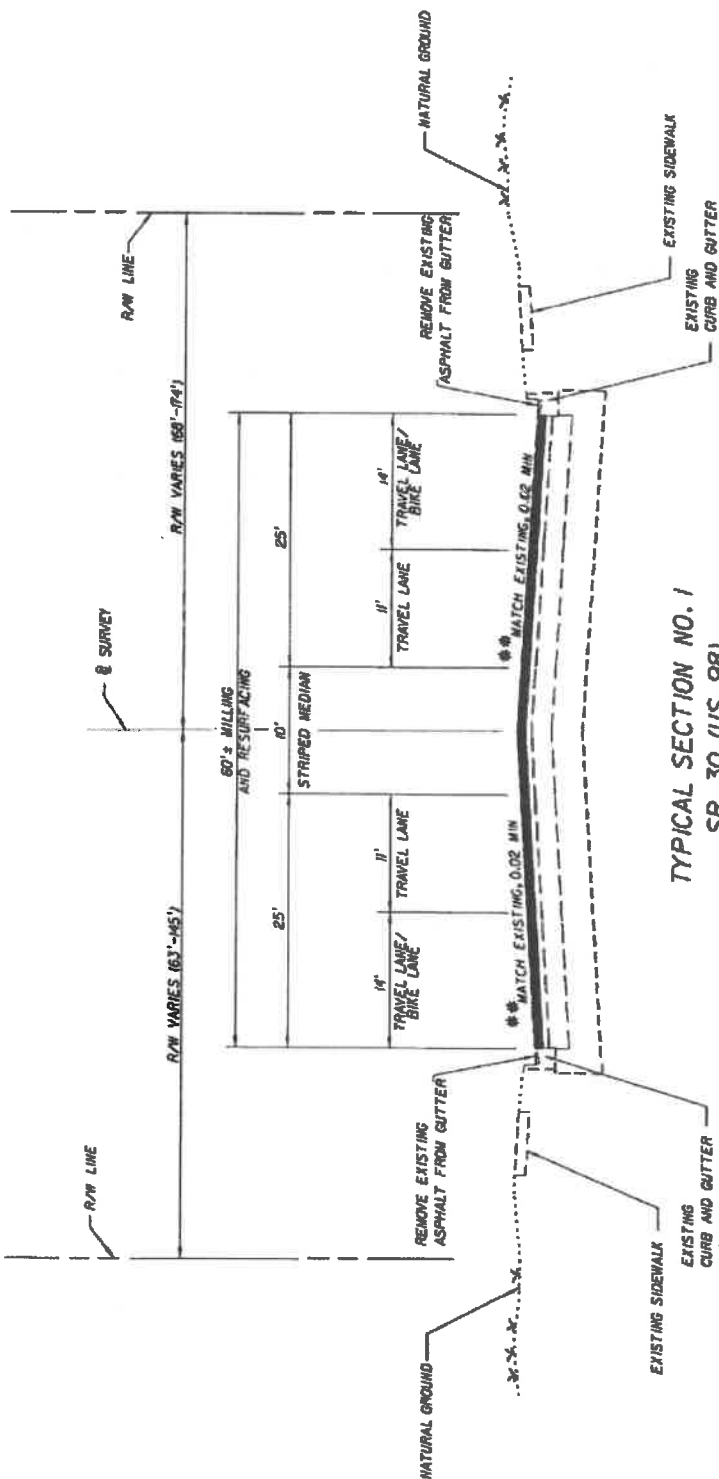
NOTES: THE SCALE OF THESE PLANS MAY VARY THROUGHOUT THE DRAWING.  
 CONTRACTOR: C. W. Roberts Contracting, Inc.  
 District Secretary: Tommy Burnett, P.E.  
 Resident Engineer: David Burnett, P.E.  
 Project Manager: Johnnie Kirkland  
 Project Administrator: Melvin Rhodes  
 Date Work Started: 10/09/2011  
 Date Work Final Accepted: 07/20/2012

| KEY SHEET REVISIONS |                         |
|---------------------|-------------------------|
| DATE                | DESCRIPTION             |
| W/D/WH              | ADDED SHEET 9A TO INDEX |

ROADWAY PLANS  
 ENGINEER OF RECORD: MICHAEL D. BIVALITZ, P.E.  
 P.E. No. 57077

| FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|-------------|-----------|--------------|
| 12          | 12        | 12           |

SR 30 (US 98) FROM SANTA ROSA SOUND BRIDGE TO EAST PASS BRIDGE



**TYPICAL SECTION NO. 1**  
**SR 30 (US 98)**  
**STA. 42+28.34 TO STA. 55+60.00**

- TYPICAL SECTION NOTES**
- 1 ASPHALT SHALL BE REMOVED FROM THE GUTTERS BY WHATEVER MEANS DETERMINED BY THE CONTRACTOR. ANY CURB DAMAGED BY THE REMOVAL WILL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
  - 1 MILLING OPERATION IS RESTRICTED TO ONLY THAT AREA WHICH CAN BE FILLED AND COVERED WITH ASPHALT WITHIN THE SAME WORK OPERATION.
  - 1 CONTRACTOR TO USE ONLY STATIC COMPACTION FOR COMPACTION OF ASPHALT.
  - 1 VIBRATOR TYPE SWEEPER IS TO BE USED FOR CLEANING BILLED SURFACES.
  - 1 6" SOD TREATMENT TO BE ADDED IN ALL AREAS OF NEWLY CONSTRUCTED SIDEWALK AND CURB AND GUTTER.

**TRAFFIC DATA**


|                        |                      |
|------------------------|----------------------|
| PRESENT YEAR           | = 2007 AADT = 44500  |
| ESTIMATED OPENING YEAR | = 2014 AADT = 56600  |
| ESTIMATED DESIGN YEAR  | = 2028 AADT = 91600  |
| DESIGN HOUR            | T = 7.33hr (24 HOUR) |
| DESIGN SPEED           | = 45 MPH             |

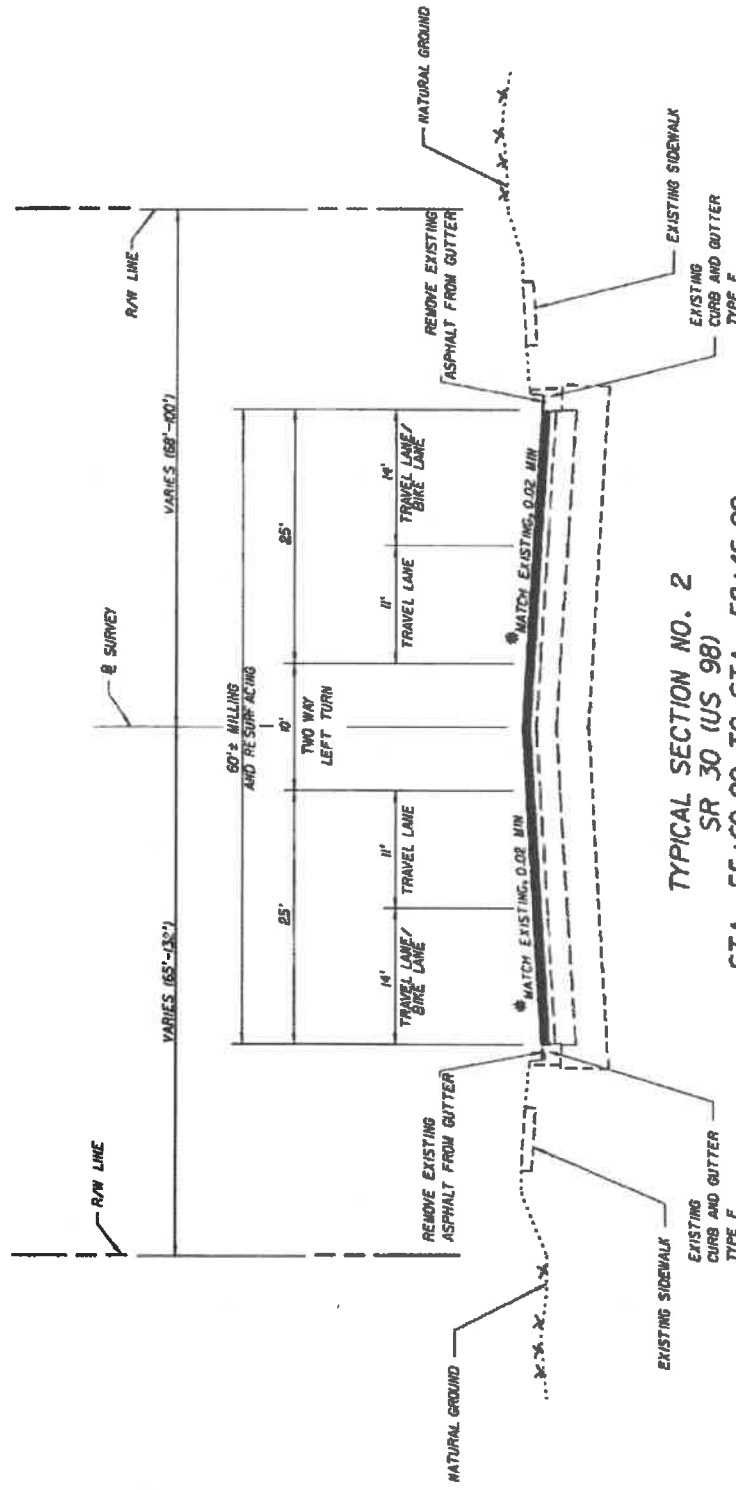
- TRAVEL LANES AND TURN LANE MILLING**  
 WILL EXISTING ASPHALT PAVEMENT 12 1/2" AVG. DEPTH)
- TRAVEL LANES AND TURN LANE RESURFACING**  
 TYPE SP STRUCTURAL COURSE (TRAFFIC C) (1 1/2" (1) PG 76-22),  
 AND FRACTION COURSE FC-9.5 (TRAFFIC C) (1" (1) PG 76-22)

\* SEE TYPICAL SECTION SHEET 7 FOR SLOPE CORRECTION AND MILLING AND RESURFACING DETAIL.

**REGULATORY SPEED**

STA. 42+28.34 IMP (18.095) - STA 49+04.00 IMP (18.987) = 35 MPH  
 STA. 49+04.00 IMP (18.987) - STA 53+86.00 IMP (19.820) = 45 MPH  
 STA. 53+86.00 IMP (19.820) - STA 57+58.00 IMP (16.500) = 55 MPH  
 STA. 57+58.00 IMP (16.500) - STA 58+15.00 IMP (16.770) = 45 MPH  
 STA. 58+15.00 IMP (16.770) - STA 58+03.75 IMP (16.840) = 35 MPH

|   |          |   |  |
|---|----------|---|--|
|  |          | MICHAEL D. DYMALTY, P.E.<br>CIVIL ENGINEER<br>2328 LAUREN PARWAY STE. 400<br>PALM BEACH, FL 33409<br>PHONE (561) 848-3009<br>FAX (561) 848-3009<br>CERTIFICATE OF AUTHORIZATION 88888 |  |
| STATE OF FLORIDA<br>DEPARTMENT OF TRANSPORTATION                                      |          | FINANCIAL PROJECT ID<br>416946-1-52-01  |  |
| ROAD NO.  | COUNTY   | SHEET NO.   |  |
| 30  | OKALOOSA | 3   |  |
| REVISIONS   | DATE     | DESCRIPTION   |  |
|   |          |   |  |



**TYPICAL SECTION NO. 2**  
**SR 30 (US 98)**  
**STA. 55+60.00 TO STA. 58+46.00**

**TYPICAL SECTION NOTES**

- ASPHALT SHALL BE REMOVED FROM THE GUTTERS BY WHATEVER MEANS DETERMINED BY THE CONTRACTOR. ANY CURBS DAMAGED BY THE REMOVAL WILL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- MILLING OPERATION IS RESTRICTED TO ONLY THAT AREA WHICH CAN BE WILLED AND COVERED WITH ASPHALT WITHIN THE SAME WORK OPERATION.
- CONTRACTOR TO USE ONLY STATIC COMPACTION FOR COMPACTION OF ASPHALT.
- A VACUUM TYPE SWEEPER IS TO BE USED FOR CLEANING MILLED SURFACES.

**TRAFFIC DATA**

PRESENT YEAR = 2007 AADT = 44500  
 ESTIMATED OPENING YEAR = 2014 AADT = 56600  
 ESTIMATED DESIGN YEAR = 2028 AADT = 91600  
 = 9.47% D = 59.85% T = 7.33% (24 HOUR)  
 : SIGN HOUR T = 3.66%  
 : SIGN SPEED = 45 MPH

**TRAVEL LANES AND TURN LANE MILLING**  
 WILL EXISTING ASPHALT PAVEMENT (2 1/2" AVG. DEPTH)

**TRAVEL LANES AND TURN LANE RESURFACING**  
 TYPE SP STRUCTURAL COURSE (TRAFFIC C1 (1 1/2") (PG 76-22)),  
 AND FRICTION COURSE FC-9.5 (TRAFFIC C1 (1") (PG 76-22))

\* SEE TYPICAL SECTION SHEET 7 FOR SLOPE CORRECTION AND MILLING AND RESURFACING DETAIL.

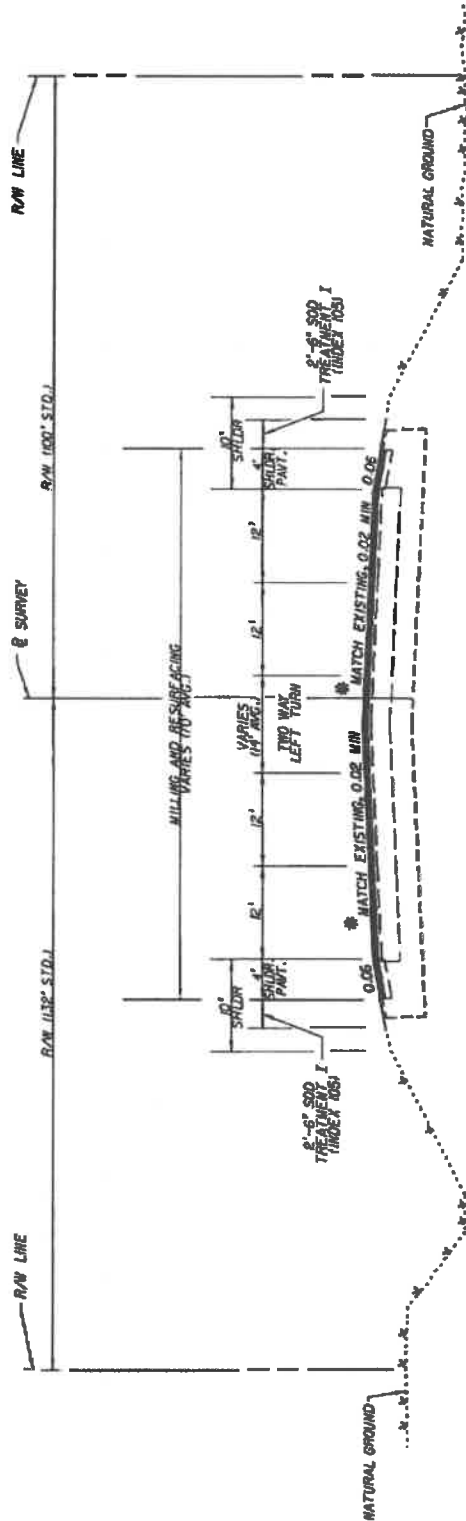
**REGULATORY SPEED**

STA. 42+28.74 IMP 18.080 - STA 49+04.00 IMP 18.980 = 35 MI  
 STA. 43+28.74 IMP 18.080 - STA 49+04.00 IMP 18.980 = 45 MI  
 STA. 44+28.74 IMP 18.080 - STA 49+04.00 IMP 18.980 = 35 MI  
 STA. 45+28.74 IMP 18.080 - STA 49+04.00 IMP 18.980 = 35 MI  
 STA. 46+28.74 IMP 18.080 - STA 49+04.00 IMP 18.980 = 35 MI



| REVISIONS | DESCRIPTION | DATE |
|-----------|-------------|------|
|           |             |      |

|   |          |                      |  |
|---|----------|----------------------|--|
| STATE OF FLORIDA  |          |                      |  |
| DEPARTMENT OF TRANSPORTATION  |          |                      |  |
| ROAD NO.  | COUNTY   | FINANCIAL PROJECT ID |  |
| 30  | OKALOOSA | 416946-1-52-01       |  |
| MICHAEL D. BYWATER, P.E.<br>P.E. LICENSE NUMBER 8707<br>2928 SANDSPRINGWAY AVE. S.W.<br>ALBANY, FLORIDA 32310<br>PHONE NO. (904) 344-4500<br>FAX NO. (904) 344-4500<br>CERTIFICATE OF AUTHORIZATION 00000 |          |                      |  |
|   |          |                      |  |



**TYPICAL SECTION NO. 3**  
**SR 30 (US 98)**  
**STA. 58+46.00 TO STA. 62+31.18**  
**CLEAR ZONE: 14'**

**TRAVEL LANE MILLING**

WILL EXISTING ASPHALT PAVEMENT (2 1/2" AVG. DEPTH)

**TRAVEL LANE RESURFACING**

TYPE SP STRUCTURAL COURSE (TRAFFIC C1(12") (FG 76-22), AND FRICTION COURSE FC-5 (1 1/2") (FG 76-22)

**TURN LANE AND MEDIAN CROSS OVER MILLING AND RESURFACING**

WILL EXISTING ASPHALT PAVEMENT (1 1/2" AVG. DEPTH) TYPE SP STRUCTURAL COURSE (TRAFFIC C1(12") (FG 76-22), AND FRICTION COURSE (TURN LANES) FC-5 (TRAFFIC C1(12") (FG 76-22) AND FRICTION COURSE (CROSS OVERS) FC-5 (TRAFFIC C1(12") (FG 76-22)

**SHOULDER MILLING AND RESURFACING**

WILL EXISTING ASPHALT PAVEMENT (1/2" AVG. DEPTH) FRICTION COURSE FC-5 (1 1/2") (FG 76-22)

**TYPICAL SECTION NOTES**

- MILLING OPERATION IS RESTRICTED TO ONLY THAT AREA WHICH CAN BE FILLED AND COVERED WITH ASPHALT WITHIN THE SAME WORK OPERATION.
- CONTRACTOR TO USE ONLY STATIC COMPACTION FOR COMPACTION OF ASPHALT.
- VACUUM TYPE SWEEPER IS TO BE USED FOR CLEANING MILLED SURFACES.
- DESIGN CLEAR ZONE DOES NOT APPLY TO CLEAR ZONE WIDTHS FOR WORK ZONES.

**TRAFFIC DATA**

DESIGN YEAR = 2007 AADT = 44500  
 ESTIMATED OPERING YEAR = 2014 AADT = 56600  
 ESTIMATED DESIGN YEAR = 2028 AADT = 98600  
 DESIGN HOUR T = 9.47X D = 59.25X T = 7.33X (84 HOUR)  
 DESIGN SPEED = 45 MPH

SEE TYPICAL SECTION SHEET 8 FOR SLOPE CORRECTION AND MILLING AND RESURFACING DETAIL.

**REGULATORY SPEED**

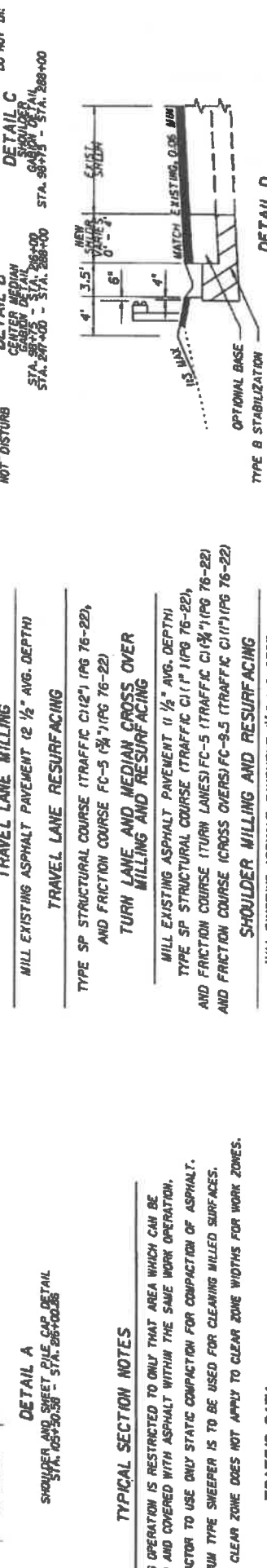
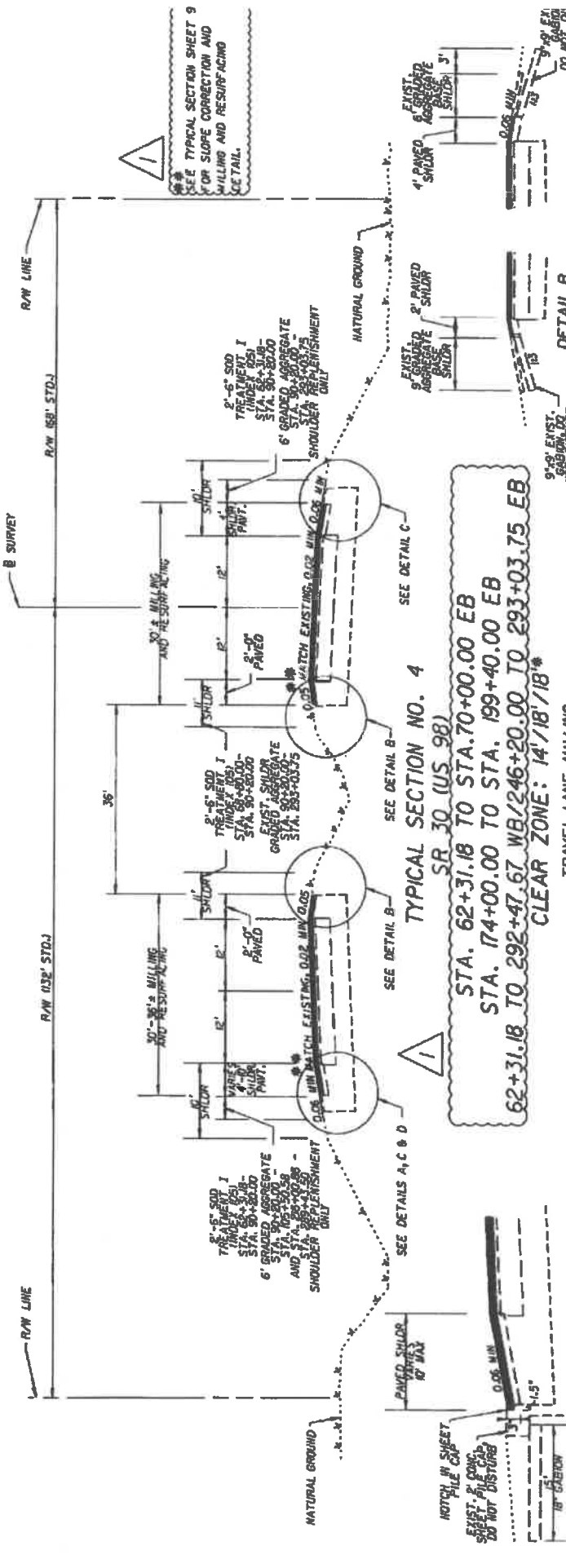
STA. 42+28.34 (MP 12.053) - STA. 49+04.00 (MP 12.981) = 35 MPH  
 STA. 49+04.00 (MP 12.981) - STA. 103+06.00 (MP 13.250) = 45 MPH  
 STA. 103+06.00 (MP 13.250) - STA. 275+52.00 (MP 16.500) = 45 MPH  
 STA. 275+52.00 (MP 16.500) - STA. 289+19.00 (MP 16.770) = 45 MPH  
 STA. 289+19.00 (MP 16.770) - STA. 293+03.75 (MP 16.846) = 35 MPH

| REVISIONS | DESCRIPTION | DATE | REVISIONS | DESCRIPTION |
|-----------|-------------|------|-----------|-------------|
|           |             |      |           |             |

|  |                    |  |
|--|--------------------|--|
| STATE OF FLORIDA<br>DEPARTMENT OF TRANSPORTATION |                    | FINANCIAL PROJECT ID<br>416946-1-52-01 |
| ROAD NO.<br>30                                   | COUNTY<br>OKALOOSA | SHEET NO.<br>5                         |
| <b>TYPICAL SECTION</b>                           |                    |  |



SCOTT D. BOWLETTE, P.E.  
 P.E. LICENSE NUMBER 30797  
 GEORGE W. SMITH AND PARTNERS  
 2500 ALPHARETTA ROAD, SUITE 400  
 ALPHARETTA, GA 30201  
 PHONE 404.770.7310  
 FAX 404.770.7311  
 WWW.GEORGEWSMITH.COM  
 DESIGNER OF AUTOMATION RECORD



**TYPICAL SECTION NOTES**

MILLING OPERATION IS RESTRICTED TO ONLY THAT AREA WHICH CAN BE MILLED AND COVERED WITH ASPHALT WITHIN THE SAME WORK OPERATION. CONTRACTOR TO USE ONLY STATIC COMPACTION FOR COMPACTION OF ASPHALT. A VACUUM TYPE SWEEPER IS TO BE USED FOR CLEANING MILLED SURFACES. DESIGN CLEAR ZONE DOES NOT APPLY TO CLEAR ZONE WIDTHS FOR WORK ZONES.

**TRAFFIC DATA**

PRESENT YEAR = 2007 AADT = 44500  
 ESTIMATED OPENING YEAR = 2014 AADT = 56600  
 ESTIMATED DESIGN YEAR = 2028 AADT = 91600  
 TRUCK PERCENT = 9.47% D = 59.25X T = 7.33X (24 HOUR)  
 SIGN HOUR T = 3.66X  
 SIGN SPEED = 45/55/65 MPH

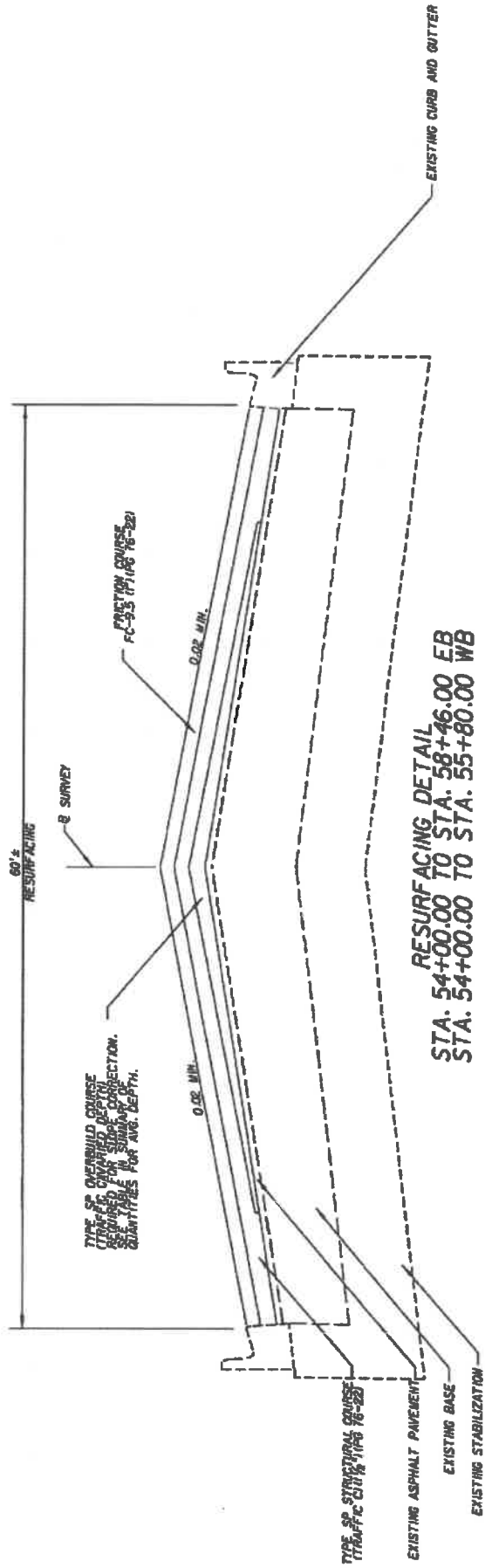
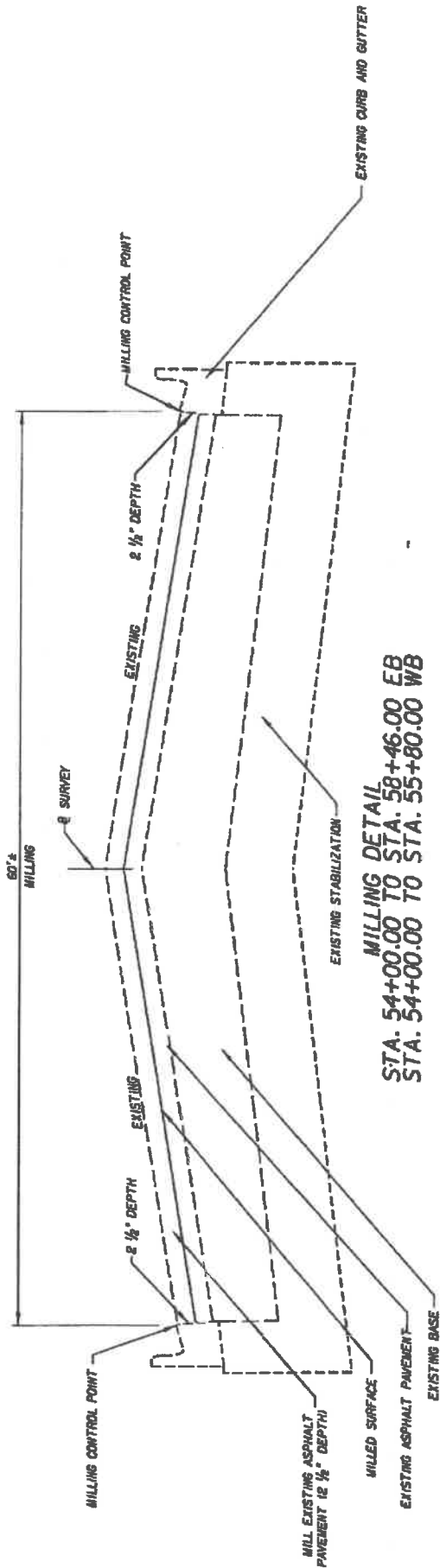
**TYPICAL SECTION**


REGULATORY SPEED

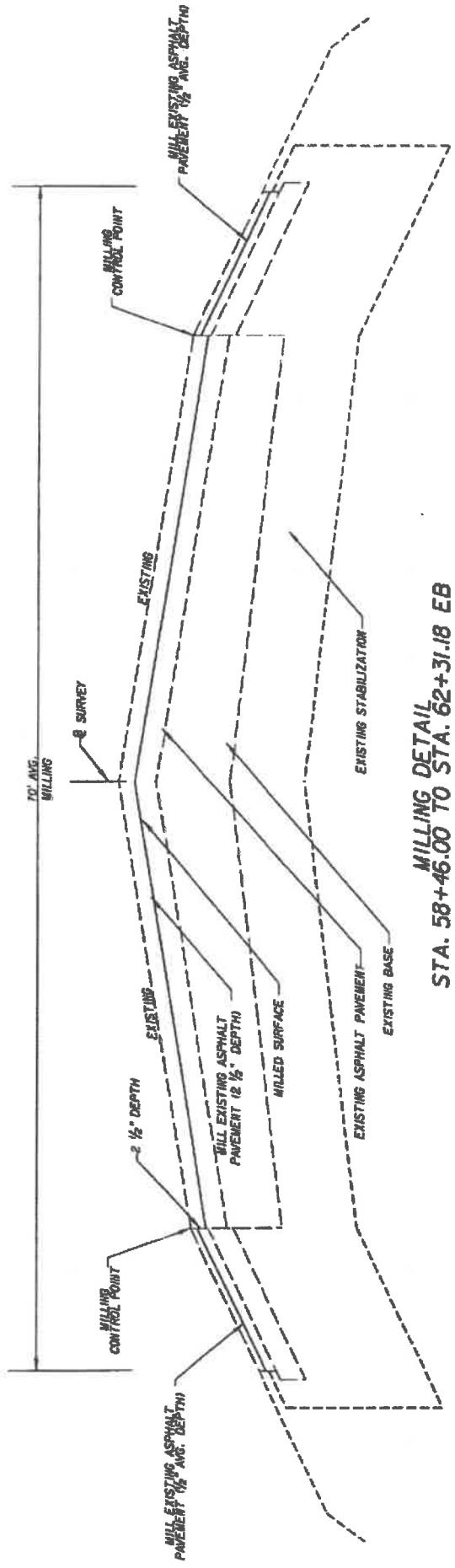
STA. 42+28.34 IMP (12.05%) - STA. 69+04.00 IMP (12.98%) = 35 MI  
 STA. 69+04.00 IMP (12.98%) - STA. 83+26.00 IMP (13.25%) = 45 MI  
 STA. 83+26.00 IMP (13.25%) - STA. 97+28.00 IMP (15.30%) = 35 MI  
 STA. 97+28.00 IMP (15.30%) - STA. 112+00 IMP (16.70%) = 45 MI  
 STA. 112+00 IMP (16.70%) - STA. 128+12.00 IMP (18.84%) = 35 MI  
 STA. 128+12.00 IMP (18.84%) - STA. 145+03.75 IMP (19.84%) = 35 MI

| REVISION | DATE | DESCRIPTION  |
|----------|------|--|
| 1        |      | REVISE EB STATION RANGE APPLICATION, REFER TO SHEET SA |

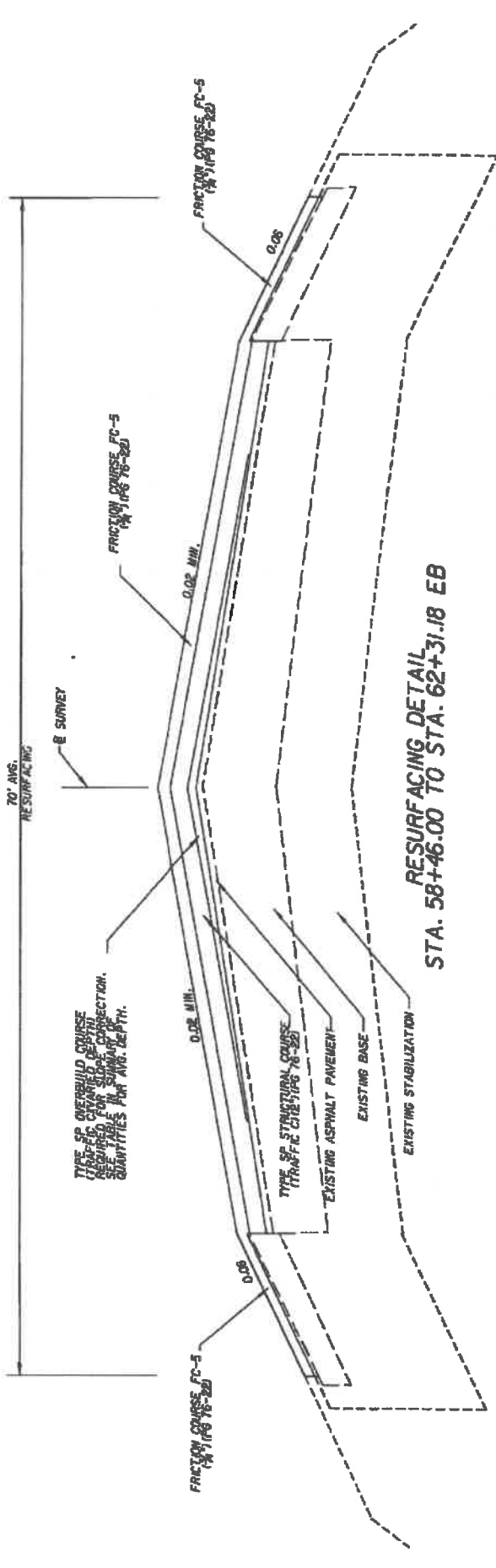
| STATE OF FLORIDA | DEPARTMENT OF TRANSPORTATION |
|------------------|------------------------------|
| ROAD NO.         | 418946-1-52-01               |
| PROJECT ID       | OKALOOSA                     |
| DATE             | 01/27                        |
| SCALE            | AS SHOWN                     |
| DESIGNED BY      | OKALOOSA                     |
| CHECKED BY       | OKALOOSA                     |
| APPROVED BY      | OKALOOSA                     |



|  |                           |                                     |  |   |
|--|---------------------------|-------------------------------------|--|---|
| <b>NOT TO SCA</b>  |                           | <b>TYPICAL SECTION</b>              |  | SHEET NO<br><b>7</b>                          |
| <b>STATES OF FLORIDA</b>   |                           | <b>DEPARTMENT OF TRANSPORTATION</b> |  | FINANCIAL PROJECT ID<br><b>416946-1-52-01</b> |
| ROAD NO<br><b>30</b>   | COUNTY<br><b>OKALOOSA</b> |                                     |  |   |
|   |                           |                                     |  |   |
| MICHAEL A. EMANUEL, P.E.<br>P.E. LICENSE NUMBER 12887<br>OVERSEAS BIRTH AND NATIONALITY<br>2000<br>ALPHARETTA, GA 30009<br>PHONE NO. (770) 784-8888<br>FAX NO. (770) 784-8888<br>CERTIFICATE OF AUTHORIZATION NUMBER |                           |                                     |  |   |
| REVISIONS  | DATE                      | DESCRIPTION                         |  |   |
|  |                           |                                     |  |   |



**MILLING DETAIL**  
**STA. 58+46.00 TO STA. 62+31.18 EB**

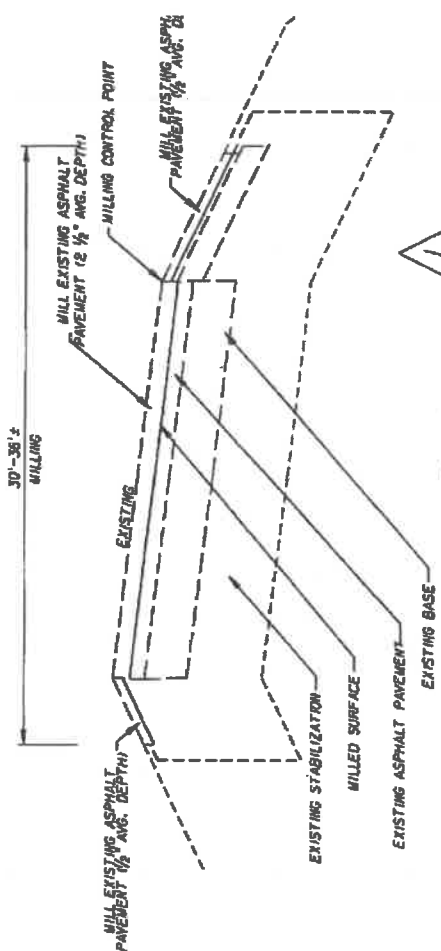


**RESURFACING DETAIL**  
**STA. 58+46.00 TO STA. 62+31.18 EB**

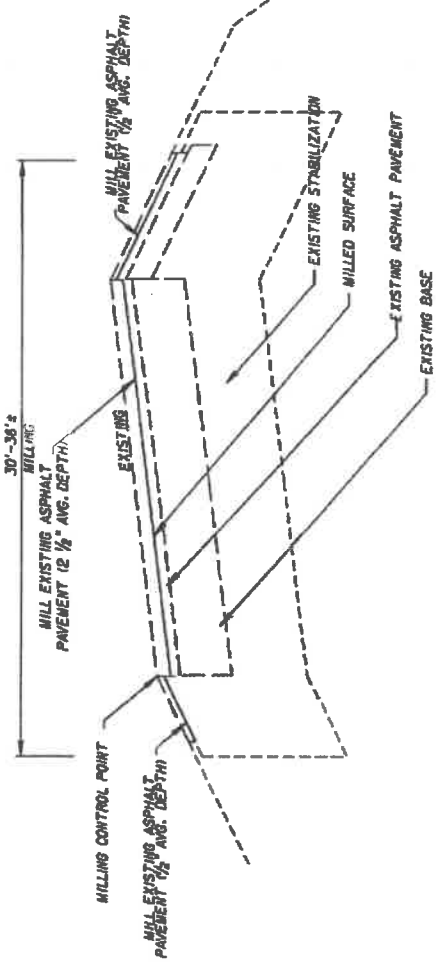
| REVISIONS |      | DESCRIPTION |             |
|-----------|------|-------------|-------------|
| NO.       | DATE | NO.         | DESCRIPTION |
|           |      |             |             |

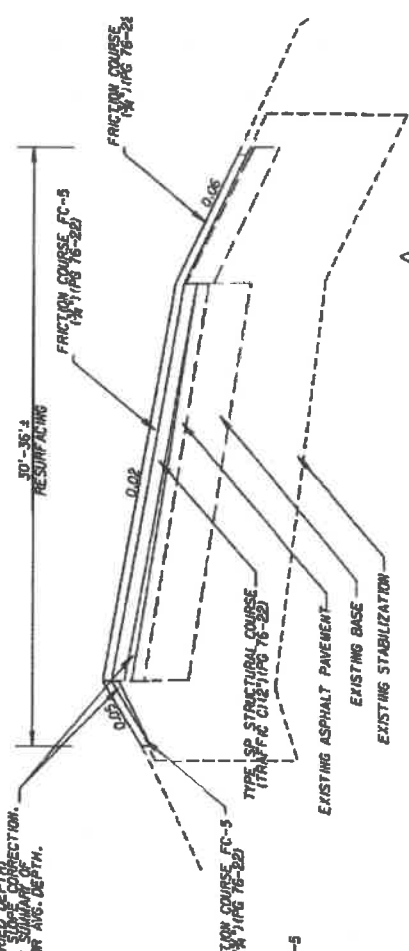
|  |                           |  |                                      |
|--|---------------------------|--|--------------------------------------|
|   |                           | STATE OF FLORIDA<br>DEPARTMENT OF TRANSPORTATION |                                      |
| ROAD NO.<br><b>30</b>  | COUNTY<br><b>OKALOOSA</b> | FINANCIAL PROJECT ID<br><b>416946-1-52-01</b>    | <b>TYPICAL SECTION</b>               |
| MICHAEL D. DYWIDEG, P.E.<br>P.E. LICENSE NUMBER 80707<br>2201 W. BAYVIEW AVENUE, SUITE 200<br>ALPHARETTA, GA 30009<br>PHONE 404.487.4600<br>FAX 404.487.4601<br>CERTIFICATE OF AUTHORIZATION 00000 |                           |  | NOT TO SCALE                         |
| SHEET NO.<br><b>8</b>  |                           |  | PROJECT NO.<br><b>416946-1-52-01</b> |



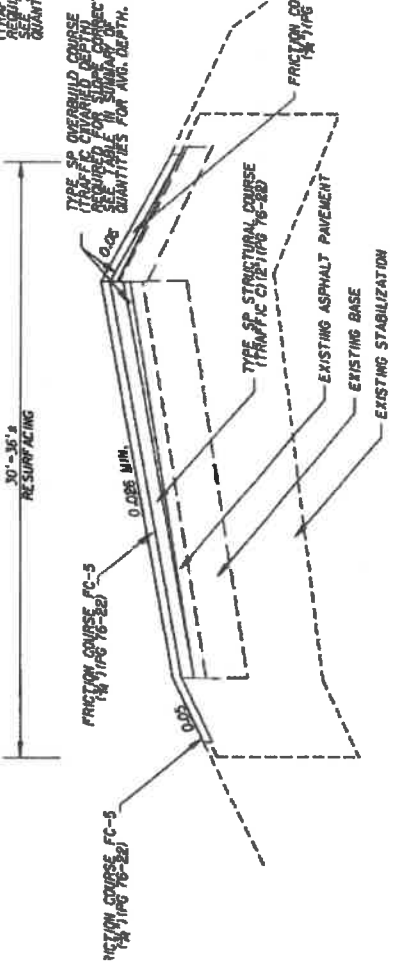
**MILLING DETAIL**  
 STA. 271+20.00 TO STA 289+23.66 EB  
 (SUPERELEVATED SECTION)



**MILLING DETAIL**  
 STA. 83+60.00 TO STA. 104+00.00 WB  
 STA. 152+00.00 TO STA. 177+00.00 WB  
 STA. 193+40.00 TO STA. 198+40.00 WB  
 STA. 284+20.00 TO STA. 288+20.00 WB



**RESURFACING DETAIL**  
 STA. 62+31.18 TO STA. 65+80.00 EB  
 STA. 174+00.00 TO STA. 185+30.00 EB  
 STA. 190+00.00 TO STA. 199+40.00 EB  
 STA. 245+40.00 TO STA. 246+20.00 E



**RESURFACING DETAIL**  
 STA. 271+20.00 TO STA 289+23.66 EB  
 (SUPERELEVATED SECTION)

**NOT TO SCALE**

STATE OF FLORIDA  
 DEPARTMENT OF TRANSPORTATION  
 COUNTY: OKALOOSA  
 ROAD NO.: 30  
 FINANCIAL PROJECT ID: 416946-1-52-01

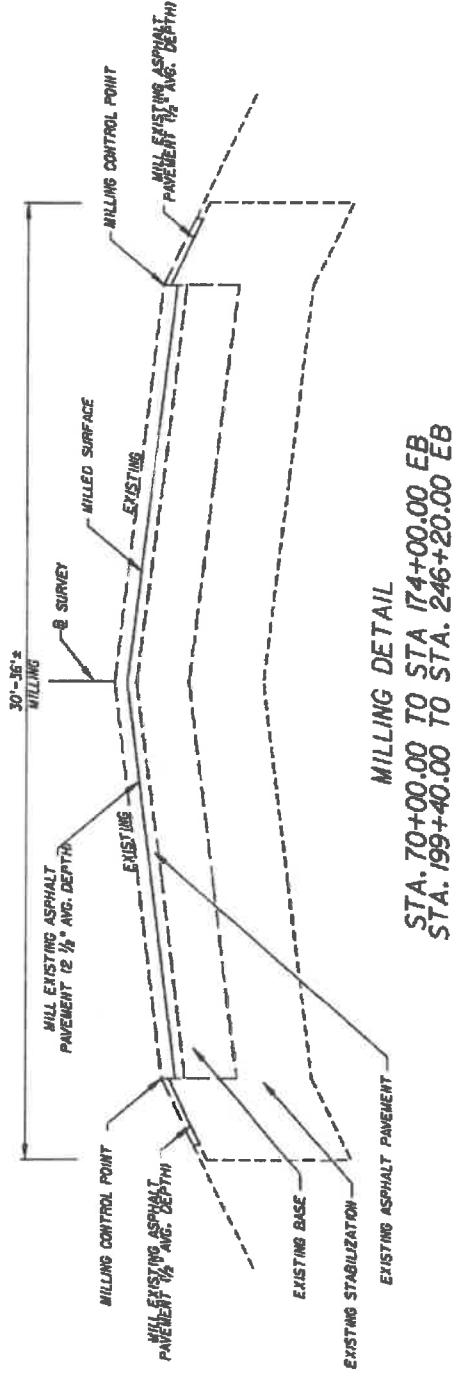
REVISIONS

| NO. | DESCRIPTION                         | DATE |
|-----|-------------------------------------|------|
| 1   | REVISE EB STATION RANGE APPLICATION |      |

**TYPICAL SECTION**

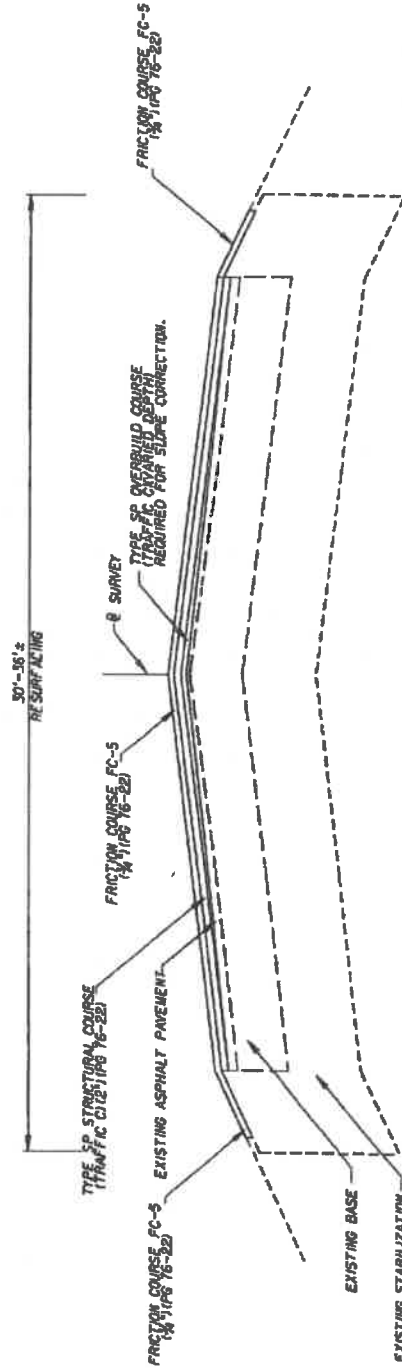
DATE: 08/20/00  
 DRAWN BY: J. J. JONES  
 CHECKED BY: J. J. JONES  
 PROJECT NO.: 416946-1-52-01





**MILLING DETAIL**

STA. 70+00.00 TO STA 174+00.00 EB  
 STA. 199+40.00 TO STA. 246+20.00 EB




**RESURFACING DETAIL**

STA. 70+00.00 TO STA 174+00.00 EB  
 STA. 199+40.00 TO STA. 246+20.00 EB

| NO. | REVISIONS | DATE | DESCRIPTION    |
|-----|-----------|------|----------------|
| 1   | Δ         |      | SHEET 5A ADDED |

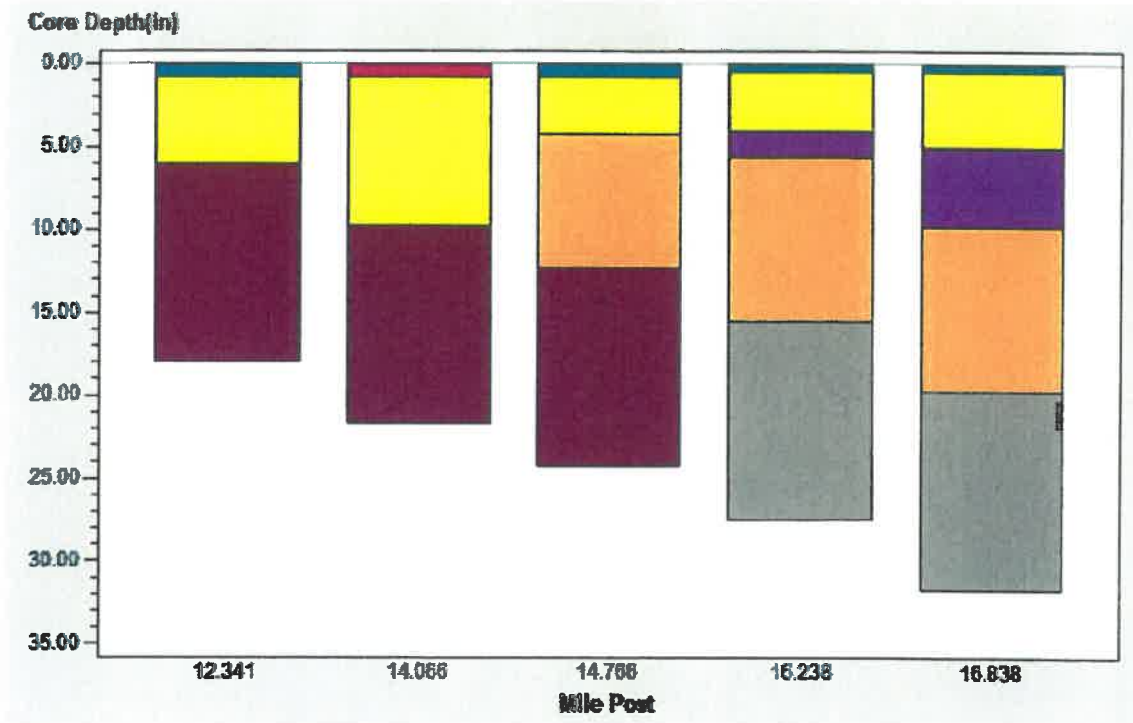
  

|   |    |  |          |
|---|----|--|----------|
|  |    | STATE OF FLORIDA<br>DEPARTMENT OF TRANSPORTATION |          |
| ROAD NO.  | 30 | COUNTY   | OKALOOSA |
| FINANCIAL PROJECT ID<br>416946-1-52-01  |    |  |          |

|  |  |                |
|--|--|----------------|
| MICHAEL B. WYLLIETTE, P.E.<br>P.E. LICENSE NUMBER: 50970<br>CERTIFICATE OF PROFESSIONAL ENGINEERING<br>STATE OF FLORIDA, EXPIRES 08/31/2025<br>PROJECT NO. 170177-0105<br>CERTIFICATE OF REGISTRATION NUMBER |  | SHEET NO.<br>5 |
|--|--|----------------|

**Core Makeup**  
**Project # 416946 -1 -52 -01 / Roadway ID # 57030000**  
**Local Name: SR 30 MILLING AND RE**  
**Lane R2**



**Layer Types**

|             |            |           |           |           |             |             |
|-------------|------------|-----------|-----------|-----------|-------------|-------------|
| <b>FC2</b>  | <b>FC5</b> | <b>S3</b> | <b>S2</b> | <b>T2</b> | <b>SAHM</b> | <b>SCLY</b> |
| <b>SHEL</b> |            |           |           |           |             |             |

[Download Graph Data to Excel](#)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**PAVEMENT EVALUATION CORING AND CONDITION DATA**

Cored By: J.MORALES

Date: 12/08/2008

Typical Section No. 01

|   |                        |   |                                      |
|---|------------------------|---|--------------------------------------|
| <b>Item:</b> 416946                     |                        | <b>Name:</b> SR 30 MILLING AND RE                                 | <b>Lanes:</b> 4                      |
| <b>Fin. Proj. ID:</b> 416946 -1 -52 -01 |                        | <b>From:</b> SANTA ROSA SOUND BRI                                 | <b>Shoulder Type &amp; Condition</b> |
| <b>F.A. Proj. No.:</b>                  |                        | <b>To:</b> EAST PASS BRIDGE                                       | <b>Inside:</b> 1                     |
| <b>County:</b> 57                       | <b>SR No.:</b> CR 2378 | <b>Beg MP:</b> 12.475 <b>End MP:</b> 16.841<br><b>Lgth:</b> 4.366 | <b>Outside:</b> 0                    |

Median Curbed: N Paved:[ ] Lawn:[ ] Other:[ ] Curb & Gutter: Y

| Core No. | Mile Post or Sta. No. | Lane | W P h e t e h l | Pavement Layer (in) |      |      |      |      |      | Base  |                | Crack |       |                | P v t d | C R u e p t h (in) | D C S r l o o p s e (%) | Comments                   |
|----------|-----------------------|------|-----------------|---------------------|------|------|------|------|------|-------|----------------|-------|-------|----------------|---------|--------------------|-------------------------|----------------------------|
|          |                       |      |                 | Top                 | FC2  | FC5  | S3   | S2   | T2   | SAHM  | Core Lgth (in) | SCLY  | SHEL  | D e p t h (in) |         |                    |                         |                            |
| 1        | 12.096                | L2   | N               | 0.50                |      |      | 3.50 |      |      | 4.00  |                |       |       | B II           | L F     | 0.12               | 3.00                    | #1, #2, #3                 |
| 2        | 12.341                | R2   | Y               | 0.75                |      |      | 5.25 |      |      | 6.00  |                | 12.0  |       | B I B          | L F     | 0.50               | 1.10                    | #2, #4, #5, #6             |
| 3        | 12.385                | L2   | Y               | 0.50                |      | 1.00 | 6.30 |      |      | 7.80  |                | 12.0  |       | B III          | M P     | 0.25               | 3.70                    | #4, #5, #7, #8             |
| 4        | 12.880                | R1   | Y               | 0.50                |      |      | 3.50 | 2.50 | 8.50 | 15.00 | 12.0           |       | 15.00 | B III          | M F     | 0.25               | 1.20                    | #2, #4, #5, #9, #10        |
| 5        | 12.657                | L1   | Y               | 0.50                |      | 3.00 | 3.00 |      |      | 6.50  |                | 12.0  |       | B I B          | L F     | 0.50               | 2.20                    | #2, #4, #5                 |
| 6        | 13.261                | R3   | N               | 0.50                |      | 1.00 | 3.00 |      |      | 4.50  |                | 12.0  |       | B I B          | L F     |                    | 7.20                    | #2, #4                     |
| 7        | 13.575                | L2   | Y               |                     | 1.00 |      | 7.75 |      |      | 8.75  |                | 12.0  |       | B I B          | L F     | 0.13               | 3.60                    | #2, #4                     |
| 8        | 14.066                | R2   | N               |                     | 0.75 |      | 9.00 |      |      | 9.75  |                | 12.0  |       | B I B          | L F     | 0.13               | 2.40                    | #2, #4                     |
| 9        | 14.166                | L2   | Y               |                     | 1.00 |      | 7.50 |      |      | 8.50  |                | 12.0  |       | B I B          | M F     | 0.13               | 2.80                    | #2, #4, #11, #12, #13      |
| 10       | 14.266                | R1   | Y               |                     | 1.00 |      | 9.00 |      |      | 10.00 |                | 12.0  |       | A I B          | L F     | 0.13               | 1.30                    | #2, #4                     |
| 11       | 14.638                | L1   | N               |                     | 1.00 |      | 8.50 |      |      | 9.50  |                | 12.0  |       | B II           | L F     | 0.13               | 2.00                    | #2, #4                     |
| 12       | 14.766                | R2   | N               | 0.75                |      |      | 3.50 |      | 8.00 | 12.25 |                | 12.0  | 12.25 | B II           | M F     | 0.25               | 3.30                    | #2, #4, #5, #8, #14        |
| 13       | 14.158                | L2   | Y               |                     | 0.70 |      | 9.90 | 0.40 |      | 11.00 |                | 12.0  |       | B I B          | M F     | 0.13               | 3.30                    | #4, #12, #13, #15, #16 #17 |
| 14       | 15.394                | R1   | Y               | 0.50                |      | 1.00 | 5.00 |      | 5.25 | 11.75 | 12.0           |       | 11.75 | C II           | M F     | 0.13               | 3.60                    | #2, #4, #14                |
| 15       | 15.638                | L2   | N               |                     | 0.75 | 3.00 | 3.25 |      |      | 7.00  |                | 12.0  | 7.00  | B II           | M F     | 0.25               | 3.30                    | #4, #5, #8, #18            |
| 16       | 16.238                | R2   | Y               | 0.50                |      |      | 3.50 | 1.60 | 9.90 | 15.50 | 12.0           |       | 15.50 | C II           | M F     | 0.13               | 3.80                    | #1, #2, #4                 |
| 17       | 16.338                | L1   | Y               |                     | 1.00 |      | 6.50 |      |      | 7.50  |                | 18.0  |       | B I B          | M F     | 0.13               | 3.40                    | #2, #4                     |
| 18       | 16.538                | R1   | N               | 0.50                |      | 4.70 |      | 3.85 | 9.95 | 19.00 | 12.0           |       | 19.00 | C II           | M F     | 0.13               | 3.30                    | #1, #2, #4                 |
| 19       | 16.738                | L3   | N               | 0.50                |      |      | 3.25 |      |      | 3.75  |                | 12.0  | 3.75  | C II           | M F     |                    | 3.20                    | #1, #2, #4, #19            |
| 20       | 16.838                | R2   | Y               | 0.50                |      |      | 4.50 | 4.80 | 9.95 | 19.75 | 12.0           |       | 19.75 | C II           | M F     | 0.13               | 1.80                    | #1, #2, #4                 |

Comments

PCR ENTERED BY TOM HAYDEN (EGS) ON 4-7-09. CONTACT TOM HAYDEN FOR MORE DETAILED INFO (850-386-1253)  
 #1-MODERATE TRANS. CRACKING#2-MODERATE RAVELING#3-CONCRETE BRIDGE BELOW CORE#4-POLISHED AGGREGATE#5-MODERATE RUTTING#6-SUICIDE LANE PRESENT#7-SEVERE RAVELING#8-MODERATE SPALLING#9-SEVERE TRANS. CRACK #10-LONG. CRACKING#11-CULVERT 33"BELOW PAVEMENT #12-WEST BOUND BREAKDOWN LANE PRESENT#13-CONCRETE FOOTER PRESENT IN WB LANE#14-MOD. TRANS. CRACKING #15-LIGHT RAVELING#16-CLOGGED DRAIN IN MEDIAN#17-CORE LOCATED AT CONCRETE BOX CULVERT#18-LONG. CRACKING PRESENT#19-BOX CRACKING PRESENT

**CONTRACT PLANS COMPONENTS**

ROADWAY  
SIGNING AND PAVEMENT MARKING  
SIGNALIZATION

**INDEX OF ROADWAY PLANS  
SHEET NO. SHEET DESCRIPTION**

- 1 KEY SHEET
- 2 SIGNATURE SHEET
- 3A-3B SUMMARY OF PAY ITEMS
- 4-5 TYPICAL SECTION
- 50-1 - 50-19 SUMMARY OF QUANTITIES
- 6 PROJECT LAYOUT
- 7 PROJECT NOTES
- 8-13 ROADWAY PLANS
- 14-21 CURB RAMP DETAILS
- 22 DRAINAGE STRUCTURES
- 23-42 TEMPORARY TRAFFIC CONTROL PLAN
- 43 EROSION AND SEDIMENT CONTROL PLAN
- CTL-1 THRU CTL-2\* PROJECT NETWORK CONTROL SHEETS

\* THESE SHEETS ARE INCLUDED IN THE INDEX OF ROADWAY PLANS ONLY TO INDICATE THAT THEY ARE PART OF THE ROADWAY PLANS SET. THESE SHEETS ARE CONTAINED IN A SEPARATE DIGITALLY SIGNED AND SEALED DOCUMENT

**CONTRACTOR: C.W. ROBERTS CONTRACTING**  
**CONSULTANT: ATKINS, N.A.**  
**DISTRICT SECRETARY: PHILLIP GAINER P.E.**  
**PROJECT MANAGER: WILLIAM THIFNER**  
**PROJECT ADMINISTRATOR: DARYL GOSS**  
**DATE WORK STARTED: 4/4/2017**  
**DATE OF FINAL ACCEPTANCE: 8/15/2017**

**GOVERNING DESIGN STANDARDS:**

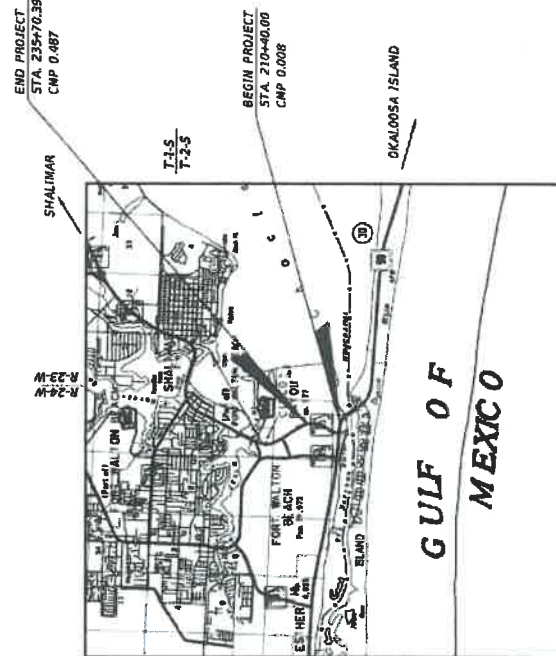
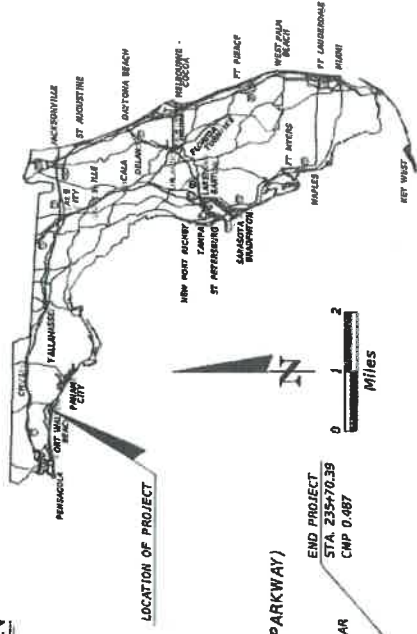
Florida Department of Transportation, FY2016-17 Design Standards eBook (DSesb) and applicable Design Standards Revisions (DSRs) at the following website:  
<http://www.dot.state.fl.us/roads/design/DesignStandards/Standards.shtm>

**GOVERNING STANDARD SPECIFICATIONS:**

Florida Department of Transportation, JANUARY 2017 Standard Specifications for Road and Bridge Construction at the following website:  
<http://www.dot.state.fl.us/programmanagement/implemented/SpecBooks>

**STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION  
AS-BUILT PLANS  
CONTRACT PLANS**

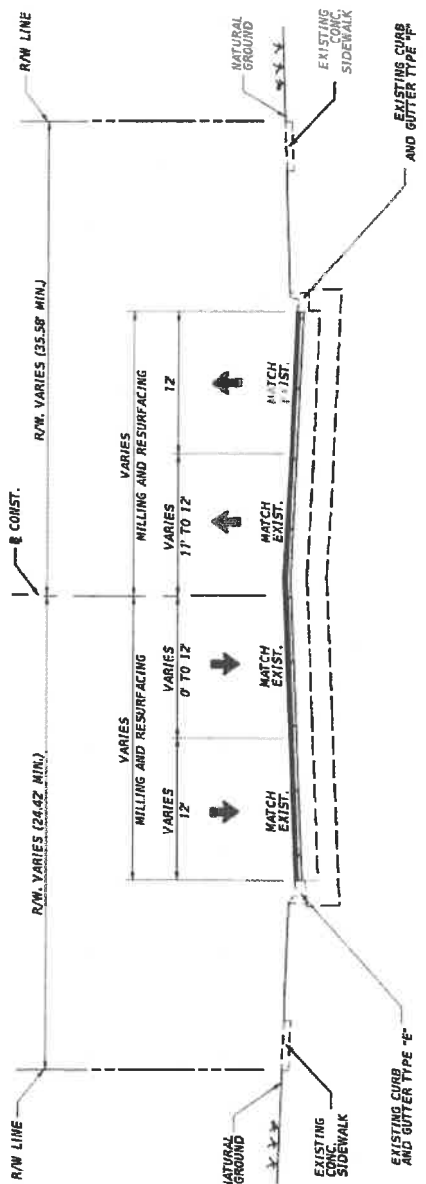
**FINANCIAL PROJECT ID 432567-1-52-01  
(FEDERAL FUNDS)  
OKALOOSA COUNTY (40001)  
STATE ROAD NO. 145  
SR 145 (PERRY STREET) FROM SR 30 (US 98) TO SR 85 (EGLIN PARKWAY)**



**ROADWAY PLANS**  
**ENGINEER OF RECORD:**  
**RAMESH B. REDDOLI, P.E.**  
 P.E. NO.: 73451  
 BES, INC.  
 11007 N 56TH STREET, SUITE 208  
 TEMPLE TERRACE, FL 33617  
 TEL NO. (813) 985 7800  
 CONTRACT NO. C8180  
 VENDOR NO. 20-0242028  
**CERTIFICATE OF AUTHORIZATION NO. 9835**  
**FDOT PROJECT MANAGER:**  
**HOWARD C. HODGE III, P.E.**  
 TEL NO. (850) 526 2291

| DATE | DESCRIPTION |
|------|-------------|
|      |             |

| CONSTRUCTION CONTRACT NO. | FISCAL YEAR | SHEET NO. |
|---------------------------|-------------|-----------|
| T 3611                    | 17          | 1         |



TYPICAL SECTION 1  
 SR 145  
 STA 210+40.00 TO STA 222+49.27

MILLING  
 MILL EXISTING PAVEMENT (2')

RESURFACING  
 FRICTION COURSE FC-12.5, TRAFFIC B, PG 76-22 (2')

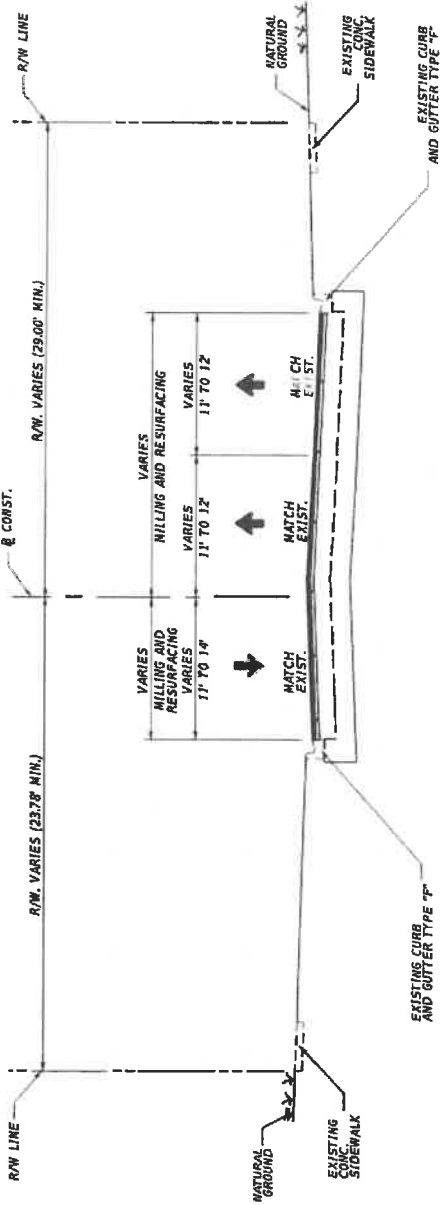
**TRAFFIC DATA**  
 CURRENT YEAR = 2013 ADT = 23,300  
 ESTIMATED OPENING YEAR = 2018 ADT = 24,500  
 ESTIMATED DESIGN YEAR = 2022 ADT = 26,100  
 K = 5.0% D = 52.10% T = 1.53% (24 HOUR)  
 DESIGN HOUR T = 0.78 %  
 DESIGN SPEED = 35 MPH

**NOTES**  
 1. USE STATIC COMPACTION THROUGHOUT THE PROJECT.

| DATE | DESCRIPTION | BY | DATE |
|------|-------------|----|------|
|      |             |    |      |

|  |   |
|--|---|
| BESS INC.<br>5611 ST. JOSE<br>TAMPA, FL 33617<br>(813) 985-7800    | STATE OF FLORIDA<br>DEPARTMENT OF TRANSPORTATION<br>ROAD NO. SR 145<br>COUNTY OKALOOSA<br>FINANCIAL PROJECT ID 432667-1-52-01 |
| TAMMISH B. REIDOLLI, P.E. NO. 79431<br>C.A. NO. 9893               | <b>TYPICAL SECTION</b>  |
| 10/31/2018 10:20:00 AM K:\PROJECTS\SR 145\2018\TYPICAL\TYPICAL.DWG | SHEET NO. 4   |



**TYPICAL SECTION 2**  
**SR 145**  
**STA 222+49.27 TO STA 235+70.39**

MILLING  
 WILL EXISTING PAVEMENT (2")

RESURFACING  
 FRICTION COURSE FC-12.5, TRAFFIC B, PG 76-22 (2")

**TRAFFIC DATA**  
 CURRENT YEAR ADOT = 23,300  
 ESTIMATED OPENING YEAR = 2018 ADOT = 24,500  
 ESTIMATED DESIGN YEAR = 2032 ADOT = 26,100  
 K = 9.0% D = 52.0% T = 1.55% (24 HOUR)  
 DESIGN HOUR T = 0.78 %  
 DESIGN SPEED = 35 MPH

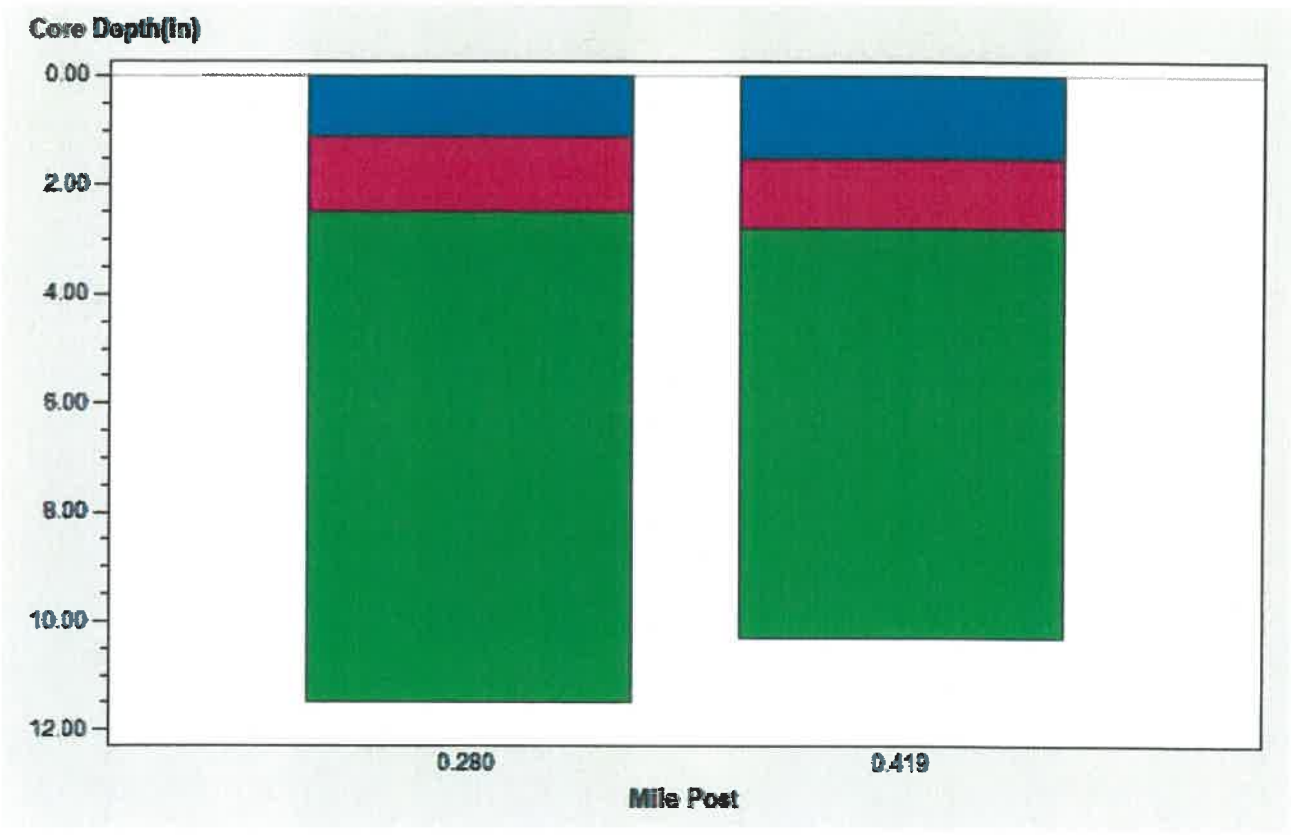
**NOTES**  
 1. USE STATIC COMPACTION THROUGHOUT THE PROJECT.

| DATE | DESCRIPTION | REVISIONS | DATE | DESCRIPTION |
|------|-------------|-----------|------|-------------|
|      |             |           |      |             |

|   |  |   |  |
|---|--|---|--|
| BESS INC<br>11007 N. 56TH ST., #208<br>TAMPA, FLORIDA 33617<br>(813) 986-7000<br>RAMESH B. REDDOLLU, P.E. NO. 74881 |  | STATE OF FLORIDA<br>DEPARTMENT OF TRANSPORTATION<br>ROAD NO. SR 145<br>COUNTY OKALOOSA<br>FINANCIAL PROJECT ID 432507-52-01 |  |
| TYPICAL SECTION   |  | SHEET NO. 5   |  |

**Core Makeup**  
**Project # 432567 -1 -31 -01 / Roadway ID # 57040001**  
**Local Name: SR 145 (PERRY STREET)**  
**Lane R2**



**Layer Types**

|     |      |      |
|-----|------|------|
| FC6 | SP2F | SAHM |
|-----|------|------|

[Download Graph Data to Excel](#)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**PAVEMENT EVALUATION CORING AND CONDITION DATA**

**Cored By: TOOLE,  
FUSSELL, PORTER &  
SHIVER**

**Date: 01/27/2015**

**Typical Section No. 57**

|   |                |  |                           |
|---|----------------|--|---------------------------|
| Item: 432567                                  |                | Name: SR 145 (PERRY STREET)                | Lanes: 3                  |
| Fin. Proj. ID: 432567 -1 -31 -01              |                | From: SR 30 (US 98)                        | Shoulder Type & Condition |
| F.A. Proj. No.:                               |                | To: SR 85 (EGLIN PARKWAY)                  | Inside:                   |
| County: 57                                    | SR No.: SR 145 | Beg MP: 0.000 End MP: 0.487<br>Lgth: 0.487 | Outside:                  |
| Median Curbed: N Paved:[ ] Lawn:[ ] Other:[ ] |                |  | Curb & Gutter: Y          |

| Core No. | Mile Post or Sta. No. | Lane | W P<br>h a<br>e t<br>e h<br>l | Pavement Layer (in) |      |  |  | Core Lgth (in) | Base SAHM | Crack |   |                      | P v o<br>t n<br>d t | R u e<br>t p<br>t h<br>(in) | D e r l<br>o o<br>s p<br>s e<br>(%) | Comments |                      |
|----------|-----------------------|------|-------------------------------|---------------------|------|--|--|----------------|-----------|-------|---|----------------------|---------------------|-----------------------------|-------------------------------------|----------|----------------------|
|          |                       |      |                               | FC6                 | SP2F |  |  |                |           |       |   | D e p<br>t h<br>(in) |                     |                             |                                     |          | T y p<br>e s         |
| 1        | 0.280                 | R2   | Y                             | 1.10                | 1.40 |  |  | 2.50           | 9.0       |       | B | II                   | M                   | F                           | 0.10                                | 3.60     |                      |
| 2        | 0.419                 | R2   | Y                             | 1.50                | 1.30 |  |  | 2.80           | 7.5       | 2.80  | B | II                   | M                   | F                           | 0.10                                | 3.00     | CORE TAKEN IN CURVE. |

Comments

ROADWAY IS IN FAIR CONDITION. SEVERAL UTILITY PATCHES HAVE BEEN MADE IN THE ROADWAY. MODERATE CRACKING WITH NO SIGNIFICANT RUTTING WAS FOUND. ASPHALT PAVEMENT IN THE CURB AND GUTTER VARIES IN THICKNESS THROUGHOUT THE PROJECT.

Code Descriptions



Output produced by "pccd3.sas" program.

This request took 0.98 seconds of real time (v9.4 build 1519).



**FLEXIBLE PAVEMENT DESIGN  
 QUALITY CONTROL CHECKLIST**

State Proj. No. N/A

Federal Aid No. N/A

FP ID No. 415474-2

County OKALOOSA

**Flexible Pavement Design Review**

**Satisfactory  
 Yes/No/NA**

|   |                         |
|---|-------------------------|
| Pavement Design Summary Sheet.....  | <u>Y</u>                |
| Project Location and Description.....   | <u>Y</u>                |
| Traffic Data and ESAL <sub>D</sub> Calculations.....  | <u>Y</u>                |
| Resilient Modulus (M <sub>R</sub> ).....  | <u>Y</u>                |
| Reduced Resilient Modulus (M <sub>R</sub> ) for base high-<br>water clearance less than 3 ft..... | <u>Y (GAP AREAS)</u>    |
| Required Structural Number (SN <sub>R</sub> ) Calculations.....                                   | <u>Y</u>                |
| Calculated Structural Number (SN <sub>C</sub> ) Calculations.....                                 | <u>Y</u>                |
| Base Material Selection.....  | <u>Y</u>                |
| Friction Course Selection.....  | <u>Y</u>                |
| Stabilized Subgrade Evaluation.....   | <u><del>Y</del> N/A</u> |
| Shoulder Design.....  | <u>Y</u>                |
| Coordination with Other Offices.....  | <u>Y</u>                |
| Other Special Details.....  | <u>Y</u>                |
| Final Pavement Design Drawing or Narrative.....   | <u>Y</u>                |

**Rehabilitation**

|   |                  |
|---|------------------|
| Field Evaluation of Project.....                          | <u>Y</u>         |
| Pavement Coring and Evaluation Complete.....              | <u>Y</u>         |
| Distress Evaluation.....                                  | <u>Y</u>         |
| Existing Cross Slope and Correction Method.....           | <u>*PIB (DB)</u> |
| Milling Depth and Purpose.....                            | <u>Y</u>         |
| Overlay Structural Number (SNO) Calculations.....         | <u>Y</u>         |
| Overbuild Recommendation.....                             | <u>*PIB (DB)</u> |
| Pavement Evaluation Coring and Condition Data Report..... | <u>Y</u>         |

**Projects That Do Not Require Design Calculations**


|   |            |
|---|------------|
| Existing Pavement Evaluation.....               | <u>N/A</u> |
| Existing Cross Slope and Correction Method..... | <u> </u>   |
| Asphalt Thickness.....                          | <u> </u>   |
| Base Type and Thickness.....                    | <u> </u>   |
| Future Milling Considerations.....              | <u> </u>   |
| Structural Evaluation.....                      | <u> </u>   |

**Plans Review**

|  |                  |
|--|------------------|
| Plans Conform to Pavement Design.....  | <u>*PIB (DB)</u> |
| Cross Slope Correction Addressed.....  | <u>*PIB</u>      |
| Design Details Adequately Covered..... | <u>Y</u>         |

Standard Plans Indexes Properly Referenced..... 4  
Project is Constructible with Current Technology..... 4

Comments

QA by  Date 10-7-21

# **OKALOOSA COUNTY WATER AND SEWER**

**OKALOOSA COUNTY, FLORIDA**



## **STANDARD SPECIFICATIONS AND DESIGN MANUAL**

**JUNE 2007**



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PUMP STATION RTU PANEL 120/240 VOLT .....8  
PUMP STATION RTU PANEL 277/480 VOLT .....9  
PUMP STATION RTU PANEL 277/480 VOLT .....10  
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**ABBREVIATIONS/DEFINITIONS**

1. And/Or – An option of OCWS Engineer or representative.
2. Approval – Approval of Plans - A review by OCWS Engineer of Plans, stating that the plans are in substantial compliance with OCWS specifications.
3. ASCE – American Society of Civil Engineers.
4. ASTM – American Society for Testing and Materials.
5. AWWA – American Water Works Association.
6. Contractor – The individual, partnership, firm, corporation, or any acceptable combination thereof contracting for the performance of the prescribed work.
7. Connection Costs –
8. Corporation Stop – A special brass valve designed for insertion in the water mains to which can be attached to the service line of the Owner.
9. CRF – Concurrency Review Form
10. Curb Stop – A special brass valve designed for the installation between the service line and Owner’s plumbing, and to be used only by OCWS for conveniently turning water on and off.
11. Developer - The party or parties paying for the installation of the water main and appurtenances.
12. Developer’s Engineer – the Professional Engineer (licensed in the State of Florida) employed by the Developer who is responsible for the submission of engineering plans and project development.
13. Distribution System – The pipes, mains, valves, fittings and other related appliances through which water is transmitted to customers of OCWS.
14. Drop Manholes – A precast, concrete, structure used where one sewer joins another several feet below. The lower sewer enters the manhole at the bottom in the usual manner. The upper sewer, however, turns down sharply just outside the manhole and enters it at the bottom. To permit cleaning of the upper sewer from the manhole, the upper sewer also extends to the manhole at constant slope past the sharp drop through which the sewage flows.
15. Easement – A right to use or control the property of another for designated purposes.
16. FDEP – Florida Department of Environmental Protection
17. FDOT – Florida Department of Transportation
18. Inspector – OCWS’ authorized representative assigned to make detailed inspection of contract performance.
19. Job Site – The location of the project where water mains and appurtenances are to be installed.
20. Lateral – A sewer line that connects to the main sewer and terminates at or near the property line or easement.

21. Mains – The pipe in the street, easement, avenue or alley, extending parallel or nearly parallel to the line of property abutting thereon.
22. Manhole – A concrete (precast or poured in place) structure providing access to a sewer. The lower portion is cylindrical, with an inside diameter of at least 4 feet. The upper portion generally tapers to an opening of approximately 2 feet. The opening is capped with a heavy cast-iron cover seated on a cast iron frame.
23. Owner – The person who has legal or equitable title to any premises.
24. OCWS – Okaloosa County Water and Sewer, or its authorized representative
25. OCWS’ Attorney – The law firm and/or attorney hired and/or retained by the OCWS.
26. OCWS Engineer – The regular employed staff Engineer of Okaloosa County Water and Sewer.
27. Paving – The surface of a street, or treatment thereof.
28. Property Service Lateral - A sewer line that extends from the property line or easement to a residence, building or industry.
29. Right of Way – A general term denoting lands, property or interest therein, usually in a strip acquired for or devoted to transportation purposes.
30. Service Main – The temporary supply pipe installed on streets where no standard water main exists.
31. Sewer Main – A pipe or conduit that carries wastewater. Belonging to OCWS the pipe in the street, easement, avenue or alley, extending parallel or nearly parallel to the line of property abutting thereon.
32. Standard Drawings – Drawings approved for repetitive use, showing details to be used where appropriate.
33. Street – Every way or place of whatever nature, whether within or without the established service area of OCWS open to the use of the public, including streets, alleys, highways, park, or other road, and all public places.
34. Structures – All other structures
35. Tap – A corporation stop, valve, or fitting, installed in the main of OCWS to which can be connected a private water lateral for water service.
36. Utility Structures – Catch basin, drainage basin, power box, poles, junction boxes, and other similar structures.
37. Water Service – The furnishing or supplying of water through OCWS water system for the residential, commercial, industrial, or fire protection uses, or the readiness to furnish water for said purposes. Materials include pipe, fittings, valves, motor, and meter box (from main to meter).
38. Water System – OCWS distribution system, located in the County established service area contiguous thereto, and supplying the County and citizens thereof with water service, together with any extensions and additions thereto hereafter made.

# **SECTION 1**

## **INTRODUCTION**





**SECTION 1 INTRODUCTION**

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1.1 PURPOSE

The purpose of this document is to outline Okaloosa County Water and Sewer (OCWS) minimum requirements for the design, construction, and installation of potable water distribution and wastewater collection systems within OCWS' jurisdiction.

1.2 DESCRIPTION OF DESIGN MANUAL

This manual identifies a single set of standards, submittal requirements, and approval procedures to be used in the evaluation, design, and construction of projects. This manual is not intended to serve as a step-by-step instructional handbook nor can this manual address every situation, which may arise during the course of construction. The application of sound engineering principles and judgment, combined with the information contained herein, are necessary in order to successfully design potable water distribution and wastewater collection projects.

1.3 UPDATES TO THE ENGINEERING DESIGN MANUAL

This manual is intended to be a dynamic document. As design criteria and technology evolve, the manual will require revisions and modifications. As changes are made, supplements or revisions will be forwarded to the registered holder of each manual. It will be each registered holder's responsibility to maintain a current manual.

Comments and suggestions concerning the content and format of the design manual are welcome. Please submit your comments or suggestions to:

Okaloosa County Water and Sewer  
Engineering Department  
1804 Lewis Turner Boulevard, Suite 300  
Fort Walton Beach, Florida 32547  
[subdivisionregs@esginc.net](mailto:subdivisionregs@esginc.net)

+++ END OF SECTION +++



**SECTION 2**

**GENERAL INFORMATION**



**SECTION 2 GENERAL INTRODUCTION**

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2.1 PURPOSE

The purpose of this section is to provide general information regarding applicability, certifications submittal documents, submittal review, and Okaloosa County Water and Sewer (OCWS) approval for potable water distribution and sanitary sewer collection system designs.

2.2 APPLICABILITY

The requirements of this manual are applicable to any person, company, corporation, or other entity proposing to install new or modify existing potable water distribution or sanitary sewerage collection systems connecting to or with the potential to connect to OCWS' existing services.

2.3 CERTIFICATION REQUIREMENTS

2.3.1 ENGINEERING DESIGN

All planning and construction documents shall be prepared, certified, and submitted by a Professional Engineer licensed in the State of Florida. Non-certified documents or documents prepared by Professionals registered in States other than Florida shall not be accepted for review.

2.3.2 SURVEY

All plat and survey information provided to OCWS for record documents shall be prepared, certified, and submitted by a Professional Land Surveyor licensed in the State of Florida. Non-certified documents or documents prepared by Professionals registered in States other than Florida shall not be accepted for review.

2.4 SUBMITTAL REQUIREMENTS

The Design Engineer shall submit to OCWS for approval, all design documents as specified herein. Documents may include, but are not limited to, concept studies, calculations, construction drawings, and specifications. OCWS' approval for the proposed design documents shall be required prior to authorization of any subsequent phase of construction.

All design documents shall be prepared and sealed by a Professional Engineer licensed in the State of Florida. Submittals shall be organized and presented in an easily understandable format for review. Submittals that are not presented in an organized, neat, and easily understandable manner may be returned to the Design Engineer for clarification without review.

## 2.5 SUBMITTAL, REVIEW, AND APPROVAL

### 2.5.1 APPLICABILITY

The design of any expansion to, or modification of, the potable water distribution or sanitary sewer collection systems within OCWS' service area, whether privately owned or OCWS-owned, shall require approval by OCWS' Engineer prior to construction. All design work shall be prepared in accordance with the appropriate section(s) of this manual.

### 2.5.2 SUBMITTALS

#### *2.5.2.1 Design Documents*

Three (3) copies of the design documents (drawings, specifications, etc.) shall be initially submitted for OCWS' review and consideration. OCWS' Engineer will provide appropriate comments within a reasonable period of time (approximately 10 working days). OCWS reserves the right to request additional review time and additional review materials should the complexity of a design warrant the request.

Once all of the comments have been addressed to the satisfaction of OCWS' Engineer and once three (3) complete sets of the corrected final design documents have been delivered to OCWS for distribution, an approval letter shall be issued authorizing the construction. The Contractor shall obtain one set of OCWS-approved final design plans at OCWS' Office prior to construction. A set of final corrected approved plans, bearing OCWS' approval stamp, shall be required to be on the job site at all times. Work will not be allowed to commence without an approved set of final corrected documents on site (see Design Review Process outline in the figures following this section).

Approved corrected documents can be picked up at OCWS' Office located at:  
1804 Lewis Turner Boulevard, Suite 300  
Fort Walton Beach, Florida 32547

#### *2.5.2.2 Preliminary Plat*

If the Owner/Developer plans to plat or re-plat the property, the Design Engineer shall submit one (1) copy of the preliminary plat, along with the submittal of the design documents.

#### *2.5.2.3 Subdivision Lotting and Main Layout Plans*

In addition to the other submittal requirements of this section, subdivision designs shall include three (3) copies each of the lotting layout and main layout.

#### *2.5.2.4 Backflow Information*

The Owner/Developer shall comply with the Okaloosa County Cross-connection and Backflow Prevention Policy and Requirements of the FDEP for backflow prevention.

### 2.5.3 RESTRICTIONS

The Contractor shall not be allowed to begin construction on any potable water distribution or wastewater collection system without obtaining a set of OCWS-approved construction documents. Approval of the plans shall be valid for a period of 180 days. If construction has not begun by the end of the 180 days, the plans shall be declared void and a new submittal shall be required for approval. Any modifications to the plans shall be approved by all reviewing agencies.

### 2.6 NOTIFICATION OF CONSTRUCTION

The Developer's Contractor shall pay all service connection costs and then notify OCWS' Engineering Department two (2) weeks in advance of beginning the construction of any approved work to schedule a preconstruction meeting. Contractor shall notify OCWS' engineering department 48 hours in advance of beginning the construction of any approved work for inspection services. OCWS' Engineering Department will make periodic inspections of the proposed project while under construction. Once the water and sanitary sewer mains have been laid and successfully tested, OCWS will issue a preliminary approval letter permitting the street paving where applicable. A final letter of acceptance for the project will not be issued by OCWS until a successful field final inspection has been performed and all work is completed in accordance with these specifications. Call 609-5058 for inspections.

### 2.7 MAINTENANCE PERIOD

The Contractor Developer shall be responsible for the quality of all work installed for a period of not less than one (1) year after the final letter of acceptance has been issued.

### 2.8 RESPONSIBLE CHARGE OF CONSTRUCTION

The Developer/Owner is held to be in responsible charge of any job submitted to OCWS for construction. OCWS' Engineering Personnel will make periodic inspection of the job site and will bring to the attention of the Contractor on the job, Engineer and the Developer any discrepancies that he may observe. This will in no way relieve the Developer, Engineer, or Contractor from their responsibility to comply with OCWS specifications.

### 2.9 DISPUTES, ERRORS, AND OMISSIONS

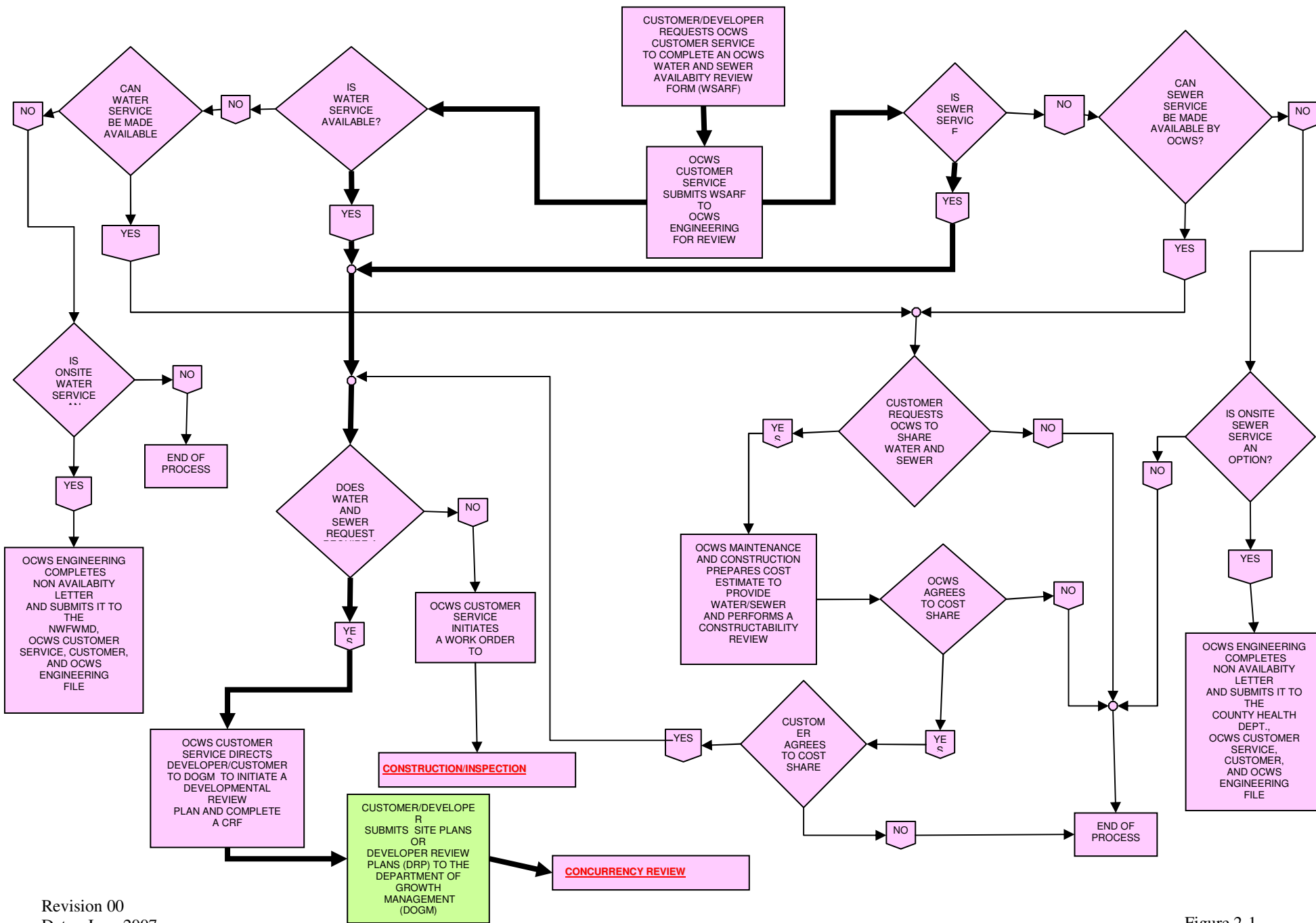
Should any portion of the plans and specifications be unclear or in dispute, they shall be brought to the attention of the individual(s) in responsible charge of construction. OCWS' Engineering Department shall be notified as to the nature of the dispute and its proposed resolution prior to construction. It is the responsibility of the Developer/Owner to obtain approval from OCWS Engineering Department for any deviation from the original construction plans. Unless otherwise specified, OCWS' Engineering Department will require revised plans to be submitted for approval. Construction on the disputed work shall not be allowed until the Developer obtains approval of the revised plans. Failure to obtain written approval could result in the rejection of the work and require the removal of all disputed portions of the installation at no cost to OCWS.

2.10 CHANGE OF CONDITIONS/MISREPRESENTATIONS/CHANGE IN THE WORK

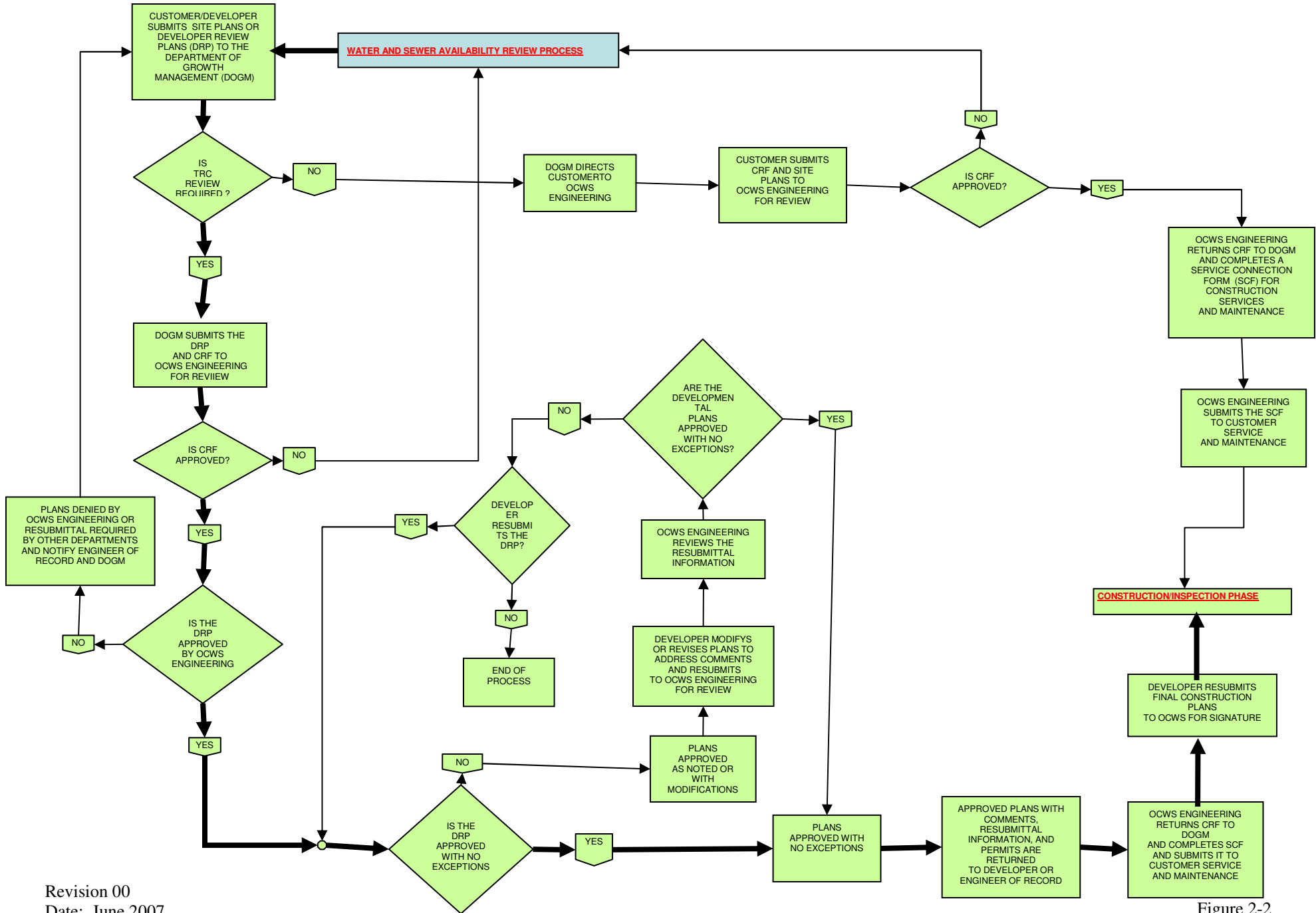
Should the site conditions vary significantly from those shown on the approved set of plans or should the developer or owner modify the design, Okaloosa County and OCWS will require that the plans be corrected and resubmitted for approval. Resubmittal shall result in the stoppage of work pertaining to all of the changes in the design until such time as the plans have been reviewed and approved by Okaloosa County.

+++ END OF SECTION +++

**OKALOOSA COUNTY WATER AND SEWER DEPARTMENT AVAILABILITY REVIEW**



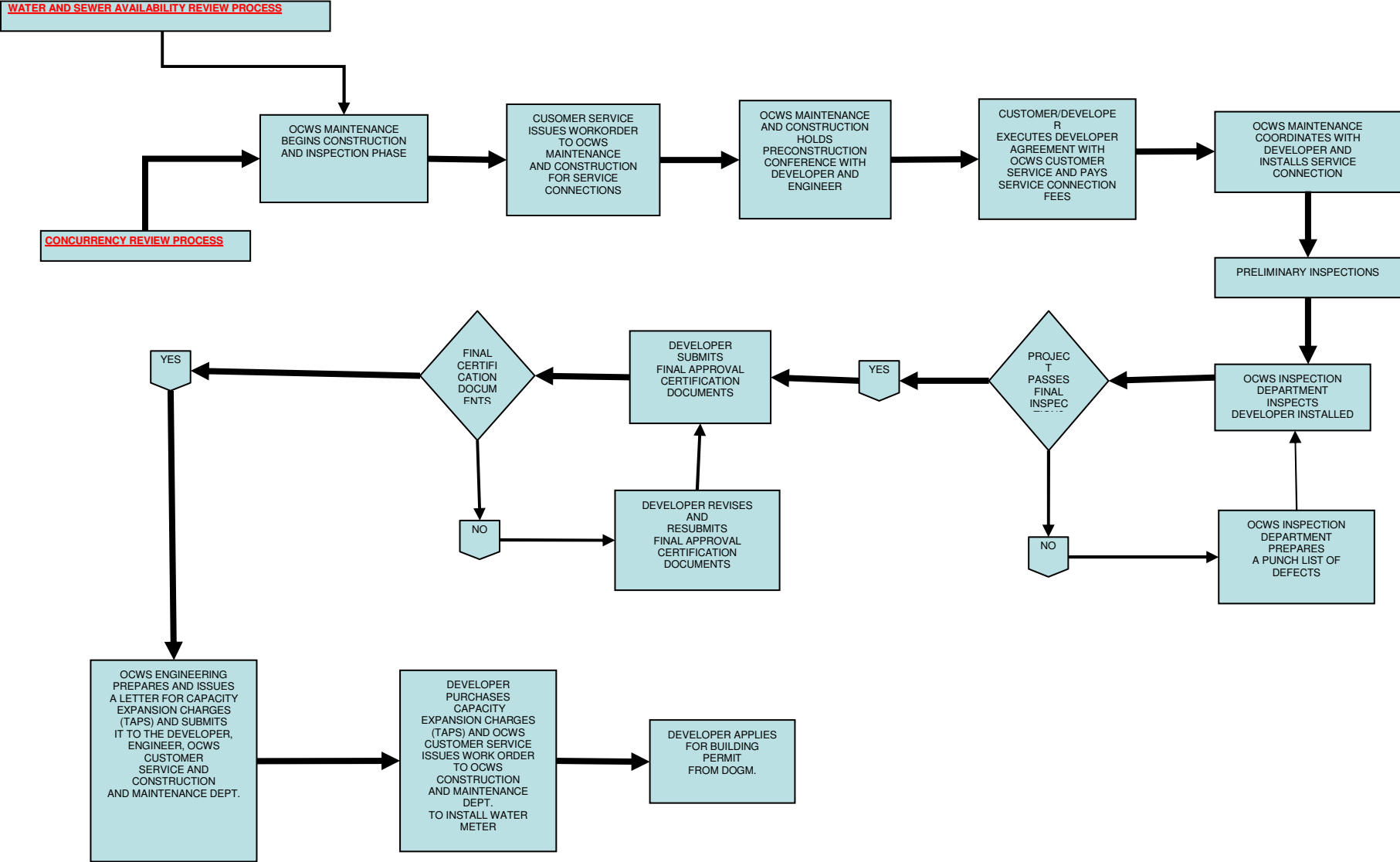
**OKALOOSA COUNTY WATER AND SEWER DEPARTMENT CONCURRENCY REVIEW**



Revision 00  
Date: June 2007

Figure 2-2

**OKALOOSA COUNTY WATER AND SEWER DEPARTMENT CONSTRUCTION/INSPECTION**







**SECTION 3**  
**DRAFTING STANDARDS**



**SECTION 3 DRAFTING STANDARDS**

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### 3.1 PURPOSE

The intent of this section is to set forth a common format and information requirement for all construction related submittals. The following section presents the guidelines to which all construction plans shall adhere.

### 3.2 DRAWING REQUIREMENTS

For any connection, regardless of size, to Okaloosa County Water and Sewer's (OCWS) water distribution or sanitary sewer collection systems, OCWS shall require construction plans to be submitted for review and approval. Construction shall not proceed until written approval by OCWS has been obtained.

#### 3.2.1 SHEET SIZE

Full size construction plans shall be submitted on the preferred American National Standard sheet size of 22.00" X 34.00" ("D" size). OCWS may approve construction plans submitted on 11" X 17" on a case-by-case basis.

#### 3.2.2 ELECTRONIC SUBMITTALS

All commercial projects and projects that involve more than two single family dwellings and that require TRC review shall be submitted in electronic form on a compact disk (CD) using the 2000 or later version of Auto CAD or Adobe Reader (pdf format).

#### 3.2.3 TITLE BLOCK INFORMATION

In an effort to streamline project tracking and facilitate the review process, OCWS requires a title block (of the Design Engineer's choosing) be located on each sheet of the drawing package. At a minimum, the title block shall contain the following information:

- Engineering Firm's Name, Address, and Telephone Number
- Professional Engineer's Seal/Signature and date of issuance
- Project Title
- Project Address (if available)
- Drawing Title
- CAD drawing file name, Engineer's Project Number, Design Engineer's Email Address
- Sheet Number (in "Sheet \_\_ of \_\_" Format)
- Scale (indicate "NA" in block if not applicable)

### 3.2.4 HORIZONTAL AND VERTICAL SCALES

#### *3.2.4.1 Plans and Profiles*

The appropriate scales for original plans are 1"= 50' horizontal with vertical scale of 1"= 5' and 1"= 20' horizontal with vertical scale of 1"= 2'. For the purposes of clarity, other scales may be allowed with the approval of OCWS' Engineer. Engineer shall use the appropriate scale to maximize the visual representation of the project. OCWS may require changes in scale or multiple scales to achieve their goal.

#### *3.2.4.2 Plat*

The appropriate scale for plat sheets shall vary to accommodate the project scope. It is recommended that the scale chosen by the Engineer be rounded to the nearest 100' increment (i.e.; 1" = 100', 1" = 200', 1" = 500', etc.).

### 3.2.5 GRAPHIC SCALE

A graphic scale shall be required on each sheet. The purpose of the graphic scale is to allow for the reduction of the plans while maintaining an accurate reference to scale.

### 3.2.6 SHADING

The use of shading to indicate areas of interest will not be allowed except that digital aerials will be allowed to be lightly shaded. Cross-hatching or dot patterns are acceptable techniques to highlight areas of interest. Shading is not permitting due in part to the difficulties in reproducing the documents for archival purposes. Shaded areas tend to produce either a dark block (obscuring items of interest) or no shading at all with the current reproducing process employed by OCWS.

### 3.2.7 LETTERING

Lettering shall be of a size and clarity that the document will remain legible when reduced 50%. Acceptable fonts include Roman-S for single stroke lettering and Roman - D for double stroke lettering, or similar. Drawings that are rendered illegible at 50% reduction shall be reformatted and resubmitted. Notes and title blocks shall not be adhesively applied on Drawings. All general notations shall be lettered in upper case; however, any lengthy sentence or phrase may be lettered in upper and lower case.

### 3.2.8 UTILITY LOCATIONS

The Engineer of Record shall utilize all existing utility locations in design considerations. Resolution of unforeseen utility conflicts during construction shall be the sole responsibility of the Engineer of Record.

Engineer shall contact Sunshine State One-Call of Florida, Inc. at 800-432-4770 or 386-575-2009 to perform the required utility location survey during the design of the project and incorporate utility information into the design of the project.

### 3.3 DRAWING PACKAGE

In general, the drawing package shall consist of a Title Sheet, Plat Layout, Utility Plan, Drainage Plan, Profile Sheet(s), Detail Sheet(s), and shall address all requirements of the project including drainage utility plans and profiles.

#### 3.3.1 TITLE SHEET REQUIREMENTS

The following information shall be supplied on the Title Sheet of the design documents submitted to OCWS for review:

- Name of Project
- Index of Drawings, Vicinity Map, Legend, Graphic Scale, and North Arrow
- General notes applicable to the complete set of plans shall be shown on the Title Sheet if space permits or the first sheet, if necessary
- The following note shall be placed on the Title Sheet or other appropriate sheet near the front of the plans:

*“CAUTION EXISTING UTILITIES: UNDERGROUND UTILITY INFORMATION SHOWN ON THESE DRAWINGS IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. LOCATION, SIZE, AND MATERIAL TYPE WERE OBTAINED FROM AVAILABLE RECORDS SUPPLIED BY THE RESPECTIVE UTILITY COMPANY. SUNSHINE STATE ONE-CALL OF FLORIDA, INC. 386-575-2009 MUST BE NOTIFIED 48 HOURS PRIOR TO ANY EXCAVATION FOR VERIFICATION OF LOCATION.”*

The vicinity map should be appropriately sized to identify major and minor roadways with sufficient detail to allow driving to the project site. The location and boundaries of the site should be clearly defined.

#### 3.3.2 PLAT/LOTING LAYOUT

The Plat/Lotting layout shall include, but not be limited to, the following:

- All existing property lines, including their corners
- Bearing and distance of all proposed property lines
- Proposed property corners
- Lot numbers
- Street names
- Building offset dimensions
- Location of all existing water and sewer laterals
- Existing and proposed sanitary and water easements with notations
- Existing and proposed utility easements
- Bearing and distance to the nearest Section corner



- Coordinates
- Right of way dimensions with curve data
- Elevations of ditches, curbs, roadways, existing grade using the datum specified in Section 5.

### 3.3.3 PLAN AND PROFILE SHEET REQUIREMENTS

All plan and profile sheets shall be provided with a revision block to identify the following:

- Date of revision
- Detailed explanation of changes made. Each revision shall be referenced to the specific Drawing change using a unique note number and symbol.

#### *3.3.3.1 Plan View*

The plan view shall include, but not be limited to, the following:

- Existing and proposed sewer utilities, size, direction of flow, manholes, sewer laterals, and appurtenances.
- Existing and proposed water utilities, size, valve locations, lateral locations and appurtenances.
- Existing and proposed topographic features within a 50 foot radius of the construction.
- All existing and known proposed gas, electric, telephone conduits, fiber optic cables, and any other underground or overhead utilities within a 50 foot radius of the construction area.
- All existing pipes, culverts, conduits, and utilities of any nature crossing the proposed improvements, plotted and labeled.
- North Arrow and Graphic Scale.
- Stations shall be shown above each 100-foot station on 50-scale and 20-scale plans (i.e. 1+00, 2+00, etc.) and above each 500-foot station on 100-scale plans (i.e. 5+00, 10+00, etc.).
- Station direction shall be either south to north or west to east.
- Plans covering more than one sheet shall be cross-referenced on each sheet to identify the location of the adjacent profile or plan sheet. Match lines are acceptable in plan view with proper referencing station or adjacent sheet number.
- Centerlines of the installed water or sewer utility shall be referenced by dimensions to the easement boundary and/or associated property boundary.
- Bench marks shall be accurately plotted and labeled on the plan.
- Street names, houses, fences, and drives shall be shown for a minimum of 50 feet beyond right-of-way or the fronts of the houses for lines located in the street or rights-of-way.
- Trees, steps, walks, and other topographic features shall be shown to the extent that they may be pertinent to the improvement location or construction.
- Existing property lines, lot lines, easements, and other boundary lines shall be shown a minimum of 75 feet beyond any proposed or existing right-of-way.

In instances where additional information is required, the limit shall be extended.

- Existing ditches having a bottom width of 4 feet or less shall be indicated by drawing the centerline of the ditch. Ditches and channels having a bottom width greater than 4 feet shall be shown by Drawing each side of the ditch and noting its width.
- Street right-of-way widths shall be shown adjacent to and after the street name. For example: ROAD 50' R/W (if uniform width). ROAD (R/W varies) - with dimension if the width is not uniform.
- The phrase, "DO NOT DISTURB," shall be used to indicate existing conditions or facilities, which are to remain in place during construction.

### 3.3.3.2 Profile View

The information to appear in the profile view shall include, but not be limited to, the following:

- The grid shall be set up on a 1-inch square basis. The vertical scale for 50-scale plans shall be 1" = 5' and for 20-scale plans shall be 1" = 2'.
- The limits, by station, shall be shown for all encasements, tunnels, and bored segments.
- The type of backfill used, when not identified in the general notes, shall be placed directly above the profile grid with leader and arrow defining the limits of each type of backfield.
- The ASTM designation of pipe classification shall be shown below the pipe profile if different from the designation and classification shown in the General Notes, or Standard Specifications.
- The pipe material, size, and grade shall be indicated between all manholes. This information shall be parallel to and shown above smaller pipes; however, on pipes of sufficient diameter, this information should be placed inside the pipe. Grades shall be shown as a percent (i.e., 0.50%).
- Invert elevation shall be shown to the nearest hundredth of a foot and at the following locations:
  - All breaks in the grade
  - Breaks necessary for profile continuation onto another sheet
  - Center line of standard manholes with continuous grade
  - Conduits that are critical to the pipe gradient
  - Intersecting pipe
  - All locations necessary to substantiate the profile grade
  - Both pipe invert edges when there is a drop or slant inlet
- Proposed manhole rim elevation shall be shown to the nearest tenth (e.g. Rim El. 424.9+/-).
- The water surface elevations of ponding and/or 100 year flooding areas shall be shown.
- The flow line of all ditches deeper than one foot having impact on sewer depth or location shall be plotted and labeled.
- Existing/proposed ground profile.

- The finish floor elevation for the lowest point of a building to be drained via gravity flow to the sewer (i.e., basement) shall be shown on the plans. When an elevation cannot be obtained, the Engineer shall estimate an elevation and duly note this fact by using the word “*ASSUMED*” adjacent to the elevation.
- Drainage pipe and structures, swales, and ditches, where conflicts or crossings occur, drainage facilities should be shown.
- Any underground telephone conduit, water lines, gas lines, etc., shall be shown when crossing the proposed facility.

#### 3.3.4 DETAIL SHEET

Standard Drawings are drawings prepared by Okaloosa County Water and Sewer and furnished to the Design Engineer to incorporate into the final construction Contract Documents. These Drawings illustrate typical items of work (e.g. hydrant installations, deadman layout, etc.) and their requirements. These Standard Drawings are typically presented on a Detail Sheet at the end of the set of drawings.

It is not practical to expect a “Standard Detail” to be applicable for every situation that might arise. Therefore, for any proposed construction that is not covered in the “Standard Details,” Okaloosa County Water and Sewer shall request “Special Details.” The “Special Details” shall be produced by the Engineer and shall have sufficient detail to accurately depict the proposed construction. Junction chambers, special pipe bedding and railroad crossings are typical examples of items, which might require Special Details.

+++ END OF SECTION +++

## **SECTION 4**

# **FINAL RECORD DRAWINGS/AS-BUILTS**



**SECTION 4 FINAL RECORD DRAWINGS/AS-BUILTS**

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#### 4.1 PURPOSE

The intent of this section is to ensure that the Final Record Drawings/As-builts accurately depict the water and wastewater facilities as constructed.

#### 4.2 GENERAL

A record of all deviations from Okaloosa County Water and Sewer (OCWS) approved construction drawings shall be made by the CONTRACTOR. Where “as constructed” information differs from the original proposed information, the Engineer shall mark a line through the proposed information and add the corrected information near the crossed out original data. Original data shall under no circumstances be erased from the original plans. Changes must be sufficiently dark to ensure a quality image. NO RED LINE markings will be accepted.

Change identified on the Record Drawings shall be noted in the revision block and labeled as "As Constructed Changes" and further annotated as required in Section 3.

The Engineer of Record or Florida Registered Surveyor shall stamp and sign ALL SHEETS verified and submitted for Final Record Drawings.

#### 4.3 PROCESS

OCWS will notify the ENGINEER/CONTRACTOR that a particular project is ready for Final Record Drawings. The Engineer shall produce the Final Record Drawings and submit three copies of them to OCWS for review. OCWS' Engineer will review the submittal and verify the deviations noted. NOTE: The review process is to ensure compliance with OCWS' general guidelines and requirements, is only cursory, and in no way releases the Engineer from the liability of, or the responsibility for, his design. It is the Design Engineer's responsibility to accurately depict the facilities as constructed.

#### 4.4 FINAL RECORD DRAWINGS/AS-BUILT REQUIREMENTS

At a minimum, Final Record Drawings/As-Builts submitted to OCWS for consideration shall consist of drawing sheets (22" X 34") containing the following information:

- Title Block (See Section 3 of this Manual)
- North arrow
- Graphic scale
- Overall plan view of the project



- Manhole rim and invert elevations, elevations of buried valves, and fittings established by employing referenced datums (See Section 5 of this Manual)
- Pipe information (bearings and distances, depth of cover, percent slope and material type)
- Lateral information (location measurements from upstream manholes, perpendicular distance from the mainline, depth, and sizing of lateral, and measurements from property corners, lateral size, and material type)
- Casing information (Start and end points, thickness, size, material type, grade, length including beginning and endpoint, etc.)
- Property line and easement information (See Section 6 of this Manual)
- X, Y, and Z coordinates in state plane coordinates, as outlined in Section 5 of this manual, for all appurtenances installed including meters, manholes, fire hydrants, valves, etc.
- Single electronic copy of the final Record Drawings shall be submitted on compact disks in the latest version of AutoCAD (as outlined in Section 3).

Final acceptance will not be made until an approved set of record drawings is received by OCWS.

#### 4.5 SURVEYS

All as-built surveys shall be performed in accordance with Section 5 (Surveying), and referenced to Okaloosa County GIS Horizontal and Vertical Datums.

On-site project benchmarks shall be flagged during the survey.

Manhole rim elevations shall be determined in reference to a marked or painted spot on the rims.

Invert measurements shall be taken with a plumb rod whenever possible. Non-plumb rod measurements shall be corrected to reflect the actual vertical measurement.

Horizontal positions of As-Built improvements, which vary from plan locations, shall be noted.

#### 4.6 CERTIFICATION

The three sets of As-Builts submitted to OCWS shall be certified and bear the seal of an Engineer or Surveyor licensed in the State of Florida and shall contain the following statement:

“I, (Engineer’s Name), A LICENSED ENGINEER OR SURVEYOR IN THE STATE OF FLORIDA, CERTIFY THAT THIS AS-BUILT PLAN(S) OF THE WATER AND/OR SANITARY SEWER MAIN INSTALLATION OF (Project Name) IS CONSTRUCTED IN COMPLIANCE WITH THE OKALOOSA COUNTY WATER AND SEWER DEPARTMENT SPECIFICATION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

LICENSE NO. \_\_\_\_\_ (SEAL) \_\_\_\_\_

All As-Built surveys, which include improvements within easements across private property, shall require additional certification by a Registered Land Surveyor stating that all improvements are located within the easements and that improvements and easements are located correctly as shown.

#### 4.7 AUDIT OF RECORD DRAWINGS

OCWS reserves the right to randomly audit and confirm the accuracy of data submitted on Final Record Drawings through the use of a third party Land Surveyor. Any discrepancies revealed by the audit shall be resolved by the Engineer to the satisfaction of OCWS' Engineer and the third party Land Surveyor at no expense to OCWS.

+++ END OF SECTION +++



**SECTION 5**  
**SURVEYING**



**SECTION 5 SURVEYING**

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5.1 PURPOSE

This section describes the survey requirements for design, construction, and acceptance of water and wastewater system improvement project

5.2 GENERAL STANDARDS

Unless otherwise specified, all surveying activities, including the preparation of maps, plans, and other documents based on survey information, shall be performed in accordance with the “Minimum Technical Standards for Land Surveying in the State of Florida.” All data collected by the surveys shall be coordinated under the guidance and supervision of a Land Surveyor or Engineer registered in the State of Florida.

5.3 HORIZONTAL AND VERTICAL CONTROL

5.3.1 DATUMS

All projects submitted to Okaloosa County Water and Sewer (OCWS) for consideration shall be referenced to Okaloosa County Geographical Information Systems Horizontal and Vertical Datums. Horizontal datum shall be Florida State Plane Coordinate System, North Zone, NAD 83 – 90, Vertical datum shall be NAVD 1988.

The source for horizontal and vertical datum shall be the established Okaloosa County GIS monuments. This information shall be obtained from the Okaloosa County GIS Department.

5.3.2 PROJECT CONTROL POINTS

*5.3.2.1 Project Control Point Location*

Project horizontal and vertical control points shall be established in the vicinity of the project using generally accepted survey methods. These new points shall be set within the public right-of-way or easement limits, be located so as to avoid disturbance, and generally provide coverages of the entire project area.

*5.3.2.2 Project Control Marker*

Project horizontal and vertical control points shall consist of semi-permanent markers or objects recoverable by conventional survey metal detectors or by location reference points.



Points set in the ground in maintained areas shall be flush with the ground. Trees are not to be used for setting control points or references except where there is no practical alternative. No spikes, nails, etc., are to be driven into a tree, except under the above described circumstances. Trees shall not be “blazed” under any circumstances, and only water-based paint may be used if it is necessary to mark a tree.

It shall be the responsibility of the Project Engineer or Surveyor to maintain the required horizontal and vertical control points until final acceptance.

#### *5.3.2.3 Horizontal Control Points*

Project horizontal control may be established directly on system features (such as manholes, valves, etc.), by APS observation, or by the use of traditional survey control points and/or baselines. A minimum of two inter-visible points shall be required to monument the horizontal datum.

#### *5.3.2.4 Vertical Control Points*

Project vertical control shall include a minimum of two points, one near each end of the project, or one point per 1000 feet  $\pm$  for larger projects.

### 5.4 HORIZONTAL AND VERTICAL ACCURACY

New project horizontal control points shall be established with positional accuracies of 1:5000. New project vertical control points shall be established with level run closures of  $\pm 0.005'$  X (distance in miles)<sup>1/2</sup> or the equivalent.

Horizontal and vertical accuracies for alignment data (coordinates, bearings and distances, elevations, etc.) are the same as for control points. Horizontal locations of topographic and planimetric features shall be accurate to within  $\pm 0.5$  feet. Vertical locations of structures and map features shall be  $\pm 0.01$  ft for artificial features and  $\pm 0.10$  feet for natural features.

### 5.5 INFORMATION SHOWN ON THE PLANS

All horizontal, vertical, and other information critical to the design and construction of the improvements shall be shown on the plans. Such data and information shall include, but not be limited to the following:

- Notes identifying the horizontal and vertical datums and monuments on which they are based shall be shown on the plans and other applicable documents. References to other pertinent datums related to the project, such as previous survey, design, or construction datums, shall be identified by notes, including conversion factors relating to the datum.
- Locations, descriptions, coordinates and/or elevations of new project control points and associated reference points.
- Alignment data of the improvements, including coordinates, bearings and distances, elevations, final stations, offsets, and curve data.

- Offset distances to parallel features (such as roads, railroads, ditches, sidewalks, R/Ws, easement limits, etc.) within 30 feet of the improvement alignment.

## 5.6 ADDITIONAL DATA AND INFORMATION

It may be necessary to obtain and provide additional data and information critical to the design and construction of the improvements. Such data and information may include, but not be limited to, that described in the following sections.

### 5.6.1 FIELD PROFILES

Profile elevations along the improvement alignment shall be obtained at approximately 50 - 100 ft intervals with intermediate grade breaks or sufficiently spaced to accurately depict the terrain. Profile drawings shall delineate all existing improvements, structures, roads, ditches, streams, etc., within 25 feet of the improvement alignment, with notes regarding size, type, and description of such feature.

### 5.6.2 CROSS-SECTIONS TOPOGRAPHY AND PLANIMETRY

Cross-sections or topography and planimetry may be necessary at critical locations to evaluate alignment, slope, and excavation requirements. All cross-sections, topography, and planimetry critical to the improvement design shall be shown on the plans or other documents.

Topography generated from aerial photography shall be clearly identified as such, with notes regarding date of photography, original mapping scale and contour intervals, and datum references. The accuracy and completeness of this work is the sole responsibility of the Engineer or Land Surveyor even though obtained from other sources. Field checks and supplemental field topographic surveys may be required as necessary.

### 5.6.3 UTILITIES

Information regarding all publicly and privately owned surface and subsurface utilities affecting the proposed improvements shall be shown on the plans. This information shall be obtained by field surveys of existing utilities located by the Utility Owner and existing maps that may be supplied by the utilities.

### 5.6.4 HIGHWAYS AND RAILROADS

When portions of the improvements are within railroad or road right-of-ways, topography and planimetry shall be provided as necessary for the design and construction of the improvements or as required by the affected reviewing agency

### 5.6.5 EXISTING RIGHTS-OF-WAY, EASEMENTS, AND PROPERTY LINES

Where the location of the improvements in relation to the existing features such as rights-of-way, easements, and property lines is critical to the design or construction, sufficient information shall be shown to correctly establish the location of such features. Notes

regarding the source of such information, and the name and address of OCWS or owning agencies shall also be shown. Existing monumentation, pertinent improvements and evidences of prescriptive use within the project limits shall be shown.

Where improvements are located within Florida Department of Transportation (DOT) right-of-ways, Engineer shall identify and reference on the drawings the specific DOT roadway name, stationing, and centerline offsets. Drawings shall show the station identification and offsets every 50 feet or more as needed.

#### 5.6.6 SANITARY SERVICE CONNECTION SURVEY

Where existing housing is present along the site of a proposed sewer extension or replacement, a sanitary service connection survey shall be conducted. The survey shall determine the controlling elevations for design. The following information shall be shown.

- Type of structure
- Basement facilities (if present)
- Size, type, and location of existing service lateral
- Elevation of the lowest possible living area floor
- Any additional information that may be required for design of the sewer line

All elevations should be determined by actual field measurements; however, if a unit cannot be entered, an estimated lowest living area floor elevation shall be made from a known elevation from some other point on the unit. In this case, the elevation must be clearly marked as being estimated. Should an estimated elevation control or have the potential to control the vertical elevation of the sewer, OCWS' Engineer shall arrange provisions for entry and actual determination of service elevation.

+++ END OF SECTION +++

**SECTION 6**  
**EASEMENTS**



**SECTION 6 EASEMENTS**

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6.1 PURPOSE

The purpose of this section is to provide guidelines for developing easement documents required as part of a water or wastewater improvement project.

6.2 GENERAL

All proposed sanitary sewer or water distribution system improvements must be constructed in public rights-of-way, platted or deeded easements, or Okaloosa County Water and Sewer (OCWS) owned property.

6.2.1 ACQUISITION

Easements will generally be acquired by plat recorded utility easement, or by deed. In any case, it should be clear from the wording of the dedication or the description that the intent is to convey a utility easement rather than a fee parcel, and that the rights of the use include constructing, operating, maintaining, and accessing the facility or appurtenances.

6.2.2 LOCATION

Whenever possible, easements shall be strips of uniform width located along and parallel with existing boundary or easement property. Without running along a boundary, the easement should be located so as to minimize interference with other property rights. Easement widths and location shall be approved by OCWS prior to conveyance.

It should also be clear as to the dimensions, length width, area, and location of the easement, as well as the specific use (water, sewer, general utilities) and whether the easement is permanent or temporary.

6.2.3 CERTIFICATION CRITERIA

All easement documents (plats or descriptions) not prepared by OCWS shall be prepared under the supervision of a Florida Registered Land Surveyor and shall be in accordance with "Minimum Technical Standards for Land Surveying in the State of Florida" and with Section 5 (Surveying) of this manual.

6.2.4 RESTRICTIONS

Proposed easements that are partially or wholly within existing easements shall not be accepted without the permission of the existing easement Owner.



No structures, either existing or proposed, shall be permitted within an easement without prior approval of OCWS.

Easements shall not be vacated without a reversion clause in the original conveyance, or without an officially recorded act of abandonment by OCWS and the property Owner.

Utility easements provided to serve multi-family dwellings, or a single family development that includes OCWS maintained water and sewer utilities shall stipulate in the recorded easement document that the Owner or the Developer shall be responsible for repair or restoration of pavement, sidewalks, landscaping, and drainage facilities.

### 6.2.5 SCHEDULE

Project schedules shall be established as to allow sufficient time for easement acquisition whether obtained by OCWS or the Developer. In the case of off site easements, approval for construction shall not be provided without the proper easements in place. Easement location and requirements shall be determined as early as possible.

## 6.3 EASEMENT WIDTHS

Whenever possible, the total easement width (permanent and temporary) should be sufficient to permit the Contractor to have flexibility in the method of construction. Minimum widths of Sanitary Sewer, Water Distribution, and Temporary Construction Easements using trench construction are tabulated below; however, in no case shall these guidelines be a substitute for sound engineering judgment.

| SIZE OF MAIN | Permanent Easement <sup>1</sup>    |                                    | Temporary / Construction Easement <sup>1</sup> |
|--------------|------------------------------------|------------------------------------|--|
|              | Water Distribution                 | Sanitary Sewer                     | Water Distribution/Sanitary Sewer              |
| 4" - 6"      | 3 x depth of pipe<br>(15 ft. min.) | 3 x depth of pipe<br>(15 ft. min.) | 15' on each side of permanent easement         |
| 8" - 12"     | 3 x depth of pipe<br>(15 ft. min.) | 3 x depth of pipe<br>(15 ft. min.) |  |
| Other        | As required by OCWS                | As required by OCWS                | As required by OCWS                            |

<sup>1</sup> Permanent and Temporary/Construction easement widths are subject to site conditions. Okaloosa County Water and Sewer reserves the right to request easement widths greater than the minimum illustrated in the table above if site conditions require.

## 6.4 PLATTED EASEMENTS

Plats shall clearly show easement widths, lengths, dimensions, areas, specific use, and location in relation to plat or lot boundary lines. A statement of dedication to OCWS shall be shown on the plat, and shall include any restrictions of use not otherwise shown.

## 6.5 DEEDED EASEMENTS BY DOCUMENT

Easements not obtained by platting shall be acquired by recorded utility easements or deeds. When acquired for OCWS by the Developer, OCWS shall be furnished with one original and one copy of the recorded documents. When the easements are to be acquired directly by OCWS, the Engineer shall provide OCWS with necessary owner information and shall submit a legal description and easement location sketch.

### 6.5.1 LEGAL DESCRIPTION

For easements not obtained by OCWS, a legal description shall be prepared by a Land Surveyor registered in the State of Florida. The legal description shall include pertinent information including but not limited to:

- Project title
- Creation date
- Revisions dates
- Name and address of grantor
- Grantor's tax parcel ID number
- Recording information for parent parcel

### 6.5.2 EASEMENT LOCATION SKETCH

An easement location sketch shall be prepared on 8½ X 11" or 11" X 17" paper to accompany the legal description. The sketch shall include a project title, date, and revisions dates corresponding to the legal description. Also included are the following:

- North arrow and graphic scale
- Proposed easement widths, lengths, dimensions, areas, and locations in relation to property lines.
- Type of easement (permanent or temporary)
- Specific use of easement (water, sewer, general utilities, etc.)
- Parent parcel Owner's name, address, tax parcel ID number, and recording information (recorded utility easement or deed or plat book and page numbers)
- Any existing or proposed structures within the easement
- General location references to section, township and range, or recorded plats
- Any existing easements or rights of way including owning agency, R/W widths, road names, and source information
- Easement location sketches should contain enough information to enable a Land Surveyor to locate and stake the easement in the field.

#### 6.6 EASEMENT ENCROACHMENT

On occasion, a permanent structure or landscaping is found to be encroaching upon an existing easement. In such cases, OCWS shall review each encroachment on a case-by case basis. If OCWS' Engineer deems it acceptable, the Owner shall prepare a drawing depicting the location and description of the encroachment. The Drawing shall be suitable for recording and meet the requirements of easement location sketches as outlined in this section. The Owner shall also complete the latest revision of the "Owner Information Sheet for Hold Harmless Agreement for Encroachment into OCWS Easement," which may be obtained from OCWS.

#### 6.7 PROPERTY SERVICE CONNECTION EASEMENT

Occasionally, a sanitary sewer may be located such that the permanent easement does not extend to the property line of an adjacent property to be served with a proposed property service connection. This occurs due to topographic or geographic considerations such as parallel streams. In these instances, a 10 foot sanitary sewer and water easement shall be provided from the proposed service facility easement to the property line at the most likely location of the property service connection. Sufficient temporary construction easement shall also be provided.

#### 6.8 FIELD VERIFICATION

When required by OCWS, the Engineer shall field stake all existing utilities, existing and proposed easements, related property lines, and other pertinent structures to clearly establish location.

+++ END OF SECTION +++

**SECTION 7**  
**WATER DISTRIBUTION**



**SECTION 7 WATER DISTRIBUTION SYSTEMS**

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7.1 PURPOSE

This Section establishes the minimum standards and technical design criteria for water distribution systems within Okaloosa County Water and Sewer (OCWS) service area. Adherence to these standards will expedite review and approval of plans. Hydraulic design principles presented herein represent acceptable procedures. Any departure from these design requirements should be brought to the attention of OCWS Engineer and discussed prior to submission of plans for approval. Such departure shall be documented and justified.

7.2 RECLAIMED/REUSE WATER PIPING SYSTEMS

The requirements of this section shall also pertain to reclaimed/reuse water piping systems, with the exception that the piping shall be colored Panetone Purple No. 5-22C as required by FDEP.

7.3 GENERAL LOCATION CRITERIA

7.3.1 WATER MAIN LOCATION

Whenever possible, water mains in subdivision construction projects shall be located in the street right-of-way. If the water main is installed parallel to a state road or highway, the water mains shall be located outside of State right of ways in dedicated easements. However, if OCWS determines that it is not practical to locate the mains outside of the State right of ways, then OCWS may approve location in Street right of way on a case-by-case basis. If OCWS' Engineer determines that it is not practical to locate water mains in the street right of way, then the main shall be located in an easement dedicated solely for the water utility service.

*7.3.1.1 Installation in Right-of-Way*

When installed in rights-of-way, water mains shall be located a minimum of five (5) feet behind the curb opposite the sidewalk and sanitary sewer. Fire hydrants are to be on the same side of the road as water line. The water mains shall maintain a consistent alignment with respect to the centerline of the road. This distance shall be clearly indicated on the design drawings submitted for review and approval. Reference standard drawings for the typical location and layout of water mains within the Right-of-Way.

#### *7.3.1.2 Installation in Dedicated Easement*

All water mains located outside of dedicated rights-of-way shall be centered within a minimum 15-foot easement. In such cases, no water main shall be located within five (5) feet of utility structure or ten (10) feet of any permanent structure. At OCWS's discretion, additional easement widths and/or water main/structure separation shall be provided when the pipe size or depth of cover so dictates.

If a water main is located adjacent to a road right-of-way, a minimum 10-foot easement may be provided upon the review and approval of OCWS Engineer. If a 10-foot easement is granted adjacent to the road right-of-way, the main shall be positioned such that there is a minimum of five (5) feet from centerline of pipe to edge of easement, opposite road right-of-way. Water mains shall not be placed under retention ponds, tennis courts, or other structures, unless approved by OCWS. If approval is granted, restrained joint ductile iron pipe shall be required as directed by OCWS.

#### *7.3.1.3 Installation Along Lot Lines*

In general, water mains shall not be located along side or rear lot lines of properties. Water mains along a lot line may be allowed on a case-by-case basis provided that such a configuration will result in improved network circulation. In such cases, the water mains shall be located in a dedicated easement.

### 7.3.2 WATER LATERAL LOCATION

OCWS' inspector shall provide direction for the layout of tap locations using his best judgment. Typically, service taps and laterals shall be located within a distance of 3 feet from property lines and outside the limits of sidewalks and driveways. Laterals shall terminate at the back side of right of way or easement lines or right of way if same. See detail. Lot corners, easements, ditches, sidewalks, driveways and back of curb must be staked before the water laterals are laid. Each individually platted lot shall have its own lateral.

### 7.3.3 FIRE HYDRANT LOCATION

The Governing Fire Authority is the final authority regarding number of hydrants and their spacing. The following guidelines shall be used to locate the hydrants required.

Fire hydrants shall be located, if possible, on property lines, within the right-of-way or easement or the proposed street, two (2) foot, more or less, from the back of the easement or right-of-way line if same fire hydrants shall be installed on all dead end lines 6-inches or greater. Hydrants shall be located on the same side of the street as the water line, and typically on the same side of the street or intersection that does not conflict with storm sewer piping, utility structures, or sidewalks. Maximum spacing for residential subdivisions is 660 feet and for commercial establishments is 300 feet driving distance from the furthest point of the structure.

Hydrants shall be placed at lot lines or in general to minimize potential conflict with future building plans.

#### 7.3.4 VALVE LOCATION

Valves shall generally be located on property lines and/or right-of-way lines and at the radius points of intersections. In general, valves shall be located behind the back of curbs or edge of pavement.

##### *7.3.4.1 Commercial and Residential Areas*

Sufficient valves shall be provided on water mains so that inconvenience and sanitary hazards can be limited during repairs. Valves shall be located at every intersection of a grid and at not more than 800-foot intervals.

As a general rule, valves 8 inches and less, shall be spaced along a main a minimum distance in feet of main diameter in inches times 100 (i.e., a 6 inch main would need a valve every 600 feet).

##### *7.3.4.2 Cul-de-sac*

Isolation valves are required at the intersection of the beginning of a cul-de-sac.

##### *7.3.4.3 Dead End Street*

Valves shall be required at the end of each dead end street or road, which could be extended in the future. The valve at a dead end shall be properly restrained joint pipe in order to allow future extension without disruption of service. Thrust blocks or rodding are not acceptable. No taps or service laterals will be allowed between said valve and plug (this will prevent service disruptions when the main is extended).

#### 7.3.5 METER AND VAULT/METER BOX LOCATION

Meters shall be centered in the vault or meter box to allow for reading and ease of removal or maintenance. Large meters, 3 inches and greater, shall be installed at a location acceptable to OCWS and adjacent to the property boundary. At a minimum, a space of 10 feet by 16 feet of graded site shall be provided to locate the meter and box. The site shall be located outside the limits of any drainage facilities or parking lots, and in a well drained accessible location.

### 7.4 DESIGN CRITERIA

Water distribution systems shall be designed to satisfy the ultimate tributary population's domestic/commercial water demand and fire protection requirements for the ultimate population to be served by the proposed line.

#### 7.4.1 FIRE FLOW REQUIREMENTS

It is the responsibility of the Developer's Engineer to coordinate with the local authorities having jurisdiction to ensure that fire flow requirements are met.

#### 7.4.2 DESIGN CALCULATIONS

If requested by OCWS, the Developer's Engineer shall submit signed, sealed, and dated design calculations along with the construction plans for the water distribution projects. Calculations shall show the water mains having sufficient hydraulic capacity to transport peak hourly flows and the combination of maximum daily fire flows while meeting the requirements of this section. Designed daily flow velocities shall not exceed 5 feet per second. Peak hour maximum daily flow velocities shall not exceed 10 feet per second anywhere in OCWS' system.

#### 7.4.3 PRESSURE AND FRICTION LOSS

All water mains shall be designed in accordance with this Section. The system shall be designed to maintain a minimum pressure of 20 psi at all points in the distribution system under all conditions of flow. Higher pressures may be required at commercial, industrial and high-density residential areas. Design Engineer is responsible for monitoring and measuring the normal working pressure at the point of connection of the new water line. Monitoring shall be performed for a minimum of 24-hours. Contact OCWS to coordinate location of connection to the system. For pressures greater than 75 psi, the Design Engineer may need to make special provisions (e.g. pressure reducing valves).

Friction losses through water mains shall be based on the Hazen and Williams formula. In the use of Hazen and Williams formula, the value for "C" shall be 120 for ductile iron pipe and 130 for PVC pipe. "C" values greater than 130 shall not be allowed.

#### 7.4.4 DIAMETER

Only 4", 6", 8", 10", and 12" diameter water mains shall be permitted (larger sizes shall be considered on case-by-case basis). Four (4) inch water mains shall be permitted only in dead end or cul-de-sac areas with a maximum length of 300 feet of pipe. As a minimum, six (6) inch diameter gridded or looped systems shall be required in low-density residential projects. In commercial, industrial, and high-density residential areas, eight (8) inch minimum gridded or looped mains shall be required. Larger size mains shall be required to allow the withdrawal of the required fire flow while maintaining the residual pressure specified. Fire protection water mains shall be installed as follows:

No fire main servicing a fire hydrant (public or private) shall be less than six (6) inches in diameter.

For systems containing mains less than eight (8) inches in diameter, OCWS may require the Design Engineer to submit a complete hydraulic analysis of the system. This submittal does not relieve the Design Engineer of responsibility for his design. He shall

be responsible for ensuring that all elements thereof that supply water to hydrants and/or building fire protection systems can supply the required fire flow without exceeding the prescribed velocity.

7.4.5 ALLOWABLE DEFLECTION OF PVC C-900 and DUCTILE-IRON PIPE JOINTS

The maximum allowable deflection for ductile iron pipe shall be as given in AWWA C600. If the alignment requires deflection in excess of the above limitations, bends shall be furnished to provide angular deflections within the limit set forth. Joining of PVC pipe should be in accordance with ASTM D2321

Typical Maximum Deflections for PVC C-900 and Ductile Iron Pipe

| Size<br>Inches | Nominal Laying<br>Length<br>Feet | Maximum Recommended Deflection |                         |
|----------------|----------------------------------|--------------------------------|-------------------------|
|                |                                  | PVC-<br>C-900                  | DIP<br>Deflection Angle |
| 4              | 20                               | 3.5                            | 3                       |
| 6              | 20                               | 3.5                            | 3                       |
| 8              | 20                               | 3.5                            | 3                       |
| 10             | 20                               | 3.5                            | 3                       |
| 12             | 20                               | 3.5                            | 3                       |

7.4.6 FLANGED PIPE

Flanged pipe shall only be installed above ground or with the flanges in valve pits. Bolts shall be 316 stainless steel. Gaskets shall be Toruseal or equal.

7.4.7 FIRE HYDRANTS

7.4.7.1 General

This section provides the minimum requirements with regard to spacing. The local authority having jurisdiction may establish more stringent requirements regarding placement and interval of spacing.

All fire hydrants shall be located as shown on the plans. The hydrants shall be located in such manner as to provide complete accessibility and also in a manner that the possibility of damage from vehicles or injury to pedestrians will be minimized. All hydrants shall stand plum with the pumper nozzle facing the curb and the bury line of the hydrant at the finished grade. Fire hydrants installed in state highway right-of-ways shall be in accordance with any Department of Transportation requirements. All fire hydrants shall be connected to the main in the manner shown in the Water Standard Detail Sheet. Also, where present, the retaining chains and swivel clips for the fire hydrant port caps must turn freely. The chains must be untangled and the swivel serving the cap must operate without hindrance.

*7.4.7.2 Installation*

A 6" Mechanical Joint (M. J.) hydrant connection shall be provided using a 6" M.J. tee with megalug restraining gland. Acceptable grade for all fire hydrants shall be interpreted as center line nozzle heights of no less than 18" and not more than 24" above top of back of curb or sidewalk, whichever is closest to hydrant.

*7.4.7.3 Single-Family Residential*

The spacing between hydrants in a residential area shall not exceed 660 feet along public streets or approved fire routes. Fire routes shall be as defined by the local governing authority. In a cul-de-sac, a fire hydrant shall not be more than 300 feet from the last lot.

*7.4.7.4 Multi-Family Residential/Commercial*

The spacing between fire hydrants in a commercial area shall not exceed 300 feet along public streets or approved fire routes. Fire routes shall be as defined by the local governing authority.

*7.4.7.5 Obstacle Clearance*

For fire fighting capability, fire hydrants shall be located a minimum of 50 feet from the structure to be protected.

Where a hydrant is located in a congested area, a minimum 15 foot clearance shall be provided and maintained from the hydrant ports and any obstacle (i.e. utility poles, fencing, landscaping, or similar obstruction). Such clearance is required in order to minimize the potential for damage to the surrounding property during periodic flow testing or flushing.

7.4.8 DEAD ENDS

In order to provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins whenever practical, as determined by the Department. Where dead-end mains occur, the main shall be reduced to a four (4) inch diameter pipe after the last fire hydrant in an effort to reduce the potential for stagnant water.

7.4.9 MAIN TERMINUS EXTENSIONS

At the terminus of a main to be extended, the Engineer shall install an isolation valve and a sufficient amount of piping to restrain the valve. The table below lists the minimum length of piping required to restrain the isolation valve for various sizes of main.

| SIZE OF PIPE | MINIMUM LENGTH OF PIPING REQUIRED TO RESTRAIN ISOLATION VALVE |
|--------------|---|
| 4" - 6"      | 1 JOINT OF PIPING (APPROXIMATELY 20 FT.)                      |
| 8" - 12"     | 2 JOINTS OF PIPING (APPROXIMATELY 40 FT.)                     |
| >12"         | AS DIRECTED BY THE OCWS ENGINEER                              |

7.4.10 SEPARATION OF WATER AND SEWER MAINS

Water mains that are laid in the vicinity of existing or proposed pipelines designated to carry treated or untreated wastewater shall meet the horizontal and vertical separations as follows.

Extreme care should be exercised when designing water mains at or near certain sites such as sewage treatment plants or industrial complexes. No water pipe shall pass through or come in contact with any part of a sanitary sewer manhole.

*7.4.10.1 Horizontal Separation*

**NORMAL CONDITIONS:** Water mains shall be located at least 10 feet horizontally from gravity and/or force mains carrying treated or untreated wastewater or current DEP Standard. The distance shall be measured from inside edge of pipe to inside edge of pipe.

**UNUSUAL CONDITIONS:** When local conditions prevent a horizontal separation of 10 feet, a water main may be laid closer to a pipe carrying treated or untreated wastewater provided that the bottom of the water main is at least 18 inches above the top of the pipe carrying treated or untreated wastewater and the water main is laid in a separate trench or on an undisturbed earth shelf or current DEP Standard.

*7.4.10.2 Vertical Separation*

**NORMAL CONDITIONS:** Water mains shall be laid to provide a separation of at least 18 inches between the bottom of the water main and the top of the sewer or current DEP Standard.

**UNUSUAL CONDITIONS:** When construction conditions at crossings prevent a vertical separation of 18 inches as described herein above, the sewer pipe shall be constructed of ductile iron pipe centered a minimum of 10 feet in both directions from point of crossing or current DEP Standard. The pipe joints on bottom shall be constructed to maximize spacing from crossings. Should it become necessary for the sewer to cross over the water main, special precautions will be required. Such cases shall require review and written approval by County.



#### 7.4.11 WATER MAIN/ SEWER CROSSING

Ductile iron pipe shall be used at all line crossings. The ductile iron pipe shall extend 10 feet on either side of the crossing and shall maximize joint spacing. Whenever possible, water mains shall cross above sewer mains unless the previously described upgrades are enacted. Adequate structural support for both the water main and the sewer mains shall be provided to prevent excessive deflection of joints and settling. Ten (10) foot horizontal separation of water mains and storm drains is required, otherwise upgrade water main as previously specified until separation is regained.

#### 7.4.12 WATER MAIN/STORM WATER CROSSING

Ductile iron pipe shall be used at all line crossings. The ductile iron pipe shall extend 10 feet on either side of the crossing and shall maximize joint spacing. Whenever possible, water mains are allowed to cross over drainage pipes as long as minimum 36" of cover from top of pipe to the finish grade (i.e., top of back of curb) and a minimum separation of 12 inches below the pipes is maintained. Where it is not possible to lay the water line go over the top of drainage pipes and maintain the required cover, the water main can be laid under drainage pipe by utilizing ductile iron mechanically restrained offset fittings. No water main shall pass through or come in contact with a storm drain pipe or manhole.

A minimum separation of 12 inches or greater as prescribed by governing authority, shall be maintained between the water line and the drainage pipe. The minimum cover for the water line shall be 36 inches.

#### 7.4.13 WATER SERVICE

With the exception of cul-de-sacs, water service shall, if at all possible, run perpendicular to the water main. Each individually platted lot shall have its own lateral.

#### 7.4.14 WATER SERVICE SIZE AND MAXIMUM NUMBER OF WATER METERS

The maximum number of meters for 3/4 inch and 1 inch laterals is presented in the table below.

| LATERAL PIPE SIZE<br>(INCHES) | MAXIMUM NUMBER METERS SERVED |                |
|-------------------------------|------------------------------|----------------|
|                               | 3/4" METERS                  | (or) 1" METERS |
| 3/4                           | 1                            | N/A            |
| 1                             | 2                            | 1              |

#### 7.4.15 THRUST RESTRAINT

Plugs, caps, tees and vertical or horizontal bends, on water lines 4 inches in diameter or larger, and fire/flush hydrants shall be provided with thrust restraints. Valves shall be securely anchored or shall be provided with thrust restraints to prevent movement.

Thrust restrains shall be restrained joint piping and fittings. The use of concrete blocking will be reviewed on a case-by-case basis.

#### *7.4.15.1 Mechanically Restrained Pipe and Fittings*

Mechanically restrained joints shall be installed at all connections, any bend, tee, fire hydrant, and dead end valve. The Design Engineer shall calculate and clearly call out on the plans the restrained length of pipe in order to accomplish the desired goal.

#### *7.4.15.2 Thrust Blocks*

Thrust blocks may be used in conjunction with the mechanical thrust restraint for fire/flush hydrants. In such cases, blocks must be constructed per Standard Drawings and be inspected by OCWS's personnel prior to pouring.

Thrust blocking shall be concrete of a mix not leaner than: 1 cement, 2 ½ sand, 5 gravel; and having a compressive strength of not less than 3,000 psi after 28 days. The base and thrust bearing sides of thrust blocks shall be poured directly against undisturbed earth. The sides of thrust blocks not subject to thrust may be poured against forms. The area of bearing shall be as illustrated in the standard detail drawing. Blocking shall be placed/poured to prevent concrete from obstructing the fitting joint so that the fitting joints will be accessible for repair. Note: Calcium chloride additives are not allowed in deadmen due to their corrosive properties on threaded rods and piping.

### 7.4.16 OPERATION OF EXISTING WATER DISTRIBUTION FACILITIES

Unless prior approval has been obtained, the operation of ANY valve on the existing public distribution system shall be restricted to OCWS' personnel ONLY.

### 7.4.17 TRENCH PREPARATION

#### *7.4.17.1 General*

It is the responsibility of the Contractor to maintain a safe working environment and comply with OSHA Code of Regulations Part 1926 (latest revision).

#### *7.4.17.2 Excavation*

A trench shall be opened so that the pipe can be installed to the alignment and depth required. It shall be evacuated only so far in advance of pipe laying as necessary. The trench shall be excavated to the depth required so as to provide a uniform and continuous bearing support for the pipe on undisturbed ground. Bell holes shall be provided at each joint to permit jointing to be made and inspected properly.

During excavation, if ashes, cinders, muck or other organic material considered unstable is uncovered at the bottom of the trench at subgrade, it shall be removed and replaced with approved material for a depth not less than 12 inches. This

material shall be tamped in layers of 6 inches to provide a uniform and continuous bearing characteristic of that area's soil condition. Where the bottom of the trench at subgrade consists of unstable material to such a degree that it cannot be removed and replaced with an approved material to support the pipe properly, a suitable foundation shall be constructed. Excavated material shall be piled in such manner that it will not endanger work, obstruct natural watercourse, sidewalks or driveways.

Fire hydrants and valve boxes or other utility controls shall be left unobstructed and accessible at all times. Street gutters shall be kept clear or other satisfactory provisions made for street drainage. All surface material, which is suitable for reuse in restoring the surface, shall be kept separate from the excavated materials.

#### *7.4.17.3 Sheet piling and Bracing*

Open cut trenches shall be sheeted and braced as required by OSHA Code of Regulations Part 1926 (latest revision) and as may be necessary to protect life, property, or the work. Trench bracing may be removed after the backfilling has been completed or has been brought up to such an elevation as to permit its safe removal. A trenching box may be used in place of sheet piling and bracing as long as said box is in compliance with above referenced OSHA Code.

#### 7.4.18 DEWATERING

Water shall not be allowed in the trench at any time. An adequate supply of well points, headers, and pumps, all in first class operating condition, shall be used to remove the ground water. The use of gravel (angular stone/57 stone) and pumps shall also be an acceptable means of removing the water on a case-by-case basis as approved by the Department. At no time shall any pumps emit an unacceptable noise level that exceeds the County's ordinance, or the Contractor will be required to shut down pumping operations.

The trench shall be excavated no more than the available pumping facilities are capable of handling. The discharge from pumps shall be routed to settling basins or other acceptable erosion and sedimentation control devices prior to discharging to natural or existing drainage channels or storm sewers. Any and all permits required for dewatering are the responsibility of the Contractor and shall be obtained prior to commencement of construction.

The Department reserves the right to require the submittal of a dewatering plan in instances where complexity of the project dictates. When requested, the plan shall be designed and stamped by a Licensed Engineer registered in the State of Florida.

## 7.4.19 PIPE LINE CONSTRUCTION

### *7.4.19.1 Pipe Laying*

All water mains, service lines and appurtenances shall be installed as specified in these technical provisions and in accordance with the approved plans and appropriate standard detail sheets as provided herein.

The bottom of the trench shall not be excavated below the specified grade. If undercutting occurs, the bottom of the trench shall be brought up to the original grade with approved material, thoroughly compacted as directed by OCWS Engineer and/or his representative.

Before placing pipe into the trench, the outside of the spigot and the inside of the bell shall be wiped clean and dry before applying lubrication. Every precaution shall be taken to prevent foreign material from entering the pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.

All mechanical joints shall be made up in strict accordance with the manufacturer's specifications. Gaskets shall be evenly seated, the gland placed in position with the bolts, and evenly tightened.

All slip joints shall be made up in strict accordance with the manufacturer's specifications. The bell shall be carefully cleaned and lubricated before the gasket is inserted.

After placing a length of pipe in the trench, the spigot end shall be centered in the bell, the pipe forced home, and brought to correct alignment per the manufacturer's recommended installation procedures.

Water mains will be installed with 36" minimum cover. Maximum cover of 42" will be accepted. Cover depths will be determined from top of pipe to the top of finished landscaping grade as indicated on the plans. Exceptions to stated depth requirement include those portions of water main within casings or those portions that go over or under storm drains, sanitary sewers or other utilities as shown on plans.

In those cases where depth differences are extreme or other circumstances prevent the use of offset fittings, properly restrained M. J. 45° bends can be used in conjunction with ductile iron pipe. Alignment and depth of pipe will be spot checked during construction and/or "As-Built" inspections.

At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug or other approved means. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

#### *7.4.19.2 Backfilling*

All backfilling material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks, stones or other material which is considered unsuitable. Materials that are considered unsuitable must be disposed of off site in compliance with all pertinent codes of City State, County, and Federal regulatory agencies. The Contractor shall not backfill any fitting, thrust block restrainer gland, valve, hydrant assembly and/or meter/backflow assembly until such appurtenances have been inspected in place by a designated representative of OCWS or unless approved by OCWS. All such inspections shall be scheduled two (2) working days in advance.

#### *7.4.19.3 Valves and Fittings*

All valves and fittings shall be set and joined to the pipe in the proper location as specified in the plans. A roadway valve box shall be provided for every valve. This valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve. The box cover should be flush with surface of the finished pavement or grade level as specified in the plans.

A bronze or stainless steel 2" diameter disc shall be cast into the pad for all valves 12" or larger. Valve nomenclature to be stamped into the disc shall include the valve manufacturer/model, the year produced, the valve size, type, number of turns, and direction to open the valve. The Design Engineer shall clearly label the requirement for this marker on the approved construction plans.

### 7.4.20 ENCASEMENT REQUIREMENTS

#### *7.4.20.1 General*

Encasement is required when crossing all railroads, and some State, County and City roadways, which have excessive traffic flow or other critical situations (such as protecting building foundations). Whenever possible, encasement and mains shall cross the roadway and/or railroad, perpendicular to the roadbed. A valve will be required on each end of the encasement. In all cases, the agency requiring the encasement shall have the final approval of the engineering design.

#### *7.4.20.2 Encasement Pipe*

Pipe to be installed under pavement where open trenching is not permitted shall be installed through steel casing, which has been jacked and bored. Casing shall extend beyond the back of slope or edge of pavement a minimum of 6 feet, whichever is greater.

#### *7.4.20.3 Encasement Spacers*

Water mains shall be pushed or pulled through the encasement piping on spacers placed no more than 10 feet apart. A minimum of two spacers/runners per joint of pipe shall be required. The spacer shall have a clearance range of 1 to 1.5 inches between the spacer and the inside of the encasement piping. Spacers shall be

required in the first foot of each end of the encasement (See Miscellaneous Detail 120).

7.4.20.4 Encasement Ends

All casing ends shall be sealed with an engineered end sealing device.

7.4.21 CROSS CONNECTION CONTROL

The water purveyor (OCWS) shall require all privately maintained water systems, at their expense, to install an approved backflow prevention assembly. The selection, location, and installation of the device shall be based on OCWS' "*Cross-Connection and Backflow Prevention Policy*" (latest revision), which may be obtained from OCWS.

7.5 MATERIAL REQUIREMENTS

7.5.1 INSPECTION OF MATERIALS

All materials delivered to the job site will be new and of domestic origin. All materials are subject to inspection by the Department's representative. Any materials found during inspection or during the progress of the work to be defective or not meeting specifications shall be rejected and removed from the job site without delay. Materials and/or work not inspected by OCWS' representative prior to installation may be required by OCWS to be uncovered by the Contractor at his expense in order to verify compliance. Copies of the Packing Lists shall be furnished on demand.

7.5.2 PIPE

7.5.2.1 Ductile Iron Pipe

Ductile iron pipe shall be in accordance with ANSI A21.50/AWWA C150 and conform to requirements of A21.5/AWWA C 151. Push-on and restrained joint pipe shall have a minimum rated working pressure of 350 psi. All buried pipe shall be pressure class as follows:

| SIZE (INCHES) | PRESSURE CLASS          |
|---------------|-------------------------|
| 4 – 12        | Class 350               |
| >12           | As Directed by Engineer |

Pipe wall thickness shall be as specified in above referenced AWWA latest edition. Restrained joint ductile iron pipe shall be required for thrust restraints or for other situations that the Department deems necessary.

All ductile iron pipe shall be cement-lined and seal-coated in accordance with ANSI/AWWA Standard C104/A21.4. All ductile iron pipe for underground installation shall be coated on the outside with a 1-mil thick bituminous material applied as recommended by the pipe manufacturer.

### 7.5.2.2 Polyethylene Tubing

Polyethylene tubing (DR 9) and fittings ¾” through 2”. All polyethylene tubing and fittings furnished shall conform to all applicable provisions and requirements of the latest revision of AWWA C901, C906, or CSA B137.1 and, by inclusion all appropriate standards referenced there in. In addition, the polyethylene tubing and fittings shall meet the requirements of NSF/ANSI Standard 14.

### 7.5.2.3 PVC Pipe

PVC pipe shall be in accordance with AWWA C-900 DR 18.

| SIZE (INCHES) | PRESSURE CLASS          |
|---------------|-------------------------|
| 4 – 12        | Class 150               |
| >12           | As Directed by Engineer |

### 7.5.2.4 HDPE Pipe

HDPE pipe shall conform to ASTM D 1248, PE 3408, Type III, Class C, Category 5 and Grade 34. The HDPE pipe shall be DR 11 with the Blue Striping @ 120 DEGREES. All connections to PVC shall be made using an MJ Adapter followed by a minimum of two DI pipe segments (restrained).

| SIZE (INCHES) | PRESSURE RATING         |
|---------------|-------------------------|
| 4 – 12        | 160 psi @ 73 F          |
| >12           | As Directed by Engineer |

## 7.5.3 FITTINGS

### 7.5.3.1 Ductile Iron Fittings

#### 7.5.3.1.1 Mechanical Joint Fittings (4 through 12 inch)

All fittings shall be ductile iron mechanical joint for use with previously specified ductile-iron pipe. Cast ductile-iron fittings 4-inch through 12-inch shall be pressure rated at 350 psi minimum. All fittings shall conform to ANSI/AWWA C110/A21.10 and/or ANSI/AWWA C153/A21.53 (latest editions). All fittings shall be cast and machined allowing the bolt holes to straddle the vertical centerline. Only those fittings and accessories that are of domestic manufacture will be acceptable. All fittings shall be complete with gaskets, follower glands, alloy steel tee bolts and hex nuts.

#### 7.5.3.1.2 Compact Fittings

Compact fittings will be allowed on 4” through 12” sizes only. All other sizes (larger than 12”) shall be full bodied.

#### 7.5.3.1.3 Coatings

All fittings shall be cement-lined and seal-coated in accordance with ANSI/AWWA C104/A21.4. All fittings for underground installation shall be outside coated with a 1-mil thick bituminous material applied as recommended by the manufacturer.

#### 7.5.3.1.4 Certificates

If requested, the material supplier and/or Contractor shall furnish to OCWS, certifications that all fittings comply with the following requirements:

Fittings are of the material specified (furnish physical and chemical certifications if applicable).

Fittings shall be capable of withstanding, without bursting, hydrostatic tests of three times the rated water working pressure. The results of the specified tests (AWWA Standards) shall be retained for one year, and shall be available to the purchaser at the foundry.

Fittings shall be cast and machined at one foundry location to assure quality control and provide satisfactory test data.

Fittings shall have distinctly cast on them the pressure rating, nominal diameter of openings, manufacturer's identification, country where case, and number of degrees or fraction of the circle.

Ductile iron fittings shall have the letters "D. I." or "Ductile" cast on them. Cast letters and figures shall be on the outside body of the fitting and shall have dimensions no smaller than those shown in ANSI/AWWA C110 and C153.

Fittings and all accessories shall be of domestic manufacture.

#### 7.5.3.2 Fittings (Less than 4 Inches)

Fittings equal to and less than 2 inches shall be PVC - Schedule 40 or as required.

### 7.5.4 VALVES

#### 7.5.4.1 Resilient Wedge Gate Valves (4" - 12")

Gate valves on water main size 4" to 12": in diameter shall incorporate resilient wedge gates with mechanical joint ends. All gate valves shall be of domestic origin and shall meet or exceed AWWA C-515 or C-509. Resilient wedges shall be of natural or synthetic rubber and be bonded or mechanically attached to the gate using stainless steel hardware and shall be rated at a working pressure of 200 psi.



The interior and exterior of the valve body shall be fusion-bonded epoxy coated in accordance with AWWA C-550 (latest edition) in order to provide a corrosion resistant seat, applied in a manner to withstand the action of line fluids and operation of the sealing gate under long-term service. Valve seats shall seal by compression only. Valves shall be supplied with 2” square operating nuts and shall be designed to provide a bubble or bottle tight seal regardless of direction of flow. Opening shall be in the counterclockwise direction.

The following resilient wedge gate valves are accepted for installation:

| MANUFACTURER          | MODEL NO.   |
|-----------------------|-------------|
| American Flow Control | Series 2500 |
| Mueller               | A-2360      |

7.5.4.2 Resilient Seat Gate Valves (2”)

All 2” gate valves located below grade must be ductile iron resilient wedge meeting or exceeding AWWA C515 standards, latest edition. All 2” gate valves shall have a standard 2” operating nut and standard FPT openings. No bronze/brass type gate valves will be accepted in underground applications.

| MANUFACTURER          | SIZE | MODEL NO. |
|-----------------------|------|-----------|
| American Flow Control | 2”   | 502       |
| Mueller               | 2”   | A-2360    |

7.5.5 BACKFLOW PREVENTION DEVICES

The Owner/Developer shall comply with the Okaloosa County Cross-connection and Backflow Prevention Policy and Requirements of the FDEP for backflow prevention.

7.5.6 VALVE BOXES

Cast iron valve boxes shall be provided for all vales installed underground. The valve boxes shall be adjustable to fit the depth of earth covered over the valve and shall be designed so as to prevent the transmission of surface loads directly to the valve or piping. The valve boxes shall be manufactured of cast iron and shall be of the two piece design, screw type, including a bottom section and top section with lid cover. Only those valve boxes that are of domestic manufacture will be acceptable.

The casting shall be manufactured of clean, even grain, gray cast iron with a minimum tensile strength of 21,000 psi. It shall be smooth, true to pattern, free from blowholes, sand holes, projections and other harmful defects. The seating surface of both the lid cover and the top section shall be cast so that the cover will not rock after it has been

seated, and will fit tightly with no play. The Department reserves the right to require a certification of compliance from the manufacturer.

Valve box must be an integral unit that is telescopic and adjustable. Extension pieces, if required shall be ductile iron pipe. Valve box lids should have the word WATER cast on the top. All valve boxes located outside of roadway pavement shall have concrete pad (two foot to three foot diameter) poured around the box at finished grade level or prefab valve collar.

7.5.7 TAPPING SLEEVES

7.5.7.1 *Restrained Tapping Sleeves*

Tapping sleeves that will be restrained to D.I. pipe shall be mechanical joint or fabricated mechanical joint.

Fabricated Mechanical Joint: Tapping sleeve shall be of split mechanical joint design with separate end and side gaskets. The mechanical joint end dimensions shall conform to ANSI/AWWA C-110/A21.10. Sleeves shall be fusion epoxy coated per Manufacturer’s recommendations. Bolts shall be corrosion resistant, high strength, low alloy in conformance with ANSI/AWWA C-111/A21.11.

| MANUFACTURER | MODEL NO. |
|--------------|-----------|
| JCM          | 414       |

\*Stainless steel tapping sleeve suitable only if tap size is equal to or less than ½ size of water main

7.5.7.2 *Non-Restrained Tapping Sleeves*

Tapping sleeves that will not be restrained shall have a 17-7 Type 304 stainless steel body, flange, bolts, nuts, and washers. Sleeve shall be furnished with a ¾” test plug in the test outlet. Branch shell shall have a minimum thickness of 12 gauge, and back shell shall be a minimum of 14 gauge. Sleeve shall have a full circumferential gasket and a branch gasket with double O-Ring, hydraulic lip, and a T-304 stainless steel ring insert bonded within.

| MANUFACTURER | MODEL NO.         |
|--------------|-------------------|
| JCM          | 432               |
| Ford         | Style FTSS (Fast) |

## 7.5.8 TAPPING VALVES

*7.5.8.1 Tapping Valves (4" through 12")*

Tapping valves for 4" - 12" taps shall be ductile iron resilient seating meeting AWWA C509 with a minimum working pressure of 200 psi. Valves shall be full port opening to accept full-size shell cutters and shall be provided with an alignment ring. Valves shall be non Rising Stem (NRS) with a 2" square nut. The following tapping valves are approved for use.

| MANUFACTURER          | MODEL NO. |
|-----------------------|-----------|
| American Flow Control | 2500      |
| Mueller               | T-2360    |

## 7.5.9 ENCASEMENTS

*7.5.9.1 Encasement Pipe*

Where water main borings are required, the encasement pipe shall conform to the requirements of ASTM A53, Grade B steel piping (for sizes 24" and smaller). The encasement shall be set straight and true to grade as indicated on the construction plans. Each end shall be sealed. Thicknesses listed herein are minimum requirements. Borings under railroads or State highways shall meet their respective permit requirements.

Encasement size and thickness shall be as indicated below:

| DIAMETER OF WATER MAIN (INCHES) | MINIMUM CASING DIAMETER (INCHES) | MINIMUM CASING THICKNESS (INCHES) | ASTM / AWWA STANDARD |
|---------------------------------|----------------------------------|-----------------------------------|----------------------|
| 4                               | 12                               | .25                               | ASTM A53             |
| 6                               | 14                               | .25                               | ASTM A53             |
| 8                               | 16                               | 0.375                             | ASTM A53             |
| 10                              | 18                               | 0.375                             | ASTM A53             |
| 12                              | 24                               | 0.375                             | ASTM A53             |

*7.5.9.2 Encasement Spacers*

Encasement spacers shall be as manufactured by Cascade Water Works, Inc., Advanced Products and Systems, Inc., or Pipeline Seal and Insulator, Inc. Spacers for 4" - 12" piping shall be stainless steel with 8" long runners as shown on the applicable details.

7.5.10 FIRE HYDRANTS

*7.5.10.1 Requirements*

All hydrants shall conform to AWWA C502 (latest edition), and have the following characteristics:

- 5¼” main valve opening
- One 4½” steamer nozzles (NST)
- Two 2½” hose nozzles (NST)
- Bronze main seat threading surfaces
- 6” bottom connection (shoe), mechanical joint with accessories
- Operating nut - 1¼” National Standard Pentagon Nut
- Bury – (or height to eliminate extension) 30 inches
- Open – left
- Brass to Brass – seating
- Color – Fire Hydrant Red

*7.5.10.2 Extensions*

Fire hydrant extensions shall be by the same manufacturer as the fire hydrant type used.

*7.5.10.3 Coating / Painting*

All public hydrants, as designated on the plans, shall be painted with an epoxy coating to a thickness of 3 mil. Color of epoxy coating for public hydrants shall be red.

Hydrants approved for installation include:

| MANUFACTURER     | MODEL NO.       |
|------------------|-----------------|
| Mueller          | Super Centurion |
| American Darling | B84B            |

7.5.11 CORPORATION STOPS

*7.5.11.1 Corporation Stops (¾” and 1”)*

Corporation stops, ¾” and 1” sizes, shall be ground key (plug) designs conforming to ANSI/AWWA C800. The stops shall have AWWA/CC taper threaded inlets and a male coupling threaded outlet with an inside driving thread.

The following devices have been accepted for installation:

| MANUFACTURER | MODEL NO.   |
|--------------|-------------|
| Ford         | FB 1000-3-G |
| Ford         | FB 1000-4-G |

7.5.11.2 Corporation Stops (1½” and 2”)

Corporation Stops, 1½” and 2” sizes, shall be ball corporation designs conforming to ANSI/AWWA C800. The stops shall have AWWA/CC taper threaded inlets and a female iron pipe thread outlet. Corporation stops, sizes 1½” and 2”, shall be tapped onto mains through the use of an approved service saddle.

The following devices have been accepted for installation:

| MANUFACTURER | CATALOG NO. | DESCRIPTION |       |        |
|--------------|-------------|-------------|-------|--------|
|              |             | VALVE       | INLET | OUTLET |
| Ford         | FB 1600-7   | 2”          | 2”    | 2”     |
| Mueller      | B-20045     | 2”          | 2”    | 2”     |

7.5.12 SERVICE SADDLE/SLEEVE (¾” THROUGH 2”)

In an effort to eliminate problems with direct taps, such as stripped or leaking threads and split pipe, all ¾” through 2” taps shall be made through the use of approved service saddles/sleeves. The service saddle/sleeve will have a body with an AWWA/CC threaded outlet, seal, and suitable means for attachment to the main meeting the requirements of ANSI/AWWA C800. The service/saddle/sleeve shall be designed to provide a drip tight connection when used as a service connection to the main. Service saddles shall be double strapped, heavy-duty design, with a corrosion resistant finish for up to a 12” main.

The following service saddles/sleeves have been accepted for installation on ductile iron water main:

- ¾” – 2” Service Saddles/Sleeves

| MAIN SIZE                 | SADDLE/SLEEVE           |
|---------------------------|-------------------------|
| Less than or equal to 12” | Ford 202B, JCM 406      |
| Greater than 12”          | As Directed by Engineer |

7.5.13 GRIP JOINT COUPLING

| MANUFACTURER | CATALOG NO. | DESCRIPTION |       |        |
|--------------|-------------|-------------|-------|--------|
|              |             | CORP SIZE   | INLET | OUTLET |
| Ford         | C84-33G     | ¾"          | Mip   | CTS    |
| Ford         | C84-44G     | 1"          | Mip   | CTS    |
| Ford         | C84-66G     | 1½"         | Mip   | CTS    |
| Ford         | C84-77G     | 2"          | Mip   | CTS    |

7.5.14 GRIP PACK JOINT COUPLING

| MANUFACTURER | CATALOG NO. | DESCRIPTION |       |        |
|--------------|-------------|-------------|-------|--------|
|              |             | CORP SIZE   | INLET | OUTLET |
| Ford         | C14-33G     | ¾"          | Fip   | CTS    |
| Ford         | C14-44G     | 1"          | Fip   | CTS    |
| Ford         | C14-66G     | 1½"         | Fip   | CTS    |
| Ford         | C14-77G     | 2"          | Fip   | CTS    |

7.5.15 CURB STOPS

7.5.15.1 Curb Stops (¾" through 1")

| MANUFACTURER | CATALOG NO. | DESCRIPTION |       |             |
|--------------|-------------|-------------|-------|-------------|
|              |             | CURB SIZE   | INLET | OUTLET      |
| Ford         | B43-232WG   | 5/8"        | 3/4"  | 5/8" X 3/4" |
| Ford         | B13-232W    | 5/8"        | ¾"    | 5/8"        |
| Ford         | B41-233WG   | 5/8"        | ¾"    | ¾"          |
| Ford         | B41-344WG   | ¾"          | 1"    | 1"          |
| Ford         | B43-344WG   | ¾"          | 1"    | 1"          |
| Ford         | B11-333W    | ¾"          | ¾"    | ¾"          |
| Mueller      | B-20283     | ¾"          | ¾"    | ¾"          |
| Ford         | B11-444W    | 1"          | 1"    | 1"          |
| Mueller      | B-0283      | 1"          | 1"    | 1"          |

7.5.15.2 Curb Stops (1½" through 2")

Curb stops for services shall be bronze ball valves.

| MANUFACTURER | CATALOG NO. | DESCRIPTION |      |              |
|--------------|-------------|-------------|------|--------------|
|              |             | TYPE        | SIZE | OUTLET       |
| Ford         | BF43-666WG  | Ball Valve  | 1½"  | Meter Flange |
| Ford         | BF43-777WG  | Ball Valve  | 2"   | Meter Flange |
| Ford         | B41-777WG   | Ball Valve  | 2"   | Female IP    |
| Ford         | B11-777W    | Ball Valve  | 2"   | Female IP    |

## 7.5.16 STRAIGHT PIPE COUPLINGS (¾" THROUGH 2")

| MANUFACTURER | CATALOG NO. | DESCRIPTION |      |        |
|--------------|-------------|-------------|------|--------|
|              |             | TYPE        | SIZE | OUTLET |
| Ford         | C44-33-G    | Compression | ¾"   | ¾"     |
| Ford         | L44-33G     | Compression | ¾"   | ¾"     |
| Mueller      | H-15403     | Compression | ¾"   | ¾"     |
| Ford         | C44-44-G    | Compression | 1"   | 1"     |
| Ford         | L44-44G     | Compression | 1"   | 1"     |
| Mueller      | H-15403     | Compression | 1"   | 1"     |
| Ford         | C44-66-G    | Compression | 1½"  | 1½"    |
| Ford         | L44-66G     | Compression | 1 ½" | 1 ½"   |
| Mueller      | H-15403     | Compression | 1½"  | 1½"    |
| Ford         | C44-66-G    | Compression | 2"   | 2"     |
| Ford         | L44-77G     | Compression | 2"   | 2"     |
| Mueller      | H-15403     | Compression | 2"   | 2"     |

## 7.5.17 MECHANICAL RESTRAINT

## 7.5.17.1 Wedge Action Restrainer Gland (for D. I. Pipe)

Restraint for standardized mechanical joint fittings shall be incorporated in the design of the follower gland and shall impart multiple wedging action against the pipe, increasing its resistance as the pressure increases. Restraining glands shall be manufactured of high strength ductile iron conforming to ASTM A536. The wedges shall be ductile iron and heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53.

| NOMINAL PIPE SIZE | EBAA IRON "MEGALUG" SERIES 1100 |                  | FORD "UNI-FLANGE" SERIES 1400 |                  | RATED PRESSURE |
|-------------------|---------------------------------|------------------|-------------------------------|------------------|----------------|
|                   | SERIES NUMBER                   | NUMBER OF WEDGES | CATALOG NUMBER                | NUMBER OF WEDGES |                |
| 4"                | 1104                            | 2                | UFR 1400-D-4                  | 2                | 350            |
| 6"                | 1106                            | 3                | UFR 1400-D-6                  | 3                | 350            |
| 8"                | 1107                            | 4                | UFR 1400-D-8                  | 4                | 350            |
| 10"               | 1110                            | 6                | UFR 1400-D-10                 | 6                | 350            |
| 12"               | 1112                            | 8                | UFR 1400-D-12                 | 8                | 350            |

## 7.5.17.2 Wedge Action Restrainer for Push-on Joints (for D. I. Pipe)

Restraint for push-on bells of ductile iron pipe shall consist of a wedge action retainer gland installed on the pipe spigot, connected to a ductile iron follower

gland installed behind the pipe bell. The connecting rods and nuts shall be of high strength, low alloy material meeting ANSI/AWWA C111/A21.11. The wedge action retainer assembly for push-on pipe shall be in a kit form from a single manufacturer.



| NOMINAL<br>PIPE SIZE | EBAA IRON "MEGALUG"<br>SERIES 1700 |                  |                     | FORD "UNI-FLANGE"<br>SERIES 1450 |                    |                    | RATED<br>PRESSURE |
|----------------------|------------------------------------|------------------|---------------------|----------------------------------|--------------------|--------------------|-------------------|
|                      | SERIES<br>NO.                      | #OF TIE<br>BOLTS | TIE<br>BOLT<br>SIZE | CATALOG<br>NUMBER                | #OF<br>TIE<br>RODS | TIE<br>ROD<br>SIZE |                   |
| 4"                   | 1704                               | 4                | ¾" x 13"            | UFR 1450-D-4                     | 4                  | ¾" x 17"           | 350               |
| 6"                   | 1706                               | 6                | ¾" x 13"            | UFR 1450-D-6                     | 6                  | ¾" x 17"           | 350               |
| 8"                   | 1708                               | 6                | ¾" x 13"            | UFR 1450-D-7                     | 6                  | ¾" x 17"           | 350               |
| 10"                  | 1710                               | 8                | ¾" x 18"            | UFR 1450-D-10                    | 8                  | ¾" x 24"           | 350               |
| 12"                  | 1712                               | 8                | ¾" x 18"            | UFR 1450-D-12                    | 8                  | ¾" x 24"           | 350               |

#### 7.5.17.3 Rubber-Gasket Restraint for Push-on Pipe (for D. I. Pipe)

Restraint for push on ductile iron pipe shall be standard, which meets all the material requirements of ANSI/AWWA C111/A21.11.

| NOMINAL<br>PIPE SIZE | AMERICAN FAST-GRIP<br>GASKET | U.S. PIPE FIELD<br>LOK 350 | RATED<br>PRESSURE |
|----------------------|------------------------------|----------------------------|-------------------|
|                      | DEFLECTION                   | DEFLECTION                 |                   |
| 4"                   | 5                            | 5                          | 250               |
| 6"                   | 5                            | 5                          | 250               |
| 8"                   | 5                            | 5                          | 250               |
| 10"                  | 5                            | 5                          | 250               |
| 12"                  | 5                            | 5                          | 250               |

#### 7.5.17.4 Rubber-Gasket for Push-on Pipe (for D. I. Pipe)

Rubber gaskets used shall be standard per all requirements of ANSI/AWWA C111/A21.11. American's Fastite gasket ranges in pipe size from 4 to 12 inch with maximum deflection of 5 degrees.

#### 7.5.17.5 Pipe Bell Restraint Harness (for PVC C900 DR18 Pipe)

The use of pipe bell restraint harness systems is discouraged. Use this system only where specifically approved by OCWS. Restraint for C900 D18 Pipe Bells shall incorporate a split ring behind the pipe bell. A serrated ring shall be used to grip the pipe and a sufficient number of bolts shall be used to connect the bell ring and the gripping ring. The combination shall have a minimum working pressure rating of 150 psi. The restraint shall be approved by Factory Mutual. Restraining rings shall be manufactured of high strength ductile iron conforming to ASTM A536.

| NOMINAL<br>PIPE<br>SIZE | EBAA IRON "MEGALUG"<br>SERIES 1600 |               |              | FORD "UNI-FLANGE"<br>SERIES 1350 |              |             | RATED<br>PRESSURE |
|-------------------------|------------------------------------|---------------|--------------|----------------------------------|--------------|-------------|-------------------|
|                         | SERIES<br>NO.                      | # OF<br>BOLTS | BOLT<br>SIZE | CATALOG<br>NUMBER                | # OF<br>RODS | ROD<br>SIZE |                   |
| 4"                      | 1604                               | 2             | ¾"x 13"      | UFR 1350-C-4                     | 2            | ¾"x 9"      | 150               |
| 6"                      | 1606                               | 2             | ¾"x 18"      | UFR 1350-C-6                     | 2            | ¾"x 9"      | 150               |
| 8"                      | 1608                               | 2             | ¾"x 18"      | UFR 1350-C-7                     | 2            | ¾"x 12"     | 150               |
| 10"                     | 1610                               | 4             | ¾"x 22"      | UFR 1350-C-10                    | 4            | ¾"x 17"     | 150               |
| 12"                     | 1612                               | 4             | ¾"x 22"      | UFR 1350-C-12                    | 4            | ¾"x 17"     | 150               |

*7.5.17.6 Wedge Action Restrainer Gland (for PVC C900 DR18 Pipe)*

Restraint for standardized mechanical joint fittings shall be incorporated in the design of the follower gland and shall impart multiple wedging action against the pipe, increasing its resistance as the pressure increases. Restraining glands shall be manufactured of high strength ductile iron conforming to ASTM A536. The wedges shall be ductile iron and heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53.

| NOMINAL<br>PIPE SIZE | EBAA IRON<br>"MEGALUG"<br>SERIES 2000PV |                       | FORD "UNI-FLANGE"<br>SERIES 1500C |                       | RATED<br>PRESSURE |
|----------------------|---|-----------------------|-----------------------------------|-----------------------|-------------------|
|                      | SERIES<br>NUMBER                        | RESTRAINT<br>SEGMENTS | CATALOG<br>NUMBER                 | RESTRAINT<br>SEGMENTS |                   |
| 4"                   | 2004PV                                  | 4                     | UFR 1500-C-4                      | 4                     | 150               |
| 6"                   | 2006PV                                  | 4                     | UFR 1500-C-6                      | 6                     | 150               |
| 8"                   | 2008PV                                  | 6                     | UFR 1500-C-8                      | 6                     | 150               |
| 10"                  | 2010PV                                  | 6                     | UFR 1500-C-10                     | 8                     | 150               |
| 12"                  | 2012PV                                  | 8                     | UFR 1500-C-12                     | 8                     | 150               |

**7.5.18 ALL THREAD RODS AND EYE BOLTS**

All thread rods shall be threaded ¾ inch Grade 316 stainless steel rods manufactured according to ASTM F593 treated with anti-seize compound. Tensile strength shall be a minimum of 74 ksi. Yield strength shall be minimum of 42 ksi. Stainless steel nuts and washers to match and shall be according to ASTM F594. Eye bolts shall be Grade 316 stainless steel with matching washers and nuts treated with an anti-seize compound.

**7.5.19 BACKFILL**

*7.5.19.1 Coarse Aggregate*

Coarse aggregate shall consist of naturally occurring materials such as gravel, or resulting from the crushing of parent rock, to include natural rock, slags, expanded clays and shales (lightweight aggregates), and other approved inert

materials with similar characteristics, having hard, strong, durable particles, conforming to the specific requirements of Section 901 “*Course Aggregate*” of FDOT’s Standard Specifications.

*7.5.19.2 Fine Aggregate*

Fine aggregate shall consist of natural silica sand, screenings, local materials, or subject to approval, other inert materials with similar characteristics, or combination thereof, having hard, strong, durable particles, conforming to the specific requirements of Section 902 “*Fine Aggregate*” of FDOT’s Standard Specifications.

+++ END OF SECTION +++

## **SECTION 8**

# **WASTE WATER COLLECTION**



**SECTION 8 WASTE WATER COLLECTION**

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8.1 PURPOSE

This section establishes the minimum standards and technical design criteria for sanitary sewer collection systems within Okaloosa County Water and Sewer service area. Adherence to these standards will expedite review and approval of plans. Any departure from these design requirements should be brought to the attention of Okaloosa County Water and Sewer Engineer and discussed prior to submission of plans for approval. Such departure shall be documented and justified. This section shall be coordinated and implemented with Section 11.

8.2 REGIONAL PLANNING AND COORDINATION

The County desires to address sewer system expansion on regional basis to eliminate the proliferation of small lift stations and gravity interceptors. Therefore, to maximize the efficiency of the OCWS sewer system, sewer system development shall consider the affects that future development of the surrounding areas within the draining basin could have on the design of the collective, conveyance, and pumping systems. Developers shall coordinate with OCWS to evaluate potential opportunities to upsize proposed facilities to serve future areas on a regional basis. Refer to the requirements presented in Section 11, as well as the requirements of the Okaloosa County Land Development Code.

8.3 GENERAL LOCATION CRITERIA

Sewers shall be located using sound Engineering judgment to determine the most cost-effective and environmentally sensitive alignment which best serves the needs of the entire tributary area. Additionally, it is imperative that all alternatives worthy of consideration receive maximum and equal consideration with regard to environmental impact. The cost for acquisition of easements can be significant; therefore, sewers should be located within existing easements and right-of-ways whenever feasible and practical. Whenever possible, sewers in subdivision construction projects shall be located in the street right of way. If the sewer main is installed parallel to a state road or highway, the sewers shall be located outside of State right of ways in dedicated easements. However, if OCWS determines that it is not practical to locate sewers in dedicated easements, OCWS may approve locating sewers in State right of ways on a case-by-case basis.

When selecting the sewer alignment, consideration shall be given, but shall not be limited to, the following general location criteria:

- Elevation requirements necessary to provide appropriate service with due consideration of sanitary facilities in basements.
- Environmentally sensitive areas and constraints such as creeks, wetlands, trees, protected habitats, etc.

- Existing utilities, railroads, highways, and overhead facilities.
- Location of other existing and proposed sewerage facilities.
- Property values, easement needs and potential damages to the affected properties.
- Existing and proposed high water elevations, including high water for appropriate design periods.
- Anticipated extension of existing streets and the potential for the development of contiguous areas.
- Continuity with adjacent design segments.

### 8.3.1 GRAVITY SEWER ALIGNMENT CRITERIA

#### *8.3.1.1 Horizontal Alignment Criteria*

In subdivision construction, preference shall be given to aligning sewers along street centerlines. Sewers shall be constructed with a straight alignment between manholes. Whenever possible, sewers shall be designed within the right-of-ways of proposed streets and highways.

Sanitary sewer laterals must extend six (6) feet beyond limits of the utility easement at a minimum depth of three (3) feet, and 45 degree angle at property line to three (3) feet above ground. A firm fitted cap shall be installed at the end of the lateral and shall not be permanently attached. A single lateral may serve no more than two single family dwelling units and shall be located at the property line between the dwelling units. (Reference Standard Drawings.)

#### *8.3.1.2 VERTICAL ALIGNMENT CRITERIA*

In establishing the elevation of the proposed sanitary sewer, the elevations of existing or proposed interceptor sewers, or the elevations of inflow pipes to existing pump stations or wastewater treatment plants and all other utilities, shall be considered. Service lateral lines shall be a minimum of three (3) feet below ditch bottom.

### 8.3.2 SEWER FORCEMAIN ALIGNMENT CRITERIA

#### *8.3.2.1 Sewer Force Main Installation in Right-of-Way*

When installed in rights-of-way, sewer force mains shall be located a minimum of five (5) feet behind the curb opposite the sidewalk and sanitary sewer. The sewer force mains shall maintain a consistent alignment with respect to the centerline of the road. This distance shall be clearly indicated on the design drawings submitted for review and approval. Reference standard drawings for the typical location and layout of sewer force mains within the Right of -Way.

#### *8.3.2.2 Sewer Force Main Installation in Dedicated Easement*

All sewer force mains located outside of dedicated rights-of-way shall be centered within a minimum 15-foot easement. In such cases, no sewer force main shall be located within five (5) feet of utility structure or ten (10) feet of any permanent

structure. At OCWS' discretion, additional easement widths and/or sewer force main/structure separation shall be provided when the pipe size or depth of cover so dictates.

If a sewer force main is located adjacent to a road right-of-way, a minimum 10-foot easement may be provided upon the review and approval of OCWS Engineer. If a 10-foot easement is granted adjacent to the road right-of-way, the force main shall be positioned such that there is a minimum of five (5) feet from centerline of pipe to edge of easement, opposite road right-of-way. Force mains shall not be placed under retention ponds, tennis courts, or other structures, unless approved by OCWS. If approval is granted, restrained joint ductile iron pipe shall be required as directed by OCWS.

#### *8.3.2.3 Installation Along Lot Lines*

In general, sewer force mains shall not be located along side or rear lot lines of properties.

#### *8.3.2.4 Sewer Force Main Valves*

Sufficient isolation valves shall be located at not more than 1,500-foot intervals whenever possible, valves shall be located at midpoints of uphill gradients. Air relief valves shall be installed at high points in the system in addition to other areas deemed necessary by the design Engineer.

## 8.4 DESIGN FLOW DETERMINATION

The design flow for each segment of the sewer system shall be determined in accordance with FDEP Regulations. Additionally, when the total number of equivalent residential units (ERU's) exceeds 500 for each segment of the sewer system, the design flow for each segment shall be determined as follows:

- Prepare a drainage map, which defines the tributaries for each element of the sewer.
- Examine each tributary area to determine its potential land use and equivalent population.
- Determine the average daily flow based upon the equivalent population.
- Determine the design or peak flow based upon the average daily flow and the appropriate peaking factor.

### 8.4.1 DRAINAGE MAP

If required by OCWS, the Developer shall prepare a drainage map to aid in the review of the design. The map shall show the actual area to be served by the proposed project, the location of the existing and proposed sewers, the portion of the project area tributary to each individual sewer element, and any points of inflow, which contribute additional flow from adjacent areas. Adjacent future contributing areas shall be shown in entirety on the Drainage Map. The Drainage Map shall be prepared on a standard size sheet at an appropriate scale to show the entire project and adjacent future contributing areas. Two or more sheets may be used for large scale projects. The purpose of the Drainage Map is to graphically depict the basis for the design flow calculations. Specific information

required includes, but is not limited to, the following:

- A key map showing the general location of the project area, including any areas not within the project area but which contribute to the proposed system.
- A general layout of the proposed system with the drainage area tributary to each major element of the system defined.
- The basis for determining the number of existing and future users and the equivalent population for each drainage area, i.e., the number of single family or multi-family dwelling units; type and size of existing commercial, industrial and institutional users; and the number of acres of undeveloped land by zoning classification.
- A zoning designation for each drainage area.
- A designation for each sewer line.
- A numbering system for manholes, which shall be carried out to the computation sheets.
- All proposed sewer sizes.
- The location of estimated or actual flow entering the proposed system from outside areas, undeveloped or developed. These areas are to be shown in entirety on the Drainage Map and shall include the same types of information required for the proposed service area.
- An adequate number of spot elevations must be obtained in areas of undeveloped land to show the natural drainage of the area if necessary.
- An indication of the existing system's ability to receive the proposed flow with sufficient capacity.
- Identification of the boundaries of known or potential jurisdictional wetlands within the proposed development and outside areas, undeveloped and developed.

If requested, the Drainage Map and design calculations shall be presented for review with submittal of the preliminary and construction plans.

## 8.4.2 DESIGN FLOW

### *8.4.2.1 Collector Sewers*

Collector sewers are primarily installed to receive wastewater directly from property service connections (laterals). A major change in land use within a tributary area can have a significant impact on the collector system's ability to transport the necessary flow. Collector sewers should, therefore, be designed to transport the saturation population (final build out) flow, which might be expected during their service life (flowing full).

### *8.4.2.2 Interceptor Sewers*

An interceptor sewer is a principal sewer to which collector sewers are tributary. All interceptor sewers should be designed for saturation population unless otherwise directed by OCWS.

For a major industrial water user or undeveloped industrial land in the tributary area, OCWS will require the Engineer to supply an estimated average daily flow and potential wastewater constituent characterization in accordance with

Ordinance 98-3.

## 8.4.3 HYDRAULIC DESIGN CRITERIA

### 8.4.3.1 Gravity Sewer

Mannings equation shall be used to determine proper pipe size and slope to transport the design flow. Design shall be for full flow at saturation conditions (include a peaking factor of 3) with the following characteristics:

- Roughness coefficient  $n = 0.013$  (Sanitary Sewers Only- Ten State Standards)\*
- Minimum velocity  $v = 2$  feet/second
- Minimum pipe size  $D = 8$  inches
- Minimum acceptable grades (See 8.4.3.1.3)

\* Due to potential of a slime layer build up in a sewer line, the referenced roughness coefficient shall be the only one used in calculations.

#### 8.4.3.1.1 Hydraulic Grade Line

The hydraulic grade line should not rise above the crown of the sewer pipe. When critical, the hydraulic grade line shall be computed to show its elevation at manholes, transition structures, and junction points of flow in pipes, and shall provide for the losses and the differences in elevation. If velocity entering a manhole is above critical, the hydraulic grade line must be computed to ensure that no service connections are surcharged. The pipe exiting the manhole must be adjusted in elevation to ensure that the energy gradient remains level across the manhole.

#### 8.4.3.1.2 Velocity

All gravity sanitary sewers shall be designed to carry the design flow (including any peaking factor) at a minimum velocity of 2.0 feet per second. The maximum allowable design velocity allowed shall be 15 feet per second based on the design flow. When severe topographic or other unusual conditions require a design velocity greater than 10 feet per second, the hydraulic design and pipe material must be specifically approved in writing by OCWS Engineer.

#### 8.4.3.1.3 Minimum Sanitary Sewer Grades

The minimum acceptable grades for various sewer main sizes are indicated below:

| MAIN SIZE | MINIMUM ACCEPTABLE GRADE         |                |
|-----------|----------------------------------|----------------|
| 8"        | 0.50%                            | 5' per 1000    |
| 10"       | 0.30%                            | 2.8' per 1000' |
| 12"       | 0.22%                            | 2.2' per 1000' |
| OTHER     | AS DIRECTED BY THE OCWS ENGINEER |                |

#### 8.4.3.1.4 Sewer Size Changes

When increasing the sewer size by 6 inches or less, crown elevations shall match at the centerline of the manhole.

When increasing the sewer size by more than 6 inches, the springlines of the smaller and larger sewer shall match at the centerline of the manhole. However, for the hydraulic design calculations, the Design Engineer shall match crown elevations at the centerline of the manhole by raising the elevation of the smaller sewer.

#### 8.4.3.2 Sewer Force Mains

Hazen Williams equation shall be used to determine proper pipe size to transport the design flow. Design shall be for full flow at saturation conditions (include a peaking factor of 3) with the following characteristics:

- Roughness coefficient  $C=120$  to  $140$ , as appropriate
- Minimum velocity  $v = 2$  feet/second
- Maximum velocity  $v = 10$  feet/second

## 8.5 DESIGN CRITERIA

### 8.5.1 SEWER PIPE

#### 8.5.1.1 Size

The minimum allowable inside diameter for sewer pipe, other than property service connections, shall be 8 inches. All single dwelling laterals shall have a minimum inside diameter of 4 inches; however, commercial or industrial connections shall be individually considered.

#### 8.5.1.2 Transitions

Where ductile iron or plastic composite pipe connects to another pipe material (i.e., clay, concrete, etc.) a concrete collar and an appropriate fitting for joining the two materials shall be used.

#### 8.5.1.3 Depth Requirements

If the grade at any time (during or after) construction is less than 3 feet from the top of the sanitary sewer pipe then ductile iron pipe will also be required.

Composite plastic pipe can be used in areas where the cover above the pipe is in the range of 3 to 20 feet.

#### *8.5.1.4 Sewer Gradient Elevations*

All sewer gradient elevations shall be referenced to the North American Vertical Datum specified in sections. When connecting into or extending existing sewer facilities that were constructed using another datum, an election equation shall be shown on the plans. Datum shall be verified by a licensed land surveyor.

#### *8.5.1.5 Flooding and Ponding Areas*

The top of sanitary manhole elevations shall be a minimum of 2 feet above existing, proposed, or projected 100-year high water elevations. Relocate manholes when this minimum elevation causes the manhole to be above the natural ground creating obstructive mounds.

#### *8.5.1.6 Water Main Clearance Criteria*

The minimum horizontal clearance between the sewer and water mains shall be 10 feet or current FDEP Standards. The vertical clearance shall be at least 18 inches or current FDEP Standards. If at all possible, the sewer shall be located below the water main. Should it become necessary for the sewer to cross over the water main, special precautions will be required. Such cases shall require review and written approval by County.

#### *8.5.1.7 Disturbed Soil*

Ductile iron pipe shall be required in all fill areas and areas of disturbed ground.

#### *8.5.1.8 Lot Lines/Limited Access Areas*

If approved by OCWS Director, all sewer mains located along lot lines or between areas of limited access shall be D.I. from property line to property line. When it becomes necessary to run a sanitary sewer along lot lines or between adjacent streets, no offsets unless approved by OCWS will be allowed in the sanitary sewer line. Unless approved by OCWS Director, no gravity sewers or force mains may be located along lot lines or rear lot lines.

#### *8.5.1.9 Encasements*

Ductile iron pipe will be required in all encasements. Sanitary sewer mains that run through storm sewer, storm boxes, other utility mains, boxes, manholes or conduits shall be ductile iron and required to be encased.

### 8.5.2 MANHOLES

#### *8.5.2.1 Manhole Locations*

Manholes shall be required at the following:

- Changes in sewer grades or alignment.



- Sewer junctions.
- Where required not to exceed the maximum manhole spacing.
- Changes in sewer diameters.
- Termination points. The exact location of the terminal manhole in each sewer line shall be based on many factors including manhole spacing, driveway locations, the position of improvements on the lots being served, and the location of present temporary sanitary facilities, such as septic tanks, etc. A definitive single policy cannot be established to cover all circumstances, although the sewer line would normally terminate a minimum of 25 feet past the lot line of the last property served. This is to allow enough room for the last lot to have a wye and lateral run into the sanitary sewer main without encroaching adjacent property.

#### *8.5.2.2 Maximum Manhole Spacing*

The maximum manhole spacing distances shall be 400 feet for all new sanitary sewer collection system construction. When certain conditions warrant, such as the elimination of a manhole, the manhole spacing can be exceeded with the approval of OCWS' Engineer.

#### *8.5.2.3 Manhole Diameter*

The minimum diameter of a manhole shall be 4 feet unless otherwise directed by OCWS' Engineer. Regardless of the recommendations offered, all manholes shall be checked to ensure that sufficient wall is supplied between pipe openings to meet all pre-cast manhole criteria.

#### *8.5.2.4 Water Tightness*

Watertight manholes, covers, and water seal inserts (rain stoppers) are to be used whenever the manhole covers may be flooded by street runoff or anticipated high water.

#### *8.5.2.5 Drop Inlets*

Where the distance between a manhole invert and the line coming into the manhole is greater than 6 inches (0.5 ft) the grade of the incoming line shall be changed to bring this distance down to 6 inches or a drop connection shall be installed (except youthful lines 10 inches or greater where invert may match crown of said youthful). The grade distance between the influent and effluent shall be 6 inches (0.5 ft) or less, except for standard drop connection construction. The minimum distance (from manhole invert to invert of incoming line) required for a drop connection is 22 inches. This is the distance needed for installing a required Memphis tee and  $\frac{1}{4}$  bend.

#### *8.5.2.6 Manhole Collars*

A 6-inch collar shall be used when it is absolutely certain the manhole rim will not be lowered in the future. When it is anticipated that the manhole rim may be lowered, a 12-inch or greater collar shall be specified.

Manholes will be adjusted to the final grade by pre-cast extensions. Manhole extensions will not exceed more than 1.5 feet of chimney as measured from the top of the manhole rim to the point where the manhole starts to increase in size.

#### *8.5.2.7 Manhole Inverts*

### 8.5.3 LATERALS

Each platted lot shall have its own individual sanitary sewer connection. Laterals should serve no more than two single family owned units. Each duplex, apartment, or condominium that has the potential to be sold as an individual dwelling on its own lot shall have a separate sanitary sewer connection. If a single-family dwelling is built upon several lots, only one sanitary sewer lateral will be required.

#### *8.5.3.1 Minimum Size and Grade*

Sanitary sewer laterals shall be a minimum of 4 inches in diameter and run perpendicular to the sanitary sewer line. Laterals located in cul-de-sacs are not required to run perpendicular to the sewer main. Laterals shall have a minimum slope of 1/8-inch per foot (1%) for laterals. However, in all cases, the invert elevation of the property lateral at the easement or property line shall be equal to or higher than the crown of the sewer.

#### *8.5.3.2 Lateral Connections*

Lateral connections to the main collector pipe shall be made using a wye installed at an angle no greater than 45 degrees from the horizontal centerline. Lateral Stacks (installing wyes at 90 degrees from the horizontal centerline) are prohibited.

#### *8.5.3.3 Lateral Location*

The sanitary sewer lateral shall extend perpendicular from the main to the street right-of-way or utility easement if greater. Extend the service lateral at 45 degrees at the ROW or easement line and extend above finished grade 3.0'. At the property line, the sanitary sewer lateral shall be placed no shallower than 3 feet and no deeper than 6 feet deep with respect to final grade, unless otherwise approved by OCWS.

Sanitary sewer laterals on lots that have less than 15' of street frontage shall be extended on to property to within 5 feet of the building line.

When a sewer main runs along a lot line, laterals shall be stubbed outside building limits to prevent any possible conflict with the building slab.

### 8.5.4 FLOTATION

All sewers and sewer structures to be constructed where high groundwater conditions

exist or where flooding of the trench is anticipated shall be designed to prevent flotation or excessive pipe flexing. In these conditions, ductile iron pipe shall be used.

#### 8.5.5 CONCRETE ENCASEMENTS

Concrete encasement shall extend a minimum length of 2 feet beyond the point where a minimum 3 foot depth of cover is reached or to a point 5 feet beyond the tops of banks when crossing a ditch or stream. Encasements may be used when it is necessary to prevent floatation, when crossing streams, ditches, or existing storm drains, where soil conditions may indicate the possibility of heavy erosion, where crossing over or under utilities with less than 2-feet of clearance, or in areas where the sewer has less than the required minimum cover. Concrete encasement is not acceptable unless specifically approved by OCWS' Engineer.

#### 8.5.6 ENCASEMENT REQUIREMENTS

##### *8.5.6.1 General*

Encasement is required when crossing all State highways, railroad, and some County and City roadways, which have excessive traffic flow or other critical situations (such as protecting building foundations). Encasement and mains shall cross the roadway and/or railroads as near as possible perpendicular to the roadbed. In all cases the agency requiring the encasement shall have the final approval of the Engineering design. Ductile iron pipe will be required in all encasements.

##### *8.5.6.2 Encasement Pipe*

Pipe to be installed under pavement where open trenching is not permitted shall be installed through steel casing, which has been jacked and bored. Casing shall extend out past both sides of pavement a minimum of 3 feet or past toe of slope whichever is greater.

##### *8.5.6.3 Encasement Spacers*

Sewer mains shall be pushed through the encasement piping on spacers placed no more than 10 feet apart. A minimum of two spacers/runners per joint of pipe shall be required. The spacer shall have a clearance range of 1 to 1.5 inches of clearance between the spacer and the inside of the encasement piping. Spacers shall be required in the first foot of each end of the encasement.

##### *8.5.6.4 Encasement Ends*

All casing ends shall be sealed with an end seal as manufactured by Pipeline Seal and Insulators, Inc. or equal (See Miscellaneous Detail 120).

## 8.5.7 RAILROAD CROSSINGS

### *8.5.7.1 Criteria Coordinate with railroad owner*

In addition to the individual railroad's design requirements the following criteria shall be strictly adhered to when the planning for sewer construction affects railroad rights-of-way and facilities (railroad may specify more stringent requirements):

- Sewers shall cross tracks at an angle as close to 90 degrees as practical, but preferably never less than 45 degrees. Sewers shall not be placed under railroad bridges where there is a likelihood of restricting the required waterway area of the bridge or where there is a possibility of endangering the foundations.
- Sewer lines crossing under railroad tracks and rights-of-way shall be bored and jacked casings unless the railroad company grants written permission for open-cut construction.
- Sewer lines laid longitudinally along railroad rights-of-way shall be located as far as practical from any tracks or other important structures. If located within 25 feet of the centerline of any track, or should there be danger of damage from leakage to any bridge, building or other important structure, the sewer shall be encased.
- When placed along railroad rights-of-way, the top of the pipe shall have a minimum cover of 4 feet.

### *8.5.7.2 Railroad Conflict Drawings*

Railroad conflict drawings shall conform to the following criteria:

- Drawings shall be prepared to scale showing the relationship between the proposed sewer and the railroad, angle of crossing, location of utilities, original survey station of the railroad (when available), right-of-way lines, topography and general layout. The profile established from a field survey shall show the sewer in relation to the actual ground and tracks. The limits of boring or tunneling by station, sewer line soundings and borings and all other pertinent information shall be shown on the drawing.
- Railroad conflict drawings shall be submitted along with a complete questionnaire, which shall be furnished by the railroad company.

## 8.5.8 HIGHWAY CROSSING

Sewer pipe installations under State, County, or City maintained roadways, which are designated by their governing agencies, shall meet the following requirements (more stringent criteria may be required on a project specific basis):

- Sewers shall cross roadways at an angle as close to 90 degrees as practical, but preferably never less than 45 degrees. Sewers shall not be placed under roadway bridges where there is a likelihood of restricting the required area of the bridge or where there is a possibility of endangering the foundations.
- Borings under roadways shall have a minimum depth of 4 feet from the surface elevation to the top of the boring. The top of the tunnel lining shall not be above the

- invert of existing or proposed ditches.
- Borings under roadways shall extend a minimum of 10 feet outside the existing pavement, as measured at right angles to the roadway, or to the toe of the slope when the roadway is on fill and the toe of slope exceeds 10 feet outside the existing paving.
- Sewer lines laid in a longitudinal direction on highway rights-of-way shall be located a sufficient distance from the edge of the pavement to allow adequate working room and to provide maximum safety to the motorist when the roadway is to remain open to traffic. Those sewer lines within the roadway rights-of-way, but not located under paved areas, shall have no less than 5 feet of cover.
- Metallic wire shall be laid in the trench above ALL thermoplastic pipes from edge of pavement to the right-of-way line or from end of tunnel to right-of-way line on all crossings of State Right of Ways.

#### 8.5.9 INTERRUPTION OF EXISTING SEWER SERVICE

Existing sewer customers shall not be placed out of service in order to connect or lay new sewer piping. The Contractor shall coordinate with the Board all service interruptions prior to construction. The Contractor shall be responsible for providing temporary service through by-pass pumping if necessary to all of the County's customers affected by the construction.

#### 8.5.10 TRENCH PREPARATION

##### *8.5.10.1 Excavation*

All excavation shall be done in accordance with OSHA Code of Regulation Part 1926 (latest revision). A trench shall be opened so that the pipe can be installed to the alignment and depth required. It shall be excavated only so far in advance of pipe laying as necessary.

The trench shall be excavated to the depth required so as to provide a uniform and continuous bearing support for the pipe on undisturbed ground. Bell holes shall be provided at each joint to permit jointing to be made and inspected properly.

During excavation, if ashes, cinders, muck or other organic material considered unstable is uncovered at the bottom of the trench at sub grade, it shall be removed and backfilled with approved material for a depth not less than 12 inches. This material shall be tamped in layers of 6 inches to provide a uniform and continuous bearing characteristic of that area's soil condition. Where the bottom of the trench at subgrade consists of unstable material to such a degree that it cannot be removed and replaced with an approved material to support the pipe properly, a suitable foundation shall be constructed. Excavated material shall be piled in such a manner that it will not endanger work, obstruct natural watercourse, sidewalks or driveways.

Fire hydrants, valve boxes, or other utility controls shall be left unobstructed and accessible at all times. Street gutters shall be kept clear or other satisfactory provisions made for street drainage. All surface materials, which are suitable for

reuse in restoring the surface, shall be kept separate from the excavated materials.

#### *8.5.10.2 Sheet piling and Bracing*

Open cut trenches shall be sheeted and braced as required by OSHA Code of Regulations Part 1926 (latest revision) and as may be necessary to protect life, property or the work. Trench bracing may be removed after the backfilling has been completed or has been brought up to such an elevation as to permit its safe removal. The use of a trenching box may be used in place of sheet piling and bracing as long as said box is in compliance with above referenced OSHA Code.

#### *8.5.10.3 Dewatering*

Water shall not be allowed in the trench at any time. An adequate supply of well points, headers and pumps, all in first class operating condition, shall be used to remove the ground water. The use of gravel and pumps shall also be an acceptable means of removing the water on a case-by-case basis as approved by the OCWS. At no time shall any pumps emit an unacceptable noise level as determined by the OCWS' Engineer or Contractor will be required to shut down pumping operations.

The trench shall be excavated no more than the available pumping facilities are capable of handling. The discharge from pumps shall be routed to settling basins or other acceptable erosion and sedimentation control devices prior to discharging to natural or existing drainage channels or storm sewers. Any and all permits required for Dewatering are the responsibility of the Contractor and shall be obtained prior to commencement of construction.

### 8.5.11 PIPE LINE CONSTRUCTION

#### *8.5.11.1 Pipe Laying*

All sewer mains, laterals, and appurtenances shall be installed as specified in these technical provisions, manufacturer's recommendations, and in accordance with the approved plans and appropriate standard detail sheets as provided herein.

The bottom of the trench shall not be excavated below the specified grade. If undercutting occurs, the bottom of the trench shall be brought up to the original grade with approved material, thoroughly compacted as directed by OCWS' Engineer and/or his representative.

Before placing pipe into the trench, the outside of the spigot and the inside of the bell shall be wiped clean and dry before applying lubrication. Every precaution shall be taken to prevent foreign material from entering the pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.

All slip joints shall be made up in strict accordance with the manufacturer's specifications. The bell shall be carefully cleaned before the gasket is inserted.

After placing a length of pipe in the trench, the spigot end shall be entered in the bell, the pipe forced home, and brought to correct alignment.

#### *8.5.11.2 Backfilling*

All backfilling material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks, stones of other material which is considered unsuitable. The Contractor shall not backfill any connection or appurtenances that require OCWS' inspection. Failure to provide the opportunity for inspection shall be grounds for the removal and replacement of all disputed items. All such inspections shall be scheduled two working days in advance.

## 8.6 MATERIAL REQUIREMENTS

### 8.6.1 INSPECTION OF MATERIALS

All materials delivered to the job site are submitted to inspection by OCWS' representative. Any materials found during inspection or during the progress of the work to be defective or not meeting specifications shall be rejected and removed from the job site without delay. Materials and/or work not inspected by the Board's representative prior-to installation shall be uncovered by the Contractor at his expense in order to verify compliance. Copies of the Packing List shall be furnished on demand. All materials used for sanitary sewer construction shall be new and of domestic origin. No used material shall be allowed.

### 8.6.2 PIPE

#### *8.6.2.1 Ductile Iron Pipe*

Ductile iron sewer pipe shall be push-on joint in accordance with ASTM A 746-latest version and ANSI/AWWA C111/A21.11. Pipe wall thickness shall be in accordance to bury depth as specified in above referenced AWWA latest edition. The pipe shall be protected with epoxy coatings as provided by Protecto 401 by Vulcan Painters, Birmingham, Alabama or approved equal. All ductile iron pipe for underground installation shall be outside coated with Industry Standard bituminous material applied by means of airless spray or other factory approved method. Each pipe segment shall be clearly indentified as having the Protecto 401 coating.

#### *8.6.2.2 Plastic Composite Pipe (8"— 12")*

PVC composite pipe shall be push-on joint in accordance with ASTM D2680-90 (latest version). Minimum pipe stiffness, when measured in accordance with ASTM D24 12, shall be 200 psi. The thermoplastic material shall meet or exceed the requirements of ASTM D1784. Contech Construction Products, Inc. Truss Pipe, a PVC composite pipe, has been approved for installation.

### 8.6.3 LATERALS

Laterals shall be solid wall PVC and be 4 inch conforming to the requirements of ASTM A746 or ASTM D3034. Solid wall lateral pipe shall be SDR 23.5.

### 8.6.4 FITTINGS

#### *8.6.4.1 Iron Fittings*

Fittings shall be ductile iron and shall be designated and manufactured in accordance with ANSI A21.1 latest version. Fittings shall be protected with an epoxy coating (Protecto 401 or equal) in accordance with ANSI/AWWA C104/A21.4.

#### *8.6.4.2 Plastic Fittings (< 4 inches)*

Pipe with diameters of less than 4 inches shall have PVC composite fittings that conform to ASTM D2680-80.

### 8.6.5 COUPLINGS AND CONNECTORS

Couplings and connectors may be used to join similar and dissimilar materials as well as pipes of the same diameter or of different diameters. Indiana Seal Flexible Couplings or Flex-Seal Couplings (Mission Rubber Co.) using series 300 stainless steel hose clamps shall be used.

### 8.6.6 EPOXY COATINGS

All manholes, ductile iron pipe, and other sewer system components on interceptor/outfall lines (sewer mains with diameters of 18" and greater) shall be protected from corrosion by the use of factory applied epoxy coatings. In addition to the epoxy coating requirement as described below, OCWS may extend the use of protective coatings to include the first two segments (or 500 ft. of sewer main) of any branch sewer emanating from the interceptor/outfall lines. OCWS further reserves the right to require protective coatings on any manhole, ductile iron pipe, or component of any collector line (less than 18" in diameter) as is deemed necessary by OCWS' Engineer.

#### *8.6.6.1 Concrete and Masonry*

##### *8.6.6.1.1 Exterior*

Epoxy coatings on concrete and masonry (i.e. manholes, concrete pipes, etc.) shall be applied to the exterior with a polyamide coal tar epoxy, Series 46H-413 Hi-Build Tnemec-Tar or approved equal. A seal coat of epoxy shall be applied to the exterior of the structure per the manufacture's recommendations.



#### 8.6.6.1.2 Interior

Following this review, OCWS may require the interior of concrete masonry structures (i.e. manholes, concrete pipe, etc.) to be coated using Sprayroq or equal. As a minimum, all manholes receiving force main discharge flows shall be coated as described above.

#### 8.6.6.2 Ductile Iron

Epoxy coatings on ductile iron pipe and fittings shall have a ceramic epoxy lining on the interior and a bituminous coating on the exterior except for 6" back from the spigot end. The bituminous coating shall not be applied to the first 6" of the exterior of the spigot ends. The material used for the lining shall be a two component amine cured epoxy. Epoxy shall be Protecto 401 by Vulcan Painters, Birmingham, Alabama or approved equal. The epoxy shall be applied to a thickness of at least 40 mils.

### 8.6.7 MANHOLES

#### 8.6.7.1 Precast Manholes

Precast manholes shall be reinforced concrete conforming to the requirements of ASTM C478. The concrete when tested in compression shall be not less than 4000 psi.

#### 8.6.7.2 Cast in place Manholes

Cast in place manholes, saddle type (dog houses) shall not be used unless approved otherwise by OCWS' Director.

#### 8.6.7.3 Manhole Rim and Casting

Ferrous casting shall be of uniform quality, free from blowholes, shrinkage, distortion or other defects. Metal used in the manufacture of castings shall conform to ASTM A-48 (latest revision) Class 35B for Gray Iron. All castings shall be manufactured true to pattern; component parts shall fit together in a satisfactory manner. Component parts of a specified design shall be interchangeable. Round frames and covers shall have continuously machined bearing surfaces to prevent rocking and rattling. Tolerances shall be accepted foundry standards as outlined in the Iron Castings Handbook published by the American Cast Metals Institute (tolerances shall not exceed +/- 1/16 inch per foot of major dimension). Castings shall be coated with bituminous asphalt coating. All manhole covers shall have the following cast on the cover: Okaloosa County Sanitary Sewer. (Refer to detail sheet.)

#### 8.6.7.4 Manhole Steps

Manhole steps shall be copolymer polypropylene plastic with ½" diameter grade 60 reinforcements and shall conform to ASTM C478. All steps shall be built into the walls of the precast sections in straight alignment so as to form a continuous

ladder with a maximum distance of 16 inches between steps.

#### *8.6.7.5 Manhole Joint*

Joints between manhole sections shall be made with a preformed butyl sealant. Butyl sealants shall meet the hydrostatic performance requirements of ASTM C880. Use ConSeal CS-102 or approved equal. Manhole joints shall be grouted on the exterior only. Lifting eyes are not acceptable.

#### *8.6.7.6 Concrete Collars*

Shall conform to the requirements of Section 8.6.7.1 and shall be a maximum height of 12 inches as required to bring the manhole to the required height.

#### *8.6.7.7 Hydraulic Cement*

Joints shall be grouted on the outside of the manhole with mortar. Use a rapid setting, non-shrink, hydraulic cement specially formulated for underwater use. The cement shall be non-staining, containing no organic materials. Use BONSAL Instant Hydraulic Cement or approved equal.

#### *8.6.7.8 Pipe-to-Manhole Connector Assembly*

Flexible connector assemblies shall be made of a rubber compound especially formulated to resist weather, ozone, oils, acids, alkalis, and animal/vegetable fats with a stainless internal band and external clamp. The assembly shall be inserted into the precast manhole at the factory and shall meet the requirements of ASTM C823. Use NPC Inc. or approved equivalent.

### 8.6.8 ENCASUREMENT REQUIREMENTS

#### *8.6.8.1 General*

Encasement is required when crossing all railroads, and some State, County, and City roadways, which have excessive traffic flow or other critical situations (such as protecting building foundations). Whenever possible, encasement and mains shall cross the roadway and/or railroads, perpendicular to the roadbed. A valve will be required on each end of the encasement. In all cases, the agency requiring the encasement shall have the final approval of the Engineering design.

#### *8.6.8.2 Encasement Pipe*

Pipe to be installed under pavement where open trenching is not permitted shall be installed through steel casing, or high density polyethylene pipe (HDPE) based on the method of installation, which has been jacked and/or bored. Casing shall extend beyond the back of slope or edge of pavement a minimum of 6 feet.

Casing size and thickness shall be as indicated below:

| DIAMETER OF SEWER MAIN (INCHES) | MINIMUM CASING DIAMETER (INCHES) | MINIMUM CASING THICKNESS (INCHES) | ASTM / AWWA STANDARD           |
|---------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| 4"                              | 12"                              | .25"                              | ASTM A53                       |
| 6"                              | 14"                              | .25"                              | ASTM A53                       |
| 8"                              | 16"                              | .25"                              | ASTM A53                       |
| 10"                             | 18"                              | .25"                              | ASTM A53                       |
| 12"                             | 24"                              | .375"                             | ASTM A53                       |
| Larger than 12"                 | As Approved by County Engineer   | As Approved by County Engineer    | As Approved by County Engineer |

#### 8.6.8.3 Encasement Spacers

Encasement spacers shall be as manufactured by Cascade Water Works Inc., Advanced Products and Systems Inc., or Pipeline Seal and Insulator Inc. Spacers to be stainless steel body with runners a minimum of 8" in length for piping under 12" in diameter.

### 8.6.9 BACKFILL

#### 8.6.9.1 Coarse Aggregate

Coarse aggregate shall consist of naturally occurring materials such as gravel, or resulting from the crushing of parent rock, to include natural rock, slags, expanded clays and shales (lightweight aggregates), and other approved inert materials with similar characteristics, having hard, strong, durable particles, conforming to the specific requirements of Section 901 "Course Aggregate" of FDOT's Standard Specifications.

#### 8.6.9.2 Fine Aggregate

Fine aggregate shall consist of natural silica sand, screenings, local materials, or subject to approval, other inert materials with similar characteristics, or combination thereof, having hard, strong, durable particles, conforming to the specific requirements of Section 902 "Fine Aggregate" of FDOT's Standard Specifications.

### 8.6.10 VALVES

#### 8.6.10.1 Resilient Wedge Gate Valves (4" - 12")

Gate valves on sewer force main size 4" to 12" in diameter shall incorporate resilient wedge gates with mechanical joint ends. All gate valves shall be of domestic origin and shall meet or exceed AWWA C-515 or C-509. Resilient wedges shall be of natural or synthetic rubber and be bonded or mechanically

attached to the gate using stainless steel hardware and shall be rated at a working pressure of 200 psi.

The interior and exterior of the valve body shall be fusion-bonded epoxy coated in accordance with AWWA C-550 (latest edition) in order to provide a corrosion resistant seat, applied in a manner to withstand the action of line fluids and operation of the sealing gate under long-term service. Valve seats shall seal by compression only. Valves shall be supplied with 2” square operating nuts and shall be designed to provide a bubble or bottle tight seal regardless of direction of flow. Opening shall be in the counterclockwise direction.

The following resilient wedge gate valves are accepted for installation:

| MANUFACTURER          | MODEL NO.   |
|-----------------------|-------------|
| American Flow Control | Series 2500 |
| Mueller               | A-2360      |

8.6.10.2 Resilient Seat Gate Valves (< 4”)

All gate valves < 4” located below grade must be ductile iron resilient wedge meeting or exceeding AWWA C515 standards, latest edition. All gate valves shall have a standard 2” operating nut and standard FPT openings. No bronze/brass type gate valves will be accepted in underground applications.

| MANUFACTURER          | MODEL NO. |
|-----------------------|-----------|
| American Flow Control | 502       |
| Mueller               | A-2360    |

8.6.11 VALVE BOXES

Cast iron valve boxes shall be provided for all vales installed underground. The valve boxes shall be adjustable to fit the depth of earth covered over the valve and shall be designed so as to prevent the transmission of surface loads directly to the valve or piping. The valve boxes shall be manufactured of cast iron and shall be of the two piece design, screw type, including a bottom section and top section with lid cover. Only those valve boxes that are of domestic manufacture will be acceptable.

The casting shall be manufactured of clean, even grain, gray cast iron with a minimum tensile strength of 21,000 psi. It shall be smooth, true to pattern, free from blowholes, sand holes, projections and other harmful defects. The seating surface of both the lid cover and the top section shall be cast so that the cover will not rock after it has been seated, and will fit tightly with no play. The Department reserves the right to require a certification of compliance from the manufacturer.

Valve box must be an integral unit that is telescopic and adjustable and shall house the entire valve and operator extension. Extension pieces, if required shall be ductile iron pipe. Valve box lids should have the work sewer cast on the top. All valve boxes located outside of roadway pavement shall have concrete pad (two foot to three foot diameter) poured around the box at finished grade level.

+++ END OF SECTION +++

## **SECTION 9**

# **SEWER TESTING AND INSPECTION**



**SECTION 9 SEWER TESTING AND INSPECTION**

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**9.1 PURPOSE**

This section outlines the requirements for acceptance testing of gravity sewer pipe (plastic composite and ductile iron).

**9.2 GENERAL**

Testing shall be accomplished through the combination of visual inspections, low pressure air tests, and leakage tests methods. Acceptance tests shall only be performed after all work adjacent to and over the pipeline has been completed. Backfilling, placement of fill, grading, initial/base layer of paving, concrete work, and any other superimposed loads shall be completed and in place prior to any testing. All testing shall be performed in the presence of OCWS representative, after the installation of all other utilities (including power poles). Tests performed in the absence of OCWS's representative shall be considered invalid and shall be repeated at the Contractor's expense.

**9.2.1 VISUAL INSPECTION**

OCWS's representative shall visually inspect all gravity sewer pipe (plastic composite and ductile iron) installed to verify alignment and ensure the pipe is free from obstructions and debris. The Contractor shall ensure that survey staking is provided to identify easement locations, as well as, final location and grade of proposed culverts, storm drains, and ditches. Contractor shall call for a visual inspection when a maximum of 10 manholes have been installed and following installation of all laterals. The inspector shall use the sunlight or spotlight, and mirrors to "flash" the sewer pipe one section at a time. When the full diameter of the pipe is visible between adjacent manholes, the segment of piping is deemed properly aligned and free of sags and debris. If the segment of pipe fails the visual inspections, the pipe shall be cleaned and/or replaced and re-tested. Contractor shall provide a bill of materials of the installed pipeline at the time of the visual inspection. Contractor may be requested to excavate the pipe for inspection.

**9.2.2 LOW-PRESSURE AIR TEST**

On all sanitary sewer lines (plastic composite and ductile iron), including private sewer lines, the Contractor shall conduct a line acceptance test using low-pressure air testing. For ductile iron pipelines, test in accordance with the applicable requirements of ASTM C924. For PVC pipelines, test in accordance with ASTM F 1417-98 and UBPPA UNI-B-6.

For gasketed joint plastic composite pipe (Truss Pipe), it is often desirable to begin and finish a run with the factory bell in place (lay the upstream section of the pipe backwards) or coat the spigot ends at each manhole with a heavy bodied moisture cured urethane adhesive. Take care to coat both ends of spigot/spigot section entering the manhole.

The Contractor shall furnish all labor, equipment, and any appurtenant items necessary to satisfactorily perform the vacuum test. All testing equipment shall be approved for vacuum testing manholes.

*9.2.2.1 Air Test Procedure (Dry Conditions)*

The following procedure shall be used during the low—pressure air testing of sewer mains located above the ground water table:

- Isolate section of sewer by inflatable stoppers or other suitable test plugs. Plug or cap the ends of all branches, laterals, tees, wyes, and stubs to be included in the test. Securely brace all plugs or caps to prevent blow-out. One of the plugs or caps should have an inlet tap, or other provision for connecting a hose to a portable air source.

(Note: Special attention should be placed on the exposed spigot end of composite plastic pipe. If not properly sealed, air can leak through the porous material in the pipe's annulus.)

- Connect the air hose to the inlet tap. Add air slowly to the test section until the pressure inside the pipe reaches 4.0 psig.
- Allow the pressure to stabilize such that a pressure between 4.0 psig and 3.5 psig is maintained for at least two minutes. The pressure will normally drop slightly until equilibrium is obtained; however a minimum of 3.5 psig is required.
- Disconnect the air supply and decrease the pressure to 3.5 psig. before starting the test.
- Use the Time-Pressure Drop Method to determine if the segment of pipe is "Acceptable". Determine the minimum acceptable time for a 1 psig. drop in pressure from 3.5 psig to 2.5 psig. Compare the minimum acceptable time to that actually observed in the field to determine if the rate of air loss is within acceptable limits. Minimum holding times are listed in the following table depending on length and size of mains.

Minimum specified time required for a 1.0 psig pressure drop for size and length of pipe.

| Pipe Diameter (Inches) | Specification Time for Length Shown (Minutes: Seconds) |        |        |        |        |        |        |        |
|------------------------|--|--------|--------|--------|--------|--------|--------|--------|
|                        | 100 ft   | 150 ft | 200 ft | 250 ft | 300 ft | 350 ft | 400 ft | 450 ft |
| 8                      | 7:34   | 7:34   | 7:34   | 7:34   | 7:36   | 8:52   | 10:08  | 9:24   |
| 10                     | 9:26   | 9:26   | 9:26   | 9:53   | 9:52   | 13:51  | 15:49  | 17:48  |
| 12                     | 9:20   | 9:20   | 9:24   | 14:15  | 17:05  | 19:56  | 22:47  | 25:38  |
| 15                     | 14:10  | 14:10  | 17:48  | 22:15  | 26:42  | 31:09  | 35:35  | 40:04  |
| 18                     | 17:00  | 19:13  | 25:38  | 32:03  | 38:27  | 44:52  | 51:16  | 57:41  |
| 21                     | 19:50  | 26:10  | 34:54  | 43:37  | 52:21  | 61:00  | 69:48  | 78:31  |
| 24                     | 22:47  | 34:9   | 45:34  | 56:58  | 68:22  | 79:46  | 91:10  | 102:33 |

#### 9.2.2.2 Air Test Procedure (Wet Conditions)

All test procedures are measured as gage pressure, which is any pressure greater than atmospheric. Since water produces a pressure of 0.43 psig for every foot of depth over the main, air test pressures must be increased to offset the depth of groundwater over the sewer line.

In areas where groundwater is known to exist, the Contractor shall install one-half inch diameter capped PVC pipe nipple, approximately 10" long, through the manhole wall on top of one of the sewer lines entering the manhole. This shall be done at the time the sewer line is installed. Immediately prior to performing the line acceptance test, the groundwater elevation shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic tube to the nipple. The hose shall be held vertically and a measurement of the height in feet of water over the invert of the pipe shall be taken after the water has stopped rising in the plastic tube.

Multiply the height in feet above the pipe invert to the groundwater table by 0.43 psig/ft and add it to the required 3.5 psig minimum test pressure. For example, if the height of water is 9.5 feet, then the added pressure will be 0.43 psig/ft x 9.5 ft or 4.9 psig. This increases the test pressure from 3.5 psig to 8.4 psig and the 2.5 psig to 7.4 psig, respectively. The allowable drop of 1 psig for the time allowed as outlined in Table 1 still remains the same for 8.4 psig and the 2.5 psig to .4 psig, respectively.

If however, the groundwater level is 2 ft or more above the top of the pipe at the upstream end, or if the air pressure required for the test calculates out to be greater than the 9 psig gage, the air test method should not be used. In this case, a visual inspection for leakage would produce a more conservative test. Before the air test method is used, the groundwater level should be lowered by pumping or dewatering.

### 9.2.3 VACUUM TESTING OF MANHOLES

As requested by OCWS, all sanitary sewer manholes constructed by the Contractor shall be vacuum tested for leakage in the presence of an OCWS Representative. Vacuum testing shall be performed in accordance with ASTM C 1244. The vacuum test requirement will not apply to any existing manhole, or any existing manhole that has been converted to a drop manhole by the Contractor.

The Contractor shall furnish all labor, equipment, and any appurtenant items necessary to satisfactorily perform the vacuum test. All testing equipment shall be approved for vacuum testing manholes.

#### 9.2.3.1 Vacuum Testing Procedure

All lifting holes shall be plugged with an approved non-shrink grout inside and out. Manhole joints shall be grouted from the outside only. All pipes entering the manhole shall be plugged. The Contractor shall securely brace the plugs in order to keep them from being drawn into the manhole. The test head shall be placed at the inside of the top of the cone section of the manhole and the seal inflated in accordance with the manufacturers recommendations.

A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time for the vacuum to drop to 9 inches of mercury shall not be less than that shown in the table below:

| DEPTH (FEET) | MANHOLE DIAMETER (INCHES) |    |     |
|--------------|---------------------------|----|-----|
|              | 48                        | 60 | 72  |
| 0-8          | 20                        | 26 | 33  |
| 10           | 25                        | 33 | 41  |
| 12           | 30                        | 39 | 49  |
| 14           | 35                        | 46 | 57  |
| 16           | 40                        | 52 | 67  |
| 18           | 45                        | 59 | 73  |
| 20           | 50                        | 65 | 81  |
| 22           | 55                        | 72 | 89  |
| 24           | 59                        | 78 | 97  |
| 26           | 64                        | 85 | 105 |
| 28           | 69                        | 91 | 93  |
| 30           | 74                        | 98 | 121 |

(Times shown are minimum elapsed times, in seconds, for a drop in vacuum of 1 inch of mercury.)

### 9.3 SEQUENCE OF TESTING

The sequence of testing shall be as follows:

- Construction completed and all backfill and superimposed loads in place
- Landscaping over and around sewer appurtenances is completed
- Manholes completed
- Lines thoroughly cleaned
- Visual testing (“flashing”)
- Determination of groundwater table
- Air Testing or Infiltration Testing Pipe Manhole

### 9.4 TEST FAILURE

Should a line or manhole fail to pass any of the acceptance test as outlined, the Contractor shall, at his expense, determine the source of the failure, make any necessary repairs, and retest the segment of piping or manhole in question at no cost to the Authority.

### 9.5 MANDREL EQUIPMENT

Because the inside diameter of composite plastic piping varies from that of solid wall PVC, equipment systems used to perform Mandrel tests shall be specifically Designed for the pipe material being tested. Mandrels that do not specifically state the size and type of piping for which it is applicable shall not be allowed.

### 9.6 AIR / VACUUM TEST EQUIPMENT

Equipment systems used to perform low-pressure air tests shall be specifically Designed for this purpose. Systems approved by OCWS shall be Cherne Air-Loc Equipment, Lansas Products, or approved equal. Isolation of pipe segments shall be accomplished through the use of plugs (mechanical or pneumatic type). Pressurization of the sewer main shall be accomplished through the use of an air compressor that has an oil free air source, singular control panel, main shut-off valve, pressure—regulating valve, 9 psig pressure relief valve, input pressure gauge, and a continuous monitoring pressure gage. The continuous monitoring pressure gage shall have a pressure range from 0 psig to at least 10 psig with minimum divisions of 10 psig. The gage face shall be a minimum of 4 inches in diameter and have an accuracy of  $\pm .04$  psig.

+++ END OF SECTION +++



**NEW CONSTRUCTION INSPECTION  
(MINIMUM CHECKLIST, NOT ALL INCLUSIVE)**

**Preliminary Sewer Inspection**

- \_\_\_ Check all lots for sewer service; service should be at lot corner (within 36") and stubbed up at least 3' above ground at rear of easement or right of way (at property line).
- \_\_\_ Check all sewer services on each lot (use camera and save film). Look for broken, cut or crushed services.
- \_\_\_ Check all service for caps.
- \_\_\_ Check for trash in sewer services (video). Camera the laterals for misalignment, cracks, & defects.
- \_\_\_ Check manholes for steps (first step should be no more than 2' below rim).
- \_\_\_ Check invert for smooth transition.
- \_\_\_ Flash sewer mains; look for bellies in mains and alignment (check for identity of pipe diameter versus slope (check for minimum slope of 0.5% for 8-inch diameter pipe).
- \_\_\_ Check manhole for voids. All cracks, holes (lifting pin holes, etc.) and seams must be grouted.
- \_\_\_ Check for trash in manholes.
- \_\_\_ Check seals in manholes (do not accept if infiltration detected at seams or bottoms). Smooth transition grout in manholes.
- \_\_\_ Check rings on top of manholes:
  - \_\_\_ Rings should be sealed with concrete;
  - \_\_\_ Lid should be heavy duty type;
  - \_\_\_ Should not be stacked out more than 18".
- \_\_\_ Force mains must be pressure checked and also have tracer wire installed. Pressure test for FM requires holding minimum 100 psi for 2 hours with less than 5 psi drop. Force main pipe must be green.
- \_\_\_ Check against OCWS Sanitary Sewer requirements.

**PRELIMINARY LIFT STATION INSPECTION**

- \_\_\_ Coordinate with lift station crew and electricians (SCADA as required).
- \_\_\_ Check wet well for sand or trash.
- \_\_\_ Check size of pumps (do they meet specifications?).
- \_\_\_ Check level system for high and low level switching devices.
- \_\_\_ Check for valves and check valve.
- \_\_\_ Check lids on station and valve box; (ensure ability to lock lids).
- \_\_\_ Check control panel box; (ensure it can be locked).
- \_\_\_ Check against OCWS lift station requirements.





## **SECTION 10**

# **WATER TESTING AND INSPECTION**



**SECTION 10 WATER TESTING AND INSPECTION**

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10.1 PURPOSE

This section outlines the requirements for acceptance testing of water mains.

10.2 GENERAL

Testing shall be accomplished through the combination of visual inspections, and hydrostatic pressure testing. The Contractor shall provide all labor, material and equipment necessary for conducting tests. All testing shall be performed in the presence of the OCWS' representative. Tests performed in the absence of the OCWS' representative shall be considered invalid and shall be repeated at the Contractor's expense.

Contractor shall call for a visual inspection of installed water lines to verify the grade of the water line. Contractor shall provide a minimum of 48 hours notice for visual inspections.

Following approval of visual inspections, Contractor shall request OCWS to perform a hydrostatic pressure test of the water line. Contractor shall provide a minimum of 48 hours notice for pressure testing. Contractor shall ensure that air is evacuated from the line, valves have been bled off, hydrants are on line, and all water services are on line. Water leaks from weep holes are not acceptable.

Following successful completion of the pressure test, a certificate of completion shall be issued by OCWS. Water lines that do not successfully pass the pressure test will be retested following repair by the Contractor. OCWS shall charge the Contractor a retesting fee for subsequent tests as provided for in Appendix A of the Okaloosa County Water and Sewer Ordinance.

10.3 VISUAL INSPECTION

The OCWS' representative shall visually inspect selected pipe and appurtenances at the point of delivery for damage and other defects. The OCWS' inspection of random materials delivered to the site in no way relieves the Contractor of his responsibility to make certain that all materials comply with the OCWS' requirements. Damaged materials or materials not meeting the OCWS' requirements shall be removed from the site and replaced. Contractor shall provide a bill of materials of the installed pipeline at the time of the visual inspection.

10.4 HYDROSTATIC TESTING

The purpose of a pressure test is to locate defects in materials or workmanship, thereby permitting proper repair. All pressure testing of lines should be done hydrostatically. Do not use

air pressure to test water lines. THE USE OF AIR TO PRESSURE TEST A LINE, OR THE FAILURE TO REMOVE ALL AIR FROM A LINE PRIOR TO TESTING, CAN CAUSE EXPLOSIVE PRESSURES TO BUILD UP IN THE LINE CAUSING SERIOUS PERSONAL INJURY.

#### 10.4.1 PRESSURE TEST RESTRICTIONS

The following restrictions shall be adhered to:

- Test pressure shall not be less than 1.50 times the working pressure at the lowest point along the test section, but not less than 150 psi.
- Test pressures shall not exceed pipe or thrust-restraint design pressures.
- Hydrostatic tests shall be of at least 2 hour duration.
- The test pressure shall not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves: Note: Resilient wedge gate valves approved by OCWS typically have a working pressure limit of 200 psig while resilient wedge gate valves incorporated with large backflow devices have a working pressure limit of 175 psig.

The following items must be considered prior to testing:

- The pipe to be tested must be sufficiently backfilled (partial backfill) to prevent movement while under pressure.
- Joint restraint at fittings should be permanent and constructed to withstand test pressure. If concrete thrust blocks are used, sufficient time must be allowed before testing to permit the concrete to cure. Cure time of seven days is recommended when Type I Portland Cement is used; three days is recommended when Type III Portland Cement is used.
- Test ends should be restrained to withstand the applicable thrusts that are developed under the test pressure.

#### 10.4.2 AIR TESTING OF TAPPING SLEEVE

The OCWS maintenance staff will air test each tapping sleeve installed to ninety (90) psig for a period of 10 minutes. No pressure drop will be allowed. Successful testing of sleeve shall not relieve the Contractor of any leaks that may occur during the warranty period. At the Contractor's expense, the Board will repair all leaks that occur in the warranty period.

#### 10.4.3 HYDROSTATIC TEST PROCEDURE

Construction of all service lines, fire hydrants and any/all other connections involving restrained joints and/or thrust blocking shall have been completed and inspected prior to scheduling of hydrostatic pressure test. Testing shall be in accordance with AWWA C600 hydrostatic pressure test scheduled with OCWS' representative with a minimum of two (2) working days in advance. OCWS' representative must be on site while flushing and testing is being performed.

#### *10.4.3.1 Flushing*

Foreign material left in the pipeline during installation often results in valve or hydrant seat leakage during pressure testing. Every effort should be made to keep lines clean during installation. Flushing shall be accomplished by partially opening and closing valves and hydrants several times under expected line pressure with adequate flow velocities to flush foreign materials out of the valves and hydrants. Mains shall be flushed to achieve a velocity of not less than 2 ft/second.

#### *10.4.3.2 Filling the Line*

The main should be filled slowly from OCWS' approved source of potable water. The water may be introduced from lines in service through valved connections, or by temporary connections to hydrants, or by taps made at the connection cap. All such connections, however, should be made at the lowest point in the line whenever possible.

#### *10.4.3.3 Expelling Air from Pipe Line*

Compressed entrapped air can greatly amplify any surges as well as pumping pressures. Furthermore, entrapped air can cause erroneous pressure test results. ALL air should be expelled from the pipeline during filling and again before making either pressure or leakage tests. Automatic air release valves located at high points are recommended for extended sections of new water main. If permanent air vents are not present at the high points, the Contractor may use corporation cocks at these points to expel the air as the line is filled with water. After the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cock shall be removed and the pipe plugged or left in place. It will be left to the Board's representative to determine if flushing alone (without the use of air vents or corporation stops) is sufficient to expel the entrapped air from the main.

#### *10.4.3.4 Pressure Testing*

All valves not required to be closed for isolation of the new main being tested shall be open during the testing including fire hydrant valves. The line shall be pumped up to no less than 150 psig and no more than 200. Once the pressure equalizes the line shall hold said pressure for a minimum of two hours. If line is not holding specified pressure at time of arrival of OCWS' representative, the test will be cancelled and rescheduled at the convenience of OCWS. This shall be repeated until the test requirements are satisfactory.

#### *10.4.3.5 Flow Test*

A minimum of 23 gpm shall be provided at each service.

#### *10.4.3.6 Examination*

The Contractor shall examine all exposed pipe, fittings, valves, hydrants, thrust blocks, restraints, and joints during the course of the hydrostatic testing. Any



damaged or defective work or material shall be repaired or replaced, and the test shall be repeated until satisfactory results are obtained.

#### 10.5 DISINFECTION AND BACTERIOLOGICAL TESTING

Upon successful passing of the pressure test, the main(s) shall be disinfected by the Contractor who shall coordinate his testing with OCWS. The Contractor shall perform bacteriological testing of water mains. If such samples do not demonstrate satisfactory results, re-chlorination will be required. All service connections shall be made before testing and shall also be disinfected. The Contractor shall be responsible for the cost of chlorination during construction and testing.

#### 10.6 FINAL INSPECTION

For the final inspection before acceptance by OCWS, all valve boxes shall be plumb and to grade, and curb stops shall be adjusted to the proper elevations (see standard drawing). OCWS' representative will check each valve to verify the valve is in the open position. Each curb stop shall be opened and closed. By-pass valves on meters shall be in the "closed" position. Adjustment of the by-pass valve after final inspection is prohibited.

Upon completion of the project, OCWS' inspector shall verify that all valves are in the "open" position with the sole exception of the by-pass valve on larger meters. By-pass valves on large meters shall be in the "closed" position.

#### 10.7 TEST FAILURE

Should a line fail to pass any of the acceptance tests as outlined, the Contractor shall, at his expense, determine the source of the failure, make any necessary repairs, and contact OCWS to re-test the segment of piping in question.

#### 10.8 PRESSURE TEST EQUIPMENT

Equipment systems used to perform water pressure test shall be specifically designed for this purpose. The continuous monitoring pressure gage shall be liquid filled (glycerine) having a pressure range from 0 psig with minimum divisions of 5 psig. The gage face shall be a minimum of 4 inches in diameter and have an accuracy of  $\pm .04$  psig. The gauge shall meet or exceed Grade B ANSI-ASME B40.1.

+++ END OF SECTION +++

NEW CONSTRUCTION INSPECTION  
(MINIMUM CHECKLIST, NOT ALL INCLUSIVE)

Preliminary Water System Inspection

1. \_\_\_ Check all valves - make sure all valves are open (valve connection to existing OCWS main to remain closed until Bacteria Test passed, OCWS approval granted and FDEP certified).
2. \_\_\_ Open water services on each lot to check pressure. Look for broken or cut services.
3. \_\_\_ Water services should be extended at least 18" above ground and within 36" of lot line.
4. \_\_\_ Open all fire hydrants, check flow - Fire Department responsible for testing flow.
5. \_\_\_ Check for valve boxes - All water valves and fire hydrant valves should be in boxes with collars and brought up to grade.
6. \_\_\_ Check all easements - Ensure all water mains and services are within easements.
7. \_\_\_ Check burial depth on water main. Verify that finished grade is established and a minimum of 36" of cover is provided.
8. \_\_\_ Verify "as builts" are correct.
9. \_\_\_ Check against OCWS' Water Specifications.

**CONTRACTOR WILL BE RESPONSIBLE FOR LOCATING AND MAINTAINING  
WATER AND SEWER LOCATIONS DURING CONSTRUCTION.**

**PROVIDE CONTRACTOR A COPY OF FINAL INSPECTION REPORT:  
CONTRACTOR NEEDS TO READ AND UNDERSTAND REPORT AND ANNOTATE  
ON THE REPORT ANY ITEMS HE DISAGREES WITH.**

**OCWS NEEDS ALL PLATS AND AS-BUILTS IN OFFICE PRIOR TO THE COUNTY  
ACCEPTING MAINTENANCE.**

**NEW CONSTRUCTION INSPECTION**  
(MINIMUM CHECKLIST, NOT ALL INCLUSIVE)

Preliminary Water System Inspection

1. \_\_\_ Pressure test water main to not less than 150 PSI for 2 HRS with no more than 5 PSI drop in pressure. If pressure drops more than 5 PSI in 2 HRS, conduct maximum allowable leakage test.
2. \_\_\_ After 2 HRS pressure test: bleed pressure off; ensure all valves including fire hydrant valves are open; if any valves were closed, rerun the pressure test.

Preliminary Water System Inspection (After pressure test)

- 1 \_\_\_ Check valves; make sure water mains are under pressure.
2. \_\_\_ Check all water services; make sure tracer wire is installed and provides a continuous circuit.
3. \_\_\_ Check all curb stops; should be locking curb stops.
4. \_\_\_ Check water service taps; all taps should be 45° from vertical (taps made vertically will not be accepted).
5. \_\_\_ Open water services; make sure tap is open all the way.
6. \_\_\_ Open fire hydrant(s) and check hydrant valves; check for valve boxes on hydrant(s).
7. \_\_\_ Check fittings; for reinforcements around fittings, bends, hydrant, etc.
8. \_\_\_ Check for tracer wire; should be 14 gauge on mains and services; should extend 18" above valve box when uncoiled.
9. \_\_\_ Make sure each lot has a service; service should be located on lot corner and should protrude at least 18" above ground at the rear of the easement or right of way (at property line).
10. \_\_\_ Fire hydrant(s) should be located on lot line with 4" pumper nozzle facing the road with at least 18" clearance above the ground.
11. \_\_\_ Perform a rough check of cover over water main and proper location.
12. \_\_\_ Turn water off until final inspection is complete - Inform Contractor water is off.
13. \_\_\_ Get contact information:  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
24 Hour Telephone Number: \_\_\_\_\_  
Office Number: \_\_\_\_\_  
FAX Number: \_\_\_\_\_
14. \_\_\_ Check against OCWS' Water Specification requirements.

**SECTION 11**  
**PUMP STATIONS**



**SECTION 11 PUMP STATIONS**

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### 11.1 INTRODUCTION

The purpose of this document is to present the OCWS' guidelines and procedures regarding the planning, design, and construction of new wastewater pump stations in the OCWS' service area.

- Service area planning
- Design Requirements
- Design Flow Estimation
- Peaking Factors
- Wet Well Sizing Requirements
- Controls
- Control Room
- Site Plans

The service area planning procedures establish guidelines that developers must follow during the planning of proposed wastewater services for new developments. These procedures include:

- A method for establishing the service area boundaries of the proposed wastewater facility
- A procedure for performing wastewater flow rate projections using existing and projected land use information and DEP requirements.

The standard pump station design type presented in this document is limited to submersible pump stations that will serve new developing areas of the OCWS' wastewater system. The average daily flow rate (ADF) capacities of the stations and gravity interceptors covered in this document are limited to a range of up to 1,000 gallons per minute (gpm).

General specifications for materials and equipment are presented but are not intended to be used as construction specifications. Detailed construction specifications must be prepared by a professional engineer registered in the State of Florida.

General pump station configurations and dimensions are presented for guidance and should be carefully reviewed to confirm that conflicts with specific equipment selection requirements do not exist. Dimensions presented in this document are intended to show relative sizing. Actual dimensions may vary and will depend on specific structural or foundation requirements of the proposed pump station. Equipment from specific manufacturers may require adjustments to the dimensions shown for proper installation.

**THE DESIGN INFORMATION IN THIS REPORT SHOULD NOT BE CONSIDERED A PREDESIGN. THIS IS A GUIDANCE DOCUMENT TO USE IN PREDESIGN**



PREPARATION. ALL DRAWINGS AND SPECIFICATIONS ARE PRESENTED FOR CONFORMANCE GUIDANCE AND NOT FOR USE IN CONSTRUCTION.

## 11.2 SERVICE AREA PLANNING

In order to plan properly for wastewater service, two important tasks must be completed by the initial developer:

- Establish service area boundaries
- Project the ultimate 20-year wastewater ADF for the service area

### 11.2.1 ESTABLISHING SERVICE AREA BOUNDARIES

The initial developer is responsible for determining the boundaries of the development area and for demonstrating how this area would best be served by a pump station. The initial developer will provide all the necessary supporting information and data to OCWS staff. The OCWS staff will review the initial developer's planning documents to confirm that the proposed wastewater service area assumptions are acceptable.

The initial developer must consider the following criteria when determining the service area boundaries:

- Physical barriers and topographic limitations that preclude the use of gravity interceptors
- The potential wastewater flow rate from future developments in the service area

The importance of each of these criteria is discussed below.

#### *11.2.1.1 Physical Barriers and Topographic Limitations*

Physical barriers include major roadways, streambeds, high ridge points, and other obstacles that prevent the use of gravity interceptors. These types of barriers generally make cost effective service area boundaries. The general topography of the area is another factor to consider when establishing service area boundaries. Areas that have ground slopes in the range of 0.5 to 1.0 percent generally will provide adequate sanitary sewer pipe flow velocities at relatively shallow pipe burial depths. Ground slopes less than this generally require increased excavation (depth) to ensure adequate pipe slopes and flow velocities.

Because excavation depth increases with distance, this factor often determines the cost effectiveness of the pump station service areas boundaries. Pump station wet wells should not exceed a depth of 25 feet.

#### *11.2.1.2 Potential Wastewater Flow Rates*

The ultimate wastewater flows that will be conveyed by the interceptor or to the pump station from the areas being developed also must be considered when establishing boundaries. The design ADF of the submersible pump stations or interceptors considered in this manual must be less than 1,000 gpm. The maximum design flow limitation is required because service areas that produce

wastewater flows greater than 1,000 gpm generally will involve a more comprehensive planning effort than can be covered by this document.

The typical range of service area sizes to be considered in this document is less than 1,500 acres. This range is based upon the flow range up to 1,000 gpm and an average unit flow factor of 0.7 gpm per acre (discussed later in this section) and includes developments with an average of three single family dwellings per acre. The range decreases to 30 to 400 acres for high-density apartments or office complexes. If the physical barriers and topography indicate that an area greater than 1,500 acres can be serviced by a single pump station or interceptor, then a more comprehensive facilities planning study will be required to assess the need of a high-capacity regional pump station.

### 11.2.2 PROJECTING SERVICE AREA WASTEWATER FLOWS

Determining the projected wastewater flows for future growth within a service area is an essential factor when planning a pump station. This document presents a method to calculate the projected ultimate wastewater ADF based upon the type and size of the developments within the service area, unit wastewater flow factors, and the phasing of the developments.

#### *11.2.2.1 Service Area Data Collection*

The initial developer is responsible for estimating the projected ultimate wastewater ADF for his and other developer's developments within the service area and for obtaining all necessary information about the type, size, and phasing of the developments proposed within a service area. This information must be obtained by contacting the other developers within the service area. Certified return receipt letters are required for this correspondence. The initial developer must describe to the other developers that application for the proposed pump station is being submitted and what impact it could have on them. The letters also must describe what information is requested from them and how this information will be used. Correspondence between the initial developer and the other developers must be documented and included in the wastewater service application submittal. If no response is received by the initial developer within a reasonable time, OCWS reserves the option of projecting whatever wastewater flow contribution it considers appropriate for the land parcel in question.

## 11.3 PUMP STATION DESIGN REQUIREMENTS

### 11.3.1 INTRODUCTION

This chapter presents a standard approach to the design of submersible pump stations with wastewater ADFs of up to 1,000 gpm. The sizing criteria and specifications for design and construction presented in this document are intended as guidelines for engineers and developers designing standard submersible pump stations for use in the OCWS' wastewater system.

The standards presented in this chapter are based upon input from OCWS' maintenance staff and on an inspection of the OCWS' existing wastewater pump stations. OCWS' maintenance personnel have had both positive and negative experiences with various pump station designs. As a result, they realize that certain design features can enhance or hinder the pump station's ability to operate or the maintenance personnel's ability to maintain these stations. Therefore, the design criteria presented in this document include design features to enhance the operation and maintenance of the OCWS' future pump stations. Also, the use of standardized designs will help to ensure that stations designed by different engineers meet a minimum acceptable level of quality and require minimum operation and maintenance.

The OCWS will consider variations of the design standards presented in this document with proper documentation and review.

### 11.3.2 SIZE CRITERIA

The dimensions of the control room, wet well, valve pit, and the station site should be considered during the design of the pump station. Criteria for establishing the dimensions, as well as the importance of each of these components, are presented in the following sections. Criteria for establishing the capacity of the submersible pumps provided in the station are included also.

### 11.3.3 WET WELL

The wet well is a key component of a properly operating pump station. The dimensions of the wet well determine the frequency and duration of pump cycles, as well as the detention time of the wastewater at the station. As a result, a fixed volume of liquid must be retained and then pumped at a fixed rate, creating a cyclic pump operation. Presented below is a method for designing the minimum wet well volume for a submersible pump station.

### 11.3.4 SUBMERSIBLE PUMPS

In a duplex station, the submersible pumps shall be designed to operate at the PHF, and in a triplex station, two pumps operating in parallel shall be designed to have sufficient capacity to meet the PHF. The PHF can be calculated using PHF:ADF ratios. The minimum PHF:ADF ratio shall be 3.0 for pump stations designed based upon the criteria presented in this document. Consideration will be given to other PHF:ADF ratios only after a review, by OCWS staff, of supporting design information. Alternating LEAD/LAG pump control strategies shall be provided to control both duplex and triplex pump stations.

### 11.3.5 VALVE PIT

Clearance must be provided in the valve pit to allow for maintenance of the valves. The exact dimensions will be determined by discharge pipe size and specific valve assembly and disassembly clearances. The pit shall contain all check valves, gate valves, and

associated fittings for station operation. At least 18 inches of space should be provided between all pipes and walls for easy disassembly of mating flanges. The 18 inch spacing also applies between the pipe and the valve pit bottom. Pipe supports should be located as needed to fully support the equipment in the valve pit, without hindering their operation or maintenance.

#### 11.3.6 SITE DIMENSIONS

The pump station site will be designed to allow easy truck access to the pump station for operation, maintenance, and equipment removal. Truck access is only required on one side of the station. A minimum of 30 ft shall be provided between the station front and the property line at the truck access side of the station. A minimum 5 ft clearance between the pump station and the site property lines will be required on the other three sides. In most cases the station should be oriented with the open side to face south or east and perpendicular to the access street if possible. This will provide sufficient room for a truck to back into the site, make a 90 degree turn, and back under the equipment removal hoist.

For small sites with limited area, the open side of the pump station may be oriented to face the access road. This will allow a truck to back into the site without making a turn. In this case a 10 foot distance to the property line is required. Setback distances are governed by the city zoning ordinances, and the pump station shall be designed to follow these regulations. In many cases, pump stations are located in easements and rights-of-way that may allow the setback distances to be reduced. However, distances greater than the minimums are always desirable.

#### 11.3.7 ELECTRICAL CONTROL PANEL

Developer shall coordinate with OCWS to purchase a standard control panel based on the size of the pumps or provide a panel in accordance with the specifications and drawings.

### 11.4 SUBMITTALS

This section establishes specific submittal requirements from the initial developer for review and approval by OCWS and OCWS staff. The submittals are designed to be completed fully by the initial developer, so that minimal interpretation of the initial developer's submittal information is required by OCWS staff. If information is incomplete, the application will be returned to the initial developer for correction and resubmittal. The developer should formalize the following procedure on standardized forms to make review an objective and straightforward process.

#### 11.4.1 SUBMITTAL ITEMS

The following list of items shall be required for each new proposed regional pump station or interceptor installation submitted for approval to OCWS.

- Application. This will contain general information, i.e., type of project, owner's name, developer's name, engineer/architect's name, etc. (May be in a letter format)

- Request for Information Letters. Copies of the certified return receipt letters, return receipts, and any correspondence between the initial developer and other developers within the service area are to be included.
- Development Area Land Use Map. This map shall show land use planning using the WUFC classifications, presented in Table 3-2, of the initial developer's development area. The scale range for the map shall be between 1" = 500' and 1" = 100'.
- Flow Estimating Data Sheet. The data sheet shall contain the information presented in Table 4-1 of this document. Every development or parcel of land within the service area will be inventoried and included on this data sheet. The data sheet is completed by the initial developer for the development area and all future developments within the service area. The service area flows shall be estimated using the procedures presented in this document. Areas currently zoned agricultural and not likely to be rezoned within the planning period, as determined by the other developer, shall be included in the A-1 category for wastewater projection purposes.
- Service Area Land Use Map. This map shall include all land parcels within the service area. The service area shall include an area bounded by the practical limits for wastewater service using the guidelines given in the section titled "Establishing Service Area Boundaries." OCWS staff shall be given a draft service area boundary to approve before completing the planning study and evaluation. The map shall include the following information:
  - List of all land parcels and current owners within the service area.
  - The proposed service area boundaries shall be identified.
  - All land parcels included within the service area boundaries, either in part or in whole, shall be identified according to the list provided. Partial land parcels included in the service area limits should be included in the planning projection. These areas should be noted as partial inclusions on the planning map with both area inside and outside of the service area shown.
  - Existing zoning district classifications used by the Okaloosa County Planning Division shall be indicated and the boundaries shown.
  - Easily identifiable and legible elevation contours shall be shown.
- Service Area Topographic Map. A topographic map of the service area shall include the following information:
  - Contours at 5' intervals
  - Streets, waterways, and drainage courses
  - Railroads
  - All other physical barriers
  - Limits of proposed development
  - Limits of final service area
  - Existing sanitary sewer system
  - Proposed location of new pump station
  - Proposed connection to existing system
  - All land parcels and their zoning classification

The map scale range shall be between 1" = 500' and 1" = 100'. Scales of 1" = 100' are preferred.

## 11.5 GUIDELINE SPECIFICATIONS FOR CONSTRUCTION

The pump stations presented in this document shall be constructed to ensure long operational life with minimum operation and maintenance costs. The following section describes general conformance specifications for structural and architectural, mechanical, electrical and instrumentation, and geotechnical and civil disciplines.

### 11.5.1 VALVE HOUSING BOX

- The exterior of the valve housing box shall be water proofed by the manufacturer with two coats of Kopper's Bitumastic 300-M pr approved equal type sealant to prevent ground water infiltration.
- The interior of the valve housing box shall have a smooth plastered finish, bottom section to be sloped to one corner.
- There shall be a minimum of 18 inches clearance on all sides of valves and fittings.
- The check valves shall be a full body cast iron valve with external lever and spring as manufactured by Empire Specialty Co. Inc., or approved equal. Cast Iron Body, renewable Buna N Seal, and AWWA C115 Flanged connection. The shaft, center pin, disc arm set screw, seat screws and disc arm key shall be stainless steel.
- All exposed hardware shall be of corrosion resistant, stainless steel.
- The Access Hatches shall be aluminum double-door type, rated at 300 lb/sq. ft. A minimum of 3' x 3' overall, mounted and centered on the box as shown on the drawings. Doors shall be of skid-proof design.
- All valve housing boxes shall be a solid cast in place or precast concrete box with bottom grouting of box bottom not permitted.
- The gate valves shall be AWWA C509 Compression Resilient Seated, Flanged Cast Iron Body with epoxy coated interior, and manual hand wheel actuator.
- An emergency by-pass gate valve with an Ever-tite Quick Coupling, Part "F", Female x Male iron pipe adaptor with male thread, 4" aluminum, shall be used, and installed within the valve box proceeding the in-line check and gate valve. The coupling should be located in a manner that it is accessible when the access hatch is open, with no obstructions so that a 4" suction hose can be easily attached for emergency operations.

### 11.5.2 WET WELL

- There shall be stainless steel pull chains fastened with stainless steel clamps to the lift rings on each pump. The stainless steel chain shall be of adequate strength to permit raising and lowering of the pumps.
- The entire internal discharge riser pipes shall be scheduled 80 P.V.C. joined with schedule 80 P.V.C. cement, or welded 304 stainless steel.
- A double door aluminum access frame and cover, rated at 300 lb/sq. ft., complete with hinged and flush locking mechanism, 316 S.S. upper guide holder and level sensor(s) cable holder shall be furnished and installed on the pump station wet well. Frame shall be securely placed, mounted above the pumps. Frame shall be provided with sliding nut rails to attach the accessories required. Lower guide bar holders shall be integral with the discharge connection. Guide bars shall be of at least 316 stainless

- steel pipe. Doors shall be of skid proof design.
- All lift eyes within the interior and exterior of wet well shall be cut off flush with the existing surface, and sealed with a Bitumastic type sealant.
  - Steps will not be allowed inside the wet well.
  - Schedule 80 PVC with a flange on each end shall be used from the exterior of the wet well into the valve box.
  - The discharge piping shall be intermediately supported inside the wet well by the use of a stainless steel uni-strut bolted to the well wall, and stainless steel u-bolts and clamps secured to the discharge pipe and strut.
  - All fasteners inside wet well shall be 316 stainless steel and coated with Never Sieze or equal.
  - Hatch to wet well shall be as a minimum 4' x 4' in size or larger, as specified on plans.
  - All wet wells shall have an approved interior lining system.
  - Wet Well shall be 6' diameter or larger or 6' x 6' square or larger as specified on plans.
  - A guide system for pump removal shall be installed inside the wet well for each pump. The entire guide system shall be manufactured of a minimum 316 stainless steel and in accordance with the pump manufacture guidelines. All pipes for rail type guides shall have as a minimum, two (2) inches in diameter. The guide system shall not support any portion of the weight of the pump. The lower guide bracket shall be incorporated and tightly secured to the discharge connection elbow with 316 stainless steel fasteners. The entire guide system shall conform to Underwriters Laboratory (U. L.) requirements, for use in Class I, Division I, Group D environments.
  - Influent piping shall be C-900 or C-905 PVC Pipe and be turned down to a level 6 inches below the lowest water level.

#### 11.5.2. A ALTERNATE WET WELL/VALVE BOX

- Stand alone Fiberglass Structures may be used for Wet Well and Valve Pit. The FRP structures must meet and or exceed ASTM-D3753 standards. The structures must be Third Party Tested and Certified to meet the ASTM-D3753 standards. A copy of this certification must be provided with Submittal Data. Manufacturers that do not have this Third Party Certification included with the submittal data will not be approved. The structures must have labels that have serial numbers visible and states the manufacturer, date of manufacture, depth, diameter, and that structure meets ASTM-D3753 standards. If the Manufacturer is contacted they must be able to state purchaser, diameter, depth, and date that the wet well was purchased simply by providing the serial numbers. Manufacturers that do not maintain files that track serial numbers will not be accepted as warranties will not be verifiable.
- The fiberglass structures must have a standard 10 Year structural warranty. The fiberglass structures must have a printed 10 Year warranty label gel coated next to ASTM and serial number label. Copy of this warranty must be included with the submittal data. Approved Manufacturer is L.F. Manufacturing, Giddings, Texas ([www.lfm-frp.com](http://www.lfm-frp.com)).
- Wet wells/Valve Pits shall have 12" risers with "Drop In" Aluminum Hatch Cover. Upon completion the wet well and valve pit shall have an 8" concrete slab poured

over top. On wet wells 8' in diameter or larger an extra hatch cover shall be supplied on opposite side of wet well to allow installation of future equipment.

- The wet well shall include guide rail systems with SST components and fiberglass I-Beams or dual SST pipe for slide rails. The basis of design for the guide rail system is Hydromatic Pump's Pultruded/MTM Rail System. The base elbow and sealing flange shall be constructed of Cast Iron.
- Valve pit shall include two (2) epoxy coated swing check valves with outside lever and spring, three (3) full port SST plug valves (By American), Emergency pump out connection with dust cap and all the necessary gaskets, straight pipe, brackets, elbows, tees, and fittings. Minimum valves and pipe size shall be 4".
- All piping will be Sch. 40 SST for corrosion resistance and strength. Where piping passes through a wall sleeves shall be used with rubber link seals to make a watertight penetration. The sleeves must be large enough for flange of pipe being used to pass freely through (Example: 4" pipe would require a 10" sleeve to allow 9-1/2" O.D. diameter of 4" flange). The link seals are used so that the rubber acts as vibration isolator while pump is running.
- All piping in wet well and valve pit shall be welded Flange X Flange Sch. 40 SST. Hardware used for connections must be SST bolts with Brass nuts.
- Discharge piping in wet well must have "air release" valves (Waterman type, or equal).
- Oil filled pressure gauges rated for 1-1/2 times specified pumping pressures with 3/4" SST ball valves must be provided for each discharge. Gauges must be located between check and plug valve so that static head can be observed when pump is off, TDH can be observed while pumps are running, and plug valves can be shut to observe "dead head" pressure.
- The Emergency Pump Out Connection Dust Cap must be tapped with 1/4" pet cock so as to bleed off any accumulated pressure that may build up prior to removing cap.

### 11.5.3 PLATES, SHEETS, AND SHAPES

#### *11.5.3.1 Aluminum Plates, Sheets and Shapes*

All aluminum plates and shapes shall be of type AA 5052 alloy conforming to applicable requirements of ASTM Designation B 209-67, (latest revision).

Aluminum extended shapes shall be 6061 or 6062 alloy conforming to ASTM B 221-67, (latest revision).

All surfaces in contact with concrete shall be coated with Bitumastic (Kopper's 50 or equal).

#### *11.5.3.2 Stainless Steel Plates, Sheets, and Shapes*

All stainless steel plates and sheets shall be type 316 alloy conforming to the applicable requirements of ASTM Designation A-182, (latest revision).

Stainless Steel pipe shall be schedule 5, Type 316 alloy conforming to the applicable requirements of ASTM-312, (latest revision).



### *11.5.3.3 Fastenings*

Fasteners insofar as practical shall be concealed. Where exposed, fastening shall be of 316 stainless steel, where not indicated otherwise and countersunk wherever possible. All fastenings coming into contact with aluminum and /or submerged shall be of stainless steel.

All hardware used to assemble ductile iron fittings shall be stainless steel. Threads shall be coated with antiseize compound.

All threaded fasteners to include threaded rods shall be coated with antiseize compound.

## 11.5.4 SUBMERSIBLE PUMPING EQUIPMENT

### *11.5.4.1 Pumps*

Pumps shall be submersible, heavy duty, recessed impeller type or an approved equal by the Okaloosa County Water & Sewer Engineering Department.

The pumps shall be capable of handling raw, unscreened sewage. The discharge connection elbow shall be permanently installed in the wet well along with the discharge piping. The pumps shall be automatically connected to the discharge connection elbow when lowered into place, and shall be easily removed for inspection or service. There shall be no need for personnel to enter pump well. Sealing of the pumping unit to the discharge connection elbow shall be accomplished by the simple linear downward force of the pump. A sliding guide bracket shall be an integral part of the pump unit. The entire weight of the pump unit shall be guided by no less than two guide bars and pressed tightly against the discharge connection elbow with metal-to-metal contact by gravity only. Sealing of the discharge interface by means of a diaphragm, O-ring, or other devices will not be acceptable. No portion of the pump shall bear directly on the floor of the wet well. The pump, with its appurtenances and cable, shall be capable of continuous submergence underwater, without loss of water-tight integrity to a depth of 65 ft. Totally submersible design, with all electrical parts housed in an air-filled cast-iron, water tight enclosure. Thrust and radial bearings shall be of the ball type, the motor shafting shall be stainless steel and designed for extremely difficult sewage pumping service. The motors (less than 20 hp) shall be designed to operate on 3-phase, 60-cycle, 240/volt alternating current, and motors (greater than or equal to 20 hp) shall be designed to operate on 3-phase, 60-cycle, 480 volt alternating current, and each shall be non-overloading at all points on the pump curve. Alternate voltages may be considered by OCWS on a case by case basis.

### *11.5.4.2 Manufacturing*

- Design HP of 25 or less: The duplex submersible pumps shall be as manufactured by ESSCO, Wemco, Hydromatic, or KSB. Submittal data must be reviewed and approved by Okaloosa County Water and Sewer Engineering

prior to final approval and purchase.

- Design HP greater than 25: Pump selection for applications exceeding a design horse power of 25 HP, shall be at the discretion and approval of Okaloosa County Water & Sewer Engineering, prior to approval of design. Submittal data must be reviewed and approved by Okaloosa County Water and Sewer Engineering prior to final approval and purchase.

#### *11.5.4.3 Submittal Data*

The contractor shall provide three (3) copies of the following submittal data for each item of pumping equipment:

- Certified Dimensional Print
- Typical Performance Curve
- Pictorial and Schematic Wiring Prints
- Parts Listed and Instructional Prints
- Pump Components and Warranty

#### *11.5.4.4 Pump Characteristics*

Pumps shall furnish the following:

- Pump to pass minimum sphere of 3 1/2 inch diameter.
- Minimum motor size, 5 HP, unless otherwise approved by OCWS.
- Recessed impellar unless otherwise approved by the OCWS Engineering Department.

#### *11.5.4.5 Controls*

Automatic control of the duplex submersible pumps shall be by means of a system of float switches or compressed air. The switch shall be capable of starting and stopping the pumps at an adjustable differential, starting the lead pump first and then the lag pump if wet well level continues to rise, running both pumps simultaneously and automatic alternation of the lead and lag pumps. The control shall be housed in a Stainless Steel NEMA Standard 250, Type 4x enclosure with a pad lock hasp and handle. The enclosure shall include:

- Dead front enclosure made of stainless steel.
- Two (2) motor starters of adequate size.
- 120-Volt, 20-Amp duplex receptacle.
- Four (4) circuit breakers, one for each pump, one for the receptacle and one for the control circuitry.
- Two (2) HOA (hand-off automatic) switches.
- Three (3) pole overload relay with one (1) heater per pole for each pump.
- Pump alternating circuit.
- 120 Volt AC Control Voltage.
- Two (2) run lights (green), run light shall be clearly labeled.
- Two (2) moisture detection relays and yellow warning lights.
- Two (2) 0 to 99,999.9 hour elapsed time meters.
- Phase Failure relay required (plug-in type, 8-pin).

- A minimum of 12" x 12" shall be vacant on inside of sub panel for additional equipment.
- A high level float switch will be provided and wired to a terminal strip in the panel.
- A 110-Volt exterior flood light, 175 wattage rating, with a remote switch installed inside the main control panel, shall be mounted adjacent to and overhead of the panel and wet well.
- A motor over-temp circuitry shall be installed, so that if the motor reaches an over-temp condition, the control voltage to that motor is interrupted. This shall illuminate a red warning light in the panel.
- The controller shall be completely assembled, tested and ready for operation prior to final acceptance inspection.

#### *11.5.4.6 Alternate Control Systems*

Alternate control systems and arrangements will be considered provided all functional characteristics are met.

### 11.5.5 ELECTRICAL

#### *11.5.5.1 General*

All electrical equipment shall be installed in accordance with the N.E.C. Code, as last revised. All materials used shall be new and unused, of the highest quality, and of proper type for the use intended. Where applicable, all material shall carry the approval of the Underwriters' Laboratory. Substitutes, which tend to lower the quality of the work, will not be permitted. The project is to result in a complete and operable Lift Station. Any items not specified, but normally included in such installations shall be furnished and installed regardless of omissions from specifications. However, specified omissions are not affected by this requirement. The electrical service and starting gear shall be mounted on a suitably sized panel frame constructed of aluminum 4" x 4" x 1/4" angle. All details of service characteristics shall be verified with the local utility.

#### *11.5.5.2 Materials*

- Conduit and conduit fittings shall be P.V.C. Electrical connectors and couplings shall be of the approved plastic water-tight type.
- Wire and cable shall be properly sized to carry the anticipated loading. Insulation, unless otherwise noted, shall be typed RHW neoprene jacket for all sizes.
- Conduit into wet well shall be large enough for easy removal of pump leads and/or float leads but as a minimum 2" diameter. There shall be one conduit for each pump, plus one for float switch cables if used.

#### *11.5.5.3 Installations*

- All conduit runs, whether or not terminated in boxes, shall be capped or plugged to prevent the entrance of foreign objects before wires are pulled.

Conduit projecting into the wet well shall be plugged to a depth no more than 2" from the control panel with non-hardening compound, after the wires are pulled to prevent corrosive gases from reaching the control panel. Compound should be easily removed for removal/replacement of wiring.

- Outlets, switches, boxes, etc., shall be rigidly secured and located properly with respect to easy accessibility.
- No electrical splices allowed except in control panel.
- All work shall be tested and subject to final approval of the engineer.

#### *11.5.5.4 Stand-by Facilities*

A double throw safety switch suitable sized to carry the operating current of the station with attached emergency generator receptacle shall be installed between the main disconnect and the controller. The unit shall be housed in a NEMA 3R stainless steel enclosure. The receptacle shall be a Crouse-Hinds, rated for 100-Amp minimum, larger as required. A 45 degree angle adapter is recommended to allow for easier generator connection, and to prevent water intrusion.

#### *11.5.5.5 Lightning Arrestor*

The lightning arrestor for the main service entrance shall be Joshlin or approved equal.

#### *11.5.5.6 Main Disconnect*

The main disconnect safety switch shall be a fused, enclosed service entrance, weather-proof enclosure, 4 wire S/N, 240/480 Volt AC of sufficient size to carry all pumps operating simultaneously.

### 11.5.6 GENERAL REQUIREMENTS

#### *11.5.6.1 As-Built Records*

A complete set of As-Built records shall be kept by the Contractor. These records shall show all items of construction and equipment which differ in size, shape or location from those shown on the contract drawings, also any additional work, existing features or utilities revealed by construction work which are not shown on the contract drawings. These reports shall be kept up-to-date daily. They may be kept on a marked set of contract drawings to be furnished by the contractor for this purpose, or in any other form, which is approved prior to the beginning of the work. They shall be available at all times during construction for reference by the Engineer and Owner, and shall be delivered to the OCWS Engineering Department upon completion of the work.

#### *11.5.6.2 Nameplate*

Each piece of mechanical equipment and motors shall be provided with a substantial nameplate of non-corrodible metal securely fastened in place, and clearly and permanently inscribed with the manufacturer's name, model, or type designation, serial number, rated capacity, electrical or other power

characteristics, and other appropriate nameplate data. Spare nameplates shall be provided for each lift station and placed inside each control panel (one nameplate for each model pump).

#### *11.5.6.3 Lubricants*

All the equipment shall be delivered fully lubricated with oil and/or grease insofar as possible. If any point cannot be so serviced, it shall be clearly marked to the effect that it is not lubricated and requires servicing prior to operation. An adequate supply of the proper lubricant, with the instructions for its application shall be supplied with the equipment for each point not lubricated prior to shipment. The Contractor shall also provide the Owner with a sufficient amount of proper lubricants for one complete change of lubricant for all equipment furnished.

#### *11.5.6.4 Operating Manuals and Parts Listed*

The Contractor shall furnish three (3) complete, bound sets of literature giving the following information to the Okaloosa County Water and Sewer Engineering Department.

- Clear and Concise instruction for operations, adjustment and lubrication and other of the equipment. These instructions shall include a complete lubrication chart.
- A list of all parts of the equipment, with catalog number and other data necessary for ordering replacement parts.
- Such instructions and parts listed shall have been prepared specifically for the model and type of equipment furnished and shall not refer to other models and types of similar equipment.
- Complete sets of electrical schematic(s), (as built) one of which shall be encapsulated in plastic and permanently mounted to the inside of the liftstation door.

#### *11.5.6.5 Telemetry Equipment*

A telemetry fee shall be paid to:

Okaloosa County Water and Sewer System  
1804 Lewis Turner Boulevard, Suite 300  
Fort Walton Beach, Florida 32547

This fee will cover the expense of installing telemetry equipment, at the time of purchasing other associated connection cost.

#### *11.5.6.6 Fencing*

Fence specifications will vary, subject to the requirements of the developer and the Okaloosa County Water and Sewer System.

*11.5.6.7 Force Main (Thermoplastic piping)*

A #14 copper insulated tracer wire shall be laid over the full length of the force main.

*11.5.6.8 Water Service*

A ¾" Potable water service with backflow preventor shall be made available at Lift Station Site.

+++ END OF SECTION +++



## **SECTION 12**

## **VARIANCES**





**SECTION 12 VARIANCES**

12.1 PURPOSE.....1

12.2 GENERAL .....1



12.1 PURPOSE

The purpose of this section is to provide guidelines for any deviations deemed necessary to the standard specifications and design manual.

12.2 GENERAL

If any deviations to the design standards are deemed necessary due some unique characteristics of the project topography, etc, written justification must be submitted to the Director of OCWS and written approval of the deviation obtained prior to any construction.

+++ END OF SECTION +++



# **DIVISIONS**



**DIVISION 1 GENERAL REQUIREMENTS**

SECTION 01570 MAINTENANCE AND PROTECTION OF TRAFFIC

SECTION 01710 CLEANING

SECTION 01730 OPERATION AND MAINTENANCE DATA





## SECTION 01570

### MAINTENANCE AND PROTECTION OF TRAFFIC

#### 1.1 GENERAL

- A. All streets and trafficways shall be kept open for the passage of traffic and pedestrians during the construction period unless otherwise approved by OCWS.
- B. When required to cross, obstruct or temporarily close a street or trafficway, CONTRACTOR shall provide and maintain suitable bridges, detours or other approved temporary expedient for the accommodation of traffic. Closings shall be for the shortest time practical, and passage shall be restored immediately after completion of backfill and temporary paving or bridging.
- C. CONTRACTOR shall give the required advance notice to the fire and police departments of his proposed operations.
- D. CONTRACTOR shall give reasonable notice to owners or tenants of private property who may be affected by his operations.
- E. CONTRACTOR shall provide signs, signals, barricades, flares, lights and all other equipment, service and personnel required to regulate and protect all traffic, and warn of hazards. All such work shall conform to requirements of the OWNER or OCWS having jurisdiction. Remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.

#### 1.2 TRAFFIC SIGNALS AND SIGNS

- A. Provide and operate traffic control and directional signals required to direct and maintain an orderly flow of traffic in all areas under CONTRACTOR'S control, or affected by CONTRACTOR'S operations.
- B. Provide traffic control and directional signs, mounted on barricades or standard posts:
  - 1. At each change of direction of a roadway and at each crossroad.
  - 2. At detours and hazardous areas.
  - 3. At parking areas.

#### 1.3 FLAGMEN

- A. Provide qualified and suitably equipped flagmen when construction operations encroach on traffic lanes, as required for regulation of traffic and in accordance with the requirements of OCWS having jurisdiction.

#### 1.4 FLARES AND LIGHTS

- A. Provide flares and lights during periods of low visibility:
  - 1. To clearly delineate traffic lanes, to guide traffic and to warn of hazardous areas.

2. For use by flagmen in directing traffic.
- B. Provide illumination of critical traffic and parking areas.

#### 1.5 PARKING CONTROL

- A. Control all CONTRACTOR related vehicular parking within the limits of the Work to preclude interference with public traffic or parking, access by emergency vehicles, OWNER'S operations, or construction operations. Provide temporary parking facilities for the public as may be required because of construction or operations.
- B. Monitor parking of all construction and private vehicles:
  1. Maintain free vehicular access to and through parking areas.
  2. Prohibit parking on or adjacent to access roads, or in non-designated areas.

#### 1.6 HAUL ROUTES

- A. If extensive hauling is necessary, consult with governing authorities and establish thoroughfares, which will be used as haul routes and site access.
- B. Confine construction traffic to designated haul routes.
- C. Provide traffic control at critical areas of haul routes to expedite traffic flow, to minimize interference with normal public traffic.

## SECTION 01710

### CLEANING

#### PART 1 - GENERAL

##### 1.1 REQUIREMENTS OF REGULATORY AGENCIES

- A. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and anti-pollution regulations.

##### 1.2 PROGRESS CLEANING

- A. General: Clean the Site, Work areas and other areas CONTRACTOR is permitted to occupy by Laws and Regulations at least weekly. Dispose of materials lawfully according to Laws and Regulations:
  - 1. Comply with requirements in NFPA 241, Standard for Safeguarding Construction, Alteration and Demolition Operations, for removal of combustible waste materials and debris.
  - 2. Do not hold other materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 F.
  - 3. Provide suitable containers for storage of waste materials and debris.
  - 4. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately.
- B. Project:
  - 1. Maintain Project free of waste materials and debris.
  - 2. Keep exterior dust generating areas wetted down.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire Work area, as appropriate.
- D. Installed Work: Keep installed Work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.
- H. Waste Disposal: Burying or burning waste materials on the Site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

### 1.3 FINAL CLEANING

- A. General: Provide final cleaning.
  1. Complete the following cleaning and waste-removal operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean and remove from the Project rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Hose clean sidewalks and loading areas.
    - d. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - e. Leave water courses, gutters, and ditches open and clean.
    - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of spatter, grease, stains, fingerprints, films, and similar foreign substances.
    - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.
    - h. Remove tags and labels that are not permanent.
    - i. Touch up and otherwise repair and restore chipped, scratched, dented or otherwise marred surfaces to specified finish and match adjacent surfaces.
      - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
    - j. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    - k. Maintain the cleaning until OWNER occupies the Project or portion thereof.
    - l. Leave Project clean and in a neat and orderly condition satisfactory to OCWS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)



## SECTION 01730

### OPERATION AND MAINTENANCE DATA

#### PART 1 GENERAL

##### 1.1 SCOPE

- A. CONTRACTOR shall provide operation and maintenance data in the form of instructional manuals for use by the OWNER'S personnel for:
  - 1. All equipment and systems.
  - 2. All valves, gates and related accessories.
  - 3. All instruments and control devices.
  - 4. All electrical gear and equipment.
- B. Each manual shall be prepared specially for the Project and shall include all pertinent instructions, as-built drawings, bills of materials, listings, technical bulletins, and other printed materials required to provide fully accurate and comprehensive information for the safe and proper operation, maintenance and repair of the equipment or system supplied for the Project. The manual shall include any specific information required by the applicable Specification Section. It also shall include all data that must accompany said manual as directed by current regulations of any participating government agency.

##### 1.2 FORMAT

- A. Each operation and maintenance manual shall be bound in a durable, permanent, stiff cover binder of one or more volumes. Binders shall be of the three-ring type or three post type and shall not be overfilled. Covers shall be oil, moisture and wear resistant.
- B. The contents of the manual shall be printed on 8-1/2 by 11 inches 30 pound (minimum) paper and binding holes shall be reinforced with plastic, cloth or metal.
- C. All contents shall be original quality copies. That is, the material shall either be original manufacturer printed or typed materials or xerographic copies that are indistinguishable from the original. Manuals that contain copies that are not clear, not completely legible, off-center, skewed, or where text or drawings are cut by the binding holes shall be subject to disapproval. Pages that contain approval or date stamps, comments, or other markings that cover any portion of text or drawing are unacceptable. Electronically transmitted facsimile (fax) copies are also unacceptable.
- D. Drawings, diagrams and illustrations up to and including 11 by 17 inches in size shall be bound into the manual. Larger size documents shall be folded and inserted into clear plastic pockets or envelopes bound into the manual and marked as to contents.



- E. Manuals shall be organized into sections or categories of information such as operating instructions, preventive maintenance, drawings, and parts list. Use dividers and indexed tabs to separate sections.
- F. Provide a table of contents indicating the title of each section and a complete listing of the contents of each section in the order of presentation within the section.
- G. The manuals shall be identified by labels firmly attached to the front cover and the spine. Identify each binder with the following:
  1. Title "OPERATING AND MAINTENANCE INSTRUCTIONS".
  2. Name or type of equipment or system manual concerns.
  3. Identity of building or structure, as applicable.
  4. Title of Project.
  5. Volume number, if more than one.

### 1.3 CONTENTS

- A. Provide complete, detailed written operating instructions for each product including: function; operating characteristics; limiting conditions; operating instructions for startup, normal and emergency conditions; regulation and control; operational troubleshooting; and shutdown. Also include, as applicable, written descriptions of any alarms generated by the product and the proper responses to such alarm conditions.
- B. Include written explanations of all safety considerations relating to operation and maintenance procedures.
- C. Provide complete, detailed written preventive maintenance instructions including all information and instructions to keep the product properly lubricated, adjusted and maintained so that the item functions economically throughout its full design life. These instructions shall include, but are not limited to the following:
  1. Written explanations with illustrations for each preventive maintenance task such as inspection, adjustment, lubrication, calibration and cleaning. Also provide pre-startup checklists for each piece of equipment and long-term shutdown maintenance requirements.
  2. Recommended schedule for each preventive maintenance task.
  3. Lubrication charts indicating recommended types of lubricants, frequency of application or change, and where each are to be used or applied.
  4. Table of alternative lubricants.
  5. Troubleshooting instructions.
  6. List of required maintenance tools and equipment.
- D. Complete bills of material or parts lists for products provided. Lists or bills of material may be provided on a per drawing or per equipment assembly basis. The bills of material shall indicate:
  1. The name, address and phone number of the manufacturer.
  2. The name, address and phone number of the nearest manufacturer's representative, parts warehouse or parts supplier.
  3. The manufacturer's shop order and/or serial number(s) for the equipment or assembly.

4. For each part or piece:
  - a. The parts cross reference number. The cross-reference number shall be used to identify the part on the assembly drawing, Shop Drawing or other type of illustration where the part is clearly shown.
  - b. The part name or description.
  - c. The manufacturer's part number.
  - d. The quantity of each part used in each assembly.
  - e. The current unit price of the part.
- E. Complete instructions for the ordering of all replaceable parts including any reference numbers (e.g. shop order or serial number) that will expedite the ordering process.
- F. Manufacturer's recommended inventory levels for spare parts and consumable supplies for the first two years of operation. Consumable supplies are those items used up or worn out by the operation of the equipment or items used to maintain the operation of the product. This would include such items as lubricants, recorder chart papers, chart inks, reagents, and testing chemicals used for the calibration or operation of the equipment. Lead time, shelf life values and any special storage requirements shall also be recommended.
- G. Manufacturers installation and operation bulletins, diagrams, schematics, and equipment cut-aways. Catalog materials should be avoided unless it is the only material available that shows the identification or description of a particular component of the equipment. Where materials pertain to multiple models or types, mark the literature to indicate the specific equipment supplied. Marking may be in the form of checking, the use of arrows, highlighting or underlining to show the pertinent information or the crossing-out or other means of obliterating information that does not apply to the equipment or materials supplied.
- H. Original quality copies of all approved Shop Drawings that have been updated to an as-installed condition. Reduced drawings are permissible only if the reduction is to not less than one half of the original size and all lines, dimensions, lettering, and text are completely legible on the reduction.
- I. Complete electrical schematic and wiring diagrams. Complete point-to-point wiring and wiring numbers or colors between all terminal points shall be shown.
- J. If programmable logic controllers are included in the product, provide complete logic listings in ladder logic format shall be provided. The listing shall include complete cross-referencing of all logic elements. All elements shall be annotated with clearly understandable tags or descriptive labels.
- K. If programmable logic controllers are included in the product, provide complete manufacturer's programming manuals.
- L. Copy of warranty bond and service contract as applicable.
- M. When copyrighted material is used in the manual, CONTRACTOR shall obtain the copyright holder's written permission to use such material.

#### 1.4 SUBMITTALS

- A. The CONTRACTOR shall submit operation and maintenance manuals to OCWS within 90 days after the approval of Shop Drawings for the product. The submittal shall consist of three complete sets of each operation and maintenance manual.
- B. One copy of the manual and listing will be returned to the CONTRACTOR stamped either "Approved" or "Revise and Resubmit," the latter when the submitted manual is considered inadequate, inaccurate, incomplete or lacking required information. Discrepancies will be noted on the return transmittal of a "Revise and Resubmit" submittal.
- C. The CONTRACTOR shall rectify all unapproved submittals by replacing portions or adding additional data or materials, as required, to the manual. The manual's index or table of contents and the itemized cross-reference list shall be revised to reflect all revisions or additions. The CONTRACTOR shall resubmit three complete sets of the operation and maintenance manuals.
- D. Upon approval of the operation and maintenance manuals, the CONTRACTOR shall submit ten complete sets of manuals to the OWNER.

#### PART 2 – PRODUCTS (NOT USED)

#### PART 3 – EXECUTION (NOT USED)

**DIVISION 2 SITE CONSTRUCTION**

|               |                         |
|---------------|-------------------------|
| SECTION 02110 | CLEARING                |
| SECTION 02220 | EXCAVATION AND BACKFILL |
| SECTION 02512 | BITUMINOUS PAVING       |
| SECTION 02606 | MANHOLES                |



## SECTION 02110

### CLEARING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope: CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to perform all clearing and grubbing as shown and specified.
- B. Related Work Specified Elsewhere:
  - 1. Section 01570, Maintenance and Protection of Traffic
  - 2. Section 02512, Bituminous Paving
  - 3. Section 02606, Manholes
  - 4. Section 15051, Buried Piping Installation
  - 5. Section 15052, Exposed Piping Installation
  - 6. Section 15100, Valves, 4 Inch and Larger

##### 1.2 QUALITY ASSURANCE

- A. Codes and Standards: State and local laws and code requirements shall govern the hauling and disposal of trees, shrubs, stumps, roots, rubbish, debris and other matter.

##### 1.3 JOB CONDITIONS

- A. Protection:
  - 1. Streets, roads, adjacent property and other works and structures shall be protected throughout the entire project. CONTRACTOR shall return to original condition, satisfactory to OCWS, damaged facilities caused by the CONTRACTOR'S operations.
  - 2. Trees, shrubs and grassed areas which are to remain shall be protected by fences, barricades, wrapping or other methods as shown, specified or approved by OCWS. Equipment, stockpiles, etc. shall not be permitted within tree branch spread. Trees shall not be removed without approval of OCWS unless shown or specified.
- B. Salvable Improvements:
  - 1. Unless specified elsewhere carefully remove items to be salvaged and store on premises in approved location, all in accordance with recommendations of specialists recognized in the Work involved.

##### 1.4 GUARANTEE

- A. CONTRACTOR shall guarantee that Work performed under this Section will not permanently damage trees, shrubs, turf or plants designated to remain, or other

adjacent work or facilities. If damage resulting from CONTRACTOR'S operations appears during the period up to 18 months after completion of the project he shall replace damaged items at no expense to OWNER.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 CLEARING AND GRUBBING

- A. Limits of clearing shall be all areas within the Contract limit lines except as otherwise shown. Damage outside these limits caused by the CONTRACTOR'S operations shall be corrected at the CONTRACTOR'S expense.
- B. Except as noted below, CONTRACTOR shall remove from the site and satisfactorily dispose of all trees, shrubs, stumps, roots, brush, masonry, rubbish, scrap, debris, pavement, curbs, fences and miscellaneous other structures not covered under other Sections as shown, specified or otherwise required to permit construction of the new Work.
- C. Burning on site shall not be done unless approved by authorities having jurisdiction.
- D. All burning, on or off the site, shall be in complete accordance with rules and regulations of local authorities having jurisdiction.
- E. Trees and shrubs shall be trimmed when doing so will avoid removal or damage. Trimmed or damaged trees shall be treated and repaired by persons with experience in this specialty who are approved by OCWS. Trees and shrubs intended to remain, which are damaged beyond repair or removed, shall be replaced by the CONTRACTOR.
- F. Control air pollution caused by dust and dirt, and comply with governing regulations.

### 3.2 TOPSOIL REMOVAL

- A. Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4 inches. Topsoil shall be substantially free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, and other objectionable material.
- B. Strip topsoil, which is satisfactory to whatever depths are encountered, and in such manner as to prevent intermingling with the underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping.
  - 1. Where trees are shown or directed to be left standing, stop topsoil stripping a sufficient distance from such trees to prevent damage to the main root system.
- C. Stockpile topsoil in storage piles in areas shown, or where otherwise approved by OCWS. Construct storage piles to freely drain surface water. Cover storage piles

if required to prevent windblown dust. Topsoil in excess of quantity required shall remain property of OWNER.

- D. Dispose of excess topsoil as waste material off site.





## SECTION 02220

### EXCAVATION AND BACKFILL

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope:
1. CONTRACTOR shall provide all labor, materials, equipment and incidentals required to perform all excavating, backfilling, filling and grading, and disposing of earth materials as shown, specified, and required for construction of structures, manholes, vaults, conduits, pipelines, roads, and other facilities required to complete the Work in every respect.
  2. All necessary preparation of subgrade for slabs and pavements is included.
  3. All temporary means needed to prevent discharge of sediment to water courses from dewatering systems or erosion are included.
  4. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof.

##### 1.2 QUALITY ASSURANCE

- A. Tests:
1. Engage the services of a qualified testing laboratory to make tests and determine acceptability of the fill or material as listed below. Laboratory shall be acceptable to OCWS.
  2. Required Tests:
    - a. Compacted Select Fill: Compaction, ASTM D 1556 and ASTM D 1557, and ASTM D 2922.
- B. Permits and Regulations:
1. Obtain all necessary permits for work in roads, rights-of-way, railroads, etc. Also obtain permits as required by local, state and federal agencies for discharging water from excavations.
  2. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
- C. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
1. ASTM A 36, Specification for Structural Steel.
  2. ASTM A 328, Specification for Steel Sheet Piling.
  3. ASTM D 422, Method for Particle-Size Analysis of Soils.
  4. ASTM D 1556, Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
  5. ASTM D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft 16/cu ft) (2,700 KN-m/cum).

6. ASTM D 2922, Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
7. OSHA Standard, Title 29, Code of Federal Regulations, Part 1926, Section .650 (Subpart P - Excavations).

### 1.3 SUBMITTALS

- A. Excavation Plan: Prior to start of excavation operations, submit written plan to demonstrate compliance with OSHA Standard 29 CFR Part 1926.650. As a minimum, excavation plan shall include:
  1. Name of competent person.
  2. Excavation method(s) or protective system(s) to be used.
  3. Copies of "manufacturer's data" or other tabulated data if protective system(s) are designed on the basis of such data.

### 1.4 JOB CONDITIONS

- A. Existing Utilities: Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during all operations.
  1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult piping or utility owner and OCWS immediately for directions as to procedure. Cooperate with OWNER and utility owner in keeping services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
  2. In general, service lines to individual houses and businesses are not shown; however, CONTRACTOR shall assume that a service exists for each utility to each house or business.
- B. Protection of Persons and Property: Barricade open excavations occurring as part of the Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
  1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

- A. Select Fill:
  1. Place select fill where shown or specified below and around structures, pipelines, roads, tanks, walks, and other work.
  2. Use well graded granular material or bank run gravel, free from organic matter. Not more than 70 percent by weight shall pass through a No. 40

sieve; not more than 10 percent by weight shall pass through a No. 200 sieve; and 100 percent shall pass a 6-inch square sieve.

3. Advise OCWS in writing of source and, if required, submit a sample of the material for approval.
- B. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, or natural or crushed sand, approved by OCWS.
- C. Drainage Fill: Washed, uniformly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 4 sieve.
- D. General Backfill and Fill Materials: Provide approved soil materials for backfill and fill, free of clay, rock or gravel larger than 6 inches in any dimension, debris, waste, vegetable and other organic matter and other deleterious materials. Previously excavated materials meeting these requirements may be used for backfill.

## PART 3 -EXECUTION

### 3.1 INSPECTION

- A. Provide OCWS with sufficient notice and with means to examine the areas and conditions under which excavating, filling, and grading are to be performed. OCWS will notify CONTRACTOR if conditions are found that may be detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

### 3.2 EXCAVATION

- A. Perform all excavation required to complete the Work as shown, specified and required. Excavations shall include earth, sand, clay, gravel, hardpan, decomposed rock, pavements, rubbish and all other materials within the excavation limits.
- B. Excavations for structures and pipelines shall be open excavations. Provide excavation protection system(s) required by ordinances, codes, law and regulations to prevent injury to workmen and to prevent damage to new and existing structures or pipelines. Unless shown or specified otherwise, protection system(s) shall be utilized under the following conditions.
  1. Excavation Less Than 5 Feet Deep: Excavations in stable rock or in soil conditions where there is no potential for a cave-in may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.
  2. Excavations More Than 5 Feet Deep: Excavations shall be sloped and benched, shielded or shored and braced.

3. Excavation protection system(s) shall be installed and maintained in accordance with drawings submitted under Article 1.3 above.
- C. Where the pipeline is to be placed below the ground water table, well points, cofferdams or other acceptable methods shall be used to permit construction of said structure or pipeline under dry conditions. Dry conditions shall prevail until the pipelines are properly jointed, tested and backfilled. Water level shall be maintained below top of backfill at all times.
  - D. Pumping of water from excavations shall be done in such a manner to prevent the carrying away of unconsolidated concrete materials, and to prevent damage to the existing subgrade.
  - E. Subgrades for roadways, structures and trench bottoms shall be firm, dense, and thoroughly compacted and consolidated; shall be free from mud, muck, and other soft or unsuitable materials; and shall remain firm and intact under all construction operations. Subgrades which are otherwise solid, but which become soft or mucky on top due to construction operations, shall be reinforced with crushed stone or gravel. The finished elevation of stabilized subgrades shall not be above subgrade elevations shown.
  - F. Pipe Trench Preparation:
    1. No more than 200 feet of trench may be opened in advance of pipe laying.
    2. Trench width shall be minimized to greatest extent practical but shall conform to the following:
      - a. Sufficient to provide room for installing, jointing and inspecting piping, but in no case wider at top of pipe than pipe barrel OD plus 2 feet.
      - b. Enlargements at pipe joints may be made if required and approved by OCWS.
      - c. Sufficient for shoring and bracing, or shielding and dewatering.
      - d. Sufficient to allow thorough compaction of backfill adjacent to bottom half of pipe.
      - e. Do not use excavating equipment, which requires the trench to be excavated to excessive width.
    3. Depth of trench shall be as shown. If required and approved by OCWS, depths may be revised.
  - G. Material Storage: Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
    1. Locate and retain soil materials away from edge of excavations.
    2. Dispose of excess soil material and waste materials as specified hereinafter.
  - H. Where OCWS considers the existing material beneath the bedding material unsuitable, CONTRACTOR shall remove same and replace it with select backfill.

### 3.3 UNAUTHORIZED EXCAVATION

- A. All excavation outside the lines and grades shown, and which is not approved by OCWS, together with the removal and disposal of the associated material shall be

at CONTRACTOR'S expense. Unauthorized excavations shall be filled and compacted with select backfill by CONTRACTOR at his expense.

### 3.4 DRAINAGE AND DEWATERING

- A. General:
  - 1. Prevent surface and subsurface water from flowing into excavations and from flooding adjacent areas.
  - 2. Remove water from excavation as fast as it collects.
  - 3. Maintain the ground water level below the bottom of the excavation to provide a stable surface for construction operations, a stable subgrade for the permanent work, and to prevent damage to the Work during all stages of construction.
  - 4. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations.
  - 5. Obtain OCWS' approval before shutting down dewatering system for any reason.
- B. Standby Requirements for Dewatering: Provide standby equipment to insure continuity of dewatering operations.
- C. Disposal of Water Removed by Dewatering System:
  - 1. Dispose of all water removed from the excavation in such a manner as not to endanger public health, property, or any portion of the Work under construction or completed.
  - 2. Dispose of water in such a manner as to cause no inconvenience to OWNER, OCWS, or others involved in work about the site.
  - 3. Convey water from the construction site in a closed conduit. Do not use trench excavations as temporary drainage ditches.

### 3.5 SHEETING, SHORING AND BRACING

- A. General:
  - 1. Used material shall be in good condition, not damaged or excessively pitted. All steel or wood sheeting designated to remain in place shall be new. New or used sheeting may be used for temporary work.
  - 2. All timber used for breast boards (lagging) shall be new or used, meeting the requirements for Douglas Fir Dense Construction grade with a bending strength not less than 1500 psi or Southern Pine No. 2 Dense.
  - 3. All steel work for sheeting, shoring, bracing, cofferdams etc., shall be designed in accordance with the provisions of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", of the AISC except that field welding will be permitted.
  - 4. Steel sheet piling shall be manufactured from steel conforming to ASTM A 328. Steel for soldier piles, wales and braces shall be new or used and shall conform to ASTM A 36.

5. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
  6. Unless otherwise shown, specified, or ordered, all materials used for temporary construction shall be removed when work is completed. Such removal shall be made in a manner not injurious to the structure or its appearance or to adjacent Work.
  7. Safe and satisfactory sheeting, shoring and bracing shall be the entire responsibility of CONTRACTOR.
- B. Removal of Sheeting and Bracing:
1. Remove sheeting and bracing from excavations unless otherwise ordered in writing by OCWS. Removal shall be done so as to not cause injury to the Work. Removal shall be equal on both sides of excavation to ensure no unequal loads on pipe or structure.
  2. Defer removal of sheeting and bracing, where removal may cause soil to come into contact with concrete, until the following conditions are satisfied:
    - a. Concrete has cured a minimum of 7 days.
    - b. Wall and floor framing up to and including grade level floors are in place.

### 3.6 TRENCH SHIELDS

- A. Excavation of earth material below the bottom of a shield shall not exceed the limits established by ordinances, codes, laws and regulations.
- B. When using a shield for pipe installation:
  1. Any portion of the shield that extends below the mid-diameter of an installed rigid pipe (i.e. RCCP) shall be raised above this point prior to moving the shield ahead for the installation of the next length of pipe.
  2. The bottom of the shield shall not extend below the mid-diameter of installed flexible pipe (i.e. Steel, DI, PVC, etc.) at any time.
- C. When using a shield for the installation of structures, the bottom of the shield shall not extend below the top of the bedding for the structures.
- D. When a shield is removed or moved ahead, extreme care shall be taken to prevent the movement of pipe or structures or the disturbance of the bedding for pipe or structures. Pipe or structures that are disturbed shall be removed and reinstalled as specified.

### 3.7 GENERAL REQUIREMENTS FOR BACKFILL, FILL, AND COMPACTION

- A. Furnish, place and compact all backfill required for structures, trenches and to provide the finished grades shown and specified. Unless otherwise specified fill may be obtained from on-site sources.
- B. Backfill excavations as promptly as Work permits, but not until completion of the following:

1. Acceptance by OCWS of construction below finish grade including dampproofing, waterproofing, and perimeter insulation.
  2. Inspection, testing, approval, and recording of locations of underground utilities.
  3. Removal of concrete formwork.
  4. Removal of shoring and bracing.
  5. Removal of trash and debris.
  6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
- C. Keep excavations dry during backfilling operations. Bring backfill around piping up evenly on all sides.
- D. Place all backfilling in pipe trenches, which are below structures, other pipes, or paved areas, in horizontal layers not exceeding 6 inches in depth and thoroughly compact each before the next layer is placed. In other pipe trenches, compacted layers shall be 6 inches up to the pipe centerline and 12 inches thereafter.
- E. Prior to the installation of pipes which are to be installed in fill sections, place the fill as described herein, until a minimum height of 2 feet above the pipe is reached, unless otherwise required in other Sections. The fill for the trench width shall then be excavated and the pipe installed and backfilled. The remainder of the fill shall then be placed.
- F. Unless otherwise specified or directed by OCWS fill shall be placed in horizontal loose lifts not exceeding 8 inches in thickness and shall be mixed and spread in a manner assuring uniform lift thickness after placing.
- G. Control the water content of fill material during placement within the range necessary to obtain the compaction specified. In general, the moisture content of the fill shall be within 3 percent of the optimum moisture content for compaction as determined by laboratory tests. Perform all necessary work to adjust the water content of the material to within the range necessary to permit the compaction specified. Do not place fill material when free water is standing on the surface of the area where the fill is to be placed. No compaction of fill will be permitted with free water on any portion of the fill to be compacted.
- H. Perform Compaction of fill with equipment suitable for the type of material placed and which is capable of providing the densities required. CONTRACTOR shall select compaction equipment and submit it and his proposed procedure to OCWS for approval.
- I. Compact fill shall be compacted by at least two coverages of all portions of the surface of each lift by compaction equipment. One coverage is defined as the condition obtained when all portions of the surface of the fill material have been subjected to the direct contact of the compactor.
- J. Test the effectiveness of the equipment selected by CONTRACTOR at the commencement of compaction by construction of a small section of fill within the area where fill is to be placed. If tests on this section of fill show that the specified compaction is not obtained, CONTRACTOR shall increase the number of coverages, decrease the lift thicknesses or obtain a different type of compactor.
- K. If the specified densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly



functioning compaction equipment, the CONTRACTOR shall perform whatever work is required to provide the required densities. This work shall include complete removal of unacceptable fill areas, and replacement and recompaction until acceptable fill is provided.

- L. CONTRACTOR shall repair, at his own expense, any after settlement that occurs. He shall make all repairs and replacements necessary within 30 days after notice from OCWS or OWNER.

### 3.8 SELECT FILL

- A. Provide select fill in the following locations:
  - 1. Support below and around piping and foundations.
  - 2. Subgrade for roads and pavements.
  - 3. Where shown or directed by OCWS.
- B. Subgrade surface shall be level, dry, firm and subject to OCWS' approval. Do not place fill if any water is on the surface of area to receive fill.
- C. Place fill in horizontal loose lifts of 8 inches maximum thickness. It shall be mixed and spread in a manner to assure uniform lift thickness after placing.
- D. Compact each layer of fill before placement of the next lift.
- E. Do not use fill containing lumps, pockets or concentrations of silt or clay, rubble, debris, wood or other organic matter. Fill containing unacceptable material shall be removed and disposed of.
- F. The water content of the fill being compacted shall be above the bulking water content for the material. CONTRACTOR shall wet the fill materials during placement to achieve water contents needed for effective compaction.
- G. Perform compaction of fill with equipment suitable for the type of fill material being placed. Select equipment, which is capable of providing the densities required, and submit selection of the equipment to OCWS for approval.
- H. Compact each layer of fill material by at least two complete coverages of all portions of the surface of each lift using approved compaction equipment. One coverage is defined as the condition reached when all portions of the fill lift have been subjected to the direct contact of the compacting surface of the compactor.
- I. The minimum density to be obtained in compacting the select fill shall be 95 percent of maximum density obtained in the laboratory in accordance with ASTM D 1557 Method C including Note 2. This percentage is of Modified Proctor density. If the field and laboratory tests indicate unsatisfactory compaction, CONTRACTOR shall provide the additional compaction necessary to obtain the specified degree of compaction. All additional compaction work shall be performed by CONTRACTOR at no additional cost to OWNER until the specified compaction is obtained.
- J. Select fill necessary to replace subgrade materials disturbed and softened as a result of CONTRACTOR'S operations or to backfill unauthorized excavation shall be provided, placed and compacted at CONTRACTOR'S expense.

### 3.9 UNCOMPACTED BACKFILL

- A. Compaction of trench backfill above top of pipe in locations other than those specified will not be required except to the extent necessary to prevent future settlement.
- B. Place material above embedments so that no excessive or unbalanced load, shock or impact occurs on the pipe or results in displacement of the pipe.

### 3.10 GRADING

- A. General: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth subgrade surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

### 3.11 DISPOSAL OF EXCAVATED MATERIALS

- A. Material removed from the excavations which does not conform to the requirements for fill or is in excess of that required for backfill shall be hauled away from the project site by the CONTRACTOR and disposed of in compliance with ordinances, codes, laws and regulations at no additional cost to the OWNER.

### 3.12 RESTORING AND RESURFACING EXISTING ROADWAYS AND FACILITIES

- A. Place 1-1/2 inches of temporary bituminous pavement immediately after backfilling trenches in paved roadways, which are to be retained for permanent use. Maintain the surface of the paved area over the trench in good and safe condition during progress of the entire Work, and promptly fill all depressions over and adjacent to the trench caused by settlement of backfilling. The permanent replacement pavement shall be equal to that of the existing roadways unless otherwise specified.
- B. Pavement, gutters, curbs, sidewalks or roadways disturbed or damaged by the CONTRACTOR'S operations, except areas designated "New Pavement" or "Proposed Pavement", shall be restored by him at his own expense to as good condition as they were previous to the commencement of the Work and in accordance with applicable local and state highway specifications.



## SECTION 02512

### BITUMINOUS PAVING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope:
  - 1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified or required to furnish and install hot mix-hot laid bituminous paving.
  - 2. The Work includes the following:
    - a. Coarse graded base course.
    - b. Fine graded surface course.
    - c. Pavement marking.
    - d. Testing as specified.
- B. Related Sections:
  - 1. Section 02220, Excavation and Backfill.

##### 1.2 QUALITY ASSURANCE

- A. Tests:
  - 1. The services of a qualified testing laboratory shall be engaged by CONTRACTOR to make tests and determine acceptability of the pavement materials. The laboratory shall be acceptable to OCWS.
  - 2. Required Tests:
    - a. Refer to State Highway Department requirements.
- B. Reference Standards: Comply with the applicable provisions and recommendations of the following, unless otherwise shown or specified.
  - 1. Standard Specifications for Road Work of the State of Florida.
  - 2. Federal Specification (FS) TT-P-115, Paint, Traffic, Highway, White and Yellow.

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
  - 1. Job mix formula proposed, giving complete data on materials, including source, location, percentages, temperatures, and all other pertinent data.
- B. Material Certificates:
  - 1. In lieu of laboratory reports required in the State Standards, CONTRACTOR may submit certificates of compliance for the following:
    - a. Coarse and fine aggregates from each material source and each required grading.
    - b. Asphalt or tar cement for each penetration grade.

- c. Job-mix design mixtures for each material or grade.
  - d. Density of uncompacted bituminous concrete.
  - e. Density of compacted bituminous concrete.
  - f. Density and voids analysis for each series of bituminous concrete mixture test specimens.
  - g. Bituminous concrete plant inspection.
2. Certificates that materials, mixtures and plant comply with Specification requirements.
  3. Certificates signed by CONTRACTOR.

#### 1.4 JOB CONDITIONS

- A. Weather Limitations: Use weather limitations in the State Standards for the following:
  1. Application of bituminous prime coats.
  2. Construction of base and surface courses.
- B. Grade Control: Establish and maintain the required lines and grades, including crown and cross-slope for each course during construction operations.

### PART 2 - PRODUCTS

#### 2.1 PAVEMENT THICKNESS

- A. Provide premixed base course of 5 inches and surface course of 2 inches for a total depth of 7 inches.

#### 2.2 MATERIALS

- A. Aggregate, mineral filler, bitumen, and prime coat shall be in accordance with the State Standards.
- B. Aggregate includes stone, gravel, slag and sand.
- C. Mineral filler includes limestone dust, portland cement or other inert material.
- D. Bitumen includes asphalt and tar cement.
- E. Prime coat includes asphaltic cutback, tar or asphalt emulsion.

## 2.3 BITUMINOUS-AGGREGATE MIXTURES

- A. Job-Mix Criteria:
1. Provide job mix formulas as follows:
    - a. Base Course:

| <u>Sieve Designation<br/>(Square Opening)</u> | <u>Percent<br/>Passing</u> |
|---|----------------------------|
| 2-1/4 inches                                  | 100                        |
| 1-1/2 inches                                  | 80-100                     |
| 3/4 inch                                      | 55-80                      |
| 3/8 inch                                      | 35-60                      |
| No. 10  | 15-35                      |
| No. 40  | 5-20                       |
| No. 200                                       | 2-10                       |
| Bitumen (percent)                             | 3.5 - 6.0                  |

- b. Surface Course:

| <u>Sieve Designation<br/>(Square Opening)</u> | <u>Percent<br/>Passing</u> |
|---|----------------------------|
| 3/4 inch                                      | 100                        |
| 1/2 inch                                      | 80-100                     |
| 3/8 inch                                      | 70-100                     |
| No. 4   | 50-79                      |
| No. 10  | 33-60                      |
| No. 40  | 16-37                      |
| No. 80  | 9-23                       |
| No. 200                                       | 2-8                        |
| Bitumen (percent)                             | 4.0 - 8.0                  |

## 2.4 TRAFFIC AND PARKING MARKING MATERIALS

- A. Traffic lane marking paint with chlorinated rubber base.
- B. Factory mixed, quick drying and non bleeding, FS TT-P-115, Type III.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Examine the subgrade on which bituminous concrete will be installed. Notify OCWS in writing of conditions detrimental to the proper and timely completion

of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to OCWS.

### 3.2 PRIME COAT

- A. Apply prime coat to subgrade in accordance with the requirements of the State Standards.

### 3.3 FRAME ADJUSTMENT

- A. Set frames of drainage structures to final grade in an approved manner. Include existing frames and frames furnished under other Sections of these Specifications.

### 3.4 PAVEMENT INSTALLATION

- A. Preparing the mixtures, paving equipment, placing the mixes, and compacting the mixes shall be in accordance with the State Standards.
- B. Preparing the mixtures includes the plant equipment, stockpiling, heating, aggregate processing, mixing of aggregate and bituminous material, and transporting to job site.
- C. Paving equipment includes bituminous pavers, rolling equipment and hand tools.
- D. Placing the mixes includes paver placing, hand placing, spreading, tamping and jointing.
- E. Compacting the mixes includes breakdown rolling, second rolling and finish rolling.

### 3.5 PAVEMENT QUALITY REQUIREMENTS

- A. General: In addition to other specified conditions, comply with the following minimum requirements:
  - 1. Provide final surfaces of uniform texture, conforming to required grades and cross sections.
  - 2. Take not less than one 4-inch diameter pavement specimen for each complete course for each 10,000 square feet of pavement, if directed by OCWS.
  - 3. Repair holes from test specimens as specified for patching defective work.
- B. Density:
  - 1. If directed by OCWS, compare density of in-place material against laboratory specimen or certificates on same bituminous concrete mixture. Use nuclear devices.
  - 2. Minimum acceptable density of in-place course material will be 90 percent of the recorded laboratory specimen or certificate density. Maximum acceptable density will be 98 percent.
- C. Thickness: In-place compacted thickness shall average not less than the thickness specified.
- D. Surface Smoothness:

1. Test finished surface of each bituminous concrete course for smoothness, using a 10-foot straightedge applied parallel to and at right angles to centerline of paved areas.
2. Check surfaced areas at intervals directed by OCWS.
3. Surfaces will not be acceptable if exceeding the following:
  - a. Base Course: 3/8 inch in 10 feet.
  - b. Surface Course: 1/4 inch in 10 feet.
  - c. Crowned Surfaces:
    - 1) Test crowned surfaces with a crown template, centered and at right angles to the crown.
    - 2) Surfaces will not be acceptable if varying more than 1/4 inch from the template.

### 3.6 PATCHING

- A. As directed by OCWS, remove and replace all defective areas. Cut out such areas and fill with fresh bituminous concrete. Compact to the required density.

### 3.7 CLEANING AND PROTECTION

- A. Cleaning: After completion of paving operations, clean surfaces of excess or spilled bituminous materials and all foreign matter.
- B. Protect newly finished pavement until it has become properly hardened by cooling.
- C. Cover openings of drainage structures in the area of paving until permanent coverings are placed.

### 3.8 MARKING PAVEMENT

- A. Cleaning:
  1. Sweep surface with power broom supplemented by hand brooms to remove loose material and dirt.
  2. Do not begin marking bituminous concrete pavement until approved by OCWS.
- B. Application:
  1. Using mechanical equipment, provide uniform straight edges in two separate coats. Apply in accordance with paint manufacturer's recommended rates.





## SECTION 02606

### MANHOLES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope: CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install all precast, cast-in-place and masonry manholes.
- B. General:
  - 1. Manholes shall conform in shape, size, dimensions, material, and other respects to the details shown or as ordered by OCWS.
  - 2. Cast-iron frames, grates and covers shall be the standard frame and grate or cover unless otherwise shown.
  - 3. Concrete for cast-in-place manholes and for inverts in precast and masonry manholes shall be Class A and shall conform to the requirements specified under Section 03300.
- C. Related Sections:
  - 1. Division 2 Sections on Earthwork.
  - 2. Section 03300, Cast-In-Place Concrete.
  - 3. Division 15 Sections on Piping.

##### 1.2 QUALITY ASSURANCE

- A. Reference Standards:
  - 1. ASTM C 32, Specification for Sewer and Manhole Brick (made from Clay or Shale).
  - 2. ASTM C 139, Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
  - 3. ASTM C 140, Method of Sampling and Testing Concrete Masonry Units.
  - 4. ASTM C 207, Specification for Hydrated Lime for Masonry Purposes.
  - 5. ASTM C 478, Specification for Precast Reinforced Concrete Manhole Sections.
  - 6. AWWA C302, Reinforced Concrete Pressure Pipe, Noncylinder Type, for Water and Other Liquids.

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
  - 1. Drawings showing design and construction details of all precast concrete and cast-in-place manholes including details of joints between the manhole bases and riser sections and stubs or openings for the connection of sewers.

## PART 2 - PRODUCTS

### 2.1 PRECAST CONCRETE MANHOLES

- A. Precast manholes shall conform to the details shown. Provide cast-in-place concrete bases where shown.
- B. Except where otherwise specified precast manhole components shall consist of reinforced concrete pipe sections especially designed for manhole construction and manufactured in accordance with ASTM C 478 except as modified herein.
- C. Precast, reinforced concrete manhole bases, riser sections, flat slabs and other components shall be manufactured by wet cast methods only, using forms which will provide smooth surfaces free from irregularities, honeycombing or other imperfections.
- D. Joints between manhole components shall be the tongue and groove type employing a single, continuous rubber O-ring gasket and shall conform to AWWA C302. The circumferential and longitudinal steel reinforcement shall extend into the bell and spigot ends of the joint without breaking the continuity of the steel. Joints between the base sections, riser sections and top slabs of manholes 72 inches in diameter and less shall be rubber and concrete joints. Joints for manhole components greater than 72 inches in diameter shall be provided with steel bell and spigot rings.
- E. All precast manhole components shall be of approved design and of sufficient strength to withstand the loads imposed upon them. They shall be designed for a minimum earth cover loading of 130 pounds per cubic foot, an H-20 wheel loading, and an allowance of 30 percent in roadways and 15 percent in rights-of-way for impact. Manhole bases shall have two cages of reinforcing steel in their walls, each of the area equal to that required in the riser sections. Wall thickness shall not be less than 5 inches. Concrete top slabs shall not be less than 8 inches thick.
- F. Lifting holes, if used in manhole components, shall be tapered, and no more than two shall be cast in each section. Tapered, solid rubber plugs shall be furnished to seal the lifting holes. The lifting holes shall be made to be sealed by plugs driven from the outside face of the section only.
- G. The point of intersection (P.I.) of the sewer pipe centerlines shall be marked with 1/4-inch diameter steel pin firmly enclosed in the floor of each manhole base and protruding approximately 1-inch above the finished floor of the base.
- H. Mark date of manufacture and name or trademark of manufacturer on inside of barrel.
- I. The barrel of the manhole shall be constructed of various lengths of riser pipe manufactured in increments of one foot to provide the correct height with the fewest joints. Openings in the barrel of the manholes for sewers or drop connections will not be permitted closer than one foot from the nearest joint. Special manhole base or riser sections shall be furnished as necessary to meet this requirement.

- J. A precast or cast-in-place slab or precast eccentric cone, as shown or approved, shall be provided at the top of the manhole barrel to receive the cast iron frame and cover.
- K. Manhole sections shall contain manhole steps, 12 inches on centers, accurately positioned and embedded in the concrete. Steps are specified under Section 05501.

## 2.2 MASONRY MANHOLES

- A. Masonry manholes, where shown or otherwise approved by OCWS, shall conform to the following:
  - 1. Brick: Brick shall conform to the requirements of ASTM C 32, Grade SS for sewer brick and Grade MS for manhole brick.
  - 2. Concrete Blocks: Concrete blocks shall be machine-made, solid segmental blocks not less than 8 inches wide and shaped so that the completed structure in which they are used will conform to the details shown or otherwise approved. Blocks shall be of compact texture and like blocks shall be uniform in shape and size.
  - 3. Concrete blocks shall conform to ASTM C 139. Testing of blocks shall be done in accordance with ASTM C 140.
  - 4. Mortar: The mortar shall be composed of portland cement, hydrated lime, and sand, in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime.
  - 5. Cement shall be Type II portland cement as specified for concrete masonry.
  - 6. Hydrated lime shall be Type S conforming to ASTM C 207.
  - 7. The sand shall comply with the Specifications for "Fine Aggregate" for concrete except that all of the sand shall pass a No. 8 sieve.

## 2.3 MISCELLANEOUS METALS

- A. Metal frames, covers, steps, toe pockets and similar required items shall be provided as shown and in accordance with Division 5 Sections on Metal Fabrications.

## 2.4 DROP CONNECTIONS

- A. Drop connections for manholes shall be constructed where shown or ordered and shall conform to the design and details shown. Pipe and fittings shall be ductile iron, reinforced concrete, or vitrified clay as shown or otherwise approved. Concrete for pipe encasement shall be Class B as specified under Section 03300. Concrete shall be bonded to manhole in the manner shown or otherwise approved by OCWS.

## PART 3 - EXECUTION

### 3.1 LAYING MASONRY

- A. Brick shall be satisfactorily wet when being laid and each brick shall be laid in mortar so as to form full bed, end and side joints in one operation. The joints shall not be wider than 3/8-inch, except when the bricks are laid radially, in which case the narrowest part of the joint shall not exceed 1/4-inch. Masonry work shall be kept moist for a period of three days after completion, and precautions shall be taken to prevent freezing during cold weather.
- B. For concrete block, the vertical keyways shall be completely filled with mortar.
- C. Each grading ring shall be laid in a full bed of mortar and shall be thoroughly bonded.

### 3.2 PLASTERING

- A. The outside of brick manholes, brick stacks and grading rings shall be neatly plastered with 1/2 inch of cement mortar as the Work progresses.

### 3.3 MANHOLE BASES

- A. Cast-in-place bases shall be placed on suitable foundations after the pipes are laid. They shall be cast monolithically to an elevation at least 12 inches above the top of the highest pipe entering the manhole, except where a drop connection is to be installed. Base, walls and bottom shall be at least of the thickness shown and reinforced to withstand the loads to be expected. Connections for sewer pipes shall conform to the details shown.
- B. Precast bases shall be set on a crushed stone or crushed gravel foundation as shown. Precast bases shall be set at the proper grade and carefully leveled and aligned.

### 3.4 PRECAST MANHOLE SECTIONS

- A. Set sections vertical with steps and sections in true alignment. The base of the bell or groove end at joints between components shall be buttered with 1:2 cement-sand mortar to provide a uniform bearing between components. All joints shall be sealed with cement mortar inside and out and troweled smooth to the contour of the wall surface. Raised or rough joint finishes will not be accepted.
- B. Install sections, joints and gaskets in accordance with manufacturers recommendations.
- C. Lifting holes shall be sealed tight with a solid rubber plug driven into the hole from the outside of the barrel and the remaining void filled with 1 to 2 cement-sand mortar.

### 3.5 MANHOLE CHANNELS

- A. All invert channels through manholes shall be constructed of Class A concrete. Channels shall be properly formed to the sizes, cross sections, grades and shapes shown or as ordered. Benches shall be built up to the heights shown or as ordered and given a uniform wood float finish. Care shall be taken to slope all benches for proper drainage to the invert channel.

### 3.6 GRADING RINGS

- A. Grading rings or brick stacks shall be used for all precast and masonry manholes where required. Stacks or grade rings shall be a maximum of 12 inches in height, constructed on the roof slab or cone section on which the manhole frame and cover shall be placed. The height of the stack or grade rings shall be such as is necessary to bring the manhole frame to the proper grade.
- B. Brick work shall be as specified in Articles 2.2 and 3.1 above.

### 3.7 STUBS FOR FUTURE CONNECTIONS

- A. As shown or required for connections, cast iron sleeves, asbestos-cement couplings, bell end tile, ductile iron or reinforced concrete pipe stubs with approved watertight plugs shall be installed in manholes. Where pipe stubs, sleeves or couplings for future connections are shown or ordered, CONTRACTOR shall provide all materials and work for their construction.

### 3.8 GRADING AT MANHOLES

- A. All manholes in unpaved areas shall be built as shown or directed to an elevation higher than the original ground. The ground surface shall be graded to drain away from the manhole. Fill shall be placed around manholes to the level of the upper rim of the manhole frame, and the surface evenly graded on a 1 to 5 slope to the existing surrounding ground unless otherwise shown. The slop shall be covered with 4 inches of top soil, seeded and maintained until a satisfactory growth of grass is obtained.
- B. Manholes in paved areas shall be constructed to meet the final surface grade. In paved areas on State Highways, all manholes shall be 1/2 inch below final wearing surfaces. Manholes shall not project above finished roadway pavements to prevent damage from snowplows.
- C. CONTRACTOR shall be solely responsible for the proper height of all manholes necessary to reach the final grade at all locations. CONTRACTOR is cautioned that OCWS'S review of Shop drawings for manhole components will be general in nature and CONTRACTOR shall provide an adequate supply of random length precast manhole riser sections to adjust any manhole to meet field conditions for final grading.

### 3.9 MANHOLE WATERTIGHTNESS

- A. All manholes shall be free of visible leakage. Each manhole shall be tested for leaks and inspected, and all leaks shall be repaired in a manner subject to OCWS' approval.

### 3.10 FLEXIBLE PIPE JOINT AT MANHOLE BASE

- A. An approved flexible joint shall be provided between each pipe entering and exiting the manhole. This may be accomplished by the installation in the manhole base of the bell end of a pipe or by other means subject to approval of OCWS. Joints shall be similar to the approved pipe joints. The joint into the manhole base shall be completely watertight.

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**OKALOOSA COUNTY  
WATER AND SEWER**

**DIVISION 3**

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**DIVISION 3 CONCRETE**

SECTION 03300      CONCRETE





## SECTION 03300

### CONCRETE

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope:
  - 1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install cast-in-place concrete, reinforcement and related materials.
- B. Coordination:
  - 1. Review installation procedures under other Sections and coordinate the installation of items that must be installed in the concrete.
  - 2. Notify other contractors in advance of the placing of concrete to provide the other contractors with sufficient time for furnishing of items included in their contracts that must be installed in the concrete.
- C. General:
  - 1. Class "A" concrete shall be steel reinforced and includes the following:
    - a. Cast-in-place manholes.
    - b. Precast manholes.
    - c. Other reinforced concrete structures.
  - 2. Class "B" concrete shall be placed without forms or with simple forms, with little or no reinforcing, and includes the following:
    - a. Concrete fill.
    - b. Curbs and gutters.
    - c. Sidewalks.
    - d. Encasements, etc.
  - 3. Steel Reinforcement: Includes bars, ties, supports and welded wire fabric.

##### 1.2 QUALITY ASSURANCE

- A. Source Quality Control:
  - 1. Concrete Testing Service:
    - a. CONTRACTOR shall employ acceptable testing laboratory to perform materials evaluation, testing and design of concrete mixes.
    - b. OWNER will employ a separate testing laboratory to evaluate concrete delivered to and placed at the site.
    - c. CONTRACTOR'S laboratory shall also evaluate concrete delivered to and placed at the site.
  - 2. Certificates, signed by concrete producer and CONTRACTOR, may be submitted in lieu of material testing when acceptable to OCWS.
  - 3. Quality Control: Perform sampling and testing during concrete placement, as follows:

4. Quality Control: OWNER'S testing laboratory will perform sampling and testing during concrete placement, as follows:
  - a. Sampling: ASTM C 172.
  - b. Slump: ASTM C 143, one test for each load at point of discharge.
  - c. Air Content: ASTM C 31, one for each set of compressive strength specimens.
  - d. Compressive Strength: ASTM C 39, one set for each 50 cubic yards or fraction thereof of each class of concrete; 1 specimen tested at 7 days, 2 specimens tested at 28 days.
    - 1) When the total quantity of concrete is less than 50 cubic yards, the strength tests may be waived by OCWS if field experience indicates evidence of satisfactory strength.
5. Report test results in writing to OCWS on same day tests are made.
- B. Reference Standards: Comply with the applicable provisions and recommendations of the following, except as otherwise shown or specified.
  1. ACI 301, Specifications for Structural Concrete for Buildings (includes ASTM Standards referred to herein except ASTM A 36).
  2. ACI 304, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
  3. ACI 305, Hot Weather Concreting.
  4. ACI 306, Cold Weather Concreting.
  5. ACI 315, Manual of OCWSing and Placing Drawings for Reinforced Concrete Structures.
  6. ACI 318, Building Code Requirements for Reinforced Concrete.
  7. ACI 347, Guide to Formwork for Concrete.
  8. ACI 350, Environmental OCWSing Concrete Structures.
  9. ASTM A 36, Specification for Structural Steel.
  10. Concrete Reinforcing Steel Institute, Manual of Standard Practice, includes ASTM Standards referred to herein.

### 1.3 SUBMITTALS

- A. Samples: Submit samples of materials as specified and may be requested by OCWS, including names, sources and descriptions.
- B. Shop Drawings: Submit for approval the following:
  1. Copies of manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures and bonding agents.
  2. Drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315, Chapters 1 thru 7. For walls, show elevations to a minimum scale of 1/4-inch to 1 foot. Show bar schedules, stirrup spacing, diagrams of bent bars, arrangements and assemblies, as required for the fabrication and placement of concrete reinforcement.
  3. List concrete materials and concrete mix designs proposed for use. Include the results of all tests performed to qualify the materials and to establish the mix designs in accordance with ACI 301, 3.9. Submit

written report to OCWS for each proposed concrete mix at least 15 days prior to start of Work. Do not begin concrete production until mixes have been reviewed and are acceptable to OCWS. Mix designs may be adjusted when material characteristics, job conditions, weather, test results or other circumstances warrant. Do not use revised concrete mixes until submitted to and accepted by OCWS.

- C. Laboratory Test Reports: Submit copies of laboratory test reports for concrete cylinders, materials and mix design tests. OCWS' review will be for general information only. Production of concrete to comply with specified requirements is the responsibility of CONTRACTOR.

#### 1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver concrete reinforcement materials to the site bundled, tagged and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings shown on placement diagrams.
- B. All materials used for concrete must be kept clean and free from all foreign matter during transportation and handling and kept separate until measured and placed in the mixer. Bins or platforms having hard clean surfaces shall be provided for storage. Suitable means shall be taken during hauling, piling and handling to insure that segregation of the coarse and fine aggregate particles does not occur and the grading is not affected.

### PART 2 - PRODUCTS

#### 2.1 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type II.
- B. Aggregates: ASTM C 33.
  - 1. Fine Aggregate: Clean, sharp, natural sand free from loam, clay, lumps or other deleterious substances. Dune sand, bank run sand and manufactured sand are not acceptable.
  - 2. Coarse Aggregate: Clean, uncoated, processed aggregate containing no clay, mud, loam, or foreign matter, as follows:
    - a. Crushed stone, processed from natural rock or stone.
    - b. Washed gravel, either natural or crushed. Use of slag and pit or bank run gravel is not permitted.
- C. Coarse Aggregate Size: Size to be ASTM C 33, Nos. 57 or 67, unless permitted otherwise by OCWS.
- D. Water: Clean, drinkable.
- E. Air-Entraining Admixture: ASTM C 260.
- F. Water-Reducing Admixture: ASTM C 494, Type A. Only use admixtures that have been tested and accepted in mix designs.
- G. Water-Reducing High Range Admixture: ASTM C 494, Type F/G. Only use admixtures that have been tested and accepted in mix designs.

## 2.2 FORM MATERIALS

- A. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.
- B. Exposed Concrete Surfaces: Acceptable panel-type to provide continuous, straight, smooth, as-cast surfaces. Use largest practical sizes to minimize form joints.
- C. Unexposed Concrete Surfaces: Suitable material to suit project conditions.
- D. Provide 3/4-inch chamfer at all exposed corners.

## 2.3 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60.
- B. Welded Wire Fabric: ASTM A 185.
- C. Steel Wire: ASTM A 82.
- D. Supports for Reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place.
  - 1. Use wire bar type supports complying with CRSI recommendations, except as specified below. Do not use wood, brick, or other unacceptable materials.
  - 2. For slabs on grade, use supports with sand plates or horizontal runners where base materials will not support chair legs.
  - 3. For all concrete surfaces, where legs of supports are in contact with forms, provide supports complying with CRSI, Manual of Standard Practice as follows:
    - a. Either hot-dip galvanized, plastic protected or stainless steel legs.
  - 4. Over waterproof membranes, use precast concrete chairs.
- E. Slump Limits:
  - 1. Proportion and design mixes to result in concrete slump at the point of placement of not less than 1 inch and not more than 4 inches.
  - 2. Class "A" and "B" Concrete: Proportion and design mixes to result in concrete slump at point of placement of not less than 1 inch and not more than 4 inches.
  - 3. Class "C" Concrete: Proportion and design mixes to result in concrete slump:
    - a. Not more than 4 inches prior to adding high range water-reducer.
    - b. Not more than 8 inches at point of placement after adding high range water-reducer.

## 2.4 RELATED MATERIALS

- A. Waterstops:
  - 1. Flat dumbbell or centerbulb type, size to suit joints, uniform minimum thickness of 3/8-inch by 9-inches minimum width of Polyvinyl Chloride.
    - a. Manufacturer: Provide waterstops of one of the following:
      - 1) W.R. Meadows, Incorporated.
      - 2) A.C. Horn, Incorporated.

- 3) Or equal.
- B. Moisture Barrier: Clear 8 mils thick polyethylene; polyethylene-coated barrier paper; 1/8-inch thick asphalt core membrane sheet.
- C. Joint Fillers:
  - 1. Provide preformed expansion joint filler complying with ASTM D 1752, Type II Cork.

## 2.5 GROUT

- A. Nonshrink, Nonmetallic Grout:
  - 1. Prepackaged nonstaining cementitious grout requiring only the addition of water at the job site.
  - 2. Product and Manufacturer: Provide one of the following:
    - a. Euco N-S, as manufactured by the Euclid Chemical Company.
    - b. Masterflo 713, as manufactured by Master Builders Company.
    - c. Or equal.
- B. Nonshrink, Nonmetallic 100% Solids, High Strength Epoxy Grout:
  - 1. Use prepackaged solvent-free, moisture-insensitive, 3-component epoxy grouting system.
  - 2. Product and Manufacturer: Provide one of the following:
    - a. Euco High Strength Grout, as manufactured by the Euclid Chemical Company, Cleveland, OH.
    - b. Sikadur 42, Grout-Pak, as manufactured by the Sika Chemical Company, Lyndhurst, NJ.
    - c. Or equal.
- C. Ordinary Cement-Sand Grout:
  - 1. Except where otherwise specified use 1 part cement to 3 parts sand complying with the following:
    - a. Cement: ASTM C 150, Type II.
    - b. Sand: ASTM C 33.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. CONTRACTOR and his installer shall examine the substrate and the conditions under which Work is to be performed and notify OCWS in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to OCWS.

### 3.2 FORMWORK

- A. Formwork: Construction so that concrete members and structures are correct size, shape, alignment, elevation and position, complying with ACI 347.

- B. Provide openings in formwork to accommodate Work of other trades. Accurately place and securely support items built into forms.
- C. Clean and adjust forms prior to concrete placement. Apply form release agents or wet forms, as required. Retighten forms during and after concrete placement if required to eliminate mortar leaks.

### 3.3 REINFORCEMENT, JOINTS, AND EMBEDDED ITEMS

- A. Comply with the applicable recommendations of specified codes and standards, and CRSI, Manual of OCWSing and Placing Drawings, for details and methods of reinforcement placement and supports.
- B. Clean reinforcement to remove loose rust and mill scale, earth, and other materials which reduce or destroy bond with concrete.
- C. Position, support, and secure reinforcement against displacement during formwork construction or concrete placement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
  - 1. Place reinforcement to obtain the minimum concrete coverages as shown and as specified in ACI 318. Arrange, space, and securely tie bars and bar supports together with 16 gage wire to hold reinforcement accurately in position during concrete placement operations. Set with ties so that twisted ends are directed away from exposed concrete surfaces.
  - 2. Reinforcing steel shall not be secured to forms with wire, nails or other ferrous metal. Metal supports subject to corrosion shall not touch formed or exposed concrete surfaces.
- D. Provide sufficient numbers of supports of strength required to carry reinforcement. Do not place reinforcing bars more than 2 inches beyond the last leg of any continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
- E. Splices:
  - 1. Provide standard reinforcement splices by lapping ends, placing bars in contact, and tying tightly with wire. Comply with requirements shown for minimum lap of spliced bars.
- F. Install welded wire fabric in as long lengths as practical, lapping at least one mesh.
- G. Concrete shall not be placed until the reinforcing steel is inspected and permission for placing concrete is granted by OCWS. All concrete placed in violation of this provision will be rejected.
- H. Joints: Provide construction, isolation, and control joints as indicated or required.
- I. Installation of Embedded Items: Set and build into the Work anchorage devices and embedded items required for other Work that is attached to, or supported by cast-in-place concrete. Use setting diagrams, templates and instructions provided under other Sections and other contracts for locating and setting. Refer also to Paragraph 1.1.B., Coordination.

### 3.4 CONCRETE AND PLACEMENT

- A. Proportioning and Design of Mix:
  - 1. Minimum compressive strength at 28 days: 4000 psi.
  - 2. Maximum water cement ratio by weight: 0.45.
  - 3. Minimum cement content: 564 pounds per cubic yard.
  - 4. Normal weight: 145 pounds per cubic foot.
  - 5. Use air-entraining admixture in all concrete: provide not less than 4 percent nor more than 8 percent entrained air for concrete exposed to freezing and thawing, and from 2 percent to 4 percent for other concrete.
  - 6. Calcium Chloride: Do not use calcium chloride in concrete, unless otherwise authorized in writing by OCWS. Do not use admixtures containing calcium chloride.
- B. Job-Site Mixing: Use drum type batch machine mixer, mixing not less than 1-1/2 minutes for one cubic yard or smaller capacity. Increase mixing time at least 15 seconds for each additional cubic yard or fraction thereof.
- C. Ready-Mixed Concrete: ASTM C 94.
- D. Concrete Placement: Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.
- E. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into all parts of forms.
- F. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement, and curing.
  - 1. In hot weather comply with ACI 305.
  - 2. In cold weather comply with ACI 306.

### 3.5 QUALITY OF CONCRETE WORK

- A. Make all concrete solid, compact and smooth, and free of laitance, cracks and cold joints.
- B. All concrete for liquid retaining structures, and all concrete in contact with earth, water, or exposed directly to the elements shall be watertight.
- C. Cut out and properly replace to the extent ordered by OCWS, or repair to the satisfaction of OCWS, surfaces which contain cracks or voids, are unduly rough, or are in any way defective. Patches or plastering will not be acceptable.
- D. Repair, removal, and replacement of defective concrete as ordered by OCWS shall be at no additional cost to OWNER.

### 3.6 CURING

- A. Curing: Begin initial curing as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours. Continue curing use of moisture-retaining cover or membrane-forming curing compound. Cure formed surfaces by moist curing until forms are removed. Provide protection as required to prevent damage to exposed concrete surfaces.



### 3.7 FINISHES

#### A. Finish:

1. After placing concrete slabs, do not work the surface further until ready for floating. Begin floating when the surface water has disappeared or when the concrete has stiffened sufficiently. Use a wood float only. Check and level the surface plane to a tolerance not exceeding 1/4-inch in 10 feet when tested with a 10 foot straightedge placed on the surface at not less than 2 different angles. Cut down high spots and fill all low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat the surface to a uniform, smooth, granular texture.
2. After floating, begin the first trowel finish operation using a power-driven trowel. Begin final troweling when the surface produces a ringing sound as the trowel is moved over the surface.
3. Consolidate the concrete surface by the final hand troweling operation. Finish shall be free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8-inch in 10 feet when tested with a 10-foot straight edge. Grind smooth surface defects which would telegraph through applied floor covering system.

### 3.8 GROUT PLACEMENT

#### A. General:

1. Place grout as shown and in accordance with manufacturer's instructions. If manufacturer's instructions conflict with the Specifications do not proceed until OCWS provides clarification.
2. Drypacking will not be permitted.
3. Manufacturers of proprietary products shall make available upon 72 hours notification the services of qualified, full-time employee to aid in assuring proper use of the product under job conditions.
4. Placing grout shall conform to the temperature and weather limitations described in Article 3.4 above.

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**OKALOOSA COUNTY  
WATER AND SEWER**

**DIVISION 9**

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**DIVISION 9 FINISHES**

SECTION 09900 PAINTING



## SECTION 09900

### PAINTING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

###### A. Scope:

1. CONTRACTOR shall provide all labor, materials, tools, equipment and incidentals as shown, specified and required to furnish and apply paint systems.
  - a. General CONTRACTOR shall be responsible for surface preparation and painting of all new and existing interior and exterior items and surfaces throughout the Project areas included in the general, hvac, plumbing and electrical contracts as described in this Specification.
  - b. CONTRACTOR shall be responsible for surface preparation and painting of all new and existing interior and exterior items and surfaces throughout the Project areas included under this and other Sections.
2. Extent of painting is specified and includes the following. Painting shown in schedules may not provide CONTRACTOR with complete indication of all painting Work. CONTRACTOR is directed to Article 2.1 where all surfaces of the generic types specified shall be prepared and painted according to their status, intended function and location, using the painting system for that surface, function and location as specified, unless specifically identified on the Drawings as a surface not to receive specified painting system.
  - a. All new and specifically identified existing surfaces and items except where the natural finish of the material is specified as a corrosion-resistant material not requiring paint; or is specifically shown as indicated by written note, or specified as a surface not to be painted. Piping Systems to be painted include, but are not limited to, the following:
    - 1) Above ground piping and supports.
    - 2) Accessory items.
  - b. Surface preparation and painting of all new and specifically identified existing items, both interior and exterior, and other surfaces, including items furnished by OWNER, are included in the Work, except as otherwise shown or specified.
  - c. Removal of all substances, top coats, primers and all intermediate coats of paint and other protective or decorative toppings on those items and surfaces to remain that are identified to receive a painting system under this Specification, in order to provide surfaces acceptable for application of painting system specified.
3. Types of products required include the following:

- a. Amine catalyzed epoxies.
  - b. Polyamine and polyamidoamine catalyzed epoxies.
  - c. Fiberglass fiber reinforced polyamine and polyamidoamine catalyzed epoxies.
  - d. Cycloaliphatic amine catalyzed epoxies.
  - e. Homopolymer organic/inorganic oxirane capped thermosetting resins.
  - f. Polyamide catalyzed epoxies.
  - g. Waterborne, cementitious acrylics.
  - h. Waterborne, styrenated acrylates.
  - i. Aliphatic acrylic polyurethanes.
  - j. Inorganic, zinc-rich ethyl silicates.
  - k. Heat-resistant silicones.
  - l. Waterborne, vinyl and latex acrylics.
  - m. Auxiliary materials and accessories.
- B. Coordination:
- 1. Review installation, removal and demolition procedures under other Sections and coordinate them with the Work specified herein.
  - 2. Notify other contractors in advance of the surface preparation and painting Work included in this Specification to provide them sufficient time for installation, removal, demolition and coordination of interrelated items that are included in their contracts and that must be installed, removed or demolished in coordination with the painting Work.
  - 3. Coordinate the painting of areas that will become inaccessible once equipment, laboratory furniture, lockers and similar fixed items have been installed.
  - 4. Coordinate primers with finish paint materials in order to provide primers that are compatible with finish paint materials used. Review other Specifications and other contracts where primed surfaces are provided, to ensure compatibility of the total painting system for the various surfaces. CONTRACTOR shall be responsible for coordinating the compatibility of all shop-primed and field-painted items in other Specifications and in the general, hvac, plumbing and electrical contracts.
  - 5. Furnish information to OCWS on the characteristics of the finish materials proposed for use, to ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and repaint as required. Notify OCWS in writing of anticipated problems using the specified painting systems with surfaces primed by others. Reprime all equipment primed in the factory and other factory-primed items that are damaged or scratched.
- C. Related Sections:
- 1. Division 15, Sections on Piping, Valves, and Appurtenances.
- D. Work Not Included: The following categories of Work are not included as part of the painting Work, or are included in other Specifications or in the hvac, plumbing or electrical contracts:
- 1. Shop-Priming: Shop-priming of structural metal, miscellaneous metal fabrications, other metal items and fabricated components such as shop-

fabricated or factory-built heating and ventilating and electrical equipment or accessories shall conform to applicable requirements of this Section but are included under other Specifications or in the hvac, plumbing or electrical contracts.

2. Pre-finished Items:
  - a. Items furnished with such finishes as baked-on enamel, porcelain and polyvinylidene fluoride shall only be touched up at the Site by CONTRACTOR using manufacturer's recommended compatible field-applied touchup paint.
  - b. Items furnished with such finishes as chrome plating or anodizing.
3. Concealed Surfaces: Nonmetallic wall or ceiling surfaces in areas not exposed-to-view, and generally inaccessible areas, such as furred spaces, pipe chases and duct and elevator shafts.
4. Concrete surfaces below elevation, unless otherwise shown or specified.
5. Concrete floors, unless specifically identified on the Drawings as a surface to be painted.
6. Face brick, glazed structural tile and prefaced, ground-faced or split-faced concrete unit masonry.
7. Exterior face of architectural precast concrete.
8. Collector bearings, shafts and chains, wood flights, wood stop logs and wood baffles.
9. Corrosion-Resistant Metal Surfaces: Where the natural oxide of the item forms a barrier to corrosion, whether factory- or Site-formed, including such materials as copper, bronze, muntz metal, zinc, terne metal and stainless steel.
10. Operating Parts and Labels:
  - a. Do not paint moving parts of operating units, mechanical and electrical parts such as valve and damper operators, linkages, sensing devices, interior of motors and fan shafts.
  - b. Do not paint over labels required by governing authorities having jurisdiction, or any equipment identification, performance rating, name or nomenclature plates.
  - c. Cover moving parts and labels during the painting Work with protective masking. Remove all protective masking upon completion of Work. Remove all paint, coatings or splatter which comes in contact with such labels.
11. Do not paint structural steel to receive fireproofing specified in Section 07811.
12. Structural and miscellaneous metals covered with concrete, shall not receive primers, intermediate or finish coats of paint.
13. Existing structures, equipment and other existing surfaces and items unless otherwise shown or specified.

E. Definitions:

1. The term "paint" includes pretreatment and all painting system materials, such as primer, emulsion, enamel, organic/inorganic polymer coating,

stain sealer and filler, and other applied materials whether used as prime, filler, intermediate or finish coats.

2. The term "exposed" means all items not covered with cement plaster, concrete or fireproofing. Items covered with these materials shall be provided with specified primer only, except where specified as a surface not to be painted. Exposed-to-view surfaces also include those areas visible after permanent or built-in fixtures, convector covers, ceiling tile, covers for finned tube radiation, grilles, etc. are in-place, in areas scheduled to be painted.

F. Description of Colors and Finishes:

1. Color Selection:
  - a. OCWS reserves the right to select all non-standard colors for all paint systems specified within the ability of manufacturer to produce such non-standard colors. CONTRACTOR shall supply such colors at no additional expense to OWNER.
2. Color Coding of Pipelines, Valves, and Equipment:
  - a. In general, all color coding of pipelines, valves, and equipment and shall comply with applicable standards of ANSI A13.1, ANSI Z535.1 and CFR 1910.144. Provide color coding for pipelines included in Article 1.1.F.3.b, Pipeline Color Table, for specified pipelines.
3. Color Coding of Pipelines and Equipment:
  - a. Finish coats of paint for pipelines and equipment shall be coded in basic colors. Colors shall be brilliant, distinctive shades matching the following safety colors In accordance with ANSI Z535.1 color specifications for safety colors and other primary colors:

TABLE OF STANDARD COLORS

| <u>Color</u> | <u>Designation*</u>     |
|--------------|-------------------------|
| Black        | Safety Black; IN06      |
| Blue         | Safety Blue; SC06       |
| Brown        | "Chipmunk"; YB23        |
| Charcoal     | "Graphite"; GR32        |
| Gray         | "Gray-ANSI 61"; IN05    |
| Green        | Safety Green; SC07      |
| Light Gray   | "Battleship Gray"; GR13 |
| Light Green  | "Misty Jade"; GB38      |
| Orange       | Safety Orange; SC03     |
| Red          | Safety Red; SC09        |
| White        | Safety White; WH0       |
| Yellow       | Safety Yellow; SC01     |

\*Color designations are provided as Tnemec Company, Incorporated paint color numbers and are provided as a standard of quality; equivalent colors matching these colors will be acceptable

to OCWS. Provide OCWS with direct color comparisons of color numbers available from Manufacturer submitted at time of Shop Drawing submission.

- b. General Color Code: Unless otherwise specified, the following color code shall be used:

PIPELINE COLOR TABLE

| <u>Pipeline</u> | <u>Color</u> |
|-----------------|--------------|
| WATER           |              |
| Water           | Blue         |
| Drinking Water  | Light Blue   |
| Finished Water  | Dark Blue    |
| Fire Water      | Red          |
| Flushing Water  | Blue         |
| Potable Water   | Blue         |

- c. The color of the final coats shall match as closely as possible, without custom blending, the color tabulated under the specific pipeline service.
- 4. After approval by OCWS of colors and Shop Drawing submittals and prior to beginning painting Work, OCWS will furnish color schedules for surfaces to be painted listed in Article 2.1, Painting Systems.

G. Abbreviations and Symbols:

- 1. Abbreviations and symbols used in Tables are explained in Article 2.2 and provide information on generic composition of the required materials, manufacturers, number of coats and their dry mil film thickness per coat (DMFTPC) and coverage for calculating the required number of gallons for the Work.

1.2 QUALITY ASSURANCE

A. Applicator Qualifications:

- 1. Engage a single applicator regularly performing installation of paint materials, with documented skill and successful experience in the installation of the types of materials required and who agrees to employ only tradesmen who are trained, skilled and have successful experience in installing the types of materials specified.
- 2. Submit name and qualifications to OCWS along with the following information on a minimum of three successful projects:
  - a. Names and telephone numbers of owners, architects, or OCWS responsible for projects.
  - b. Approximate contract cost of the paint materials.
  - c. Amount of area installed.



3. Submit proof of acceptability of applicator by manufacturer to OCWS.
- B. Source Quality Control:
1. Obtain materials only from manufacturers who will provide the services of a qualified manufacturer's representative at the Site at the commencement of painting Work to advise on materials, mock-ups, installation and finishing techniques, at the completion of the Work to advise OCWS on the acceptability of completed Work, and during the course of the Work as may be requested by OCWS.
  2. Certify long term compatibility of all coatings with surfaces.
  3. Do not submit products that decrease the number of coats, the surface preparation, or the generic type and formulation of coating(s) specified. Products exceeding VOC limits specified will not be approved.
  4. OCWS may review manufacturers' recommendations concerning methods of installation and number of coats of paint for each painting system. CONTRACTOR shall prepare construction cost estimates based on painting systems, number of coats, coveragers and installation methods specified.
  5. All proposed "or equal" products shall be submitted with direct comparison to products specified including information on durability, adhesion, color and gloss retention, percent solids, VOC's per gallon and recoatability after curing.
  6. "Or equal" manufacturers shall furnish the same color selection as the manufacturers specified, including intense chroma and custom pigmented colors in all painting systems.
  7. Color Pigments: Provide pure, nonfading, applicable types to suit the surfaces and services indicated. Comply with the following:
    - a. Lead and Chromate: Lead and chromate content shall not exceed amount permitted by governing authorities having jurisdiction.
    - b. Areas subject to hydrogen sulfide fume exposure shall be identified by OCWS. Manufacturer shall notify OCWS of colors that are not suitable for long-term color retention in such areas.
    - c. Manufacturer shall identify colors that meet the requirements of governing authorities having jurisdiction for use in locations subject to contact with potable water or water being prepared for use as potable water.
  8. Obtain each product from only one manufacturer. Multiple manufacturing sources for the same system component will not be approved by OCWS.
  9. Certify product shelf life history for each product source for materials manufactured by the same manufacturer, but purchased and stored at different locations or obtained from different sources.
  10. Constantly store materials to be used in the painting Work between 60 and 90 degrees F, and in accordance with the manufacturer's approved written recommendations, for not more than six months. Certify to OCWS that painting materials have been manufactured within six months of installation and have not, nor will be, subjected to freezing temperatures.

- C. Testing Agency Qualifications: To qualify for approval, an independent testing agency shall demonstrate to OCWS' satisfaction, based on evaluation of criteria submitted by testing agency, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work in accordance with ASTM E329.
- D. Requirements of Regulatory Agencies:
  - 1. Painting systems for surfaces in contact with potable water, or water being treated for potable use, shall not impart any taste or odor to the water or result in any organic or inorganic content in excess of the maximum allowable contaminant level established by governing authorities having jurisdiction. All such painting systems shall be approved by the applicable regulatory agency. CONTRACTOR shall revise painting systems specified herein to provide manufacturer's regulatory agency approved painting system(s) where required.
  - 2. Comply with the regulations of governing authorities having jurisdiction for air quality and material disposal regulations. Revise painting systems specified herein in order to provide manufacturer's regulatory agency approved painting systems, where required.
  - 3. Comply with governing authorities having jurisdiction for blast cleaning operations, confined space entry and disposition of spent abrasive and debris.
- E. Reference Standards: Comply with applicable provisions and recommendations of the following, except where otherwise shown or specified:
  - 1. ASTM D4417, Field Measurement of Surface Profile of Blast Cleaned Steel, Standard Test Methods for.
  - 2. ASTM D4541, Pull-Off Strength of Coatings Using Portable Adhesion-Testers, Standard Test Method for
  - 3. ASTM E329, Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction, Standard Specification for.
  - 4. ANSI A13.1: Scheme for the Identification of Piping Systems.
  - 5. ANSI Z535.1: Safety Color Code.
  - 6. ANSI/NSF Standard 60: Drinking Water Chemicals - Health Effects.
  - 7. ANSI/NSF Standard 61: Drinking Water System Components - Health Effects.
  - 8. Code of Federal Regulations, 29 CFR 1910.144: Safety Color Code for Marking Physical Hazards.

### 1.3 SUBMITTALS

- A. Samples: Submit for approval the following:
  - 1. Copies of manufacturer's complete color charts for each coating system.
- B. Shop Drawings: Submit for approval the following:
  - 1. Copies of manufacturer's technical information and test performance data, including paint analysis, VOC content in comparison to maximum allowed by Specifications, and application instructions for each material proposed for use.

2. Submit proof of acceptability of proposed application techniques by the paint manufacturer selected.
  3. Maintenance Manual: Upon completion of the painting Work, furnish OCWS copies of detailed maintenance manual including the following information:
    - a. Complete and updated product catalog of paint manufacturer's currently available products including complete technical information on each product. Identify product names and numbers of each product used in the painting Work.
    - b. Name, address, and telephone number of manufacturer, local distributor, applicator and technical representative.
    - c. Detailed procedures for routine maintenance and cleaning.
    - d. Detailed procedures for light repairs such as dents, scratches and staining.
- C. Certificates: Submit for approval the following:
1. Certificate stating that materials meet or exceed Specification requirements.
  2. Evidence of shelf life history for all products verifying compliance with the requirements of the Specifications.
  3. CONTRACTOR shall provide notarized statement verifying that all painting systems are compatible with surfaces specified. All painting systems' components shall have been reviewed by an authorized technical representative of the paint manufacturer for use as a compatible system. Verify that all painting systems are acceptable for the exposures specified and that the manufacturer is in agreement that the selected systems are proper, compatible and are not in conflict with the paint manufacturer's recommended specifications. Show by copy of transmittal form that a copy of the letter has been transmitted to the paint applicator.
- D. Statement of Application: Upon completion of the painting Work, submit a notarized statement to OCWS signed by CONTRACTOR and painting applicator stating that the Work complies with the requirements of these Specifications and that application methods, equipment and environmental conditions were proper and adequate for the conditions of installation and use.

## PART 2 - PRODUCTS

### 2.1 PAINTING SYSTEMS

- A. New and Existing Ferrous Metals, Structural Steel (not protected by sprayed fireproofing), Miscellaneous Ferrous Metals, Exterior Surfaces of Valves, Exterior Surfaces of Ferrous Piping, and Exterior Surfaces of all Ferrous Piping; Non-submerged, Interior:

TABLE 1.

| Surface Preparation  | Generic Components   | Manufacturer, Coats, DMFTPC and Coverage                                      |
|--|--|---|
| 3.2.A.,<br>3.2.C.1.,<br>3.2.C.2.,<br>3.2.C.4.,<br>3.2.C.6.,<br>3.2.C.7.,<br>3.2.C.8. | Primer: <b>E.</b><br><br>Field Touchup: <b>E.</b><br><br>Finish: <b>F.</b> | Primer: <b>5d.</b><br><br>Field Touchup: <b>5e.</b><br><br>Finish: <b>7a.</b> |

- B. New and Existing Ferrous Metals, Galvanized (Zinc-Coated) Metals and Non-Ferrous Metals and Exterior Surfaces of Piping; Submerged or Intermittently Submerged, Interior and Exterior:

TABLE 2.

| Surface Preparation                                      | Generic Components  | Manufacturer, Coats, DMFTPC and Coverage   |
|--|---|--|
| 3.2.A.,<br>3.2.C.1.,<br>3.2.C.3.,<br>3.2.C.5.,<br>3.2.E. | Primer: <b>A.</b><br><br>Prime Coat Preparation and Touchup: <b>A.</b><br><br>Finish: <b>B.</b> | Primer: <b>2a.</b><br><br>Prime Coat Preparation and Touchup: <b>1a.</b><br><br>Finish: <b>3a.</b> |

2.2 PAINTING SYSTEM COMPONENTS AND MANUFACTURERS

- A. Painting System Manufacturers:
1. Acceptable manufacturers for each generic painting system are referenced in Article 2.1. Inclusion of a manufacturer in Article 2.2.A.1 does not mean that any paint systems of that listed manufacturer is automatically considered "equal" to the paint systems of manufacturers referenced under specific generic paint systems in Article 2.1.
  2. Where two or more manufacturers are included under specific generic paint systems, the products of those manufacturers named are considered "equal" by OCWS. Products of other listed, or unlisted, manufacturers shall be submitted to OCWS for review.
  3. Manufacturers for each generic product are specified under the Table of Products, Dry Film Thicknesses and Coverages using the following abbreviations.
  4. Product and Manufacturer: Where referenced under generic painting systems, provide painting systems as manufactured by the following:
    - a. Tnemec Company, Incorporated. **(TCI)**
    - b. Sentry Polymers, Incorporated, part of the StonCor Group, An RMP Company. **(SPI)**

- c. The Carboline Company, part of the StonCor Group, An RMP Company. **(TCC)**
  - d. The Sherwin-Williams Company. **(SWC)**
  - e. E. I. duPont de Nemours & Company. **(EID)**
  - f. Advanced Polymer Sciences, Incorporated. **(APSI)**
  - g. California Products Corporation. **(CPC)**
  - h. Surface Protection Industries, International. **(SPII)**
  - i. Glidden Company. **(GC)**
  - j. Benjamin Moore & Company. **(BMC)**
  - k. Briner-Plasite, part of the StonCor Group, An RMP Company. **(BP)**
- B. Generic Painting System Components:
- 1. Provide the following generic products as scheduled in Article 2.1 - Painting Systems:

TABLE OF GENERIC PRODUCTS

|   |  |
|---|--|
| A | Minimum 56 percent volume solids, high-build, two-component, polyamide-catalyzed epoxy; containing 3.40 pounds per gallon VOC, maximum.  |
| B | Minimum 80 percent volume solids, high-build, two-component, cycloaliphatic amine-catalyzed epoxy coating, recommended by manufacturer's product literature as providing the same maximum long-term chemical and corrosion protection as the product series of manufacturer specified; containing 1.55 pounds per gallon VOC, maximum. |

- C. Product Series, Manufacturers, Dry Mil Film Thickness per Coat (DMFTPC), and Coverage:
- 1. Provide the following products, manufacturers, and features as scheduled in Article 2.1 - Painting Systems:

TABLE OF PRODUCTS, DRY FILM THICKNESSES AND COVERAGES

|   |   |
|---|---|
| 1 | Series 66 Hi-Build Epoxoline <b>(TCI)</b> ; CarboGuard 888 <b>(TCC)</b> ; Epolon II Multi-Mil Epoxy <b>(SWC)</b> :<br><ul style="list-style-type: none"> <li>a. 1 coat, 1.5 to 2.5 dry mils, 280-475 square feet per gallon.</li> </ul> |
| 2 | Series 66 Hi-Build Epoxoline <b>(TCI)</b> ; CarboGuard 888 <b>(TCC)</b> ; Macropoxy 646 <b>(SWC)</b> :<br><ul style="list-style-type: none"> <li>a. 1 coat, 3.0 to 5.0 dry mils, 140-240 square feet per gallon.</li> </ul>             |
| 3 | Series 104 H.S. Epoxy <b>(TCI)</b> ; Dura-Plate 235 Multi-Purpose Epoxy <b>(SWC)</b> :<br><ul style="list-style-type: none"> <li>a. 1 coat, 4.0 to 6.0 dry mils, 175-260 square feet per gallon.</li> </ul>                             |

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. CONTRACTOR shall examine the areas and conditions under which painting Work is to be performed and notify OCWS in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to OCWS.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film capable of performing in accordance with claims made in manufacturer's product literature for the surfaces and conditions encountered.
- C. Do not paint over existing paint where there is no assurance that existing paint will provide an acceptable surface for the long-term adherence and durability of painting systems specified or where the manufacturer requires removal of all existing paint in order to recommend the use of the specified painting system.

### 3.2 SURFACE PREPARATION

- A. General:
  - 1. Perform all preparation and cleaning procedures as specified herein and in strict accordance with paint manufacturer's approved instructions for each particular surface and atmospheric condition.
  - 2. CONTRACTOR shall remove, as necessary, items, which must be field-painted where adjacent surfaces cannot be completely protected from splatter or overspray. Following completion of painting of each space or area, the removed items shall be reinstalled by workers skilled in the trades involved.
  - 3. Clean surfaces to be painted before applying any painting system components. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning.
  - 4. Prepare all surfaces which were improperly shop-painted, and all abraded or rusted shop-painted surfaces, as specified.

### 3.3 ADJUSTMENT AND CLEAN-UP

- A. Correct all damages to the work by cleaning, repairing or replacing, and repainting, as acceptable to OCWS.
- B. During the progress of the Work, remove from the Site all discarded paint materials, rubbish, cans and rags at the end of each work day.
- C. Upon completion of painting, clean all paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- D. At the completion of Work, touch-up and restore all damaged or defaced painted surfaces.



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**OKALOOSA COUNTY  
WATER AND SEWER**

**DIVISION 11**

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**DIVISION 11 EQUIPMENT**

SECTION 11145      LIFT STATION SPECIFICATIONS





## SECTION 11145

### LIFT STATION SPECIFICATIONS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

###### A. General Requirements:

###### 1. As-Built Records:

- a. A complete set of As-Built records shall be kept by the Contractor. These records shall show all items of construction and equipment which differ in size, shape or location from those shown on the contract drawings, also any additional work, existing features or utilities revealed by construction work which are not shown on the contract drawings. These reports shall be kept up-to-date daily. They may be kept on a marked set of contract drawings to be furnished by the contractor for this purpose, or in any other form, which is approved prior to the beginning of the work. They shall be available at all times during construction for reference by the Engineer and Owner, and shall be delivered to the OCWS Engineering Department upon completion of the work.

###### 2. Nameplate:

- a. Each piece of mechanical equipment and motors shall be provided with a substantial nameplate of non-corrodible metal securely fastened in place, and clearly and permanently inscribed with the manufacturer's name, model, or type designation, serial number, rated capacity, electrical or other power characteristics, and other appropriate nameplate data. Spare nameplates shall be provided for each lift station and placed inside each control panel (one nameplate for each model pump).

###### 3. Lubricants:

- a. All the equipment shall be delivered fully lubricated with oil and/or grease insofar as possible. If any point cannot be so serviced, it shall be clearly marked to the effect that it is not lubricated and requires servicing prior to operation. An adequate supply of the proper lubricant, with the instructions for its application shall be supplied with the equipment for each point not lubricated prior to shipment. The Contractor shall also provide the Owner with a sufficient amount of proper lubricants for one complete change of lubricant for all equipment furnished.

###### 4. Operating Manuals and Parts Listed:

- a. The Contractor shall furnish three (3) complete, bound sets of literature giving the following information to the Okaloosa County Water and Sewer Engineering Department.

- 1) Clear and Concise instruction for operations, adjustment and lubrication and other of the equipment. These instructions shall include a complete lubrication chart.
  - 2) A list of all parts of the equipment, with catalog number and other data necessary for ordering replacement parts.
  - 3) Such instructions and parts listed shall have been prepared specifically for the model and type of equipment furnished and shall not refer to other models and types of similar equipment.
  - 4) Complete sets of electrical schematic(s), (as built) one of which shall be encapsulated in plastic and permanently mounted to the inside of lift station door.
5. Telemetry Equipment:
- a. A telemetry fee shall be paid to:
    - 1) Okaloosa County Water and Sewer System
    - 2) 1804 Lewis Turner Boulevard, Suite 300
    - 3) Fort Walton Beach, Florida 32547
  - 4) This fee will cover the expense of installing telemetry equipment, at the time of purchasing other associated connection cost.
6. Fencing:
- a. Fence specifications will vary, subject to the requirements of the developer and the Okaloosa County Water and Sewer System.
7. Force Main (Thermoplastic Pipe):
- a. A #14 copper insulated tracer wire shall be laid over the full length of the force main. Refer to Section 3556 for force main specifications.
8. Water Service:
- a. A ¾" Potable water service shall be made available at Lift Station Site.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Valve Housing Box:
1. The exterior of the valve housing box shall be water proofed by the manufacturer with two coats of Kopper's Bitumastic 300-M pr approved equal type sealant to prevent ground water infiltration.
  2. The interior of the valve housing box shall have a smooth plastered finish, bottom section to be sloped to one corner.
  3. There shall be a minimum of 18" clearance on all sides of valves and fittings.
  4. The check valves shall be a waffer swing check valve with external lever and spring as manufactured by Empire Specialty Co. Inc., or approved equal. Cast Iron Body, renewable Buna N Seal, and AWWA C115 Flanged connection. The shaft, center pin, disc arm set screw, seat screws

and disc arm key shall be stainless steel.

5. All exposed hardware shall be of corrosion resistant, stainless steel.
6. The Access Hatches shall be aluminum double-door type, rated at 300 lb/sq. ft. A minimum of 3' x 3' overall, mounted and centered on the box as shown on the drawings. Doors shall be of skid-proof design.
7. All valve housing boxes shall be a solid cast in place or precast concrete box with bottom grouting of box bottom not permitted.
8. The gate valves shall be AWWA C509 Compression Resilient Seated, Flanged Cast Iron Body with epoxy coated interior, and manual handwheel actuator.
9. An emergency by-pass gate valve with an Ever-tite Quick Coupling, Part "F", Male adaptor with male thread, 4" aluminum, shall be used, and installed within the valve box proceeding the in-line check and gate valve. The coupling should be located in a manner that it is accessible when the access hatch is open, with no obstructions so that a 4" suction hose can be easily attached for emergency operations.

B. Wet Well:

1. There shall be stainless steel pull cables fastened with stainless steel clamps to the lift rings on each pump. The top end of the cable shall have a minimum of 4" loop fastened with stainless steel clamps. The cable shall be of adequate strength to permit raising and lowering of the pumps.
2. The entire internal discharge riser pipes shall be scheduled 80 P.V.C. joined with schedule 80 P.V.C. cement.
3. A double door aluminum access frame and cover, rated at 300 lb/sq. ft., complete with hinged and flush locking mechanism, 316 S.S. upper guide holder and level sensor(s) cable holder shall be furnished and installed on the pump station wet well. Frame shall be securely placed, mounted above the pumps. Frame shall be provided with sliding nut rails to attach the accessories required. Lower guide bar holders shall be integral with the discharge connection. Guide bars shall be of at least 316 stainless steel pipe. Doors shall be of skid proof design.
4. All lift eyes within the interior and exterior of wet well shall be cut off flush with the existing surface, and sealed with a Bitumastic type sealant.
5. Steps will not be allowed inside the wet well.
6. Schedule 80 PVC with a flange on each end shall be used from the exterior of the wet well into the valve box.
7. The discharge piping shall be intermediately supported inside the wet well by the use of a stainless steel uni-strut bolted to the well wall, and stainless steel u-bolts and clamps secured to the discharge pipe and strut.
8. All fasteners inside wet well shall be 316 stainless steel.
9. Hatch to Wet Well shall be as a minimum 4' x 4' in size or larger, as specified on plans.
10. Wet Well shall be 6' diameter or larger or 6' x 6' square or larger as specified on plans.
11. A guide rail system for pump removal shall be installed inside the wet

well for each pump. The guide rails shall be of at least 316 stainless steel pipe of the size indicated on the drawing, but a minimum of two (2") inches in diameter. The guide bars shall not support any portion of the weight of the pump. The lower guide bracket shall be incorporated and tightly secured to the discharge connection elbow with 316 stainless steel fasteners. The entire slide rail system shall conform to Underwriters Laboratory (U. L.) requirements, for use in Class I, Division I, Group D environments.

12. Ductile iron influent piping shall be coated with Protecto 401.

C. Alternate Wet Well/Valve Box:

1. Stand alone Fiberglass Structures may be used for Wet Well and Valve Pit. The FRP structures must meet and or exceed ASTM-D3753 standards. The structures must be Third Party Tested and Certified to meet the ASTM-D3753 standards. A copy of this certification must be provided with Submittal Data. Manufacturers that do not have this Third Party Certification included with the submittal data will not be approved. The structures must have labels that have serial numbers visible and states the manufacturer, date of manufacture, depth, diameter, and that structure meets ASTM-D3753 standards. If the Manufacturer is contacted they must be able to state purchaser, diameter, depth, and date that the wet well was purchased simply by providing the serial numbers. Manufacturers that do not maintain files that track serial numbers will not be accepted as warranties will not be verifiable.
2. The fiberglass structures must have a standard 10 Year structural warranty. The fiberglass structures must have a printed 10 Year warranty label gel coated next to ASTM and serial number label. Copy of this warranty must be included with the submittal data. Approved Manufacturer is L.F. Manufacturing, Giddings, Texas ([www.lfm-frp.com](http://www.lfm-frp.com)).
3. Wet wells/Valve Pits shall have 12" risers with "Drop In" Aluminum Hatch Cover. Upon completion the wet well and valve pit shall have an 8" concrete slab poured over top. On wet wells 8' in diameter or larger an extra hatch cover shall be supplied on opposite side of wet well to allow installation of future equipment.
4. The wet well shall include guide rail systems with SST components and fiberglass I-Beams or dual SST pipe for slide rails. The basis of design for the guide rail system is Hydromatic Pump's Pultruded/MTM Rail System. The base elbow and sealing flange shall be constructed of Cast Iron.
5. Valve pit shall include two (2) epoxy coated swing check valves with outside lever and spring, three (3) full port SST plug valves (By American), Emergency pump out connection with dust cap and all the necessary gaskets, straight pipe, brackets, elbows, tees, and fittings. Minimum valves and pipe size shall be 4".
6. All piping will be Sch. 40 SST for corrosion resistance and strength. Where piping passes through a wall sleeves shall be used with rubber link seals to make a watertight penetration. The sleeves must be large enough

for flange of pipe being used to pass freely through (Example: 4" pipe would require a 10" sleeve to allow 9-1/2" O.D. diameter of 4" flange). The link seals are used so that the rubber acts as vibration isolator while pump is running.

7. All piping in wet well and valve pit shall be welded Flange X Flange Sch. 40 SST. Hardware used for connections must be SST bolts with Brass nuts.
  8. Discharge piping in wet well must have "air release" valves (Waterman type, or equal).
  9. Oil filled pressure gauges rated for 1-1/2 times specified pumping pressures with 3/4" SST ball valves must be provided for each discharge. Gauges must be located between check and plug valve so that static head can be observed when pump is off, TDH can be observed while pumps are running, and plug valves can be shut to observe "dead head" pressure.
  10. The Emergency Pump Out Connection Dust Cap must be tapped with 1/4" pet cock so as to bleed off any accumulated pressure that may build up prior to removing cap.
- D. Plates, Sheets, and Shapes:
1. Aluminum Plates, Sheets and Shapes:
    - a. All aluminum plates and shapes shall be of type AA 5052 alloy conforming to applicable requirements of ASTM Designation B 209-67, (latest revision).
    - b. Aluminum extended shapes shall be 6061 or 6062 alloy conforming to ASTM B 221-67, (latest revision).
    - c. All surfaces in contact with concrete shall be coated with Bitumastic (Kopper's 50 or equal).
  2. Stainless Steel Plates, Sheets, and Shapes:
    - a. All stainless steel plates and sheets shall be type 316 alloy conforming to the applicable requirements of ASTM Designation A-182, (latest revision).
    - b. Stainless Steel pipe shall be schedule 5, Type 316 alloy conforming to the applicable requirements of ASTM-312, (latest revision).
  3. Fastenings:
    - a. Fasteners insofar as practical shall be concealed. Where exposed, fastening shall be of 316 stainless steel, where not indicated otherwise and countersunk wherever possible.
    - b. All fastenings coming into contact with aluminum and /or submerged shall be of stainless steel.
    - c. All hardware used to assemble ductile iron fittings shall be stainless steel. Threads shall be coated with antiseize compound.
    - d. All threaded fasteners to include threaded rods shall be coated with antiseize compound.
- E. Submersible Pumping Equipment:
1. Pumps:
    - a. Pumps shall be submersible, heavy duty, recessed impeller type or an

approved equal by the Okaloosa County Water & Sewer Engineering Department.

- b. The pumps shall be capable of handling raw, unscreened sewage. The discharge connection elbow shall be permanently installed in the wet well along with the discharge piping. The pumps shall be automatically connected to the discharge connection elbow when lowered into place, and shall be easily removed for inspection or service. There shall be no need for personnel to enter pump well. Sealing of the pumping unit to the discharge connection elbow shall be accomplished by the simple linear downward force of the pump. A sliding guide bracket shall be an integral part of the pump unit. The entire weight of the pump unit shall be guided by no less than two guide bars and pressed tightly against the discharge connection elbow with metal-to-metal contact by gravity only. Sealing of the discharge interface by means of a diaphragm, O-ring, or other devices will not be acceptable. No portion of the pump shall bear directly on the floor of the wet well. The pump, with its appurtenances and cable, shall be capable of continuous submergence underwater, without loss of water-tight integrity to a depth of 65 ft. Totally submersible design, with all electrical parts housed in an air-filled cast-iron, water tight enclosure. Thrust and radial bearings shall be of the ball type. The motor shafting shall be stainless steel and designed for extremely difficult sewage pumping service. The motor shall be designed to operate on 3-phase, 60-cycle, 240 volt alternating current and shall be non-overloading at all points on the pump curve.
2. Manufacturing:
    - a. The duplex submersible pumps shall be as manufactured by Hydromatic, ESSCO, Davis EMU, Wemco, or an approved equal by the Okaloosa County Water & Sewer Engineering Department. Submittal data required before approval if equal is requested.
  3. Submittal Data:
    - a. The contractor shall provide three (3) copies of the following submittal data for each item of pumping equipment:
      - 1) Certified Dimensional Print
      - 2) Typical Performance Curve
      - 3) Pictorial and Schematic Wiring Prints
      - 4) Parts Listed and Instructional Prints
      - 5) Pump Components and Warranty.
  4. Pump Characteristics:
    - a. Pumps shall furnish the following:
      - 1) Pump to pass minimum sphere of 3½" diameter.
      - 2) Minimum motor size, 5 HP, unless otherwise approved by OCWS Engineering.
      - 3) Recessed impellar unless otherwise approved by the OCWS Engineering Department.

5. Controls:
  - a. Automatic control of the duplex submersible pumps shall be by means of a system of sealed mercury float switches of compressed air. The switch shall be capable of starting and stopping the pumps at an adjustable differential, starting the lead pump first and then the lag pump if wet well level continues to rise, running both pumps simultaneously and automatic alternation of the lead and lag pumps. The control shall be housed in a Stainless Steel NEMA Standard 250, Type 4x enclosure with a pad lock hasp. The enclosure shall include:
    - 1) Dead front enclosure made of stainless steel.
    - 2) Two (2) motor starters of adequate size.
    - 3) 120-Volt, 20-Amp duplex receptacle.
    - 4) Four (4) circuit breakers, one for each pump, one for the receptacle and one for the control circuitry.
    - 5) Two (2) HOA (hand-off automatic) switches.
    - 6) Three (3) pole overload relay with one (1) heater per pole for each pump.
    - 7) Pump alternating circuit.
    - 8) 24 Volt Ac or 120 Volt AC Control Voltage.(120 V AC preferred)
    - 9) Two (2) run lights (green), run light shall be clearly labeled.
    - 10) Two (2) moisture detection relays and yellow warning lights.
    - 11) Two (2) 0 to 99,999.9 hour elapsed time meters.
    - 12) Phase Failure relay required (plug-in type, 8-pin).
    - 13) A minimum of 12" x 12" shall be vacant on inside of sub panel for additional equipment.
    - 14) A high level float switch will be provided and wired to a terminal strip in the panel.
    - 15) A 110-Volt exterior flood light, 175 wattage rating, with a remote switch installed inside the main control panel, shall be mounted adjacent to and overhead of the panel and wet well.
    - 16) A motor over-temp circuitry shall be installed, so that if the motor reaches an over-temp condition, the control voltage to that motor is interrupted. This shall illuminate a red warning light in the panel.
    - 17) The controller shall be completely assembled, tested and ready for operation prior to final acceptance inspection.
6. Alternate Control Systems:
  - a. Alternate control systems and arrangements will be considered provided all functional characteristics are met.
7. Electrical:
  - a. General:
    - 1) All electrical equipment shall be installed in accordance with the N.E.C. Code, as last revised. All materials used shall be new and unused, of the highest quality, and of proper type for the use intended. Where applicable, all material shall carry the approval of the Underwriters' Laboratory. Substitutes, which tend to lower the quality of the work, will not be permitted. The project is to result



in a complete and operable Lift Station. Any items not specified, but normally included in such installations shall be finished and installed regardless of omissions from specifications. However, specified omissions are not affected by this requirement. The electrical service and starting gear shall be mounted on a suitably sized panel frame constructed of aluminum 4" x 4" x 1/4" angle or galvanized steel uni-strut material. All details of service characteristics shall be verified with the local utility.

8. Materials:
  - a. Conduit and conduit fittings shall be P.V.C. Electrical connectors and couplings shall be of the approved plastic water-tight type.
  - b. Wire and cable shall be properly sized to carry the anticipated loading. Insulation, unless otherwise noted, shall be typed RHW neoprene jacket for all sizes.
  - c. Conduit into wet well shall be large enough for easy removal of pump leads and/or float leads but as a minimum 1 1/2" diameter. There shall be one conduit for each pump, plus one for float switch cables if used.
9. Installations:
  - a. All conduit runs, whether or not terminated in boxes, shall be capped or plugged to prevent the entrance of foreign objects before wires are pulled. Conduit projecting into the wet well shall be plugged to a depth no more than 2" from the control panel with non-hardening compound, after the wires are pulled to prevent corrosive gases from reaching the control panel. Compound should be easily removed for removal/replacement of wiring.
  - b. Outlets, switches, boxes, etc., shall be rigidly secured and located properly with respect to easy accessibility.
  - c. No electrical splices allowed except in control panel.
  - d. All work shall be tested and subject to final approval of the engineer.
10. Stand-by Facilities:
  - a. A double throw safety switch suitable sized to carry the operating current of the station with attached emergency generator receptacle shall be installed between the main disconnect and the controller. The unit shall be housed in a NEMA 3R painted steel enclosure. The receptacle shall be a Crouse-Hinds, rated for 100-Amp, larger as required. A 45 degree angle adapter is recommended to allow for easier generator connection, and to prevent water intrusion.
11. Lightning Arrestor:
  - a. The lightning arrestor for the main service entrance shall be Joshlin or approved equal.
12. Main Disconnect:
  - a. The main disconnect safety switch shall be an enclosed service entrance, weather-proof enclosure, 4 wire S/N, 240/480 Volt AC of sufficient size to carry both pumps operating simultaneously.

THESE SPECIFICATIONS ARE SUBJECT TO CHANGE.

**DIVISION 15 MECHANICAL**

SECTION 15051 BURIED PIPING INSTALLATION

SECTION 15052 EXPOSED PIPING INSTALLATION

SECTION 15100 VALVES, 4-INCH AND LARGER



## SECTION 15051

### BURIED PIPING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope:
1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to install and test all buried piping, fittings, and specials. The Work includes, but is not limited to, the following:
    - a. All types and sizes of buried piping, except those specified under other Sections or other contracts.
    - b. Piping beneath structures.
    - c. Supports, restraints, and thrust blocks.
    - d. Pipe encasements.
    - e. Work on or affecting existing piping.
    - f. Testing.
    - g. Cleaning and disinfecting.
    - h. Installation of all jointing and gasketing materials, specials, flexible couplings, mechanical couplings, harnessed and flanged adapters, sleeves, tie rods, and all other Work required to complete the buried piping installation.
    - i. Incorporation of valves, meters and special items shown or specified into the piping systems as required and as specified in the appropriate Division 15 Sections.
    - j. Unless otherwise specifically shown, specified, or included under other Sections, all buried piping Work required, beginning at the outside face of structures or structure foundations and extending away from structure.
- B. Coordination:
1. Review installation procedures under other Sections and other contracts and coordinate with the Work that is related to this Section.
  2. Section 15051 specifies the installation of all buried piping materials specified in Section 15052. Coordinate with this Section.
- C. Related Sections:
1. Section 02220, Excavation and Backfill.
  2. Section 03300, Cast-In-Place Concrete.
  3. Section 09900, Painting.
  4. Division 15, Sections on Piping, Valves and Appurtenances.

## 1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
  - 1. Comply with requirements of NFPA Standard No. 24 for "Outside Protection" where applicable to water pipe systems used for fire protection.
  - 2. Comply with requirements of UL, FM and other jurisdictional authorities, where applicable.
  - 3. Refer to the General and Supplementary Conditions regarding permit requirements for this Project.
- B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
  - 1. ASTM D 2321, Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
  - 2. ASTM D 2774, Practice for Underground Installation of Thermoplastic Pressure Piping.
  - 3. AWWA C105, Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids.
  - 4. AWWA C111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
  - 5. AWWA C600, Installation of Ductile-Iron Water Mains and Their Appurtenances.
  - 6. AWWA C606, Grooved and Shouldered Joints.
  - 7. AWWA C651, Disinfecting Water Mains.
  - 8. AWWA M23, PVC - Design and Installation.
  - 9. ASCE MOP No. 37, Design and Construction of Sanitary and Storm Sewers.
  - 10. NFPA 24, Private Fire Service Mains and Their Appurtenances.

## 1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
  - 1. Full details of piping, specials, manholes, joints, harnessing and thrust blocks, and connections to existing piping, structures, equipment and appurtenances.
- B. Tests: Submit description of proposed testing methods, procedures and apparatus. Prepare and submit report for each test.
- C. Certificates: Submit certificates of compliance with referenced standards.
- D. Record Drawings:
  - 1. Submit record drawings prior to the time of Substantial Completion.

## 1.4 PRODUCT STORAGE AND HANDLING

- A. Handle all pipe, fittings, specials and accessories carefully with approved handling devices. Do not drop or roll material off trucks. Do not otherwise drop, roll or skid piping.

- B. Store pipes and fittings on heavy wood blocking or platforms so they are not in contact with the ground.
- C. Unload pipe, fittings and specials opposite to or as close to the place where they are to be installed as is practical to avoid unnecessary handling. Keep pipe interiors completely free from dirt and foreign matter.
- D. Inspect delivered pipe for cracked, gouged, chipped, dented or other damaged material and immediately remove from site.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Approved pipe materials are listed in the Piping Schedule. Refer to applicable Sections for material specifications.
- B. General:
  - 1. Marking Piping:
    - a. Clearly mark each piece of pipe or fitting with a designation conforming to those shown on the laying schedule.
    - b. Cast or paint material, type and pressure designation on each piece of pipe or fitting 4 inches in diameter and larger.
    - c. Pipe and fittings smaller than 4 inches in diameter shall be clearly marked by manufacturer as to material, type and rating.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General:
  - 1. Install piping as shown, specified and as recommended by the manufacturer.
  - 2. If there is a conflict between manufacturer's recommendations and the Drawings or Specifications, request instructions from OCWS before proceeding
  - 3. All trench excavations shall be inspected by OCWS prior to laying pipe. Notify OCWS in advance of excavating, bedding and pipe laying operations.
  - 4. Minimum cover over piping shall be 3 feet unless otherwise shown or approved by OCWS.
  - 5. Earthwork required is specified in the applicable Sections of Division 2.
  - 6. Excavation in excess of that required or shown and which is not authorized by OCWS shall be replaced at CONTRACTOR'S expense with approved granular material. It shall be furnished, placed and compacted in accordance with the requirements of the applicable Section of Division 2.

- B. Manufacturer's Installation Specialist:
  - 1. Provide the services of a competent installation specialist of the pipe manufacturer when pipe laying commences for the following:
    - a. Thermoplastic pipe.
  - 2. Retain installation specialist at the site until competency of the pipe laying crew has been satisfactorily demonstrated.
- C. Separation of Sewers and Potable Water Pipe Lines:
  - 1. Horizontal and Vertical Separation:
    - a. Wherever possible, existing and proposed potable water mains and service lines, and sanitary and storm sewers shall be separated horizontally by a clear distance of not less than 10 feet.
    - b. If local conditions preclude a clear horizontal separation of not less than 10 feet, the installation will be permitted provided the potable water main is in a separate trench or on a undistributed earth shelf located on one side of the sewer and at an elevation so the bottom of the potable water main is at least 18 inches above the top of the sewer.
    - c. Exception:
      - 1) Where it is not possible to provide the minimum horizontal and vertical separation described above, both the potable water main and sewer must be constructed of cement lined ductile iron slip-on or mechanical joint pipe complying with public water supply design standards of the agency. Both pipes shall be pressure tested in accordance with the requirements of the buried piping schedule, but in no case less than 150 psi, to assure water tightness before backfilling.
  - 2. Crossings:
    - a. Provide a minimum vertical distance of 18 inches between the outside of the potable water main and the outside of the sewer when a sewer or drain must cross over a potable water main.
    - b. Center one full length section of potable water main over the sewer so that the sewer joints will be equidistant from the potable water main joints.
    - c. Provide adequate structural support where a potable water main crosses under a sewer to maintain line and grade.
    - d. Exceptions:
      - 1) Where it is not possible to provide the minimum horizontal and vertical separation described above, both the potable water main and sewer must be constructed of cement lined ductile iron pipe. Both pipes shall be pressure tested in accordance with the requirements of the buried piping schedule, but in no case less than 150 psi, to assure water tightness before backfilling.
      - 2) Encase either potable water main or sewer in a watertight carrier pipe, which extends 10 feet on both sides of the crossing, measured perpendicular to the potable water main.
- D. Plugs:

1. Temporarily plug installed pipe at the end of each day's work or other interruption to the installation of any pipe line. Plugging shall prevent the entry of animals, liquids or persons into the pipe or the entrance or insertion of deleterious materials.
  2. Install standard plugs into all bells at dead ends, tees or crosses. Cap all spigot ends.
  3. Fully secure and block all plugs and caps installed for pressure testing to withstand the specified test pressure.
  4. Where plugging is required for phasing of the Work or for subsequent connection of piping, install watertight, permanent type plugs.
- E. Bedding Pipe: Bed pipe as specified below and in accordance with the details shown.
1. Trench excavation and backfill, and bedding materials shall conform to the requirements of Section 02200, as applicable.
  2. Where the existing bedding material is deemed unsuitable by OCWS, remove and replace it with approved granular materials.
  3. Where pipe is installed in rock excavation, provide a minimum of 3 inches of crushed stone or gravel under pipes smaller than 4 inches in diameter and a minimum of 6 inches of crushed stone or gravel under pipes 4 inches in diameter and larger.
  4. Excavate trenches below the pipe bottom by an amount shown and specified. Remove all loose and unsuitable material from the trench bottom.
  5. Carefully and thoroughly compact all pipe bedding with hand held pneumatic compactors.
  6. Do not lay pipe until OCWS approves the bedding condition. If a conflict exists obtain clarification from OCWS before proceeding.
  7. No pipe shall be brought into position until the preceding length has been bedded and secured in its final position.
- F. Laying Pipe:
1. Conform to manufacturer's instructions and requirements of the standards listed below, where applicable:
    - a. Ductile Iron Pipe: AWWA C600, AWWA C105.
    - b. Thermoplastic Pipe: ASTM D 2774.
    - c. ASCE Manual of Practice No. 37.
  2. Install all pipe accurately to line and grade shown unless otherwise approved by OCWS. Remove and relay pipes that are not laid correctly.
  3. Slope piping uniformly between elevations shown.
  4. Ensure that ground water level in trench is at least 6 inches below bottom of pipe before laying piping. Do not lay pipe in water. Maintain dry trench conditions until jointing and backfilling are complete and protect and keep clean water pipe interiors, fittings and valves.
  5. Start laying pipe at lowest point and proceed towards the higher elevations, unless otherwise approved by OCWS.
  6. Place bell and spigot pipe so that bells face the direction of laying, unless otherwise approved by OCWS.



7. Excavate around joints in bedding and lay pipe so that the barrel bears uniformly on the trench bottom.
  8. Deflections at joints shall not exceed 75 percent of the amount allowed by the pipe manufacturer.
  9. For thermoplastic piping, snake piping in trench to compensate for thermal expansion.
  10. Carefully examine all pipe, fittings and specials for cracks, damage or other defects while suspended above the trench before installation. Immediately remove defective materials from site.
  11. Inspect interior of all pipe and fittings and completely clean all dirt, gravel, sand, debris or other foreign material from pipe interior and joint recesses before it is moved into the trench. Bell and spigot mating surfaces shall be thoroughly wire brushed, and wiped clean and dry immediately before the pipe is laid.
  12. Field cut pipe, where required, with a machine specially designed for cutting piping. Make cuts carefully, without damage to pipe or lining, and with a smooth end at right angles to the axis of pipe. Cut ends on push-on joint shall be tapered and sharp edges filed off smooth. Flame cutting will not be allowed.
  13. Blocking under piping will not be permitted unless specifically approved by OCWS for special conditions. If permitted, conform to requirements of AWWA C600.
  14. Touch up protective coatings in a satisfactory manner prior to backfilling.
  15. CONTRACTOR shall notify OCWS in advance of backfilling operations.
  16. On steep slopes, take measures acceptable to OCWS to prevent movement of the pipe during installation.
  17. Thrust Restraint: During the installation of the pipe, thrust blocks, tied joints, or proprietary restrained joint systems shall be provided wherever required for thrust restraint. Thrust restraint shall conform to the applicable requirements of Article 3.2.
- G. Polyethylene Encasement:
1. Provide polyethylene encasement for ductile iron piping to prevent contact between the pipe and surrounding bedding material and backfill.
  2. Polyethylene may be supplied in tubes or in sheet material.
  3. Polyethylene encasement materials and installation shall be in accordance with the requirements of AWWA C105.
- H. Jointing Pipe:
1. Ductile Iron Mechanical Joint Pipe:
    - a. Wipe clean the socket, plain end and adjacent areas immediately before making joint. Make certain that cut ends are tapered and sharp edges are filed off smooth.
    - b. Lubricate the plain ends and gasket with soapy water or an approved pipe lubricant, in accordance with AWWA C111, just prior to slipping the gasket onto the plain end of the joint assembly.

- c. Place the gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end.
- d. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly.
- e. Push gland toward socket and center it around pipe with the gland lip against the gasket.
- f. Insert bolts and hand tighten nuts.
- g. Make deflection after joint assembly, if required, but prior to tightening bolts. Alternately tighten bolts 180 degrees apart to seat the gasket evenly. The bolt torque shall be as follows:

| Pipe Size<br>(inches) | Bolt Size<br>(inches) | Range of Torque<br>(ft-lbs) |
|-----------------------|-----------------------|-----------------------------|
| 3                     | 5/8                   | 45-60                       |
| 4-24                  | 3/4                   | 75-90                       |
| 30-36                 | 1                     | 100-120                     |
| 42-48                 | 1-1/4                 | 120-150                     |

- 2. Ductile Iron Push-On Joint Pipe:
  - a. Prior to assembling the joints, the last 8 inches of the exterior surface of the spigot and the interior surface of the bell shall be thoroughly cleaned with a wire brush, except where joints are lined or coated with a special protective lining or coating.
  - b. Rubber gaskets shall be wiped clean and flexed until resilient. Refer to manufacturer's instructions for procedures to ensure gasket resiliency when assembling joints in cold weather.
  - c. Insert gasket into joint recess and smooth out the entire circumference of the gasket to remove bulges and to prevent interference with the proper entry of the spigot of the entering pipe.
  - d. Immediately prior to joint assembly, apply a thin film of approved lubricant to the surface of the gasket, which will come in contact with the entering spigot end of pipe. CONTRACTOR may, at his option, apply a thin film of lubricant to the outside of the spigot of the entering pipe.
  - e. For assembly, center spigot in the pipe bell and push pipe forward until it just makes contact with the rubber gasket. After gasket is compressed and before pipe is pushed or pulled all the way home, carefully check the gasket for proper position around the full circumference of the joint. Final assembly shall be made by forcing the spigot end of the entering pipe past the rubber gasket until it makes contact with the base of the bell. When more than a reasonable amount of force is required to assemble the joint, the spigot end of the pipe shall be removed to verify the proper positioning of the rubber

- gasket. Gaskets, which have been scoured or otherwise damaged, shall not be used.
- f. Maintain an adequate supply of gaskets and joint lubricant at the site at all times when pipe jointing operations are in progress.
3. Proprietary Joints:
    - a. Pipe which utilizes proprietary joints such as Fastite, by American Cast Iron Pipe Company, Tyton by U.S. Pipe Incorporated, restrained joints described under Paragraph 3.2.D., or other such joints shall be installed in strict accordance with the manufacturer's instructions.
  4. Flanged Joints:
    - a. Assemble flanged joints using 1/8-inch ring-type gaskets for raised face flanges. Use full face gaskets for flat face flanges, unless otherwise approved by OCWS. Gaskets shall be suitable for the service intended in accordance with the manufacturer's ratings and instructions. Gaskets shall be properly centered.
    - b. Bolts shall be tightened in a sequence, which will insure equal distribution of bolt loads.
    - c. The length of bolts shall be uniform, and they shall not project beyond the nut more than 1/4-inch or fall short of the nut when fully taken up. The ends of bolts shall be machine cut so as to be neatly rounded. No washers shall be used.
    - d. Bolt threads and gasket faces for flanged joints shall be lubricated prior to assembly.
    - e. After assembly, coat all bolts and nuts with two 8-mil coats of a high-build epoxy or bituminous coating as manufactured by Tnemec, or equal.
  5. Thermoplastic Pipe Joints:
    - a. Solvent Cement Joints:
      - 1) Bevel pipe ends and remove all burrs before making joints. Clean both pipe and fittings thoroughly. Do not attempt to make solvent cement joints if temperature is below 40 F nor in wet conditions.
      - 2) Use solvent cement supplied or recommended by the pipe manufacturer.
      - 3) Apply joint primer and solvent cement and assemble joints in strict accordance with the recommendations and instructions of the manufacturer of the joint materials and the pipe manufacturer.
      - 4) Observe safety precautions with the use of joint primers and solvent cements. Allow air to circulate freely through pipelines to permit solvent vapors to escape. Slowly admit water when flushing or filling pipelines to prevent compression of gases within pipes.
    - b. Push-On Joints:
      - 1) Bevel all field-cut pipe, remove all burrs and provide a reference mark the correct distance from the pipe end.
      - 2) Clean the pipe end and the bell thoroughly before making the joint. Insert the O-ring gasket, making certain it is properly oriented.

Lubricate the spigot well with an approved lubricant; do not lubricate the bell or O-ring. Insert the spigot end of the pipe carefully into the bell until the reference mark on the spigot is flush with the bell.

- I. Backfilling:
  - 1. Conform to the applicable requirements of Section 02220 or 02223.
  - 2. Place backfill as construction progresses. Backfill by hand and use power tampers until pipe is covered by at least one foot of fill.
- J. Connections to Valves and Hydrants:
  - 1. Install valves and hydrants as shown.
  - 2. Provide suitable adapters when valves or hydrants and piping have different joint types.
  - 3. Provide thrust restraint at all hydrants and at valves at pipeline terminations.
- K. Transitions from One Type of Pipe to Another:
  - 1. Provide all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.
- L. Closures:
  - 1. Provide all closure pieces shown or required to complete the Work.

### 3.2 THRUST RESTRAINT

- A. Provide thrust restraint on all pressure piping systems and where otherwise shown and specified.
- B. Thrust restraint may be accomplished by means of restrained pipe joints, or by concrete thrust blocks. Thrust restraints shall be designed for the axial thrust exerted by the test pressure specified in the "Buried Piping Schedule".
- C. Place concrete thrust blocks against undisturbed soil. Where undisturbed soil does not exist, or for projects where the site consists of fill material, thrust restraint shall be provided by restrained pipe joints.
- D. Restrained Pipe Joints:
  - 1. Pipe joints shall be restrained by means suitable for the type of pipe being installed.
    - a. Restrain ductile iron push-on joints and mechanical joints utilizing a proprietary restrained joint system such as American Lok-Ring, Lok-Fast, Lok-Set; U.S. Pipe Field Lok Gasket, U.S. Pipe TR Flex System; lugs and tie rods, or other systems approved by OCWS.
    - b. Where push-on type or other non-restrained joints are utilized for thermoplastic piping, CONTRACTOR shall provide tie rods or other suitable joint restraint system, subject to the approval of OCWS.
- E. Concrete Thrust Blocks:
  - 1. Provide concrete thrust blocks on pressure piping at all changes in alignment of 15 degrees or more, at all tees, plugs and caps and where shown. Construct thrust blocks of Class B concrete.

2. Install thrust blocks against undisturbed soil. Place concrete so that pipe and fitting joints will be accessible for repair.
3. Size concrete thrust blocks as shown or as approved by OCWS.

### 3.3 WORK AFFECTING EXISTING PIPING

- A. Location of Existing Piping:
  1. Locations of existing piping shown should be considered approximate.
  2. CONTRACTOR shall determine the true location of existing piping to which connections are to be made, and location of other facilities which could be disturbed during earthwork operations, or which may be affected by CONTRACTOR'S Work in anyway.
  3. Conform to applicable requirements of Division 1 pertaining to cutting and patching, and connections to existing facilities.
- B. Taking Existing Pipelines Out of Service:
  1. Do not take pipelines out of service unless approved by OCWS.
  2. Notify OCWS at least 48 hours prior to taking pipeline out of service.
- C. Work on Existing Pipelines:
  1. Cut or tap pipes as shown or required with machines specifically designed for this work.
  2. Install temporary plugs to prevent entry of mud, dirt, water and debris.
  3. Provide all necessary adapters, fittings, pipe and appurtenances required to complete the Work.

### 3.4 TESTING OF PIPING

- A. General:
  1. Test all piping except as may be exempted in the Schedule.
  2. Notify OCWS and local authorities having jurisdiction at least 48 hours in advance of testing if their presence is required.
  3. Conduct all tests in the presence of OCWS.
  4. Remove or protect any pipeline-mounted devices which may be damaged by the test pressure.
  5. Provide all apparatus and services required for testing, including but not limited to, the following:
    - a. Test pumps, bypass pumps, hoses, calibrated gauges, meters, test containers, valves and fittings.
    - b. Temporary bulkheads, bracing, blocking and thrust restraints.
  6. Provide air if an air test is required and power if pumping is required.
  7. Unless otherwise approved by OCWS, CONTRACTOR will provide fluid required for testing.
  8. Repair observed leaks and any pipeline failing to meet acceptance criteria. Retest after repair.
- B. Test Schedule:

1. Refer to the Piping Schedule for the type of test required and the required hydrostatic test pressure.
  2. Unless otherwise specified, the required hydrostatic test pressures are at the lowest elevation of the pipeline.
  3. For piping not listed in the Schedule:
    - a. Hydrostatically test pipe that will be operating at a pressure greater than 5 psig.
    - b. Use exfiltration testing or low-pressure air testing for all other piping.
  4. Hydrostatic Test Pressure:
    - a. Use test pressures listed in the Schedule.
    - b. If a test pressure is not listed in the Schedule, or if a hydrostatic test is required for piping not listed in the Schedule, the test pressure will be determined by the OCWS based on the maximum anticipated sustained operating pressure and the methods described in the AWWA Manual or Standard which applies to the piping system.
- C. Hydrostatic Testing:
1. Preparation for Testing:
    - a. For plastic pipe, follow procedures described in Section 7 of AWWA Standard C605.
    - b. Ensure that adequate thrust protection is in place and that all joints are properly installed.
    - c. Special requirements:
  2. Test Procedure:
    - a. Fill pipeline slowly to minimize air entrapment and surge pressures. Fill rate should not exceed one foot per second in the pipe being tested.
    - b. Examine exposed joints and valves, and correct visible leakage.
    - c. After the wetting period prescribed above, add fluid to pressurize line to the required test pressure. Maintain test pressure for a stabilization period of 10 minutes before beginning test.
    - d. After the stabilization period, maintain test pressure for a two-hour period. Add fluid to restore test pressure if pressure drops 5 psi below test pressure at any time during the test period.
    - e. Pump from a test container to maintain test pressure. Measure the volume of fluid pumped from the container and record on the test report. Record pressure at the test pump at 15 minute intervals for the duration of the test.
  3. Allowable Leakage Rates: Leakage is defined as the quantity of fluid that must be supplied to the pipeline or any section thereof to maintain pressure within 5 psi of the test pressure during a two-hour period. The two-hour test period shall not begin until after the pipe has been filled, exposed to the required wetting period, air has been expelled and pressure has been stabilized. Allowable leakage rates for piping system are listed below:
    - a. No Leakage: Pipe with flanged or fused joints.
    - b. Rates based on the formula or table in AWWA Manual M41:

- 1) Metal pipe joined with rubber gaskets as sealing members. This includes the following joint types:
  - Push-on joints.
  - Mechanical joints.
  - Bolted sleeve type couplings.
  - Grooved and shouldered couplings.
- c. Rates based on the formula or table in AWWA Standard 605:
  - 1) Plastic pipe joined with O-ring gasket sealing members.
- D. Exfiltration Testing:
  - 1. Plug and bulkhead the section of pipe to be tested at both ends and admit fluid until the pipe is full.
  - 2. Provide a minimum head of 2 feet above the crown of the pipe at the upstream end.
  - 3. Add fluid from a test container or from a metered supply as required to maintain the level within 3 inches of the minimum head throughout the test duration.
  - 4. Test duration shall not be less than 2 hours.
  - 5. Allowable Leakage Rates:
    - a. Leakage is defined as the quantity of fluid that must be supplied to the pipeline or any section thereof to maintain the head within 3 inches of the test elevation during the test duration after the pipe has been filled and exposed to the required wetting period plus the quantity required to refill to the original head.
    - b. Leakage shall not be greater than that allowed by the regulatory agency having jurisdiction.
- E. Low Pressure Air Testing:
  - 1. Test in accordance with requirements of the regulatory agency.
  - 2. If there are no regulatory requirements use test procedures described in ASTM Standards:
    - a. ASTM F1417 – For thermoplastic pipe.

### 3.5 CLEANING AND DISINFECTION

- A. Cleaning:
  - 1. Thoroughly clean all piping and flush in a manner approved by OCWS, prior to placing in service.
  - 2. If piping which requires disinfection has not been kept clean during storage or installation, CONTRACTOR shall swab each section individually before installation with a five percent hypochlorite solution, to ensure clean piping.
- B. Disinfection:
  - 1. Disinfect all potable and finished water piping.
  - 2. A suggested procedure for accomplishing complete and satisfactory disinfection is specified below. Other procedures will be considered for approval by OCWS.
    - a. Thoroughly flush piping prior to disinfection with water.

- b. Conform to procedures described in AWWA C651. Continuous feed method of disinfecting shall be used unless alternative method is acceptable to OCWS.
3. Water for initial flushing, testing and chlorination will be furnished by the CONTRACTOR. CONTRACTOR shall provide all temporary piping, hose, valves, appurtenances and services required. Cost of water required for re-disinfection will be paid by CONTRACTOR to OWNER at OWNER'S standard rates.
4. Chlorine will be supplied by CONTRACTOR.
5. Bacteriologic tests will be performed by OWNER. A certified test laboratory report will be made available to CONTRACTOR, if requested.
6. Chlorine concentration in the water entering the piping shall be between 50 and 100 parts per million, such that a minimum residual concentration of 25 mg/l will be left after a 24-hour retention period. Care shall be taken to ensure disinfection of the piping in all its parts. The operation shall be repeated as necessary to provide complete disinfection.
7. After the required retention period, the heavily chlorinated water shall be flushed to drain, unless otherwise directed.

### 3.6 PIPING SCHEDULE

| Service | Size   | Material | Interior Lining | Exterior Coating | Pressure Class | Joint | Test | Remarks |
|---------|--------|----------|-----------------|------------------|----------------|-------|------|---------|
| PW      | 4"-12" | D.I.     | CL              | BC               | 350            | B.S.  | HY   |         |
| PW      | 4"-12" | PVC      | --              | --               | C900           | B.S.  | HY   |         |
| FM      | 4"-12" | D.I.     | EC<br>CL        | BC               | 350            | B.S.  | HY   |         |
| FM      | 4"-12" | HDPE     | --              | --               | As Required    | B.W.  | HY   |         |
| SS      | 8"-12" | D.I.     | EC              | BC               | 350            | B.S.  | AIR  |         |
| SS      | 8"-12" | PVC      | --              | --               | ASTM 3034      | B.S.  | AIR  |         |

The following abbreviations are used in the piping schedule:

- A. Service Abbreviations  
 Potable Water                      PW                      Secondary Sludge      SS  
 Force Main                            FM
- B. Material Abbreviations  
 Polyvinyl Chloride                  PVC                      Ductile Iron              DI  
 High Density Polyethylene        HDPE
- C. Lining/Coating Abbreviations  
 Cement Lined                          CL  
 Bituminous Coated                    BC  
 Epoxy Coated                            EC
- D. Joint Abbreviations  
 Belt and Spigot                        BS                        Flanged                      Flg



|    |                                  |     |             |    |
|----|----------------------------------|-----|-------------|----|
| E. | Mechanical Joint                 | MJ  | Butt Welded | BW |
|    | <u>Test Abbreviations</u>        |     |             |    |
|    | Hydrostatic test (Pressure-psig) |     | HY ( )      |    |
|    | Exfiltration                     | EX  |             |    |
|    | Low pressure air                 | AIR |             |    |
|    | No test required                 | NR  |             |    |

## SECTION 15052

### EXPOSED PIPING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope:
1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to install and test all exposed piping, fittings, and specials. The Work includes, but is not limited to, the following:
    - a. All types and sizes of exposed piping, except those specified under other Sections or other contracts.
    - b. Piping embedded in concrete within a structure or foundation will be considered as exposed and included herein.
    - c. Supports, restraints, thrust blocks and other anchors.
    - d. Work on or affecting existing piping.
    - e. Testing.
    - f. Cleaning and disinfecting.
    - g. Installation of all jointing and gasketing materials, specials, flexible couplings, mechanical couplings, harnessed and flanged adapters, sleeves, tie rods, and all other Work required to complete the exposed piping installation.
    - h. Incorporation of valves, meters and special items shown or specified into the piping systems as required and as specified in the appropriate Division 15 Sections.
    - i. Unless otherwise specifically shown, specified, or included under other Sections, all exposed piping Work required, beginning at the outside face of structures or structure foundation and extending into the structure.
- B. Coordination:
1. Review installation procedures under other Sections and other contracts and coordinate with the Work that is related to this Section.
  2. Section 15052 specifies the installation of all exposed piping materials specified in Sections 15061 through 15070, and Sections 15121, and 15122. Coordinate with these Sections.
- C. Related Sections:
1. Section 03300, Cast-In-Place Concrete.
  2. Section 09900, Painting.
  3. Division 15, Sections on Piping, Valves and Appurtenances.

## 1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
  - 1. Comply with applicable requirements of and NFPA Standard No. 14 for "Standpipe and Hose Systems" used for fire protection.
  - 2. Comply with requirements of UL, FM and other jurisdictional authorities, where applicable.
  - 3. Refer to the General and Supplementary Conditions regarding requirements for this Project.
- B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
  - 1. ANSI B16.3, Malleable-Iron Threaded Fittings, Classes 150 and 300.
  - 2. ANSI B16.4, Cast Iron Threaded Fittings, Classes 125 and 250.
  - 3. ANSI B16.5, Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys.
  - 4. AWWA C111, Rubber Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
  - 5. AWWA C600, Installation of Ductile Iron Water Mains and Their Appurtenances.
  - 6. AWWA C606, Grooved and Shouldered Type Joints.
  - 7. AWWA C651, Disinfecting Water Mains.
  - 8. NFPA 14, Standpipe and Hose Systems.

## 1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
  - 1. Detailed drawings in plan and profile, and laying schedules.
  - 2. Details of piping, valves, supports, accessories, specials, joints, harnessing, and connections to existing pipes and structures.
- B. Tests: Submit description of proposed testing methods, procedures and apparatus. Submit copies of test report for each test.
- C. Record Drawings:
  - 1. Submit record drawings prior to the time of Final Acceptance.

## 1.4 PRODUCT STORAGE AND HANDLING

- A. Handle all pipe, fittings and accessories carefully with approved handling devices. Do not drop or roll pipe off trucks. Do not otherwise drop, roll or skid piping.
- B. Store pipes and fittings on heavy wood blocking or platforms so they are not in contact with the ground.
- C. Unload pipe, fittings and specials opposite to or as close to the place where they are to be installed as is practical to avoid unnecessary handling. Keep pipe interiors completely free from dirt and foreign matter.
- D. Inspect delivered pipe for cracked, gouged, chipped, dented or other damaged material and immediately remove from site.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Required pipe materials are listed in the Piping Schedule. Refer to applicable Sections for material specifications.
- B. General:
  - 1. Marking Piping:
    - a. Clearly mark each piece of pipe or fitting with a designation conforming to that shown on the Shop Drawings.
    - b. Cast or paint material, type and pressure designation on each piece of pipe or fitting 4 inches in diameter and larger.
    - c. Pipe and fittings smaller than 4 inches in diameter shall be clearly marked by manufacturer as to material, type and rating.
- C. Pipe Identification Markers and Arrows: Refer to Section 09900, Painting.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General:
  - 1. Install piping as shown, specified and as recommended by the manufacturer.
  - 2. If there is a conflict between manufacturer's recommendations and the Drawings or Specifications request instructions from OCWS before proceeding.
- B. Piping Installation:
  - 1. Install straight runs true to line and elevation.
  - 2. Install vertical pipe truly plumb in all directions.
  - 3. Protect and keep clean water pipe interiors, fittings and valves.
  - 4. Provide temporary caps or plugs over all pipe openings at the end of each days work, and when otherwise required or directed by OCWS.
  - 5. Cutting: Cut pipe from measurements taken at site, not from Drawings.
  - 6. Install dielectric unions wherever dissimilar metals are connected except for bronze or brass valves in ferrous piping.
  - 7. Provide a union downstream of each valve with screwed connections.
  - 8. Provide screwed or flanged unions at each piece of equipment, where shown, and where necessary to install or dismantle piping.
- C. Joints:
  - 1. General:
    - a. Make joints in accordance with the pipe manufacturer's recommendations and the requirements below.
    - b. Cut piping accurately and squarely and install without forcing or springing.

- c. Ream out all pipes to full inside diameter after cutting. Remove all sharp edges on end cuts.
- d. Remove all cuttings and foreign matter from the inside of pipe before installation. Thoroughly clean all pipe, fittings, valves, specials, and accessories before installing.

2. Mechanical Joint Pipe:

- a. Wipe clean the socket, plain end, and adjacent areas immediately before making joint. Make certain that cut ends are tapered and sharp edges are filed off smooth.
- b. Lubricate the plain end and gasket with soapy water or an approved pipe lubricant, in accordance with AWWA C111, just prior to slipping the gasket onto the plain end of the joint assembly.
- c. Place the gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end.
- d. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly.
- e. Push gland toward socket and center it around pipe with the gland lip against the gasket.
- f. Insert bolts and hand tighten nuts.
- g. Make deflection after joint assembly, if required, but prior to tightening bolts. Alternately tighten bolts 180 degrees apart to seat the gasket evenly. The bolt torque shall be as follows:

| <u>Pipe Size<br/>(inches)</u> | <u>Bolt Size<br/>(inches)</u> | <u>Range of Torque<br/>(ft-lbs)</u> |
|-------------------------------|-------------------------------|-------------------------------------|
| 3                             | 5/8                           | 45-60                               |
| 4-24                          | 3/4                           | 75-90                               |
| 30-36                         | 1                             | 100-120                             |
| 42-48                         | 1-1/4                         | 120-150                             |

3. Flanged Joints:

- a. Assemble flanged joints using 1/8-inch ring-type gaskets for raised face flanges. Use full face gaskets for flat face flanges unless otherwise approved by OCWS. Gaskets shall be suitable for the service intended in accordance with the manufacturer's ratings and instructions. Gaskets shall be properly centered.
- b. Bolts shall be tightened in a sequence, which will insure equal distribution of bolt loads.
- c. The length of bolts shall be uniform, and they shall not project beyond the nut more than 1/4-inch or fall short of the nut when fully taken up. The ends of bolts shall be machine cut so as to be neatly rounded. No washers shall be used.
- d. Bolt threads and gasket faces for flanged joints shall be lubricated prior to assembly.

- e. Alternately tighten bolts 180 degrees apart to compress the gasket evenly.
- D. Installing Valves and Accessories:
1. Provide supports for large valves, flow meters and other heavy items as shown or required.
  2. Install floor stands as shown and as recommended by the manufacturer.
  3. Provide lateral restraints for extension bonnets and extension stems as shown and as recommended by the manufacturer.
  4. Provide steel sleeves where operating stems pass through floor. Extend sleeves 2 inches above floor.
  5. Position valve operators as shown. When the position is not shown, install the valve so that it can be conveniently operated and as approved by OCWS. Avoid placing operators at angles to the floors or walls.
  6. Position flow measuring devices in pipe lines so that they have the amount of straight upstream and down stream runs recommended by the manufacturer, unless specific location dimensions are shown. Position swing check valves so that they do not conflict with the discs of butterfly valves.
- E. Unions:
1. Install dielectric unions wherever dissimilar metals are connected except for bronze or brass valves in ferrous piping.
  2. Provide a union downstream of each valve with screwed connections.
  3. Provide screwed or flanged unions at each piece of equipment, where shown, and where necessary to install or dismantle piping.
- F. Eccentric Reducers: Use eccentric reducers where shown and where air or water pockets would otherwise occur in mains because of a reduction in pipe size.
- G. Transitions from One Type of Pipe to Another:
1. Provide all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.
- H. Taking Existing Pipelines Out of Service:
1. Do not take pipelines out of service unless specifically approved by OCWS.
  2. Notify OCWS at least 48 hours prior to taking pipeline out of service.
- I. Work on Existing Pipelines:
1. Cut or tap pipes as shown or required with machines specifically designed for this work.
  2. Install temporary plugs to keep out all dirt, water and debris.
  3. Provide all necessary adapters, fittings, pipe and appurtenances required.

### 3.2 THRUST RESTRAINT

- A. Provide thrust restraint on all pressure piping systems and where otherwise shown or specified.

- B. Thrust restraint may be accomplished by means of restrained pipe joints. Thrust restraints shall be designed for the axial thrust exerted by the test pressure specified in the "Exposed Piping Schedule".
- C. Restrained Pipe Joints:
  - 1. Pipe joints shall be restrained by means suitable for the type of pipe being installed.
    - a. Restrain concrete pipe joints utilizing bell bolt, clamp type, or snap ring type restrained joints.
    - b. Restrain ductile iron mechanical joint pipe utilizing tie rods and clamps or proprietary restrained joint system such as American Lok-Fast, Fast-Tite, U.S. Trim-Tite or equal.
    - c. Restrain ductile iron pipe connected by flexible couplings or flanged coupling adapters by harnessing across the coupling or adapter using tie rods or extended bolts connecting between flanges.
    - d. Steel pipe shall have butt-welded joints, flanged joints, or flexible or mechanical coupling connectors. Provide tie rods connected to ears welded to the steel pipe for restraint at all flexible coupling connectors.

### 3.3 PAINTING

- A. Field painting is under Section 09900.

### 3.4 TESTING OF PIPING

- A. General:
  - 1. Test all piping as specified below unless otherwise authorized by OCWS.
  - 2. Notify OCWS 48 hours in advance of testing.
  - 3. Provide all testing apparatus including pumps, hoses, gages, and fittings.
  - 4. Pipelines shall hold the specified test pressure for two hours.
  - 5. Repair and retest pipelines which fail to hold specified test pressures or which exceed the allowable leakage rate.
  - 6. Test pressures required are at the lowest elevation of the pipeline section being tested, unless otherwise specified.
  - 7. Conduct all tests in the presence of OCWS. Repeat tests in the presence of local authorities having jurisdiction, if required.
- B. Schedule of Pipeline Tests:
  - 1. Test piping at the test pressure listed in the Exposed Piping Schedule.
  - 2. For piping not included in the Schedule, OCWS will notify CONTRACTOR in writing of the test pressure to be utilized.
- C. Pressure Test Procedure:
  - 1. Insure that all supports and restraint protection are securely in place.
  - 2. Fill section to be tested slowly with water and expel all air. Install cocks, if necessary, to ensure removal of air.
  - 3. Test only one section of pipe at a time.
  - 4. Apply specified test pressure required for two hours and observe pressure gage. Check carefully for leaks while test pressure is being maintained.

### 3.5 CLEANING AND DISINFECTION

- A. Cleaning:
1. Thoroughly clean all piping and flush prior to placing in service in a manner approved by OCWS.
  2. Piping 24 inches in diameter and larger shall be inspected from inside and all debris, dirt and foreign matter removed.
  3. If piping which requires disinfection has not been kept clean during storage or installation, CONTRACTOR shall swab each section individually with a five percent hypochlorite solution, to ensure clean piping.
- B. Disinfection:
1. Disinfect all potable and finished water piping.
  2. A suggested procedure for accomplishing disinfection is specified below. Other procedures will be considered for approval by OCWS.
    - a. Thoroughly flush piping prior to disinfection with water.
    - b. Conform to procedures described in AWWA C651. Continuous feed method of disinfecting shall be used unless alternative methods is acceptable to OCWS.
  3. Water for initial flushing, testing and chlorination will be furnished by CONTRACTOR. CONTRACTOR shall provide all temporary piping, hose, valves, appurtenances and services required. Cost of water required for re-disinfection will be paid by CONTRACTOR to OWNER at OWNER'S standard rates.
  4. Chlorine will be supplied by CONTRACTOR.
  5. Bacteriologic tests will be performed by OWNER. A certified laboratory report will be available to CONTRACTOR, if requested.
  6. Chlorine concentration in the water entering the piping shall be between 50 and 100 parts per million, such that a minimum residual concentration of 25 mg/l will be left after a 24-hour retention period. Care shall be taken to insure disinfection of the piping in all its parts. The operation shall be repeated as necessary to provide complete disinfection.
  7. After the required retention period, the heavily chlorinated water shall be flushed to drain, unless otherwise directed.

### 3.6 PIPING SCHEDULE

| Service | Size   | Material | Interior Lining | Exterior Coating | Pressure Class | Joint  | Test | Remarks |
|---------|--------|----------|-----------------|------------------|----------------|--------|------|---------|
| PW      | 4"-12" | D.I.     | CL              | BC               | 350            | Flg MJ | HY   |         |
| FM      | 4"-12" | D.I.     | EC<br>CL        | BC               | 350            | Flg MJ | HY   |         |



The following abbreviations are used in the piping schedule.

- A. Service Abbreviations
  - Potable Water PW
  - Force Main FM
- B. Material Abbreviations
  - Ductile Iron DI
- C. Lining Abbreviations
  - Cement Lined CL
  - Painted P
  - Epoxy Coated EC
- D. Joint Abbreviations
  - Flanged Flg
  - Mechanical Joint MJ

## SECTION 15100

### VALVES, 4-INCH AND LARGER

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope:
  - 1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install 4-inch and larger valves and appurtenances, complete and operational.
- B. Related Sections:
  - 1. Section 09900, Painting.
  - 2. Section 15051, Buried Piping Installation.
  - 3. Section 15052, Exposed Piping Installation.

##### 1.2 REFERENCES

- A. Comply with the applicable provisions and recommendations of the following standards, except as otherwise shown or specified.
- B. ANSI Standards:
  - 1. B16.1, Cast-Iron Pipe Flanges and Flanged Fittings.
  - 2. B16.34, Valves-Flanged, Threaded, and Welding End.
- C. API Standards:
  - 1. 594, Wafer Check Valves.
  - 2. 598, Valve Inspection and Test.
  - 3. 609, Butterfly Valves, Lug-Type and Wafer-Type.
- D. ASTM Standards:
  - 1. A126, Gray Iron Castings for Valves, Flanges and Pipe Fittings.
  - 2. A193, Alloy Steel and Stainless Steel Bolting Materials for High Temperature Service.
  - 3. A194, Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service.
  - 4. A307, Carbon Steel Externally Threaded Standard Fasteners.
  - 5. A380, Practice for Cleaning and Descaling Stainless Steel Parts, Equipment and Systems.
  - 6. A536, Ductile Iron Castings.
  - 7. A743, Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.
  - 8. B21, Naval Brass, Rod, Bar, and Shapes.
  - 9. B61, Steam or Valve Bronze Castings.
  - 10. B62, Composition Bronze or Ounce Metal Castings.
  - 11. B98, Copper-Silicon Alloy Rod, Bar, and Shapes.
  - 12. B124, Copper and Copper Alloy Forging Rod, Bar and Shapes.

13. B138, Manganese Bronze Rod, Bar and Shapes.
  14. D429, Test Methods for Rubber Property - Adhesion to Rigid Substrates.
  15. B584, Copper Alloy Sand Castings for General Applications.
- E. AWWA Standards:
1. C502, Dry-Barrel Fire Hydrants.
  2. C504, Rubber-Seated Butterfly Valves.
  3. C507, Ball Valves, 6 Inch Through 48 Inch.
  4. C508, Swing-Check Valves for Waterworks Service, 2 Inch Through 24 Inch.
  5. C509, Resilient-Seated Gate Valves for Water Supply Service.
  6. C550, Protective Epoxy Interior Coatings for Valves and Hydrants.

### 1.3 QUALITY ASSURANCE

- A. Qualifications:
1. Manufacturer:
    - a. Minimum of five years of experience producing substantially similar equipment and able to show evidence of at least five installations in satisfactory operation for at least five years in the continental United States.
    - b. Equipment shall be manufactured in the United States.
- B. Component Supply and Compatibility:
1. Obtain all equipment included in this Section, regardless of the component manufacturer, from the valve manufacturer to ensure compatibility and proper operation.

### 1.4 SUBMITTALS

- A. Shop Drawings:
1. Product data sheets.
  2. Complete catalog information, including dimensions, weight, specifications, and identification of materials of construction of all parts.
  3.  $C_v$  values and headloss curves.
  4. Certificates of compliance with AWWA Standards where applicable.
  5. Corrosion resistance information to confirm suitability of the valve materials for the application. Information on chemical resistance of elastomers shall be furnished from the elastomer manufacturers.
- B. Certified copies of shop test results and inspection data.
- C. Operation and Maintenance Data: Submit complete manuals including:
1. Copies of all approved Shop Drawings, test reports, maintenance data and schedules, description of operation, and spare parts information.

## PART 2 - PRODUCTS

### 2.1 GENERAL PROVISIONS

- A. Manually operated valves, with or without extension stems, shall require not more than a 40-pound pull on the manual operator to open or close a valve against the specified criteria. The gear actuator and the valve components shall be able to withstand a minimum pull of 200 pounds on the manual operator and an input torque of 300 foot pounds to an actuator nut. Manual operators include handwheel, and a T-handle wrench.
- B. Provide all valves to turn clockwise to close, unless otherwise specified.
- C. Provide all valves with permanent markings for direction to open.
- D. Provide exposed valves with flanged ends conforming to ANSI B16.1. The pressure class of the flanges shall be equal to or greater than the specified pressure rating of the valves.
- E. Provide buried valves with mechanical or push-on joints, restrained or unrestrained, as required by the piping with which they are installed.
- F. All materials of construction of the valves shall be suitable for the application as shown on the Drawings.
- G. Protect wetted parts from galvanic corrosion due to contact of two different metals.
- H. Provide all valves with manufacturer's name and rated pressure cast in raised letters on the valve body.
- I. Provide valves with brass or Type 316 stainless steel nameplates attached with Type 316 stainless steel screws. Nameplates shall have engraved letters and shall include the following information as a minimum:
  - 1. Valve size.
  - 2. Pressure and temperature ratings.
  - 3. Application (other than water and wastewater).
  - 4. Date of manufacture.
  - 5. Manufacturer's name.
- J. Clean and descale fabricated stainless steel items in accordance with ASTM A380, and as follows:
  - 1. Passivate all stainless steel welded fabricated items after manufacture by immersion in a pickling solution of 6 percent nitric acid and 3 percent hydrofluoric acid. Temperature and detention time shall be sufficient for removal of oxidation and ferrous contamination without etching the surface. Perform a complete neutralizing operation by immersion in a trisodium phosphate rinse followed by a clean water wash.
  - 2. Scrub welds with the same pickling solution or pickling paste and clean with stainless steel wire brushes or by grinding with non-metallic abrasive tools to remove weld discoloration, and then neutralize and wash clean.
- K. For stainless steel bolting, except where Nitronic-60 nuts are required, use anti-seize compound, graphite free, to prevent galling. Strength of the joint shall not be affected by the use of anti-seize compound.

## 2.2 APPURTENANCES FOR EXPOSED METALLIC VALVES

- A. Handwheels:
  - 1. Conform to the applicable AWWA Standards.
  - 2. Material of Construction: Ductile iron or cast aluminum.
  - 3. Arrow indicating direction of opening and word "OPEN" shall be cast on the trim of the handwheel.
  - 4. Maximum Handwheel Diameter: 30 inches.

## 2.3 APPURTENANCES FOR BURIED METALLIC VALVES

- A. Wrench Nuts:
  - 1. Provide wrench nuts on all buried valves of nominal 2-inch size conforming to AWWA C500.
  - 2. Arrow indicating direction of opening the valve shall be cast on the nut along with the word "OPEN".
  - 3. Material: Ductile iron.
  - 4. The nut shall be secured to the stem by mechanical means.
- B. Extension Stems for Non-Rising Stem Gate Valves and Quarter Turn Buried Valves:
  - 1. Provide extension stems to bring the operating nut to 6 inches below the valve box cover.
  - 2. Minimum Size and Material: Same as valve stem.
  - 3. Maximum Unsupported Length: 3 feet.
  - 4. Provide top nut and bottom coupling of ductile iron with pins and set screws of Type 316 stainless steel.
- C. Valve Boxes:
  - 1. Valve boxes shall be as indicated and as required.
  - 2. Type: Heavy duty, suitable for highway loading, 2-piece telescopic, and adjustable. Lower section shall enclose operating nut and stuffing box and rest on bonnet.
  - 3. Material: Cast or ductile iron.
  - 4. Coating: Two coats of asphalt varnish conforming to Federal Specification TT-C-494.
  - 5. Marking: As required for service.

## 2.4 ANCHOR AND MISCELLANEOUS MOUNTING BOLTS

- A. All bolts, nuts and washers for connection of the valve appurtenances to concrete structure or other structural members shall be obtained from the valve manufacturer, and shall be of ample size and strength for the purpose intended. Anchor bolts shall be hooked or adhesive type.
- B. Provide anchor bolts for stem guides of required strength to prevent twisting or sagging of the guides under load.
- C. Provide bolts and washers of Type 316 stainless steel and nuts of Nitronic 60. The bolts shall have rolled threads and both bolts and nuts shall be electropolished to remove burrs.

- D. Minimum Size of Anchor Bolts: 5/8 inch.

## 2.5 PAINTING OF EXPOSED VALVES, HYDRANTS AND APPURTENANCES

- A. Exterior steel, cast-iron, and ductile iron surfaces except machined surfaces of all exposed valves and appurtenances shall be finish painted in the shop. The surface preparation, priming, finish painting, and field touch-up painting shall conform to Section 09900.

## 2.6 PAINTING OF BURIED VALVES

- A. Exterior steel, cast-iron, and ductile iron surfaces except machined or bearing surfaces of all buried valves shall be shop-painted with two coats of asphalt varnish conforming to Federal Specification TT-C 494.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install all valves and appurtenances in accordance with the manufacturer's instructions.
- B. Conform to appendices of AWWA Standards, where applicable.
- C. Install all valves so that operating handwheels or levers can be conveniently turned from operating floor without interfering with access to other valves and equipment, and as approved by the ENGINEER. Orient chain operators out of the way of the walking areas. Mount valves so that indicator arrows are visible from floor level.
- D. For motor-operated valves located lower than five feet above the operating floor, orient the motor actuator to permit easy access to the push buttons and the handwheel.
- E. Install all valves plumb and level. Install all valves to be free from distortion and strain caused by misaligned piping, equipment or other causes.
- F. For buried valve installations, set valve boxes plumb and centered, with soil carefully tamped to a lateral distance of 4 feet on all sides of the box, or to the undisturbed trench face if less than 4 feet. Provide a flexible coupling next to a buried valve for ease of valve removal.
- G. Install plug valves in horizontal liquid lines with the stem horizontal and the plugs on top when the valves are open and the plugs on upstream end when the valves are closed. Install valves in vertical liquid lines with the plug at the top when closed.

### 3.2 FIELD TESTS AND ADJUSTMENTS

- A. Adjust all parts and components as required to provide correct operation of the valves.

- B. Conduct a functional field test on each valve in the presence of the ENGINEER to demonstrate that each valve operates correctly.
- C. Verify satisfactory operation and controls of motor operated valves.
- D. Demonstrate satisfactory opening and closing of valves at the specified criteria requiring not more than 40 pounds effort on the manual actuators.
- E. Test 10 percent valves of each type by applying 200 pounds effort on the manual operators. There shall be no damage to the gear actuator or the valve.

**DIVISION 16 ELECTRICAL**

SECTION 16600      INTEGRATED SPECIFICATION

SECTION 16610      TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS)  
EQUIPMENT





## SECTION 16600

### INTEGRATED SPECIFICATION

#### PART 1 – GENERAL REQUIREMENTS

##### 1.1 GENERAL INTEGRATOR SPECIFICATIONS

- A. The control system shall be a complete integrated system with the MCC pedestal panel with starters, KW meter section and L2000 controller, instrumentation, telemetry and SCADA as a complete package. The integrator shall assume responsibility for the performance of the complete integrated control system. The integrator shall perform a factory test as a complete integrated package prior to shipment. The factory test of the completed system shall be witnessed by the Engineer and/or the End User prior to shipment to the job site. The equipment shall not be shipped to the job site unless written notice to ship is received from the Engineer. The integrated control system shall be supplied by TESCO Controls Incorporated or pre-approved equal.

##### 1.2 ENCLOSURE

- A. Furnish and install all equipment as shown on drawings in a low profile 60-inch high (as specified on drawing), U.L. listed weatherproof NEMA 3R switchboard and instrument pedestal. Enclosure shall consist of a TESCO Class 24-000 section, with dead front interior and hinged gasketed exterior doors. Outer enclosure shall be constructed of 14 gauge 304 stainless steel with no exposed bolts, screws or lifting eyes. Doors shall be equipped with 316 stainless steel handles with 3-point roller bearing latches and hasps for owner padlocks. Concrete base with anchor bolts to meet applicable seismic requirements shall be provided. Provide an integrated pedestal panel with a fluorescent light and door switch per door, GFCI receptacle, ATS - if required, strip heater, thermostat and TVSS's - as required per specification. Integrated into the pedestal panel will also be the KW Meter with approval of Golf Power and meet all WUESSC requirements, DM Series Power Monitor per pump, PFR power fail relay and integrated L2000 controller, which will communicate back to SCADA all the above alarm points. Seal all openings to prevent entrance of insects and rodents. Finish shall be polyester dry powder, electrostatically applied and baked on at 380 deg. F. The painting process shall include five stages of metal preparation using dip tanks as follows: 1) Alkaline cleaner, 2) Clear water rinse, 3) Iron phosphate application, 4) Clear water rinse, and 5) Inhibitive rinse to seal phosphated surfaces. All bussing and wire shall be copper. All wire shall be stranded with locking spade pressure connectors and labeled with clip-on permanent plastic wire markers. All circuit breakers and dead front mounted devices (lights and switches) shall be equipped with engraved phenolic nameplates.

- B. The enclosure shall be compartmentalized such that the programmable pump controller and power sections are isolated from each other. The compartments containing the programmable pump controller and power sections shall be separated by barriers behind the inner dead front door. Doors shall be hinged on the same side and shall open to greater than 90 degrees. All dead front latches are 1/4 turn adjustable with 1/8" thick latching dog and knurled knob.
- C. Thermostatically controlled heating and cooling systems shall be provided, if required, and as approved by the Engineer to maintain suitable climate conditions within the control panel as required to provide proper operation of the panel and to comply with the Drawings and Specifications.

### 1.3 CIRCUIT BREAKERS

- A. All 480 volt circuit breakers shall have interrupting capacities at 14,000 amperes. All 120 volt breakers shall be rated 10,000 amperes interrupting capacity. Circuit breakers shall be of the indicating type, providing ON, OFF and TRIPPED positions of the operating handle. Circuit breakers shall be quick-make, quick-break, with a thermal-magnetic action, except when protecting motor feeders where motor circuit protector (MCP) breakers may be used. Circuit breakers shall be the bolted on type. The use of tandem or dual circuit breakers in a normal single-pole space to provide the number of poles or spaces specified is not acceptable. All multiple-pole circuit breakers shall be designed so that an overload on one pole automatically causes all poles to open. Circuit breakers shall meet the requirements of UL and NEMA AB 1. Breakers shall be Westinghouse EHD, MCP, or equal.

### 1.4 GROUNDING SYSTEM

- A. The switchboard ground bus and incoming neutral service conductor shall be connected to a "rod" type "ground". The ground rod shall be 3/4" x 10' copper clad with connection made by exothermic weld and driven in earth at base of pedestal. The ground rod shall extend up into pedestal for visible connection with an approved "exothermic weld". Grounding and bonding wires shall be installed in all PVC conduit runs and connected to ground bus and all equipment.
  - 1. Thermite welding materials shall be of size and type recommended by the manufacturer for the intended use. Materials shall be Burndy, Cadweld, manufactured by Erico Products, Inc., or equal.
  - 2. Grounding conductor - All grounding conductor shall be sized as shown on plans or in accordance with NEC Table 250-95, whichever is larger.
  - 3. Ground bus - A ground bus shall be provided in the service equipment. It shall be connected to the grounding electrode system by exothermic welded stranded copper grounding conductors. Screw type lugs shall be provided for connection of equipment grounding conductors
  - 4. Okaloosa County Minimum Requirements – for Lightning Protection, Grounding and Bonding

## 1.5 LIGHTNING PROTECTION

- A. Each site shall have its electrical power protected by transient voltage surge suppression (TVSS) at the “service entrance,” power section, at the generator transfer switch - if equipped, the power to the SCADA equipment and at each electrical panel serving the site. The manufacturer of these surge protective devices (SPD) shall ensure that their products as submitted meet or exceed the minimum standards as set forth in SECTION 16610 – attached.

## 1.6 GROUNDING AND BONDING

- A. Each site shall have its electrical service entrance properly grounded and bonded as per National Electrical Code (NEC) with sufficient ground rods driven to a SUFFICIENT depth as to ensure a measured ground resistance of 25 Ohms, or less. Ground rods shall be 5/8” diameter, copper-clad with threaded ends at a minimum. The wire used for grounding shall be un-insulated #6 solid copper wire at a minimum as well. Exothermic welding shall be used to permanently bond the ground wire to the ground rods. The contractor shall be required to provide documentation of the measured ground resistance testing that proves compliance with this requirement. Each electrical ground for equipment situated at the site shall be properly bonded to this single point ground. Multiple independent ground rods are not allowed. Every effort to ensure that there is no difference in ground potential between equipment at the site shall be made.
- B. Okaloosa County reserves the right to bring in an outside contractor to check and verify compliance with this standard.

## 1.7 LUMINARIES

- A. The luminaries shall be the size and type normally supplied with the specified cubicles. As a minimum, the luminaries shall be a 15 to 30 watt rapid start fluorescent strip type fixture with warm white lamps. A lens or guard shall be furnished and installed over each lamp. The fixture ballasts shall be capable of providing reliable starts with ambient temperatures down to 30 degrees. Ballast noise shall not exceed 50 dBA. "Noisy" ballasts shall be replaced by and at the Contractor's expense.

## 1.8 MOTOR CONTROLS, GENERAL

- A. Provide each motor with a suitable controller and devices that will perform the functions as specified for the respective motors. Controllers shall conform to the applicable requirements of NEMA ICS, ANSI C19.1, the NEC, and UL. Anticipated horsepower ratings and enclosures are shown on the plans. This information is for guidance only and does not limit the equipment size. When motors furnished differ from the expected ratings indicated, make the necessary adjustments to wiring, conduit, disconnect devices, motor starters, branch circuit protection, and other affected material or equipment to accommodate the motors actually installed, at no additional cost to the Owner.

- B. Each motor control system shall be equipped with a hand- off-auto control switch, indicating lights, elapsed time meter, motor starter, control transformer with primary fuses and secondary control power fuse.
1. Control switches and indicating lights shall be U.L. listed oil-tight devices rated heavy duty. Provide Idec, Westinghouse, or equal.
  2. Elapsed time meters shall be non-resettable with 0.0 to 99,999.9 readout. Provide Engler, Yokogawa, or equal.
  3. Motor starters shall be NEMA rated with an electrically held contractor and a single reset, 3 phase, overload relay with a normally closed holding contact and a normally open isolated contact for overload alarm. Each overload shall be ambient compensated and shall trip on 600% of full load current in less than 6 seconds. Each motor starter Size 3 and larger shall be furnished with a minimum of 4 auxiliary contacts and provisions for adding 2 more. Auxiliary contacts shall be convertible, in the field, from normally open to normally closed. Each overload relay shall have a test trip push-button built-in and a adjustable calibrated trip with indicating dial. There shall be an unbreakable steel operator, with insulated plastic foot (for safety) through the front door for manual reset. Provide Westinghouse A201, Allen Bradley 100, or equal.
  4. Control power transformers shall be sized as shown on the plans, minimum size shall be 100VA where not designated. Provide Micron, G.E., Hevi-Duty, or equal.

#### 1.9 NAMEPLATES

- A. Nameplates shall be black phenolic with white lettering. Nameplates shall be screw mounted. Glue type will not be acceptable.

#### 1.10 PANELBOARD

- A. Panelboard shall be circuit breaker type custom constructed to utilize minimum enclosure space with breakers as shown. Circuit breakers shall be bolted on type. The panelboard shall be furnished with phenolic nameplates. The panelboard transformer shall be dry type construction sized as shown on the plans with primary breaker protection. The panelboard transformer shall be a Jefferson 211, Westinghouse, or equal.

#### 1.11 PANEL LIGHTS

- A. Furnish and install push-to-test lights to indicate status and alarm conditions locally as shown on drawings. Engraved phenolic nameplates shall specify each light's function. Lights shall be wired as shown on drawings.

### 1.12 PUSH BUTTONS AND SELECTOR SWITCHES

- A. Push-buttons, and selector switches, for non hazardous indoor dry locations shall be of the oil-tight type, Westinghouse Type OT, Idec ASN, General Electric Type CR 240, Square D Class 9001, or equal, and shall be mounted in equipment covers or oil-tight NEMA 1 enclosures, as indicated. These devices shall have individual, extra large nameplates indicating their specific function.

### 1.13 RECEPTACLES, DUPLEX

- A. Receptacles shall be of specification grade and of NEMA configuration and rated 2 pole, 3 wire grounding, 20 amperes, 125 volts, such as Pass & Seymour 5252, Bryant 5252, or equal. Contact arrangement shall be such that contact is made on two sides of each inserted blade. Bases shall be of ivory phenolic composition. Wire terminals shall be suitable for 10 AWG wire and shall be screw type. Receptacles shall be UL listed. The receptacles shall have corrosion resistant conducting parts of nickel-plated brass and other metal parts of stainless steel. All external and dead front receptacles shall be installed on ground fault interrupter circuits "GFCI".

### 1.14 RELAYS, CONTROL

- A. Control relays shall be Potter and Brumfield KU, Square D Type KU, Idec Type RH or equal. Two form-C contacts (minimum) shall be provided on each relay. Provide relay energized neon lamp (inside relay case).

### 1.15 POWER MONITORS AND POWER FAIL RELAYS

- A. Power monitors shall communicate to the PLC controller with Modbus communications. Each unit shall have up to 10 channels of analog outputs, shall be able to show power quality, shall have a bright LED display, shall be able to show bidirectional with min/max on all electrical parameters and shall have true RMS measurements of Voltage, Current & Power as a minimum. Provide Electro Industries/GaugeTech model DMMS300+.
- B. The power fail relay shall continuously monitor the three phases for power loss, low voltage, phase loss, phase reversal and have automatic reset. The power fail monitor shall have a drop-out voltage adjustment and a failure indicating LED. Provide Diversified model SLA, or equal.

### 1.16 RELAYS, PROBE

- A. Probe relays shall be provided for functions as shown on plans, i.e. moisture probes, motor over-temperature, etc. The unit shall be specifically designed for monitoring conductivity type probes and switching type sensors in hazardous areas. The unit shall utilize low current (120 micro amps maximum) and low voltage (12 volts d-c maximum) limiting the power entering the hazardous area

to less than 1.5 milli-watts. Unit sensitivity shall allow pick-up on circuit closures of 100 K ohms or less. The probe relay shall be a TESCO 72-144, or equal.

#### 1.17 RELAYS, TIME DELAY

- A. Time delay relays shall be solid state relays with a timer adjustable over the range 1 to 60 seconds unless other ranges are indicated or required. Provide LED relay energized indicator lamp. Time delay relays shall be IDEC RTE, Agastat STA, or equal.

#### 1.18 SERVICE ENTRANCE

- A. The electric service meter compartment shall be arranged approximately as shown to meet the electric utility company Gulf Power and WUESSC requirements. Provide neutral bar for grounding and a L&G Meter Socket with disconnect handle for bypass mechanism. Provide guard over power company watt hour meter with hinged access cover that has a hasp for utility company padlock. Provide wire and lugs for service entrance as required by utility company. The pull section and utility compartments shall be accessible only by the utility company. A lightning arrester shall be provide to protect the panel equipment from lightning and utility power surges.
- B. Provide a meter base, test perch with test by-pass and other materials, as required by the electric utility which will provide service to the facility, for installation of metering equipment and attachment of service conductors.

#### 1.19 TERMINAL AND DISTRIBUTION BLOCKS

- A. Distribution blocks shall be furnished and installed as required for "fan-out" of control power and other 120V sources within the enclosure. The blocks shall be rated 300V at a minimum of 20 amperes and sized for the conductors served. Distribution blocks shall be similar to Square D, Connectron NFT, or equal.

#### 1.20 TVSS SPECIFICATIONS

- A. The TVSS shall be from the Surge Suppression Incorporated Company line of products. TVSS shall have the capabilities of protecting the 120V PLC Equipment, 3Phase incoming Power & 3 Phase ATS (If Required).

#### 1.21 PROGRAMABLE CONTROLLER SPECIFICATION

- A. The Programmable Controller shall have all the characteristics and features listed herein. All these features shall be readily available as an integral part of the Programmable Controller and shall be standard catalog items for the product. The use of any third party hardware or software add-on products to meet this specification is not acceptable. The Programmable Controller shall be an L2000 controller from Tesco Controls, Inc - no exceptions.

- B. Manufacturer
1. The Programmable Controller shall be procured from a manufacturer that has at least 10 years experience manufacturing its own Programmable Controllers designed specifically for the water and waste water industry. The Programmable Controller itself and support for the controller shall be available directly from the manufacturer. Programming services shall be available direct from the manufacturer as a normal practice. The manufacturer shall also produce a Supervisory Control and Data Acquisition (SCADA) system that integrates directly with the Programmable Controller, supporting the controller's native communications protocol, to take full advantage of its capabilities.
- C. Warranty
1. The Programmable Controller manufacturer shall provide a 5-year warranty with the unit. A 10-year warranty shall be available at additional cost. These warranties shall be available in writing directly from the manufacturer before bid acceptance. A warranty or service contract from a source other than the Programmable Controller manufacturer is not an acceptable substitute. The manufacturer shall provide personnel to perform the warranty service, at no additional cost to the purchaser. The replacement controller shall be available within 24 hours, installed and running at the station, without requiring that the original unit first be removed and returned to the factory.
- D. Telephone Support
1. The Programmable Controller manufacturer shall provide telephone support for questions related to any aspect of the controller, including general use, application-specific issues, programming, and use of the programming software. This support shall be available directly from the manufacturer at no extra charge with the purchase of a controller.
- E. Construction
1. The Programmable Controller should be constructed using a card cage architecture incorporating a 96 pin 3U DIN VME standard backplane interconnection. The printed circuit cards shall be designed to slide into the card rack and interconnect with the VME backplane. A high density I/O card with a mix of I/O types as well as an I/O card for each individual I/O type shall be available. The system shall operate with a minimum of 2 cards and shall be easily expandable to 20 cards. The Programmable Controller shall be solidly mountable, but shall be capable of being removed easily in the field. Card cages with a capacity of 2 to 20 slots shall be readily available. All field wiring to the I/O cards shall be done at externally mounted terminal blocks with ribbon cable interconnects to the relative I/O card.
- F. Operating Conditions
1. The Programmable Controller shall operate correctly under an ambient temperature range of -40 to +200 degrees F without requiring forced air or other special cooling measures. Coatings on connectors, component leads, and other materials used in the construction of the Programmable



Controller shall be substantially resistant to atmospheres containing significant amounts of Hydrogen Sulfide gas and Chlorine gas. Each component shall have passed testing and be certified in writing by the manufacturer to be acceptable for use in water treatment and waste water treatment environments.

G. Other

1. The Programmable Controller shall have a low-power shut-down mode suitable for use in solar or other sites where power consumption is critical.
2. The Programmable Controller shall be provided with a complete operations and maintenance manual.
3. At minimum each Programmable Controller shall be subjected by the manufacturer to a 5 day burn-in procedure at 165 degrees F before installation into the MCC pedestal panel.

H. Input/Output Characteristics

1. The Programmable Controller shall provide built-in digital filtering of analog inputs. The filter constants shall be adjustable from the keyboard and through the communications ports. Each analog input shall have an independent filter constant. The Programmable Controller shall provide a virtually infinitely variable wide range of adjustment from no filtering to extreme filtering. Each analog output shall have the ability to maintain output or zero output when entering standby mode. Each digital output shall be turned off when entering standby mode.

I. Field Wiring Terminal Blocks

1. The terminal blocks shall support the following listed characteristics:
  - a. pull-apart two piece wiring blocks for fast and easy wiring/re-wiring
  - b. separate wiring blocks for each I/O type and each wire point fully labeled
  - c. versatile internal or external analog power source
  - d. digital outputs shall have socketed 10A relays with LED "ON" indicators
  - e. entire terminal block shall snap on/off standard track mount
  - f. onboard passive circuit protection to protect programmable controller
  - g. shall be available with a built-in isolated current loop power supply, powered from the 12V DC main power. The current loop power supply shall be capable of producing at least 24V DC and 161 mA.
2. 3 distinct classes of lightning protection shall be available:
  - a. Standard Class A lightning protection shall consist of
    - 1) dual MOVs at each AI/AO
    - 2) individually fused AI/AO power source
    - 3) fused DI source and common with clamping diodes
    - 4) onboard spare fuses for all fuse types
  - b. Class AA lightning protection shall, in addition to Class A, include dual gas discharge tube at each AI/AO
  - c. Class AAA lightning protection shall offer the most comprehensive protection full 500 joule 12 stage lightning protection at each AI/AO

J. Power Supply

1. The Programmable Controller shall be powered by a 15V/5V DC power supply, with an allowed operating range of at least +/- 10%. A 12V battery backup of the 12V DC shall be available such that the 5V DC is also maintained by the 12V battery.
- K. Operator Interfaces
1. The Programmable Controller shall be available with the choice of at least two operator interface units that easily flush-mount in the enclosure door.
  2. The compact model shall have at least the following attributes:
    - a. 60 Brite Lite LED annunciators with adjacent site-specific label descriptions
    - b. 8 Brite Lite LED mode annunciators and communication activity annunciators
    - c. 8 character Brite Lite alphanumeric display of at least 0.5 inches high
    - d. 4 keys to easily traverse a user-friendly menu tree that allows full control of operation
    - e. 4 user-programmed macro keys with adjacent site specific label descriptions
  3. The full display model shall have at least the following attributes:
    - a. 360 Brite Lite LED annunciators with adjacent site-specific label descriptions
    - b. 8 character Brite Lite alphanumeric display of at least 0.5 inches high
    - c. 4 keys to easily traverse a user-friendly menu tree that allows full control of operation
    - d. 32 keys for full front panel programming
    - e. 4 user-programmed macro keys with adjacent site specific label descriptions
  4. The operator interfaces and site specific nomenclature and labels shall be completely covered with a mylar overlay that is impervious to corrosive atmospheres and wash-down environments.
- L. Communications
1. The Programmable Controller shall have the ability to simultaneously support at least 4 serial communication ports which includes an Ethernet/IEEE 802.3 and a DeviceNet industrial network. Any of these serial ports shall be usable for both communications of telemetry data and control program/configuration upload/download and support baud rates of 230,400 bps or higher. The ports shall be configurable to support the following media:
    2. Full handshake RS-232 (at least 3 ports must be configurable this way)
    3. RS-485 (at least 3 ports must be configurable this way, selectable for 2/4-wire)
    4. Direct Modem available with radio interface, supporting Bell 202 standard
- M. QuickLoad Software
1. A fast and easy to use software program shall be available free of charge to Upload and Download from a laptop computer to the controller all calibration points, setpoints and native control programming.

2. A complete user's manual shall be provided which describes the use of all programming software.

## 1.22 REACTIVE AIR LEVEL MONITORING SYSTEM

- A. The level monitoring shall be done by a reactive air system consisting of an air compressor, compression bell, 3-way solenoid valve, and level transducer. The level transducer senses the back pressure of the static air column set up in the compression bell that is periodically replenished by the purge air compressor. The compression bell shall be designed with high strength non-corrosive plastics and shaped to provide a resistance to buildup of foreign material. The specially designed programmed multi-cycle cleaning system shall prevent the compression bell from plugging while minimizing compressor run time. The reactive air control shall also provide a means of manually actuating the purging cycle when immediate purging and cleaning is necessary.
- B. The purge sequence shall be as follows:
  1. The 3-way valve is sequenced to the purge position by the controller's purge mode automatically every 8 hours (adjustable). While in the purge mode the last level transducer value is electronically held by the hold circuit.
  2. The compressor is then started to purge and clean the air lines and replenish the compression bell with a 50 PSI air blast. The air blast is retained for 4 seconds (adjustable).
  3. The 3-way valve is held in the purge position an additional 4 seconds after the compressor is stopped to allow the air dynamics to settle.
  4. The 3-way air valve is now transferred to the normal level monitoring position and the level transducer signal is held thru the purge cycle, plus 10 seconds, then released to reflect the real time level value.
  5. The system is now recharged with a 30 day supply of air in the compression bell and the controller operation is back to normal mode.
  6. Specifications:
    - a. Standard Level Range: 0-35ft.
    - b. Optional Level Ranges: 1 ft, 5 ft, 12 ft, 70 ft, 140 ft, 240 ft, 480ft
    - c. Operating Voltage: 120 VAC or 12 VDC
    - d. Temperature Range: 0 to 200 degrees Fahrenheit
    - e. Accuracy: +/- 0.125 @ 35 ft.
    - f. Repeatability: 0.2%
    - g. Interface: 2-wire analog current loop, 4-20 mA
    - h. Compressor Type: Oil-less, direct drive
    - i. Compressor Construction: Aluminum piston, teflon-sleeved aluminum cylinder
    - j. Compressor Torque: Initialize into 250 PSI head
    - k. Compressor Displacement: 0.65 CFM @ 50 PSI
    - l. Relays, Float Switch Interface
- C. Float interface relays shall be provided for functions as shown on plans. The units shall be specifically designed for monitoring intrinsically safe circuits. The unit

shall utilize low current (120 micro amps maximum) and low voltage (12 volts d-c maximum) limiting the power entering the hazardous area to less than 1.5 milliwatts. Unit sensitivity shall allow pick-up on circuit closures of 100 K ohms or less. The float switch interface relays shall be TESCO 72-144, Warwick Series 2, or pre approved equal.

### 1.23 MERCURY FLOAT SWITCH BACKUP CONTROL SYSTEM

- A. Provide float switches, stainless steel mounting bracket, mercury switch contact not affected by rotation of float about longitudinal axes, and type 50, neoprene jacket control cable to reach control panel for low level/high level alarm status as a backup for reactive air system and PC level control. The power applied to the level sensors shall be a maximum of 24 VAC with a current of less than 30 mA for intrinsic safety. Electrical connections of sensor leads and signal conditioning shall be in conformance with NEC requirements for intrinsic safety.

### 1.24 SCADA SYSTEM

- A. The central computer software shall provide the user interface to perform all graphic display presentation, alarm reporting and shall do all background tasks such as report generation, data archiving, and data base maintenance. The SCADA system shall integrate Data Express Plus to communicate directly with the Programmable Controllers, supporting the controller's native communications protocol, to take full advantage of its capabilities. Configuration of the SCADA Screens, Reports, Trends, Alarms, Communications and the HDS system shall meet the standard set by Okaloosa County and configured by Tesco Controls, Inc. – no exceptions.

### 1.25 SCADA SERVERS

- A. Configure the existing Hot-Standby SCADA servers with the following:
  - 1. SCADA Configuration
    - a. The SCADA system communications driver shall utilize the field RTU's native protocol Data Express Plus to communicate directly with the programmable controllers. This strategy allows the system to take full advantage of the PLC's built-in communications functions. All RTU and SCADA alarm setpoints, control setpoints, timer settings, and PID settings shall be selectable from the SCADA system screen.
  - 2. Screens
    - a. Each physical RTU site under this contract shall receive a graphical depiction on the SCADA system encompassing each of the field parameters that are being monitored. Graphical depiction shall include a rendering of the site, including all pertinent physical items such as pumps, tanks, meters, etc. Analog values shall be displayed in engineering units. Status points shall be displayed as ON/OFF and color coded per the OWNER'S requirements. Each site screen shall be

accessible from the main overview screen via point-and-click functionality built into the overview screen. Other screen types shall be Communications Status, Alarm Summary, Runtime Manager, Trends.

3. Reports
  - a. Process data reports shall consist of Min., Max., and Average values on an hourly, daily, weekly, monthly basis for all pertinent analog values at each site. Totalized flow data where applicable per site, shall be archived in the SCADA system's historical database and displayed in printed report format. Mechanical / maintenance data such as pump run time and number of starts shall also be archived in the historical database and displayed in printed report format.
4. Trends
  - a. Analog points shall be trended on an independent trend screen per site. Historical and real-time trends shall be provided for each analog point. Each variable per screen shall be color coded independently from the other "pen" lines on the graph. The operator shall be able to zoom in and zoom out on any part of the trend for ease of reading. A cursor function shall be included which allows the operator to select a given point on the trend and receive information on the value of the trend at that point. The operator shall be given the ability to scroll forward and backward through the allotted time on any given trend by the day and by the hour.
5. Alarms
  - a. SCADA alarming software shall be configured for notification of field, communications, and system alarms. Provide high, low, instrument fail and mechanical malfunction alarms for all analog points in the system. Provide communications fail alarms. Whenever an analog point exceeds its associated alarm limit, or discreet point changes to an alarm state, an alarm message shall be printed on the alarm printer and stored to the historical database. The alarm message shall include, time, date, tag number, and alarm status. When the operator acknowledges alarms, the alarm message shall be stored to the database and printed again. When the alarm point returns to its normal range, the alarm message shall be printed and stored to the database.
6. Communications
  - a. Communications status shall be provided on each SCS display for each RTU that is associated with the points on the active display. Communications status for all RTU's shall be provided on an overview screen. Provide trends for each RTU-SCS communications link and communication alarms for each SCS-RTU communications link. Communications system diagnostic capabilities shall be provided via radio diagnostics software resident in the master radio and remotes. Diagnostic functions shall include: power output, signal strength, deviation, frequency and voltage measurements.
7. System Database

- a. All field data collected by the SCADA server, as well as second-order-derived data, shall be stored to a central data repository that resides on the Ethernet network. This architecture is reserved for applications where data volume is large enough to warrant dedicated data handling - to avoid impedance of the SCADA server in its system control and data collection tasks.
- b. All access to the historical database, regardless of its location, shall be password protected. Access to the server upon which the data is maintained is denied without the proper password and PIN number. Access to the data itself shall be protected with another layer of password protection. Protection of data from intentional outside intervention shall be fairly easy to maintain. No one shall be given write access to the database engine except for those authorized in very unusual maintenance circumstance.
- c. Historical data integrity shall be maintained by archiving each day's, week's and month's data onto one or more storage media. The primary virtue of SCADA system data backup, shall be the retention of historical information. This historical data shall be accessible to generate detailed reports on production, energy usage, water quality etc. The data for those reports shall be made available on a type of storage medium that will deliver easy, fast, non-sequential data access. For efficient facilitation of data retrieval, 1 year's worth of data shall be inquired readily available on the hard drive.
- d. The database application shall perform several functions automatically. These functions are as follows:
  - 1) Automatic data replication
  - 2) Automatic data compression w/ generation of min., max., and avg. data tables for every analog variable collected.
  - 3) Automatic data synchronization
  - 4) Automatic data links to Microsoft's Access and Excel
- e. The HDS shall integrate seamlessly with the redundant, hot-standby SCADA Servers. The SCADA application software shall have the ability to log all data and events directly to the HDS system without requiring conversions of any kind. The database application shall monitor the LAN and/or WAN connections between the actual SCADA Servers and the HDS system. Each of the SCADA Servers shall have the MS-SQL Server application installed and fully operational. In the event that the LAN connection is lost between the primary and/or secondary SCADA Servers and the HDS system, each of the SCADA servers shall log data locally on their respective local HDD's. As soon as the connection is reestablished, the HDS system shall execute VBA that will handle all database synchronization automatically, if required.
- f. A front-end GUI application shall be supplied to allow the operators direct access to all of the database application data. This GUI shall provide a complete set of automated scripts and stored procedures that

allow MS-Access and Excel direct and automated access to the SQL database engine. Programmable function blocks shall be supplied that automatically insert data arrays into a MS-Access or Excel application. These data arrays shall consist of the analog points in the compressed SQL data tables. The GUI shall also allow direct and seamless interface between the analog trending package and the SQL database engine.

- g. The entire HDS application software shall consist of Windows-2000, SQL Server, VBA scripts, stored procedures, Excel macros, Access Basic, and an integrated RDBMS Enterprise Backup System that is fully compatible with the latest version of software.
- 8. Laptop Computer
  - a. The laptop shall be configured and tested for the new sites.
- B. SCADA System Integrator Supplied Services
  - 1. Installation
    - a. All software shall be installed and configured by the SCADA System Integrator Tesco Controls, Inc. – no exceptions.
  - 2. Startup
    - a. The SCADA System Integrator shall provide at least \_ days of on-site start-up time by qualified personnel.
  - 3. Factory Test and Testing
    - a. All field electronic components of the instrumentation system shall be thoroughly tested and burned in by the SCADA System Integrator or manufacturer before shipment.
    - b. The SCADA System Integrator shall conduct a factory test of the complete system to be witnessed by the Engineer and/or the End User, at the witness' option, prior to shipment to the job site. The equipment shall not be shipped to the job site unless written notice to ship is received from the Engineer.
    - c. Final field testing of system shall include at least \_ days acceptance test, if required. The system shall be operated by owner personnel and used to perform the functions described herein. The system will not be accepted unless the system functions as specified, and without failure, to the satisfaction of the Engineer
  - 4. Training
    - a. The SCADA System Integrator shall provide training of system engineering, operations, and maintenance personnel. The training shall consist of the following sessions:
      - 1) Plant operations (system exercise)
      - 2) Maintenance and calibration
      - 3) Engineering system modification
      - 4) Programming
      - 5) Training shall be administered on site using the delivered system in real time situations.
  - 5. Maintenance and Service

- a. The SCADA System software, components, and peripherals supplied shall be warranted for a 1-year period after final implementation and acceptance. The SCADA System Integrator shall have a staff of experienced personnel available to provide service on 24-hour notice. Such personnel shall be capable of fully testing and diagnosing the hardware and software delivered and of implementing corrective measures. The SCADA System Integrator shall, as a standard provision, make available extended maintenance and warranty agreements subsequent to expiration of the warranty period specified.
- b. The SCADA system integrator is Tesco Controls, Inc. – no exceptions.



## **Okaloosa County Water & Sewer Department**

Minimum Specifications for Lightning Protection, Grounding and Bonding at Facilities;  
Including All Lift Stations, SCADA Sites, etc.

The purpose of this specification is to provide maximum protection for and to ensure continued operation of critical equipment from adverse electrical anomalies, including strong power surges as may result from nearby lightning strikes, etc.

### **Lightning Protection-**

Each site shall have its electrical power protected by transient voltage surge suppression (TVSS) at the “service entrance” and at the generator transfer switch (if so equipped) and at each electrical panel serving the site, and on the power to the SCADA equipment itself (if so equipped). The manufacturer of these surge protective devices (SPD) shall ensure that their products as submitted meet or exceed the minimum standards as set forth in SECTION 16610 (attached).

### **Grounding and Bonding-**

Each site shall have its electrical service entrance properly grounded and bonded as per the National Electrical Code (NEC) with sufficient ground rods, driven sufficient depth as to ensure a measured ground resistance of 25 Ohms, or less. Ground rods shall be 5/8” diameter, copper-clad with threaded ends at a minimum. The wire used for grounding shall be un-insulated #6 solid copper wire, at a minimum. Exothermic welding shall be used to permanently bond the ground wire to the ground rods. The contractor shall be required to provide documentation of the measured ground resistance testing that proves compliance with this requirement. Each electrical ground for equipment situated at the site shall be properly bonded to this single point ground. Multiple independent ground rods are not allowed. Every effort to ensure that there is no difference in ground potential between equipment at the site shall be made.

Okaloosa County reserves the right to bring in an outside contractor to check and verify compliance with this standard.

## SECTION 16610

### TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS) EQUIPMENT

#### PART 1 – GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions, Special Conditions, Mechanical and Electrical Supplemental Requirements 15000/16000, and Division-1 Specification sections, apply to work specified in this section.

##### 1.2 RELATED WORK AND REQUIREMENTS

- A. Section 16111 - Conduit
- B. Section 16115 - Conduit Fittings
- C. Section 16120 - Wires, Cables, and Connectors
- D. Section 16450 – Grounding

##### 1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A minimum of 10 years engineering experience in the design and manufacture of permanently connected TVSS devices.
- B. Operates a Quality System Certified manufacturing facility as ISO 9001:2000 Compliant.
- C. CE Low Voltage Directive Compliant

##### 1.4 CODES AND REFERENCED STANDARDS

- A. UL 1449 2nd Edition listed, UL 1283 listed, CUL, ANSI/IEEE C62.41.1-2002, C62.41.2-2002, C62.45-2002, NEMA LS-1 – 1992 Section 2.2.7, IEEE Std. 1100-1999 Section 8.6.1
- B. ANSI C84.1, American National Standard for Electric Power Systems and Equipment – Voltage Ratings (60 Hertz).
- C. N.E.C. Article 285

##### 1.5 SUPPRESSOR LOCATIONS

- A. Provide TVSS at each building service entrance, switchboard, MCC & panel-board locations and/or as indicated on Contract Drawings.

## 1.6 SUBMITTALS

- A. Provide submittals for all required testing and pertinent manufacturer information described herein. Prior approval must be obtained for products by manufacturers not listed as “acceptable” below. Prior approval request must include proper documentation showing detailed (line-by-line) compliance with this specification and be submitted no less than 10 (TEN) business days prior to Contract Bid Date along with the line-by-line comparison. TVSS submittals shall include, but shall not be limited to the following items:
1. Complete schematic data for ALL suppressors indicating part numbers, conductor sizes, etc.
  2. Drawings showing dimensions of each suppressor type indicating mounting arrangement.
  3. Manufacturer shall include their UL 1449 Second Edition listing number(s).
  4. Manufacturer shall include their UL 1283 listing number(s).
  5. Letter from manufacturer stating the submitted TVSS product incorporates “directly connected protection elements” between all possible modes in every given service rating (i.e. line-to-neutral, line-to-line, line-to-ground, neutral-to-ground) “Reduced-Mode” variations will NOT be accepted.
  6. Certified test data from independent third party testing laboratory documenting NEMA LS-1 (1992) and IEEE C62.41-1991 testing (as defined herein), and the ability of the device to meet or exceed all requirements of this specification.

## PART 2 – PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. The listing of a manufacturer as “acceptable” does not imply automatic approval. It is the sole responsibility of the Contractor to ensure that any submittals made are for products that meet or exceed the specifications included herein. Subject to compliance with requirements, provide products by the following manufacturer(s) or “prior-approved” equal as described above:
1. Commonality: All TVSS devices at the service entrance, MCCs, distribution panels, sub-panels and individual load applications shall be provided by same TVSS manufacturer.
    - a. Surge Suppression Incorporated (Advantage Series), 109 Melvin St., P.O. Box 1212, Destin, FL 32540-1212 Tel: 1-888-987-8877 Point of Contact: Rick Stevens, Vice President
    - b. Liebert Corporation (Interceptor Series), 1050 Dearborn Drive, Columbus, OH. 43085. Tel: 1-614-888-0246
    - c. Control Concepts (IslaGuard Series), 328 Water Street, P.O. Box 1380, Binghamton, NY 13902-1380 Tel: 1-607-742-2484

2.2 GENERAL REQUIREMENTS

- A. TVSS devices shall be rated for the class of service necessary for the application. Protection shall be provided L-N, L-G, L-L & N-G (Per IEEE Std. 1100-1999 8.6.1 & NEMA LS-1 2.2.7) for all applications as defined in section 2.02.H.2 of this specification.
- B. TVSS must incorporate **“True” sine-wave tracking** directly connected protection elements for each and every mode within the electrical system to which it is connected. **Products utilizing basic EMI/RFI filter performance specifically will not be considered acceptable as equal to sine-wave tracking and therefore are not to be submitted.** See chart in section 2.02.G of this specification listing Category A “let-through-voltage” values acceptable (as a minimum) demonstrating requirements of sine-wave tracking product criteria. Acceptable manufacturers listed in previous sections of this specification must submit complete test data showing submitted device incorporates “true” sine-wave tracking circuitry in each and every mode available within the TVSS per the testing parameters defined in, and below chart for each mode and voltage found in the electrical system being protected, before final approval is given. Products displaying this capability in any less than ALL MODES will be deemed unacceptable. (e.g. L-N only, L-L only or L-G only)
- C. TVSS devices shall be designed for AC power systems with a minimum of AC follow current after operation. The surge current rating must be sufficient to meet the requirement of the application at clamp levels below the damage level of the equipment installed.
- D. Manufacturer shall provide permanently connected devices parallel-mounted to the service entrance, MCCs and sub panels, and series connected devices as required for individual equipment protection as indicated on Contract Drawings. TVSS device drawings shall be made available upon request.
- E. TVSS circuitry shall include only solid-state clamping components to limit the surge voltage and divert the surge current. TVSS components that “crowbar” (e.g. spark gaps, gas tubes, SCR’s, etc.) shall not be accepted. Device circuitry shall be bi-directional, enclosed in a UL listed encapsulation, thermal stress reducing compound and be of a parallel design.
- F. Electrical performance characteristics:

- 1. Service ratings:
 

|          |              |                |                        |
|----------|--------------|----------------|------------------------|
| 120/240V | Single-phase | 3-wire +Ground | Split                  |
| 208/120V | Three-phase  | 4-wire +Ground | Wye                    |
| 240/120V | Three-phase  | 3-wire +Ground | Hi-Leg Delta           |
| 480/277V | Three-phase  | 4-wire +Ground | Wye                    |
| 480V     | Three-phase  | 3-wire +Ground | Corner- Grounded Delta |

- 2. MCOV levels:

| Nominal System Voltage (VRMS) | MCOV (VRMS) |
|-------------------------------|-------------|
| 120                           | 150         |
| 208                           | 320         |
| 240                           | 320         |
| 277                           | 320         |

G. TVSS Ratings: TVSS devices supplied shall meet or exceed (at a minimum) the capabilities as listed below:

| Nominal System Voltage (VRMS) | *Max. ANSI/IEEE (Let-Through-Voltage) |      |      |      | *Max. ANSI/IEEE (Let-Through-Voltage) |     |     |     | **Max. ANSI/IEEE (Let-Through-Voltage)        |     |     |     | Peak Surge Current "kA" (Per Phase) |              |               |
|-------------------------------|---------------------------------------|------|------|------|---------------------------------------|-----|-----|-----|---|-----|-----|-----|-------------------------------------|--------------|---------------|
|                               | Category C Device (Main Service)      |      |      |      | Category B Device (Distribution)      |     |     |     | Category A Device Sine-wave tracking (Branch) |     |     |     | Cat. C                              | Cat. B       | Cat. A        |
|                               | L-N/ L-L/ L-G/ N-G                    |      |      |      | L-N/ L-L/ L-G/ N-G                    |     |     |     | L-N/ L-L/ L-G/ N-G                            |     |     |     | Service Entrance                    | Dist. Panels | Branch Panels |
| 120/240 1PH                   | 950                                   | 1175 | 835  | 865  | 420                                   | 630 | 435 | 465 | 45  | 55  | 60  | 35  | 240kA                               | 160kA        | 120kA         |
| 120/208 3PH                   | 950                                   | 1175 | 835  | 865  | 420                                   | 630 | 435 | 465 | 45  | 55  | 60  | 35  | 240kA                               | 160kA        | 120kA         |
| 120/240 3PH                   | 950                                   | 1175 | 835  | 865  | 420                                   | 630 | 435 | 465 | 45  | 55  | 60  | 35  | 240kA                               | 160kA        | 120kA         |
| 277/480 3PH                   | 1200                                  | 1400 | 1035 | 1325 | 550                                   | 945 | 590 | 880 | 70  | 145 | 110 | 35  | 240kA                               | 160kA        | 120kA         |
| 480 3PH                       | N/A                                   | 1400 | 1400 | N/A  | N/A                                   | 640 | 640 | N/A | N/A   | 145 | 145 | N/A | 240kA                               | 160kA        | 120kA         |

\* Measured at IEEE C62.41.2-2002 Category C3; 20kV 1.2x50 uS/10 kA 8 x 20µs waveform & Category B3/C1; 6kV, 1.2x50 uS/3 kA 8 x 20µS waveform. Transient shall be applied at the 90° phase angle unless otherwise indicated above.

\*\* Measured at IEEE C62.41.2-2002 Category A1; 2kV 1.2x50 µs /67A, 100kHz Ring-wave. Transient shall be applied at the 270° phase angle, positive polarity unless otherwise indicated above.

Measured Limiting Voltage Test Environment: All voltages shall be peak (±10%) Positive Polarity, Time base = 20µS, Sampling Rate = 250MS/s to ensure maximum Transient capture. Surge voltages shall be measured from the insertion of the surge on the sine wave to the peak of the surge. All tests are Static, except for the 120V circuits, which are Dynamic. All tests shall be performed in accordance with UL 1449 Second Edition with measurements performed at a point on the leads 15.24 cm (6 inches) outside of the device enclosure to simulate actual "as installed" performance. No data measured at a module, lugs, component, or undefined will be accepted.

**\*\*NOTE 1: Sine-Wave Tracking Requirements:** Along with the testing criteria marked (\*\*) above, See section 2.02.B for further clarification of sine-wave tracking requirements

**\*\*NOTE 2: ATTN: FOR ALL HOSPITAL AND HEALTHCARE FACILITY PROJECTS,** TVSS manufacturer is to remove the "sine-wave tracking" circuitry in the N-G mode. The TVSS device itself however, must still incorporate the standard threshold clamping N-G mode circuitry within the device.

H. Modes:

1. When a mode of protection is specified, the protective mode shall be specifically included.  
(Note: Line-to-Neutral-to-Line is not acceptable where "Line-to-Line" is specified.)

2. The TVSS system shall provide (Per IEEE Std. 1100-1999 8.6.1 & NEMA LS-1 2.2.7), dedicated, independent, distinct protection circuitry for every mode found in the electrical distribution system at the point of TVSS application. For example, a 277/480V, 3-phase Wye, 4-wire plus ground system has TEN (10) distinct modes that require independent and dedicated protection (i.e., L1-L2, L2-L3, L3-L1, L1-N, L2-N, L3-N, L1-G, L2-G, L3-G, and N-G). Reduced mode TVSS with only 3, 4 or 7 dedicated, distinct, independent protection modes are not acceptable, and are not to be submitted. For 6 mode Delta systems, SIX (6) dedicated, independent, distinct protection modes are required (Per IEEE Std. 1100-1999 8.6.1 & NEMA LS-1 2.2.7) (L1-L2, L2-L3, L3-L1, L1-G, L2-G, L3-G).
- I. Fusing:
1. The TVSS shall provide as a minimum, over-current, over temperature protection in the form of component-level thermal fusing to ensure safe failure and prevent thermal runaway. Surge protective devices shall contain short circuit current safety fusing within each device where no circuit breaker is specified, for over-current requirements of the NEC 2002.
  2. The fusing mechanisms employed must effectively coordinate their performance in conjunction with the high current abnormal over-voltage testing under UL 1449 2nd Edition as defined above.
- J. Features:
1. The TVSS shall be of a parallel design using fast-acting transient energy protection that will divert and dissipate the surge energy.
  2. The TVSS shall be self-restoring and fully automatic with a total response time not to exceed 1 nanosecond.
  3. The maximum continuous operating voltage shall be capable of sustaining 115% of nominal RMS voltage continuously without degrading in accordance with NEMA LS-1, 1992.
  4. The TVSS shall be UL listed at or above the available fault current level at the point of TVSS application, per UL 1449 2nd Edition, as amended. The TVSS shall be marked with the short circuit current rating. The TVSS short circuit rating shall be, as a minimum, the same rating as the power distribution equipment to which it is connected.
  5. Circuit Configuration: The circuit configuration of the TVSS shall be bi-directional, thermal stress reducing, totally encapsulated, custom parallel and solid state.
  6. TVSS devices shall provide on-board visual status of their operational readiness by indicator lights and one set of NO/NC Form C dry relay contacts for remote alarm capabilities, if such features are specifically requested.
- K. Maintenance Restrictions:
1. No TVSS device shall be supplied which requires scheduled preventive maintenance or replacement parts. Devices requiring functional testing, any special test equipment, or special training to monitor surge protection

device (SPD) status are not acceptable. TVSS devices shall require no routine maintenance. TVSS devices are considered non-repairable items and shall be fully replaced upon expiration.

- L. Warranty:
  - 1. The manufacturer shall provide unlimited free replacement of the entire TVSS (not just modules, components or sub-assemblies) for all inoperable TVSS during the warranty period. Minimum warranty period shall be 10 (TEN) years.
- M. Enclosures:
  - 1. Unless otherwise noted, NEMA 4 (or better) enclosures for indoor installations where fire suppression systems are utilized and NEMA 4X (or better) enclosures for wet/outdoor locations shall be utilized.

## PART 3 – EXECUTION

### 3.1 INSTALLATION

- A. Provide a TVSS to be installed at each building service entrance gear, MCC's, transfer switch or other location (service entrance), that the service encounters as it enters the facility and/or as indicated on Contract Drawings. Also provide TVSS devices at all distribution and panel-board locations as indicated on Contract Drawings. The TVSS shall be located immediately adjacent to the switchboard or panel-board being protected (close-nipple). The TVSS may not be located integral within the switchboard or panel-board(s) unless the switchgear manufacturer providing such products expressly meets or exceeds ALL parameters of this specification for the TVSS. Any TVSS devices not meeting or exceeding the performance criteria outlined in this specification will be deemed unacceptable.
- B. The TVSS devices are to be connected on the load-side of the over-current protective device to which it is connected as per UL 1449 and NEC Art. 285, of the electrical service it is protecting.
- C. **\*NOTE: TVSS marked L1, L2, L3, N and GND (as applicable) must be connected respectively, to phase(s), neutral and ground.**
- D. The location of the TVSS shall be chosen to minimize the lead lengths between the TVSS and the circuit breaker to which it is connected. TVSS device leads which are mounted external to the panel, must be routed within a metal conduit when necessary (rigid nipple if possible), and kept as short and straight as possible. Wire size for leads shall be as specified by manufacturer (minimum of No. 10 AWG, maximum of No. 4 AWG).
- E. TVSS devices shall be installed neatly. Twist (1 twist per 12" of lead length) the phase & neutral conductors tightly, over the entire run, from the suppressor to the service panel, and always use the shortest length of connecting cable possible.
- F. When installing a series connected TVSS, bind the supply side conductors separately from the load-side conductors.
- G. When specified, install TVSS devices in light pole bases and connect in accord with manufacturer's instructions.

- H. Connect TVSS to the basic grounding system.
- I. The electrical contractor (installer) shall verify the proper application of the TVSS (i.e. voltage, phases, etc.). The electrical contractor shall assure that all Neutral conductors are bonded to the system Ground at the service entrance or the serving isolation transformer prior to installation of the associated TVSS. The electrical contractor shall further ensure that neutral-to-ground bonds do not exist at locations that are not service entrances or newly derived power sources.
- J. All labor, materials, equipment, and services necessary for, and incidental to, the installation of the TVSS system components as specified herein shall be provided by the electrical contractor (installer).
- K. The TVSS manufacturer shall make available a trained representative to witness installation of products and to provide technical assistance. This service shall be provided on an “as-needed” cost reimbursable basis and shall be requested no less than 15 days prior to installation. This service shall be included in bid price and documentation if specified herein.





# **DRAWINGS**



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**SECTION 4**  
**FINAL RECORD DRAWINGS/AS-BUILTS**

**OKALOOSA COUNTY  
WATER AND SEWER**

**DRAWINGS**

**MISCELLANEOUS DETAILS**

|                                 |     |
|---------------------------------|-----|
| PIPE BEDDING REQUIREMENTS       | 100 |
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| ENCASEMENT SPACERS              | 120 |
| THRUST BLOCK SIZING DETAIL      | 130 |
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**WATER DISTRIBUTION DETAILS**

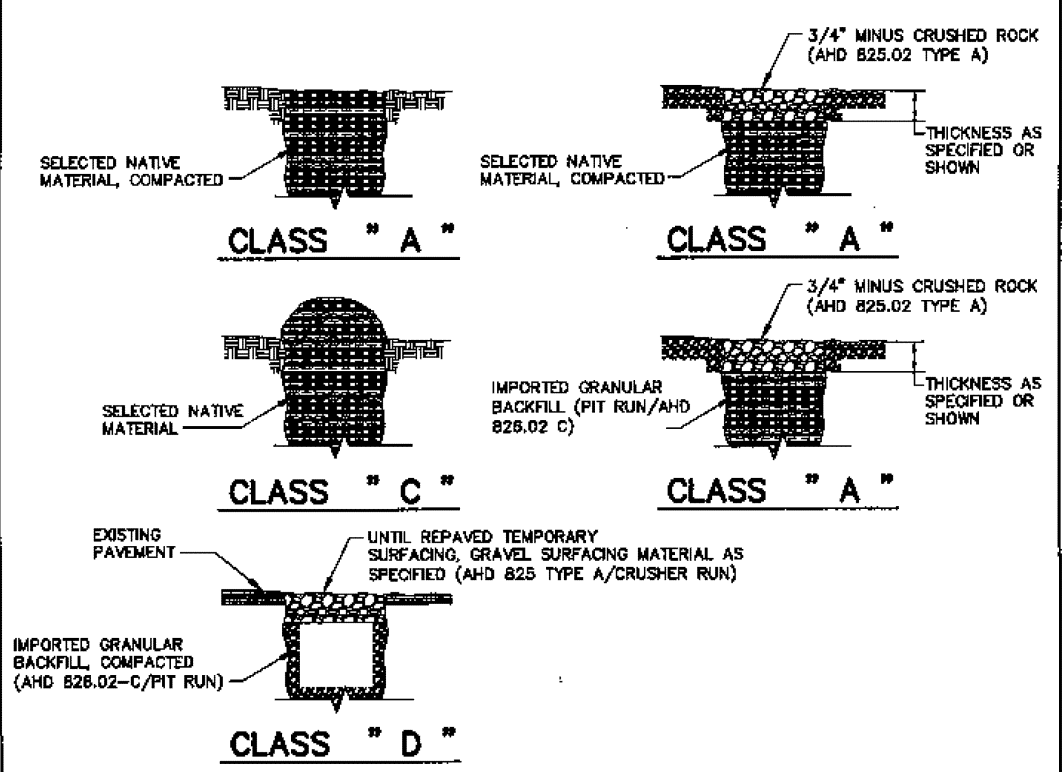
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| FIRE HYDRANT DETAIL      | 200 |
| DOUBLE CHECK BACKFLOW    | 230 |
| WATER SERVICE CONNECTION | 250 |

**SANITARY SEWER DETAILS**

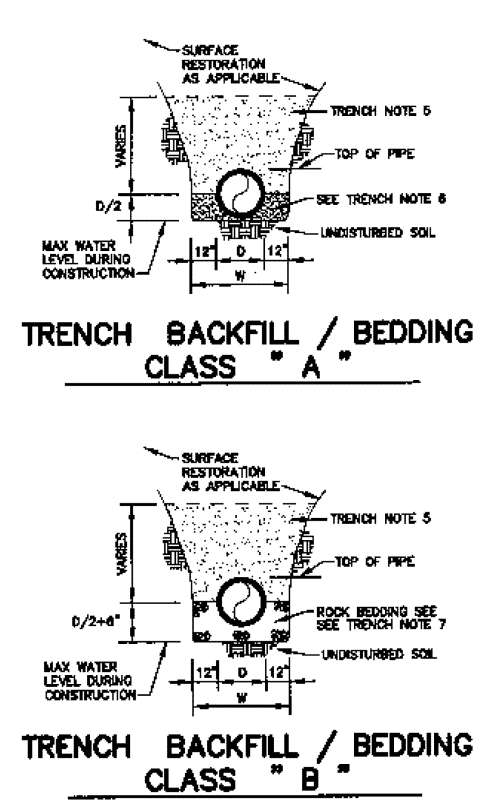
|                          |      |
|--------------------------|------|
| PRECAST CONCRETE MANHOLE | 300  |
| PRECAST DROP MANHOLE     | 310  |
| SHALLOW SERVICE LATERAL  | 320  |
| DEEP SERVICE LATERAL     | 320A |

**STANDARD PUMP STATION DETAILS**

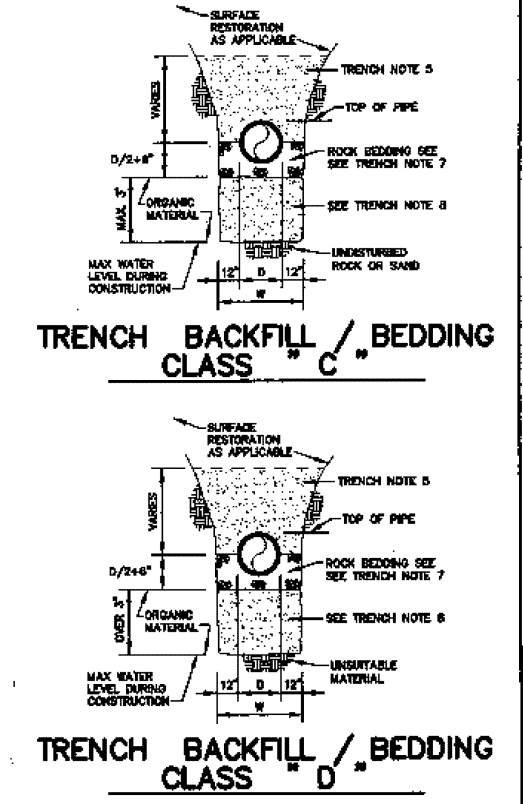
|                                     |    |
|-------------------------------------|----|
| GENERAL PUMP STATION SITE PLAN      | 1  |
| GENERAL PUMP STATION SECTION VIEW   | 2  |
| PUMP STATION RTU PANEL 120/240 VOLT | 3  |
| PUMP STATION RTU PANEL 120/240 VOLT | 4  |
| PUMP STATION RTU PANEL 120/240 VOLT | 5  |
| PUMP STATION RTU PANEL 120/240 VOLT | 6  |
| PUMP STATION RTU PANEL 120/240 VOLT | 7  |
| PUMP STATION RTU PANEL 120/240 VOLT | 8  |
| PUMP STATION RTU PANEL 277/480 VOLT | 9  |
| PUMP STATION RTU PANEL 277/480 VOLT | 10 |
| PUMP STATION RTU PANEL 277/480 VOLT | 11 |
| PUMP STATION RTU PANEL 277/480 VOLT | 12 |
| PUMP STATION RTU PANEL 277/480 VOLT | 13 |
| PUMP STATION RTU PANEL 277/480 VOLT | 14 |



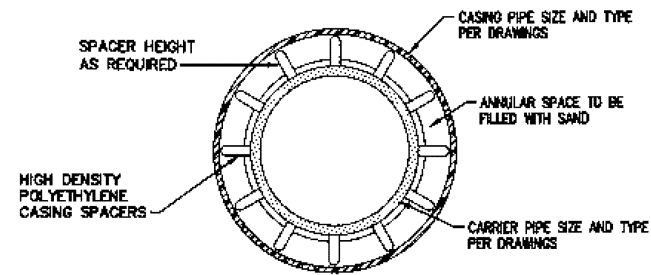
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|------|--|---|----------|
| OCWS |  | PIPE BEDDING REQUIREMENTS<br>NOT TO SCALE | MAY 2006 |
|      |  |   | 100      |



|      |  |   |          |
|------|--|---|----------|
| OCWS |  | TRENCH BACKFILL ABOVE PIPE ZONE<br>NOT TO SCALE | MAY 2006 |
|      |  |   | 110      |



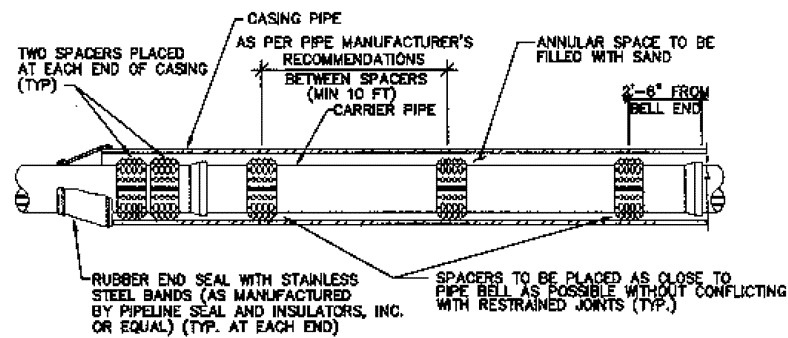
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|------|--|---|----------|
| OCWS |  | TRENCH BACKFILL ABOVE PIPE ZONE<br>NOT TO SCALE | MAY 2006 |
|      |  |   | 110      |



**CASING SPACERS - END VIEW**

**NOTES:**

1. CASING SPACERS SHALL BE USED TO INSTALL CARRIER PIPE INSIDE THE ENCASEMENT/CASING PIPE. TO PROVIDE SUPPORT AROUND THE PERIPHERY OF THE PIPE SHOULD THE PIPE TWIST AS IT IS PUSHED THROUGH THE CASING.
2. THE MAXIMUM SPAN SHOULD BE 6 1/2 FEET TO PREVENT SAGGING OF THE CARRIER PIPE. THE SPAN BETWEEN SPACERS SHOULD RESULT IN CONSERVATIVE LONG TERM SAFETY FACTOR PROVIDED TOTAL LOAD PER SPACER DOES NOT EXCEED THE MAXIMUM LOAD FOR PIPE FULL OF LIQUID PER SPACER LISTED IN THE LITERATURE. SPACERS SHALL HAVE MINIMUM HEIGHT THAT CLEARS THE PIPE BELL OR AS OTHERWISE INDICATED ON DRAWINGS. SPACER SHALL BE INSTALLED ACCORDING TO MANUFACTURERS RECOMMENDATIONS.
3. CASING SPACERS SHALL BE PROJECTED TYPE TOTALLY NON-CORRODIBLE SPACERS OF PREFORMED SECTIONS OF HIGH DENSITY POLYETHYLENE. SPACERS SHALL BE ISO 9002 CERTIFIED FOR STRENGTH AND QUALITY. PROJECTION TYPE SPACERS SHALL BE RACI TYPE SPACERS AS MARKED BY PUBLIC WORKS MARKETING, INC., P.O. BOX 38174, DALLAS, TEXAS, 75238-0174, PHONE 214-340-4226 OR 800-517-0395, OR DESIGN ENGINEER APPROVED EQUAL.
4. CASING SPACERS SHALL BE USED FOR ALL BORE AND JACK INSTALLATIONS.



**CASING SPACING DETAIL - SIDE VIEW**

N.T.S.

**NOTES:**

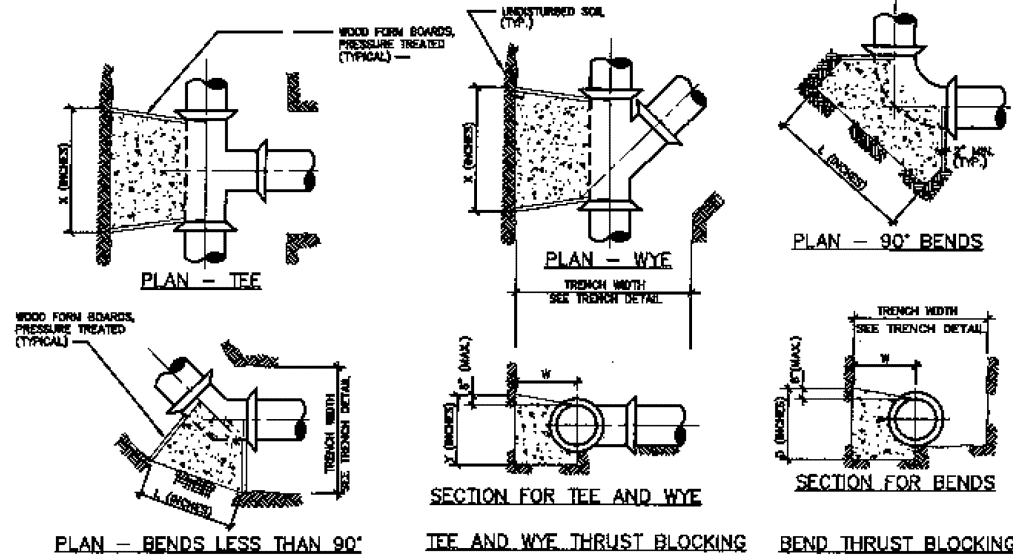
1. RESTRAINED JOINTS NOT SHOWN FOR CLARITY.
2. SPACERS SHALL BE RACI HIGH DENSITY POLYETHYLENE OR ENGINEER APPROVED EQUAL.
3. CASING SPACERS SHALL BE EVENLY SPACED ALONG PIPE LENGTH.
4. A MINIMUM OF TWO CASING SPACERS SHALL BE PLACED ALONG EACH 20' PIPE LENGTH.
5. IF THE CASING SPACER MANUFACTURER'S RECOMMENDED CASING SPACING IS MORE STRINGENT THAT THE SPACING SHOWN ABOVE, THEN THE MANUFACTURER'S RECOMMENDED SPACING SHALL BE USED.
6. THE ENDS OF THE CASING SHALL BE SEALED USING PWM MODEL 1 WA WRAP AROUND END SEAL MADE OF 1/8" THICKNESS RUBBER AND STAINLESS STEEL BANDS OR DESIGN ENGINEER APPROVED EQUAL.

OCWS

ENCASEMENT  
SPACERS  
NOT TO SCALE

MAY 2006

120



**NOTES:**

1. THRUST BLOCKS SHALL BE USED ONLY WHERE SHOWN ON THE DRAWINGS. THEY SHALL BE CONSTRUCTED WITH READY-MIX CONCRETE POURED BETWEEN THE FITTINGS AND UNDISTURBED EARTH. CAREFULLY PLACE THE CONCRETE SO THAT FITTING JOINTS ARE CLEAR AND ACCESSIBLE FOR REPAIR. WRAP ALL FITTINGS WITH POLYETHYLENE BEFORE POURING THE BLOCK. NEATLY FORM ALL THRUST BLOCKS TO THE SHAPE AND DIMENSIONS SHOWN OR INDICATED BY THE ENGINEER. NO THRUST BLOCK SHALL BE POURED UNTIL THE FORMING HAS BEEN OBSERVED BY THE ENGINEER.
2. "W" SHALL BE SUFFICIENT TO PROVIDE SOLID BACKING TO UNDISTURBED EARTH.
3. VALUES IN THE TABLE ARE BASED ON 150 PSI INTERNAL PRESSURE WITH A SILT-SAND SOIL TYPE (ASTM D2487 CLASSIFICATION = GC AND SM, CC = CLAYEY ORSILT, GRVEL-SAND-CLAY MIXTURES, SS = SILTY SANDS, SAND-SILT MIXTURES) AND 2,000 LB. PER SQUARE FOOT BEARING PRESSURE. THRUST BLOCKS WERE COMPUTED PER OPRM "THRUST RESTRAINT" DESIGN FOR DUCTILE IRON PIPE."

| SIZE OF THRUST BLOCKS FOR TEE AND WYE (INCHES) |                | SIZE OF THRUST BLOCKS FOR BENDS AND DEAD ENDS (INCHES) |   |                   |   |       |   |     |   |     |   |          |   |   |
|--|----------------|--|---|-------------------|---|-------|---|-----|---|-----|---|----------|---|---|
| SIZE OF MAIN                                   | SIZE OF BRANCH |  |   | DIRECTION OF FLOW |   |       |   |     |   |     |   |          |   |   |
|  | X              | Ø  | Y | 11.25°            |   | 22.5° |   | 30° |   | 90° |   | DEAD END |   |   |
| Ø  | L              | D  | L | D                 | L | D     | L | D   | L | D   | L | D        | L | D |
| 6  | 22             | 18   |   |                   |   |       |   |     |   |     |   |          |   |   |
| 8  | 22             | 18   |   |                   |   |       |   |     |   |     |   |          |   |   |
| 10   | 22             | 18   |   |                   |   |       |   |     |   |     |   |          |   |   |
| 12   | 22             | 18   |   |                   |   |       |   |     |   |     |   |          |   |   |
| 14   | 22             | 18   |   |                   |   |       |   |     |   |     |   |          |   |   |
| 16   | 22             | 18   |   |                   |   |       |   |     |   |     |   |          |   |   |
| 18   | 22             | 18   |   |                   |   |       |   |     |   |     |   |          |   |   |
| 20   | 22             | 18   |   |                   |   |       |   |     |   |     |   |          |   |   |
| 24   | 22             | 18   |   |                   |   |       |   |     |   |     |   |          |   |   |

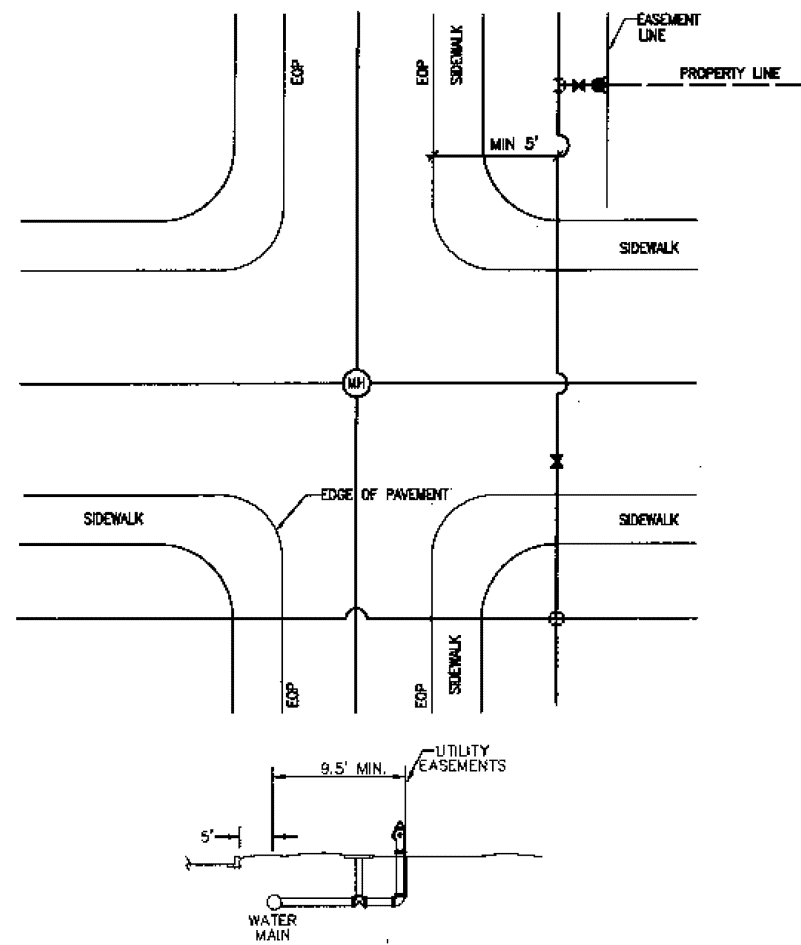
**CONCRETE THRUST BLOCK DATA**

OCWS

THRUST BLOCK  
SIZING DETAIL  
NOT TO SCALE

MAY 2006

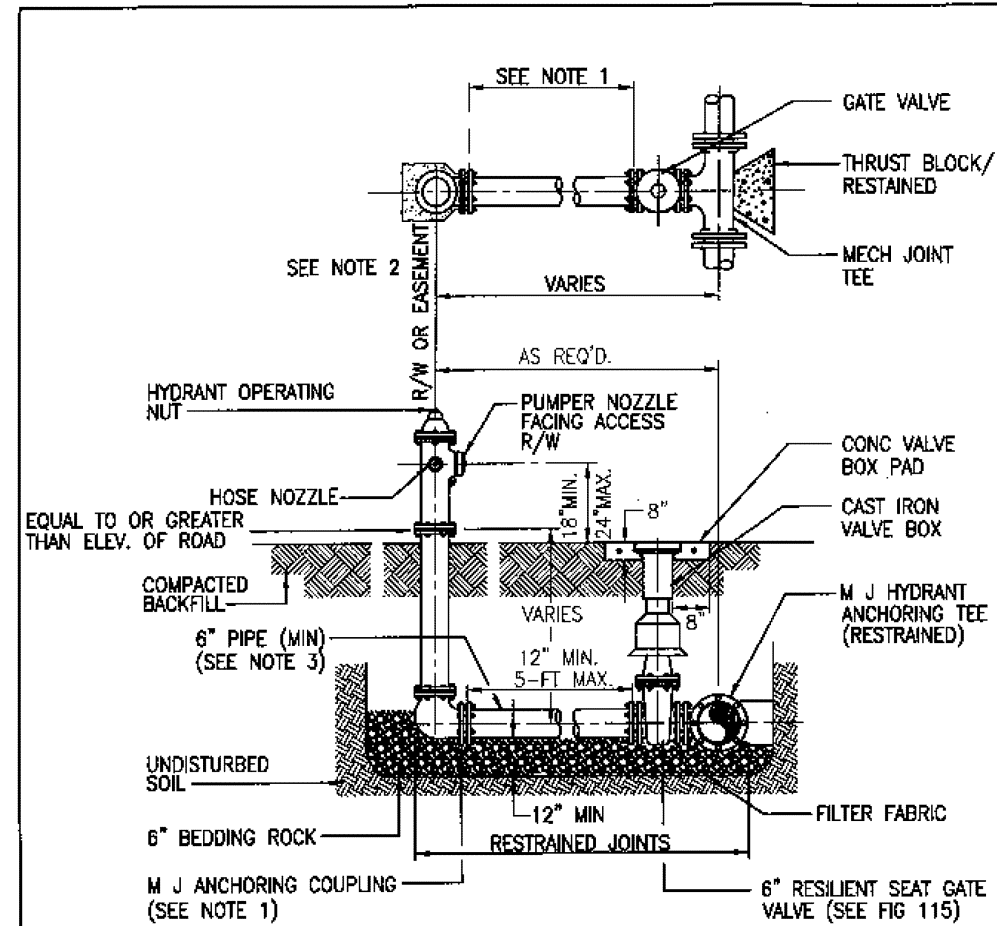
130



**GENERAL NOTES:**

1. SANITARY SEWER MAINS ARE PREFERRED IN CENTERLINE OF ROAD.
3. ALL TRENCHES WITHIN STREET BOUNDARIES (UNDER ASPHALT) SHALL BE COMPACTED TO OKALOOSA COUNTY ENGR. STANDARD SPECIFICATIONS.
4. MAIN LINE WATER VALVES AT INTERSECTIONS SHALL BE LOCATED WITHIN THE LIMITS OF THE PAVED STREET.
5. VALVE BOXES IN RESIDENTIAL GRASSED AREAS MUST BE SET IN CONCRETE PADS.
6. WATER METERS SHALL BE LOCATED AS INDICATED.
7. FIRE HYDRANTS SHOULD BE RODDED TO VALVES WITH 3/4" STEEL THRUST TIES.
8. SANITARY SEWER LATERALS MUST EXTEND SIX FEET (6') BEYOND LIMITS OF ALL UTILITY EASEMENTS ON BOTH SIDES OF STREET.

|      |                                       |          |
|------|---------------------------------------|----------|
| OCWS | TYPICAL STREET LAYOUT<br>NOT TO SCALE | MAY 2006 |
|      |                                       | 160      |

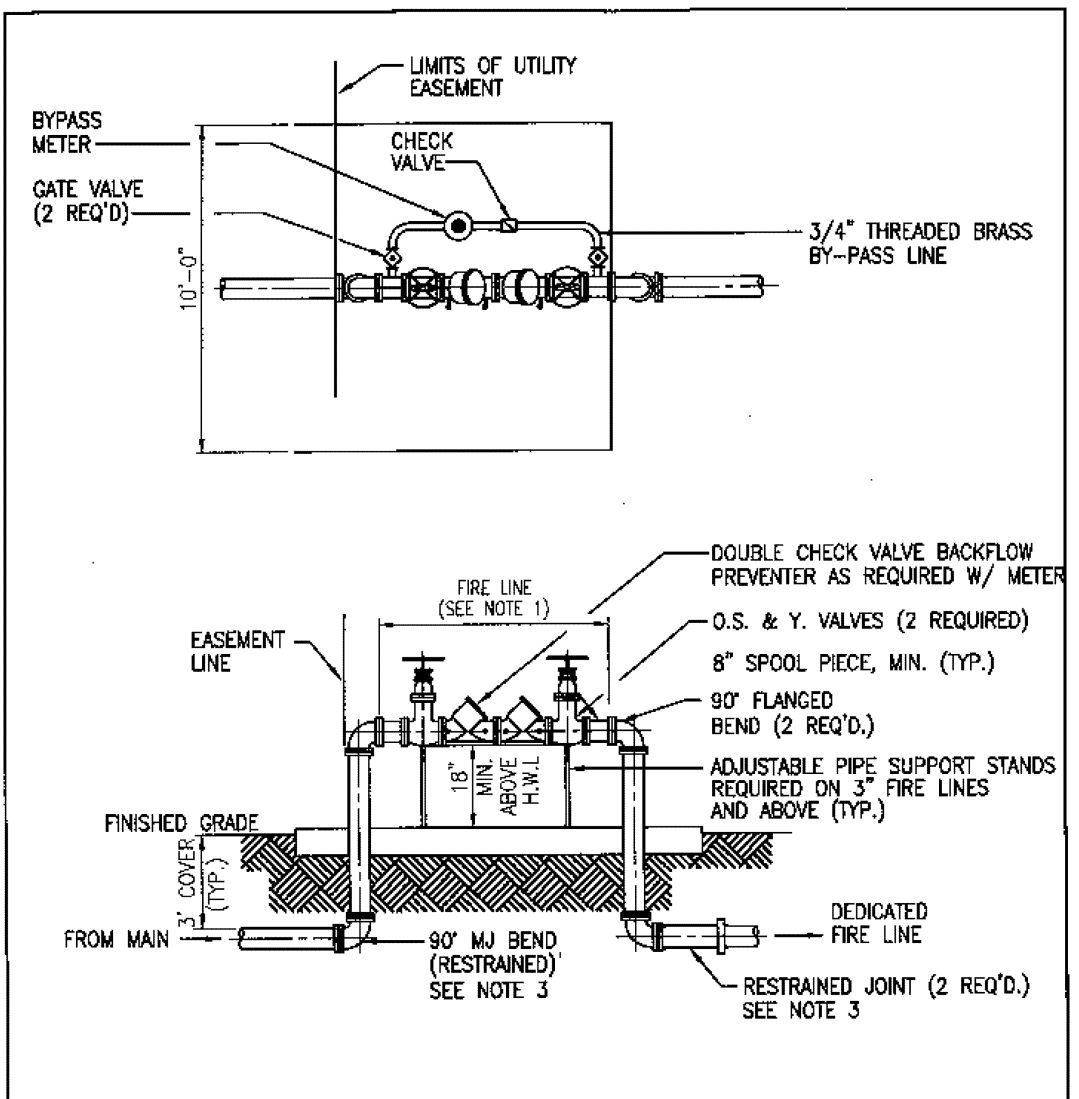


**NOTES:**

1. USE MECHANICAL JOINT RETAINER GLAND CLOW MODEL NO. F1058 OR APPROVED EQUAL.
2. HYDRANT SETBACK SHALL BE SET TO THE BACK OF THE EASEMENT OR RIGHT OF WAY.
3. SERVICE LINES FOR FIRE HYDRANTS TO BE SIZED TO ALLOW A MINIMUM OF 20 PSI RESIDUAL PRESSURE AT THE HYDRANT UNDER FIRE FLOW CONDITIONS.
4. TWO BLUE REFLECTIVE PAVEMENT MARKERS FOR IDENTIFICATION OF THE HYDRANT AND ITS VALVE LOCATION SHALL BE INSTALLED ON THE CENTER OF THE ADJACENT PAVED DRIVE LANE TO THE HYDRANT; MARKERS SHALL BE SPACED 1-FT APART, PERPENDICULAR TO THE ROAD CENTERLINE.
5. THE ELEVATION OF THE HYDRANT BASE SHALL BE EQUAL TO OR GREATER THAN THE ELEVATION OF THE EDGE OF PAVEMENT, BUT NOT LESS THAN 3 INCHES ABOVE THE FINISH GROUND SURFACE.

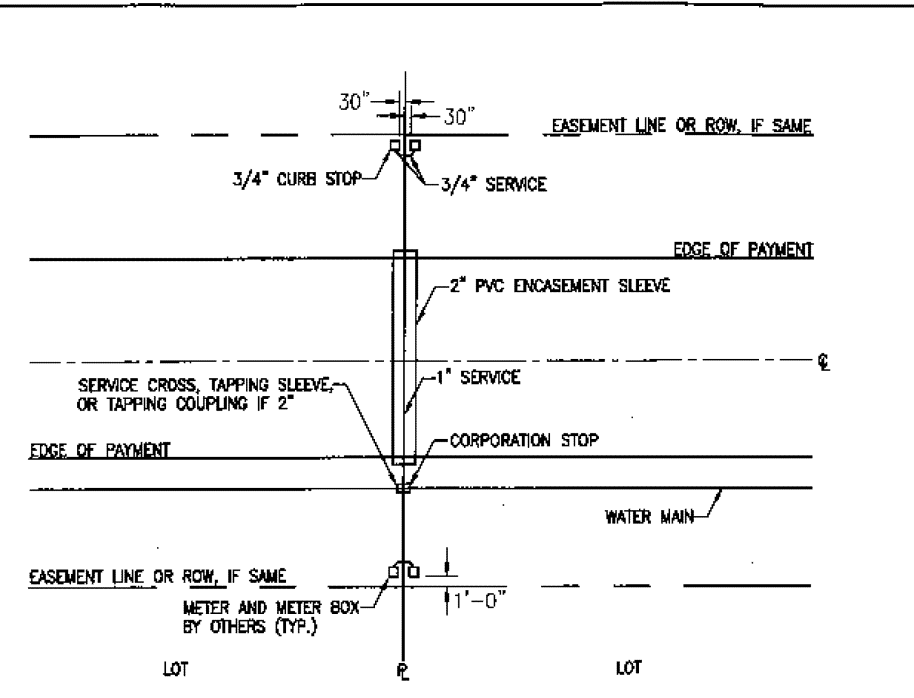
|      |                                     |          |
|------|-------------------------------------|----------|
| OCWS | FIRE HYDRANT DETAIL<br>NOT TO SCALE | MAY 2006 |
|      |                                     | 200      |



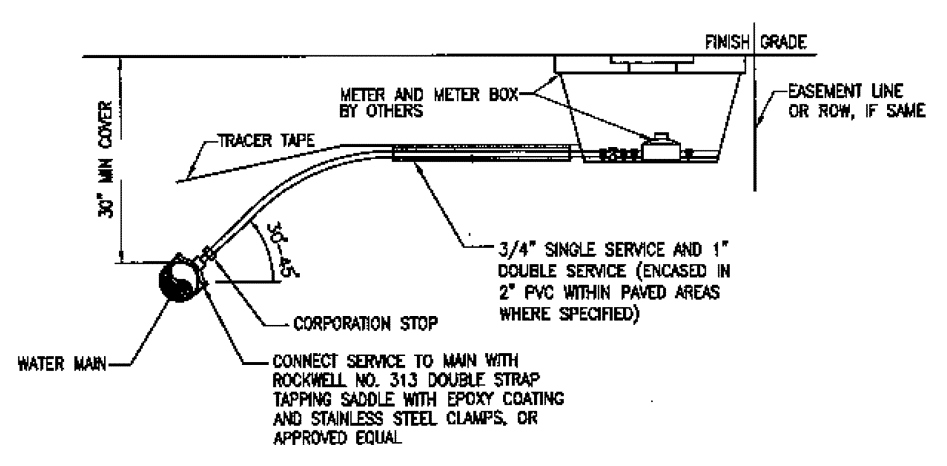


- NOTES:**
1. ALL PIPE 2" AND SMALLER SHALL BE PVC.
  2. ALL PIPE FITTINGS 4" DIA. AND LARGER SHALL BE CEMENT-LINED DUCTILE IRON WITH FLANGED FITTINGS FOR ABOVEGROUND USE. MECHANICAL JOINT FITTINGS SHALL BE USED UNDERGROUND.
  3. MEGALUGS, OR EQUAL, CAN BE USED IN PLACE OF RESTRAINED JOINTS ON ALL UNDERGROUND PIPING.
  4. PAINT ALL ABOVEGROUND DUCTILE PIPING, FITTINGS AND VALVES.

|      |                                    |          |
|------|------------------------------------|----------|
| OCWS | DOUBLE CHECK BACKFLOW NOT TO SCALE | MAY 2006 |
|      |                                    | 230      |

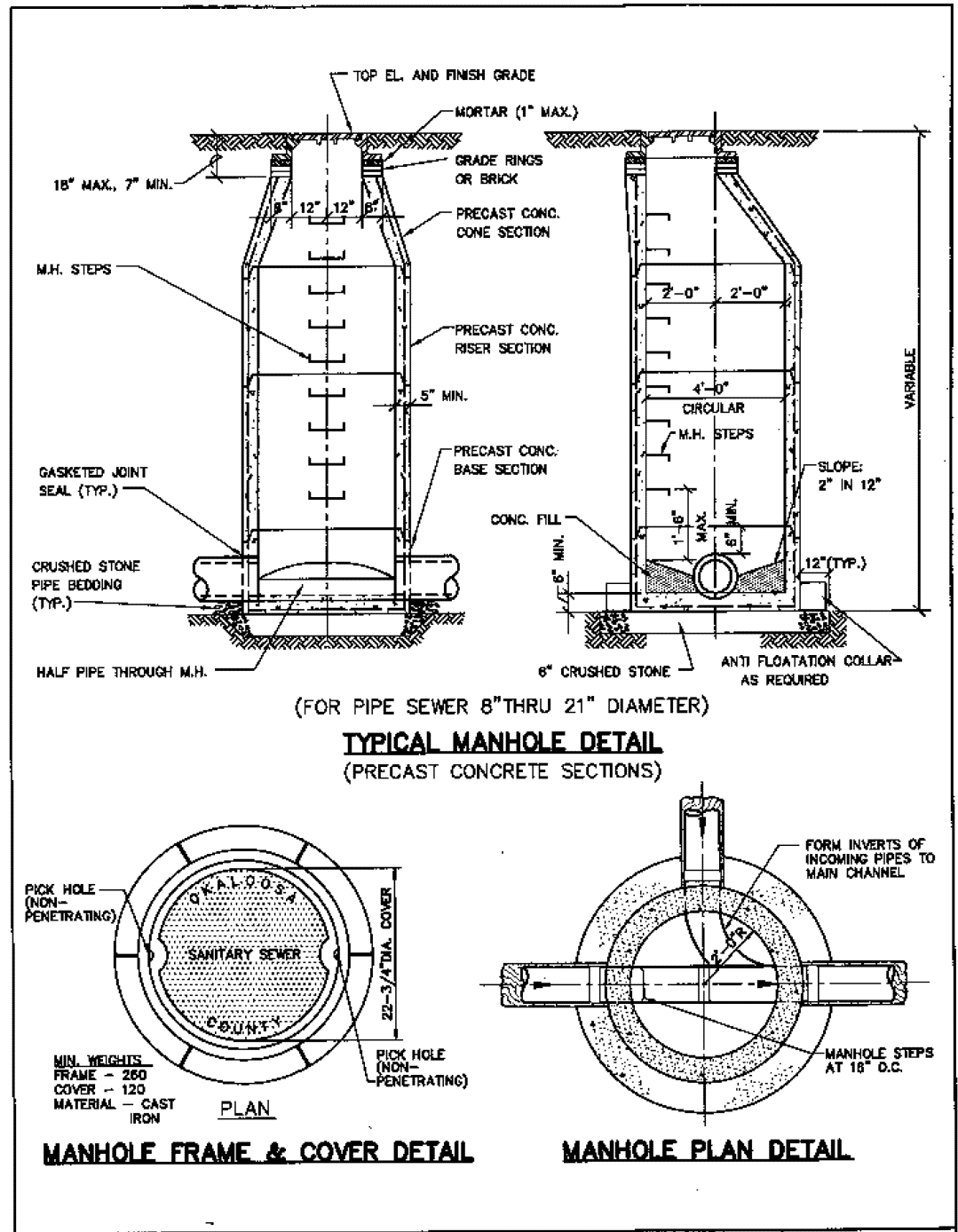


**DOUBLE WATER SERVICE CONNECTION PLAN**

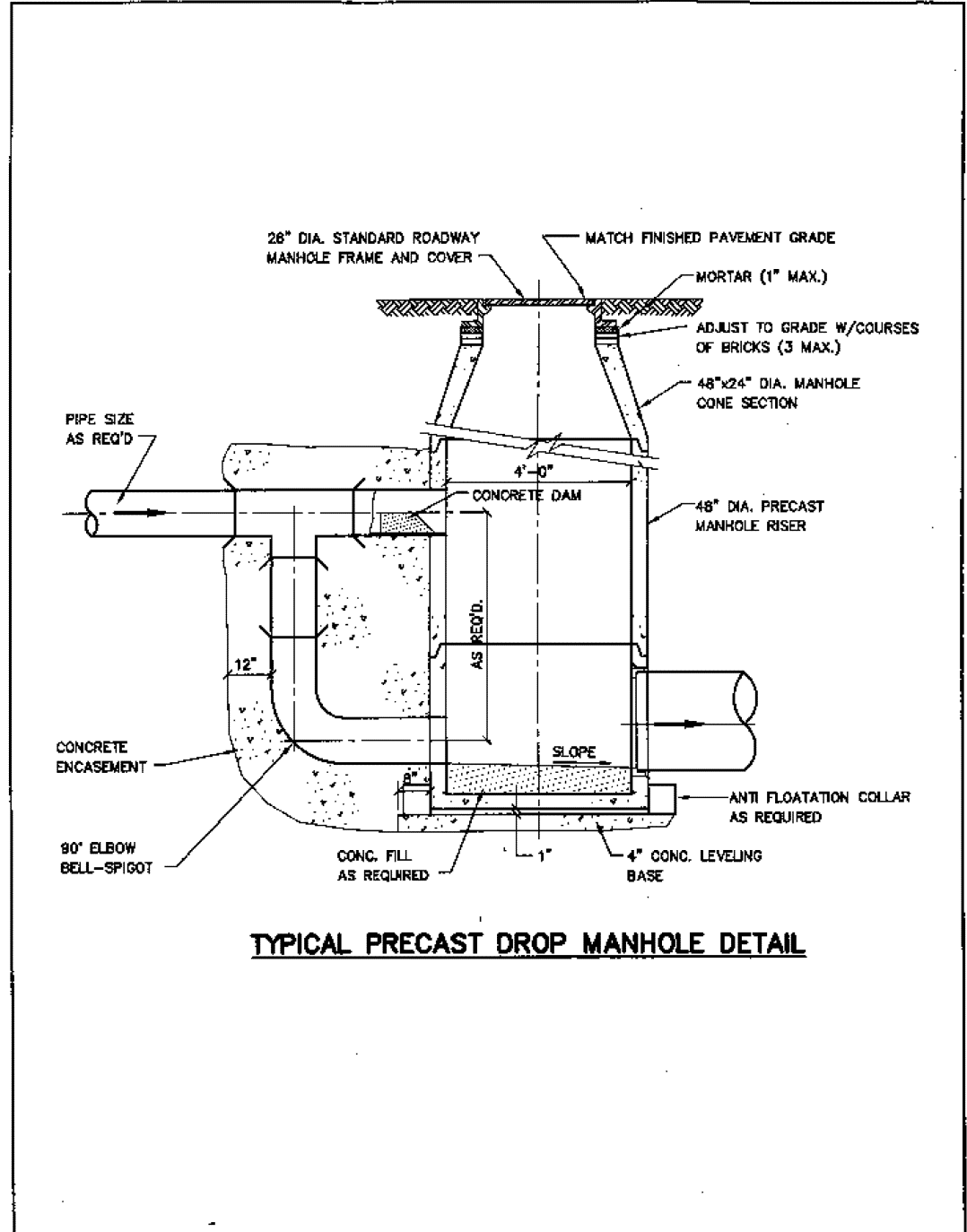


**TYPICAL WATER SERVICE DETAIL**

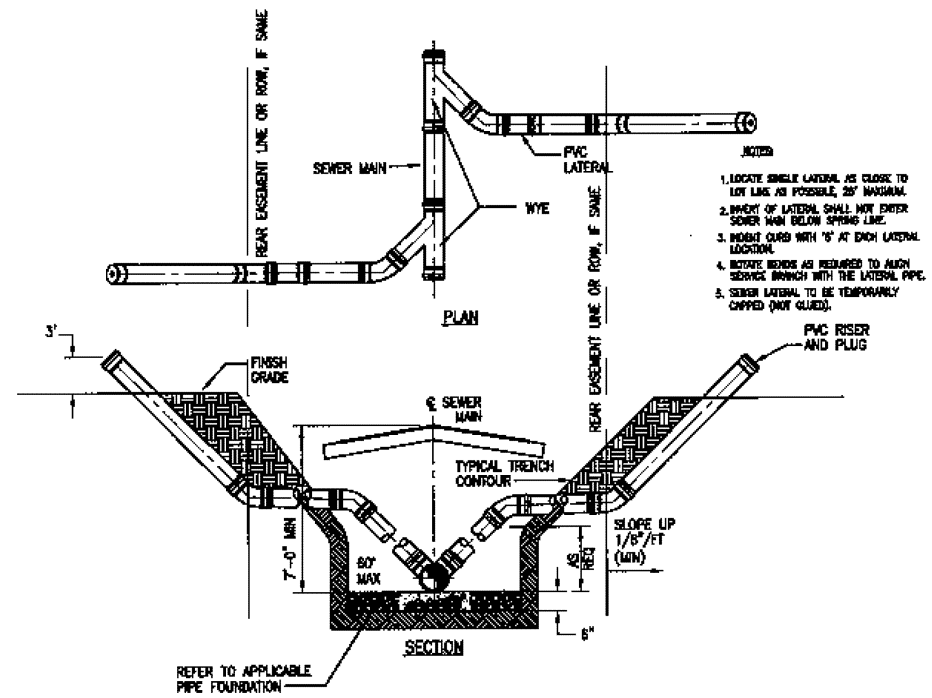
|      |                                       |          |
|------|---------------------------------------|----------|
| OCWS | WATER SERVICE CONNECTION NOT TO SCALE | MAY 2006 |
|      |                                       | 250      |



|      |  |          |
|------|--|----------|
| OCWS | PRECAST CONCRETE MANHOLE<br>NOT TO SCALE | MAY 2006 |
|      |  | 300      |

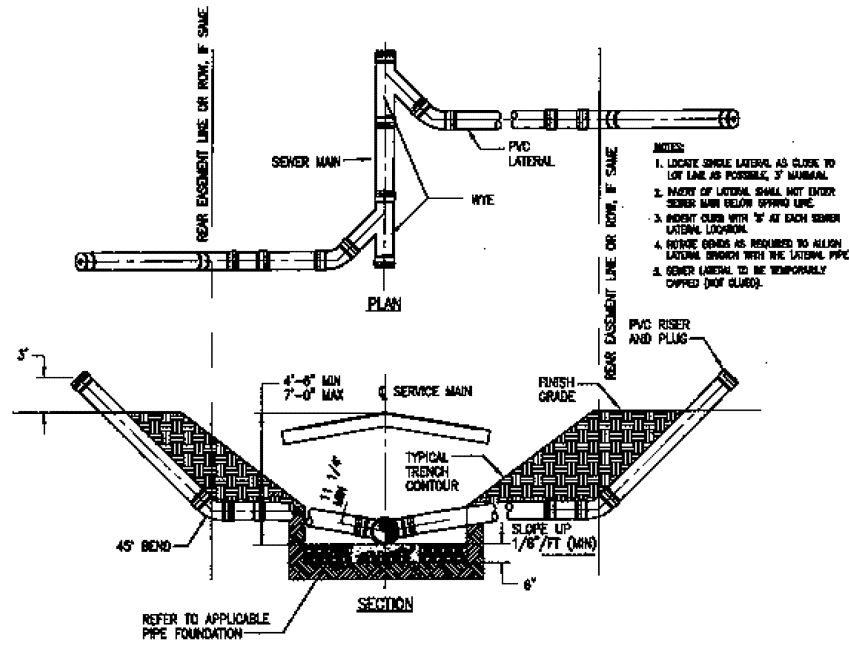


|      |                                      |          |
|------|--------------------------------------|----------|
| OCWS | PRECAST DROP MANHOLE<br>NOT TO SCALE | MAY 2006 |
|      |                                      | 310      |



- NOTES:
1. LOCATE SINGLE LATERAL AS CLOSE TO LOW LINE AS POSSIBLE, 20" MAXIMUM.
  2. POINT OF LATERAL SHALL NOT ENTER SEWER MAIN BELOW SPRING LINE.
  3. BENDS CURVED WITH 1/4" AT EACH LATERAL LOCATION.
  4. BENDS AS REQUIRED TO ALIGN SERVICE BRANCH WITH THE LATERAL PIPE.
  5. SEWER LATERAL TO BE TEMPORARILY CHIPPED (NOT GLUED).

DEEP LATERAL DETAILS

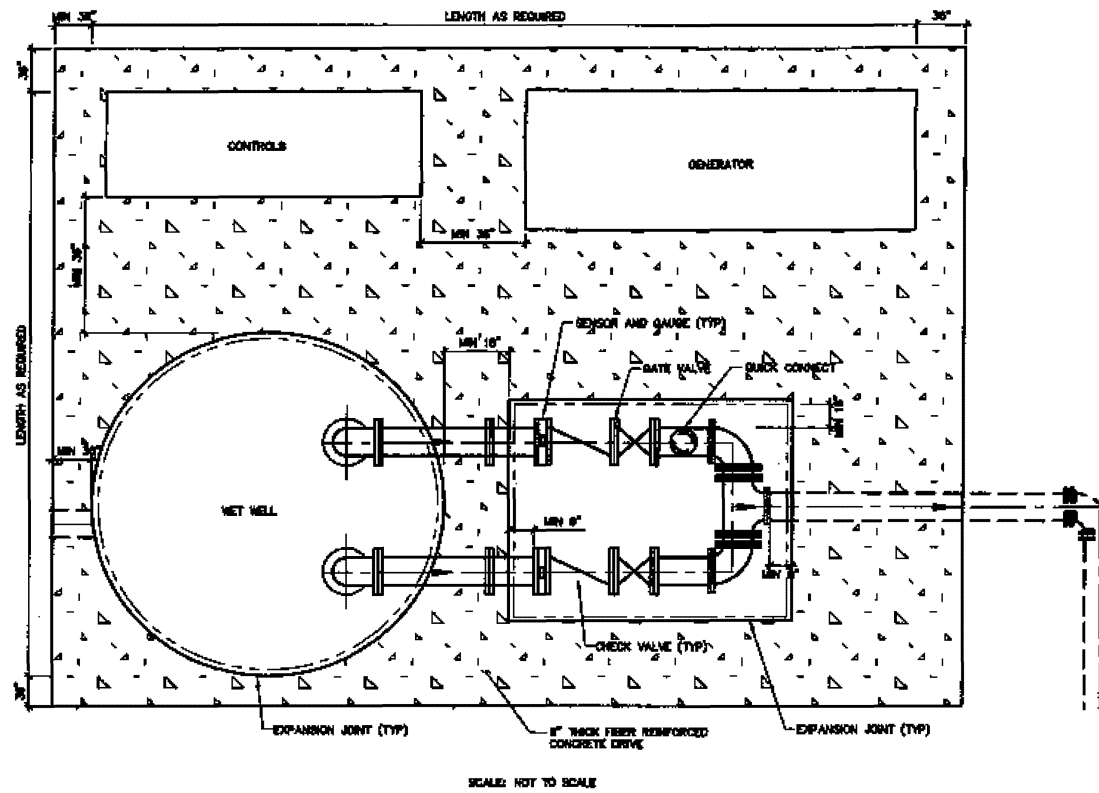
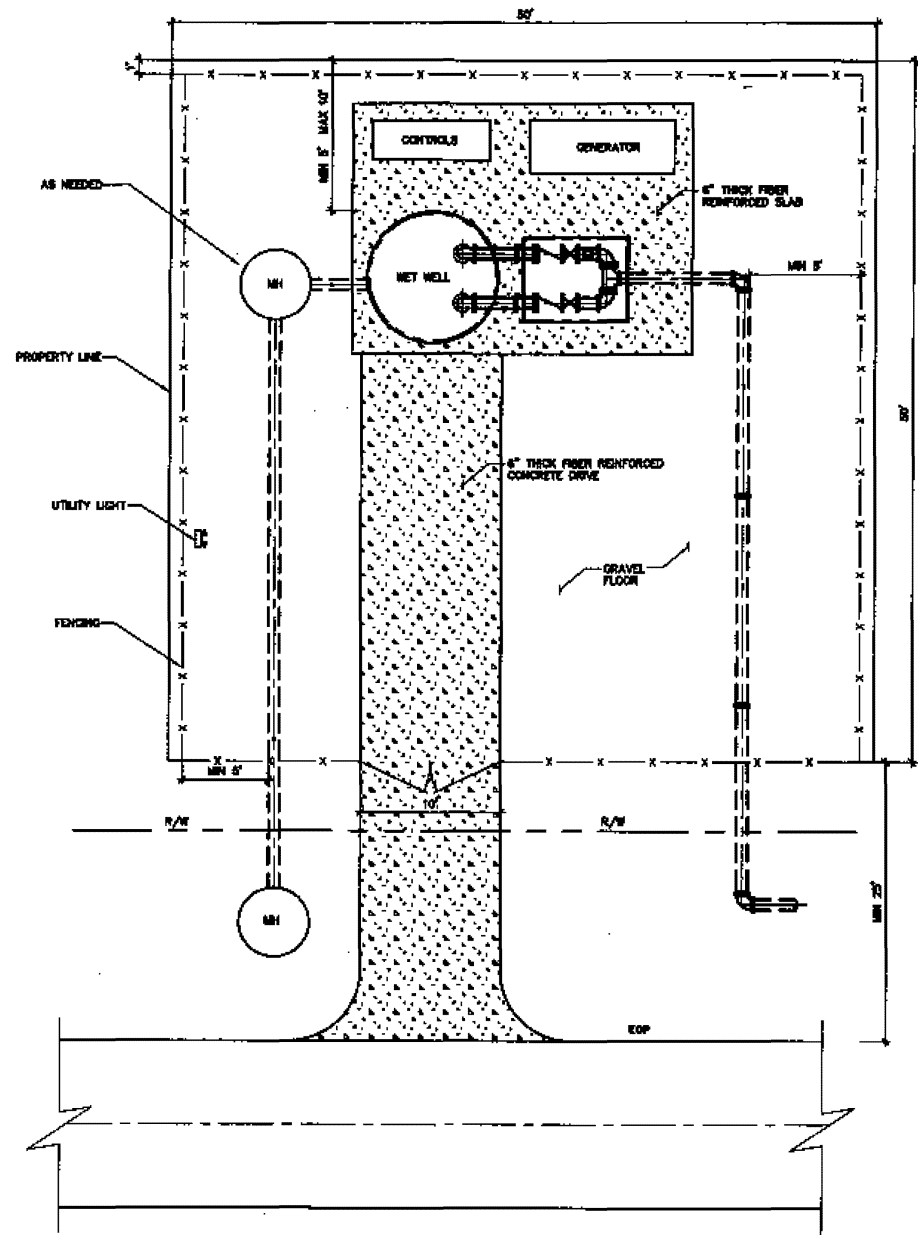


- NOTES:
1. LOCATE SINGLE LATERAL AS CLOSE TO LOW LINE AS POSSIBLE, 3" MAXIMUM.
  2. POINT OF LATERAL SHALL NOT ENTER SEWER MAIN BELOW SPRING LINE.
  3. BENDS CURVED WITH 1/4" AT EACH SEWER LATERAL LOCATION.
  4. BENDS AS REQUIRED TO ALIGN LATERAL BRANCH WITH THE LATERAL PIPE.
  5. SEWER LATERAL TO BE TEMPORARILY CHIPPED (NOT GLUED).

SHALLOW LATERAL DETAILS

|      |  |  |          |
|------|--|--|----------|
| OCWS |  | DEEP SERVICE LATERAL DETAILS<br>NOT TO SCALE | MAY 2006 |
|      |  |  | 320A     |

|      |  |   |          |
|------|--|---|----------|
| OCWS |  | SHALLOW SERVICE LATERAL DETAILS<br>NOT TO SCALE | MAY 2006 |
|      |  |   | 320      |



SCALE: NOT TO SCALE

SCALE: NOT TO SCALE

|      |            |     |          |
|------|------------|-----|----------|
| DATE | ISSUED FOR | NO. | REVISION |
|      |            |     |          |
|      |            |     |          |
|      |            |     |          |

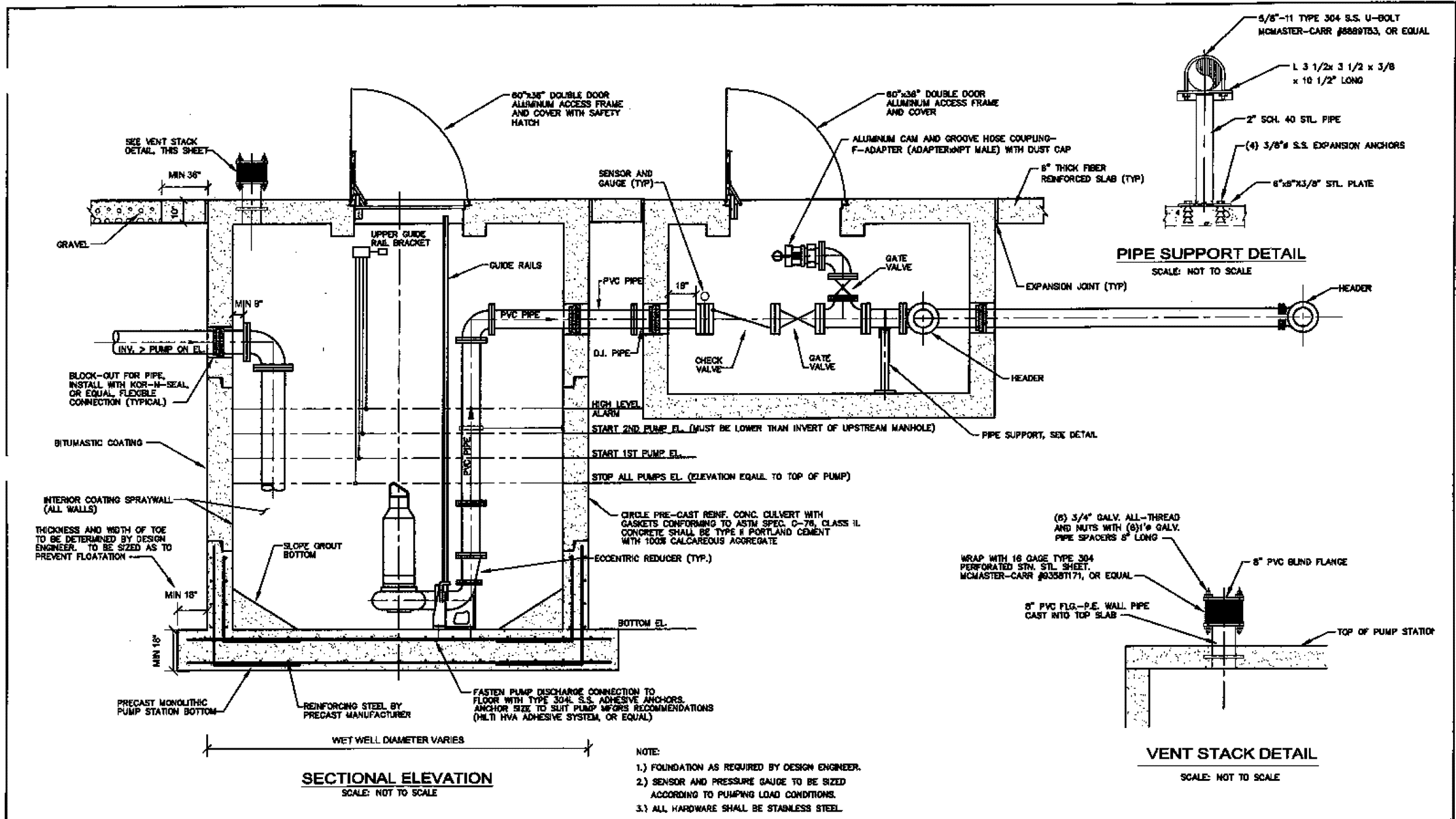
|      |      |
|------|------|
| DATE | DWG. |
| 6/08 |      |

VERIFY SCALES  
 BASE ON ONE EACH OF  
 ORIGINAL DRAWING  
 IF NOT ONE EACH ON  
 THIS SHEET ADJUST  
 SCALES ACCORDINGLY

|            |          |      |
|------------|----------|------|
| DRAWN BY   | APPROVED | DATE |
|            |          |      |
| CHECKED BY |          |      |
|            |          |      |

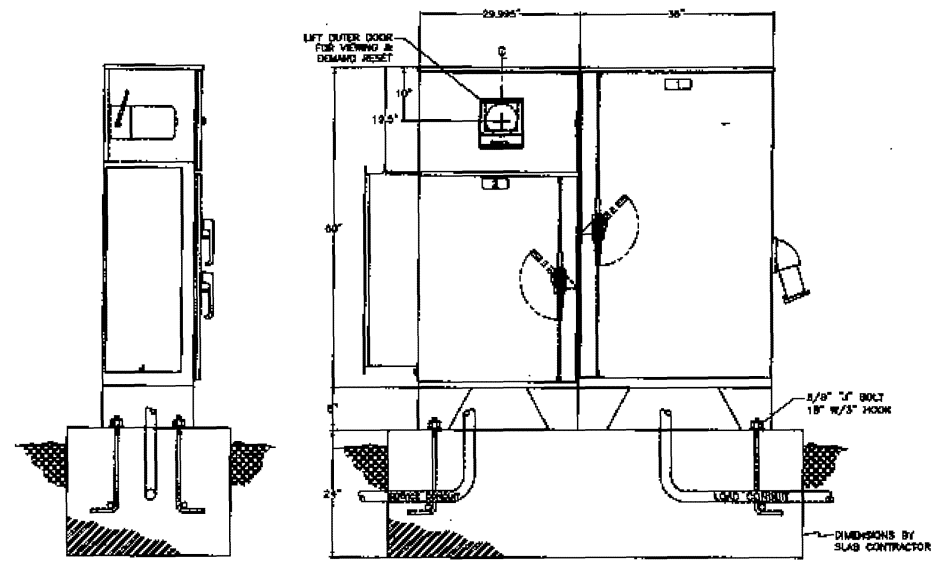
GENERAL PUMP STATION SITE PLAN

|               |
|---------------|
| SCALE         |
| PROJECT NO.   |
| DRAWING NO.   |
| SHEET 1 of 14 |

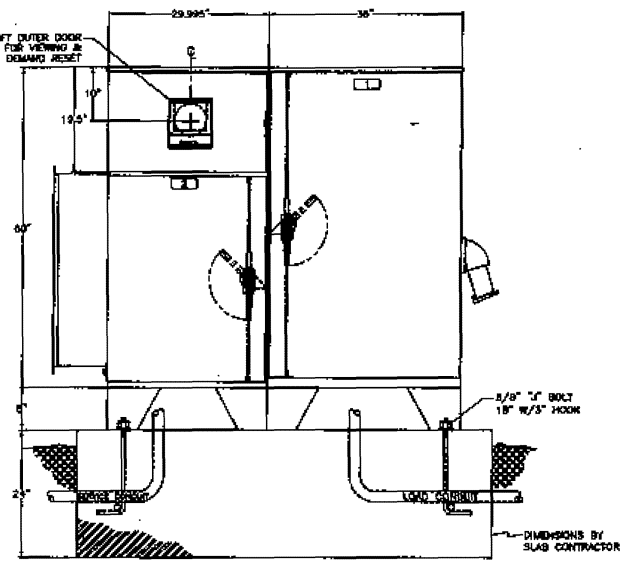


|      |           |     |          |      |    |   |              |               |       |               |
|------|-----------|-----|----------|------|----|---|--------------|---------------|-------|---------------|
| DATE | ISSUE FOR | NO. | REVISION | DATE | BY | VERIFY SCALES<br>1/8" = 1" ON ORIGINAL DRAWING<br>5/16" = 1" ON THIS SHEET<br>IF NOT ONE INCH IN THIS SHEET, SCALES ACCORDINGLY | DESIGNER     | APPROVED      | SCALE | SCALE         |
|      |           |     |          |      |    |   | DRAWN BY     |               |       | PROJECT NO.   |
|      |           |     |          |      |    |   | ENGINEER     | APPROVED      |       | DRAWING NO.   |
|      |           |     |          |      |    |   | PROJECT MGR. |               |       | SHEET 2 of 14 |
|      |           |     |          |      |    |   | CHECKED BY   | DATE MAY 2008 |       |               |

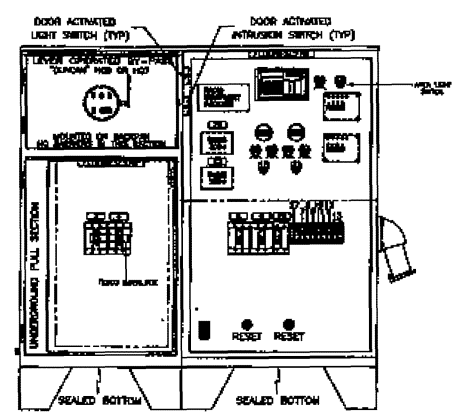
GENERAL PUMP STATION SECTION VIEW



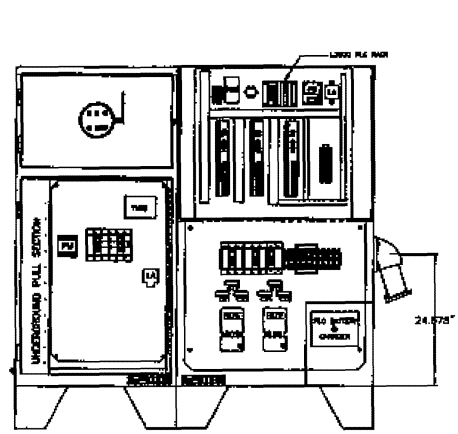
CONTROL PANEL  
SIDE VIEW



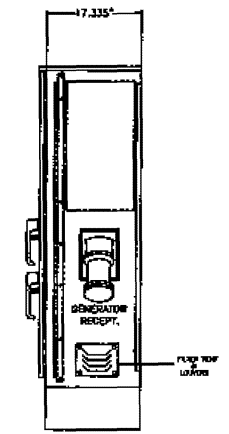
CONTROL PANEL  
ELEVATION



CONTROL PANEL  
INNER DEADFRONT DOOR  
(SHOWN WITH OUTER DOORS REMOVED)



CONTROL PANEL  
BACKPAN LAYOUT  
(SHOWN WITH ALL DOORS REMOVED)



CONTROL PANEL  
SIDE VIEW

| NAMEPLATE SCHEDULE |     |       |                              |
|--------------------|-----|-------|------------------------------|
| TAG                | QTY | TYPE  | DESCRIPTION                  |
| 1                  | 1   | PLATE | PUMP CONTROL PANEL           |
| 2                  | 1   | PLATE | SERVICE PANEL                |
| 3                  | 1   | PLATE | MAIN DISCONNECT              |
| 4                  | 1   | PLATE | GENERATOR DISCONNECT         |
| 5                  | 1   | PLATE | PUMP No.1 DISCONNECT         |
| 6                  | 1   | PLATE | PUMP No.2 DISCONNECT         |
| 7                  | 1   | PLATE | PLC                          |
| 8                  | 1   | PLATE | LEVEL CONTROLS               |
| 9                  | 1   | PLATE | PUMP CONTROLS                |
| 10                 | 1   | PLATE | HEATERS, LIGHTS & RECEPTACLE |
| 11                 | 1   | PLATE | AREA LIGHT                   |
| 12                 | 1   | PLATE | SPARE                        |
| 13                 | 1   | PLATE | SPARE DISTRIBUTION BREAKERS  |
| 14                 |     |       |                              |
| 15                 | 1   | RING  | PUMP No.1 RUNNING            |
| 16                 | 1   | RING  | PUMP No.1 FAILURE            |
| 17                 | 1   | RING  | PUMP No.1 HAND OFF AUTO      |

NOTES:  
1. U.L. LISTED "INDUSTRIAL CONTROL PANEL" PER UL 508 WITH SERVICE ENTRANCE RATING.

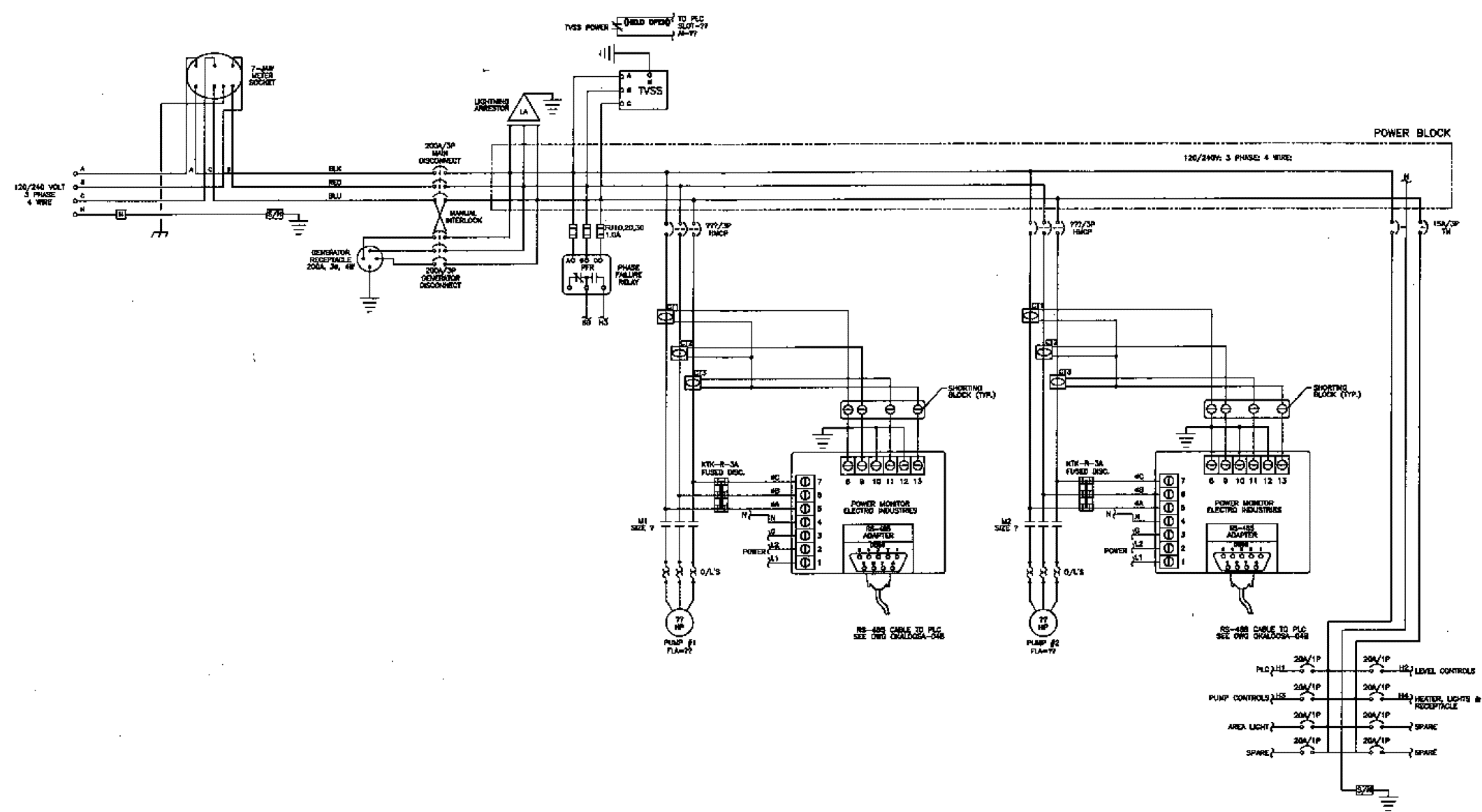
| NAMEPLATE SCHEDULE |     |       |  |
|--------------------|-----|-------|--|
| TAG                | QTY | TYPE  | DESCRIPTION  |
| 19                 | 1   | RING  | PUMP No.2 RUNNING  |
| 20                 | 1   | RING  | PUMP No.2 FAILURE  |
| 21                 | 1   | RING  | PUMP No.2 HAND OFF AUTO                                    |
| 22                 | 1   | RING  | ELECTRO INDUSTRIES POWER MONITOR VOLTAGE, AMPS, PHASE & KW |
| 23                 | 1   | RING  | ELECTRO INDUSTRIES POWER MONITOR VOLTAGE, AMPS, PHASE & KW |
| 24                 | 1   | RING  | PLC ALARM ACK/RESET SWITCH                                 |
| 25                 | 1   | RING  | AREA LIGHT ON OFF  |
| 26                 | 1   | PLATE | SPARE  |
| 27                 | 1   | PLATE | DISTRIBUTION BREAKERS DISCONNECT                           |
| 28                 | 1   | PLATE |  |
| 29                 | 1   | PLATE |  |
| A                  | 1   | PLATE | HIGH LEVEL FLOAT   |
| B                  | 1   | PLATE | LOW LEVEL FLOAT  |
| E                  | 1   | PLATE | PUMP No. 1 MOISTURE  |
| F                  | 1   | PLATE | PUMP No. 2 MOISTURE  |

PLATES 1/2" x 1 1/2"

- ENCLOSURE CONSTRUCTION NOTES**
- EXTERIOR 1/4 GA. 304 SS AND INTERIOR 1/4 GA. COLD ROLLED STEEL ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
  - CONSTRUCTION WILL BE NEMA 3R.
  - ALL NUTS, BOLTS, SCREWS AND WRENCHES WILL BE STAINLESS STEEL.
  - NUTS, BOLTS & SCREWS WILL NOT BE VISIBLE FROM OUTSIDE OF ENCLOSURE.
  - PERIODIC NAMEPLATES WILL BE PROVIDED AS REQUIRED.
  - CONTROL WIRING WILL BE MARKED AT BOTH ENDS BY PERMANENT MARK MARKERS.
  - A PLASTIC COVERED WIRING DIAGRAM WILL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
  - ENCLOSURE WILL BE FACTORY WERED AND CONFORM TO REQUIRED NEMA STANDARDS.

- TESCO'S POLY-PORC COATING SYSTEM**
- PAINT INTERIOR COMPONENTS ONLY
- INCLUDES A FIVE STAGE DRY FILM METAL PREPARATION PROCESS:
- ALKALINE CLEANSER 120F.
  - CLEAN WATER RINSE.
  - IRON PHOSPHATE APPLICATION 150F.
  - CLEAN WATER RINSE.
  - IMPRIME RINSE TO SEAL PHOSPHATED SURFACES 120F.
- FINISHED WITH AN ELECTROSTATICALLY APPLIED DRY POLYESTER POWDER COATING THEN BAKED @ 300F TO CURE.

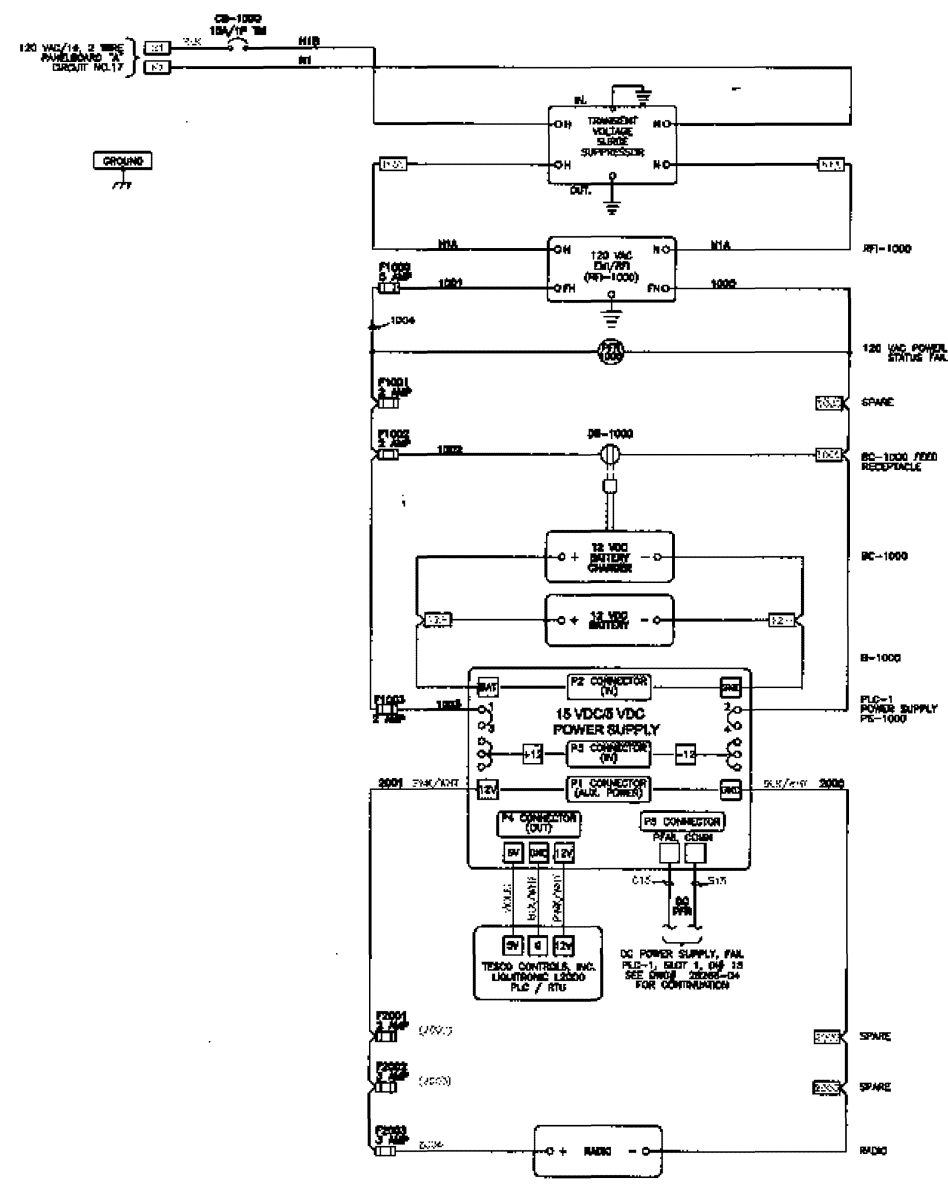
|   |  |            |     |          |      |      |  |             |             |      |                  |             |
|---|--|------------|-----|----------|------|------|--|-------------|-------------|------|------------------|-------------|
| DATE  |  | ISSUED FOR | NO. | REVISION | DATE | ENG. | VERIFY SCALES:<br>1/8" = 1" OR AS SHOWN ON DRAWING<br>0 1" | DESIGNED BY | APPROVED BY | SOL. | SCALE            | PROJECT NO. |
| DATE  |  | ISSUED FOR | NO. | REVISION | DATE | ENG. | DESIGNED BY  | APPROVED BY | DATE        | CHK. | PROJECT NO.      | CRUMB NO.   |
| OKALOOSA STANDARD<br>LIFT STATION RTU PANEL<br>120/240 VOLT |  |            |     |          |      |      |  |             |             |      | SHEET<br>3 of 14 |             |



THREE LINE POWER DIAGRAM

|      |  |            |     |          |      |      |   |   |                              |  |
|------|--|------------|-----|----------|------|------|---|---|------------------------------|--|
| DATE |  | ISSUED FOR | NO. | REVISION | DATE | ENR. | VERIFY SCALES<br>INK IS ONE INCH ON<br>ORIGINAL DRAWING<br>IF NOT ONE INCH ON<br>THIS SHEET, ADJUST<br>SCALES ACCORDINGLY | DESIGNED<br>DRAWN BY<br>CHECKED<br>PROJECT MGR.<br>CHECKED BY | APPROVED<br>DATE<br>MAY 2006 | SWL<br>SCALE<br>PROJECT NO.<br>DRAWING NO.<br>SHEET<br>4 of 14 |
|------|--|------------|-----|----------|------|------|---|---|------------------------------|--|

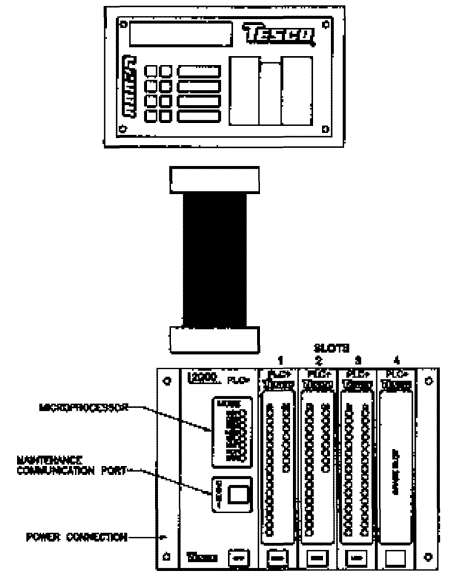
OKALOOSA STANDARD  
LIFT STATION RTU PANEL  
120/240 VOLT



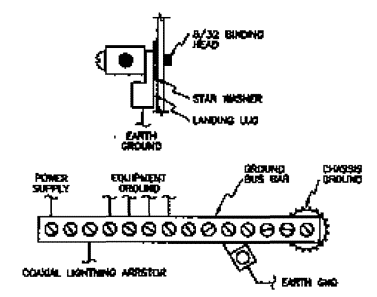
PLC POWER DISTRIBUTION & CONTROL

TVSS 120V AC (HOLD OPEN) PLC-2, SLOT 1, CN 77  
SEE DRAWING NO. FOR CONTINUATION.

POWER FAIL (HOLD OPEN) 120 VAC POWER STATUS FAIL  
PLC-1, SLOT 1, CN 77  
SEE DRAWING NO. FOR CONTINUATION.



L2000 PROGRAMMABLE LOGIC CONTROLLER LAYOUT



EQUIPMENT GROUNDING DETAIL

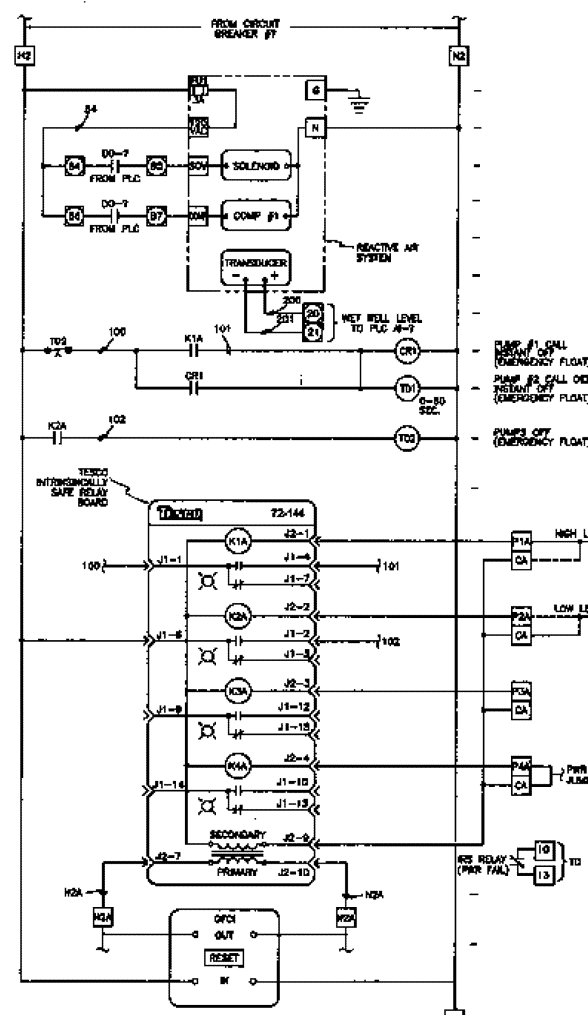
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| DATE | ISSUED FOR | NO. | REVISION | DATE | CHK. | DATE | CHK. | DATE | CHK. | DATE | CHK. | DATE | CHK. | DATE | CHK. | DATE | CHK. | DATE | CHK. | DATE | CHK. |
|      |            |     |          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

|              |          |       |
|--------------|----------|-------|
| DESIGNER     | APPROVED | SCALE |
| DRAWN BY     | APPROVES |       |
| ENGINEER     |          |       |
| PROJECT MGR. |          |       |
| CHECKED BY   | DATE     |       |
|              | MAY 2008 |       |

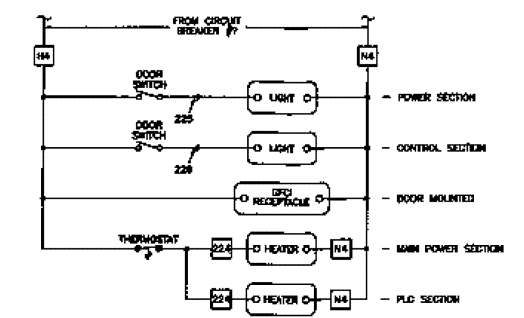
OKALOOSA STANDARD  
LIFT STATION RTU PANEL  
120/240 VOLT

|             |
|-------------|
| SCALE       |
| PROJECT NO. |
| DRAWING NO. |
| SHEET       |
| 5 of 14     |

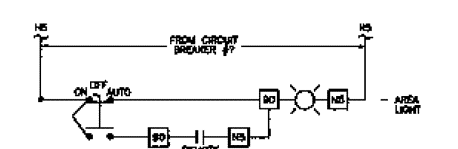




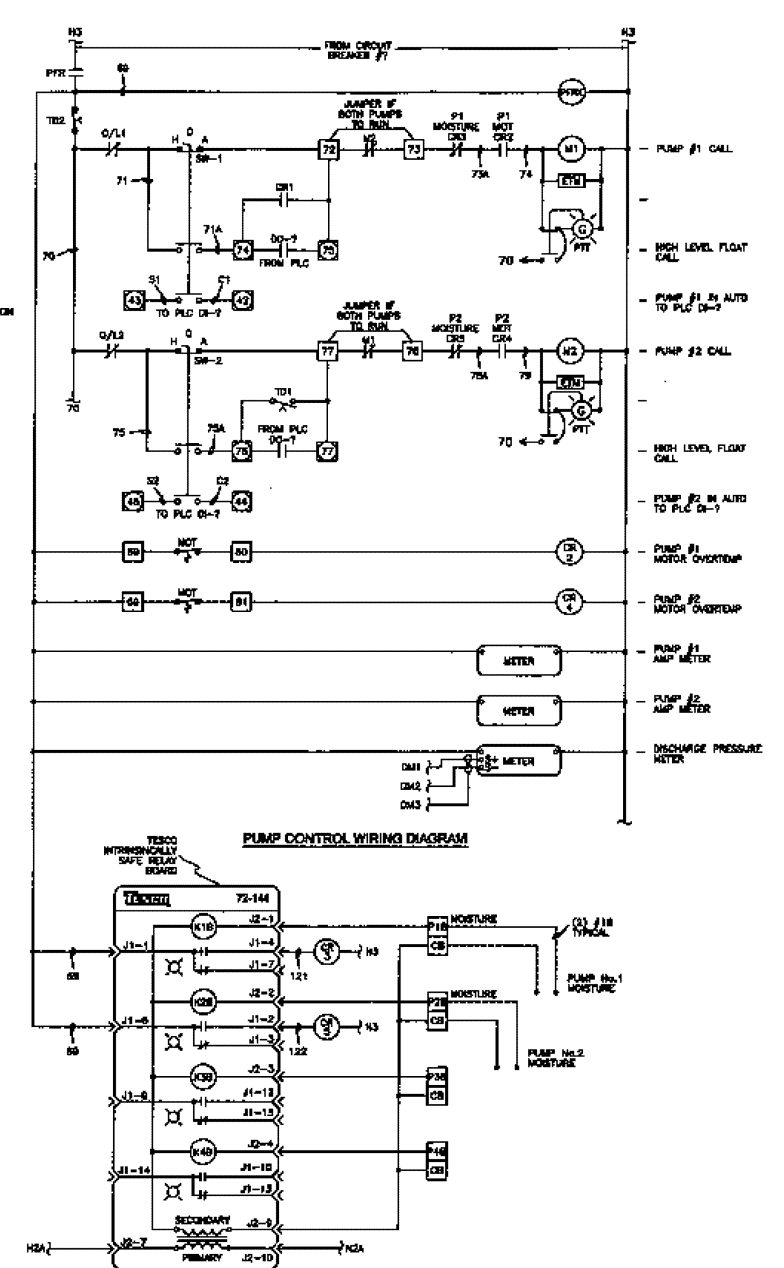
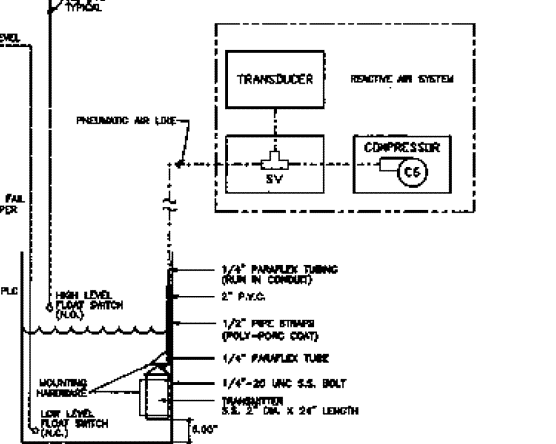
REACTIVE AIR SYSTEM MISCELLANEOUS WIRING DIAGRAM



MISCELLANEOUS WIRING DIAGRAM



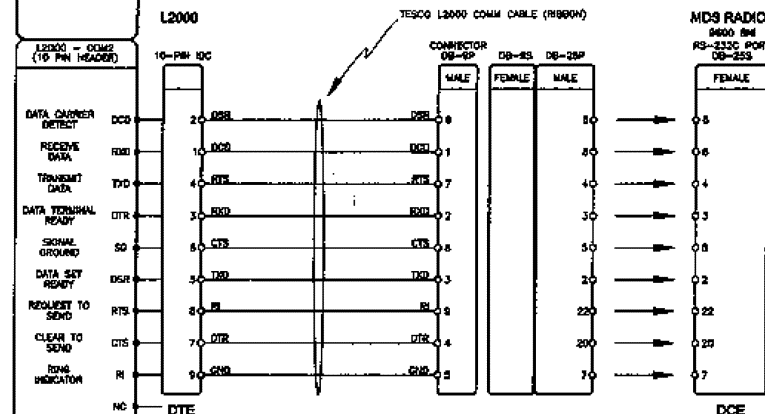
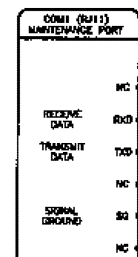
REACTIVE AIR SYSTEM PNEUMATIC AIR DIAGRAM



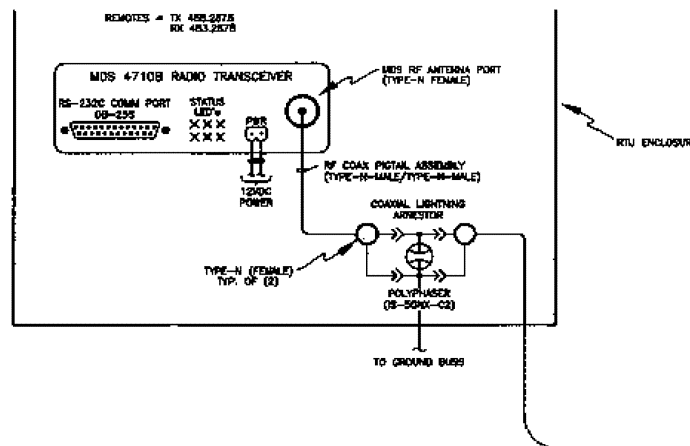
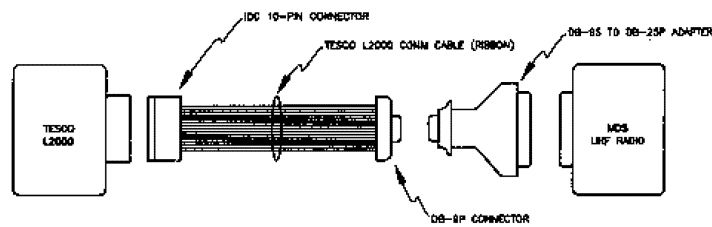
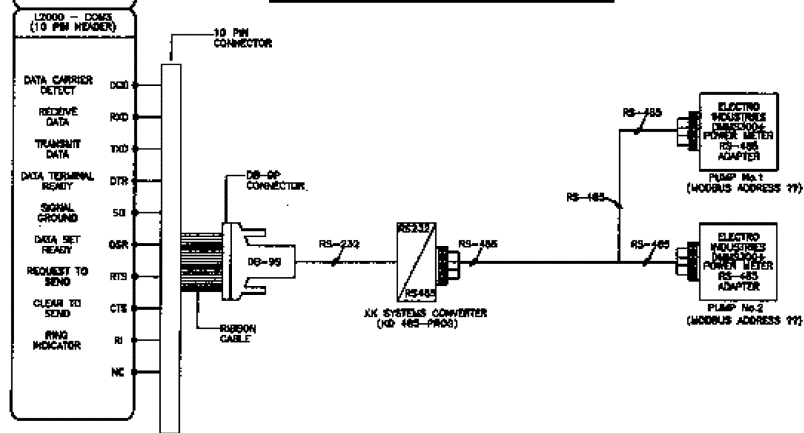
PUMP CONTROL WIRING DIAGRAM

|   |            |     |          |      |      |  |          |          |       |   |
|---|------------|-----|----------|------|------|--|----------|----------|-------|---|
| DATE  | ISSUED FOR | NO. | REVISION | DATE | CHK. | VERIFY SCALES<br>ONE IS ONE INCH ON<br>DECIMAL DIVIDER<br>IF NOT ONE INCH ON<br>THESE SCALES ACCORDINGLY | DESIGNER | APPROVER | SCALE | SCALE                                       |
|   |            |     |          |      |      |  |          |          |       |   |
| OKALOOSA STANDARD<br>LIFT STATION RTU PANEL<br>120/240 VOLT |            |     |          |      |      |  |          |          |       | PROJECT NO.<br>DRAWING NO.<br>SHEET 6 of 14 |

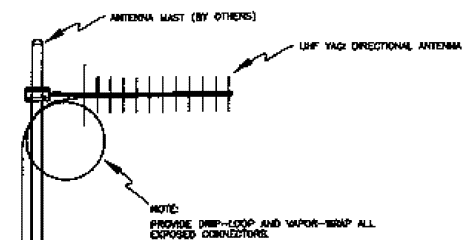
L2000 COMMUNICATIONS PORTS



L2000-TO-MDS RADIO INTERFACE WIRING DIAGRAM



RADIO BLOCK DIAGRAM (REF TO SCALE)

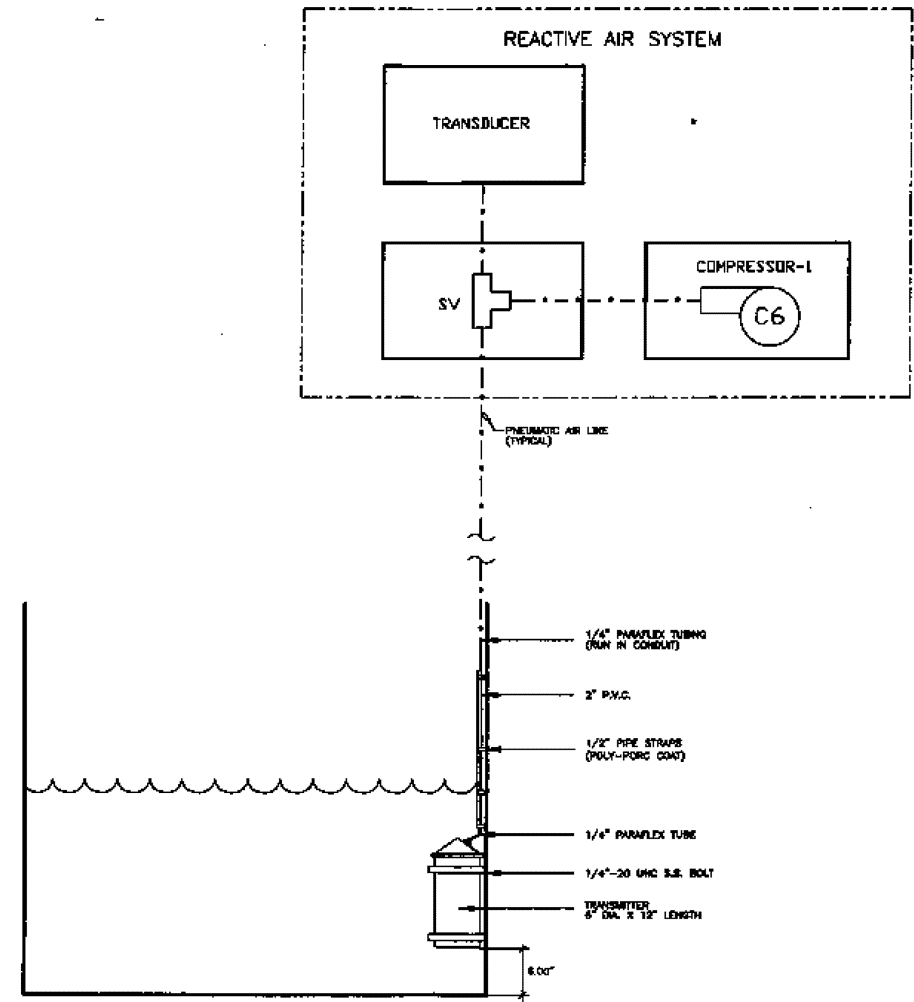


RF ANTENNA FEEDLINE (1/2" FSWL 50 OHM) (TIMES LMR-400 w/ TIMES E2-400-100C MALE RF CONNECTORS)

NOTE: FACTORY TERMINATE FEEDLINE AT ANTENNA END ONLY!

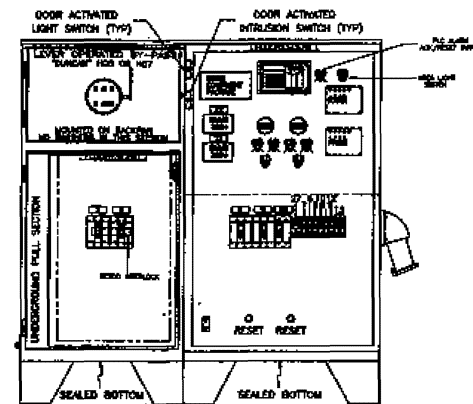
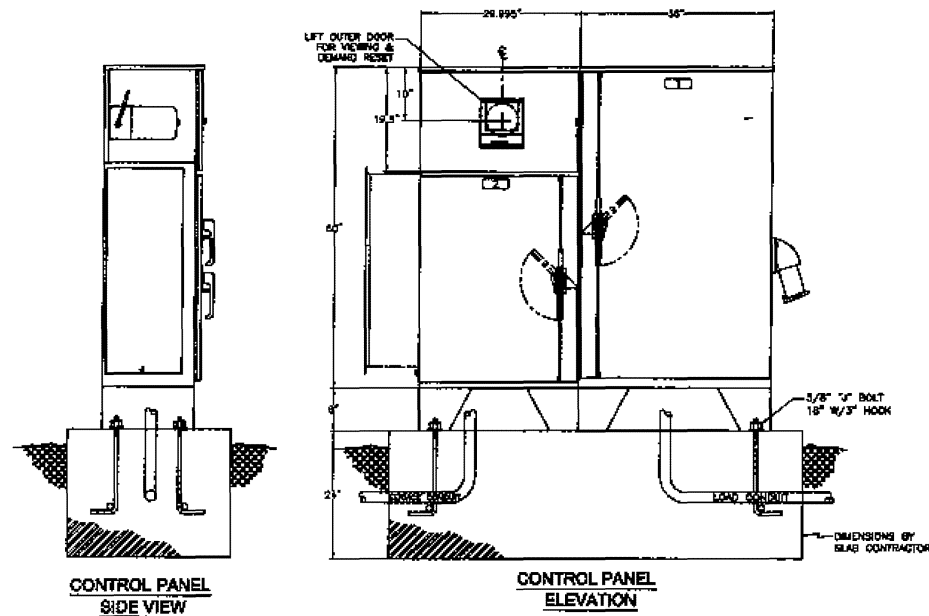
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|------|------------|-----|--------|------|-----|--|-------------|----------|-------------|
| DATE | ISSUED FOR | NO. | REASON | DATE | CHK | VERIFY SCALES  | DESIGNER    | APPROVED | SCALE       |
|      |            |     |        |      |     | MIN IS ONE INCH ON ORIGINAL DRAWING                      |             |          |             |
|      |            |     |        |      |     | IF NOT ONE INCH ON THE SPECIFICATION, SOLDER ACCORDINGLY |             |          |             |
|      |            |     |        |      |     |  | DESIGNED BY | APPROVED | PROJECT NO. |
|      |            |     |        |      |     |  | CHECKED BY  | DATE     | 7 of 14     |

OKALOOSA STANDARD  
LIFT STATION RTU PANEL  
120/240 VOLT

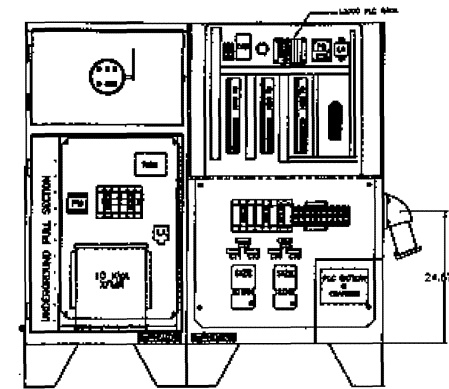


REACTIVE-AIR SYSTEM PNEUMATIC AIR DIAGRAM

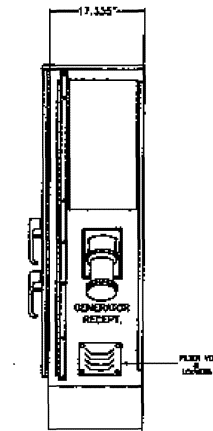
|  |  |    |  |  |      |   |             |          |          |   |
|--|--|----|--|--|------|---|-------------|----------|----------|---|
|  |  | OR |  |  | 6/10 | VERIFY SCALES<br>USE 1/8" DIA. DIA. OR<br>ORIGINAL DRAWING  | DESIGNED    | APPROVED | SEAL     | SCALE   |
|  |  |    |  |  |      | IF NOT ONE INCH OR<br>THE NEXT LARGEST<br>SCALE ACCORDINGLY | DRAWN BY    | APPROVED |          | PROJECT NO.   |
|  |  |    |  |  |      |   | ENGINEER    | APPROVED |          | DRIVING NO.   |
|  |  |    |  |  |      |   | PROJECT NO. | DATE     | MAY 2006 | DRAWN BY  |
|  |  |    |  |  |      |   | CHECKED BY  |          |          | SHEET 8 of 14   |
|  |  |    |  |  |      |   |             |          |          | OKALOOSA STANDARD<br>LIFT STATION RTU PANEL<br>120/240 VOLT |



**CONTROL PANEL  
INNER DEADFRONT DOOR**  
(SHOWN WITH OUTER DOORS REMOVED)



**CONTROL PANEL  
BACKPAN LAYOUT**  
(SHOWN WITH ALL DOORS REMOVED)



**CONTROL PANEL  
SIDE VIEW**

| NAMEPLATE SCHEDULE |     |                                    |
|--------------------|-----|------------------------------------|
| TAG#               | QTY | DESCRIPTION                        |
| 1                  | 1   | PLATE PUMP CONTROL PANEL           |
| 2                  | 1   | PLATE SERVICE PANEL                |
| 3                  | 1   | PLATE MAIN DISCONNECT              |
| 4                  | 1   | PLATE GENERATOR DISCONNECT         |
| 5                  | 1   | PLATE PUMP No.1 DISCONNECT         |
| 6                  | 1   | PLATE PUMP No.2 DISCONNECT         |
| 7                  | 1   | PLATE PLC                          |
| 8                  | 1   | PLATE LEVEL CONTROLS               |
| 9                  | 1   | PLATE PUMP CONTROLS                |
| 10                 | 1   | PLATE HEATERS, LIGHTS & RECEPTACLE |
| 11                 | 1   | PLATE AREA LIGHT                   |
| 12                 | 1   | PLATE SPARE                        |
| 13                 | 1   | PLATE SPARE DISTRIBUTION BREAKERS  |
| 14                 |     |                                    |
| 15                 | 1   | RING PUMP No.1 RUNNING             |
| 16                 | 1   | RING PUMP No.1 FAILURE             |
| 17                 | 1   | RING PUMP No.1 HAND OFF AUTO       |

1. U.L. LISTED "INDUSTRIAL CONTROL PANEL" FOR U.L. 508 WITH SERVICE ENTRANCE RATING.

| NAMEPLATE SCHEDULE |     |  |
|--------------------|-----|--|
| TAG#               | QTY | DESCRIPTION  |
| 19                 | 1   | RING PUMP No.2 RUNNING   |
| 20                 | 1   | RING PUMP No.2 FAILURE   |
| 21                 | 1   | RING PUMP No.2 HAND OFF AUTO   |
| 22                 | 1   | RING ELECTRO INDUSTRIES POWER MONITOR VOLTAGE, AMPS, PHASE LOSS & KW |
| 23                 | 1   | RING ELECTRO INDUSTRIES POWER MONITOR VOLTAGE, AMPS, PHASE LOSS & KW |
| 24                 | 1   | RING PLC ALARM ACK/RESET SWITCH                                      |
| 25                 | 1   | RING AREA LIGHT ON OFF   |
| 26                 | 1   | PLATE TRANSFORMER PRIMARY DISCONNECT                                 |
| 27                 | 1   | PLATE TRANSFORMER SECONDARY DISCONNECT                               |
| 28                 | 1   | PLATE  |
| 29                 | 1   | PLATE  |
| A                  | 1   | PLATE HIGH LEVEL FLOAT   |
| B                  | 1   | PLATE LOW LEVEL FLOAT  |
| E                  | 1   | PLATE PUMP No. 1 MOISTURE  |
| F                  | 1   | PLATE PUMP No. 2 MOISTURE  |

PLATES 1/2" x 1 1/2"

**ENCLOSURE CONSTRUCTION NOTES**

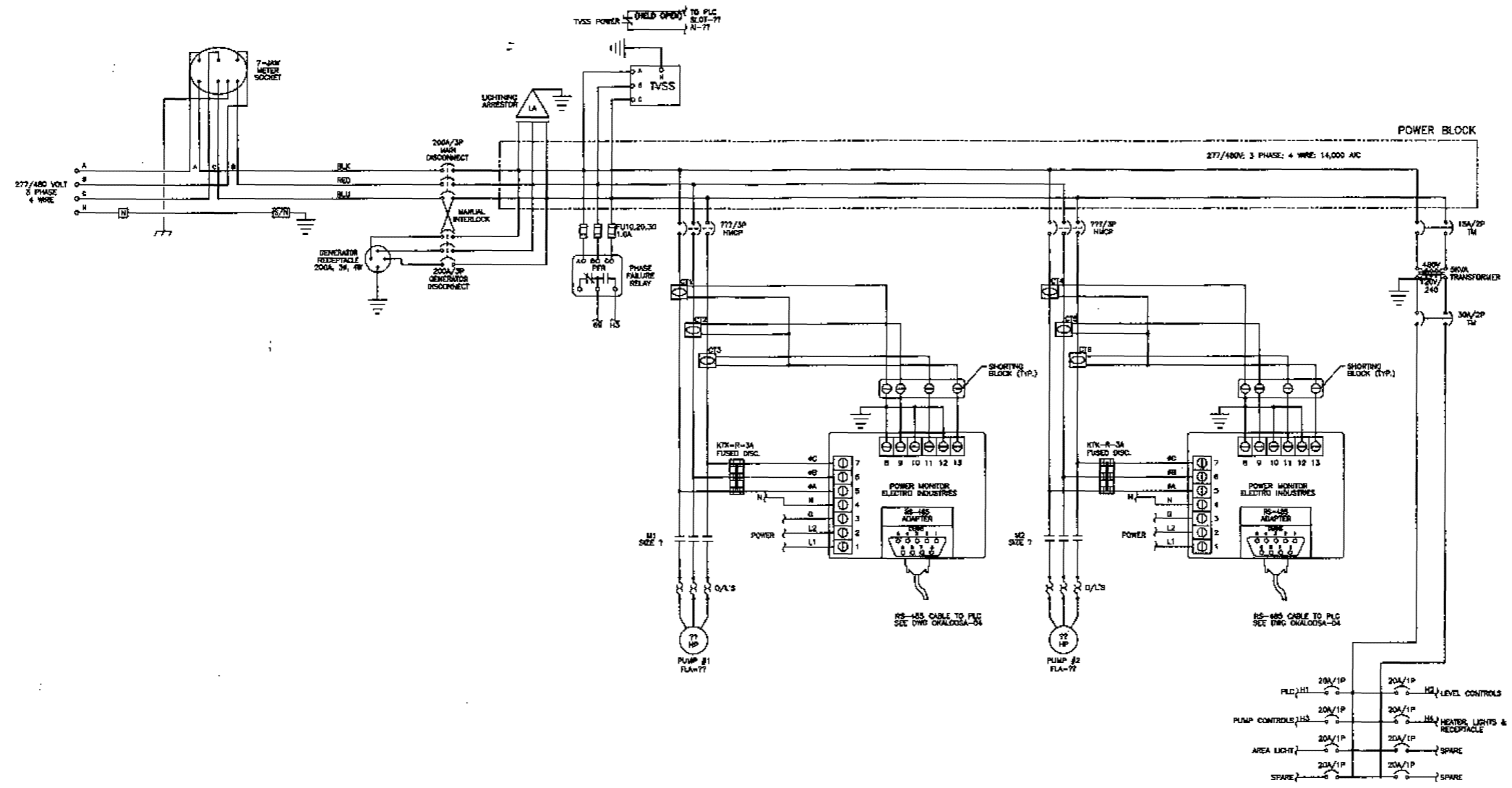
- EXTERIOR 16 GA. 304 2D S.S AND INTERIOR 14 GA. COLD ROLLED STEEL ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
- CONSTRUCTION WILL BE NEMA 3D.
- ALL NUTS, BOLTS, SCREWS AND NIBBLES WILL BE STAINLESS STEEL.
- NUTS, BOLTS & SCREWS WILL NOT BE VISIBLE FROM EXTERIOR OF ENCLOSURE.
- PUNCHED HANDPLATES WILL BE PROVIDED AS REQUIRED.
- CONTROL WIRING WILL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
- A PLASTIC COVERED WIRING DIAGRAM WILL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
- ENCLOSURE WILL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.

**TESCO'S POLY-PORC COATING SYSTEM**

- \*PAINT INTERIOR COMPONENTS ONLY\*
- INCLUDES A FIVE STAGE OF TANK METAL PREPARATION PROCESS
- ALKALINE CLEANER 100°F.
  - CLEAN WATER RINSE.
  - IRON PHOSPHATE APPLICATION 150°F.
  - CLEAN WATER RINSE.
  - FINISHIVE RINSE TO SEAL PHOSPHATED SURFACES 120°F.
- FINISHED WITH AN ELECTROSTATICALLY APPLIED DRY POLYESTER POWDER COATING THEN BAKED @ 380°F TO CURE.

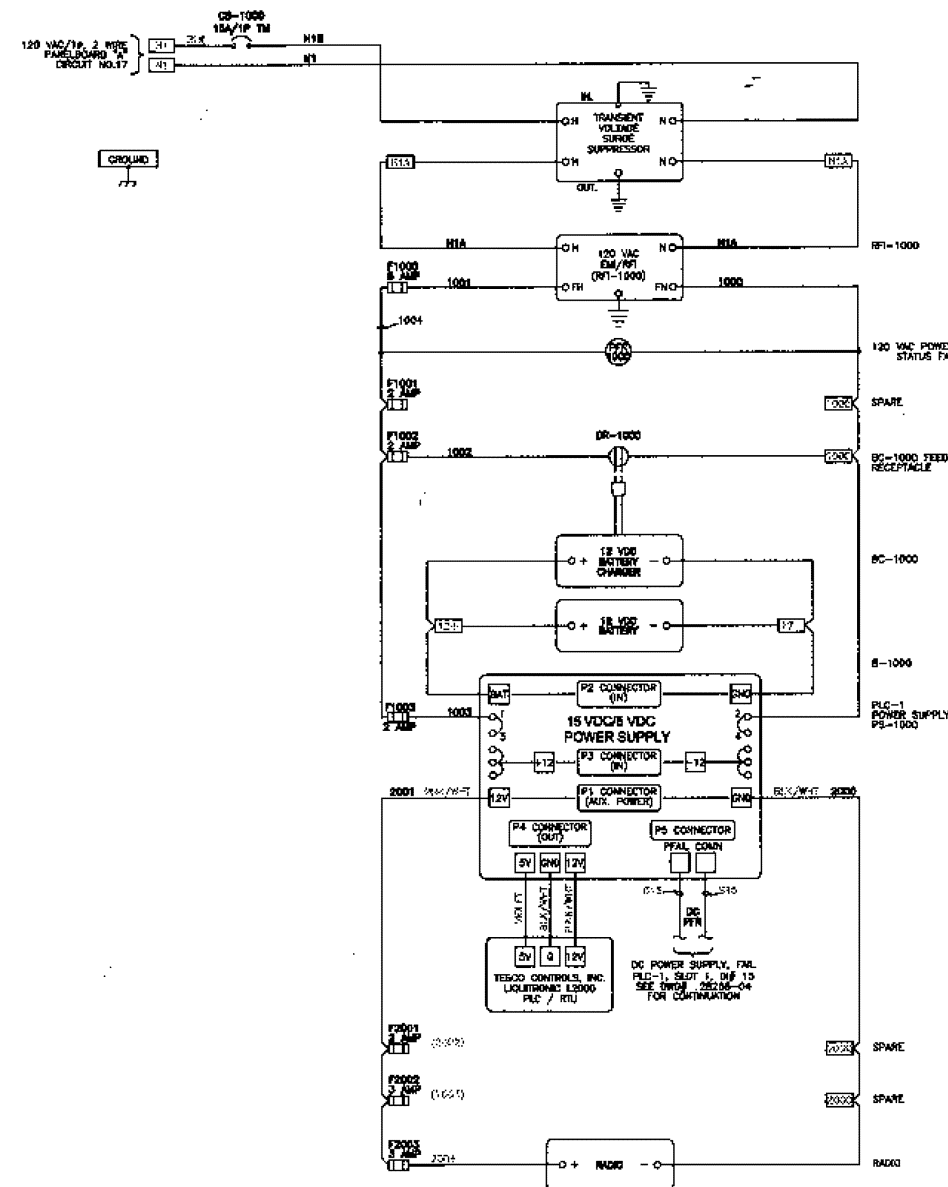
|      |            |     |          |      |    |  |  |  |     |       |             |             |               |
|------|------------|-----|----------|------|----|--|--|--|-----|-------|-------------|-------------|---------------|
| DATE | ISSUED FOR | NO. | REVISION | DATE | BY | VERIFY SCALES<br>1/8" = 1" OR ONE INCH ON ORIGINAL DRAWING<br>0 1"<br>IF NOT ONE INCH ON THE SHEET, SCALES ACCORDINGLY | DESIGNER<br>DRAWN BY<br>ENGINEER<br>PROJECT MGR.<br>CHECKED BY | APPROVED<br>APPROVED<br>DATE<br>MAY 2008 | SOL | SCALE | PROJECT NO. | DRAWING NO. | SHEET 9 of 14 |
|------|------------|-----|----------|------|----|--|--|--|-----|-------|-------------|-------------|---------------|

OKALOOSA STANDARD  
LIFT STATION RTU PANEL  
277/480 VOLT



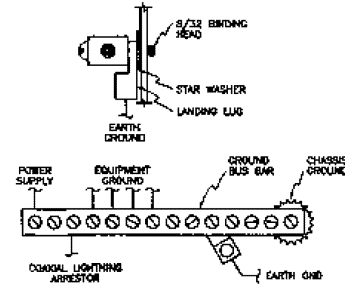
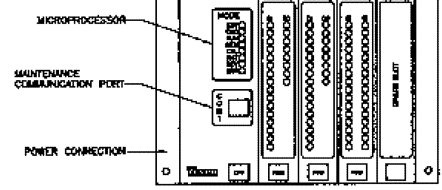
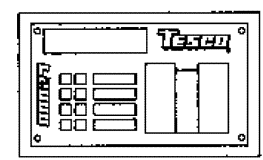
THREE LINE POWER DIAGRAM

|      |            |     |          |      |    |  |  |   |   |
|------|------------|-----|----------|------|----|--|--|---|---|
| DATE | ISSUED FOR | NO. | REVISION | DATE | BY | VERIFY SCALES<br>1/4" = 1" OR 1/8" = 1" ON<br>DIMENSIONS EXCEPTED<br>IF NOT ONE INCH ON<br>THIS SHEET ADJUST<br>SCALES ACCORDINGLY | DESIGNER<br>DRAWN BY<br>ENGINEER<br>PROJECT MGR<br>CHECKED BY        | APPROVED<br>APPROVED<br>DATE<br><b>MAY 2006</b> | SOL<br>SCALE<br>PROJECT NO.<br>SHEET NO.<br><b>10 of 14</b> |
|      |            |     |          |      |    |  | <b>OKALOOSA STANDARD<br/>LIFT STATION RTU PANEL<br/>277/480 VOLT</b> |   |   |



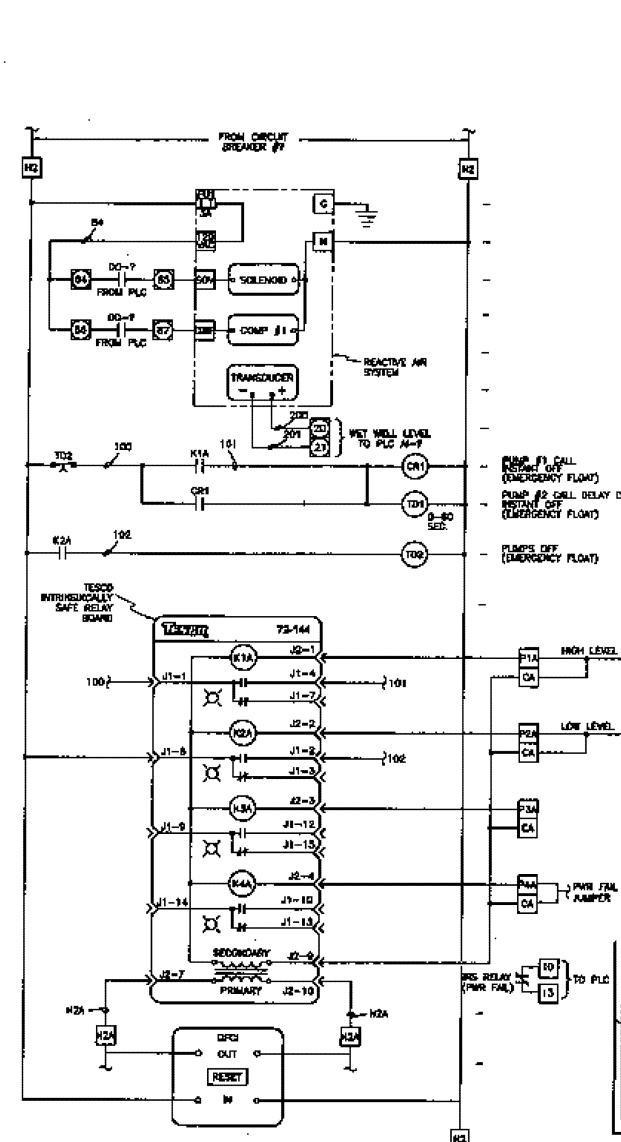
TVSS 120V (FIELD OPEN) PLC-1, SLOT 2, DIF 77  
SEE DRAWING NO. FOR CONTINUATION.

POWER FAIL (FIELD OPEN) 120 VAC POWER STATUS FAIL  
PLC-1, SLOT 7, DIF 77  
SEE DRAWING NO. FOR CONTINUATION.

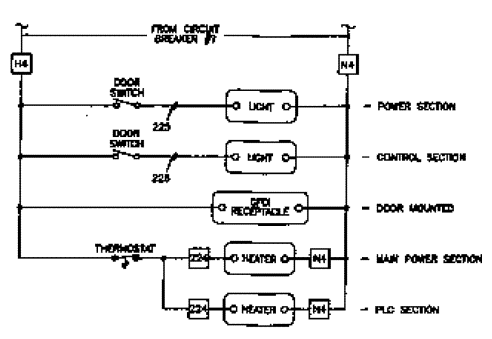


PLC POWER DISTRIBUTION & CONTROL

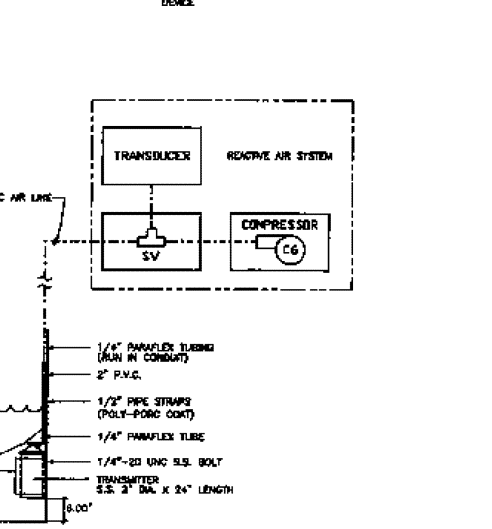
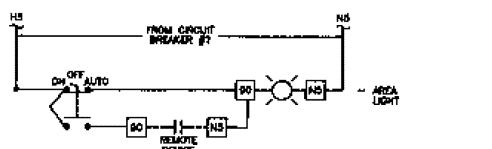
|      |            |     |          |      |      |      |  |          |          |          |              |            |          |          |          |       |       |   |             |          |
|------|------------|-----|----------|------|------|------|--|----------|----------|----------|--------------|------------|----------|----------|----------|-------|-------|---|-------------|----------|
| DATE | ISSUED FOR | NO. | REVISION | DATE | ENG. | 6/05 | VERIFY SCALES<br>AND IS ONE INCH ON<br>DIMENSION DRAWINGS<br>IF NOT ONE INCH ON<br>THIS SHEET ADJUST<br>SCALES ACCORDINGLY | DESIGNER | DRAWN BY | ENGINEER | PROJECT MGR. | CHECKED BY | DATE     | APPROVED | APPROVED | SCALE | SCALE | PROJECT NO.   | DRAWING NO. | SHEET    |
|      |            |     |          |      |      |      |  |          |          |          |              |            | MAY 2008 |          |          |       |       | OKALOOSA STANDARD<br>LIFT STATION RTU PANEL<br>277/480 VOLT |             | 11 OF 14 |



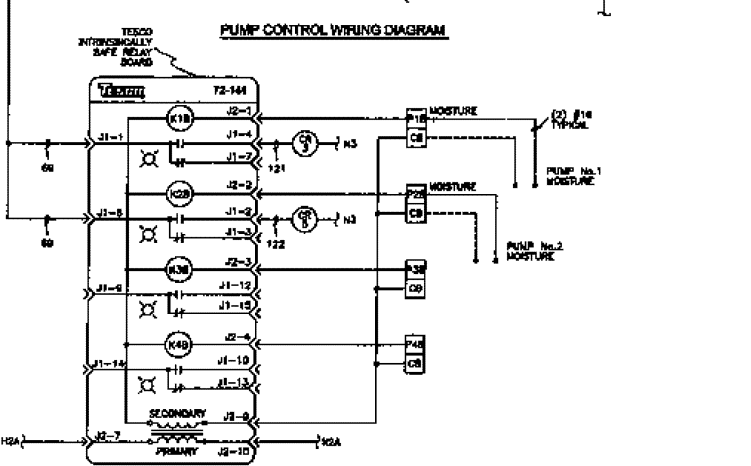
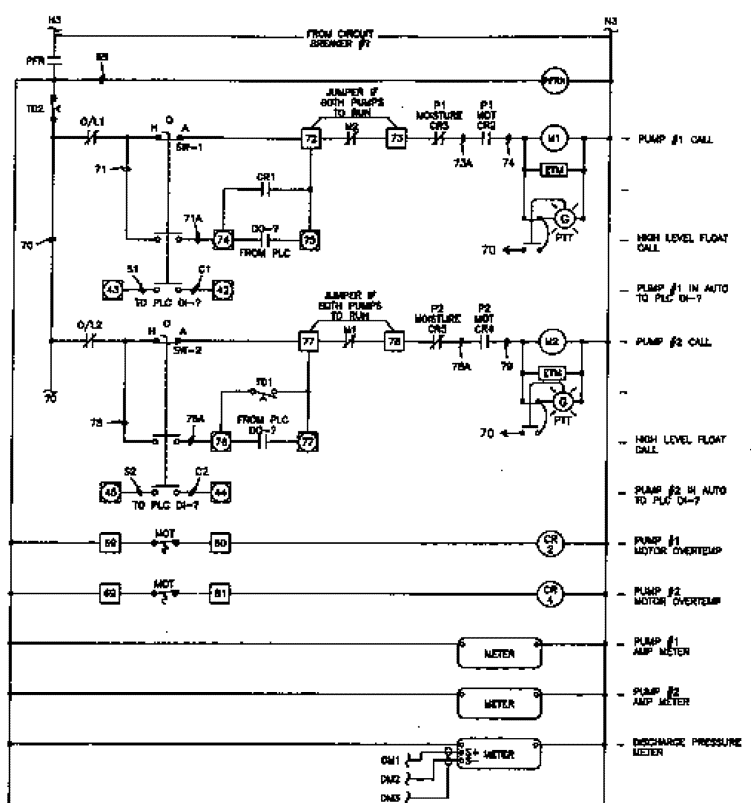
REACTIVE AIR SYSTEM MISCELLANEOUS WIRING DIAGRAM



MISCELLANEOUS WIRING DIAGRAM



REACTIVE AIR SYSTEM PNEUMATIC AIR DIAGRAM



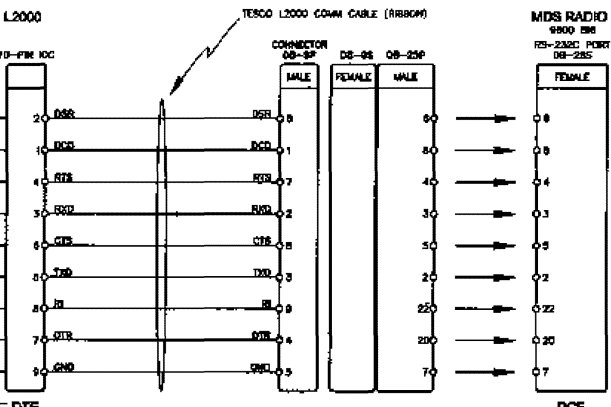
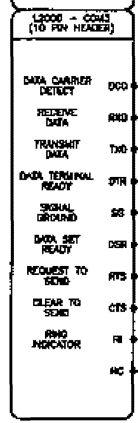
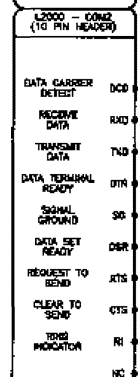
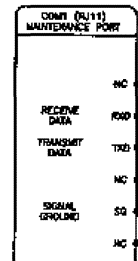
PUMP CONTROL WIRING DIAGRAM

| DATE | ISSUED FOR | NO. | REVISION | DATE | DES. | SCALE | APPROVED | SEAL | SCALE |
|------|------------|-----|----------|------|------|-------|----------|------|-------|
|      |            | 00  |          | 6/00 |      |       |          |      |       |

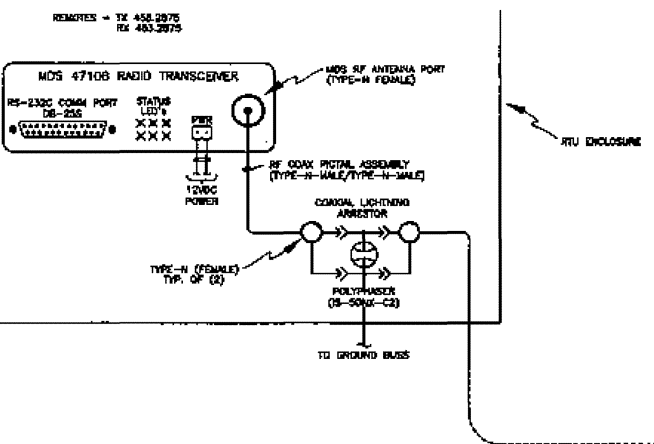
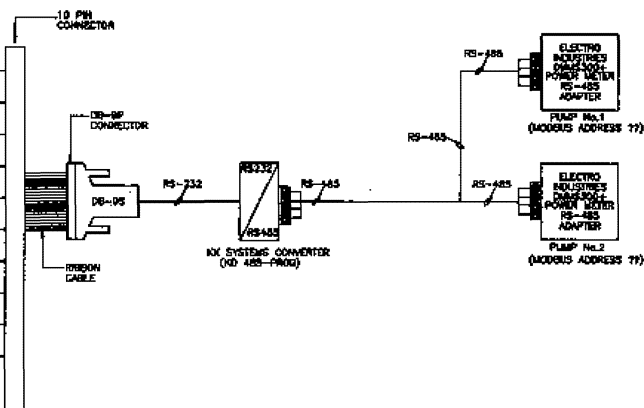
  

|  |  |   |                             |   |  |
|--|--|---|-----------------------------|---|--|
| <p>VERIFY SCALES<br/>         MAX IS ONE INCH ON ORIGINAL DRAWING<br/>         0 1'</p> <p>IF NOT ONE INCH ON THIS SHEET LIST SCALES ACCORDINGLY</p> | <p>DESIGNED BY</p> <p>DRAWN BY</p> <p>ENGINEER</p> <p>PROJECT MGR.</p> <p>CHECKED BY</p> | <p>APPROVED</p> <p>APPROVER</p> <p>DATE</p> | <p>DATE</p> <p>MAY 2000</p> | <p>OKALOOSA STANDARD<br/>         LIFT STATION RTU PANEL<br/>         277480 VOLT</p> | <p>SCALE</p> <p>PROJECT NO.</p> <p>DRAWING NO.</p> <p>SHEET 12 OF 14</p> |
|--|--|---|-----------------------------|---|--|

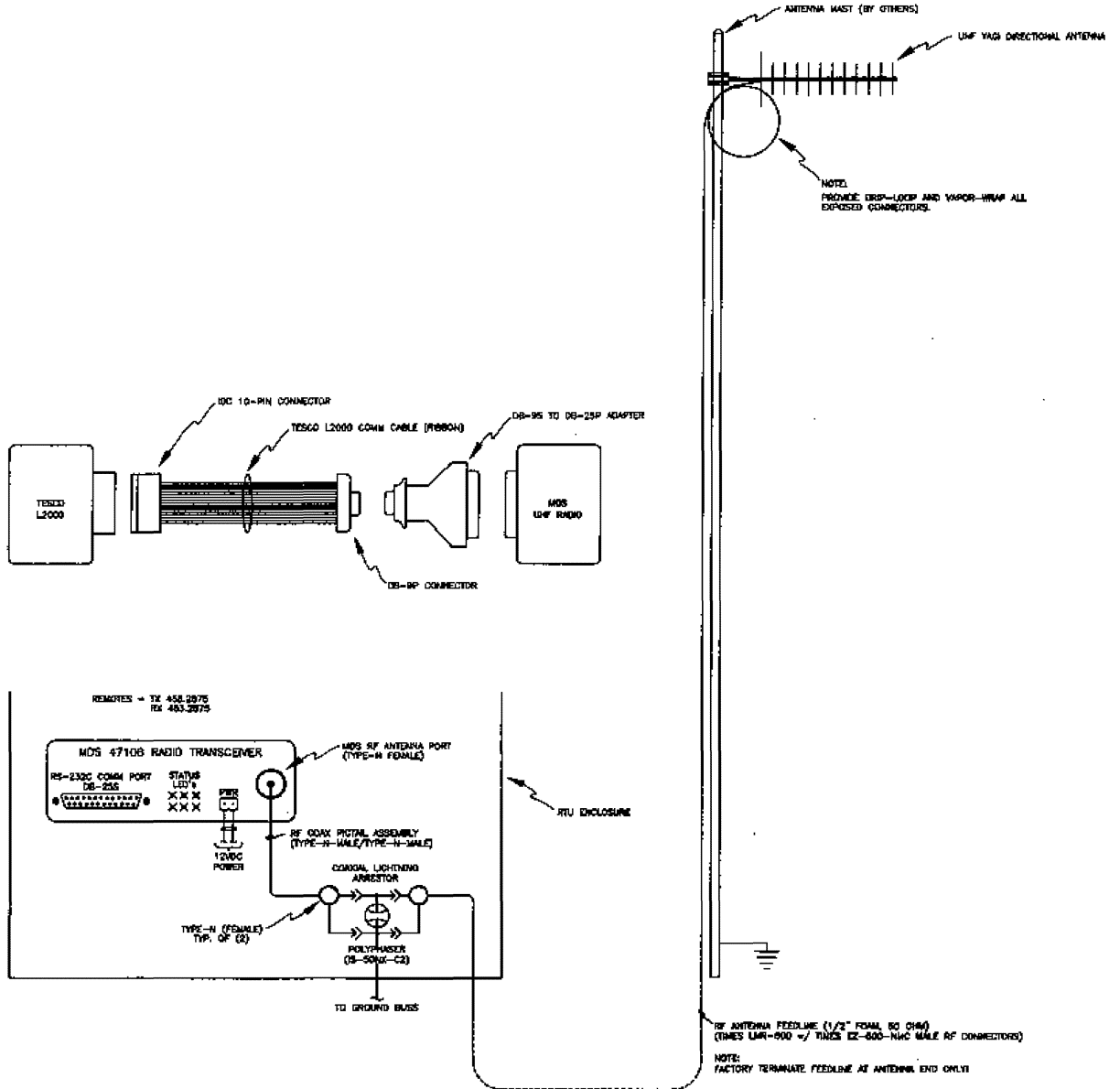
L2000 COMMUNICATIONS PORTS



L2000-TO-MDS RADIO INTERFACE WIRING DIAGRAM



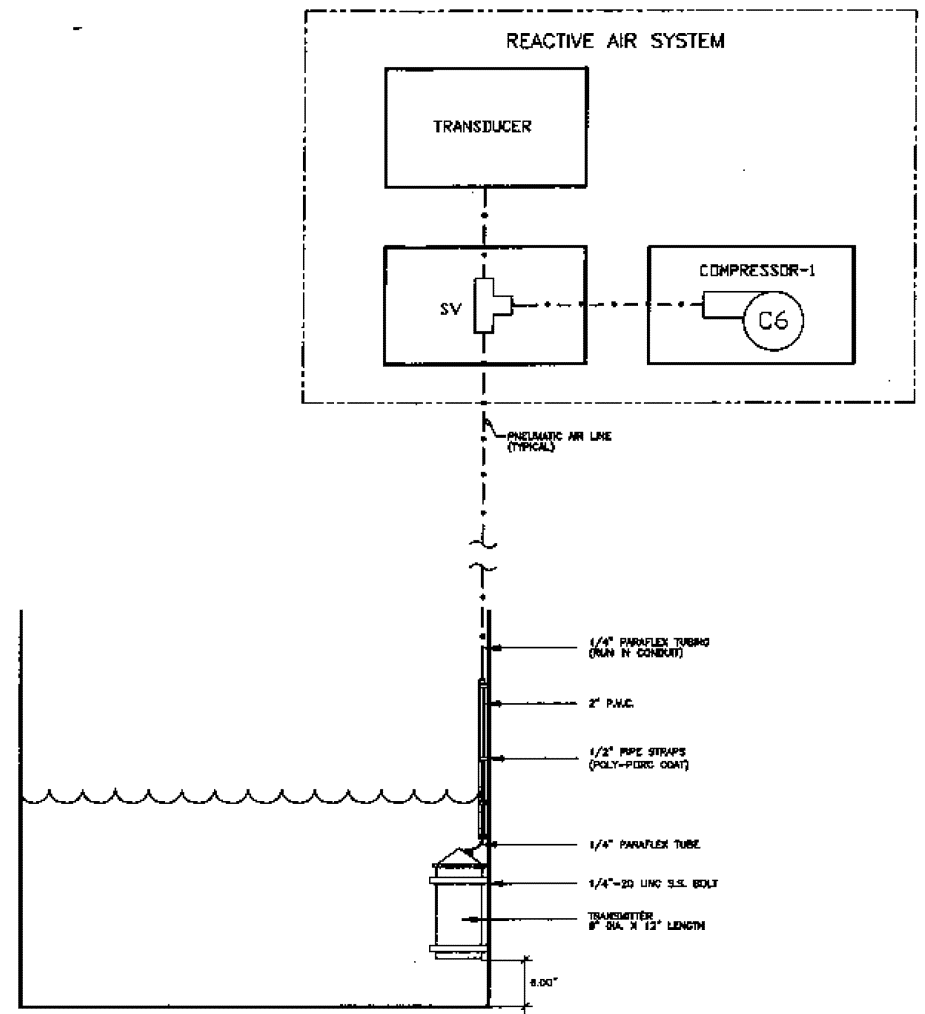
RADIO BLOCK DIAGRAM (NOT TO SCALE)



IF ANTENNA FEEDLINE (1/2" FEMAL, 50 OHM) (THRU LMR-500 +/- THRU EE-500-NMC MALE RF CONNECTORS)  
NOTE: FACTORY TERMINATE FEEDLINE AT ANTENNA END ONLY!

|      |  |            |     |          |      |      |          |          |            |          |          |       |   |             |          |
|------|--|------------|-----|----------|------|------|----------|----------|------------|----------|----------|-------|---|-------------|----------|
| DATE |  | ISSUED FOR | NO. | REVISION | DATE | ENR. | DESIGNER | DRAWN BY | CHECKED BY | DATE     | APPROVED | SCALE | PROJECT NO.   | DRAWING NO. | SHEET    |
|      |  |            |     |          |      |      |          |          |            | MAY 2008 |          |       | OKALOOSA STANDARD<br>LIFT STATION RTU PANEL<br>277/480 VOLT |             | 13 of 14 |





REACTIVE-AIR SYSTEM PNEUMATIC AIR DIAGRAM

|      |            |     |          |        |  |   |  |   |   |
|------|------------|-----|----------|--------|--|---|--|---|---|
|      |            | 00  |          | 6/1/05 | VERIFY SCALES:<br>1/4" IS ONE INCH ON ORIGINAL DRAWING<br>1/8" IS ONE INCH ON THIS SHEET. ADJUST SCALES ACCORDINGLY. | DESIGNER<br>DRAWN BY<br>ENGINEER<br>PROJECT NO.<br>CHECKED BY | APPROVER<br>APPROVED<br>DATE<br>MAY 2006 | SEAL<br>OKALOOSA STANDARD<br>LIFT STATION RTU PANEL<br>277/480 VOLT | SCALE<br>PROJECT NO.<br>DRAWING NO.<br>SHEET 14 of 14 |
| DATE | ISSUED FOR | NO. | REVISION | DATE   | CHK  |   |  |   |   |