FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.

The Reinforced Earth Company

8614 Westwood Center Drive Suite 1100, Vienna, Virginia 22182 (703) 821-1175

TERRATREL™ A WIRE FACED MSE WALL SYSTEM

GENERAL NOTES

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN, BEHIND AND BENEATH THE REINFORCED VOLUME; METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO THE TO SPECIFICATION SECTION 54B.

2. SOIL PARAMETERS:
   SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTIC UTILIZED AT THE SITE. THE VALUES OF FRICTION ANGLE (ϕ), COHESION (c), AND TOTAL UNIT WEIGHT (γ) SHALL BE PROVIDED IN THE SHOP DRAWINGS.

3. REINFORCING STRIPS FOR REINFORCED EARTH WALLS SHALL BE 1 31/32" WIDE AND 5/32" THICK, AND SHALL CONFORM TO THE PHYSICAL AND MECHANICAL PROPERTIES OF ASTM A-572 GRADE 65. GALVANIZATION SHALL BE APPLIED IN ACCORDANCE WITH ASTM A-123.

4. HA LADDERS SHALL BE SUPPLIED BY THE REINFORCED EARTH COMPANY, AND SHOP FABRICATED OF COLD DRAWN STEEL WIRE CONFORMING TO THE PHYSICAL AND MECHANICAL PROPERTIES OF ASTM A-82. ALL WELDING SHALL BE IN ACCORDANCE WITH ASTM A-185. GALVANIZING FOR PERMANENT WALL SYSTEMS SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF ASTM A-123 OR AASHTO M111 (2 OZ/SQ. FT.). HA LADDER REINFORCEMENTS MAY BE USED ONLY ON WALLS WITH HEIGHTS 20 FT OR LESS.

5. THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF THE ENGINEER TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR A SPECIFIC SITE.

6. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.

7. THE MINIMUM FACTORS OF SAFETY REQUIRED FOR DESIGN:
   OVERTURNING = 2.0
   SLIDING = 1.5
   INTERNAL PULLOUT = 1.5 (ALLOWABLE DEFORMATION = 0.75 INCH)
   BEARING CAPACITY = 2.5
   OVERALL STABILITY = 1.5
   STEEL SOIL REINFORCEMENT (AT END OF DESIGN LIFE)
   = 0.55Fy
   = 0.50Fu (AT NET SECTION OF BOLTED CONNECTION)
   WIRE FACING (AT END OF DESIGN LIFE) = 0.48Fy
   MAXIMUM PULLOUT FACTOR
   f* = 1.5 (FOR SAND)
   f* = 2.0 (FOR LIMEROCK)

LAYOUT

8. FOR LAYOUT OF THE WALLS, SEE RETAINING WALL CONTROL PLANS.

CONSTRUCTION

9. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548. INSTALLATION OF REINFORCING LADDERS AND/OR STRIPS SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.

10. FOR STRUCTURES IN EXCESS OF 20' IN HEIGHT OCCUR, THE FINISHED GRADE IN FRONT OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS A HEIGHT OF 20'. FINISHED GRADE BACKFILL SHALL BE COMPACTED TO 95% OF AASHTO T-180 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

CONFLICTING STRUCTURES

11. IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON THE WALL ELEVATIONS.

12. IF PILES ARE LOCATED WITHIN THE REINFORCED VOLUME, THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE WALL UNLESS A METHOD TO PROTECT THE STRUCTURE, WHICH IS ACCEPTABLE TO THE ENGINEER AND THE REINFORCED EARTH COMPANY, IS PROPOSED AND APPROVED IN WRITING.

13. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ANY GUARDRAIL POSTS WITHIN THE REINFORCED VOLUME. PRIOR TO PLACEMENT OF THE TOP LAYERS OF REINFORCEMENTS, INDIVIDUAL REINFORCING LADDERS AND/OR STRIPS MAY BE SYSTEMATICALLY SHIFTED TO AVOID THE POST LOCATIONS IF AUTHORIZED BY THE REINFORCED EARTH COMPANY. ANY DAMAGE DONE TO THE REINFORCING LADDERS AND/OR STRIPS DUE TO INSTALLATION OF GUARDRAIL POSTS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

14. IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN THE REINFORCED VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING LADDERS AND/OR STRIPS AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE REINFORCED EARTH COMPANY TO DETERMINE WHAT COURSE OF ACTION SHOULD BE TAKEN, UNLESS SHOWN OTHERWISE.

15. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING LADDERS AND/OR STRIPS DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPERELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.

MATERIALS NOTES

16. SUPPLIES
   ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY THE REINFORCED EARTH COMPANY:
   - PREFABRICATED WIRE FACINGS
   - REINFORCING LADDERS AND/OR STRIPS
   - HAIRPIN CONNECTORS
   - BOLT SETS
   - CONNECTOR RODS
   - SOIL RETENTION FABRIC

   ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR.

17. LADDER AND/OR STRIP LENGTHS
   THE REINFORCING LADDER AND/OR STRIP LENGTHS SHOWN ON THE PLANS ARE MEASURED FROM THE BACK FACE OF THE WIRE FACING PANELS TO THE LIMIT OF OF THE SELECT BACKFILL MATERIAL, AND ARE THE LENGTHS USED IN THE LADDER AND STRIP REINFORCEMENT CALCULATIONS.

18. THE REINFORCED EARTH COMPANY SUPPLIES WIRE FACINGS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF THE REINFORCED EARTH® RETAINING WALLS DETAILED HEREIN. THE WALL CONSTRUCTION PROCEDURES FURNISHED BY THE REINFORCED EARTH COMPANY IN ITS SPECIFICATIONS ARE INTENDED TO PROVIDE A GENERAL EXPLANATION OF THE SYSTEM. IT IS THE CONTRACTOR'S OBLIGATION TO DEVISE AND EXECUTE A PROJECT SPECIFIC ERECTION SEQUENCE, FACING UNLOADING, HANDLING SYSTEM, AND FALL PROTECTION SYSTEM. COMPLIANCE WITH THE GUIDELINES IN THE SPECIFICATIONS DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL FALL PROTECTION, SAFETY, LAWS, STANDARDS AND PROCEDURES AT THE JOB SITE. CONTRACTORS SHOULD TAKE SPECIAL PRECAUTIONS TO PREVENT THE FACINGS FROM SHIFTING OR FALLING DURING THE ERECTION PROCESS.

19. THE REINFORCED EARTH COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

20. THIS DRAWING CONTAINS INFORMATION PROPRIETARY TO THE REINFORCED EARTH COMPANY, AND IS BEING FURNISHED FOR THE USE OF THE FLORIDA DEPARTMENT OF TRANSPORTATION ONLY IN CONNECTION WITH FDOT PROJECTS, AND THE INFORMATION CONTAINED HEREIN IS NOT TO BE TRANSMITTED TO ANY OTHER ORGANIZATION UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY THE REINFORCED EARTH COMPANY. THE REINFORCED EARTH COMPANY IS EXCLUSIVE LICENSEE IN THE UNITED STATES UNDER PATIENTS ISSUED TO HENRI VIDAL, AND THE FURNISHING OF THESE DRAWINGS DOES NOT CONSTITUTE AN EXPRESSED OR IMPLIED LICENSE UNDER THE VIDAL PATENTS.

21. THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO THE INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY.

DATE : 01-01-05

INTERIM STANDARD IN ENGLISH UNITS APPLICABLE TO DESIGN STANDARDS BOOKLET PUBLISHED IN ENGLISH UNITS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEMS
THE REINFORCED EARTH COMPANY
TERRATREL WIRE WALL

INTERIM STANDARD

SHEET NOS. 1 - 6 OF 6 ARE A REPLACEMENT OF INDEX NO. 5115 OF THE DESIGN STANDARDS BOOKLET DATED JANUARY 2004.

APPROVED BY
William N. Nickas, P.E.
State Structures Design Engineer

REVISION NO.	SHEET NO.	INDEX NO.
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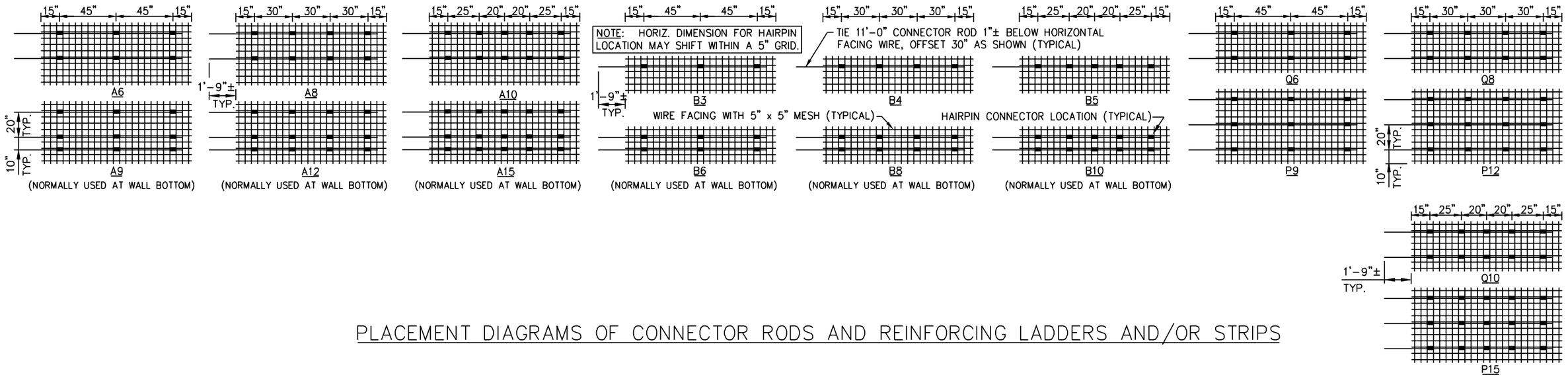
FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.

KEY:

TYPE OF WIRE FACING SUPPLIED — A 8 — DESIGNATION FOR LADDER OR STRIP PLACEMENT (SEE PLACEMENT DIAGRAMS BELOW); NUMBER OF REINFORCING LADDERS OR STRIPS



PLACEMENT DIAGRAMS OF CONNECTOR RODS AND REINFORCING LADDERS AND/OR STRIPS

DATE : 01-01-05

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

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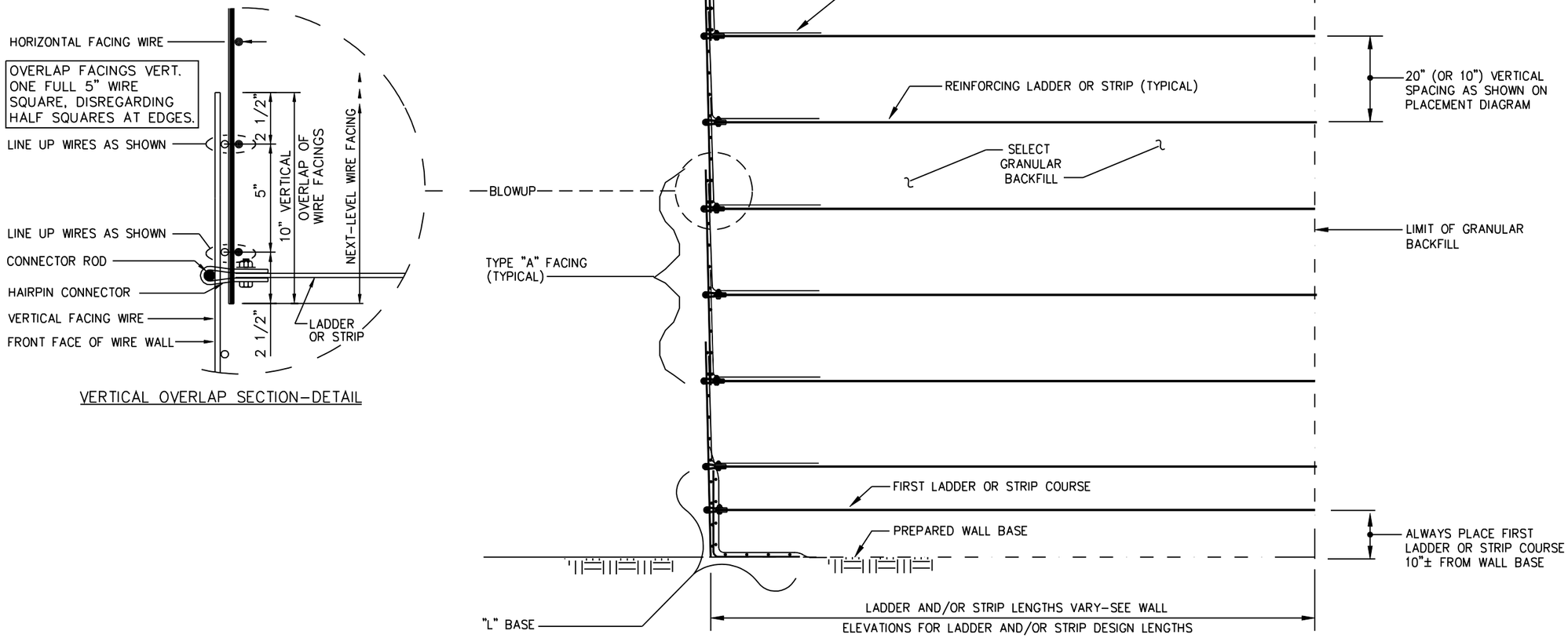

VERTICAL OVERLAP SECTION-DETAIL

TYPICAL TEMPORARY WIRE WALL SECTION

DATE : 01-01-05

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEMS THE REINFORCED EARTH COMPANY TERRATREL WIRE WALL

INTERIM STANDARD

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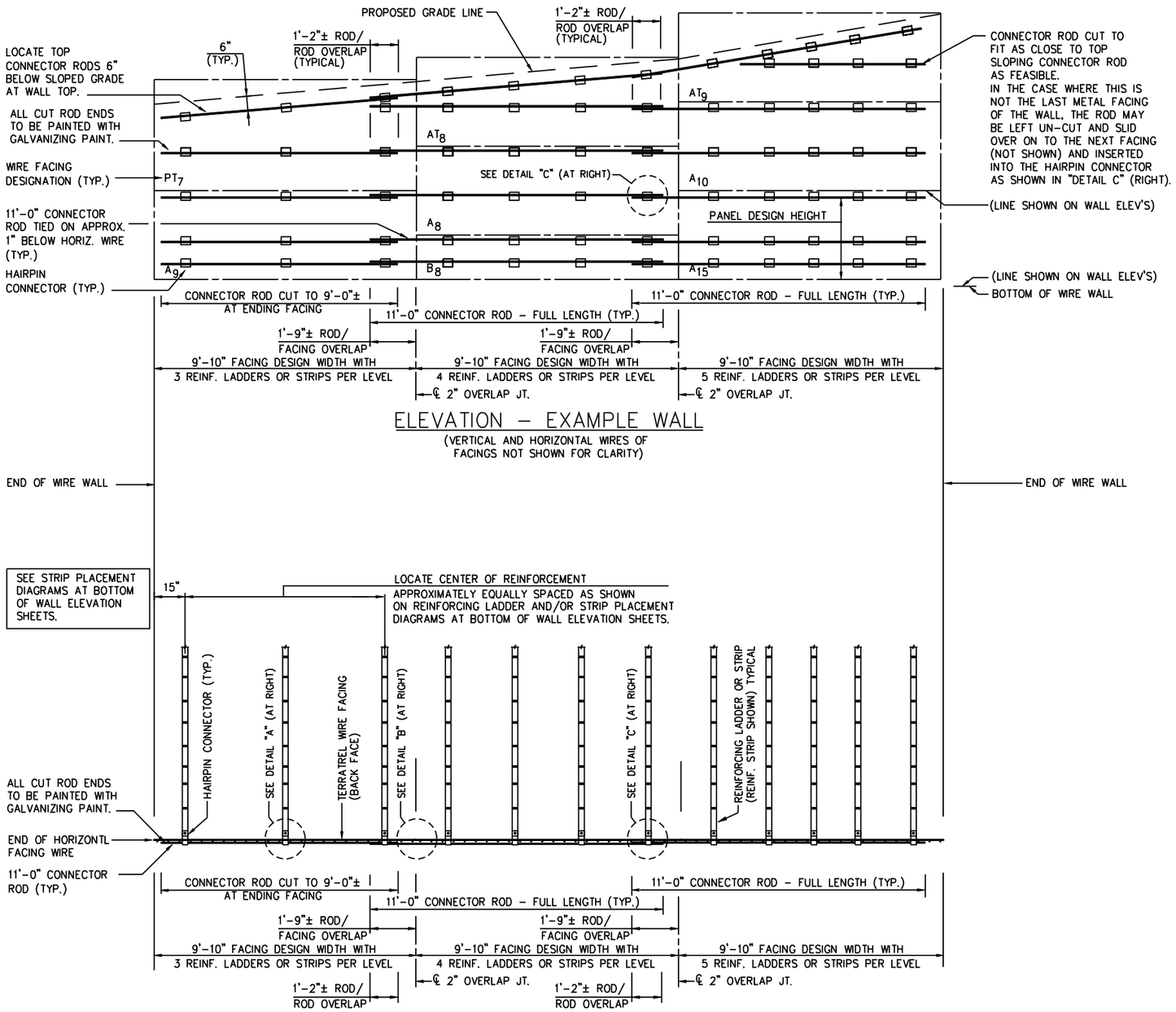
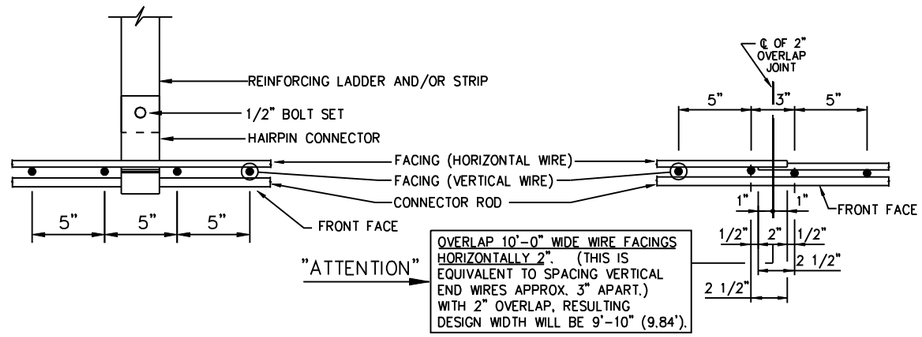
FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.



ELEVATION – EXAMPLE WALL

(VERTICAL AND HORIZONTAL WIRES OF FACINGS NOT SHOWN FOR CLARITY)

PLAN – EXAMPLE WALL



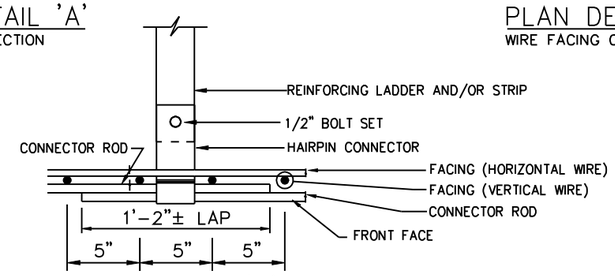
"ATTENTION" OVERLAP 10'-0" WIDE WIRE FACINGS HORIZONTALLY 2". (THIS IS EQUIVALENT TO SPACING VERTICAL END WIRES APPROX. 3" APART.) WITH 2" OVERLAP, RESULTING DESIGN WIDTH WILL BE 9'-10" (9.84').

PLAN DETAIL 'A'

STRIP CONNECTION

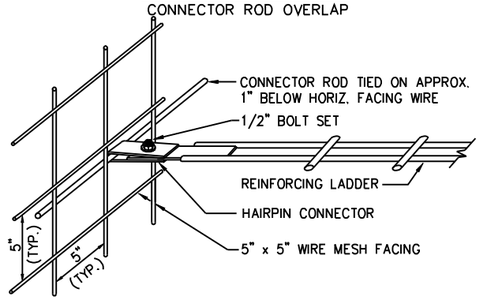
PLAN DETAIL 'B'

WIRE FACING OVERLAP JOINT

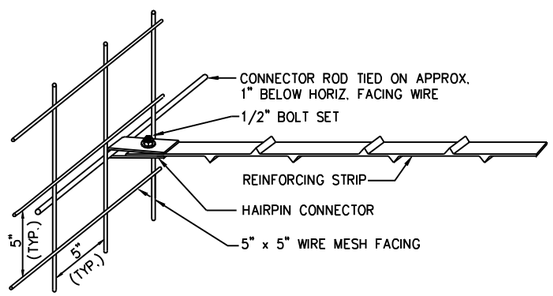


PLAN DETAIL 'C'

CONNECTOR ROD OVERLAP



CONNECTION OF LADDER TO FACING IN PERSPECTIVE



CONNECTION OF STRIP TO FACING IN PERSPECTIVE

DATE : 01-01-05

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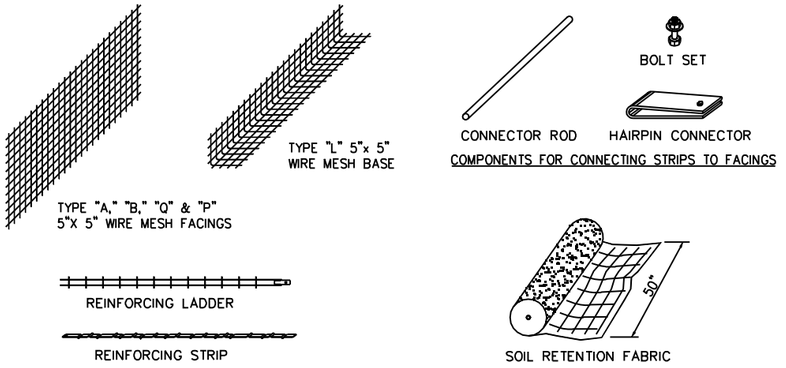
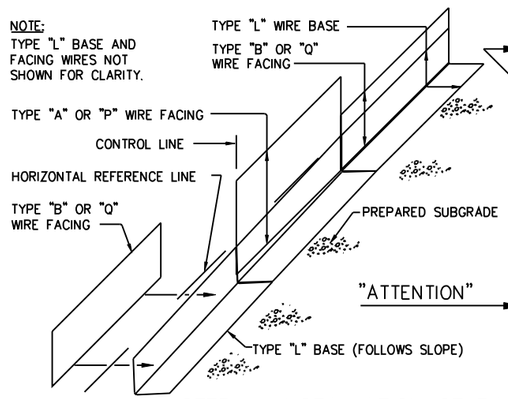


TERRATREL WIRE WALL COMPONENTS



- SET TYPE "L" BASES DIRECTLY ON SUBGRADE (FOLLOW SLOPE OR BOTTOM OF WALL ELEVATION SHOWN ON WALL ELEV. SHEETS). OVERLAP EACH BASE 2" HORIZ. (OR ALONG SLOPE) AS SHOWN ON THE "EXAMPLE WALL" SHEET OF THESE PLANS.

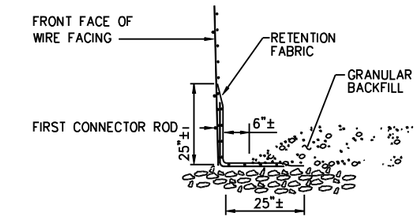
"ATTENTION"

- NOTE FACING DESIGNATION ("A_6" FOR EXAMPLE) ON WALL ELEVATION AND THEN REFER TO FACING DIAGRAMS AT THE BOTTOM OF THE SAME SHEET TO FIND ARRANGEMENT OF THE HAIRPIN CONNECTORS FOR THE REINFORCEMENTS (LADDERS AND/OR STRIPS).
- PLACE THE NUMBER OF REQUIRED HAIRPIN CONNECTORS (AS INDICATED ON IN FACING DIAGRAM AT BOTTOM OF EACH ELEVATION SHEET) ON TO CONNECTOR ROD, AND TIE-WIRE THE ROD TO THE FACING WHERE SHOWN IN FACING DIAGRAM AND PER THE "EXAMPLE WALL" SHEET.

"ATTENTION"

- TIE-WIRE BOTTOM FACINGS SECURELY TO TYPE "L" BASES, OVERLAPPING EACH FACING 2" HORIZONTALLY, SETTING THEM HORIZONTALLY TO THE PROPER DESIGN ELEVATION PER THE WALL ELEVATION SHEETS (EXCEPT WHEN NOTE ON ELEVATION SHEETS REQUIRE FACINGS TO FOLLOW SLOPE), AND MAKING SURE HORIZONTAL WIRES OF FACINGS ARE LOCATED ON THE FILL SIDE OF THE WALL.

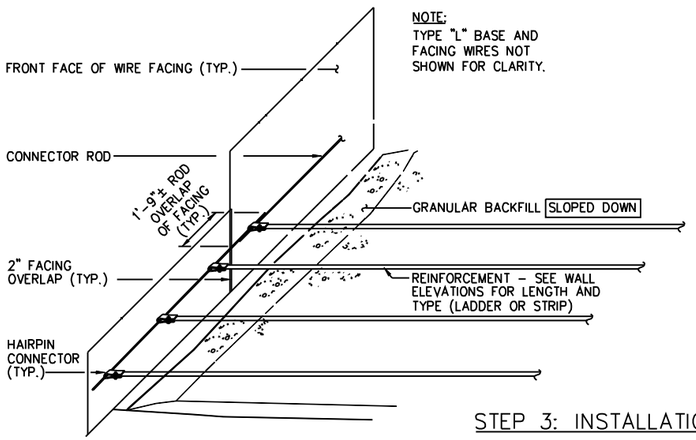
STEP 1: INSTALLATION OF BASES & 1st. FACINGS



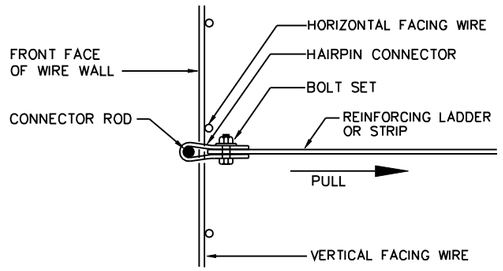
- PLACE 50"-WIDE RETENTION FABRIC AS SHOWN.
- PLACE AND COMPACT FIRST GRANULAR BACKFILL LIFT TO LEVEL OF FIRST CONNECTOR ROD LOCATION.

CAUTION ► FILL MUST BE SLOPED DOWN AS SHOWN TO PREVENT HORIZONTAL DISPLACEMENT OF FACING PRIOR TO CONNECTION OF LADDERS AND/OR STRIPS.

STEP 2: 1st. BACKFILL LIFT

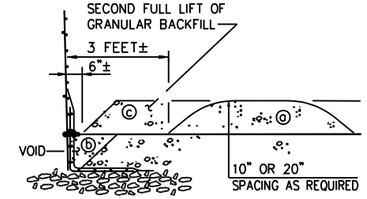


- BOLT REINFORCING LADDER AND/OR STRIPS TO HAIRPIN CONNECTORS.
- FIRMLY PULL ON EACH REINFORCING LADDER AND/OR STRIP UNTIL ASSEMBLY IS TIGHT.



SECTION DETAIL

STEP 3: INSTALLATION OF 1st. REINFORCING LADDERS AND/OR STRIPS



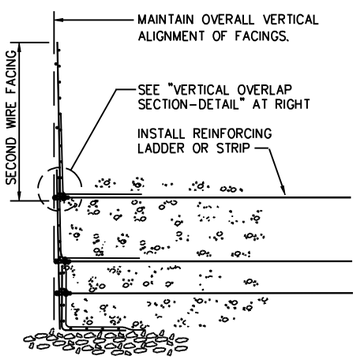
ⓐ PLACE ENOUGH BACKFILL OVER REINFORCING LADDERS AND/OR STRIPS TO SECURE POSITION AS SHOWN.

ⓑ THEN FILL VOID UNDER STRIPS NEAR FACING.

ⓒ THEN PLACE AND COMPACT SECOND GRANULAR BACKFILL LIFT TO (10" MAX.) LEVEL OF NEXT CONNECTOR ROD LOCATION.

CAUTION ► FILL MUST BE SLOPED DOWN AS SHOWN TO PREVENT HORIZONTAL DISPLACEMENT OF FACING PRIOR TO CONNECTION OF LADDERS AND/OR STRIPS.

STEP 4: 2nd. BACKFILL LIFT

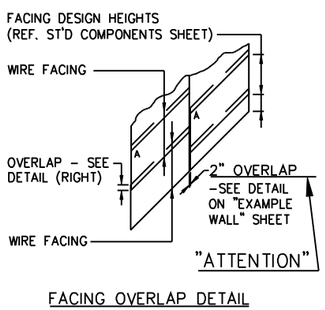


SECTION

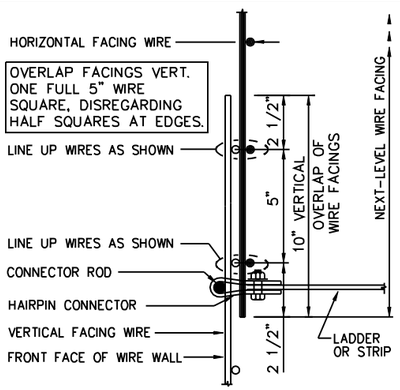
- POSITION SECOND FACING DIRECTLY BEHIND AND OVERLAP LOWER FACING AS SHOWN IN DETAIL (RIGHT). TIE-WIRE THE LOWER PORTION OF SECOND FACING TO ADJACENT FACINGS.
- PLACE STRIPS AS PER "STEP 3."
- BACKFILL AS PER "STEP 4a AND 4b."
- PLACE 50"-WIDE RETENTION FABRIC AS SHOWN IN "STEP 2."

  NOTE: FABRIC MUST ALWAYS BE APPROX. 25" VERTICAL, ALLOWING 5"± OVERLAP ON ADJACENT LAYERS. WHEN WALL ELEVATIONS CALL FOR 10" SPACING BETWEEN LADDERS AND/OR STRIPS, FABRIC MUST BE SLIT FOR PENETRATION OF MID-LEVEL LADDERS AND/OR STRIPS.
- BACKFILL AS PER "STEP 4c."

NOTES



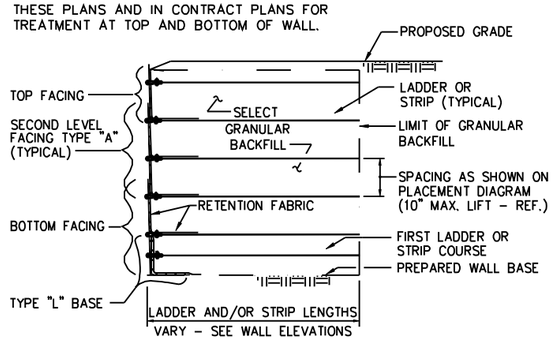
FACING OVERLAP DETAIL



VERTICAL OVERLAP SECTION-DETAIL

STEP 5: INSTALLATION OF 2nd. FACING UNITS

NOTE:
SEE "TYPICAL WALL SECTION" IN THESE PLANS AND IN CONTRACT PLANS FOR TREATMENT AT TOP AND BOTTOM OF WALL.



- REPEAT "STEP 5" UNTIL WALL IS TOPPED OUT AS SHOWN ABOVE.

COMPLETED TERRATREL WALL SECTION

DATE : 01-01-05

INTERIM STANDARD IN ENGLISH UNITS APPLICABLE TO DESIGN STANDARDS BOOKLET PUBLISHED IN ENGLISH UNITS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEMS
THE REINFORCED EARTH COMPANY
TERRATREL WIRE WALL

INTERIM STANDARD

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APPROVED BY
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State Structures Design Engineer

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04	5 of 6	05115

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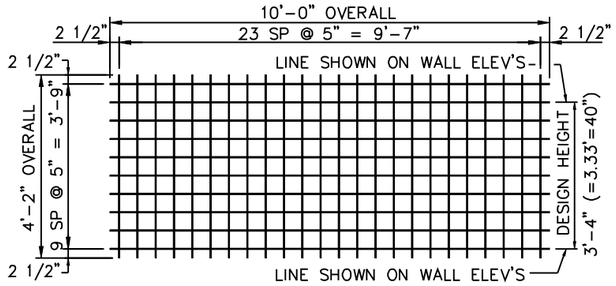
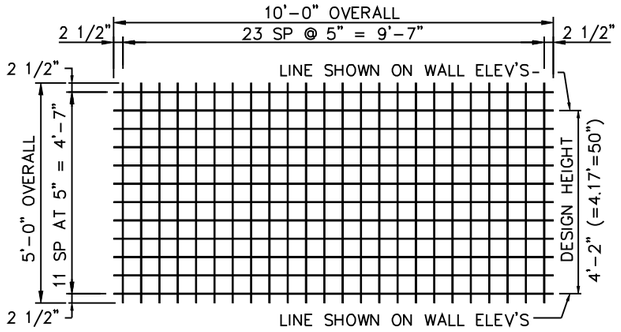


ELEVATION – TYPE "A"
5"x 5" WIRE MESH FACING



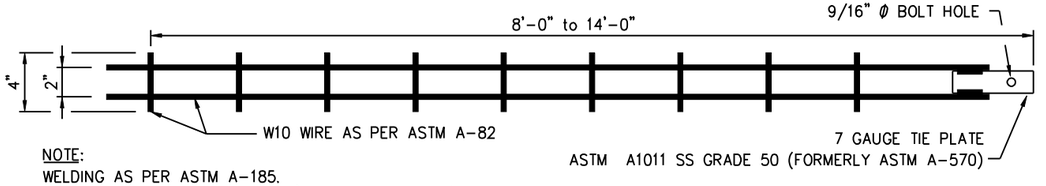
ELEVATION – TYPE "P"
5"x 5" WIRE MESH FACING

FACINGS MESH (TYPES A, B, P & Q): 5" x 5" – W8 x W8 WWF

BASE MESH (TYPE L): 5" x 5" – W5 x W5 WWF

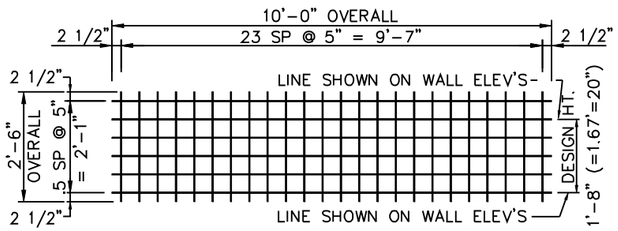
COMPONENTS FOR THIS PROJECT MAY BE BLACK OR GALVANIZED STEEL AS SPECIFIED.

NOTE: EVEN WHEN BLACK STEEL IS SPECIFIED, SOME OR ALL ELEMENTS MAY BE GALVANIZED AT THE DISCRETION OF RECO.

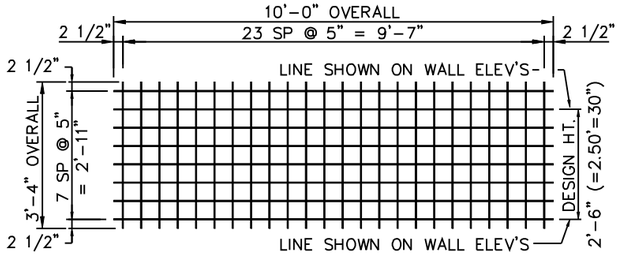


NOTE:
WELDING AS PER ASTM A-185.
GALVANIZATION (WHEN SPECIFIED) AS PER ASTM A-123.

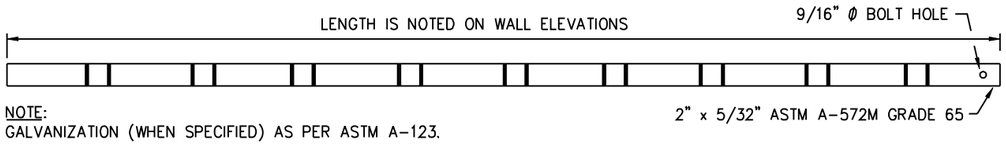
HA REINFORCING LADDER



ELEVATION – TYPE "B"
5"x 5" WIRE MESH FACING

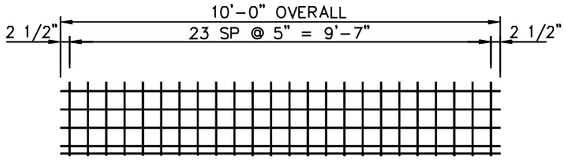


ELEVATION – TYPE "Q"
5"x 5" WIRE MESH FACING

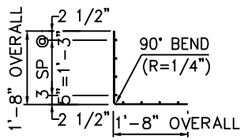


NOTE:
GALVANIZATION (WHEN SPECIFIED) AS PER ASTM A-123.

HA REINFORCING STRIP – 2" x 5/32"

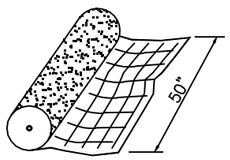


ELEVATION



SECTION

ELEVATION – TYPE "L"
5"x 5" WIRE MESH BASE



SOIL RETENTION FABRIC –
CARTHAGE MILLS 15% WOVEN
FILTER CLOTH OR EQUAL

NOTES FOR WIRE FACINGS AND BASE

1) WIRE FACINGS AND BASE SHALL BE SHOP FABRICATED OF COLD DRAWN STEEL WIRE CONFORMING TO THE MINIMUM REQUIREMENTS OF ASTM A-82 (AASHTO M 32) AND WELDED INTO THE FINISHED CONFIGURATION IN ACCORDANCE WITH ASTM A-185 (AASHTO M55).
2) DIMENSIONAL TOLERANCE = ±1/4".
3) DESIGN LENGTH = 9'-10" (FACINGS & BASE OVERLAPPED 2").
4) DESIGN HEIGHT AS SHOWN (FACINGS OVERLAPPED 10" OR TWO 5" WIRE SQUARES.)

ASTM A615 GRADE 60
GALVANIZATION (WHEN SPECIFIED)
AS PER ASTM-123
1/2"f9 ROD (SMOOTH OR DEFORMED)

CONNECTOR ROD

(TO BE TIED ON TO WIRE FACINGS IN FIELD)

1/2" Ø ASTM A325M BOLT
WITH NUT & WASHER
GALVANIZATION (WHEN SPECIFIED)
AS PER ASTM 153, CLASS C

BOLT SET

ASTM A1011 SS GRADE 50 (FORMERLY ASTM A-570)
GALVANIZATION (WHEN SPECIFIED) AS PER ASTM A153

HAIRPIN CONNECTOR

COMPONENTS FOR CONNECTING REINFORCING LADDERS AND/OR STRIPS TO WIRE FACINGS

DATE : 01-01-05

INTERIM STANDARD IN ENGLISH UNITS APPLICABLE TO DESIGN STANDARDS BOOKLET PUBLISHED IN ENGLISH UNITS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

RETAINING WALL SYSTEMS
THE REINFORCED EARTH COMPANY
TERRATREL WIRE WALL

INTERIM STANDARD

SHEET NOS. 1 - 6 OF 6 ARE A REPLACEMENT OF INDEX NO. 5115 OF THE DESIGN STANDARDS BOOKLET DATED JANUARY 2004.

APPROVED BY
William N. Nickas, P.E.
State Structures Design Engineer

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