ADOT Specific Requirements for SSL MSE Plus Concrete Panel Wall System

ADOT Vendor	SSL, LLC. 4740 Scotts Valley Drive, Suite E, Scotts Valley, CA 95066
General Information	ADOT Product ID No. 98058 Approval Date: 12/2009 Approval Renewed Date: 11/2015 Re-evaluation due: 11/2020
Design Standards	More Stringent of the following: 1. 2008 ADOT Standard Specifications for Road and Bridge Construction 2. Latest ADOT MSE Wall LRFD Based Special Provisions [Contact ADOT for latest version at the time of the application of the system to a given project.] 3. FHWA (2009), "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes," Publication No. FHWA-NHI-09-083; Authors: Berg, R.R., Christopher, B.R. and Samtani, N.C. 4. AASHTO (2012 or latest Specification or Interims) LRFD Bridge Design Specifications
HITEC Evaluation	Highway Innovative Technology Evaluation Center (HITEC) evaluation was completed in 1999. Civil Engineering Research Foundation (CERF) Report No. 40441. Report Available on file.
Facing Evaluated	• 5 ft. x 6 ft. and 5 ft. x 12 ft. wet pre-cast steel reinforced panels with a minimum thickness of 6 inches. See Sheet SD-04 of attached drawings for details.
Facing Connector	• See Sheet SD-05 of attached drawings for details
Soil Reinforcement Evaluated	• Steel grid reinforcement fabricated from W11, W20 or W24 steel wire. The longitudinal wires are spaced at 8 inches on center, and the transverse (cross) wires are spaced from 6 to 30 inches on center depending on the wall design conditions. Each grid may have between 4 and 8 longitudinal wires. In some cases, a 2 longitudinal wire grid may be used. See included drawings for details.
Notes/Constrains	In addition to the general design requirements provided in the Design Standards listed above, the following specific requirements apply: • For any project, use of the system evaluated herein is subject to ADOT approval based on project and site specific evaluation. • Only the system components evaluated as noted above are to be used. Details in the HITEC report are considered to be superseded by the figures, tables and typical details in this evaluation. Tolerances shall be the more stringent of those noted in SSL's attached drawings and the Design Standards listed above. • Use of soil reinforcements not connected to the wall face is not allowed.

	• Soil reinforcement length measured from back of the facing panel. • The transverse members on the grid shall be uniformly distributed along the complete length of the grid. • Reinforcement pullout shall be calculated based on the default values for steel grid reinforcement provided in the latest AASHTO specification (Design Standard 4 listed above.) • Number of bearing pads between panels shall be in accordance with requirements of Design Standard 2, i.e. ADOT special provisions. • Facing connector shall be designed to have adequate life considering corrosion loss based on the design (service) life of the structure noted on the plans or specifications with a minimum of 75 years design life for permanent structures. • Connector loops embedded in the facing panels shall be lined up such that the steel grid reinforcement crossbar at the connection is uniformly loaded. Therefore, with respect to the alignment of the bearing surfaced of the embedded wire loops, once the steel grid is inserted into the loops, no loop shall have a gap between the loop and the steel grid cross bar of more than 0.125 inch. • Cutting of transverse members as shown on Sheets SD-23 and SD-24 is not permitted. • In plan Sheet SD-10, there shall be a minimum cover of 4 inches of soil between the steel grid and the traffic barrier reaction slab. Also for this and all other similar details that include crushed rock fill at footing, a separation fabric shall be used as required in the latest ADOT MSE Wall LRFD based Special Provisions (Design Standard 2 listed above). • All details for penetration of culvers or other objects through the wall face shall be evaluated on a project and site specific basis. • All details for penetration of vertical and horizontal obstructions through the reinforced soil zone shall be evaluated on a project and site specific basis. Examples of these obstructions include foundation elements, catch basins, slotted drains, etc. • Drainage details shall be modified as appropriate to meet project and site specific requirements.
Assumptions	• Vendor will submit a copy of this Specific Requirements with its project- and site-specific design to ADOT and its representatives for review and approval consideration for a specific construction project. • Vendor submittals shall be in accordance with the design standards and other requirements listed herein. • ADOT and its design representatives will evaluate the project and site specific application of SSL's MSE Plus Concrete Panel system and review submittals for approval consideration in strict accordance with the design standards, limitations, and requirements listed herein. Typical details in this package my not be applicable to a given project and will be modified, based on the

site specific considerations, as necessary by the designer in consultation with the vendor.

- During construction of the SSL's MSE Plus Concrete Panel system, ADOT and its representatives will enforce project and site specific acceptance requirements in accordance with the plans and specifications.

TYPICAL DETAILS

(28 pages)

Typical details submitted to ADOT as part of the product approval process are attached. These represent generic details that must be evaluated by the designer based on project and site specific requirements. The designer shall also be responsible for ensuring conformance to the constraints and design standards noted in this evaluation.

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INDEX OF DRAWINGS

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TITLE & INDEX

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1.0 INTRODUCTION

A MECHANICALLY STABILIZED EARTH RETAINING WALL SHALL MEAN A STRUCTURE WITH A VERTICAL OR NEAR-VERTICAL FACE WHICH COMPRISES TENSILE REINFORCING ELEMENTS EMBEDDED IN A MASS OF COMPACTED SELECT FILL AND SHALL INCLUDE ALL FACING PANELS AND CONNECTIONS NECESSARY TO ENSURE THE STABILITY OF THE ENTIRE WALL SYSTEM.

THE MECHANICALLY STABILIZED EARTH RETAINING WALL SHALL COMPRISE A NON-STRUCTURAL, UNREINFORCED CONCRETE LEVELING PAD, PRECAST CONCRETE FACING PANELS AND SOIL REINFORCING ELEMENTS MECHANICALLY CONNECTED TO THE FACING ELEMENTS.

THE THEORY OF SSL MSE PLUS™ INVOLVES THE TRANSFER OF STRESSES FROM THE SOIL TO THE REINFORCING MESH THROUGH BEARING. BEARING PRESSURE IS DEVELOPED ON THE PROJECTED AREA OF THE CROSS BARS AND IS IN TURN TRANSFERRED TO THE LONGITUDINAL BARS. THIS PLACES THEM IN TENSION AND ENABLES THE SOIL MASS TO WITHSTAND LOADS IN THE DIRECTION OF THE REINFORCEMENT. THE REINFORCING ELEMENTS SHALL POSSESS SUFFICIENT STRUCTURAL STRENGTH AND GEOTECHNICAL PULLOUT RESISTANCE AND OVERALL LENGTH TO MEET THE DESIGN REQUIREMENTS WITH RESPECT TO BOTH INTERNAL AND EXTERNAL STABILITY OF THE WALL SYSTEM.

THE WORK COVERED BY THIS SPECIFICATION SHALL CONSIST OF FURNISHING MATERIALS AND CONSTRUCTION OF MECHANICALLY STABILIZED EARTH WALLS IN ACCORDANCE WITH THE SPECIFICATION, AND COMPLIANCE WITH THE LINES, GRADES, DIMENSIONS AND DESIGN SHOWN ON THE APPROVED SHOP DRAWINGS AND CONTRACT DOCUMENTS.

2.0 WALL COMPONENTS

SSL MSE PLUS™ WALL SYSTEM COMPONENTS THAT MAKE UP THE MSE PLUS™ WALL SYSTEM ARE AS FOLLOWS:

CONCRETE LEVELING PAD – CAST-IN-PLACE LEVELING PADS FOR MSE PLUS™ WALLS ARE UNREINFORCED MINOR CONCRETE, 6" DEEP AND 12" WIDE MINIMUM. THIS WILL SERVE AS A FLAT AND LEVEL STARTING SURFACE FOR THE FACING PANELS. THE ALLOWABLE ELEVATION TOLERANCES ARE +/- 1/4". IMPROPERLY PLACED LEVELING PADS WILL DECREASE PRODUCTION RATES AND CAN RESULT IN SUBSEQUENT PANEL MISALIGNMENT.

PRECAST FACING PANELS – THERE ARE THREE STANDARD TYPES OF FACING PANELS USED IN THE MSE PLUS™ WALL SYSTEM; "A", "X", "Y" & "Z". ADDITIONALLY, PANELS OF OTHER CONFIGURATIONS MAY BE USED DEPENDING ON THE GEOMETRY OF EACH WALL. THESE SPECIFIC PANELS MUST BE PRECAST.

PREFORMED BEARING PAD – THIS 3/4" PAD IS USED BETWEEN ALL HORIZONTAL JOINTS, AND PROVIDES A BEARING SURFACE BETWEEN PANELS. A MINIMUM OF TWO PADS PER JOINT IS REQUIRED. EACH PAD MUST BE GLUED TO THE PANEL SURFACE.

FILTER FABRIC – FILTER FABRIC IS GENERALLY USED ON ALL JOINTS ON THE FILL SIDE OF THE PRECAST FACING PANELS. THIS PREVENTS BACKFILL FINES FROM SEEPING THROUGH THE JOINTS WHILE ALLOWING HYDROSTATIC RELIEF. ADHESIVE IS SUPPLIED TO HOLD THE FABRIC AGAINST THE PANELS UNTIL BACKFILL IS PLACED.

SOIL REINFORCING MESH – THE MESH IS SHOP FABRICATED FROM W11, W15, W20 & W24 STEEL WIRE. THE LONGITUDINAL WIRES ARE SPACED AT 8" ON CENTER, AND THE CROSS WIRES ARE SPACED FROM 6" TO 36" ON CENTER, DEPENDING ON WALL AND DESIGN CONDITIONS. EACH MESH ELEMENT MAY HAVE 2 THROUGH 6 LONGITUDINAL WIRES. THE LENGTH OF THE MESH VARIES WITH THE HEIGHT OF THE WALL AND WALL LOADING CONDITIONS. NO DEFORMED WIRE IS PERMITTED.

MECHANICAL CONNECTION – THE CONNECTION IS COMPRISED OF AN EMBED LOOP, WITH IS CAST INTO THE BACK OF THE PANEL, AND A CONNECTION PIN. THE EMBED LOOP IS SHOP FABRICATED FROM W4.5 & W11. THE CONNECTION PIN IS SHOP FABRICATED FROM W30.

BACKFILL MATERIAL – THE BACKFILL SHALL CONFORM TO PROJECT SPECIAL PROVISIONS.

COPING – IN MOST CASES A REINFORCED CONCRETE COPING IS PLACED AT THE TOP OF THE MSE PLUS™ WALLS. IT PROVIDES AN ATTRACTIVE FINISHED APPEARANCE AND AIDS IN THE PLACEMENT OF TRAFFIC BARRIER, SOUND WALLS, FENCES AND SIGNS WHEN REQUIRED. THE COPING IS CAST-IN-PLACE.

3.0 GENERAL REQUIREMENTS

THE DESIGN OF THE MSE PLUS WALL SHALL CONFORM TO THE GENERAL DIMENSIONS OF THE WALL ENVELOPE INDICATED ON THE PROJECT PLANS PROVIDED BY THE OWNER'S ENGINEER. THE SHOP DRAWINGS SHALL LOCATE THE LEVELING PAD AT OR BELOW THE THEORETICAL ELEVATION OF THE LEVELING PAD SHOWN IN THE CONTRACT PLANS. THE MINIMUM WALL EMBEDMENT SHALL NOT BE LESS THAN THAT INDICATED ON THE PROJECT PLANS. FOR DESIGN PURPOSES, THE HEIGHT OF THE MECHANICALLY STABILIZED EARTH WALL SHALL BE EQUAL TO THE VERTICAL DISTANCE BETWEEN THE TOP OF THE LEVELING PAD AND WHERE THE FINISHED GRADE BEHIND THE WALL INTERSECTS THE BACK OF THE WALL OR TRAFFIC BARRIER.

ALL ANCILLARY STRUCTURES BEHIND, IN FRONT OF, UNDER, ON TOP OF, OR PASSING THROUGH THE WALL INDICATED ON THE PLANS SHALL BE CONSIDERED IN THE DESIGN AND INTERNAL STABILITY ANALYSES OF THE WALL.

WALLS OR WALL SECTIONS, WHICH INTERSECT AT AN ANGLE OF 170 DEGREES OR LESS, SHALL INCLUDE A SPECIAL CORNER ELEMENT TO COVER THE JOINT FORMED BY THE ABUTTING WALLS OR WALL SECTIONS AND TO PERMIT RELATIVE MOVEMENT.

THE JOINTS BETWEEN INDIVIDUAL FACING PANELS SHALL BE DIMENSIONED SO THAT THE FACING SYSTEM CAN SAFELY ACCOMMODATE A DIFFERENTIAL SETTLEMENT OF 12" OVER A HORIZONTAL DISTANCE OF 100'. THE AVERAGE WIDTH OF THE JOINTS BETWEEN INDIVIDUAL PANELS SHALL BE 3/4". FOR MOVEMENTS IN EXCESS OF 1", SSL MSE PLUS™ VERTICAL JOINTS ACT AS SLIP JOINTS, AND CAN ACCOMMODATE DIFFERENTIAL SETTLEMENT GREATER THAN 1".

4.0 DESIGN REQUIREMENTS

THE DESIGN OF THE INTERNAL STABILITY OF THE MSE PLUS WALL SHALL BE THE RESPONSIBILITY OF SSL. DESIGN CONSTRAINTS IMPOSED BY EXTERNAL (OVERALL) STABILITY, SUCH AS ALLOWABLE BEARING PRESSURE DUE TO THE COMBINED EFFECTS OF VERTICAL AND LATERAL LOADS AND MINIMUM LENGTH OF REINFORCING ELEMENTS, SHALL BE PROVIDED BY THE OWNER'S ENGINEER.

4.1 *FAILURE PLANE*

THE FAILURE PLANE FOR THE MSE PLUS WALL SYSTEMS WHICH EMPLOY INEXTENSIBLE REINFORCING ELEMENTS (i.e., STEEL) IS BASED ON THE DESIGN HEIGHT OF THE WALL (H) IN THE FOLLOWING WAY. THE LOCATION OF THE MAXIMUM TENSILE FORCES SHALL BE TAKEN AS HAVING A WIDTH OF 0.3H AT THE TOP OF THE WALL DOWN TO MID-HEIGHT OF THE WALL. THE WIDTH OF THE SO CALLED FAILURE ZONE SHALL BE ASSUMED TO DECREASE LINEARLY FROM 0.3H AT MID-HEIGHT TO ZERO AT THE BOTTOM OF THE WALL.

THE LOCATION OF THE SO-CALLED FAILURE PLANE SHALL BE ADJUSTED, WHERE NECESSARY, TO ACCOUNT FOR THE EFFECTS OF SIGNIFICANT EXTERNALLY APPLIED LOADS, SUCH AS THOSE DUE TO A BRIDGE ABUTMENT FOOTING SUPPORTED DIRECTLY ON THE MECHANICALLY STABILIZED BACKFILL.

4.2 *BACKFILL MATERIAL*

THE ANGLE OF SHEARING RESISTANCE OF THE SELECT GRANULAR BACKFILL USED IN THE REINFORCED FILL MASS SHALL BE ASSUMED TO BE 34°, UNLESS INDICATED OTHERWISE BY THE ENGINEER, FOR THE PURPOSE OF EVALUATING THE INTERNAL STABILITY OF THE WALL SYSTEM. THE ANGLE OF SHEARING RESISTANCE SHALL BE DETERMINED USING THE STANDARD DIRECT SHEAR TEST (AASHTO T-236) ON THE PORTION FINER THAN THE NO. 10 SIEVE AND UTILIZING A SAMPLE PREPARED AT 95% OF AASHTO T-99, METHODS C OR D (WITH A CORRECTION FOR OVERSIZE PARTICLES AS OUTLINED IN NOTE 7) AT OPTIMUM WATER CONTENT. NO TESTING IS REQUIRED FOR BACKFILL IN WHICH AT LEAST 80% OF THE PARTICLES ARE LARGER THAN 3/4". THE PLASTICITY INDEX SHALL NOT EXCEED THAT SHOWN IN THE SPECIAL PROVISIONS, AND THE BACKFILL MATERIAL SHALL BE FREE FROM ORGANIC AND OTHER DELETERIOUS MATTER AND SHALE OR OTHER SOFT, POOR DURABILITY PARTICLES. THE ANGLE OF FRICTION BETWEEN THE BACKFILL MATERIAL AND THE NATIVE FOUNDATION SOILS SHALL BE TAKEN AS 30° UNLESS OTHERWISE INDICATED ON THE PLANS.

4.3 *DRAINAGE*

SSL MSE PLUS™ WALLS CONSTRUCTED IN CUT AREAS OR HILLSIDES WITH ESTABLISHED PIEZOMETRIC LEVELS SHALL INCORPORATE DRAINAGE METHOD, SUITABLY PROTECTED BY APPROPRIATE FILTER MATERIAL, BEHIND AND POSSIBLY UNDERNEATH THE MASS OF REINFORCED BACKFILL. INTERNAL AND EXTERNAL DRAINAGE SHALL BE EVALUATED BY THE ENGINEER FOR ALL STRUCTURES, TO PREVENT SATURATION OF THE BACKFILL OR TO INTERCEPT ANY SURFACE FLOWS CONTAINING AGGRESSIVE ELEMENTS SUCH AS DE-ICING SALTS. INTERNAL DRAINAGE OF THE MECHANICALLY STABILIZED BACKFILL SHALL BE CONSIDERED WHERE THE ANTICIPATED RATE OF SURFACE INFILTRATION DUE TO PRECIPITATION EXCEEDS THE VERTICAL PERMEABILITY OF THE BACKFILL MATERIAL.

4.4 *LENGTH OF REINFORCING ELEMENTS*

THE LENGTH OF THE REINFORCING ELEMENTS BELOW THE TOP LAYER SHALL BE CONSTANT OVER THE ENTIRE HEIGHT OF ANY WALL SECTION. FOR WALLS WITH LEVEL BACKFILL, THE MINIMUM REINFORCEMENT LENGTH SHALL BE 0.7H, WHERE H IS THE HEIGHT MEASURED FROM THE TOP OF THE LEVELING PAD, AND NOT LESS THAN 8'. FOR WALLS WITH SLOPING BACKFILL THE MINIMUM LENGTH OF THE REINFORCING ELEMENTS SHALL BE 0.7 Hz, WHERE Hz, IS THE VERTICAL DISTANCE BETWEEN THE TOP OF THE LEVELING PAD AND THE POINT WHERE THE POINT OF MAXIMUM TENSILE FORCES (DESCRIBED IN SECTION 4.1) INTERSECTS THE SURFACE OF THE BACKFILL BEHIND THE TOP OF THE WALL. IN ADDITION, THE LENGTH OF THE REINFORCING ELEMENTS SHALL BE SUFFICIENT TO SATISFY ALL THE DESIGN CRITERIA WITH RESPECT TO BOTH INTERNAL AND EXTERNAL STABILITY.

4.5 *INTERNAL HORIZONTAL STRESSES*

FOR SSL MSE PLUS™ WALL SYSTEMS WITH INEXTENSIBLE REINFORCING ELEMENTS, THE HORIZONTAL STRESS AT EACH REINFORCEMENT LEVEL SHALL BE COMPUTED BY MULTIPLYING THE CORRESPONDING VERTICAL STRESS BY AN EARTH PRESSURE COEFFICIENT, K. THE VERTICAL STRESS SHALL BE COMPUTED USING A LAYER-BY-LAYER APPROACH FOLLOWING MEYERHOF'S ANALYSIS FOR ECCENTRICALLY LOADED FOOTINGS; I.E., THE RESULTING VERTICAL STRESS AT ANY REINFORCEMENT LEVEL IS A FUNCTION OF THE VERTICAL STRESS DUE TO THE SELF WEIGHT OF THE OVERLYING BACKFILL MATERIAL AND THE INCREASE IN VERTICAL STRESS DUE TO THE OVERTURNING EFFECTS OF THE LATERAL LOAD FROM THE RANDOM FILL RETAINED BY THE MASS OF REINFORCED BACKFILL. THE VALUE OF THE EARTH PRESSURE COEFFICIENT, K SHALL BE ASSUMED EQUAL TO THE AT-REST (Ko) VALUE AT THE TOP OF THE WALL DECREASING LINEARLY TO THE RANKINE ACTIVE VALUE (Ka) AT A DEPTH OF 20'. AT DEPTHS IN EXCESS OF 20', THE VALUE OF K SHALL BE TAKEN AS Ka. FOR NORMALLY CONSOLIDATED SOILS, Ko = L – SIN ø, WHERE ø IS THE ANGLE OF SHEARING RESISTANCE OF THE BACKFILL MATERIAL.

4.6 *STRESSES IN REINFORCING ELEMENTS*

THE REINFORCING ELEMENTS SHALL BE DESIGNED TO HAVE ADEQUATE CORROSION RESISTANCE TO ENSURE A MINIMUM DESIGN LIFE OF 75 YEARS WITH ALL MATERIAL AND OTHER FACTORS OF SAFETY INTACT AT THE END OF THE DESIGN LIFE OF THE MECHANICALLY STABILIZED EARTH STRUCTURE.

UNLESS OTHERWISE INDICATED BY THE ENGINEER, THE METAL LOSS RATES PER SSL'S PRE-APPROVAL WITH ADOT SHALL BE USED IN DETERMINING THE USEFUL AREA OF SOIL REINFORCEMENT REMAINING AT THE END OF THE NOMINAL SERVICE LIFE.

THE ALLOWABLE TENSILE STRESS IN THE LONGITUDINAL WIRES OF THE MESH REINFORCING ELEMENTS SHALL NOT EXCEED 80% OF THE NOMINAL YIELD STRESS OF THE STEEL, PROVIDED THAT THE YIELD STRESS DOES NOT EXCEED 65,000 psi. THE MAXIMUM TENSION IN ANY REINFORCING ELEMENT SHALL NOT EXCEED THE PRODUCT OF THE MAXIMUM ALLOWABLE TENSILE STRESS AND THE AREA OF STEEL REMAINING AT THE END OF THE NOMINAL SERVICE LIFE.

5.0 MATERIALS

SSL SHALL SUPPLY THE PRECAST CONCRETE FACING PANELS, REINFORCING ELEMENTS, PANEL REINFORCEMENT CONNECTIONS, BEARING PADS AND ALL OTHER NECESSARY COMPONENTS SPECIFIED IN THE CONTRACT. SSL AND THE CONTRACTOR SHALL FURNISH, TO THE OWNER'S ENGINEER, THE APPROPRIATE CERTIFICATES OF COMPLIANCE CERTIFYING THAT THE APPLICABLE WALL MATERIALS MEET THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS. MATERIALS NOT CONFORMING TO THE PROJECT SPECIFICATIONS SHALL NOT BE USED WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER'S ENGINEER.

5.1 *PRECAST CONCRETE FACING PANELS*

DISCRETE MODULAR PRECAST CONCRETE FACING PANELS SHALL NOT BE GREATER THAN 45 SQUARE FEET FOR 5' X 6' PANELS AND 90 SQUARE FEET FOR 5' X 12' PANELS. PANEL DIMENSIONS AND LAYOUT SHALL INCLUDE A MINIMUM DESIGN JOINT WIDTH OF 3/4" IN ORDER TO ACCOMMODATE DIFFERENTIAL SETTLEMENT WITHOUT IMPAIRING THE APPEARANCE OF THE FACING OR COMPROMISING THE STRUCTURAL INTEGRITY OF INDIVIDUAL PANELS.

PRECAST CONCRETE FACING PANELS SHALL HAVE A MINIMUM THICKNESS OF 6".

SEE SD-06, NOTE #1 FOR PANEL REINFORCEMENT REQUIREMENTS.

5.1.1 *CASTING OF PANELS*

THE PANELS SHALL BE CAST FACE DOWN IN LEVEL FORMS SUPPORTED ON A FIRM WORKING SURFACE. THE PANELS SHALL BE FULLY SUPPORTED UNTIL THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 1000 psi AND NO PANELS SHALL BE TRANSPORTED BEFORE THE CONCRETE STRENGTH REACHES 3400 psi.

RIGID EMBED SUPPORT SHALL BE USED TO ACCURATELY LOCATE THE PANEL REINFORCEMENT CONNECTION DEVICES WITHIN THE PANELS. THE CONCRETE IN EACH PANEL SHALL BE PLACED IN A CONTINUOUS OPERATION AND SHALL BE THOROUGHLY COMPACTED BY THE USE OF AN APPROVED VIBRATOR, SUPPLEMENTED BY HAND TAMPING, TO ENSURE THAT CONCRETE FLOWS FREELY THROUGHOUT THE PANEL FORM.

UNLESS OTHERWISE INDICATED ON THE PLANS OR IN THE PROJECT SPECIFICATIONS, THE CONCRETE SURFACE FOR THE FRONT (EXPOSED) FACE OF THE PANEL SHALL HAVE A CLASS 1 FINISH. THE BACK FACE SHALL HAVE A UNIFORM SURFACE FINISH SCREEDED TO ELIMINATE OPEN POCKETS OF AGGREGATE AND SURFACE IRREGULARITIES IN EXCESS OF 1/4".

5.1.2 *TOLERANCES*

FOR BOTH 5' X 6' AND 5' X 12' PANELS, THE DIFFERENCE BETWEEN ANY TWO DIAGONALS SHALL NOT BE GREATER THAN 1/2". ALL EMBEDS IN THE BACK OF THE PANELS SHALL BE POSITIONED WITHIN ±3/8" OF THE DESIGN LOCATIONS UNLESS NOTED OTHERWISE. SURFACE DEFECTS ON SMOOTH FORMED SURFACES MEASURED OVER A LENGTH OF 6' SHALL NOT EXCEED 1/8". SURFACE DEFECTS ON TEXTURED FINISHED SURFACES MEASURED OVER A LENGTH OF 6' SHALL NOT EXCEED 1/4" OR AS NOTED IN THE CONTRACT PLANS OR SPECIAL PROVISIONS. SEE SD-04 FOR ADDITIONAL TOLERANCES NOT GIVEN.

ACCEPTANCE OF PRECAST CONCRETE PANELS WITH RESPECT TO CONCRETE STRENGTH SHALL BE BASED ON COMPRESSION TESTS ON 6"X12" CYLINDERS (ARIZONA TEST METHOD 314). ACCEPTANCE OF A PRODUCTION LOT WILL BE MADE PROVIDED THAT THE COMPRESSIVE STRENGTH IS EQUAL TO OR GREATER THAN 4000 psi AT 28 DAYS.

5.2 *REINFORCING ELEMENTS*

REINFORCING MESH ELEMENTS, INCLUDING THE MECHANICAL CONNECTION PIECES, SHALL BE SHOP FABRICATED FROM COLD DRAWN STEEL ROD, AND SHALL BE WELDED AT THE JUNCTIONS BETWEEN LONGITUDINAL AND TRANSVERSE WIRES IN ACCORDANCE WITH ASTM A1064. GALVANIZATION SHALL BE APPLIED AFTER MESH FABRICATION AND SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF ASTM-A123.

THE REINFORCING BEND RADIUS SHALL BE 1" OR LARGER AND NEVER LESS THAN TWICE THE WIRE DIAMETER.

THE CORROSION RATE SHALL BE 12 μM/YEAR WITH A 16 YEAR GALVANIZATION LIFE.

5.3 *SELECT GRANULAR BACKFILL*

ALL BACKFILL MATERIAL IN THE REINFORCED ZONE SHALL BE FREE FROM ORGANIC AND OTHER DELETERIOUS MATERIALS AND SHALL CONFORM TO THE FOLLOWING GRADATION LIMITS AS DETERMINED BY ARIZONA TEST METHOD 201.

SIEVE SIZE	PERCENT PASSING	TEST
4"	100	ARIZONA 201
#40	0 – 60	ARIZONA 201
#200	0 – 15	ARIZONA 201

THE ELECTROCHEMICAL AND OTHER PROPERTIES OF THE SELECT GRANULAR BACKFILL SHALL MEET THE FOLLOWING REQUIREMENTS:

TEST	REQUIREMENT	TEST
SAND EQUIVALENT	12 MINIMUM	217
PLASTICITY INDEX	6 MAXIMUM	AASHTO T-90
MIN. RESISTIVITY	2500 OHM CM	AASHTO T-288
CHLORIDES	< 100 PPM	ASTM D4327
SULFATES	< 200 PPM	ASTM D4327
PH	5.0 TO 10.0	AASHTO T-289
SOUNDNESS	30% MAXIMUM	AASHTO T-104*

*SEE SPECIAL PROVISIONS FOR ALTERNATIVE TESTING AND REQUIREMENTS

6.0 LRFD DESIGN PARAMETERS

SSL'S MECHANICALLY STABILIZED EARTH STRUCTURE DESIGN IS BASED ON AASHTO LOAD AND RESISTANCE FACTOR DESIGN (LRFD) BRIDGE DESIGN SPECIFICATIONS 4TH EDITION.

6.1 *SOIL PARAMETERS*

INTERNAL DESIGN: ϕ = 34°, γ = 125 PCF
EXTERNAL DESIGN: ϕ (RETAINED BACKFILL) = 32°, γ = 125 PCF
ϕ (FOUNDATION) = 30°, γ = 125 PCF

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DESIGN NOTES

ADOT CERTIFICATION PACKAGE

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CONTRACTOR'S RESPONSIBILITY FOR QUALITY CONTROL/QUALITY ASSURANCE OF DELIVERED MATERIAL

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM THE FOLLOWING UPON RECEIPT OF MATERIALS

CONCRETE FASCIA PANELS:

1. INSPECT THE CONCRETE PANELS FOR GENERAL CONDITION.
2. INSPECT THE PANELS EMBED LOOPS.
3. INSPECT THE PANELS FOR SQUARENESS.
4. INSPECT THE CONDITION OF THE ARCHITECTURAL FINISH ON THE PANELS, AND CHECK FOR SPALLING OR CHIPPING.
5. VERIFY THAT THE PANEL NAME IS SCRIBED INTO BACK OF PANEL IS CORRECT.
6. VERIFY QUANTITY OF PANELS AGAINST THE BILL OF LADING.
7. SSL IS TO VERIFY THE PRECAST PANEL CERTIFICATE OF COMPLIANCE AND APPROVE IN WRITING.

WELDED WIRE SOIL REINFORCEMENT:

1. INSPECT THE WELDED WIRE SOIL REINFORCEMENT AND CONNECTION PINS FOR GENERAL CONDITION.
2. INSPECT THE SOIL REINFORCEMENT AND CONNECTION PINS FOR BROKEN WELDS, CRACKED OR FRACTURED WIRE, ANGLE OF THE BEND AT THE CONNECTION AND CONDITION OF THE GALVANIZATION.
3. VERIFY THAT THE MATERIAL DELIVERED CONFORMS TO SSL'S APPROVED SHOP DRAWINGS
4. VERIFY QUANTITY OF SOIL REINFORCEMENT AGAINST THE BILL OF LADING.
5. VERIFY SOIL REINFORCEMENT IS COMPLETE WITH A THE CERTIFICATE OF COMPLIANCE AND MATERIAL CERTIFICATES FOR PRODUCTS SUPPLIED BY SSL ARE WITH THE DELIVERED MATERIAL.

MISCELLANEOUS COMPONENTS:

1. INSPECT FILTER FABRIC FOR GENERAL CONDITION AND DAMAGE.
2. INSPECT BEARING PADS FOR GENERAL CONDITION.
3. VERIFY THE QUANTITY OF ALL MISCELLANEOUS ITEMS AND COMPARE TO THE BILL OF LADING OR SHIPPING DOCUMENTS.
4. STORE ALL COMPONENTS OFF OF THE GROUND AND OUT OF DIRECT SUNLIGHT TO AVOID DAMAGE.

DAMAGED MATERIAL:

1. IF ANY MISSING OR DAMAGED MATERIAL IS FOUND, AS DESCRIBED ABOVE, REJECT THE DAMAGED MATERIAL ON-SITE (IF ANY) AND NOTIFY SSL WITHIN 24 HOURS IN WRITING, FOR FURTHER EVALUATION.

SSL'S RESPONSIBILITY FOR QUALITY CONTROL/QUALITY ASSURANCE OF DELIVERED MATERIAL

1. QUALITY CONTROL FOR MATERIALS SUPPLIED BY SSL SHALL BE IN ACCORDANCE WITH SSL'S SHOP DRAWINGS AND THE PROCEDURES OUTLINED IN SSL'S QUALITY CONTROL MANUAL REV 7 DATED OCTOBER 18, 2013. ANY CHANGES TO THE QUALITY CONTROL MANUAL SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL. SHOP DRAWINGS SHALL BE UPDATED TO REFER TO THE LATEST REVISION OF THE QUALITY CONTROL MANUAL AND SUBMITTED TO THE OWNER FOR APPROVAL.
2. SSL WILL PROVIDE A CERTIFICATE OF COMPLIANCE STATING THAT ALL MATERIALS COMPLY WITH SSL'S QUALITY CONTROL MANUAL AND ALL APPLICABLE PROVISIONS AT THE BEGINNING OF THE MATERIAL SHIPMENT FOR EACH LOT OF MATERIAL RELEASED.
3. TECHNICAL ASSISTANCE IS REQUIRED AS SPECIFIED IN THE PROJECT'S SPECIAL PROVISIONS.
4. PRECAST OPERATIONS SHALL BE IN CONFORMANCE WITH THE FABRICATOR'S PRECAST CONCRETE QUALITY CONTROL PLAN.

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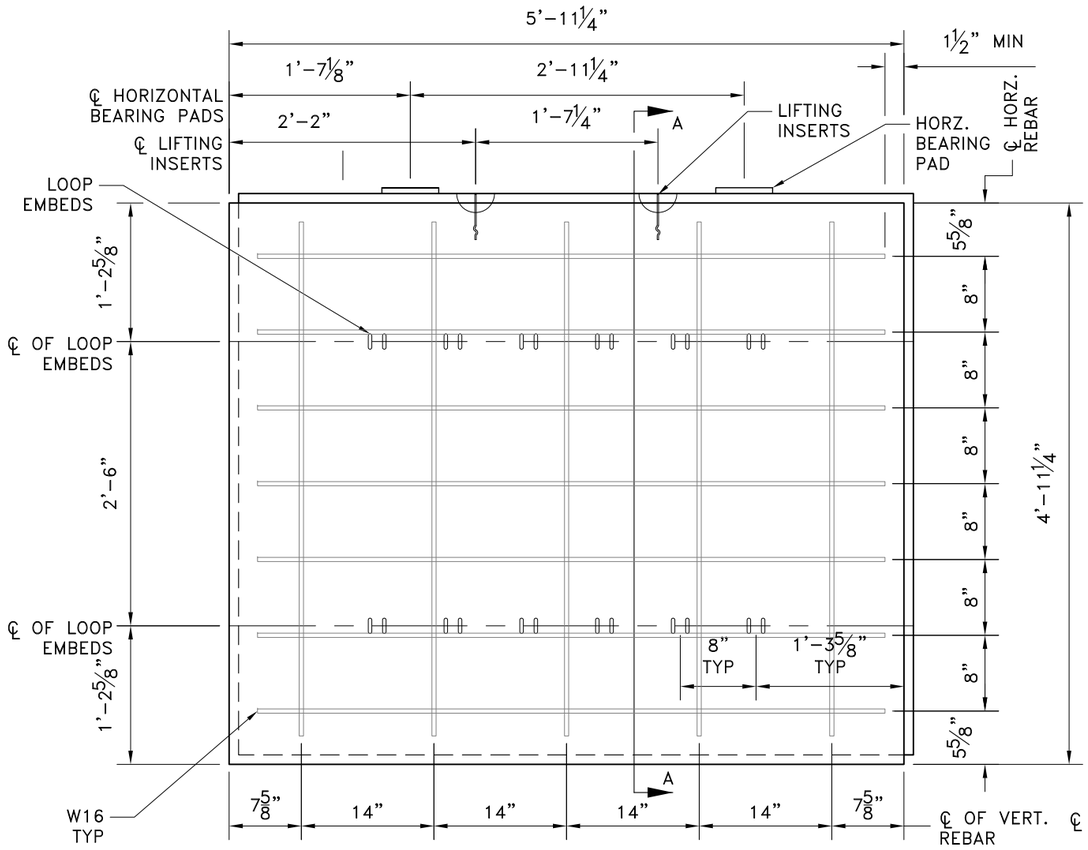
QA/QC OF MATERIALS

ADOT CERTIFICATION PACKAGE

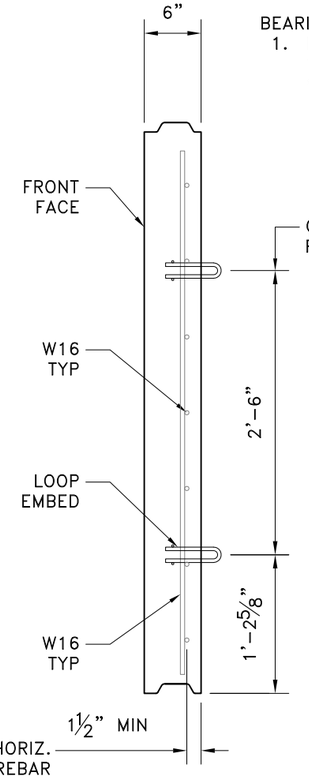
Scale: NTS
Job:
Sheet: SD-03
Sheet 03 of 28



NOTE: W16 WELDED WIRE REINFORCEMENT SHOWN. SEE PANEL REINFORCEMENT TABLE FOR OTHER OPTIONS.

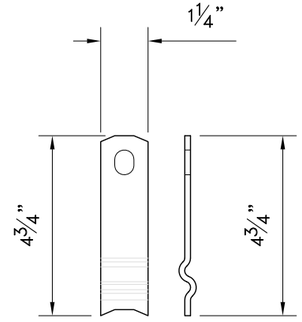
TYPICAL PANEL

SHOWN FROM BACK FACE



SECTION A–A

BEARING PAD NOTE:
1. BEARING PAD PLACEMENT SHOWN IS FOR TYPICAL "A" PANEL ONLY, SEE SD-06 FOR "X", "Y" & "Z" PANELS.



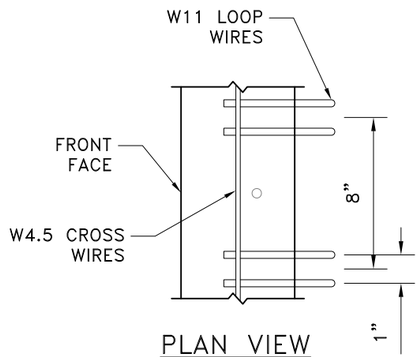
LIFTING INSERT DETAIL

NOTE:
"WAVEY-TAIL" STYLE OF INSERT SHOWN. OTHER INSERTS OF EQUAL OR GREATER CAPACITY MAY BE USED IF APPROVED BY SSL.

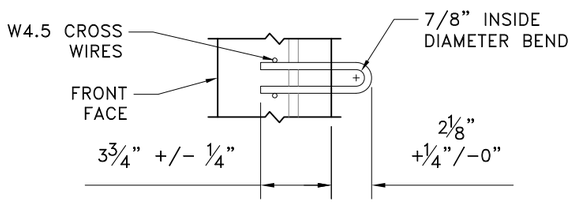
PANEL REINFORCEMENT TABLE

Panel Type	Vertical Bars Num / Size	Horz. Bars Num / Size	Minimum Vert. Area	Minimum Horz. Area
A	5 / W16 or 4 / #4	7 / W16 or 6 / #4	0.80 in²	1.12 in²
A2	5 / W16 or 4 / #4	4 / W16 or 4 / #4	0.80 in²	0.64 in²
X	7 / W16 or 6 / #4	8 / W16 or 7 / #4	1.12 in²	1.28 in²
X2	7 / W16 or 6 / #4	4 / W16 or 4 / #4	1.12 in²	0.64 in²
XY	9 / W16 or 8 / #4	8 / W16 or 7 / #4	1.44 in²	1.28 in²
XY2	9 / W16 or 8 / #4	7 / W16 or 6 / #4	1.44 in²	1.12 in²
Y	9 / W16 or 8 / #4	8 / W16 or 7 / #4	1.44 in²	1.28 in²
Y2	9 / W16 or 8 / #4	7 / W16 or 6 / #4	1.44 in²	1.12 in²
Z	9 / W16 or 8 / #4	8 / W16 or 7 / #4	1.44 in²	1.28 in²
Z2	9 / W16 or 8 / #4	7 / W16 or 6 / #4	1.44 in²	1.12 in²

18" MAX SPACING BETWEEN BARS



PLAN VIEW



ELEVATION VIEW

LOOP EMBED DETAILS

PANEL TOLERANCES:

OVERALL DIMENSIONS:

- STANDARD PANEL
  ± ½" VERTICAL
  ± ½" HORIZONTAL
- TOP AND SPECIAL PANELS
  ± 1" VERTICAL
  ± ½" HORIZONTAL

CONNECTION DEVICE LOCATIONS:

- EMBEDS
  ± 3/8" VERTICAL
  ± 3/8" HORIZONTAL

PANEL SQUARENESS:

- 90° PANEL CORNERS
  ± 3/16" USING 2' SQUARE
  (MEASURE 3 PANEL CORNERS)

PANEL DIAGONAL:

- PANELS WITH 90° CORNERS
  ½" MAX. DIFFERENCE BETWEEN DIAGONALS

SURFACE FINISH:

- FINISH AT FRONT FACE
  ± ⅛" IN 6'

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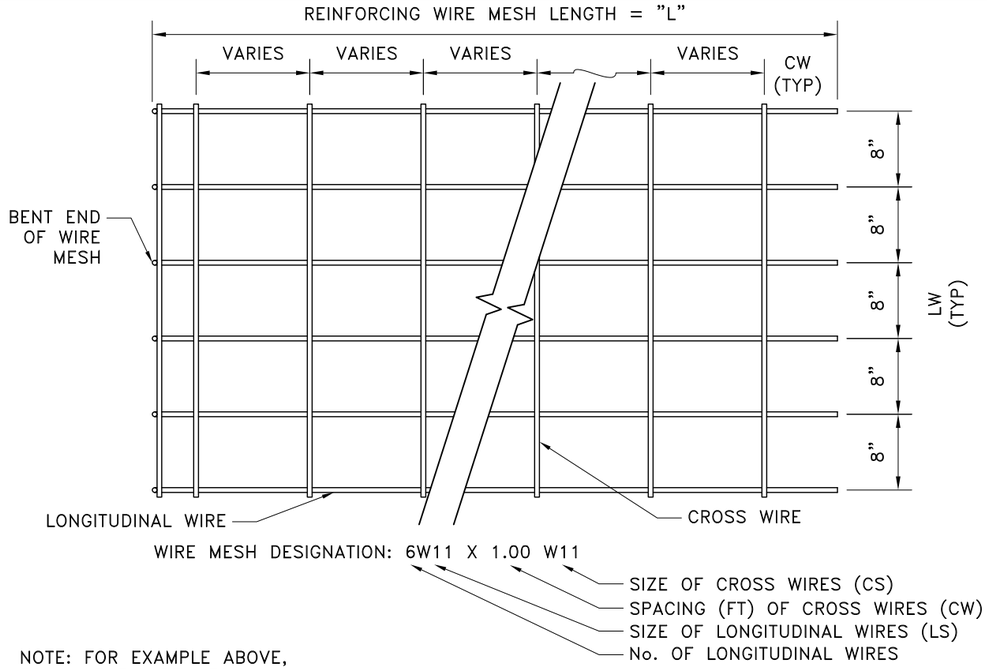
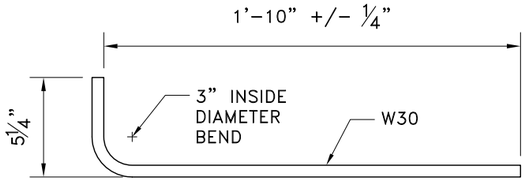
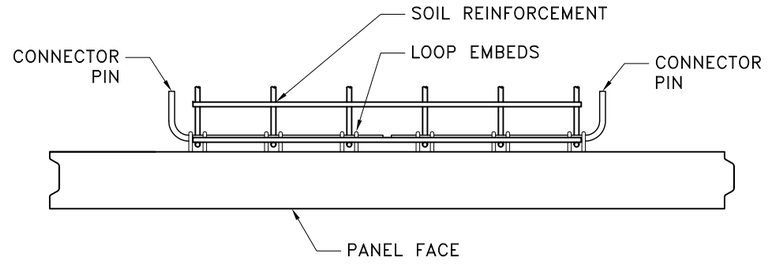


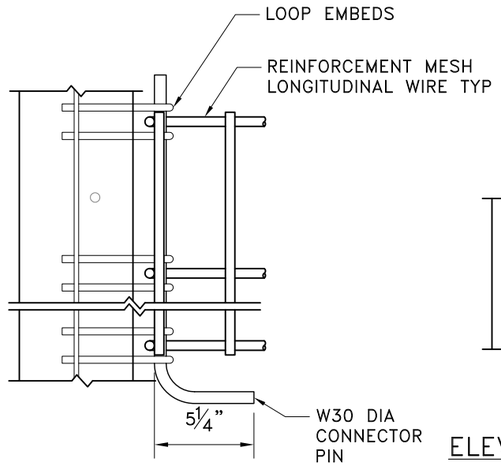
EXAMPLE SOIL REINFORCEMENT DETAIL



CONNECTOR PIN DETAIL

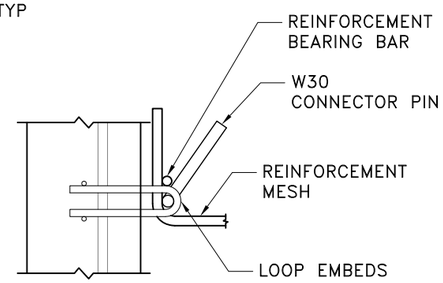


SOIL REINFORCEMENT CONNECTION DETAIL

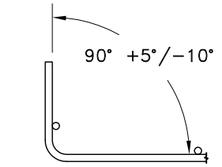


PLAN VIEW

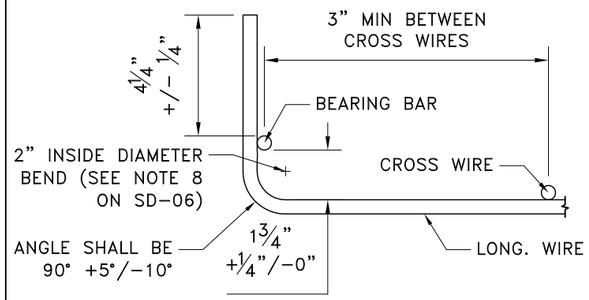
ELEVATION VIEW



REINFORCING MESH CONNECTOR BAR DETAIL

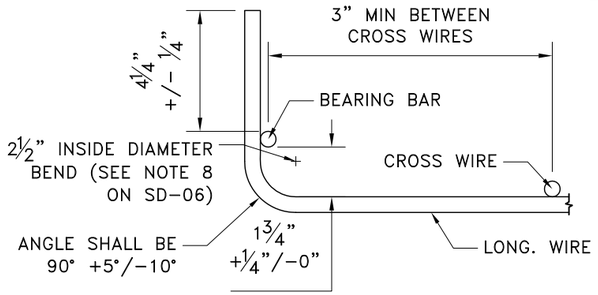


BEND TOLERANCE



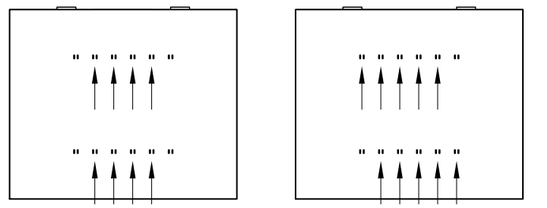
W11 & W20 WIRE MESH LOOP DETAIL

(CROSS WIRES & BEARING BAR SHALL MATCH CROSS SECTIONAL AREA OF LONGITUDINAL WIRES)



W24 WIRE MESH LOOP DETAIL

(CROSS WIRES & BEARING BAR SHALL MATCH CROSS SECTIONAL AREA OF LONGITUDINAL WIRES)



4–WIRE CONNECTION PANEL 5–WIRE CONNECTION PANEL

ATTACHMENT BY No. WIRES

(STANDARD PANELS ONLY)
NOTE: FOR SIX AND EIGHT WIRE CONNECTION PANELS, USE ALL CONNECTION POINTS PROVIDED.

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THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, SSL HAS DESIGNED THE STRUCTURE(S) SHOWN AND IS RESPONSIBLE FOR INTERNAL STABILITY ONLY. THE OWNER REMAINS RESPONSIBLE FOR EXTERNAL STABILITY INCLUDING FOUNDATION (BEARING CAPACITY AND SETTLEMENT) AND SLOPE STABILITY (SLIDING AND ROTATION).

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STANDARD DETAILS: 2 OF 3

ADOT CERTIFICATION PACKAGE

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Sheet: SD–05
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MATERIAL PROPERTIES NOTES:

1. PANEL REINFORCEMENT BARS SHALL BE DEFORMED BILLET STEEL BARS FOR CONCRETE REINFORCEMENT CONFORMING TO THE SPECIFICATION OF ASTM DESIGNATION A 615, GRADE 60, INCLUDING SUPPLEMENTARY REQUIREMENT S1 OR LOW ALLOY STEEL DEFORMED BARS CONFORMING TO THE SPECIFICATIONS OF ASTM DESIGNATION A706. STRUCTURAL WELDED WIRE REINFORCEMENT THAT CONFORMS TO ASTM A185 OR A497 SPECIFICATIONS MAY BE SUBSTITUTED FOR ASTM DESIGNATION A615.

2. W11,W15, W20 & W24 STEEL WIRE SHALL CONFORM TO THE ASTM DESIGNATION A82. THE WELDED WIRE SOIL REINFORCEMENT AND LOOP EMBED SHALL BE WELDED IN ACCORDANCE WITH ASTM DESIGNATION A185. ALL SOIL REINFORCEMENT MESH SHALL BE COMPOSED OF SMOOTH WIRE, DEFORMED WIRE SHALL NOT BE USED FOR SOIL REINFORCEMENT, LOOP EMBEDS AND CONNECTION PIN.

3. THE LOOP EMBEDS, SOIL REINFORCEMENT AND CONNECTION PINS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM DESIGNATION A123 AFTER BENDING.

4. CONCRETE PANELS TO HAVE A 28–DAY COMPRESSIVE STRENGTH OF 4000 PSI.

5. ALL PANEL REINFORCEMENT MUST HAVE A MINIMUM OF 1 1/2" COVERAGE WITH CONCRETE ON ALL SIDES.

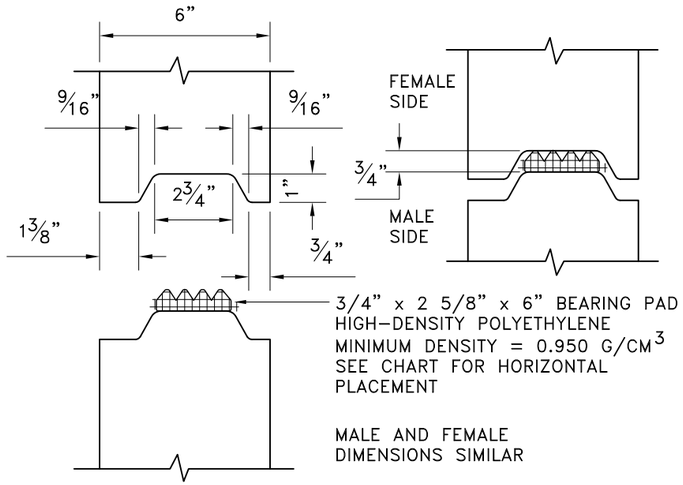
6. FOR PANELS WITH W11 W15, & W20 MESH USE "A" PANEL REINFORCEMENT. PANELS WITH 6 W24 MESH USE "X" PANEL REINFORCEMENT. PANELS WITH 7 OR 8 W24 MESH USE "Y" PANEL REINFORCEMENT. PANELS WITH 2x6 W20 & 8 W24 USE "Z" PANEL REINFORCEMENT.

7. FILTER FABRIC IS A NON–WOVEN GEOTEXTILE COMPOSED OF POLYPROPYLENE FIBERS, WHICH ARE FORMED INTO A STABLE NETWORK SUCH THAT THE FIBERS RETAIN THEIR RELATIVE POSITION. FILTER FABRIC IS INERT TO BIOLOGICAL DEGRADATION AND RESISTS NATURALLY ENCOUNTERED CHEMICALS, ALKALIS AND ACIDS.

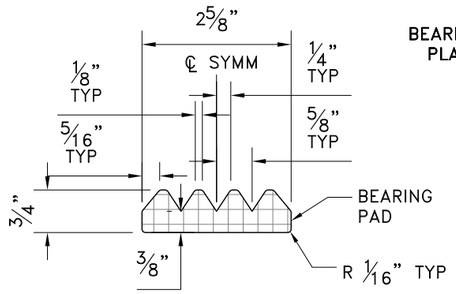
8. THE MINIMUM INSIDE BEND DIAMETER FOR THE SOIL REINFORCEMENT SHALL BE NO LESS THAN TWICE THE NOMINAL DIAMETER OF THE WIRE SIZE AND IN NO INSTANCE BE LESS THAN 1 INCH.

9. CROSS WIRES, BEARING BARS WIRE AND LONGITUDINAL WIRES ON SOIL REINFORCEMENT SHALL BE THE SAME SIZE.

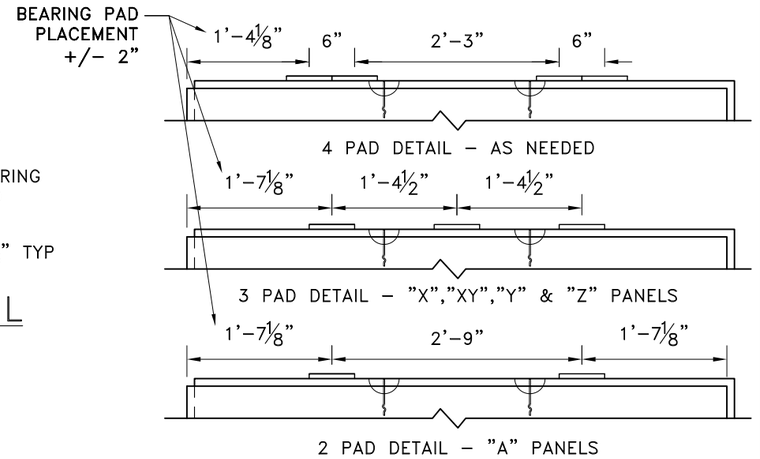
10. UNIVERSAL MESH SHALL BE SUPPLIED FOR THE USE OF REPLACING ANY STYLE OF MESH FOR THE PROJECT. THE UNIVERSAL MESH SHALL HAVE THE GREATEST NUMBER OF LONGITUDINAL WIRES, THE LARGEST CROSS SECTIONAL AREA OF LONGITUDINAL WIRES, THE SMALLEST CROSS BAR SPACING, THE GREATEST CROSS SECTIONAL AREA OF CROSS BARS, AND THE LONGEST LENGTH OF ANY STYLE OF SOIL REINFORCEMENT ON THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR NOTING WHERE THE UNIVERSAL SOIL REINFORCING IS PLACED DURING CONSTRUCTION.



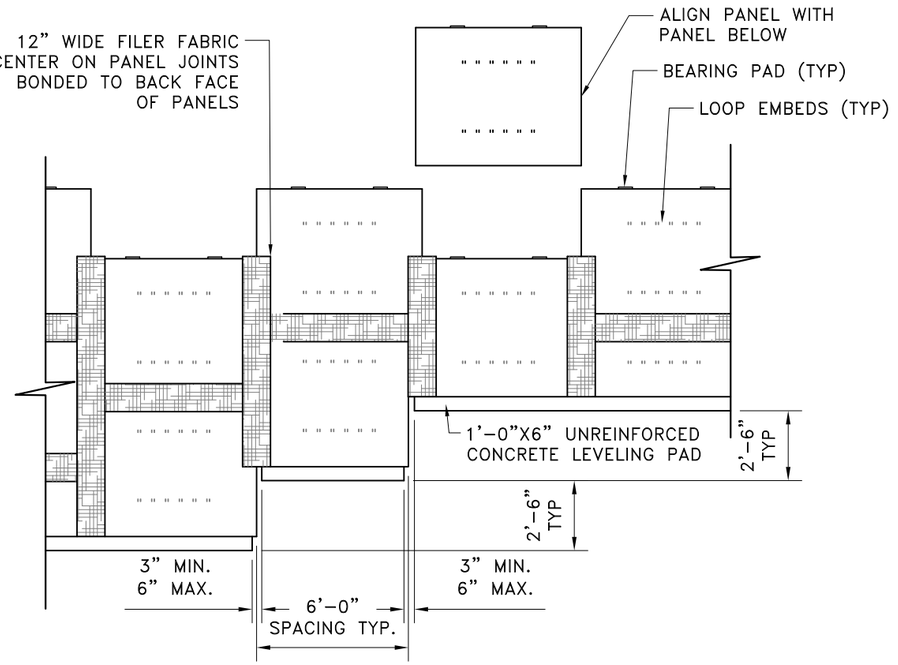
HORIZONTAL PANEL JOINT DETAIL



BEARING PAD DETAIL



BEARING PAD PLACEMENT



FILTER FABRIC DETAIL AND PANEL PLACEMENT

(BACK VIEW)

PANEL HT	Qty.
5 ft	2
10 ft	2
15 ft	2
20 ft	2
25 ft	2
30 ft	2
35 ft	3
40 ft	3
45 ft	3
50 ft	3

BEARING PAD CHART

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ADOT CERTIFICATION PACKAGE

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ERECTION SEQUENCE

SITE PREPARATION
THE AREA WHERE THE MSE PLUS™ WALL IS TO BE PLACED SHOULD BE GRADED LEVEL, TO A WIDTH EQUAL TO THE LENGTH OF THE REINFORCING MESH PLUS 12", OR TO CONTRACT SPECIFICATIONS. ANY UNSUITABLE MATERIAL SHOULD BE REMOVED AND REPLACED WITH SELECT BACKFILL AND COMPACTED ACCORDING TO THE CONTRACT SPECIFICATIONS.

CONSTRUCTION OF THE CONCRETE LEVELING PAD
CONSTRUCT THE LEVELING PADS ALONG THE LINES AND GRADES SHOWN ON SSL'S WORKING DRAWINGS. CURE THE CONCRETE AT LEAST 24 HOURS PRIOR TO THE SETTING OF THE FACING PANELS.

ERECTION OF THE BASE LINE OF PANELS
IT MUST BE EMPHASIZED THAT CARE SHOULD BE EXERCISED IN THE ALIGNMENT AND LEVELING OF THE FIRST COURSE OF PANELS.

THIS WILL ENSURE THE MOST AESTHETICALLY PLEASING RESULT AND ALSO INCREASE PRODUCTION OF THE ERECTION OF SUBSEQUENT COURSES.

A) ESTABLISH THE STARTING POINT. IF A WORKING POINT IS SHOWN ON THE DRAWINGS, OR IF THE WALL MATCHES AN EXISTING STRUCTURE, THIS WOULD BE THE STARTING POINT. IF NEITHER OF THESE ARE THE CASE, THEN BEGIN THE ERECTION ON THE FOOTING WITH THE LOWEST ELEVATION.

B) ESTABLISH A FACE OF WALL LINE. THIS LINE SHOULD BE SNAPPED ON THE CONCRETE LEVELING PAD WITH A CHALK LINE. THE METHOD FOR ESTABLISHING REFERENCE POINTS FOR THIS WILL BE LEFT TO THE DISCRETION OF THE CONTRACTOR.

C) PLACE THE BEGINNING FIRST PANEL WITH THE OUTSIDE FACE ON THE WALL LINE SHOWN IN THE APPROVED WORKING DRAWINGS. THE PANEL IS THEN LEVELED WITH A 5 FT LEVEL AND BATTERED TO THE FILL SIDE APPROXIMATELY 5/8" IN 5 FEET. THIS BATTER OF 5/8" IS TO COMPENSATE FOR BACKFILL COMPACTION EFFORT AND WILL VARY WITH THE NATURE OF THE BACKFILL MATERIAL. THE ACTUAL AMOUNT OF BATTER WILL BE DETERMINED ONLY BY TRIAL AND ERROR.

D) THE SECOND PANEL IS THEN PLACED ADJACENT TO THE BEGINNING HALF PANEL. THE THIRD PANEL IS THEN SET. CHECK THE VERTICAL JOINT SPACING BETWEEN THE TONGUE AND GROOVE OF THE PANELS AND ADJUST TO BETWEEN 1/2" AND 7/8". THE VERTICAL JOINT SHALL BE MEASURED INSIDE THE TONGUE AND GROOVE WITHIN STRUCTURAL THICKNESS OF THE PANELS. LEVEL AND CHECK THE HEIGHT BETWEEN THE PANELS.

E) ADJUST THE PANELS WITH WEDGES OR SPACERS TO ACHIEVE ±1/4" BATTER FROM POINT OF FULL PANEL TO TOP FACE OF PARTIAL PANEL.

F) CHECK BATTER AND LEVEL OF THESE PANELS BEFORE PROCEEDING. CONTINUE PANEL ERECTION.

G) BRACE ALL OF THE FULL PANELS WITH APPROVED BRACING ON THE OUTSIDE FACE. THE BATTER SHOULD BE CHECKED BEFORE SECURING. CLAMP THE SMALLER PANELS TO THE LARGER PANELS. THE BASE COURSE MUST BE CLAMPED AND BRACED TO MAINTAIN ALIGNMENT AND BATTER. NO BRACING WILL BE REQUIRED ON SUBSEQUENT COURSES. SEE DETAILS IN FIGURE 1.

H) GLUE THE FILTER CLOTH TO THE BACK FACE OF THE PANELS OVER THE JOINTS. USING NO MORE THAN A 1/4" ADHESIVE BEAD TO HOLD THE FILTER FABRIC TO THE PANEL WHILE BACKFILL IS BEING PLACED. (FIG. 2)

I) PLACE AND COMPACT APPROVED BACKFILL TO THE LEVEL OF THE FIRST ROW OF LOOP CONNECTORS USING THE MAXIMUM LIFT HEIGHT REQUIRED BY THE PROJECT SPECIFICATIONS (FIG. 3). DO NOT PLACE THE FIRST LIFT OF BACKFILL DIRECTLY AGAINST THE PANELS. COMPACT THE ZONE WITHIN 3 FEET OF THE BACK OF THE WALL FACING PANEL WITHOUT CAUSING DAMAGE TO OR DISTORTION TO THE WALL FACING PANELS BY USING LIGHT MECHANICAL TAMPERS APPROVED BY THE ENGINEER.

J) ATTACH MESH TO PANELS WITH THE PIN CONNECTORS PROVIDED. ALIGN THE BEND ON THE MESH INTO THE EMBEDS IN THE PANEL. INSERT THE PIN THROUGH 3 PAIRS OF EMBED LOOPS. REPEAT THIS STEP FOR THE OTHER 3 EMBEDS.

K) THE NEXT LIFTS OF BACKFILL ARE THEN PLACED. FILL AND COMPACT UP TO THE TOP OF THE SMALLER PANEL AS SHOWN IN FIGURE 4. OVERLAPPING MESH REQUIRES A MINIMUM OF 3" OF FILL BETWEEN LAYERS. COMPACTION TESTS SHOULD NOT BE TAKEN WITHIN 3 FEET OF THE PANELS.

ERECTION OF SUBSEQUENT COURSES
A) GLUE THE 3/4" PREFORMED BEARING PADS ON TOP OF THE SMALLER PANELS AND THEN PLACE THE SECOND ROW OF PANELS. (FIG. 5)

B) IF CARE WAS TAKEN ON THE BOTTOM COURSE OF PANELS, LITTLE IF ANY LEVELING SHOULD BE REQUIRED. THE BATTER MAY BE SET BY USING WEDGES BETWEEN THE CLAMP AND PANEL OR IN THE HORIZONTAL PANEL JOINT.

C) PLACE FILTER CLOTH ON BACK FACE OF PANELS. (FIG. 5)

D) PLACE THE BACKFILL UP TO THE NEXT LEVEL OF MESH, INSTALL THE MESH AS ABOVE, AND REPEAT THIS SEQUENCE FOR THE REMAINING WALL HEIGHT. FILL MAY BE SLOPED DOWNWARD TOWARD THE PANELS WITHIN 2 FEET OF THE BACK FACE IF NECESSARY TO PREVENT EXCESSIVE OUTWARD MOVEMENT WHEN COMPACTING THE BACKFILL.

E) INSTALL END AND TOP PANELS AS REQUIRED.

F) CONTINUE THE ABOVE PROCEDURES UNTIL ALL FACING PANELS ARE INSTALLED.

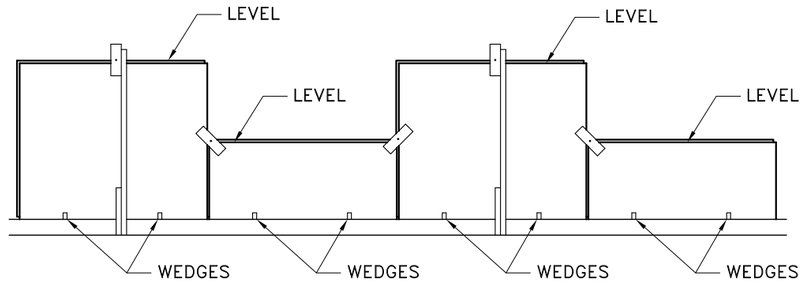


FIGURE 1

FRONT VIEW

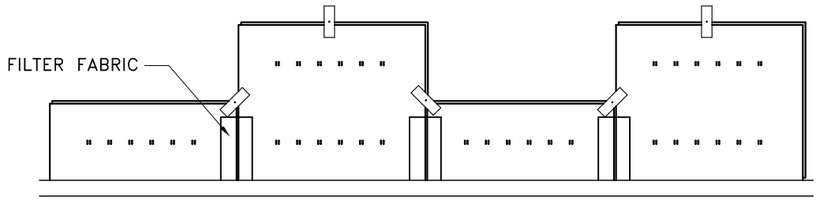


FIGURE 2

BACK VIEW

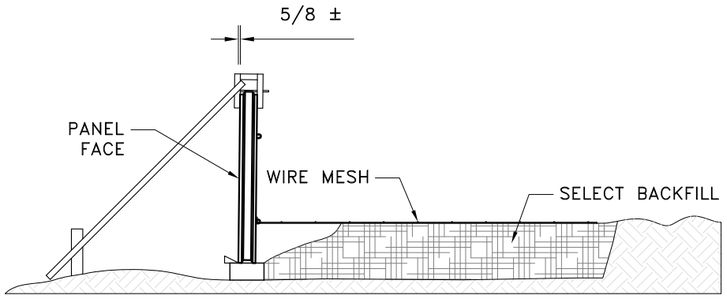
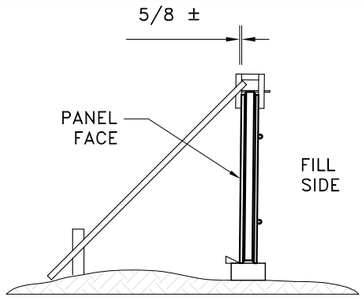
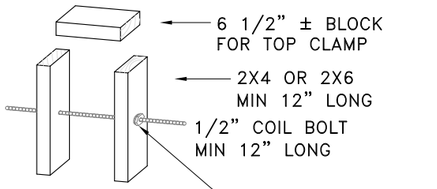


FIGURE 3



SIDE VIEW



CLAMP DETAIL

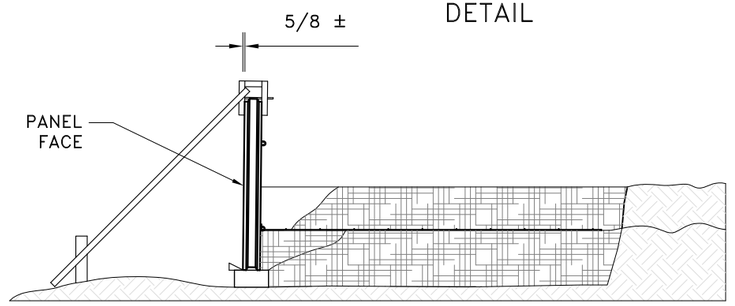


FIGURE 4

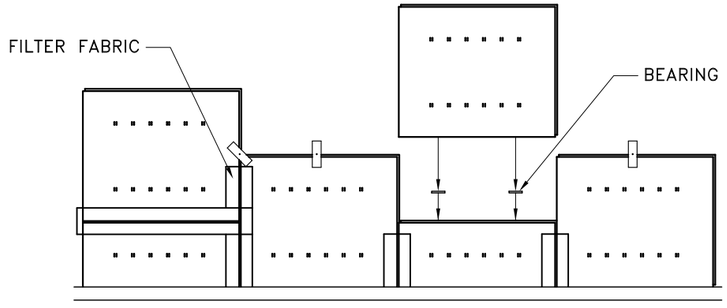


FIGURE 5

BACK VIEW

SSL, LLC. IS SUPPLYING PRECAST CONCRETE PANELS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF MSE PLUS RETAINING WALLS DETAILED TO CONFORM TO THE REQUIREMENTS OF THE OWNER'S CONTRACT DOCUMENTS. THE MSE PLUS WALL ERECTION MANUAL FURNISHED TO THE OWNER AND THE WALL CONTRACTOR PROVIDES ONLY A GENERAL EXPLANATION OF THE SYSTEM. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DEVISE AND CARRY OUT A PLAN FOR ERECTION AND ASSEMBLY OF COMPONENTS, WHICH IS PROJECT SPECIFIC. SAID PLAN SHALL PROVIDE FOR UNLOADING, HANDLING, PLACING, AND BRACING COMPONENT MATERIALS WITHOUT RELYING ON THE CONCEPTUAL DRAWINGS AND GUIDELINES PROVIDED BY SSL. ACKNOWLEDGMENT OF THE RECEIPT AND REVIEW OF THE SSL WALL ERECTION MANUAL DOES NOT RELIEVE THE WALL CONTRACTOR OF RESPONSIBILITY TO COMPLY WITH THE PROJECT SPECIFICATIONS AND DRAWINGS OR STRICT COMPLIANCE WITH ALL FALL PROTECTION, LAWS, SAFETY STANDARDS, AND PROCEDURES DURING THE PERFORMANCE OF JOB SITE WORK. PRECAUTIONS SHALL BE TAKEN TO PROTECT INSPECTORS, SUPERVISORS AND TRADESMAN FROM INJURY FROM SHIFTING OR FALLING PANELS DURING ERECTION.

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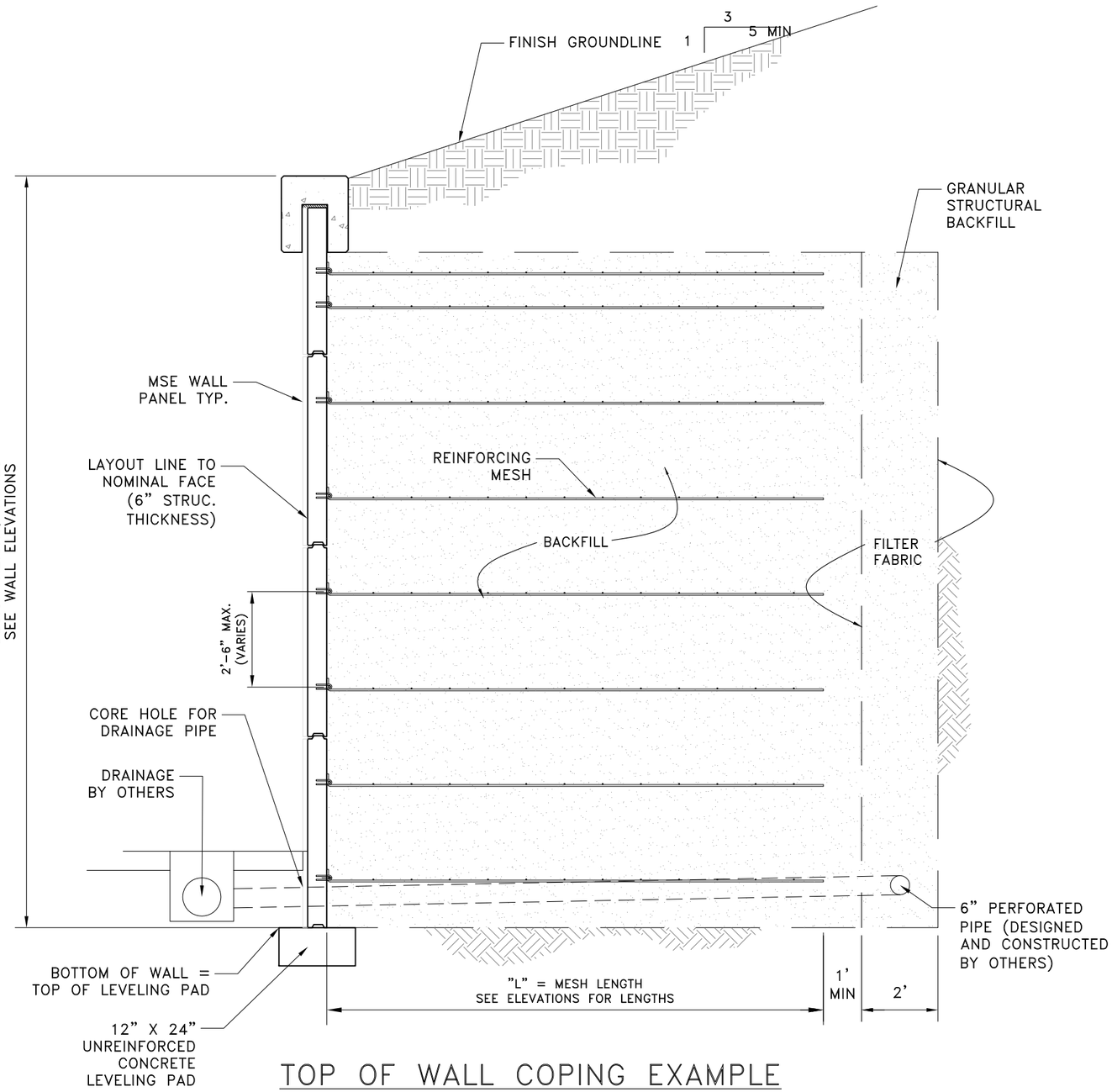
CHECK BY:					
PROJ. ENGR:	NO.	DATE	REVISION DESCRIPTION	BY	

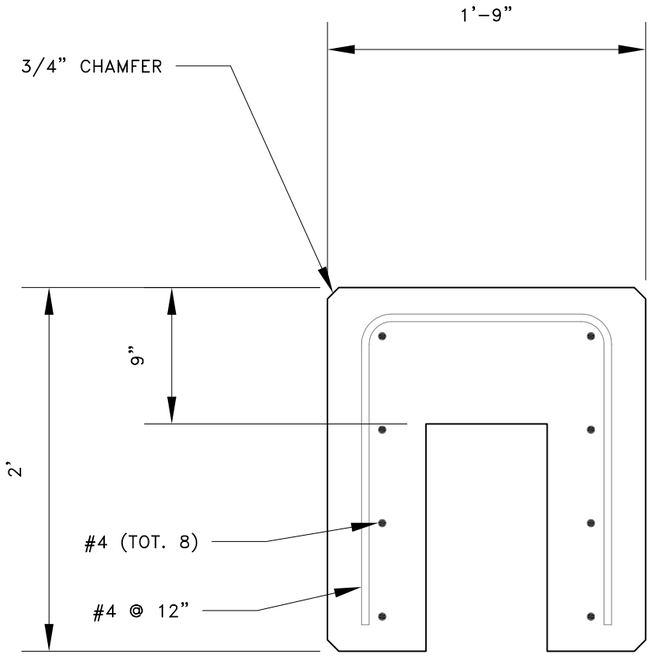
ERECTION SEQUENCE

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-07
Sheet 07 of 28



TOP OF WALL COPING EXAMPLE



PRECAST COPING OPTION

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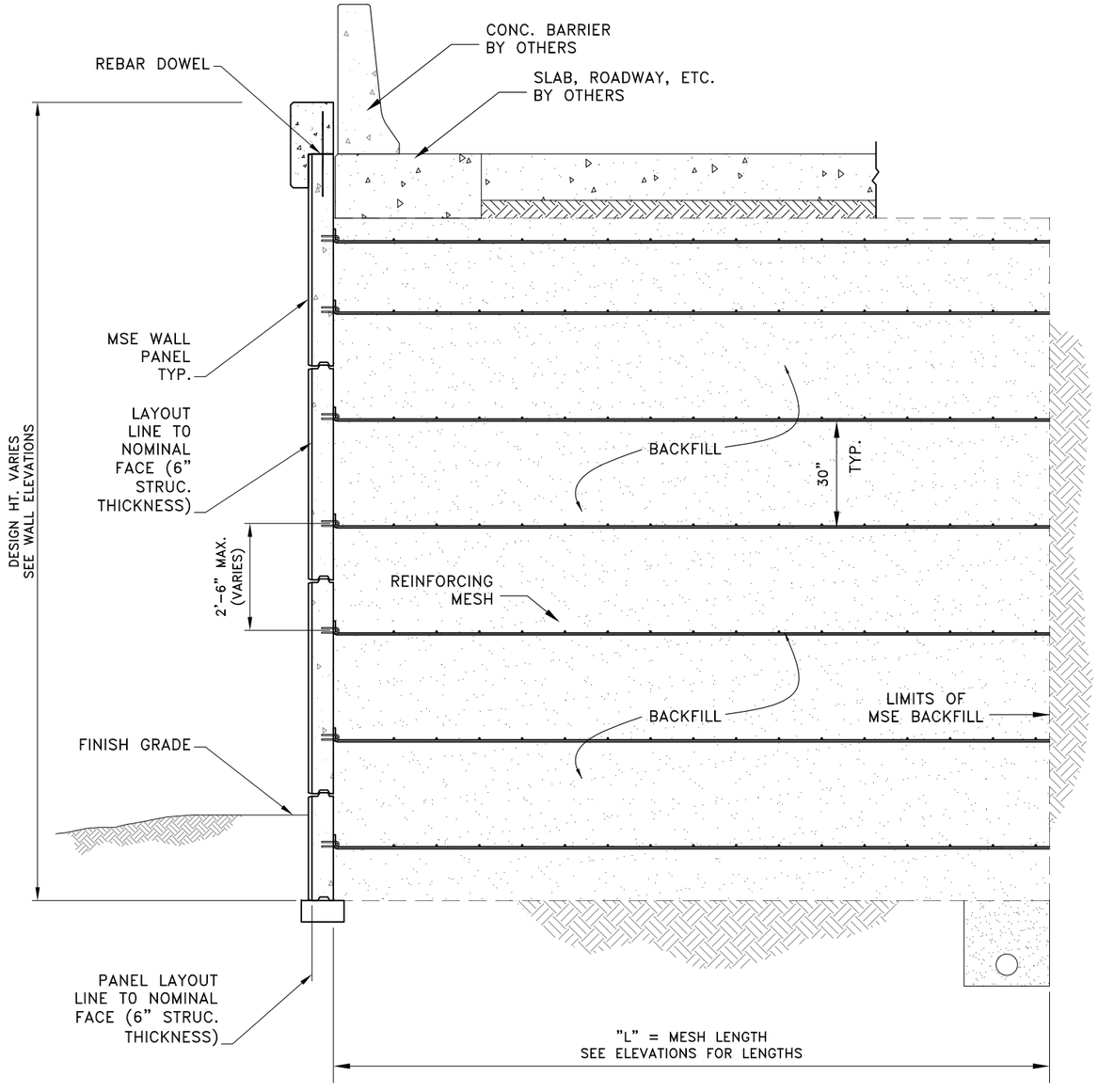
TOP OF WALL COPING

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-08
Sheet 08 of 28



TOP OF WALL BARRIER

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TOP OF WALL BARRIER

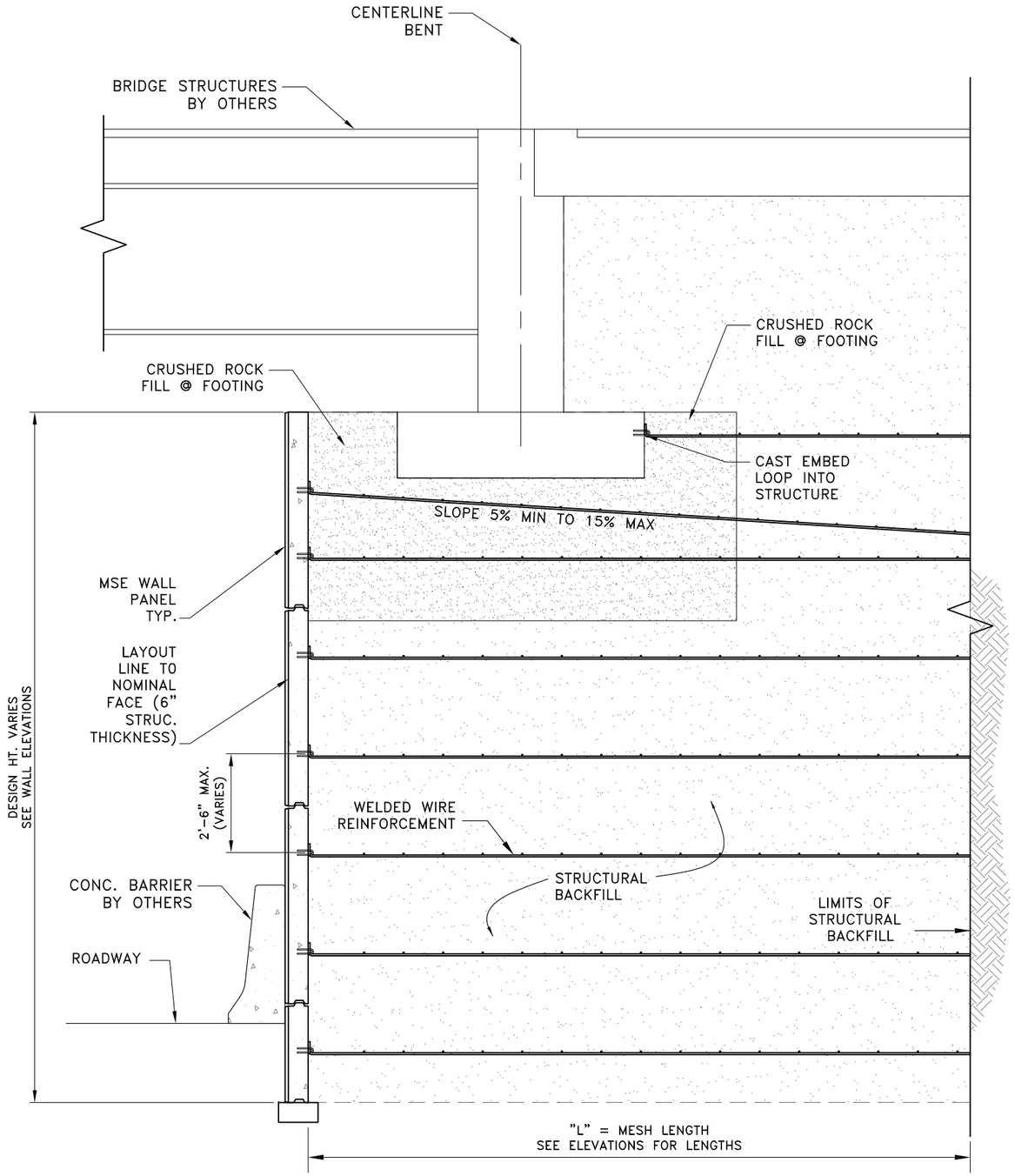
ADOT CERTIFICATION PACKAGE

Scale: NTS

Job:

Sheet: SD-09

Sheet 09 of 28



BOTTOM OF WALL TRAFFIC BARRIER

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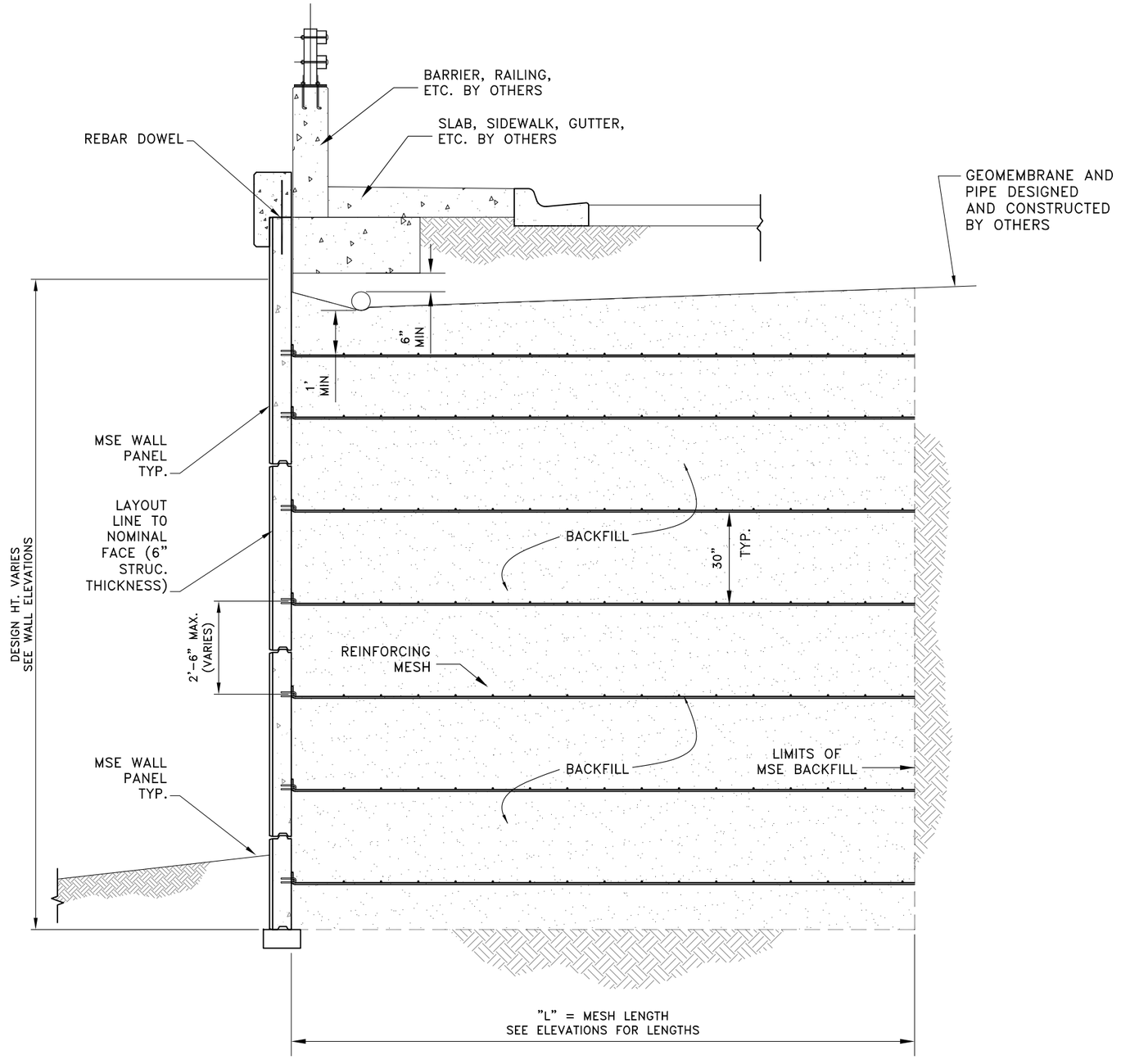
CHECK BY:					
PROJ. ENGR:	NO.	DATE	REVISION DESCRIPTION	BY	

TRAFFIC BARRIER AT BASE OF WALL

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-10
Sheet 10 of 28



NOTES:
FOR ADDITIONAL DETAILS AND DIMENSIONS SEE CONTRACT PLANE

DEICING MEMBRANE EXAMPLE

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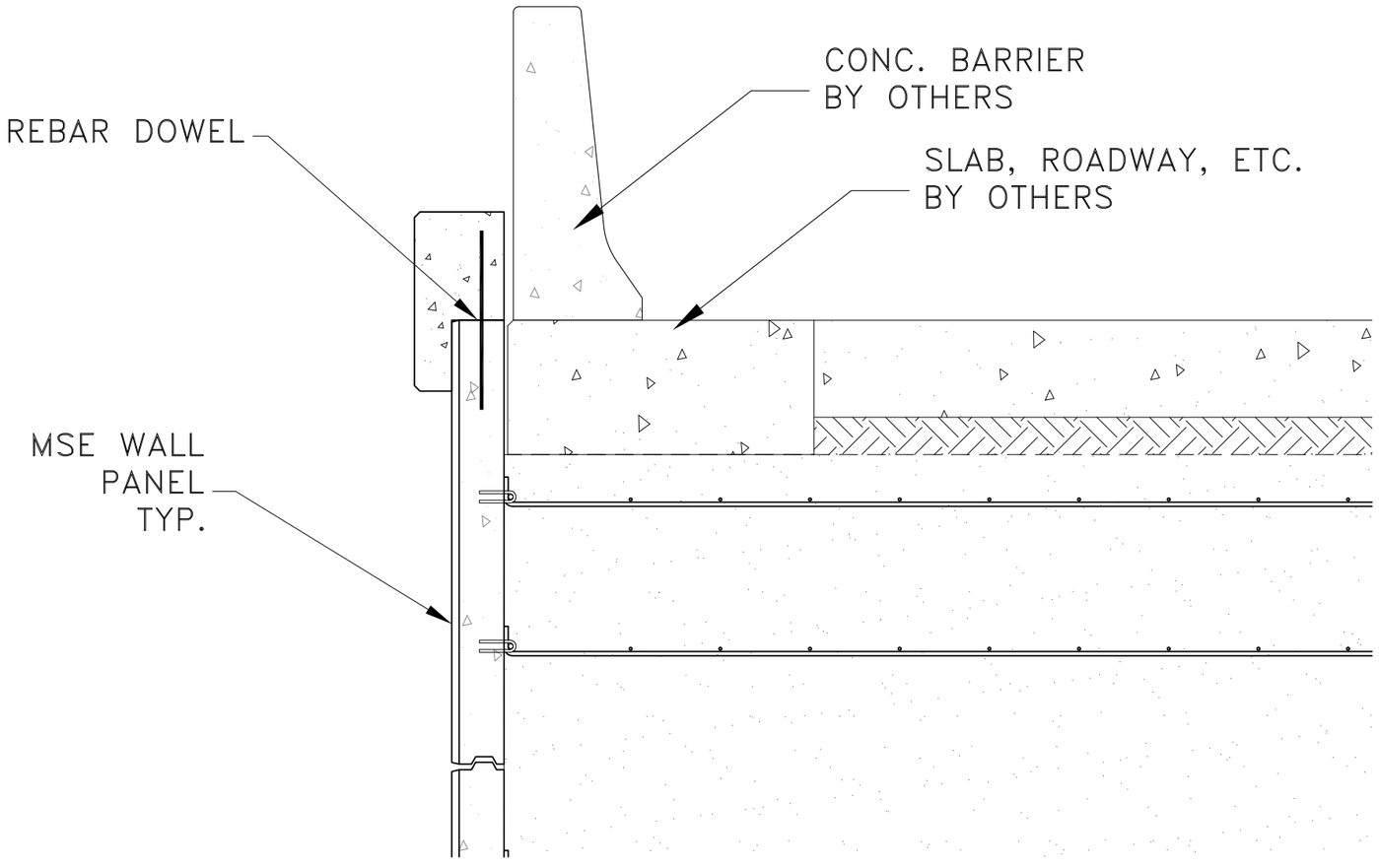
CHECK BY:					
PROJ. ENGR:					

DEICING MEMBRANE

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-11
Sheet 11 of 28



GENERAL NOTES:

1. CONSTRUCTION SPECIFICATION TO BE USED SHALL BE THE LATEST EDITION OF ARIZONA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

2. DESIGN SPECIFICATIONS TO BE USED SHALL BE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION 2007.

3. ALL CONCRETE SHALL BE CLASS " ($f'c$ = 4000 psi).

4. REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A615. ALL REINFORCING SHALL BE FURNISHED AS GRADE 60. ALL REINFORCING SHALL BE EPOXY COATED AT LOCATIONS ABOVE EL. 4000 ft.

5. ALL BENDS AND HOOKS SHALL MEET THE REQUIREMENTS OF AASHTO LRFD ARTICLE 5.10. ALL BEND DIMENSIONS FOR REINFORCING STEEL SHALL BE OUT-TO-OUT OF BARS. ALL PLACEMENT DIMENSIONS FOR REINFORCING STEEL SHALL BE CENTER OF BARS UNLESS OTHERWISE NOTED.

6. ALL REINFORCING STEEL SHALL HAVE 2 INCH CLEAR COVER UNLESS OTHERWISE NOTED.

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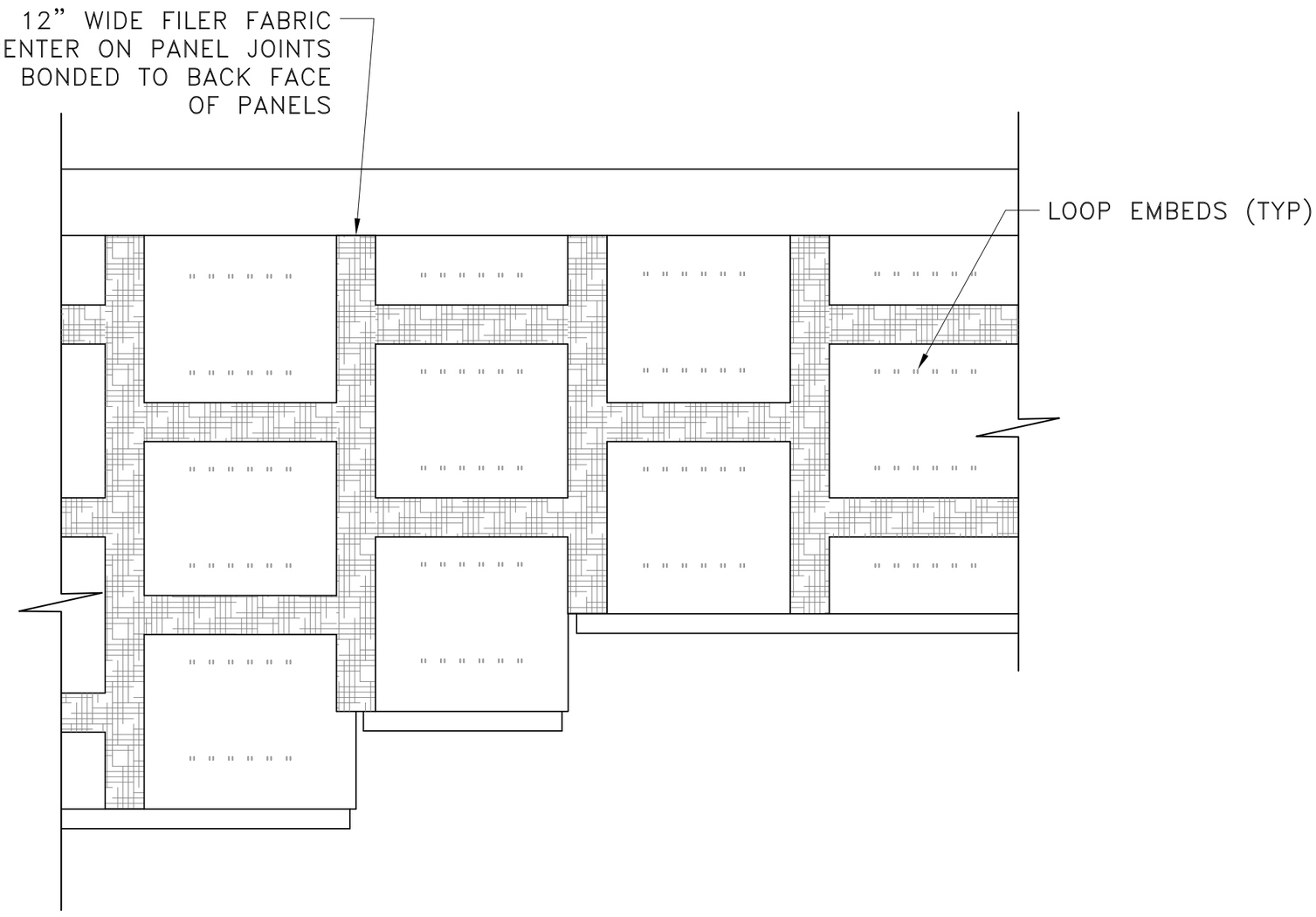
CONSTRUCTION OF CAST-IN-PLACE TRAFFIC BARRIER

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-12
Sheet 12 of 28



JOINT DRAINAGE DETAIL

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THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, SSL HAS DESIGNED THE STRUCTURE(S) SHOWN AND IS RESPONSIBLE FOR INTERNAL STABILITY ONLY. THE OWNER REMAINS RESPONSIBLE FOR EXTERNAL STABILITY INCLUDING FOUNDATION (BEARING CAPACITY AND SETTLEMENT) AND SLOPE STABILITY (SLIDING AND ROTATION).

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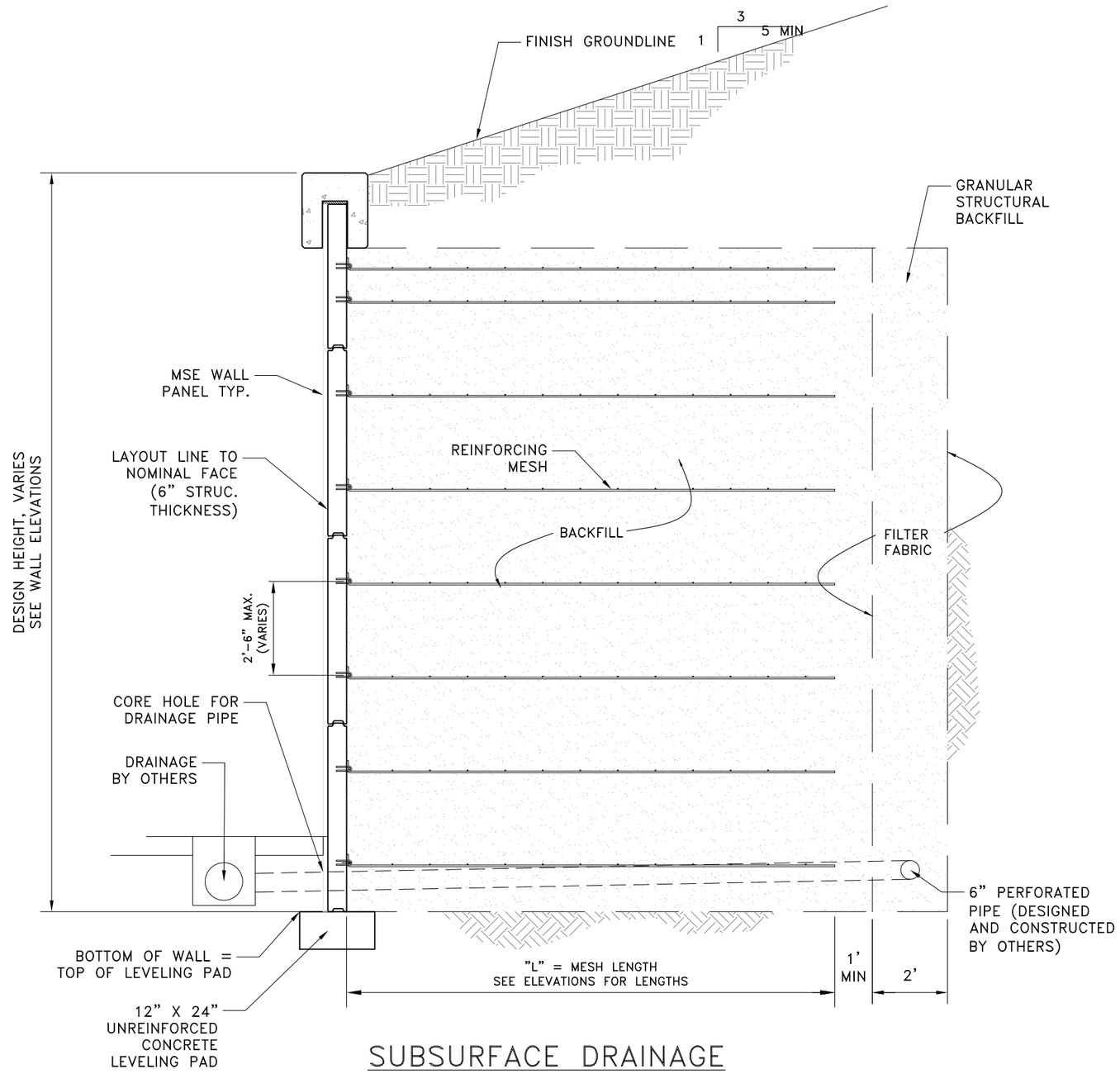
CHECK BY:					
PROJ. ENGR:	NO.	DATE	REVISION DESCRIPTION	BY	

JOINT DRAINAGE DETAIL

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-13
Sheet 13 of 28



SUBSURFACE DRAINAGE

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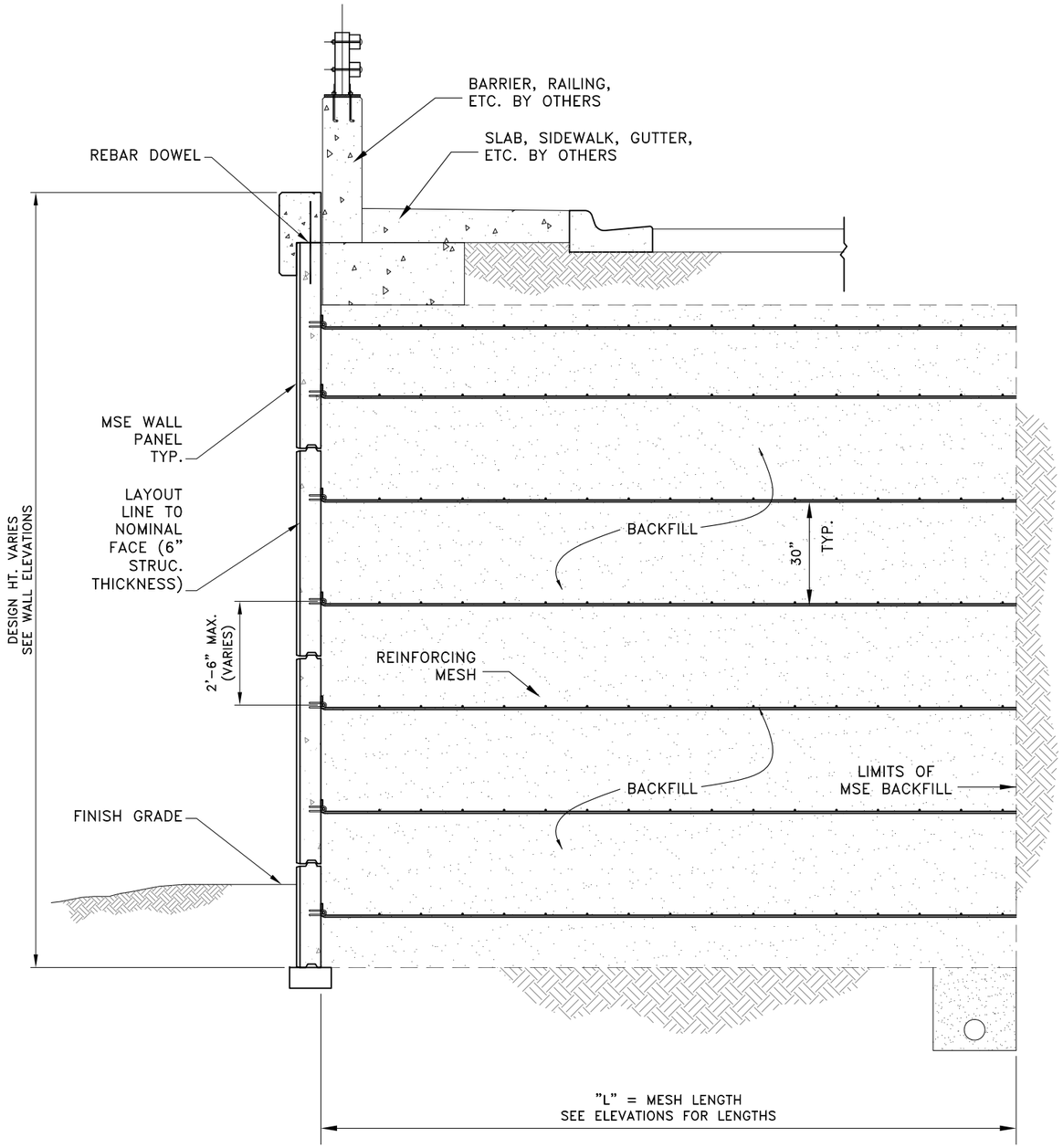
SUBSURFACE DRAINAGE

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-14
Sheet 14 of 28



LUMINAIRE SUPPORT EXAMPLE

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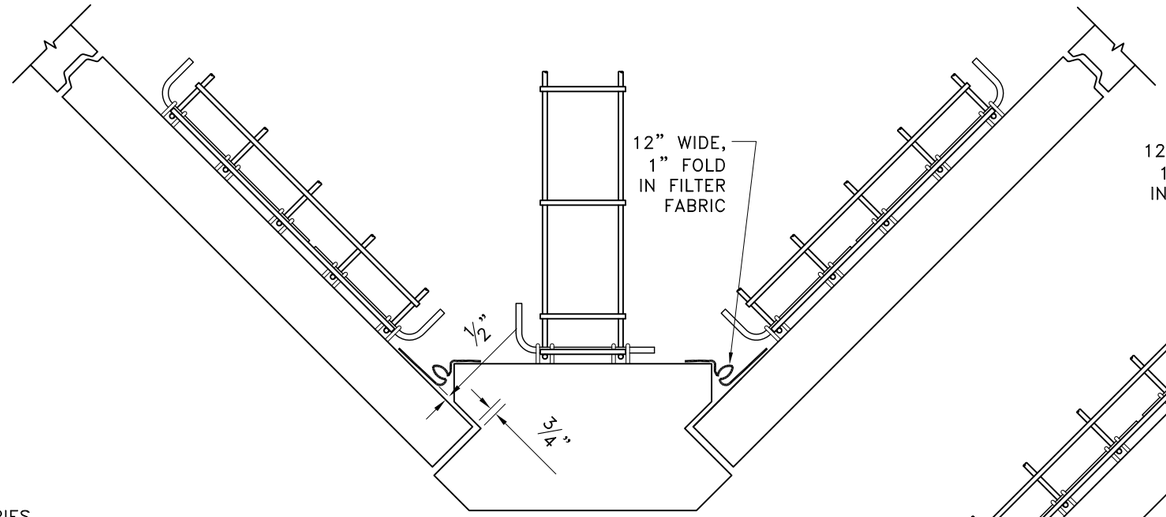
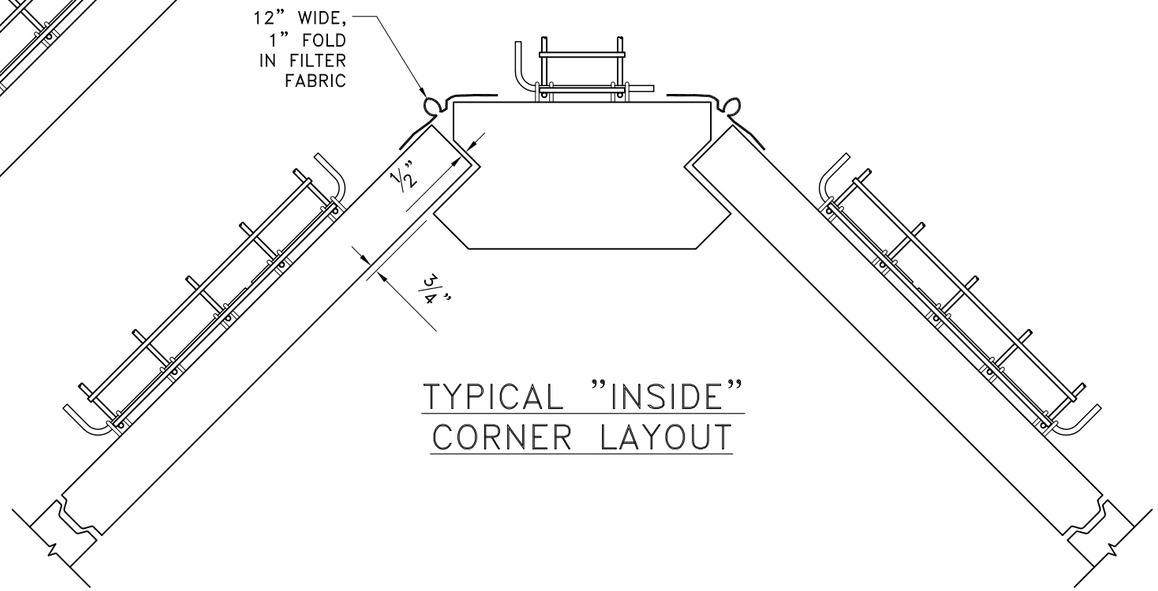
OVERHEAD LIGHT STANDARD DETAIL

ADOT CERTIFICATION PACKAGE

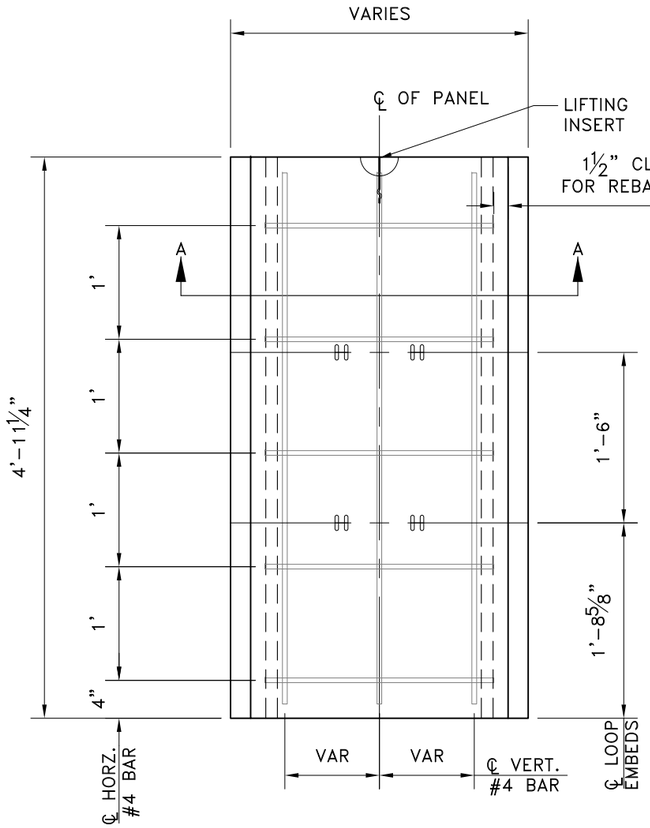
Scale: NTS
Job:
Sheet: SD-15
Sheet 15 of 28



TYPICAL "OUTSIDE" CORNER LAYOUT

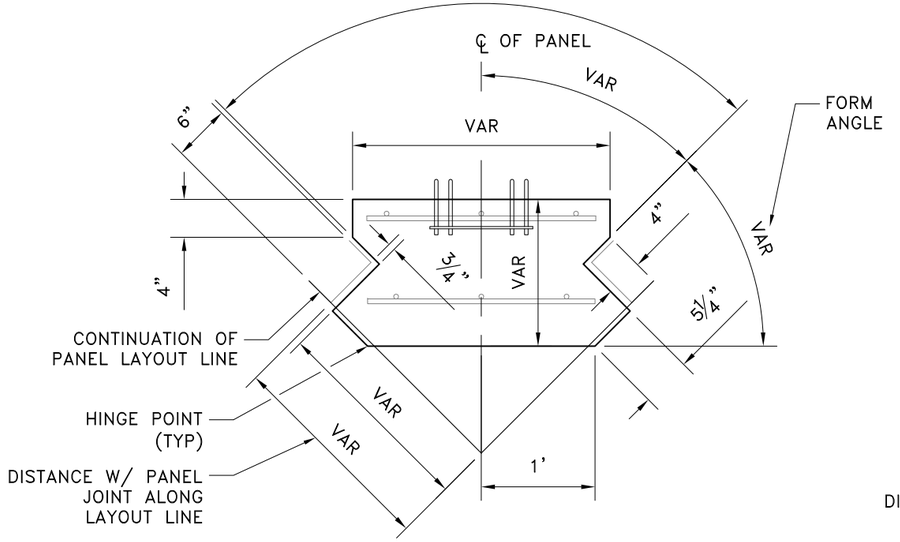


TYPICAL "INSIDE" CORNER LAYOUT

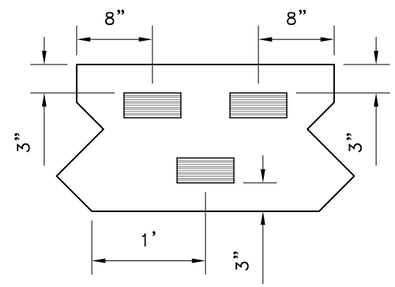


TYPICAL C CORNER PANEL

SHOWN FROM BACK FACE



SECTION A–A



BEARING PAD PLACEMENT DETAIL

NOTE: TYPICAL PLACEMENT SHOWN, PANELS WITH DIFFERENT ANGLES WILL HAVE DIFFERENT BEARING PAD LAYOUTS

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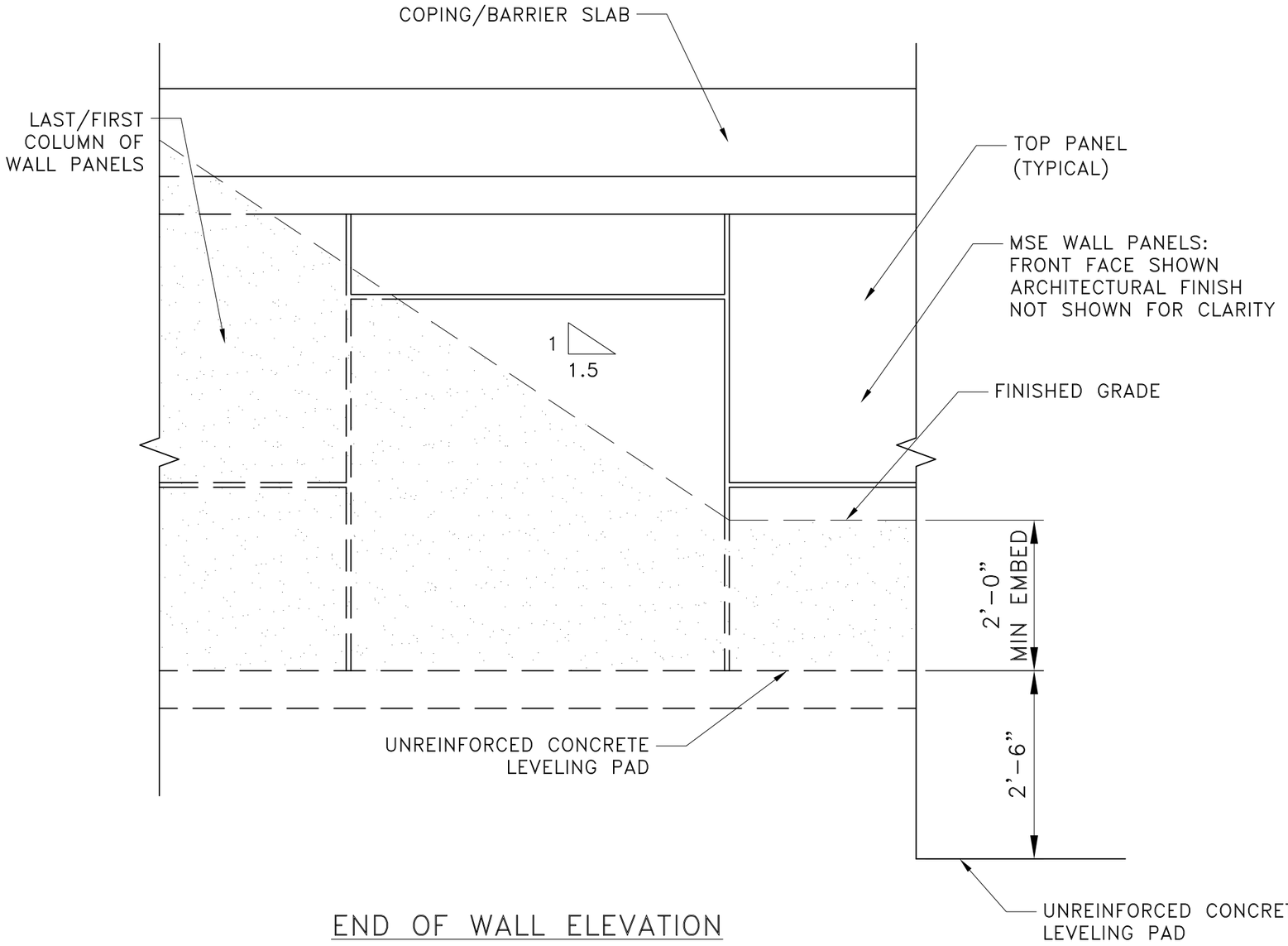
CORNER PANEL DETAILS

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-16



END OF WALL ELEVATION

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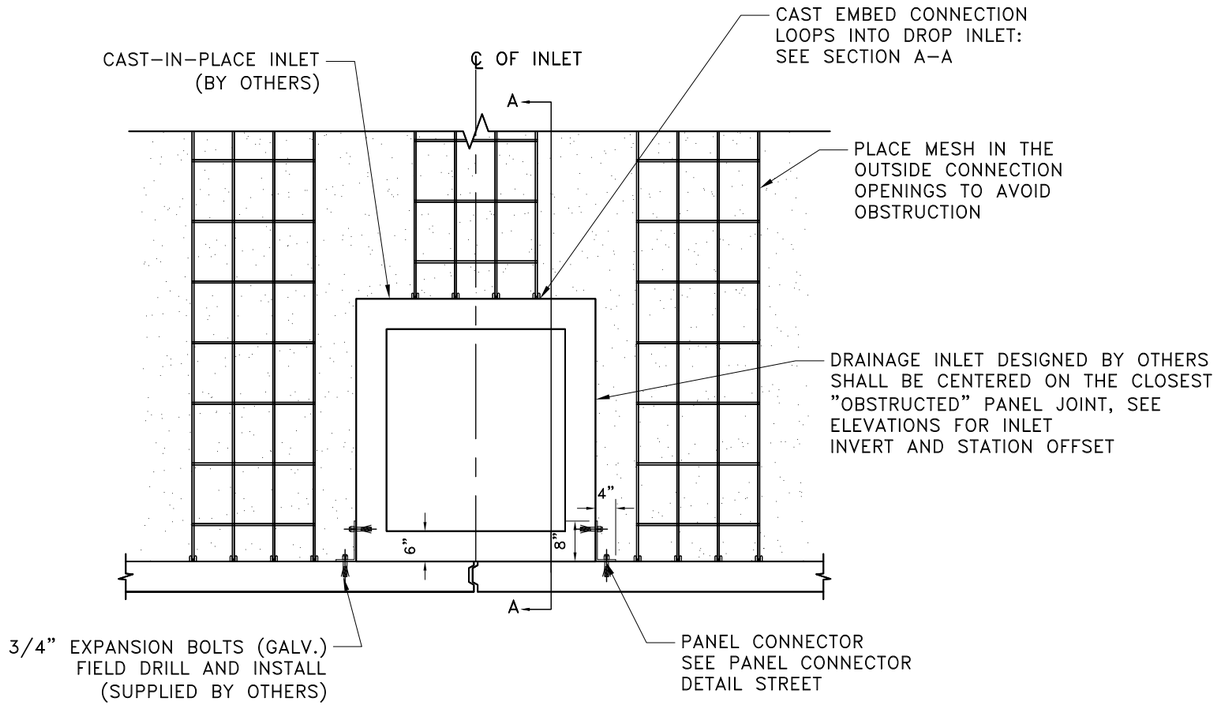
END OF WALL DETAIL AND STEPPING OF LEVELING PAD

ADOT CERTIFICATION PACKAGE

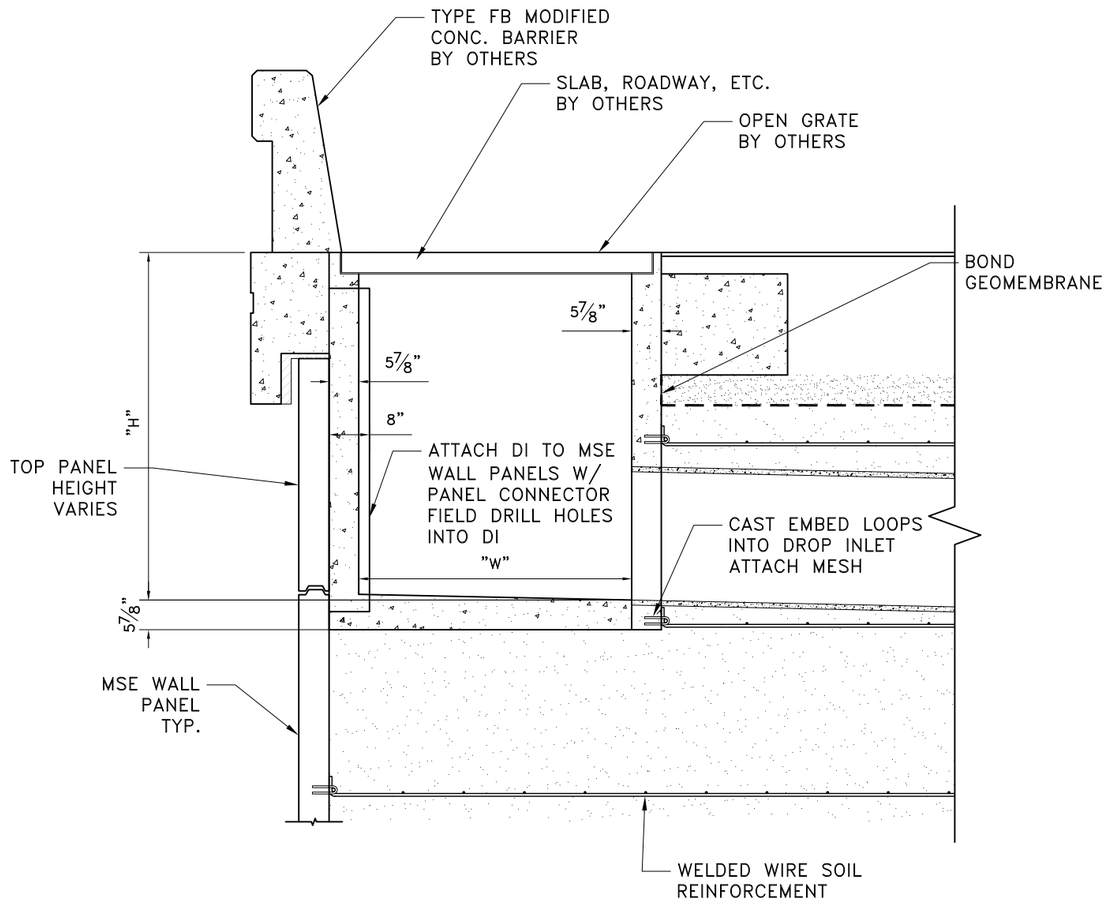
Scale: NTS

Job:

Sheet: SD-17



MESH CONNECTION PLAN



MESH CONNECTION DETAIL

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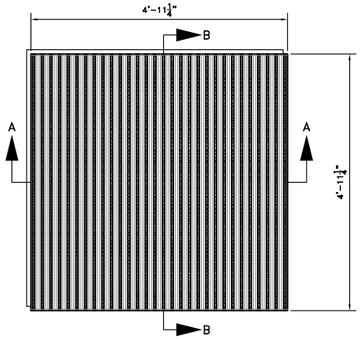
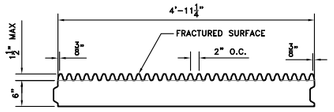
CONNECTION TO APPURTENANCES

ADOT CERTIFICATION PACKAGE

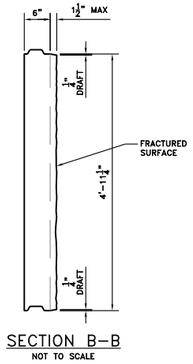
Scale: NTS
Job:
Sheet: SD-18
Sheet 18 of 28



STANDARD PANEL TYPE
ARCHITECTURAL PANEL DETAIL
(FRONT FACE SHOWN)



SECTION A–A
NOT TO SCALE

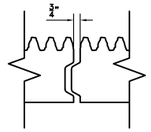


SECTION B–B
NOT TO SCALE

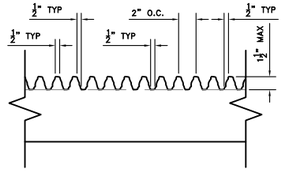
NOTES: DASHED LINE IN SECTIONS IS 6" NOMINAL THICKNESS OF PANEL.

PANEL REINFORCEMENT, EMBED LOOPS, ETC. NOT SHOWN FOR CLARITY.

PATTERN BASED UPON FITZGERALD FORMLINERS PATTERN #16959 "WALNUT FIN".

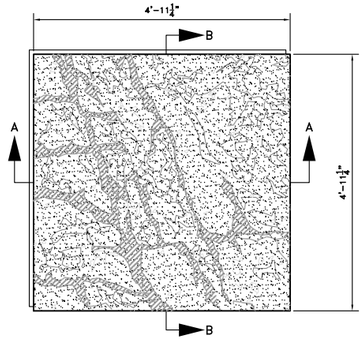


JOINT DETAIL
NOT TO SCALE

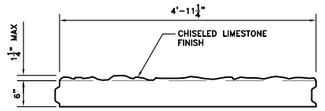


FRACTURED RIB TEXTURE DETAIL
NOT TO SCALE

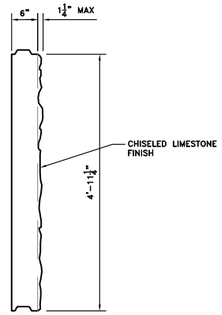
FRACTURED FIN



STANDARD PANEL TYPE
ARCHITECTURAL PANEL DETAIL
(FRONT FACE SHOWN)



SECTION A–A
NOT TO SCALE

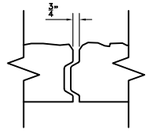


SECTION B–B
NOT TO SCALE

NOTES: DASHED LINE IN SECTIONS IS 6" NOMINAL THICKNESS OF PANEL.

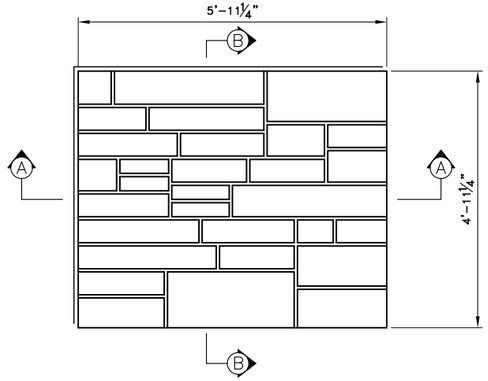
PANEL REINFORCEMENT, EMBED LOOPS, ETC. NOT SHOWN FOR CLARITY.

PATTERN BASED UPON FITZGERALD FORMLINERS PATTERN #17929 "MEDIUM CHISELED LIMESTONE".

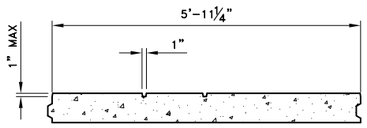


JOINT DETAIL
NOT TO SCALE

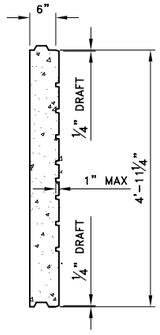
CHISELED LIMESTONE



STANDARD PANEL TYPE
ARCHITECTURAL PANEL DETAIL
(FRONT FACE SHOWN)



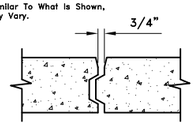
SECTION A–A
NOT TO SCALE



SECTION B–B
NOT TO SCALE

NOTES:

1. Ashlar Stone Pattern To Be Similar To What Is Shown, Actual Ashlar Stone Pattern May Vary. (Specformliner Pattern 1515)



JOINT DETAIL
NOT TO SCALE

ASHLAR STONE

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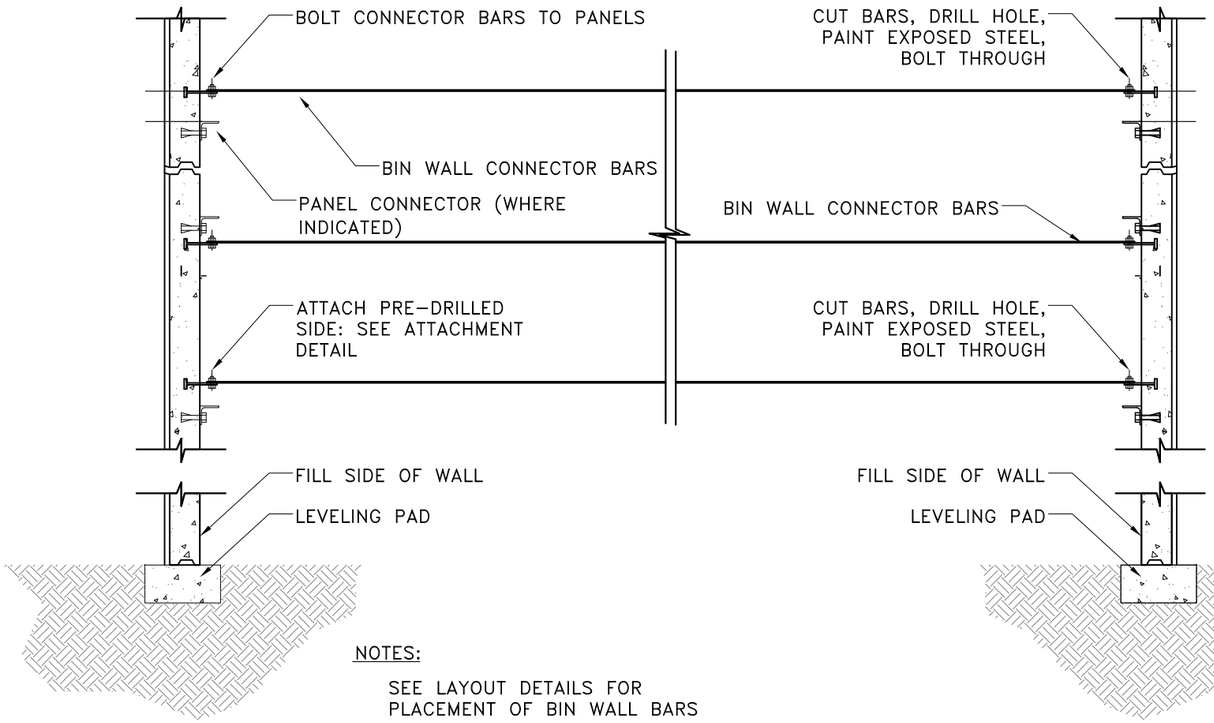
ARCHITECTURAL FINISH OPTIONS

ADOT CERTIFICATION PACKAGE

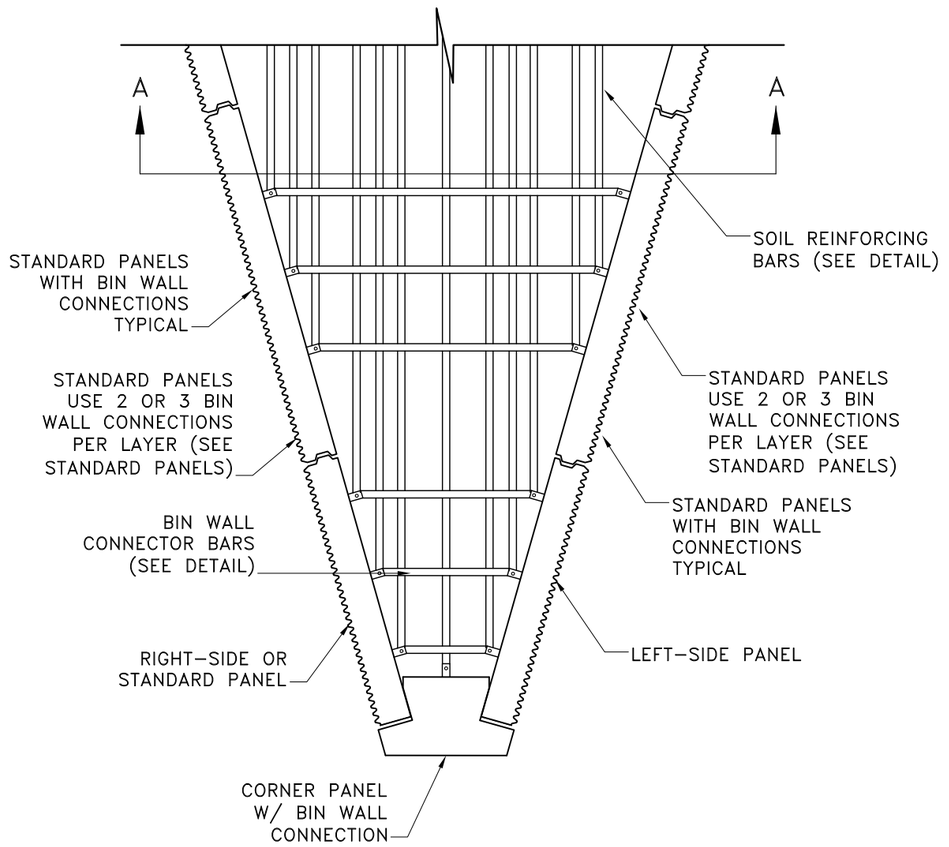
Scale: NTS
Job:
Sheet: SD-19
Sheet 19 of 28



NOTES:

SEE LAYOUT DETAILS FOR PLACEMENT OF BIN WALL BARS

SECTION A–A



BIN WALL PLAN VIEW

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INNOVATIVE CONSTRUCTION PRODUCTS
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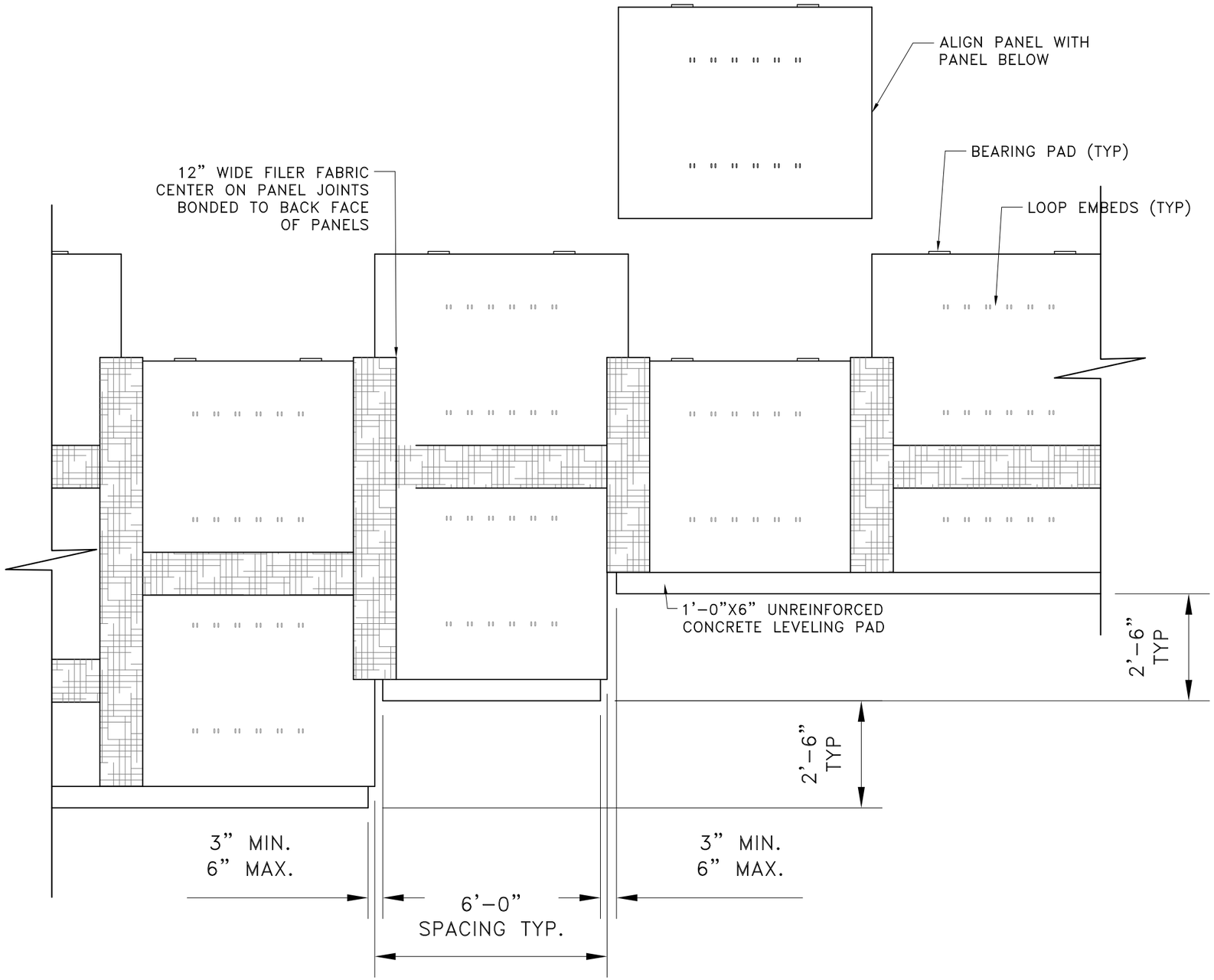
BIN WALL DETAIL

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-20
Sheet 20 of 28



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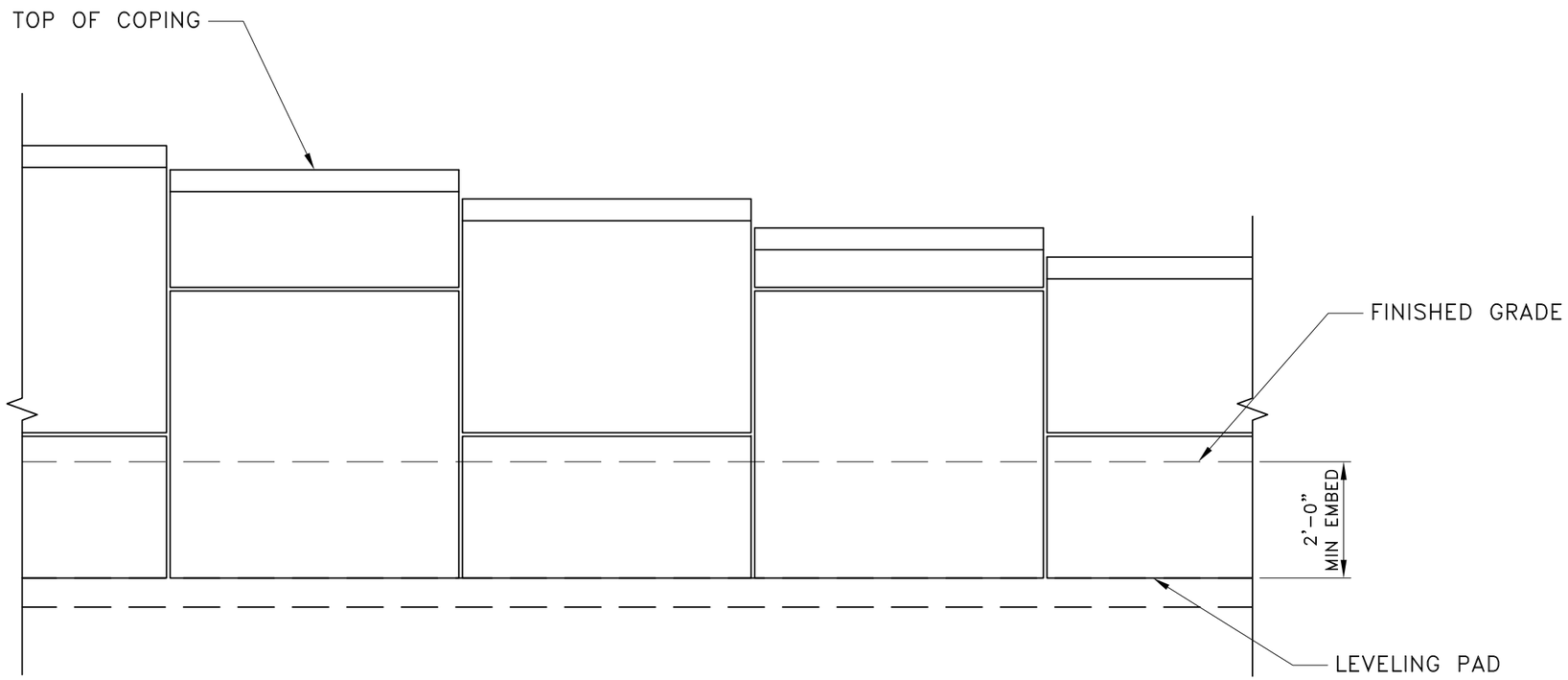
STEPPING OF LEVELING PAD WITH EXISTING AND FINAL GRADES

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-21
Sheet 21 of 28



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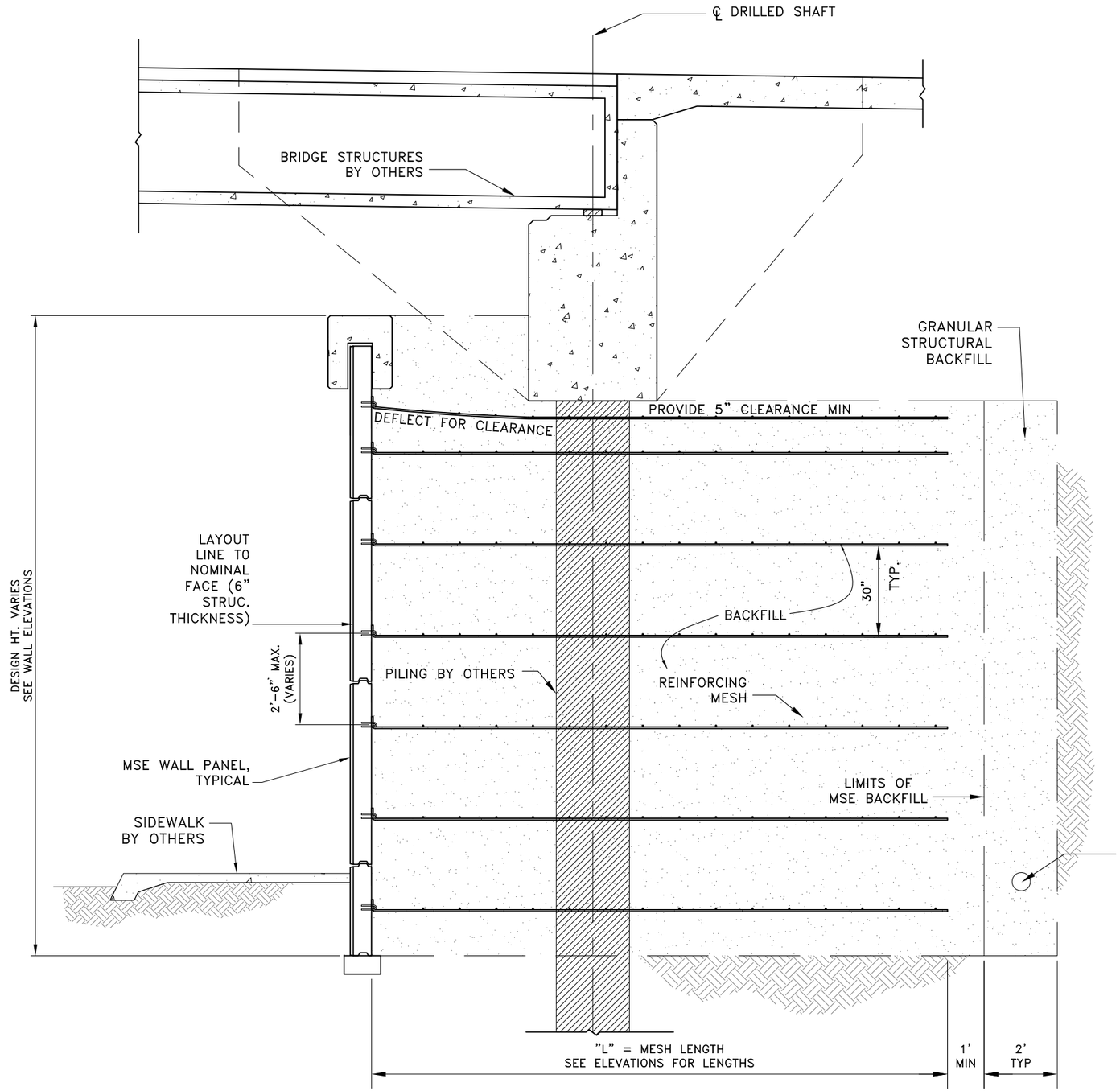
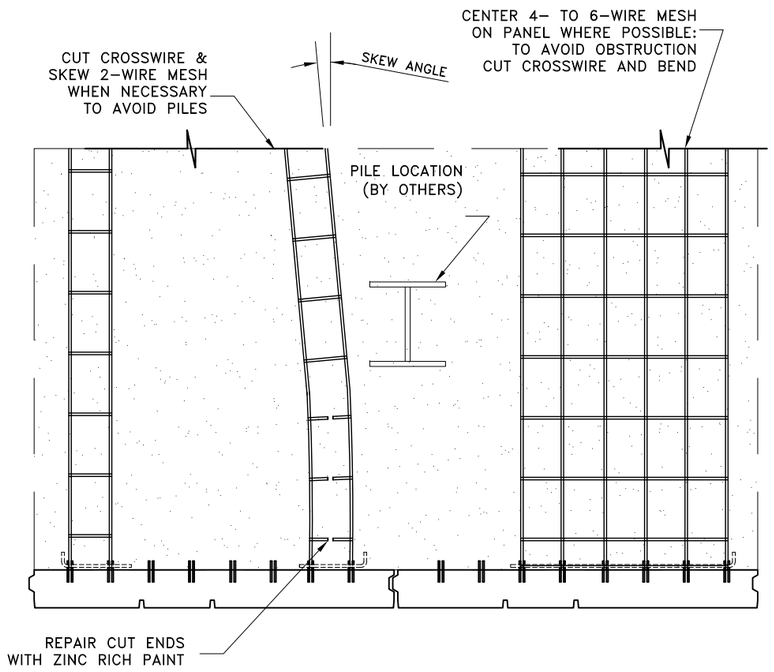
STEPPING OF TOP OF PANELS

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-22
Sheet 22 of 28





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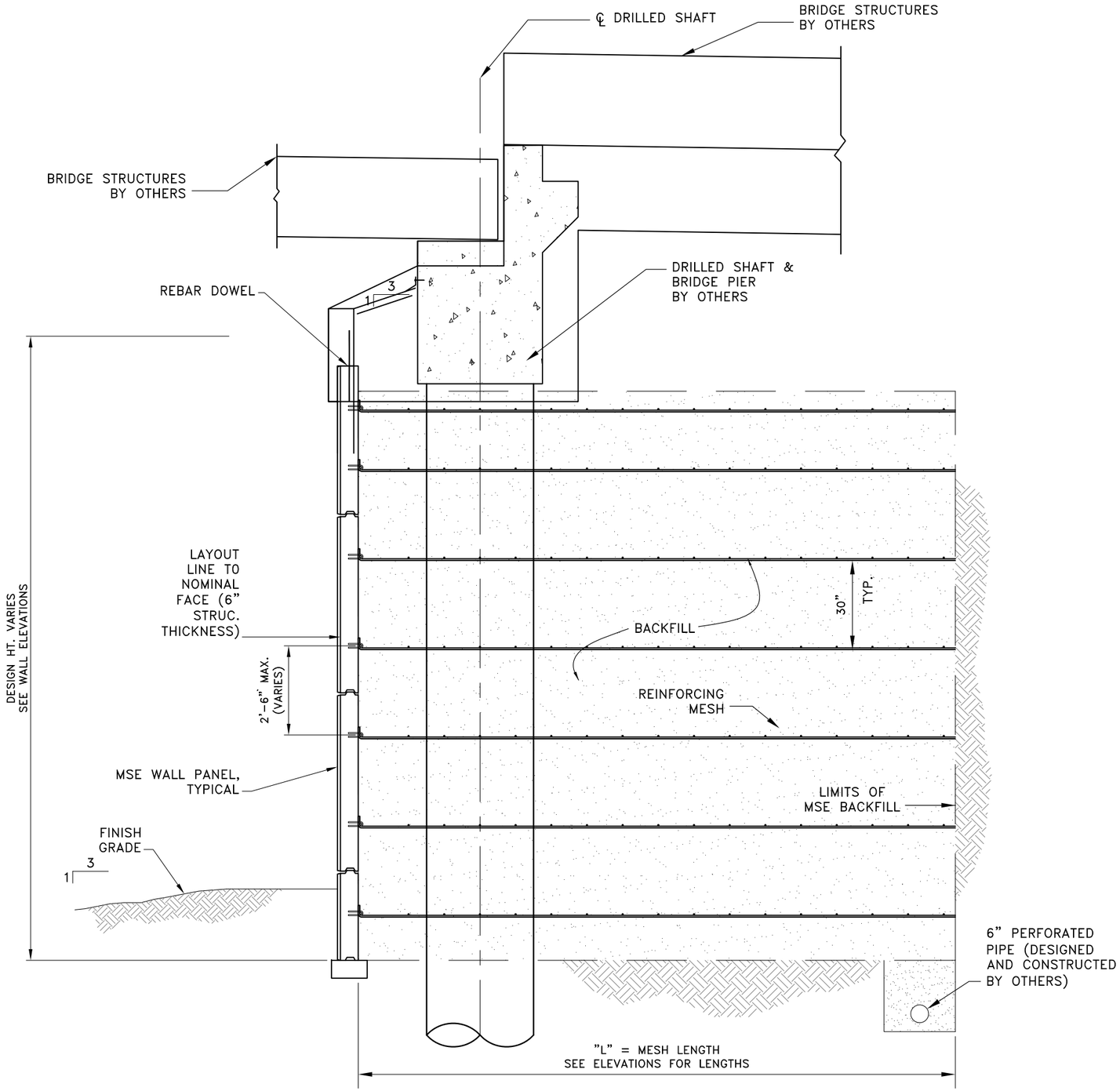
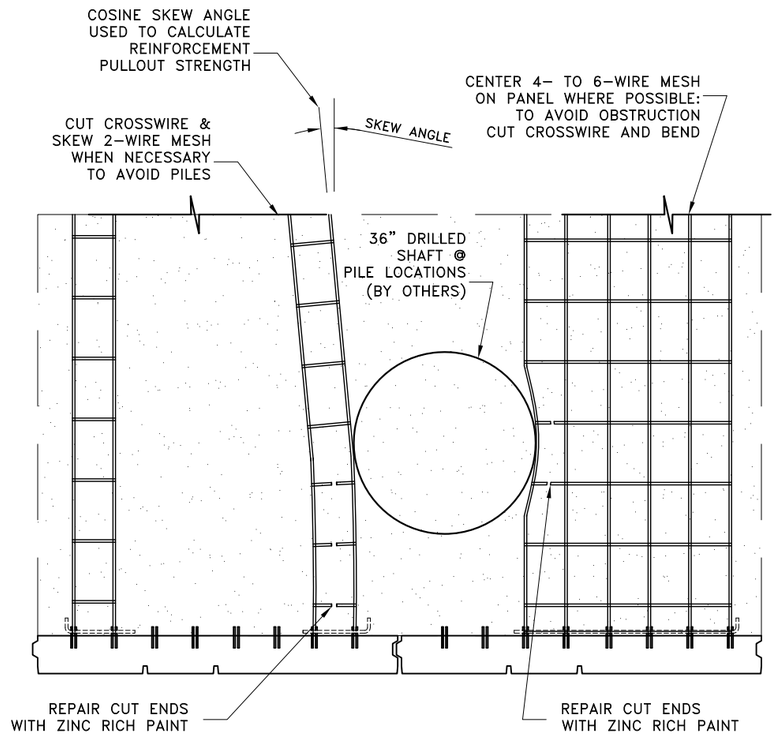
PLACEMENT OF REINFORCEMENT AROUND STEEL PILES

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-23
Sheet 23 of 28





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PLACEMENT OF REINFORCEMENT AROUND CONCRETE SHAFTS

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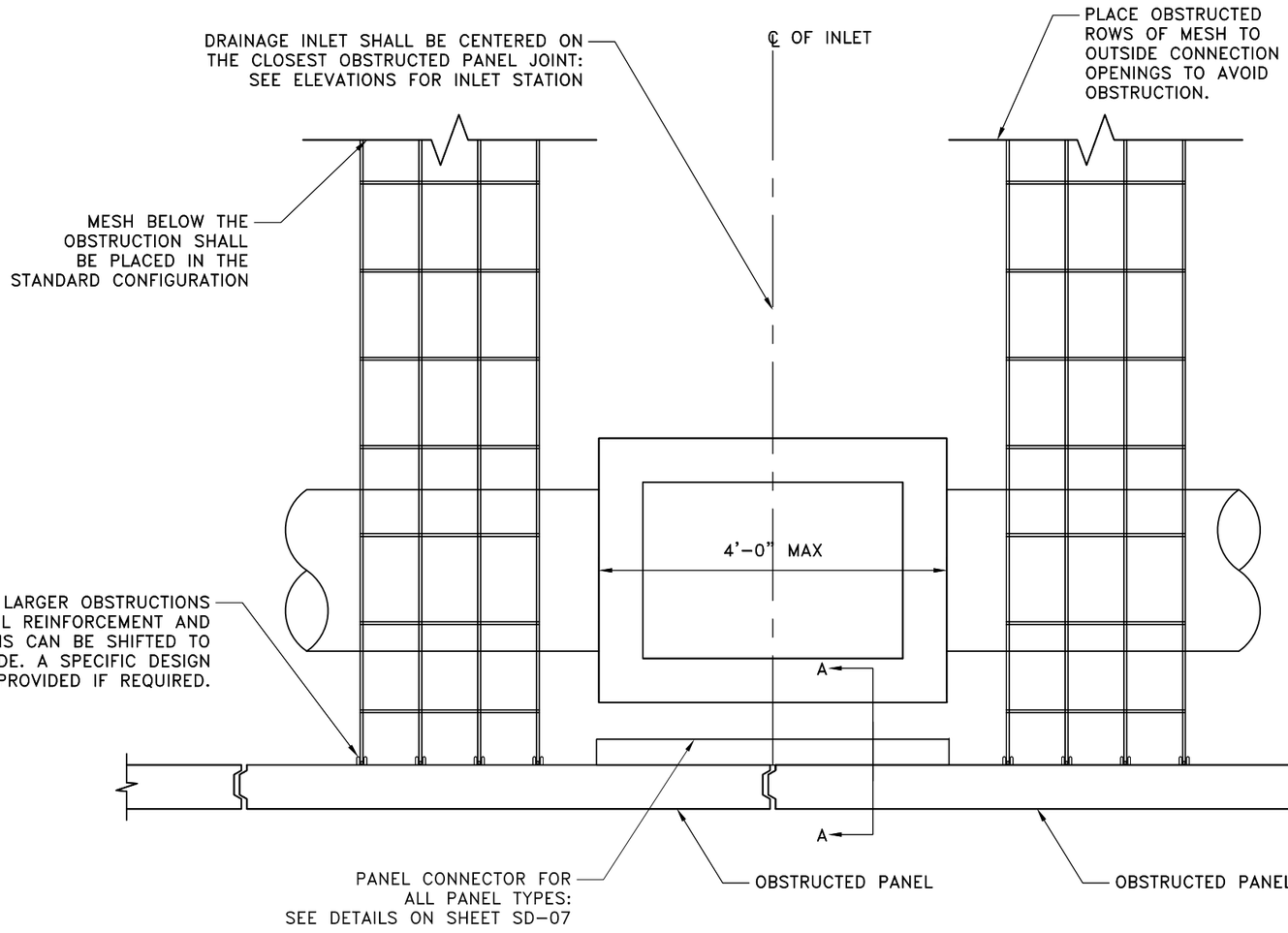

TYPICAL DRAINAGE DETAILS

(CENTER LINE OF INLET TO BE RELOCATED TO PANEL JOINT)

SCALE: 1"=20"

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ADOT CERTIFICATION PACKAGE

Scale: VARIES

Job:

Sheet: SD–25

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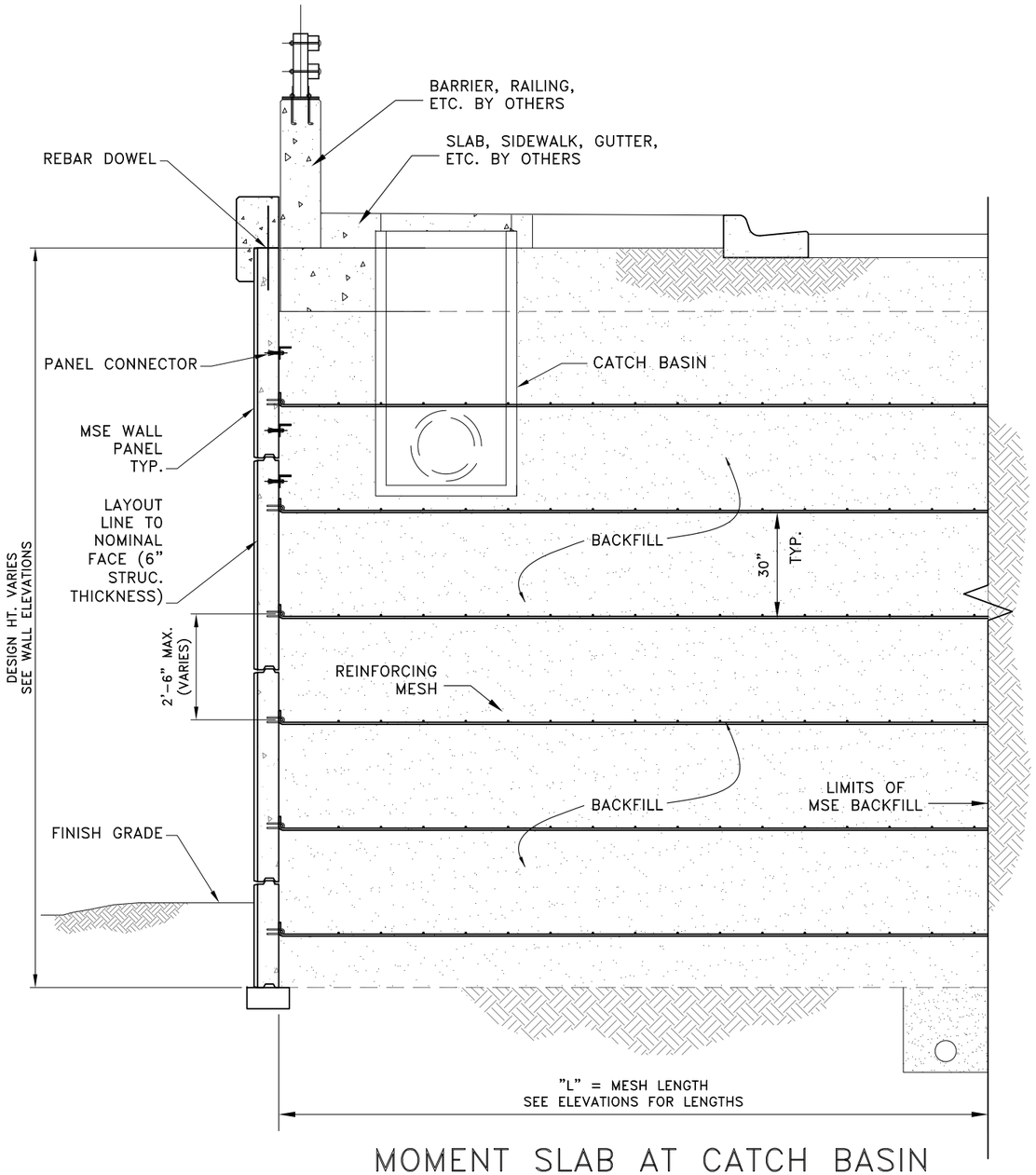
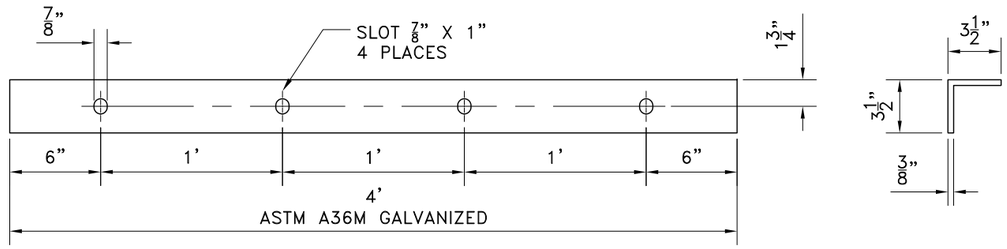
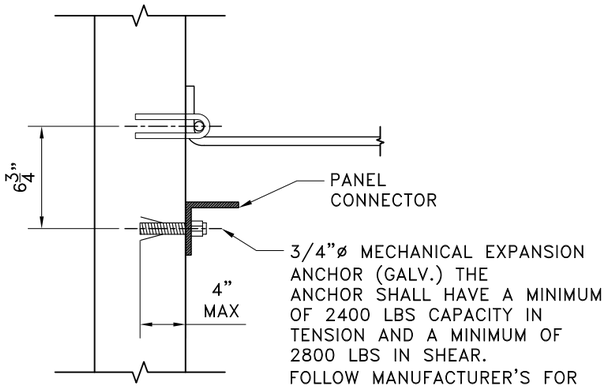


MOMENT SLAB AT CATCH BASIN



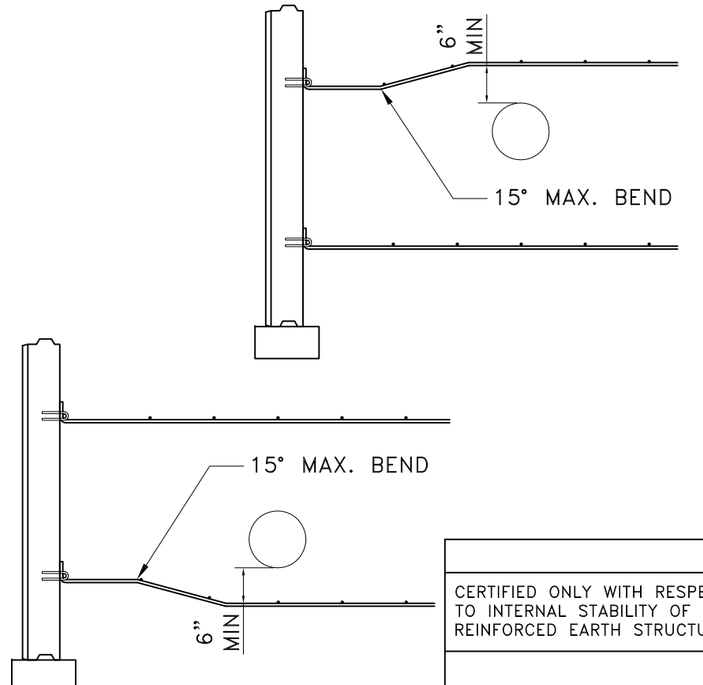
PANEL CONNECTOR DETAIL

SCALE: 1"=10"



PANEL CONNECTOR CONNECTION DETAIL

SCALE: 1"=10"



OBSTRUCTION DETAIL

NOTES:
1. OBSTRUCTION SHALL BE CONSTRUCTED BEFORE WALL INSTALLATION OR, VOID FORMER SHALL BE INSTALLED DURING BACKFILL PLACEMENT. VOID FORMER NOT SUPPLIED BY SSL.

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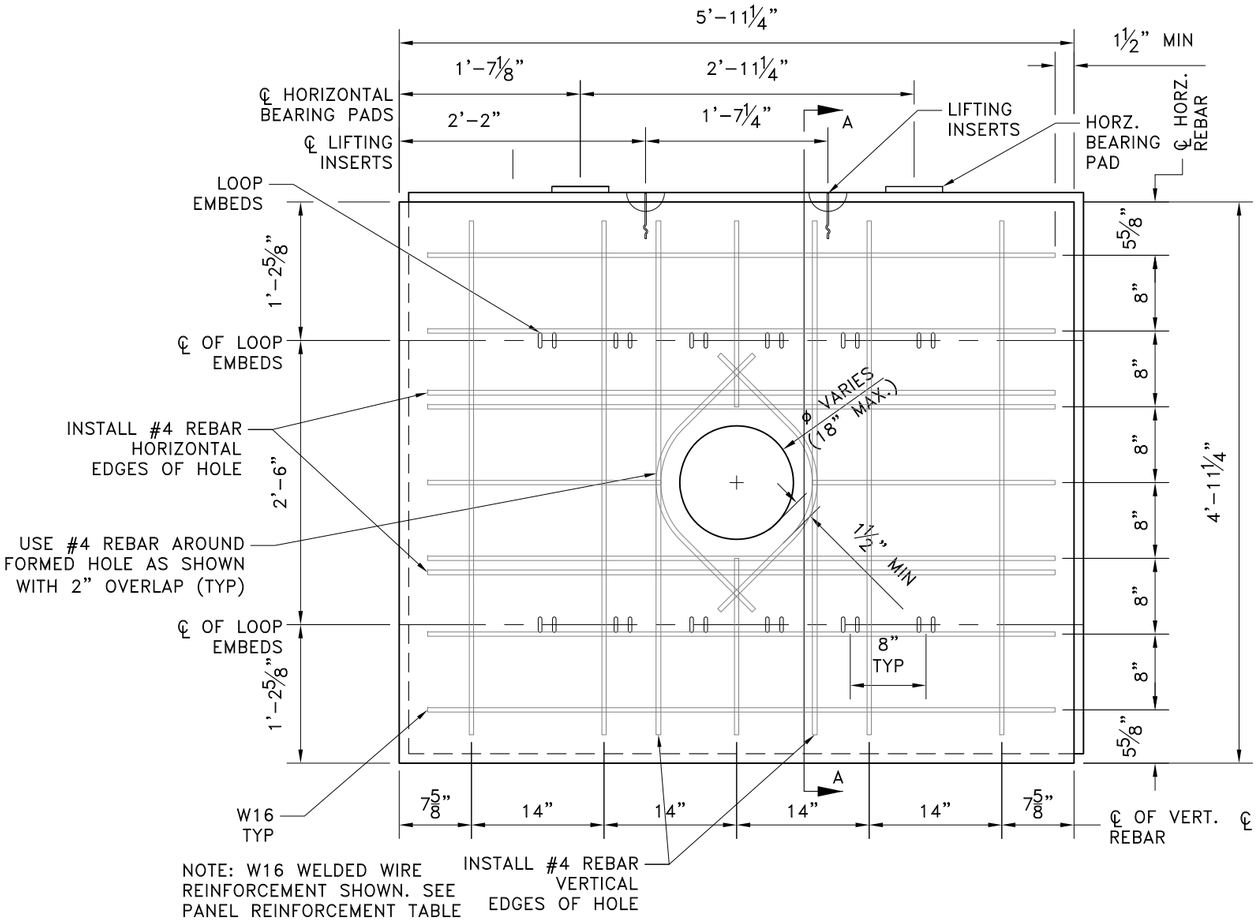
DRAINAGE DETAILS: 2 OF 2

ADOT CERTIFICATION PACKAGE

Scale: VARIES
Job:
Sheet: SD-26
Sheet 26 of 28

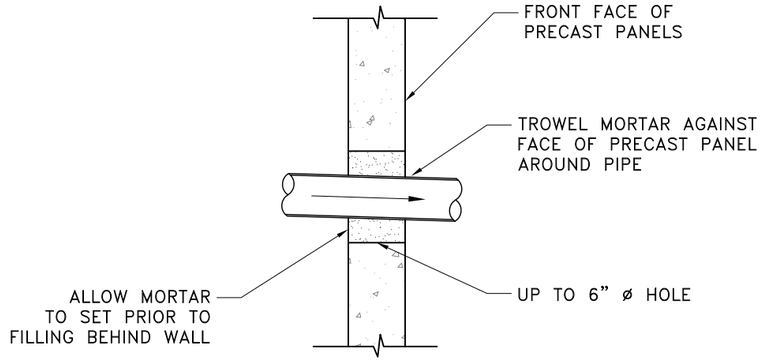


NOTE: W16 WELDED WIRE REINFORCEMENT SHOWN. SEE PANEL REINFORCEMENT TABLE FOR OTHER OPTIONS.

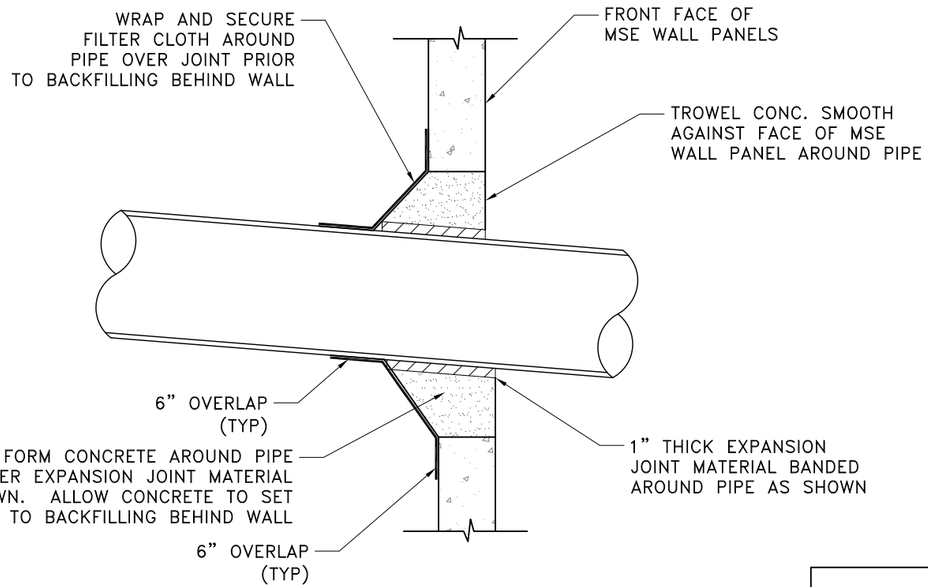
TYPICAL PANEL WITH A FORMED HOLE FOR PENETRATIONS THROUGH THE WALL FACE

SHOWN FROM BACK FACE

NOTES:
MINIMUM DISTANCE TO LOOP EMBEDS IS 4", FORMED HOLES SHALL BE A MINIMUM OF 8" FROM EDGE OF PANEL, IF A PENETRATION IS REQUIRED CLOSER THAN 8" TO THE EDGE OF THE PANEL, THE PANEL WILL BE NOTCHED OUT FROM THE EDGE OF THE PANEL AS REQUIRED.
IF MORE SPACE IS REQUIRED FOR PENETRATIONS, A WIDE PANEL SHALL BE USED.



SMALL PIPE PENETRATION DETAIL



LARGE PIPE PENETRATION DETAIL

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PIPE PENETRATION DETAILS

ADOT CERTIFICATION PACKAGE

Scale: NTS
Job:
Sheet: SD-27
Sheet 27 of 28

PROPER STORAGE AND HANDLING OF PANELS

1. THE PANELS SHOULD BE STACKED ONE ON ONE, SEPARATED BY NON–STAINING DUNNAGE, WITH A WIDTH GREATER THAN OR EQUAL TO 2.5 INCHES (OR THE HEIGHT OF THE EMBED, WHICHEVER IS GREATER). THE AMOUNT OF PANELS PER STACK VARIES.
2. DUNNAGE SHOULD BE ALIGNED IN THE VERTICAL DIRECTION. CARE SHOULD BE TAKEN NOT TO DAMAGE THE EDGES OR FACE OF THE PANELS DURING UNLOADING, STORAGE OR SETTING. THE PANELS MAY BE UNLOADED SUPPORTED BY THE PROVIDED PALLETS (SHOWN IN FIGURE 1).
3. DURING PANEL ERECTION, PANELS SHALL BE LIFTED AND SET BY THE USE OF THE TWO LIFTING ANCHORS LOCATED IN THE TOP OF EACH PANEL (SHOWN IN FIGURE 1).
4. WHEN LIFTING PANELS FROM THE STACK, MAKE SURE THAT AN ADDITIONAL PIECE OF DUNNAGE IS BELOW THE BOTTOM EDGE OF THE PANEL TO PREVENT DAMAGE WHEN ROTATING PANELS FROM HORIZONTAL TO VERTICAL (SHOWN IN FIGURE 2).
5. LIFTING LINE MUST BE VERTICAL TO AVOID DAMAGE TO PANEL.

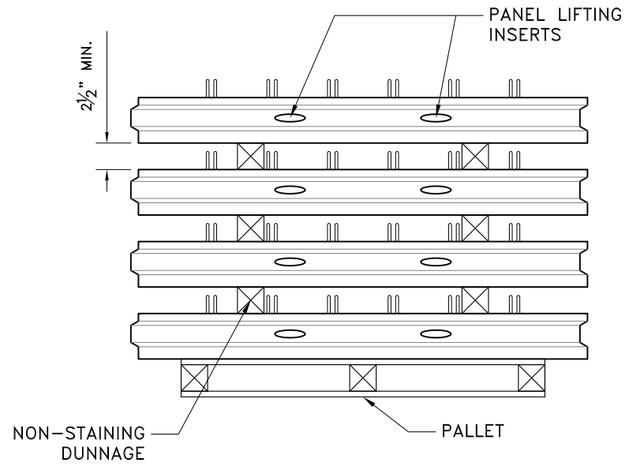

FIGURE 1

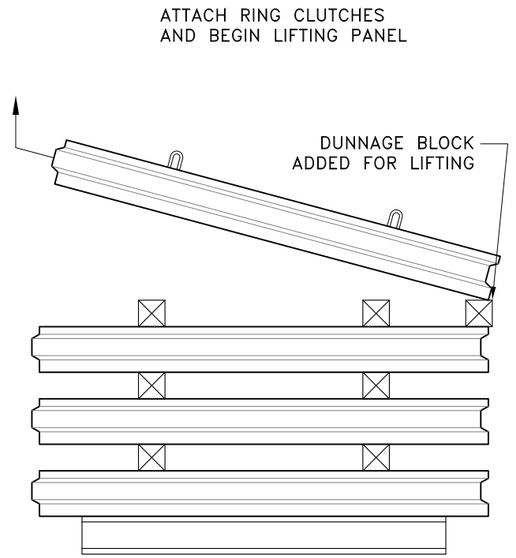

FIGURE 2

PROPER STORAGE AND HANDLING OF WELDED WIRE SOIL REINFORCING

1. SOIL REINFORCEMENT ARRIVES TO THE SITE ON A FLATBED TRUCK WITH DUNNAGE SEPARATING THE DIFFERENT BUNDLES OF SOIL REINFORCING (SEE FIGURE 3).
2. OFF–LOAD THE SOIL REINFORCING CAREFULLY, USING AT LEAST TWO BALANCED PICK POINTS (SEE FIGURE 3). MAKE SURE TO UNLOAD SOIL REINFORCING IN A WAY TO CAUSE THE LEAST DAMAGE TO THE MATERIAL.
3. PLACE SOIL REINFORCING ON THE DUNNAGE BEFORE SETTING ON THE GROUND, MAKING SURE THAT THE SOIL REINFORCING DOES NOT CONTACT THE GROUND. DO NOT PLACE THE SOIL REINFORCING DIRECTLY ON THE GROUND.
4. ENSURE THAT THE DUNNAGE UNDER THE STACKED BUNDLES OF SOIL REINFORCEMENT ARE NOT SPACED MORE 12 FEET APART HORIZONTALLY (SEE FIGURE 3). NOTE THAT THE PLACEMENT OF THE DUNNAGE IN FIGURE 3 ARE SHOWN FOR CLARIFICATION PURPOSES ONLY. DUNNAGE MAY NEED TO BE ADDED OR REMOVED BASED ON THE LENGTH OF THE SOIL REINFORCEMENT BEING PLACED INTO STORAGE.

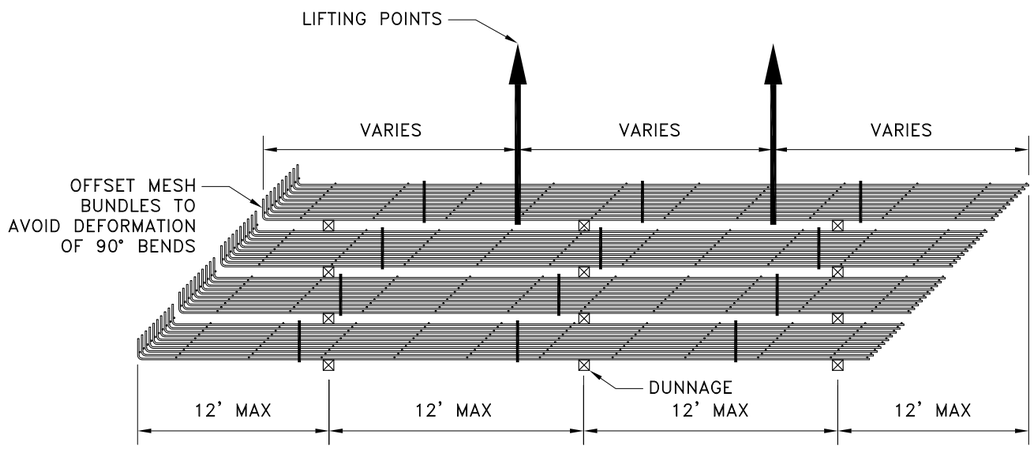

FIGURE 3

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HANDLING AND UNLOADING DETAILS

ADOT CERTIFICATION PACKAGE

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