315 Drainage Structures

315.1 General

Drainage Structure sheets show the following information:

- Drainage structures and their location
- Cross section
- Flow line elevations
- Top of grates
- Culverts and top of manhole elevations
- Vertical relationships of the entire drainage system

All projects require the plotting of drainage structures. When only cross drains are to be constructed or modified, drainage structures may be plotted on the cross section sheets. Otherwise drainage structures should be plotted on separate drainage structure sheets, utilizing the cross section sheet cell available in the FDOT CADD Software. See ***FDM 324*** for additional requirements for box and three-sided culverts utilized as drainage structures. Examples of Drainage Structures sheets are included in ***Exhibits 315-1*** through ***315-5***.

315.2 Required Information

For flush shoulder projects, show the existing ground line at the location of the structure, with the existing elevation placed immediately below the ground line at the survey baseline. Do not show existing structures, except those to be incorporated into the proposed drainage system or otherwise modified. Note the flow line elevations of the drainage structures shown in the plans. Where storm drains run laterally or diagonally across the project, the drawing should show the pipe cover.

Show the roadway template and proposed structures, with the proposed profile grade elevation, placed above the grade point. Locate the structure by station and offset from the centerline of construction. Provide flow line information at each structure and at each culvert end. Plot drainage structure details according to the applicable ***Standard Plans*** Index; e.g., show walls, grates, tops, pipes.

Include the size and length of each proposed structure on the cross drain sections. Show box and three-sided culvert lengths on the drainage structure sheet.

Depict sections for skewed cross drains along the centerline of the structure. Clear zone distances are to be measured at right angles to the traffic lane for all structures.

Determine where the construction of a drainage structure may have potential impact on existing R/W.

Note the following information for each drainage structure:

- Size
- End treatment
- Flow lines
- Structure
- Index
- Station number
- Flow direction arrows

Place the note as close to the structure as possible. Provide elevations for manhole tops, and ditch bottom inlet grates and slots. Show grate elevations for gutter inlets and edge of pavement elevations for curb and gutter inlets.

Include special grate treatment requirements in the inlet note. Include additional details; e.g., special bedding, 36" manhole rings.

Show material options on the Optional Materials Tabulation Sheet (see ***Exhibits 308-2*** and ***308-3*** in ***FDM 308***).

Modification for Non-Conventional Projects:
Delete sentence above and see Chapter 6 of the ***Drainage Manual*** for Optional Material documentation requirements.

If existing structures are to be filled and plugged and are to remain in place, show them in the plans with an appropriate note.

Include the following notes on the first drainage structure sheet as applicable:

(1) Special attention is directed to the fact that portions of some drainage structures extend into the stabilized portion of the roadbed and extreme caution will be necessary in stabilization operations at these locations.

(2) All drainage pipes have optional materials. The Optional Materials Tabulation Sheet(s) shows all materials allowed and indicates which material is plotted in the plans and used as the basis for pay quantities.

315.3 Utility Conflicts

Identify and resolve drainage structure conflicts with existing or proposed utilities as early in the design process as possible. Plot major underground utilities, as defined in ***FDM 221***, in conjunction with the structures to identify potential conflicts.

Plot a section for each location that a longitudinal pipe crosses a major underground utility line.

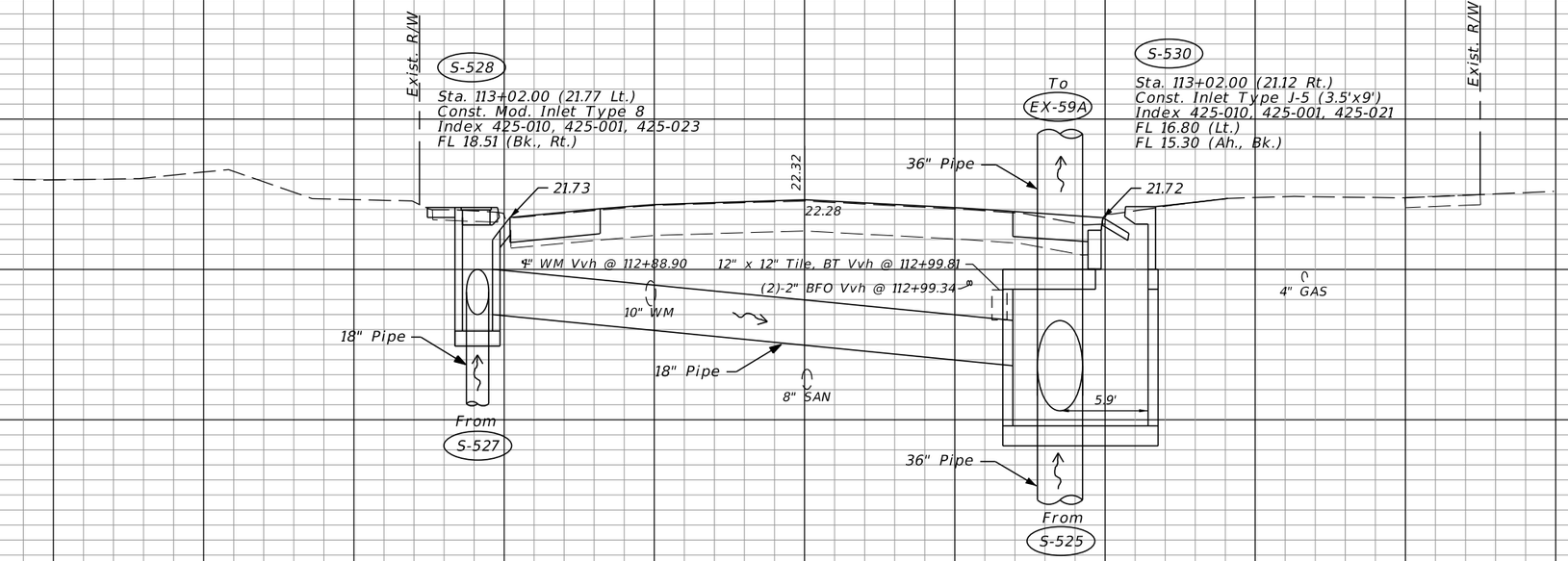
Note and plot (to scale) the utilities that have been verified (Quality Level "A" locate) in the appropriate locations on the Drainage Structure Sheets, Cross Section Sheets and bridge foundation plans. These utilities should be labeled with the following symbol:

V_{vh} = Verified Vertical Elevation and Horizontal Location

315.4 Sheet Setup

Plot drainage structures as sections along the centerline of the structure and show on a standard cross section sheet. Space the sections sufficiently to avoid overlapping of structures or notes. Label the station and offsets from the appropriate baseline or centerline, as indicated in the ***Standard Plans***. Beginning at the bottom of the sheet, show the sections successively by stations and number them sequentially, from the beginning to the end of the project. Show the structure number and location station near the right border of the sheet.

If a structure must be shown out of order, place a note in the correct sequence, referring to the sheet where the structure is shown. Use the same scale that is used for roadway cross sections, with the centerline of construction placed near the center of the sheet.



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LUKE S. WALKER, P.E.
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ROADWAY ENGINEERS, INC.
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TALLAHASSEE, FL 32301
CERTIFICATE OF AUTHORIZATION: 12345

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 22	BAY	123456-1-52-01

DRAINAGE STRUCTURES

SHEET NO.

10/30/2017 1:59:35 PM

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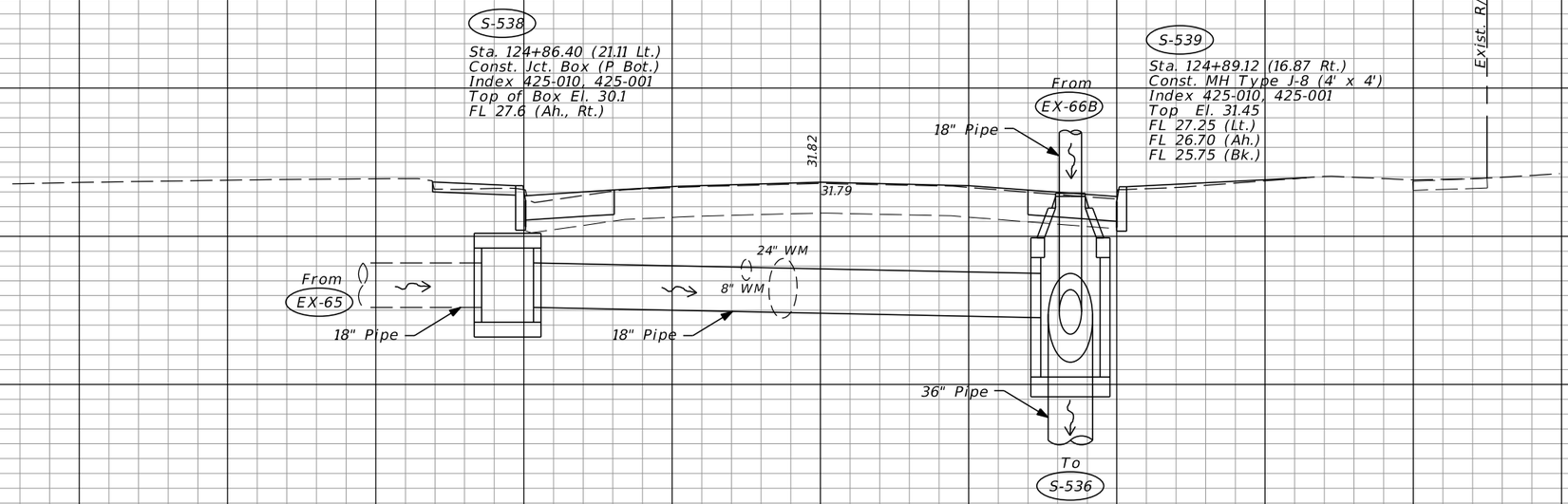

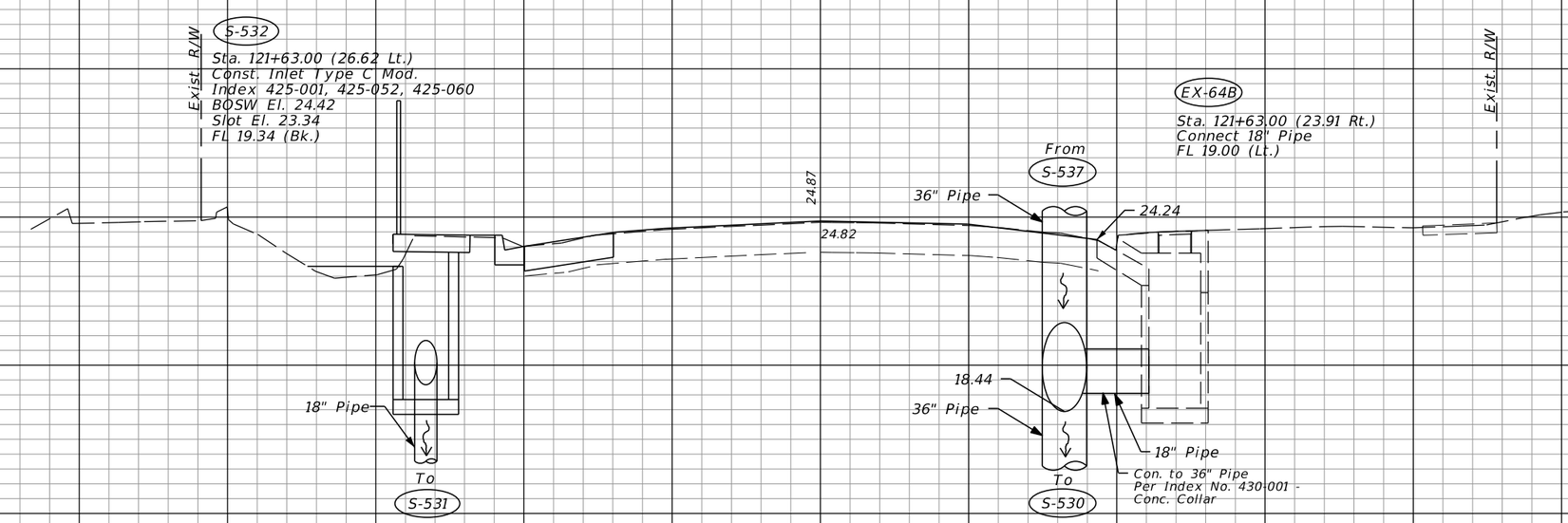

S-539
124+89.12
S-538
124+86.40
S-537
NOT USED

S-532
EX-64B
121+63.00

Scale: 1"=10' Horiz.
1"=5' Vert.

Exhibit 315-2
Date: 1/1/13

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
10	LEON	123456-7-52-01

DRAINAGE STRUCTURES

SHEET NO.

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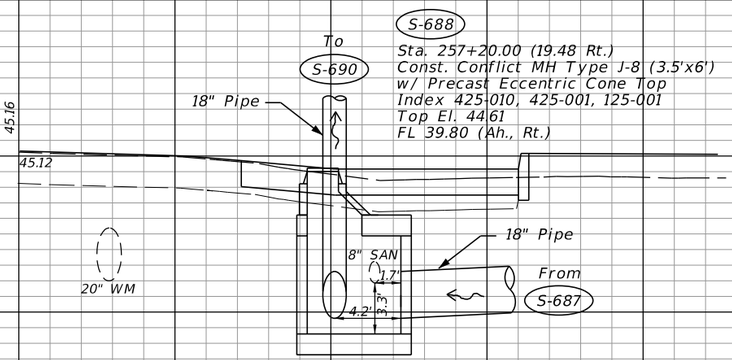
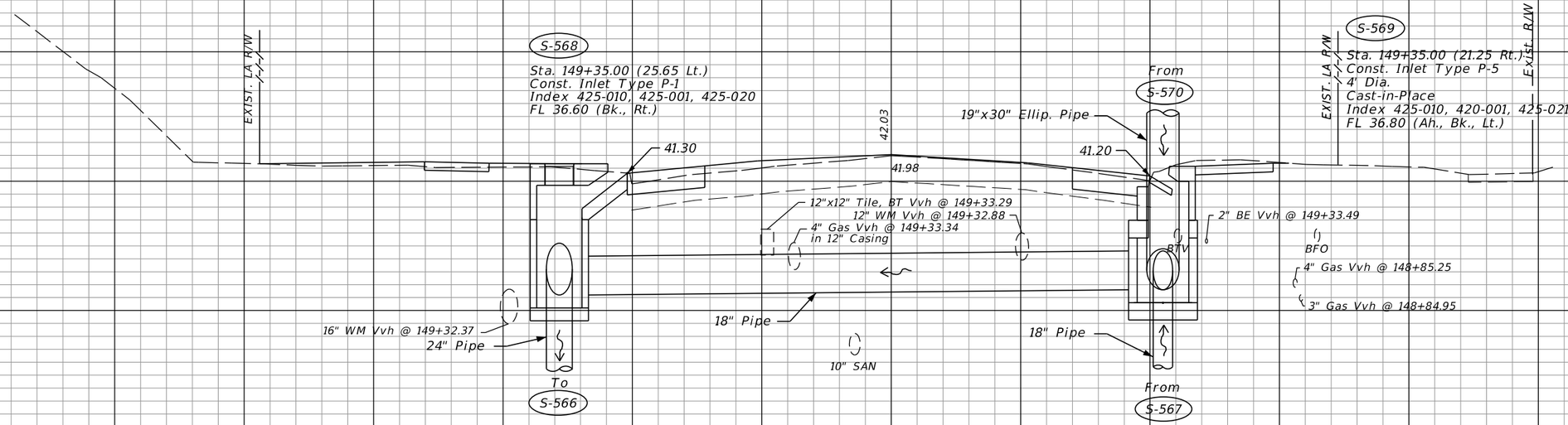


S-688

257+20.00



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NOT USED

S-569

S-568

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Scale: 1"=10' Horiz.
1"=5' Vert.

Exhibit 315-3
Date: 1/1/13

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DRAINAGE STRUCTURES

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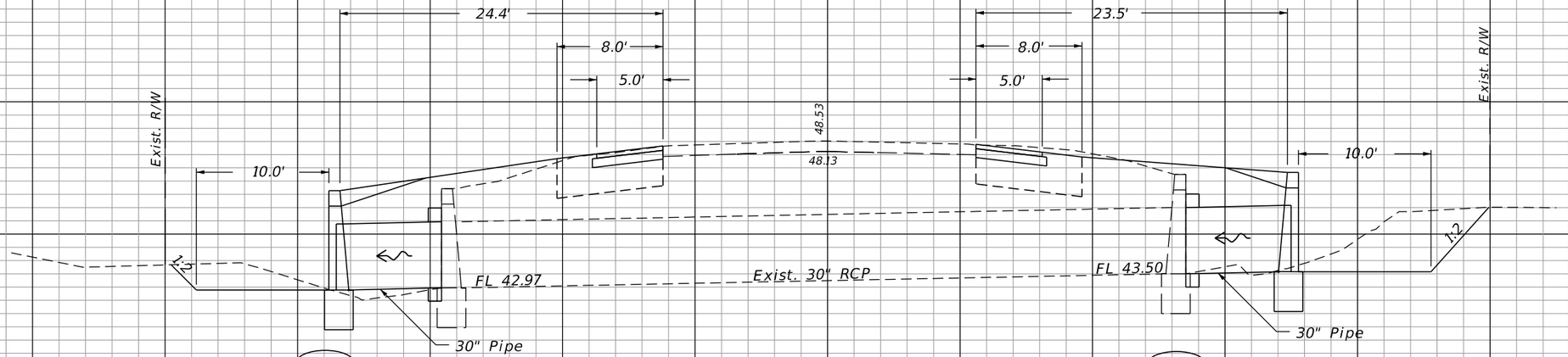

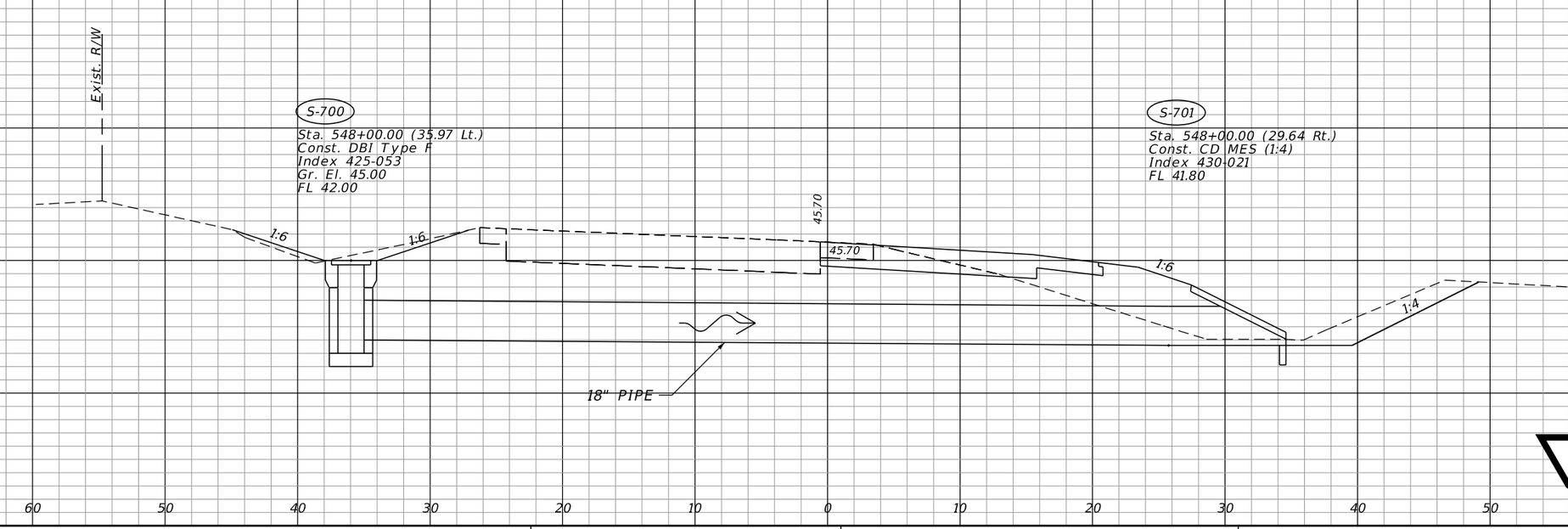

Scale: 1"=10' Horiz.
1"=5' Vert.

Exhibit 315-4
Date: 1/1/13

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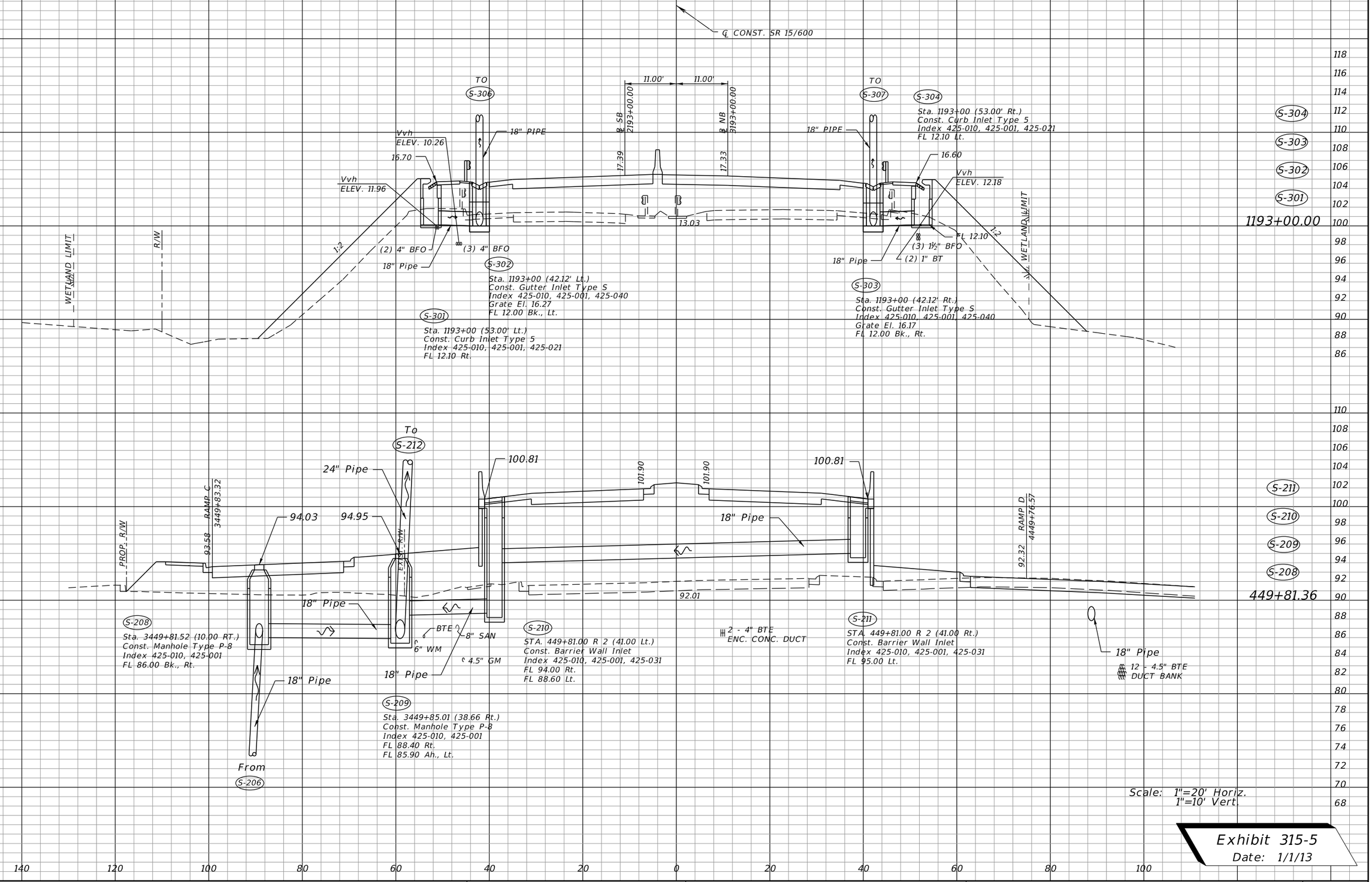

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DRAINAGE STRUCTURES

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