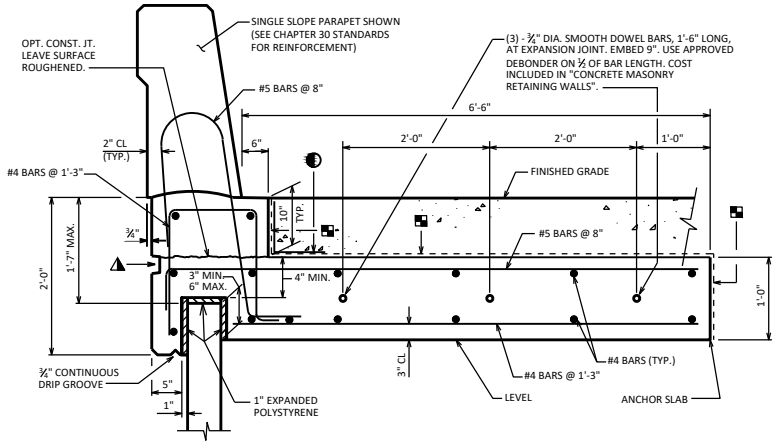


CAST-IN-PLACE CONCRETE TRAFFIC BARRIER DETAIL FOR PRECAST WALL PANELS

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPET AND ANCHOR SLAB BETWEEN EXPANSION JOINTS MAY BE USED. RUN BAR REINFORCEMENT THRU THE JOINT. SEE STANDARDS 30.07, 30.12, 30.13 & 30.30-30.32 FOR MINIMUM LAP LENGTHS IN PARAPET BARS. DEFINE CONSTRUCTION JOINT WITH A ¾" "V" GROOVE.

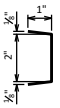
LAP LONGITUDINAL #4 BARS A MINIMUM OF 1'-0".

ALL BAR STEEL SHALL BE EPOXY COATED.

CONCRETE QUANTITY BASED ON 3" PANEL EMBEDMENT.

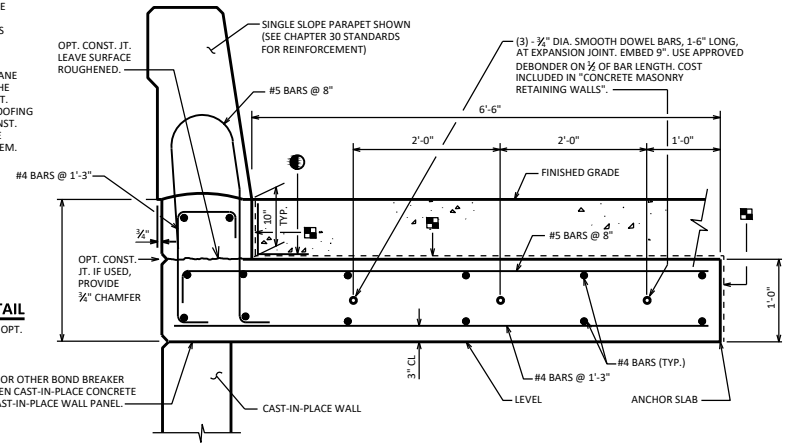
■ 18" RUBBERIZED MEMBRANE WATERPROOFING TO BE PLACED ON THESE SURFACES AT EACH JOINT.

◐ IF THE OPT. CONST. JOINT IS USED, PLACE 18" MEMBRANE WATERPROOFING ALONG THE ENTIRE LONGITUDINAL JOINT. THE MEMBRANE WATERPROOFING SEALING THE OPTIONAL CONST. JOINT IS INCIDENTAL TO THE CONCRETE MASONRY BID ITEM.



RUSTICATION DETAIL

⚠ PROVIDE RUSTICATION IF OPT. CONST. JOINT IS USED.

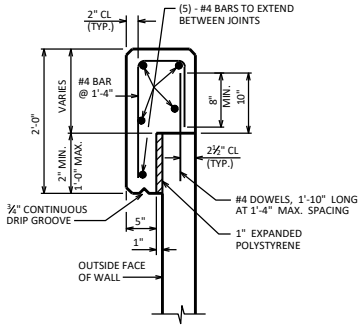


CAST-IN-PLACE CONCRETE TRAFFIC BARRIER DETIAL FOR CAST-IN-PLACE WALL PANELS

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPET AND ANCHOR SLAB BETWEEN EXPANSION JOINTS MAY BE USED. RUN BAR REINFORCEMENT THRU THE JOINT. SEE STANDARDS 30.07, 30.12, 30.13 & 30.30-30.32 FOR MINIMUM LAP LENGTHS IN PARAPET BARS. DEFINE CONSTRUCTION JOINT WITH A ¾" "V" GROOVE.

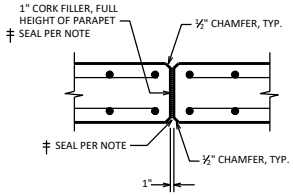
LAP LONGITUDINAL #4 BARS A MINIMUM OF 1'-0".

ALL BAR STEEL SHALL BE EPOXY COATED.

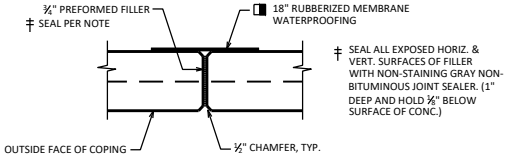


CAST-IN-PLACE CONCRETE COPING DETIAL

DESIGNER NOTE: CONCRETE COPING DESIGNED FOR STANDARD PEDESTRIAN RAILING WITH 10 FT MAXIMUM POST SPACING PER LRFD 13.8.2.



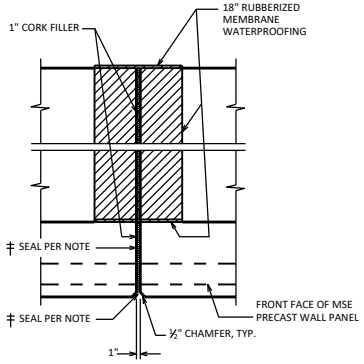
⊛ TRAFFIC BARRIER EXPANSION JOINT DETIAL



COPING EXPANSION JOINT

DO NOT RUN BAR STEEL THRU JOINT.
MAX. SPACING OF JOINT = 50'

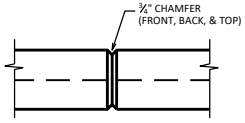
◨ MEMBRANE WATERPROOFING TO EXTEND FROM TOP OF COPING TO 6" BELOW TOP OF PANELS.



⊛ ANCHOR SLAB EXPANSION JOINT DETIAL

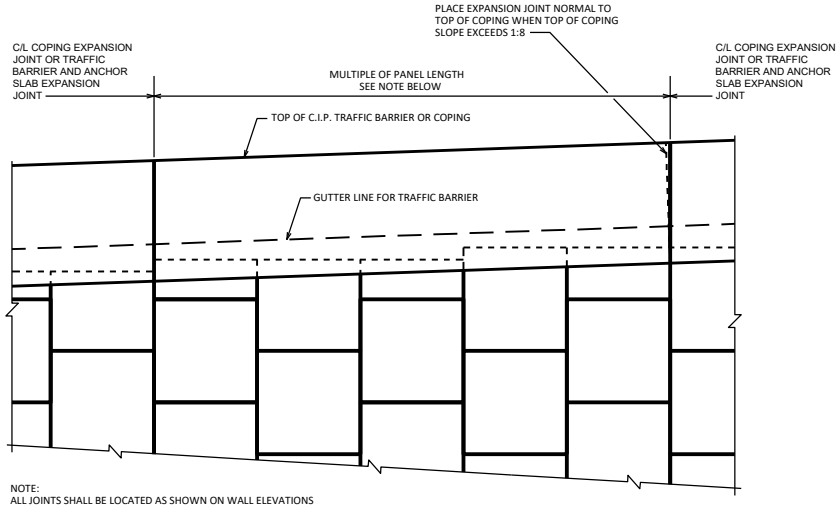
⊛ EXPANSION JOINTS TO BE SPACED AT A MINIMUM OF 20' AND A MAXIMUM OF 30'. LOCATE EXPANSION JOINTS OVER WALL JOINTS. DO NOT RUN BAR STEEL THRU JOINT, EXCEPT FOR DOWEL BARS. JOINT TO EXTEND FULL DEPTH OF PARAPET AND ANCHOR SLAB.

PROVIDE THE NUMBER OF BARS AND OVERALL LENGTH FOR QUANTITY PURPOSES, ONLY. DO NOT DETAIL SPECIFIC BAR LENGTHS BETWEEN EXPANSION JOINTS AS THESE LENGTHS ARE BASED ON UNKNOWN MSE PANEL LENGTH AND CONFIGURATION.



COPING CONTRACTION JOINT

DO NOT RUN BAR STEEL THRU JOINT.
MAX. SPACING OF JOINT = 12'



NOTE:
ALL JOINTS SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS AND MUST COINCIDE WITH PANEL JOINT ON FRONT FACE.

C.I.P. TRAFFIC BARRIER OR COPING PARTIAL ELEVATION

DESIGNER NOTES

MODIFIED ANCHOR SLAB DETAILS SHALL SATISFY AASHTO LRFD STRENGTH AND STABILITY REQUIREMENTS.

PROVIDE CONCRETE, REINFORCEMENT, AND RUBBERIZED MEMBRANE WATERPROOFING QUANTITIES FOR TRAFFIC BARRIERS. PROVIDE BILL OF BARS.

FOR STANDARD COPING, AS SHOWN ON THIS SHEET, SHOW BAR SIZE AND BAR SPACING, ONLY. DO NOT PROVIDE BILL OF BARS. CONCRETE, REINFORCEMENT, AND RUBBERIZED MEMBRANE WATERPROOFING ARE INCLUDED IN BID ITEM FOR THE MSE WALL.

MSE RETAINING WALL DETAILS

BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

DATE: 7-20

STANDARD 14.02

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

THE PLAN QUANTITY FOR THE BID ITEM (INSERT WALL SYSTEM) IS BASED ON A WALL HEIGHT MEASURED FROM THE TOP OF WALL TO A CONSTANT DEPTH OF (INSERT VALUE) BELOW FINISHED GRADE.

DESIGN DATA

THE CONTRACTOR SHALL PROVIDE COMPLETE DESIGN, PLANS, DETAILS, SPECIFICATIONS, AND SHOP DRAWINGS FOR THE RETAINING WALLS IN ACCORDANCE WITH THE SPECIAL PROVISIONS. THE RETAINING WALL MANUFACTURER SHALL PROVIDE TECHNICAL ASSISTANCE TO THE CONTRACTOR DURING CONSTRUCTION. THE COST OF FURNISHING THESE ITEMS SHALL BE INCLUDED IN THE BID ITEM "(INSERT WALL SYSTEM OR SYSTEMS)".

PLANS, ELEVATIONS AND DETAILS SHOWN ON THESE DRAWINGS ARE INTENDED TO INDICATE WALL LOCATIONS, LENGTHS, HEIGHTS, AND DETAILS COMMON TO THE WALL SYSTEM SELECTED. THE CONTRACTOR SHALL VERIFY THAT THE WALL SYSTEM SELECTED WILL CONFORM TO THE REQUIRED ALIGNMENTS AND DETAILS.

THE RETAINING WALL IS TO BE DESIGNED USING THE ELEVATIONS GIVEN ON THIS SHEET.

DESIGN FOR RETAINING WALL TO PROVIDE FOR FINISHED GRADE SLOPED BEHIND WALL AS SHOWN.

DESIGN RETAINING WALL FOR A LIVE LOAD SURCHARGE OF (INSERT VALUE).

THE MAXIMUM VALUE OF THE ANGLE OF INTERNAL FRICTION OF THE WALL BACKFILL MATERIAL IN THE REINFORCED ZONE SHALL BE ASSUMED TO BE 30° WITHOUT CERTIFIED TEST VALUES.

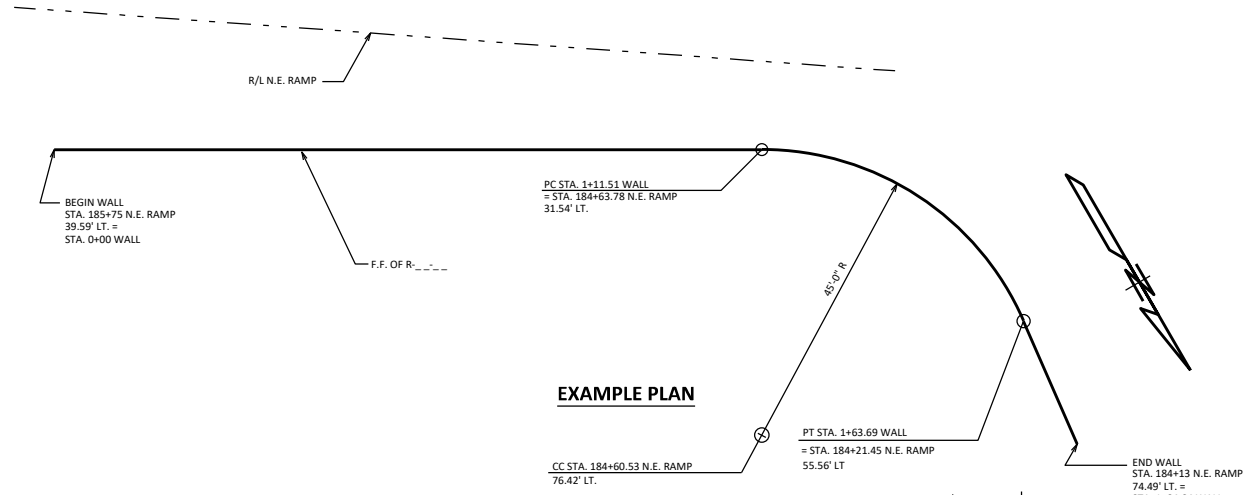
DESIGNER NOTES

- THE LENGTHS PROVIDED IN THE TABLE ARE THE MINIMUM REQUIRED REINFORCEMENT LENGTHS BASED UPON THE MINIMUM DESCRIBED IN THE WALL SYSTEM SPECIAL PROVISIONS OR EXTERNAL AND OVERALL STABILITY AT THE DESIGNATED LOCATIONS. THESE DESIGNATED LOCATIONS REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS, BUT SHALL NOT BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR DESIGN LENGTHS SHALL MEET OR EXCEED THE MINIMUM VALUES REPRESENTED IN THE TABLE AT THESE DESIGNATED LOCATIONS.
- THE LENGTHS PROVIDED IN THE TABLE ARE THE MINIMUM REQUIRED REINFORCEMENT LENGTHS BASED ON OVERALL STABILITY PERFORMED BY THE WALL DESIGNER. COMPOUND STABILITY IS THE CONTRACTORS RESPONIBILITY.
- MINIMUM EMBEDMENT BASED ON SITE SPECIFIC PARAMETERS (1'-6" MINIMUM FOR ALL WALLS ON LEVEL GROUND). FIELD EMBEDMENTS SHALL MEET OR EXCEED THE MINIMUM EMBEDMENTS. FIELD EMBEDMENTS BELOW MINIMUM EMBEDMENT SHALL NOT BE INCLUDED IN THE PAY LIMITS.
- STRATUM LOCATIONS & SOIL DESCRIPTIONS AT EACH BORING LOCATION.

NOMINAL MSE PANEL DIMENSIONS ARE 5-FOOT HIGH AND 5 TO 10 FOOT WIDE. THE WALL DESIGNER SHALL PROVIDE DETAILS BASED ON NOMINAL PANEL DIMENSIONS AND CONFIGURATION. DETAILS SHALL BE ABLE TO ACCOMMODATE VARIOUS PANEL DIMENSIONS. THE CONTRACTOR AND WALL SUPPLIER SHALL COORDINATE DETAILS BASED ON THE ACTUAL DIMENSIONS.

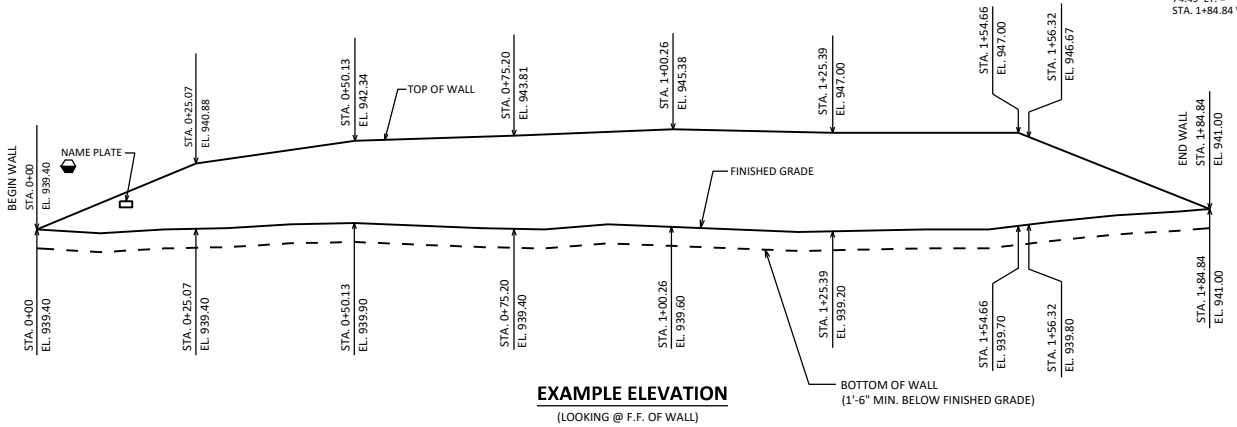
- LOCATE NAME PLATE ON THE FRONT OF WALL APPROXIMATELY 3' TO 6' HIGH. CENTER NAME PLATE BETWEEN CAST-IN-PLACE CONCRETE COPING JOINTS, CENTERED ON A NON-CAP BLOCK, OR AS DIRECTED BY THE FIELD ENGINEER

EXAMPLE PLAN



EXAMPLE ELEVATION

(LOOKING @ F.F. OF WALL)



GEOMETRY TABLE

WALL STATION	ROADWAY STATION	OFFSET TO F.F. WALL	TOP OF WALL ELEV.	FINISHED GRADE ELEV.

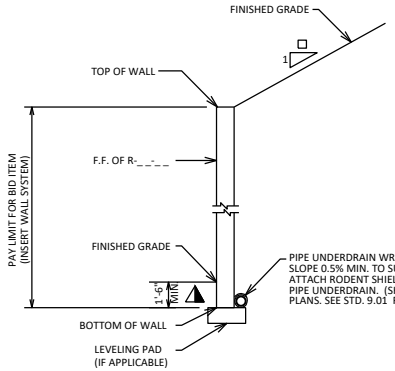
WALL EXTERNAL & OVERALL STABILITY EVALUATION

DIMENSIONS	EVALUATED LOCATIONS		
WALL HEIGHT (FEET)			
EXPOSED WALL HEIGHT (FEET)			
MINIMUM LENGTH OF REINFORCEMENT (FEET) ■			
WALL STATION			
BORING USED			
CAPACITY TO DEMAND RATIO (CDR)			
SLIDING (CDR>1.0)			
ECCENTRICITY (CDR>1.0)			
OVERALL STABILITY (CDR>1.0) ☆			
BEARING RESISTANCE (CDR>1.0)			
FACTORED BEARING RESISTANCE (PSF)			

SOIL PARAMETERS

STRATUM LOCATIONS & SOIL DESCRIPTIONS	TOTAL UNIT WEIGHT (PCF)	FRICTION ANGLE (DEGREES)	COHESION (PCF)
GRANULAR BACKFILL (REINFORCING ZONE OR BACKFILL)			
(INSERT SOIL TYPE) RETAINED SOIL *			
(INSERT SOIL TYPE) FILL ⊗ EL._ _ _-_- EL._ _ _-_			
(INSERT SOIL TYPE) ⊗ EL._ _ _-_- EL._ _ _-_			
(INSERT SOIL TYPE) ⊗ EL._ _ _-_- EL._ _ _-_			

* DESIGN WALL FOR THESE VALUES



TYP. CROSS SECT. OF RETAINING WALL

LIST OF DRAWINGS

1. (INSERT WALL SYSTEM)
2. SUBSURFACE EXPLORATION

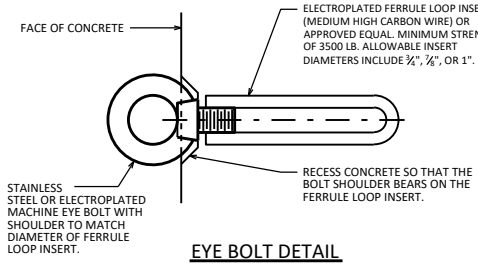
LRFD PROPRIETARY RETAINING WALLS (GENERAL PLAN)

BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

DATE: 7-23

STANDARD 14.03

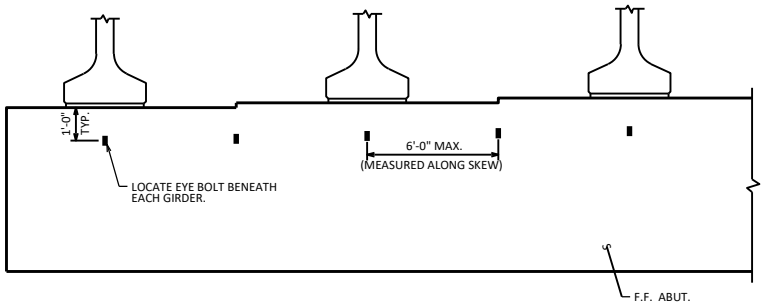


EYE BOLT DETAIL

COST INCIDENTAL TO BID ITEM "CONCRETE MASONRY BRIDGES".

CROSS SECTION THRU ABUTMENT AT MSE WALL

EXPANSION ABUT. SHOWN. SEE STANDARDS 12.01 & 12.02 FOR APPLICABLE BODY REINFORCEMENT AND STANDARDS 12.03 & 12.04 FOR BACKWALL AND WING REINFORCEMENT.



PARTIAL ELEVATION OF F.F. ABUTMENT SHOWING EYE BOLT FALL PROTECTION OPTION

RETAINING WALL NOT SHOWN

DESIGNER NOTES

DUE TO MAINTENANCE CONCERNS, MSE WALLS SHALL NOT BE USED FOR THE SINGULAR PURPOSE OF REDUCING SPAN LENGTH. IF THE GRADE LINE CANNOT BE RAISED, THEN MSE WALLS MAY BE USED TO MAINTAIN THE SUPERSTRUCTURE DEPTH. OTHER CIRCUMSTANCES MAY ALSO JUSTIFY THE USE OF MSE WALLS AT ABUTMENTS.

FALL PROTECTION SHALL BE PROVIDED. THE OPTION PROVIDED SHOULD BE BASED ON THE PREFERENCE OF THE BRIDGE MAINTENANCE AND REGION PROJECT STAFF.

IF PIPE RAILING IS USED, SEE STD. 30.26 FOR APPLICABLE NOTES. (NOTE: STD. 30.26 IS STILL UNDER DEVELOPMENT)

"SLOPE PAVING CONCRETE" ITEMS TO BE SHOWN AS PART OF BRIDGE PLAN.

BID ITEM SHALL BE "ABUTMENT ANCHORAGE" (UNDER DEVELOPMENT).

NOTES

UNFACTORED SUPERSTRUCTURE LATERAL LOADS TRANSFERRED TO THE ABUTMENT ARE TAKEN TO BE KIPS PER FOOT OF ABUTMENT LENGTH. THE VALUES ARE TO BE USED FOR THE LRFD DESIGN OF THE ABUTMENT ANCHORAGE BY THE MSE MANUFACTURER (MSE SYSTEM, DEAD MAN ANCHOR, OTHER). THE FOLLOWING AASHTO LINE LOADS SHALL BE NOTED ON PLAN:

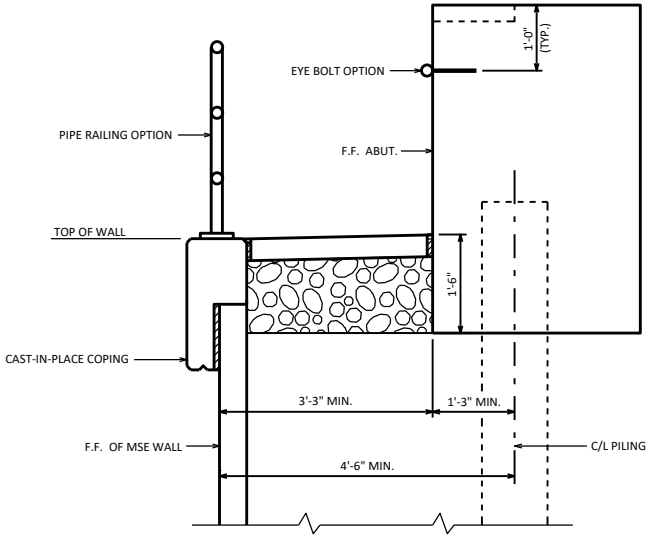
BR = ____ KLF WS = ____ KLF
TU = ____ KLF WL = ____ KLF

FOR SEMI-EXPANSION OR FIXED TYPE A1 ABUTMENTS:

THE DESIGN OF THE WALL IN FRONT OF THE ABUTMENT SHALL INCLUDE THE HORIZONTAL EARTH LOADS AND 240 PSF LIVE LOAD SURCHARGE ACTING ON THE BACK OF THE ABUTMENT BELOW THE BEAM SEATS.

SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF FILLER AND EXPANDED POLYSTYRENE WITH NON-STAINING, GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD 1/8" BELOW SURFACE OF CONCRETE).

EXPANSION ABUTMENTS TO BE BACKFILLED TO A MINIMUM OF THE BEAM SEAT ELEVATION PRIOR TO PLACING GIRDERS.



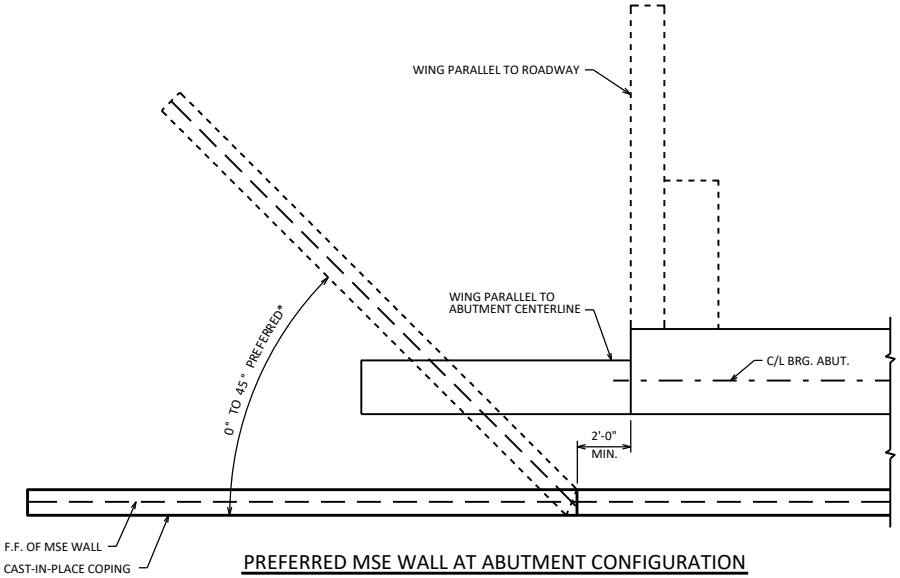
CROSS SECTION THRU ABUTMENT AT MSE WALL SHOWING BOTH EYE BOLT AND RAILING FALL PROTECTION OPTIONS

TYPE A1 SEMI-EXPANSION ABUTMENT SHOWN

MSE WALL AT ABUTMENT

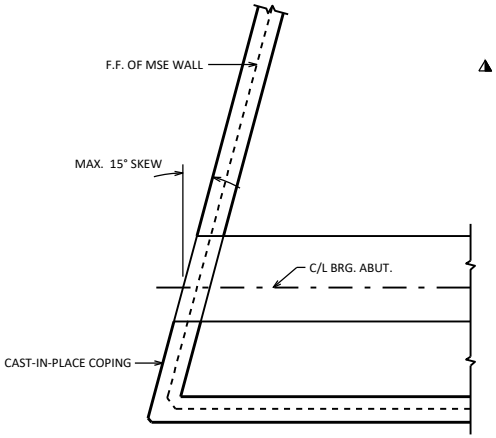
BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald* DATE: 1-18



PREFERRED MSE WALL AT ABUTMENT CONFIGURATION

* 0° WALL ANGLE REQUIRED FOR WING PARALLEL TO ABUTMENT CENTERLINE



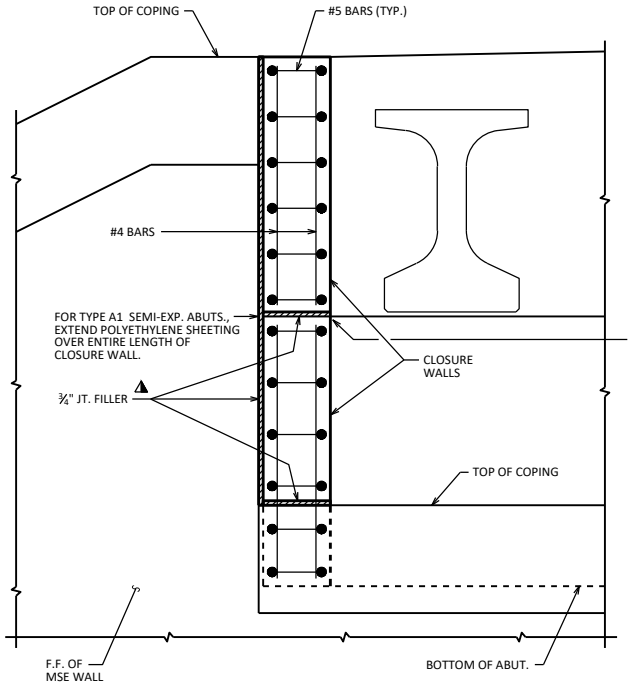
ALTERNATE MSE WALL AT ABUTMENT WITH WRAPPED MSE WALL

DESIGNER NOTES

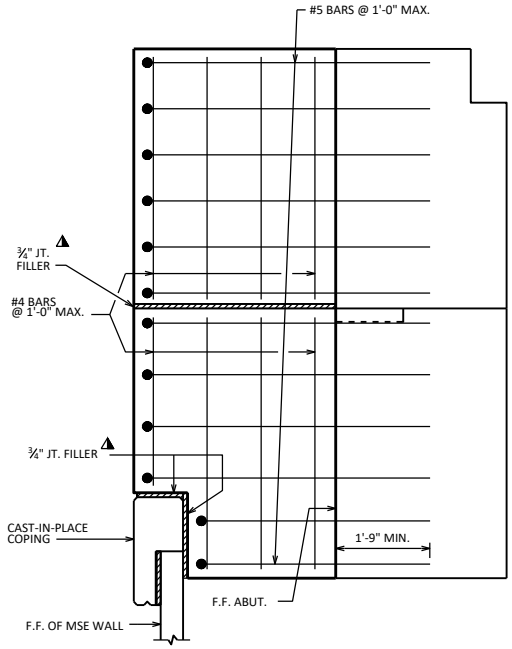
THE "PREFERRED MSE WALL AT ABUTMENT CONFIGURATION" IS THE DESIRED OPTION AS IT SEPARATES THE MSE WALL FROM THE ABUTMENT, MINIMIZING COMPLICATED DETAILS AND POTENTIAL SETTLEMENT ISSUES. THIS ADVICE IS MORE RELEVANT AS SKEW INCREASES.

NOTES

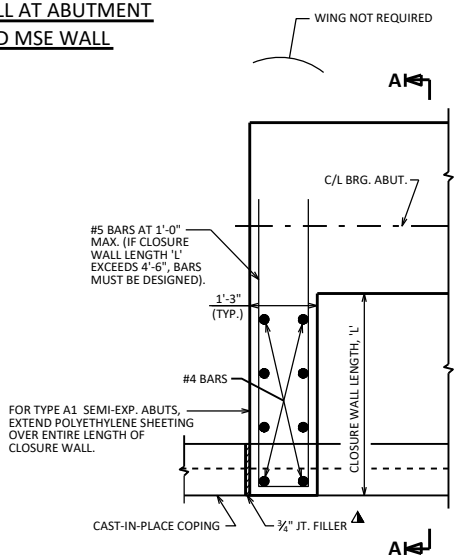
⚠ SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF FILLER WITH NON-STAINING GRAY, NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONCRETE).



FRONT ELEVATION OF ALTERNATE MSE WALL AT ABUTMENT WITH CLOSURE WALL



SECTION A-A



PLAN VIEW OF ALTERNATE MSE WALL AT ABUTMENT WITH CLOSURE WALL

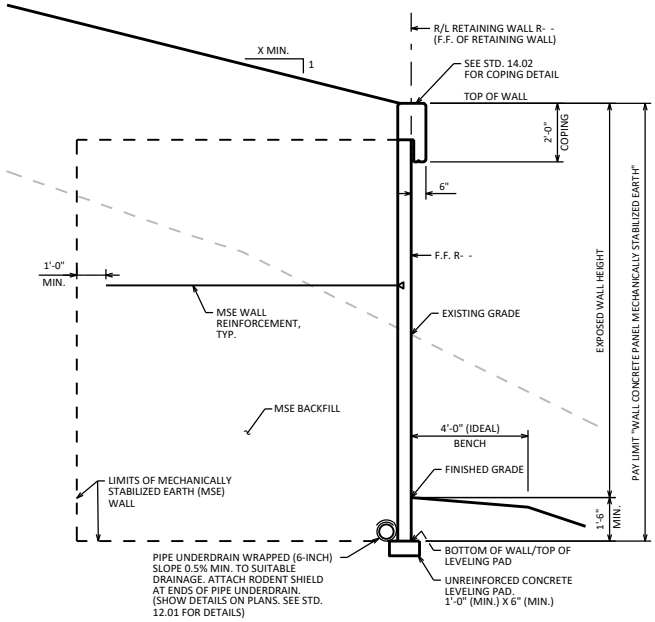
ABUT. TYPE A1 SHOWN. EXPANSION ABUT. WOULD REQUIRE CLOSURE WALL GOING TO BACKWALL WITH BENT BARS TO ACHIEVE DEVELOPMENT.

MSE WALL AT ABUTMENT LAYOUT DETAILS

BUREAU OF STRUCTURES

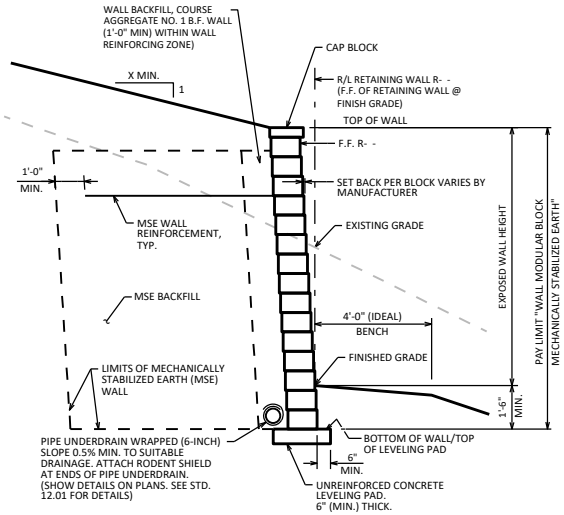
APPROVED: *Laura Shadewald* DATE: 7-17

STANDARD 14.05



TYPICAL SECTION

(MSE WALL WITH CONCRETE PANEL FACING)



TYPICAL SECTION

(MSE WALL WITH MODULAR BLOCK FACING)

DESIGNER NOTE

SEE STANDARD 14.02 FOR ADDITIONAL INFORMATION

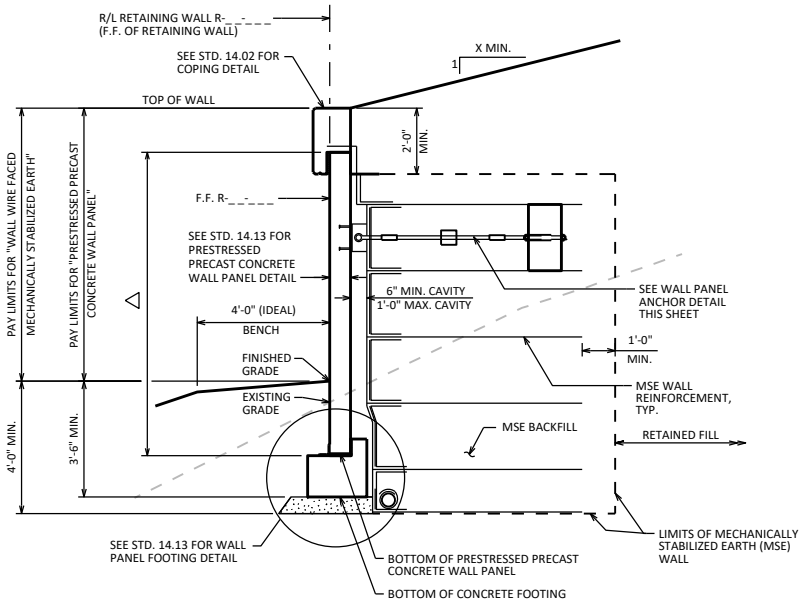
MSE WALL PANEL AND BLOCK FACING

BUREAU OF STRUCTURES

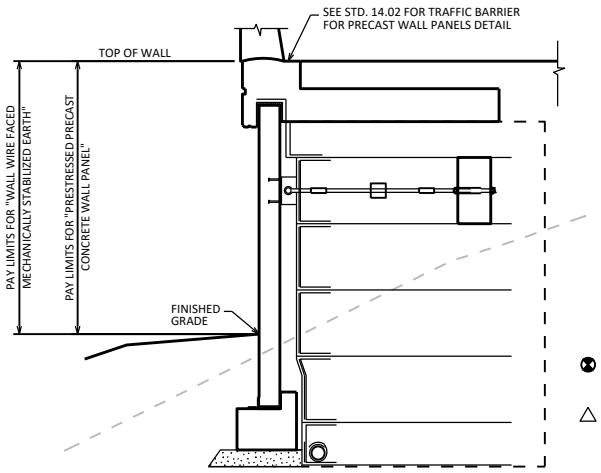
APPROVED: *Laura Shadewald*

DATE: 1-20

STANDARD 14.11



TYPICAL WALL SECTION WITH CAST-IN-PLACE CONCRETE COPING



TYPICAL WALL SECTION WITH CAST-IN-PLACE CONCRETE TRAFFIC BARRIER

SEE TYPICAL WALL SECTION WITH CAST-IN-PLACE
CONCRETE COPING DETAIL FOR ADDITIONAL INFORMATION

MATERIAL PROPERTIES

CONCRETE MASONRY RETAINING WALLS ◓	f'c = 3,500 PSI
PRESTRESSED PRECAST CONCRETE WALL PANEL	f'c = 5,000 PSI
BAR STEEL REINFORCEMENT GRADE 60	fy = 60,000 PSI
STRUCTURAL CARBON STEEL - ASTM A36	fy = 36,000 PSI

NOTES

CLEVIS, CLEVIS PIN, COUPLER, MULTIDIRECTIONAL CONNECTOR, AND TURNBUCKLE TO BE CORROSION RESISTANT AND DEVELOP 125% OF THE ULTIMATE STRENGTH OF THE 1¼" DIAMETER ROD.

ST6X25, ROD, CONNECTING HARDWARE, AND DEADMAN ANCHOR INCLUDING ALL ASSOCIATED REINFORCEMENT ARE INCLUDED IN THE BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".

FORCES APPLIED TO THE DEADMAN ANCHOR MUST BE ACCOUNTED FOR IN THE DESIGN OF MSE REINFORCEMENT WHEN SATISFYING FORCE AND MOMENT EQUILIBRIUM.

DESIGNER NOTES

⊗ SHOW BAR SIZE AND SPACING ONLY. DO NOT PROVIDE BILL OF BARS. BAR STEEL REINFORCEMENT AND CONCRETE INCLUDED IN BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".

△ WALL PANEL HEIGHT IS DEFINED AS THE LENGTH FROM THE TOP OF THE WALL PANEL TO THE TOP OF THE CONCRETE FOOTING. THE MAXIMUM ALLOWABLE WALL PANEL HEIGHT IS 30'.

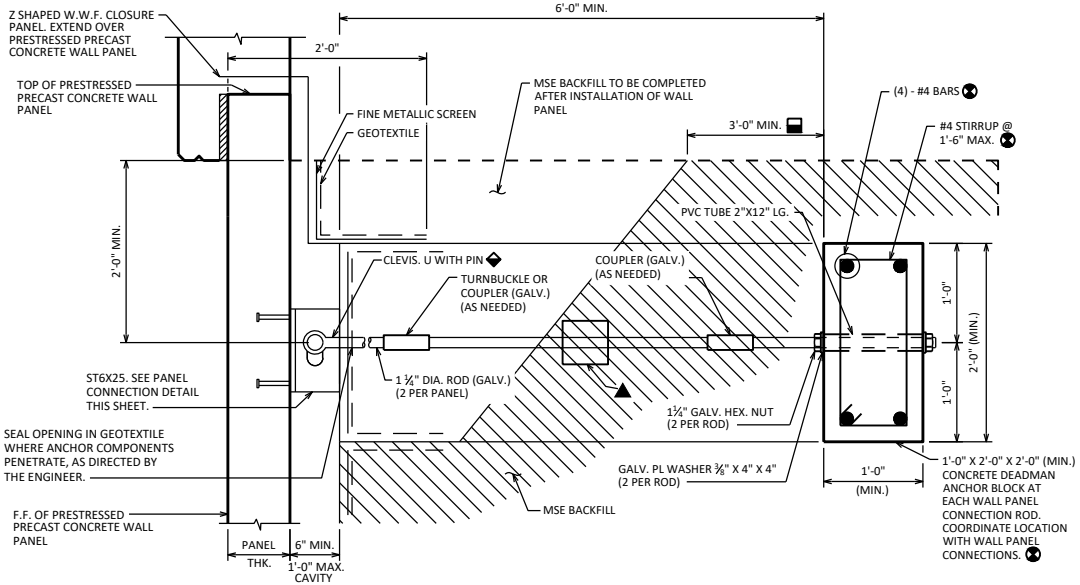
LEGEND

▬ CONTRACTOR TO DESIGN LENGTH TO PROVIDE REQUIRED HORIZONTAL CAPACITY OF ANCHOR ASSEMBLY. MINIMUM 3'-0" OF COMPACTED FILL IN FRONT OF DEADMAN ANCHOR PRIOR TO WALL PANEL ERECTION. 1¼" ROD TO BE 2'-0" MIN. BELOW TOP OF REINFORCED SOIL ZONE.

◆ CLEVIS TO BE INSTALLED TOWARDS THE TOP OF THE SLOTTED HOLE, TO ALLOW FOR SETTLEMENT OF THE WIRE FACED MSE WALL.

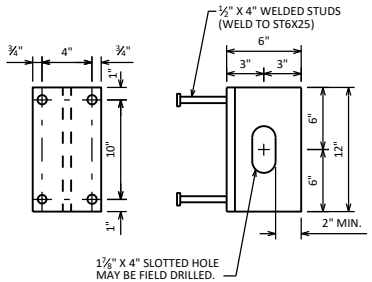
▲ OPTIONAL MULTIDIRECTIONAL CONNECTOR MAY BE USED TO FACILITATE ALIGNMENT AT THE CONNECTION.

◓ INCLUDES CONCRETE FOR COPING, FOOTING, AND DEADMAN ANCHOR.



WALL PANEL ANCHOR DETAIL

CAST-IN-PLACE CONCRETE COPING SHOWN
CAST-IN-PLACE CONCRETE TRAFFIC BARRIER SIMILAR



PANEL CONNECTION DETAIL

AS AN ALTERNATIVE, ½" (GALV.) ADHESIVE ANCHORS MAY BE USED TO AVOID AN OBSTRUCTION. ALTERNATIVE SHALL BE LIMITED TO ONE PANEL CONNECTION PER PANEL.

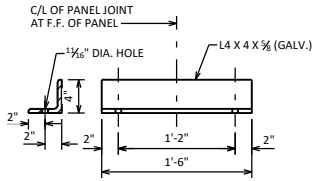
ST6X25 MAY BE WELDED TO ¾" THICK PLATE WITH (4)-½"X4" STUDS ANCHORED IN PRECAST CONCRETE PANEL. RESTORE ZINC COATING AROUND ANY WELDED AREAS. SUBMIT DETAILS FOR APPROVAL BY THE ENGINEER.

MSE WALL WIRE FACING 1

BUREAU OF STRUCTURES

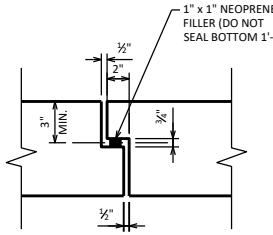
APPROVED: *Laura Shadewald* DATE: 1-19

STANDARD 14.12

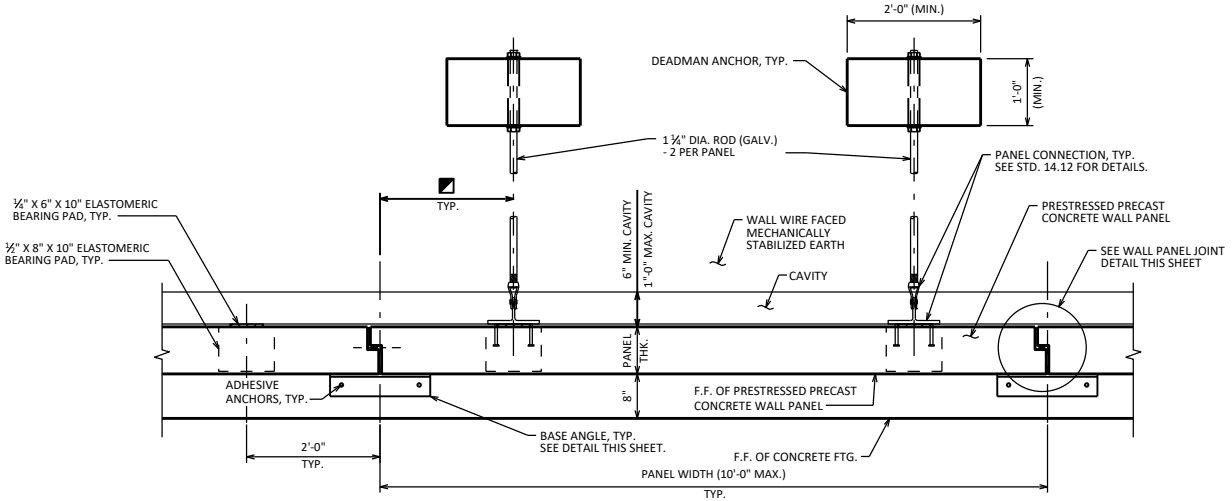


BASE ANGLE DETAIL

CENTERED ON PANEL JOINT OR AT EACH FOOTING END OR STEP ELEVATION.

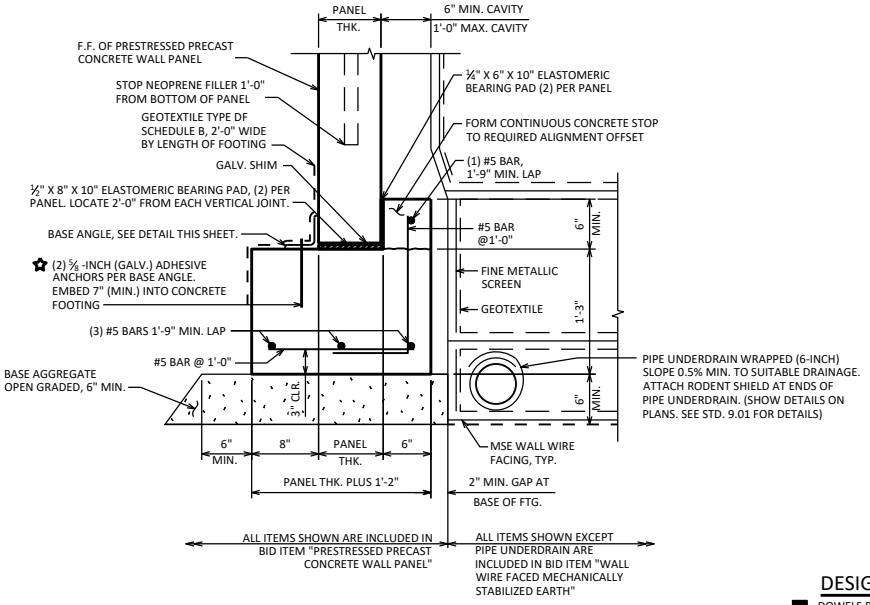


WALL PANEL JOINT DETAIL



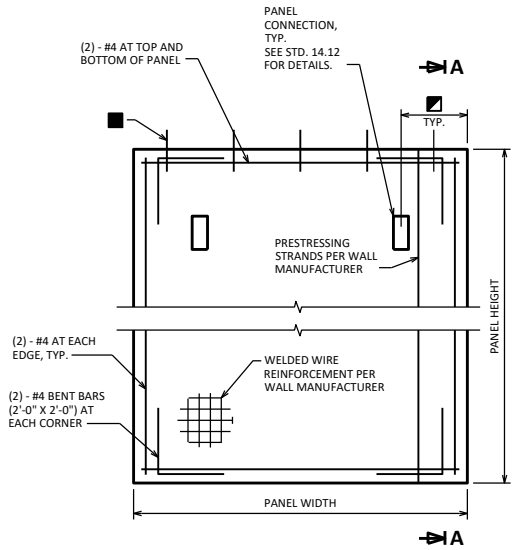
TYPICAL WALL PANEL CONNECTION - PLAN VIEW

ALL ITEMS SHOWN ARE INCLUDED IN BID ITEM "PRESTRESED PRECAST CONCRETE WALL PANEL".



WALL PANEL FOOTING DETAIL

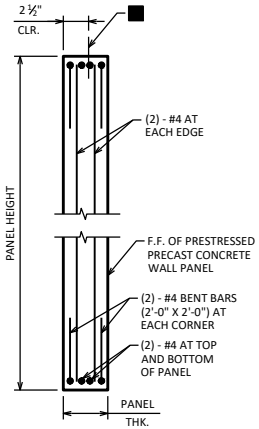
☆ ADHESIVE ANCHORS SHALL CONFORM TO SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS.



ELEVATION PRESTRESSED PRECAST CONCRETE WALL PANEL

DO NOT PROVIDE BILL OF BARS. BAR STEEL REINF. AND CONCRETE ARE INCLUDED IN BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".

PRECAST PANELS 6 FEET OR LESS IN HEIGHT DO NOT REQUIRE PRESTRESSING STRANDS.



SECTION A-A

PRESTRESSING STRANDS NOT SHOWN FOR CLARITY.

DESIGNER NOTE

■ DOWELS REQUIRED FOR CAST-IN-PLACE CONCRETE COPING ONLY. IF CAST-IN-PLACE CONCRETE COPING PROPOSED, INCLUDE THE FOLLOWING NOTE:

#4 DOWELS, 1'-3" LONG AT 2'-0" MAX. SPACING ALTERNATE ANCHORAGE: ½" DIA. ELECTROPLATED FERRULE LOOP INSERT (MEDIUM HIGH CARBON WIRE) OR APPROVED EQUAL.

LEGEND

◪ USE 2'-0" ON 10'-0" PANELS
USE 1'-0" ON PANELS LESS THAN 10'-0"

MSE WALL WIRE FACING 2

BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

DATE: 7-18

STANDARD 14.13