



**STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION**

**ROADWAY DESIGN DIVISION**  
SUITE 1300 JAMES K. POLK BUILDING  
505 DEADERICK STREET  
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**JOHN C. SCHROER**  
COMMISSIONER

**BILL HASLAM**  
GOVERNOR

**INSTRUCTIONAL BULLETIN NO. 15-12**

**Regarding Revised Standard Drawings**

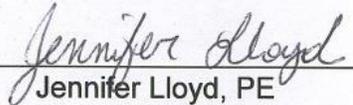
**Effective Feb. 12, 2016 letting (Dec. 2, 2015 Turn-in),** the following Standard Drawings are new and revised. Section V of the Design Guidelines is revised to incorporate these changes.

<b>DRAWING NUMBER</b>	<b>CURRENT REVISION DATE</b>	<b>DESCRIPTION</b>
<b>NEW:</b>		
W-CIP-1	8-15-15	ROADWAY FEATURES AT CAST IN PLACE RETAINING WALLS
W-MSE-1	8-15-15	ROADWAY FEATURES FOR MSE SEGMENTAL PRECAST FACING RETAINING WALL
W-MSE-2	8-15-15	ROADWAY FEATURES FOR MSE MODULAR BLOCK FACING RETAINING WALL
W-SP-1	8-15-15	ROADWAY FEATURES AT SOLDIER PILE AND SOIL ANCHORED RETAINING WALL

**Standard Drawings to be Renamed:**

EL-W-1 is renamed W-TW-1  
EL-W-2 is renamed W-SG-1

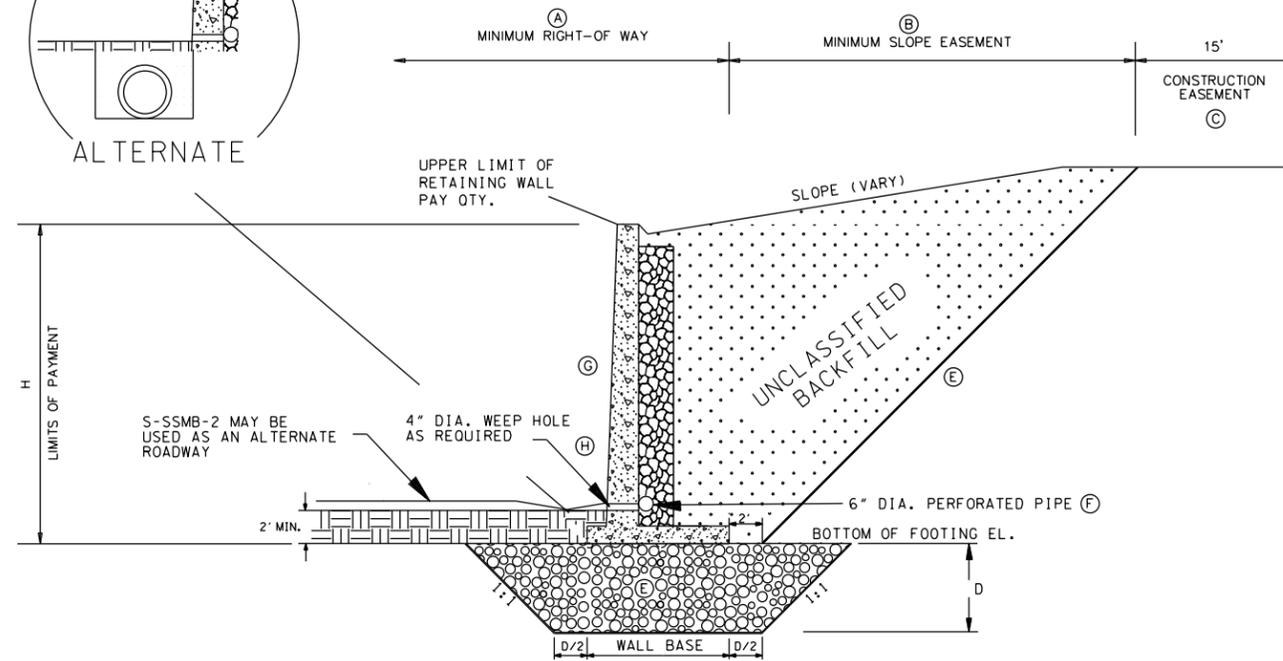
A copy of the revised and new standard drawings is attached.

  
\_\_\_\_\_  
Jennifer Lloyd, PE  
Civil Engineering Director  
Roadway Design Division

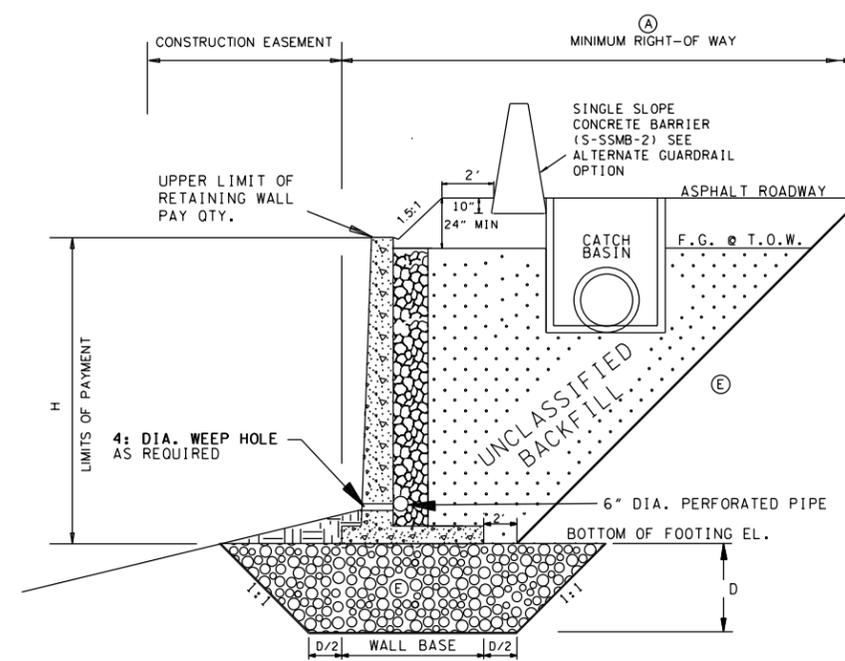
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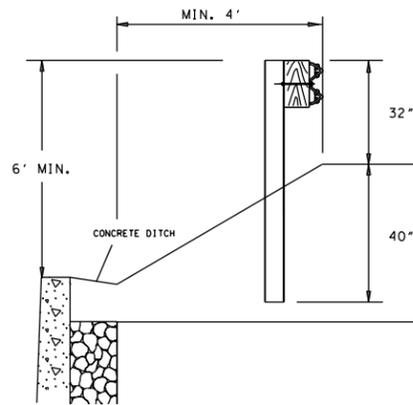
ALTERNATE



CAST IN PLACE (CIP) WALL  
TYPICAL SECTION IN CUT

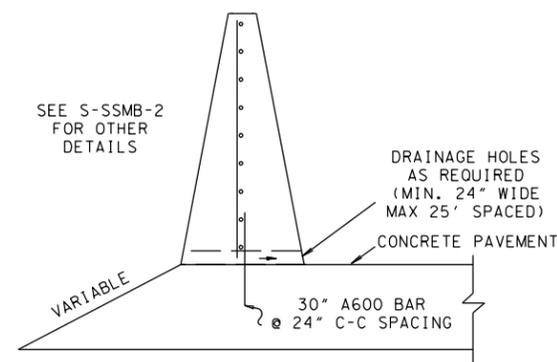


CAST IN PLACE (CIP) WALL  
TYPICAL SECTION IN FILL



ALTERNATE GUARDRAIL DETAIL

S-SSMB-2, 51" CONCRETE BARRIER WALL IS RECOMMENDED SINCE INSTALLATION PROVIDES TL-5 PROTECTION.



CONCRETE PAVEMENT  
ATTACHMENT DETAIL

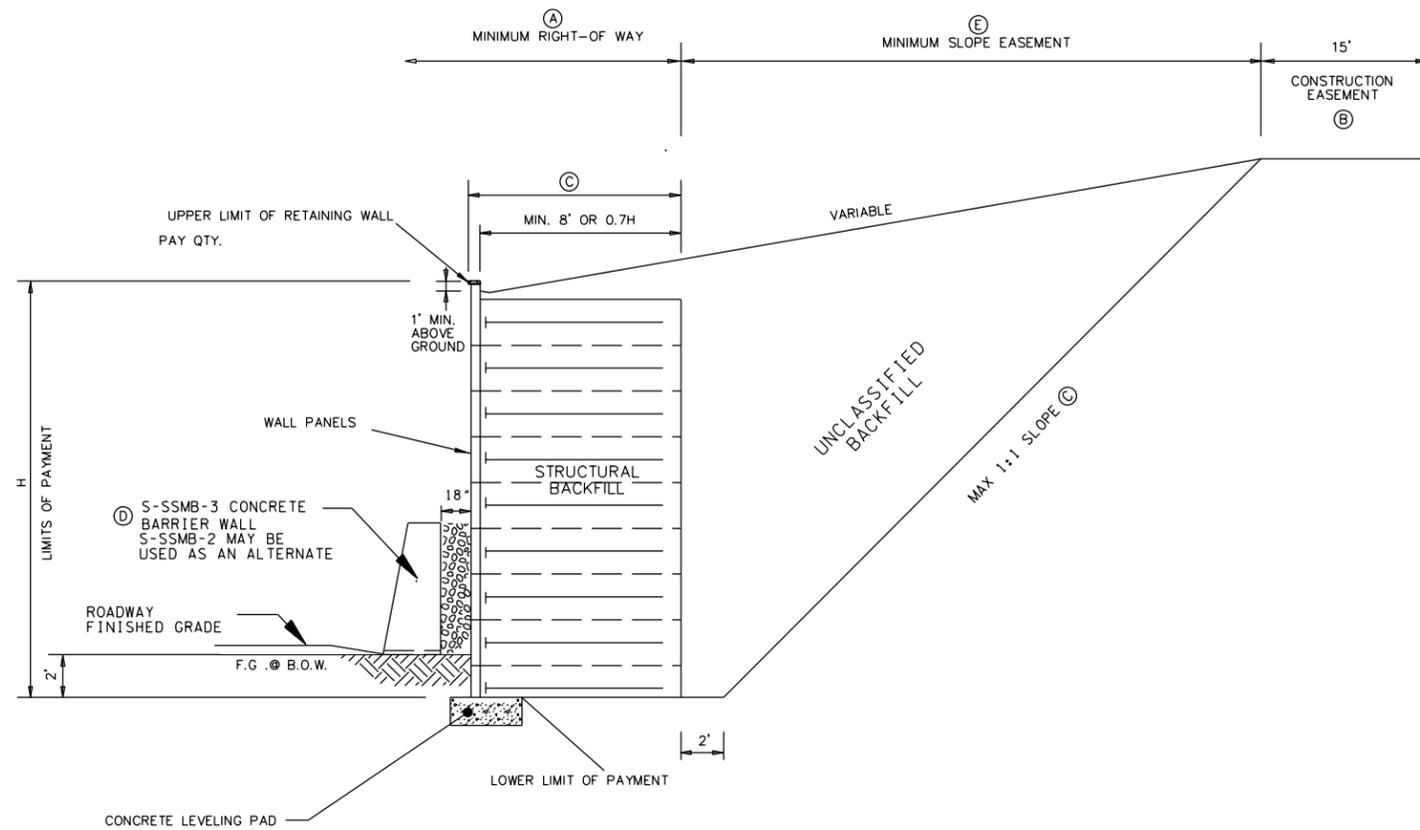
GENERAL NOTES

- THE PURPOSE OF THIS DRAWING IS TO ILLUSTRATE TO THE DESIGNER THE RIGHT-OF-WAY, SAFETY AND DRAINAGE REQUIREMENTS ASSOCIATED WITH CIP RETAINING WALLS.
- (A) ENTIRE WALL MUST BE BUILT WITHIN THE RIGHT-OF-WAY.
  - (B) BACKFILL AREA TO BE PURCHASED AS SLOPE EASEMENT UNTIL TIED IN WITH EXISTING GROUND LINE.
  - (C) 15' CONSTRUCTION EASEMENT REQUIRED BEHIND SLOPE TIE IN.
  - (D) BEGINNING AND END OF WALLS SHOULD BE PLACED OUTSIDE OF THE CLEAR ZONE. IF THIS OPTION IS NOT FEASIBLE, USE A TL-3 END TERMINAL OR CRASH CUSHION.
  - (E) UNDERCUT DEPTH AND BACKFILL SLOPE TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER.
  - (F) DRAINAGE STRUCTURES MAY BE PLACED BEHIND WALLS REQUIRED.
  - (G) CIP WALLS TYPICALLY DO NOT REQUIRE SHIELDING HOWEVER, PLACE WALL AS FAR FROM ROAD AS PRACTICAL.
  - (H) COST OF MOMENT SLAB, INCLUDING DESIGN WILL BE PAID FOR IN THE COST OF THE RETAINING WALL.

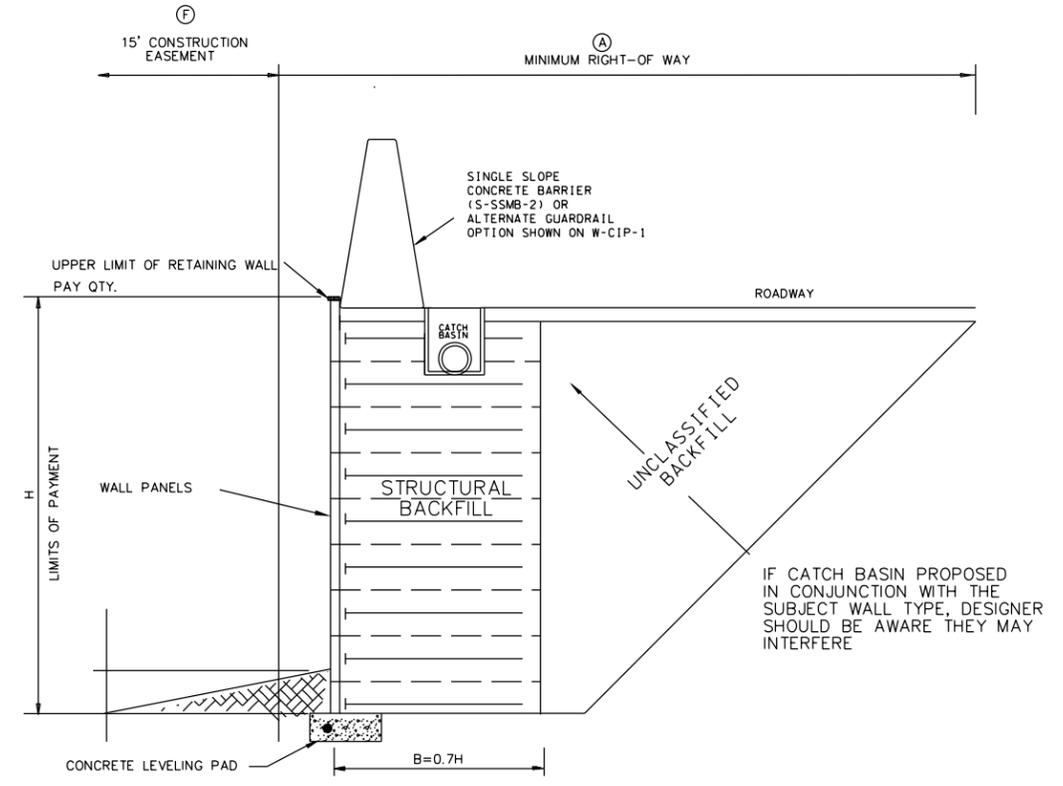
STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

ROADWAY  
FEATURES  
AT CAST IN PLACE  
RETAINING WALL

W-CIP-1



MECHANICALLY STABILIZED EARTH (MSE)  
SEGMENTAL PRECAST WALL TYPICAL SECTION IN CUT

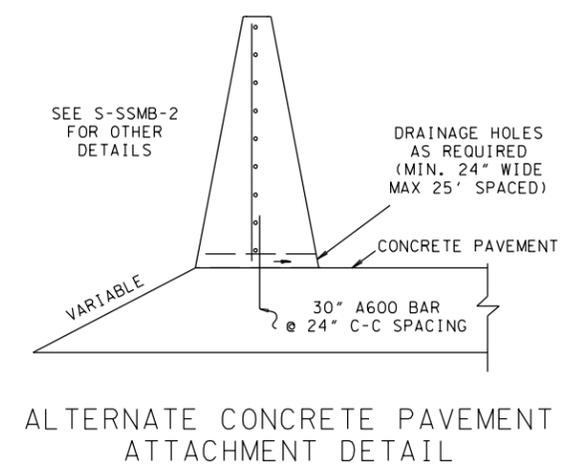
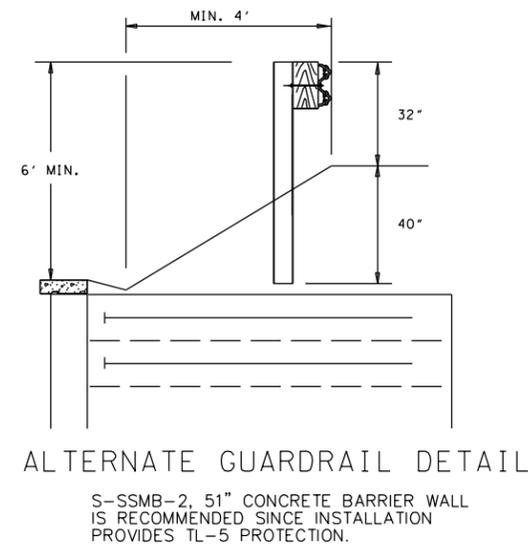


MECHANICALLY STABILIZED EARTH (MSE)  
SEGMENTAL PRECAST WALL TYPICAL SECTION IN FILL

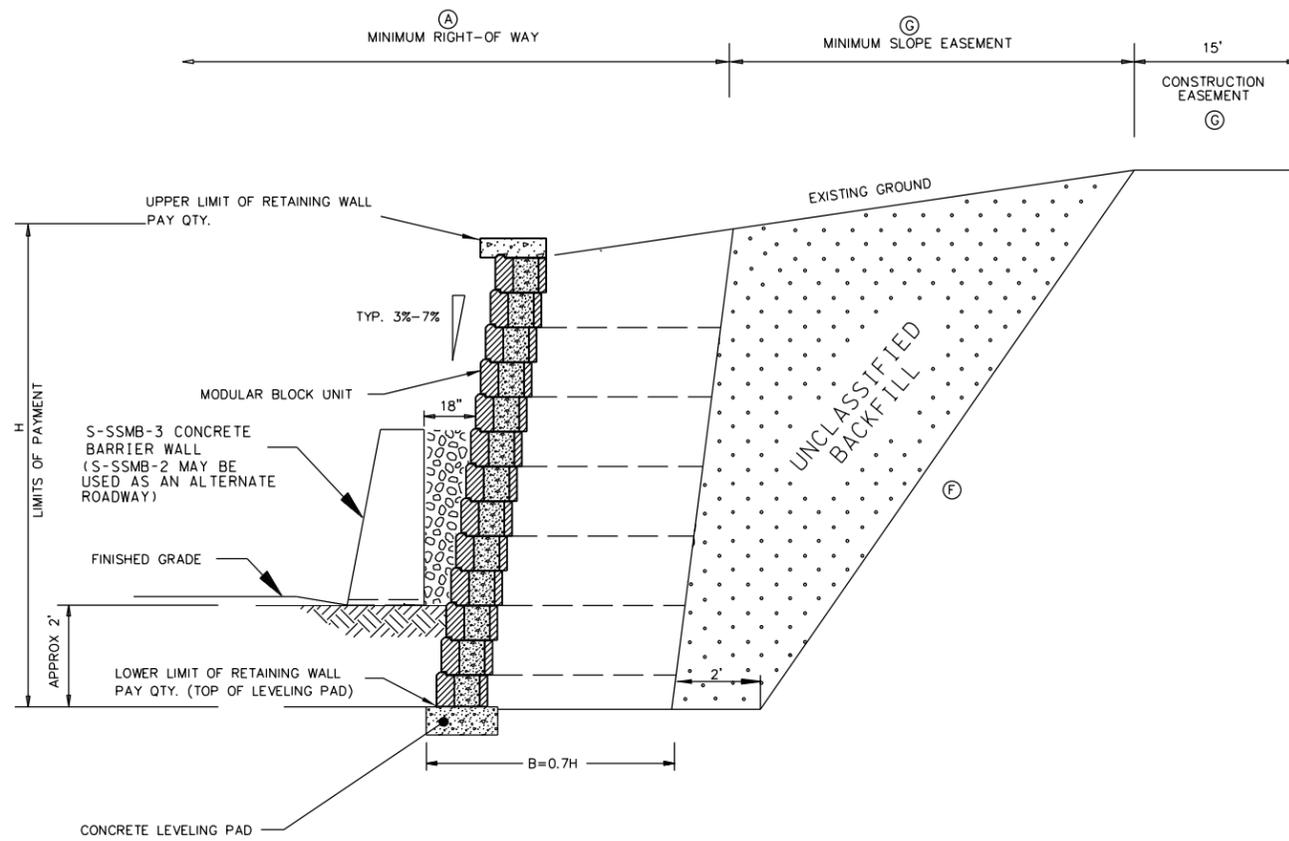
**GENERAL NOTES**

THE PURPOSE OF THIS DRAWING IS TO ILLUSTRATE TO THE DESIGNER THE RIGHT-OF-WAY, SAFETY AND DRAINAGE REQUIREMENTS ASSOCIATED WITH RETAINING WALLS. THIS IS NOT A STRUCTURAL DESIGN DRAWING.

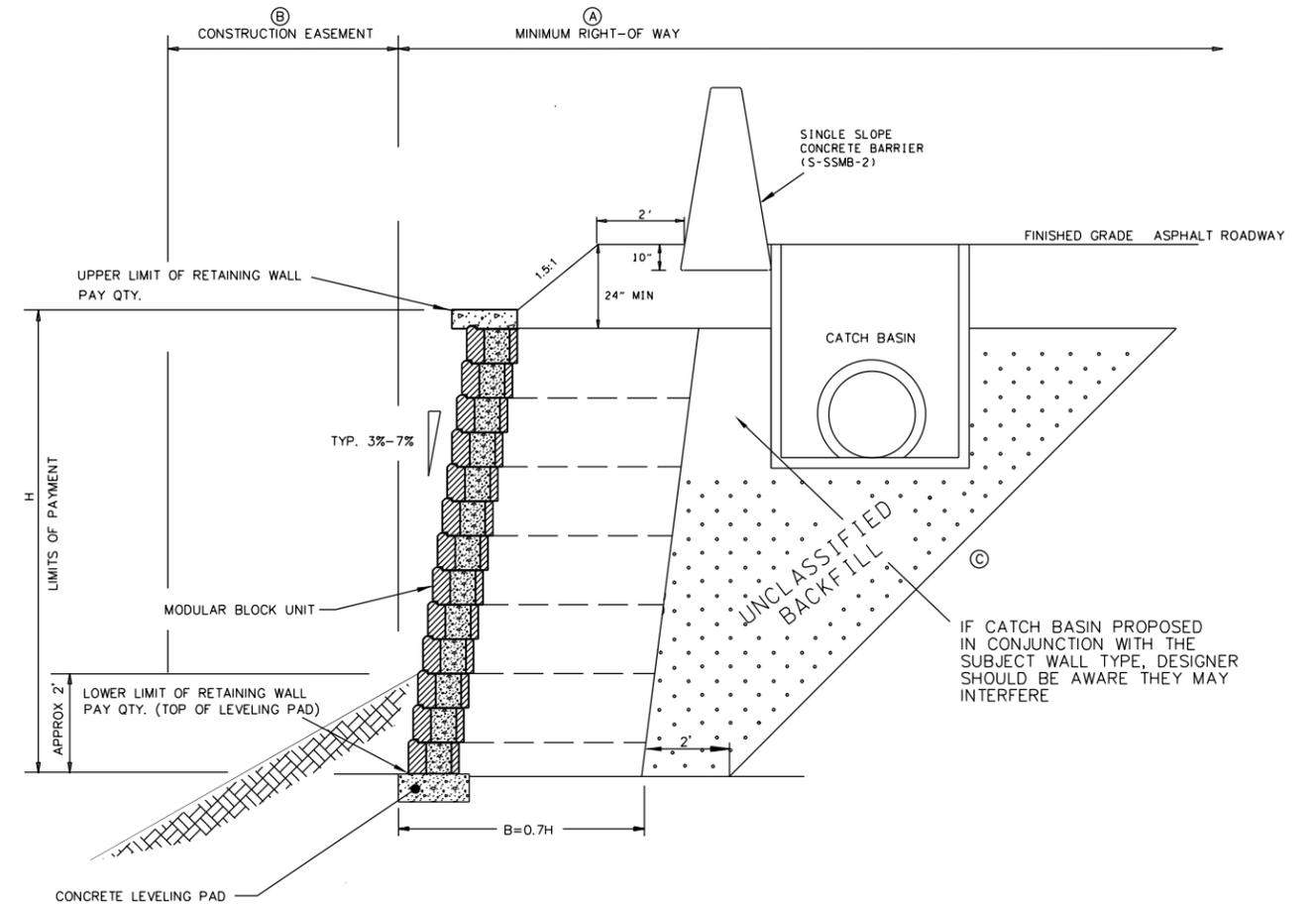
- (A) THE ENTIRE WALL MUST BE BUILT WITHIN THE RIGHT-OF-WAY PLUS 1' IN FRONT OF WALL PANELS (AT LEVELING PAD) WHEN IN A FILL.
- (B) A MINIMUM OF 15' CONSTRUCTION EASEMENT REQUIRED BEHIND SLOPE TIE IN.
- (C) ACTUAL UNDERCUT DEPTH AND BACKFILL SLOPE TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER.
- (D) IF WALL IS WITHIN CLEAR ZONE OF ROADWAY, PLACE CONCRETE BARRIER WALL (PER S-SSMB-3).
- (E) BACKFILL AREA TO BE PURCHASED AS SLOPE EASEMENT UNTIL TIED IN WITH EXISTING GROUND LINE.
- (F) COST OF LEVELING PAD, INCLUDING DESIGN WILL BE PAID FOR IN THE COST OF THE RETAINING WALL.



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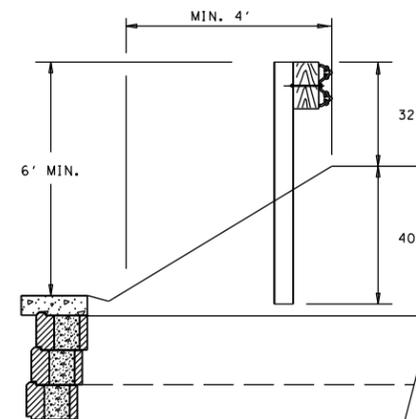
MECHANICALLY STABILIZED EARTH (MSE) WALL  
MODULAR BLOCK TYPICAL SECTION IN CUT



MECHANICALLY STABILIZED EARTH (MSE) WALL  
MODULAR BLOCK TYPICAL SECTION IN FILL

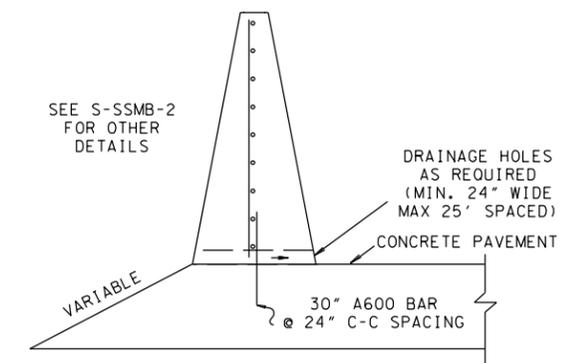
GENERAL NOTES

- THE PURPOSE OF THIS DRAWING IS TO ILLUSTRATE TO THE DESIGNER THE RIGHT-OF-WAY, SAFETY AND DRAINAGE REQUIREMENTS ASSOCIATED WITH RETAINING WALLS.
- (A) ENTIRE WALL MUST BE BUILT WITHIN THE RIGHT-OF-WAY.
  - (B) CONSTRUCTION EASEMENT IS REQUIRED FOR AT LEAST 15' FROM THE EDGE OF THE UNDERCUT FOUNDATION, OR EDGE OF LEVELING PAD, WHICHEVER IS A GREATER DISTANCE FROM THE ROADWAY.
  - (C) UNDERCUT DEPTH AND BACKFILL SLOPE TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER.
  - (D) DRAINAGE STRUCTURES MAY BE PLACED BEHIND WALLS AS REQUIRED.
  - (E) IF WALL IS WITHIN CLEAR ZONE OF ROADWAY, PLACE CONCRETE BARRIER WALL (PER S-SSMB-3).
  - (F) BACKFILL AREA TO BE PURCHASED AS SLOPE EASEMENT UNTIL TIED IN WITH EXISTING GROUND LINE.
  - (G) 15' CONSTRUCTION EASEMENT REQUIRED BEHIND SLOPE TIE IN.



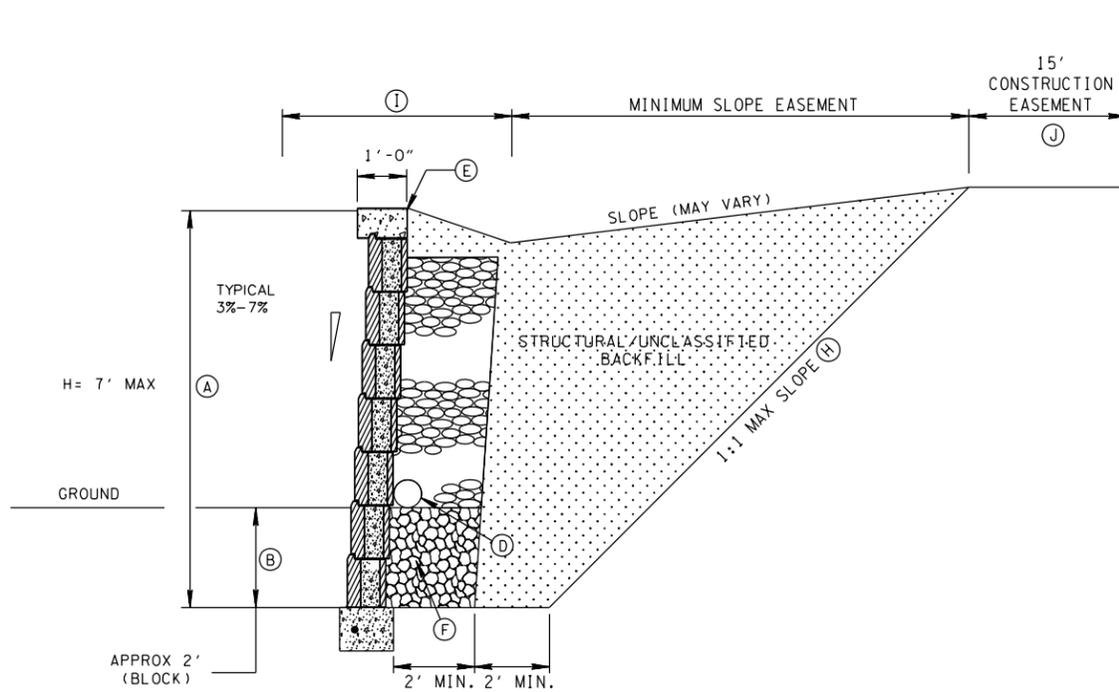
ALTERNATE GUARDRAIL DETAIL

S-SSMB-2, 51" CONCRETE BARRIER WALL IS RECOMMENDED SINCE INSTALLATION PROVIDES TL-5 PROTECTION.



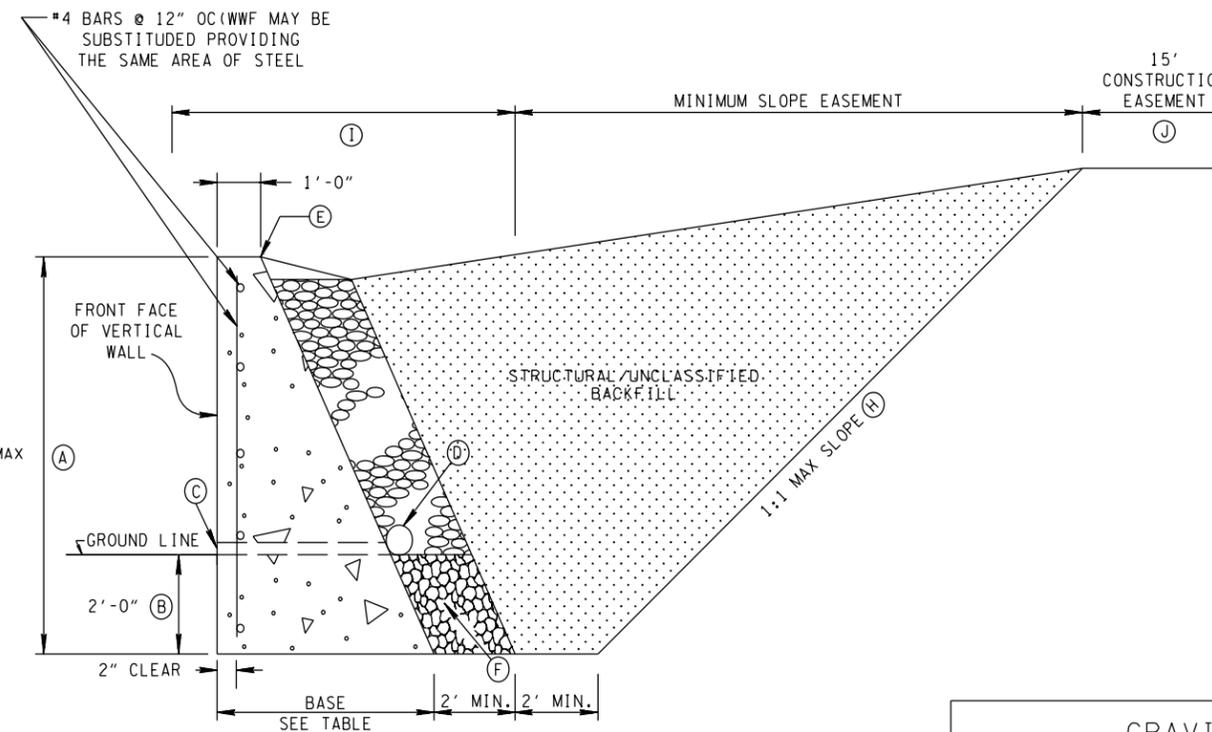
ALTERNATE CONCRETE PAVEMENT ATTACHMENT DETAIL

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION
ROADWAY FEATURES AT MSE MODULAR BLOCK RETAINING WALL
W-MSE-2



### MODULAR BLOCK GRAVITY RETAINING WALLS

PAYMENT FOR PROPOSED MODULAR BLOCK WALL GRAVITY RETAINING WALLS WILL BE MADE UNDER ITEM NO. 604-07.01 THROUGH 604-08.23, RETAINING WALL (DESCRIPTION) PER SQUARE FOOT.



### CONCRETE GRAVITY RETAINING WALLS

CONSTRUCTION SHALL MEET THE REQUIREMENTS OF TENN. STD. SPECIFICATION SECTION 604. THE WALL IS TO BE CLASS "A" CONCRETE.  
 PAYMENT FOR PROPOSED CONCRETE GRAVITY RETAINING WALLS WILL BE MADE UNDER ITEM NO. 604-07.01 THROUGH 604-08.23, RETAINING WALL (DESCRIPTION) PER SQUARE FOOT.

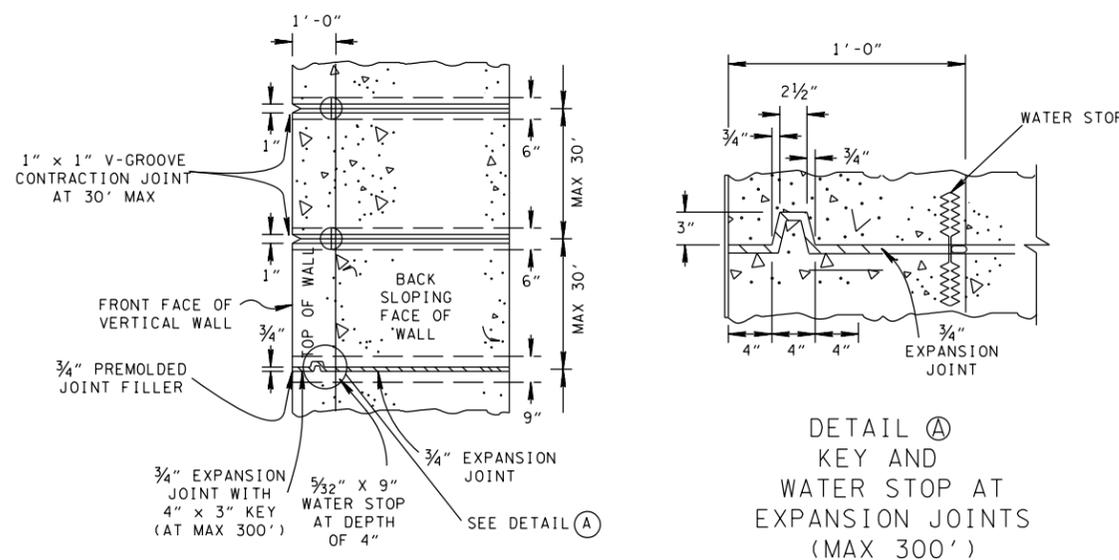
GRAVITY WALL DIMENSION AND QUANTITY TABLE

H (ft)	BASE (ft)	F <sub>T</sub> (psf)	V <sub>w</sub> (cy/ft)	F <sub>T</sub> (psf) *
2	1'-0"	600	0.074	600
3	1'-8"	850	0.148	850
4	2'-3"	1,100	0.241	1,100
5	2'-11"	1,350	0.363	1,350
6	3'-6"	1,600	0.500	1,600
7	4'-1"	1,850	0.659	1,850

\* DESIGN IS BASED ON ALLOWABLE BEARING STRESS AT BASE OF WALL BEING EQUAL TO OR GREATER THAN FT.

### GENERAL NOTES

- (A) GRAVITY WALL IS LIMITED TO 5 FEET IN HEIGHT ABOVE GROUND, WALLS GREATER THAN 5 FEET SHALL BE RETAINING WALLS DESIGNED IN CONSULTATION WITH THE SOILS AND GEOLOGY SECTION AND THE STRUCTURES DIVISION.
- (B) BASE OF WALL IS TO BE BELOW THE FROST LINE UNLESS WALL IS PLACED ON SOLID ROCK FOUNDATION. UNLESS OTHERWISE NOTED, PLACE BOTTOM TWO (2) FEET OF WALL BELOW THE GROUND LINE.
- (C) 4" DIAMETER WEEP HOLES AT MAXIMUM 10'-0" CENTER-TO-CENTER ARE TO BE PLACED AT THE LOWEST POINT PRACTICAL FOR PROPER DRAINAGE. THE ENGINEER WILL DETERMINE BOTH HORIZONTAL AND VERTICAL SPACING OF WEEP HOLES. PIPE IS TO BE PAID FOR UNDER THE PRICE BID FOR OTHER ITEMS OF CONSTRUCTION.
- (D) 6" DIAMETER PERFORATED PIPE IS TO BE CONNECTED TO AN OUTLET PIPE AT LOW POINTS AND AT A MAXIMUM SPACING OF 200'. PIPE IS TO BE PAID FOR UNDER THE PRICE BID FOR OTHER ITEMS OF CONSTRUCTION.
- (E) THE TREATMENT AT TOE OF FILL IS TO BE DETERMINED ACCORDING TO THE VOLUME AND VELOCITY OF THE RUNOFF (SEE ROADWAY PLANS).
- (F) GRANULAR BACKFILL BEHIND PROPOSED GRAVITY RETAINING WALL AND BELOW FLOW LINE OF OUTLET PIPES IS TO BE INCLUDED IN THE PRICE BID FOR THE WALL.
- (G) AT LOCATIONS WHERE A CONCRETE BARRIER PROTECTION IS ALSO NEEDED USE S-SSMB-2 IN PLACE OF GRAVITY WALL FOR UP TO 2' OF FILL AND S-SSMB-9 FOR UP TO 2' OF FILL AND S-SSMB-9 FOR UP TO 5' OF FILL.
- (H) ACTUAL UNDERCUT DEPTH AND BACKFILL SLOPE TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER.
- (I) THE ENTIRE WALL, INCLUDING GRANULAR BACKFILL TO BE INCLUDED IN THE RIGHT-OF-WAY.
- (J) IF THE WALL IS A FILL WALL, THERE SHOULD BE A 15' MINIMUM CONSTRUCTION EASEMENT IN FRONT OF THE WALL.



DETAIL A  
 KEY AND WATER STOP AT EXPANSION JOINTS (MAX 300')

NOTE: CONTRACTION JOINTS ARE TO BE PLACED AT 30' INTERVALS. EXPANSION JOINTS ARE TO BE PLACED AT INTERVALS NOT EXCEEDING 300'. WATER STOPS ARE TO BE ELASTOMERIC OR OTHER APPROVED MATERIALS USED AT EXPANSION JOINTS ONLY DIMENSIONS SHOWN ARE ABSOLUTE MINIMUM.

### CONCRETE GRAVITY RETAINING WALL EXPANSION AND CONTRACTION JOINT DETAIL PLAN VIEW

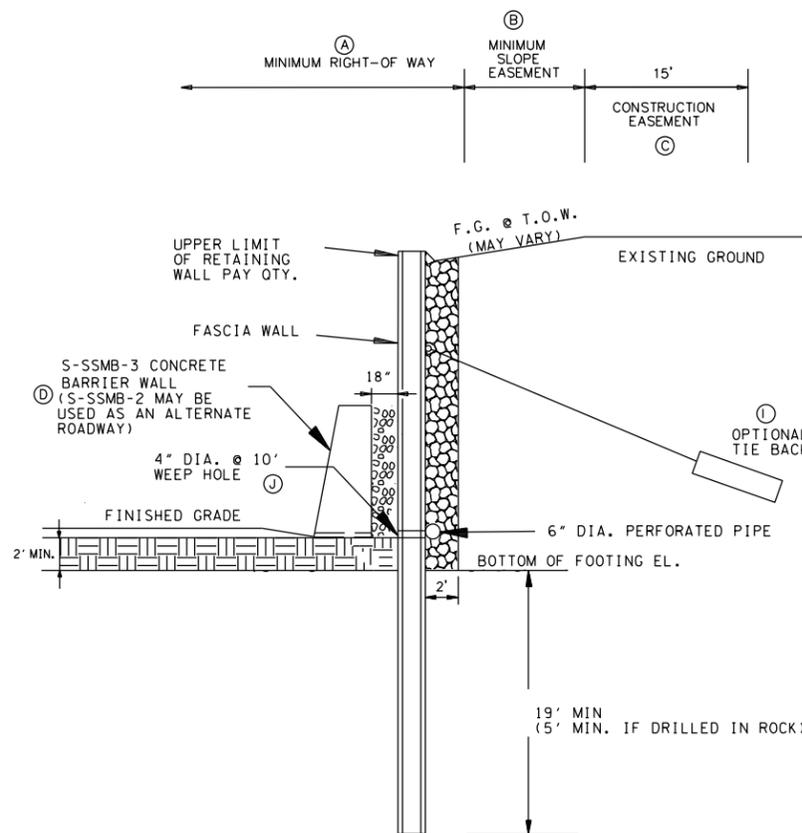
### LEGEND

- B = WIDTH AT BASE OF GRAVITY WALL
- H = HEIGHT OF WALL FROM BASE TO TOP INCLUDING ANY PORTION BELOW GROUND
- F<sub>T</sub> = BEARING STRESS AT BASE OF GRAVITY WALL (STONE AND MORTAR OR CLASS "A" CONCRETE)
- V<sub>w</sub> = VOLUME OF GRAVITY WALL (STONE AND MORTAR OR CLASS "A" CONCRETE)

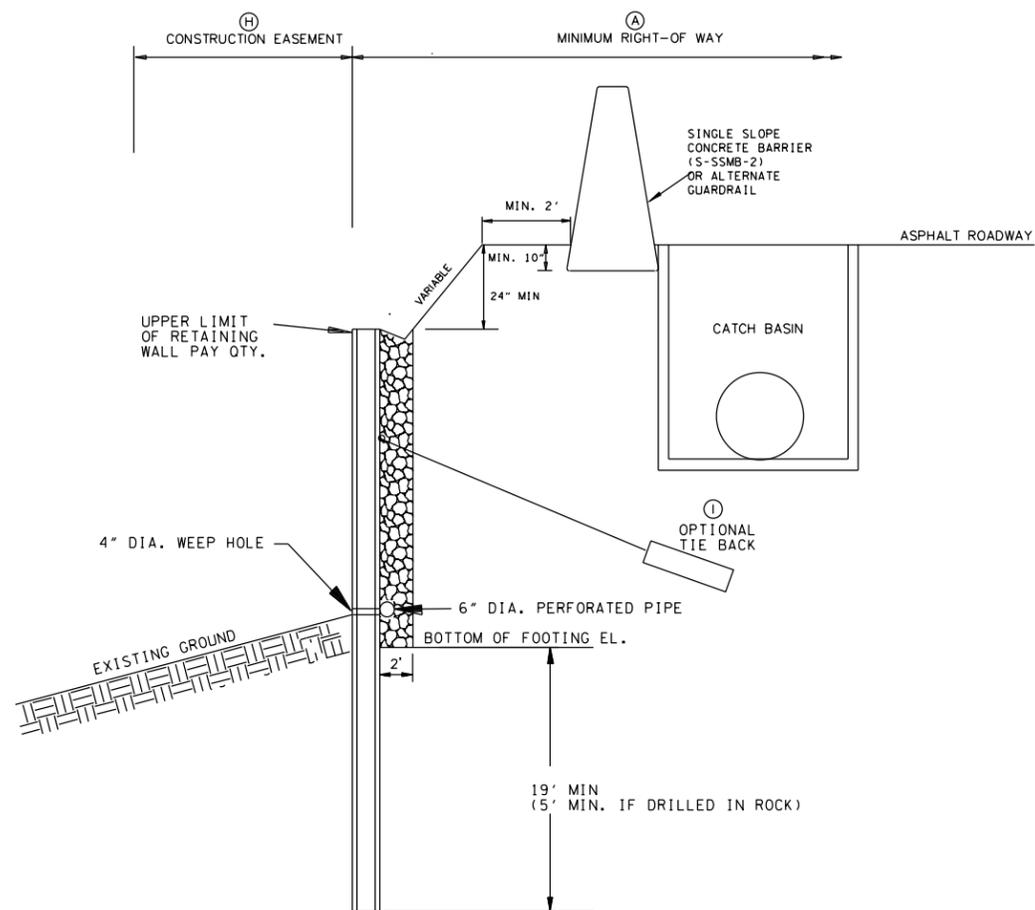
MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

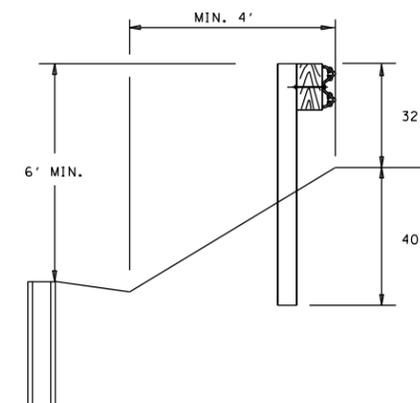
STANDARD GRAVITY-TYPE RETAINING WALLS



SOLDIER PILE WALL  
TYPICAL SECTION IN CUT

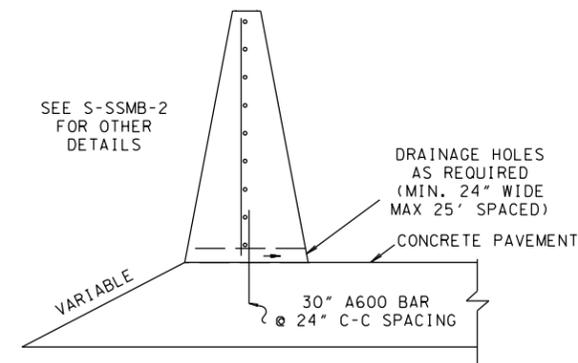


SOLDIER PILE WALL  
TYPICAL SECTION IN FILL



ALTERNATE GUARDRAIL DETAIL

SEE NOTE (E)  
S-SSMB-2, 51" CONCRETE BARRIER WALL IS RECOMMENDED SINCE INSTALLATION PROVIDES TL-5 PROTECTION.



CONCRETE PAVEMENT  
ATTACHMENT DETAIL

GENERAL NOTES

- THE PURPOSE OF THIS DRAWING IS TO ILLUSTRATE TO THE DESIGNER THE RIGHT-OF-WAY, SAFETY AND DRAINAGE REQUIREMENTS ASSOCIATED WITH RETAINING WALLS.
- (A) ENTIRE WALL MUST BE BUILT WITHIN THE RIGHT-OF-WAY. IF TIE BACK USED, MIN ROW SHALL BE EXTENDED.
  - (B) BACKFILL AREA TO BE PURCHASED AS SLOPE EASEMENT UNTIL TIED IN WITH EXISTING GROUND LINE.
  - (C) 15' CONSTRUCTION EASEMENT REQUIRED BEHIND SLOPE TIE IN.
  - (D) IF WALL IS WITHIN CLEAR ZONE OF ROADWAY, PLACE CONCRETE BARRIER WALL (PER S-SSMB-3).
  - (E) BRIDGE RAIL (STD-1-1SS) WITH MOMENT SLAB IS REQUIRED UNLESS THE ROADWAY IS EXPECTED TO HAVE LITTLE TO NO TRUCK TRAFFIC IN WHICH CASE GUARDRAIL OFFSET A MINIMUM OF 4' FROM THE WALL FACE MAY BE USED.
  - (F) DRAINAGE STRUCTURES MAY BE PLACED BEHIND WALLS REQUIRED.
  - (G) UNDERCUT DEPTH AND BACKFILL SLOPE TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER.
  - (H) COST OF MOMENT SLAB, INCLUDING DESIGN WILL BE PAID FOR IN THE COST OF THE RETAINING WALL.
  - (I) IF TIE BACK IS PROPOSED TO BE USED THE ENTIRE TIE SHALL BE INSIDE THE RIGHT-OF-WAY.
  - (J) ALIGN WALL WEEP HOLES AND BARRIER WALL WEEP HOLES.

FOUNTION TYPES

- DRILLED IN ROCK (5' MIN.)
- CONCRETE FILLED DRILLED (19' MIN.)

WALL TYPES

- STEEL PILES WITH WOOD LAGGING
- CONCRETE WITH WOOD LAGGING
- CONCRETE WITH CONCRETE LAGGING

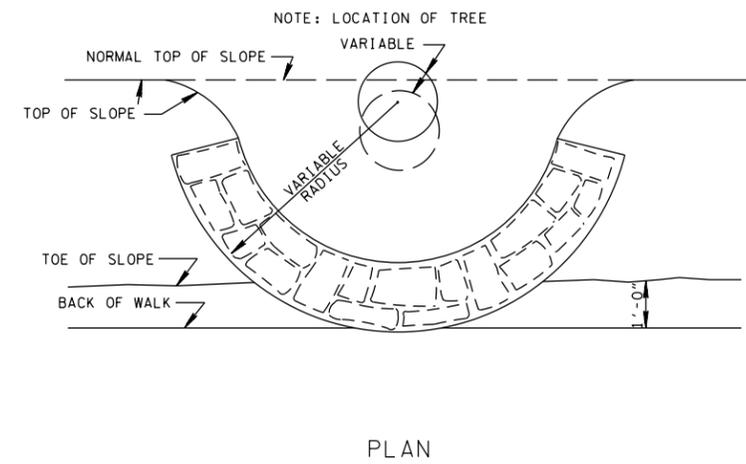
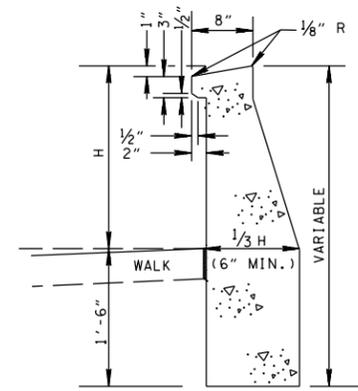
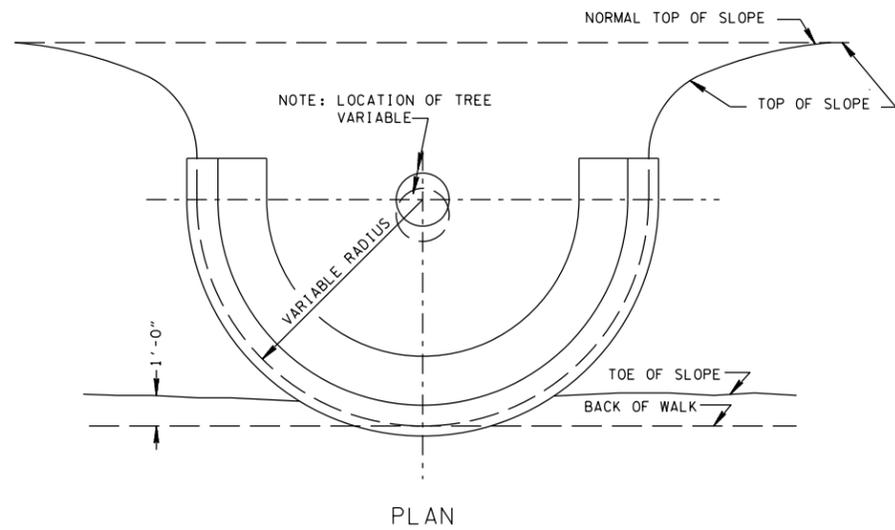
DESIGN NOTES

- (1) LAGGING FOR SOLDIER PILE WALLS, WITH AND WITHOUT PERMANENT GROUND ANCHORS, SHALL BE DESIGNED AS EITHER TEMPORARY OR PERMANENT, BASED ON THE CONDITIONS DESCRIBED BELOW.
- (2) CAST-IN-PLACE CONCRETE FASCIA PANELS SHALL BE DESIGNED AS A PERMANENT LOAD CARRYING MEMBER IN ACCORDANCE WITH AASHTO LRFD.
- (3) THE STRUCTURAL DESIGN OF SOLDIER PILES SHALL BE BASED ON THE ELASTIC SECTION MODULUS "S" FOR THE ENTIRE LENGTH OF THE PILE.
- (4) THE ANTICIPATED LATERAL DEFLECTION AT TOP OF THE SOLDIER PILE WALL SHALL BE SHOWN IN THE PLANS.

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

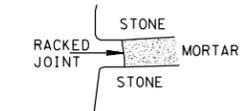
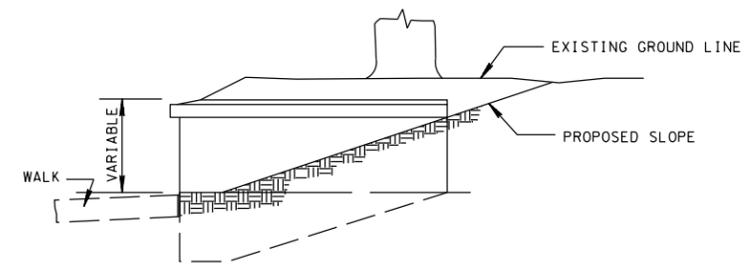
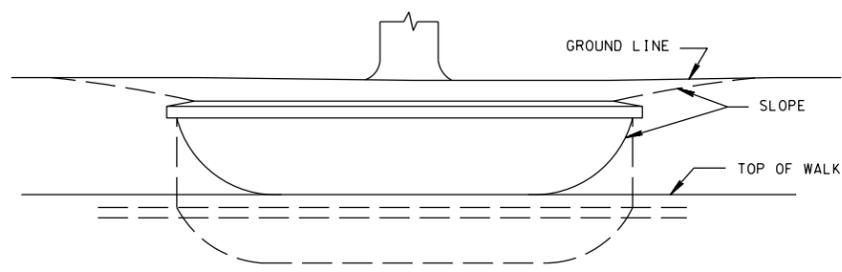
ROADWAY  
FEATURES  
AT SOLDIER PILE  
RETAINING WALL

W-SP-1



TYPICAL SECTION OF CONCRETE WALL  
NOTE: CONCRETE TO BE CLASS "A".

PLAN

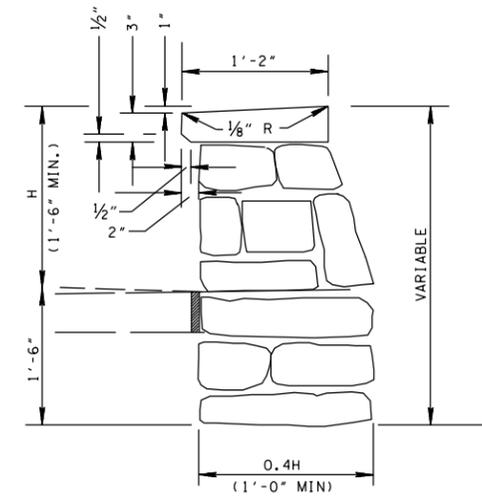
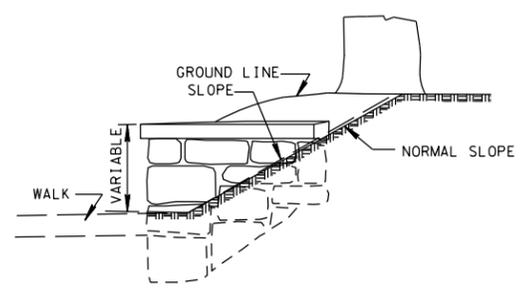
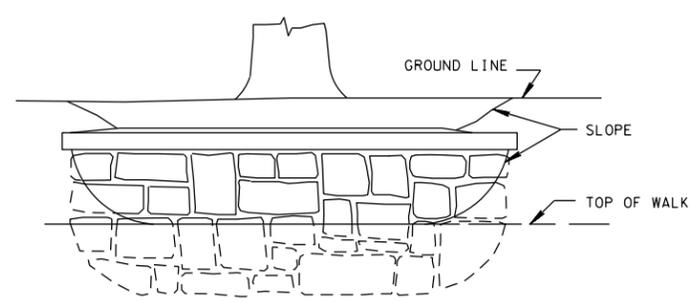


DETAIL OF RAKED JOINT

FRONT ELEVATION

SIDE ELEVATION

CONCRETE TREE WALL



FRONT ELEVATION

SIDE ELEVATION

STONE MASONRY TREE WALL

TYPICAL SECTION OF STONE MASONRY WALL

NOTE: WALLS SHALL BE OF UNCOURED MORTAR STONE MASONRY. COPING SHALL BE CLASS "A" CONCRETE.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

DETAILS OF TREE WALLS

W-TW-1