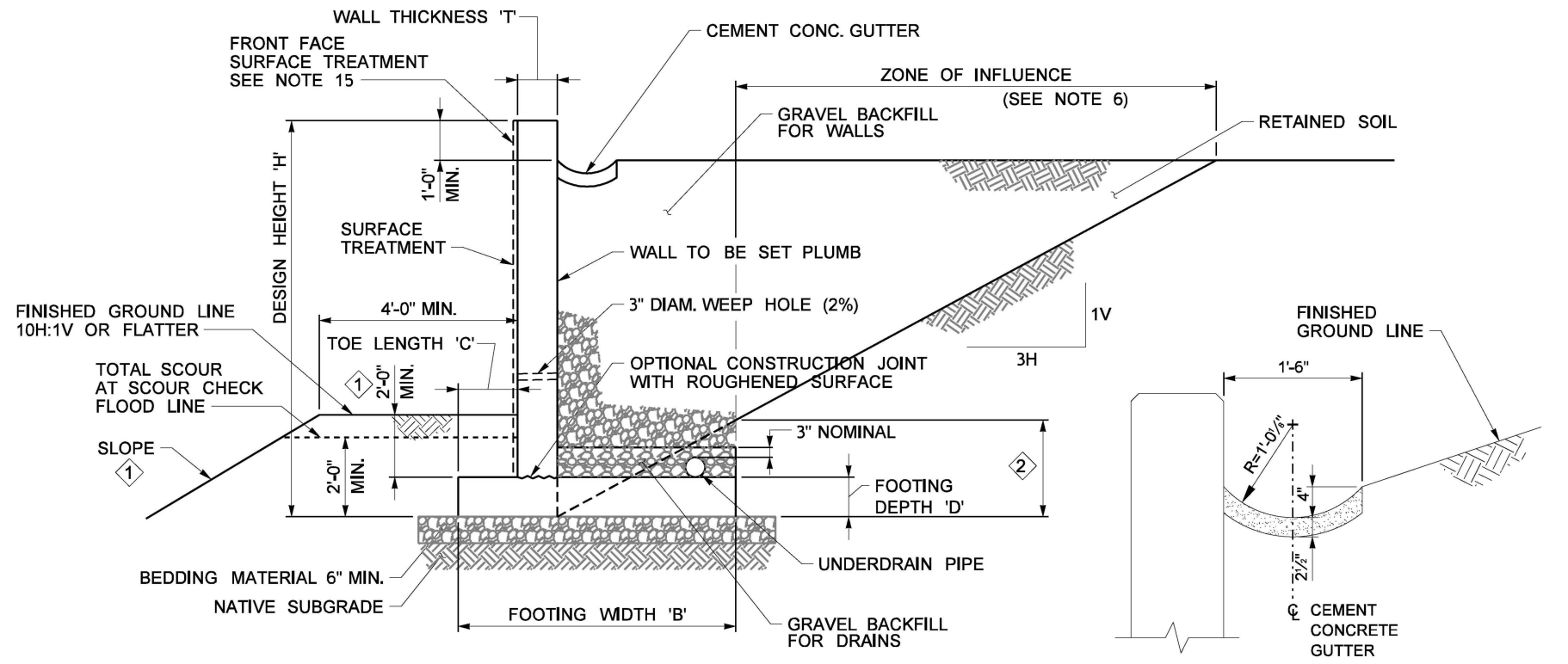


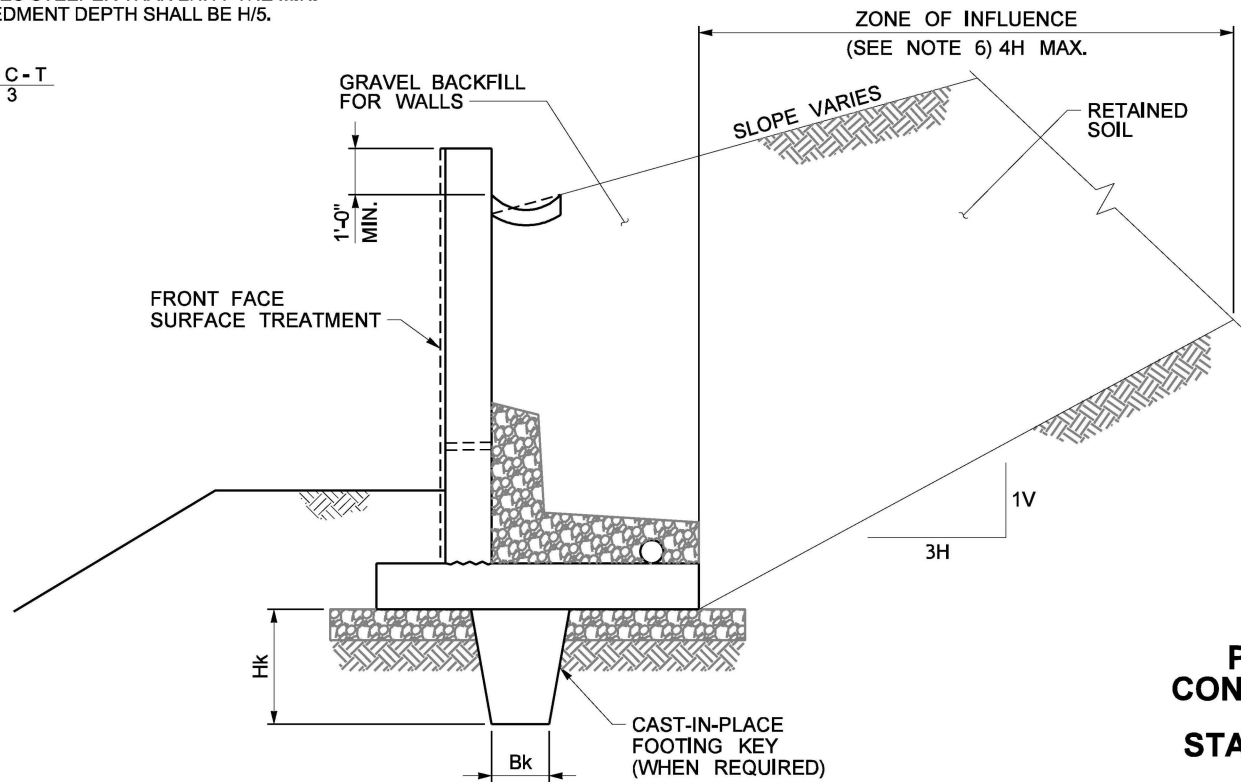
GENERAL NOTES:

1. All materials and workmanship shall be in accordance with the requirements of the current edition of the **Standard Specifications**.
2. These Precast Reinforced Concrete Retaining Walls (Walls) have been designed in accordance with the requirements of the **AASHTO LRFD Bridge Design Specifications 9th Edition 2020** and the **WSDOT Bridge Design Manual, 2023**. The seismic design for the Walls has been completed using Site Adjusted Peak Ground Acceleration (As) values as shown in the Table.
3. The Contractor shall be responsible for safely lifting, shipping, installing, and backfilling the precast Walls.
4. Precast Wall segment lengths shall be a minimum of 4 feet.
5. The native subgrade material shall be granular soil with a minimum internal angle of friction as specified in the Design Table. Bedding material shall be in accordance with **Standard Specifications 6-20.3(6)A**.
6. Retained soil may be comprised of in-situ soil or backfill. The retained soil within the Zone of Influence shall be granular soil with a minimum Internal Angle of Friction of 34 degrees and a total unit weight within the range of 125 to 145 PCF. For backfill and drainage requirements, see **Standard Plan D-4** and Contract Documents.
7. Precast concrete shall be Class 7000. Cast-in-place concrete shall be Class 4000.
8. Reinforcing steel shall conform to **Standard Specification Section 9-07.2. AASHTO M31 GR 60 (ASTM A615)** when used shall not be welded. Headed steel reinforcing bars shall conform to **Standard Specifications Section 9-07.2(1)**. The Contractor may substitute deformed welded wire reinforcement (WWR) conforming to **Standard Specifications Section 9-07.7** provided any equivalent bar area reduction is limited to 15% of the original area and spacing is no greater than 2/3 of the dimension provided in the Design Table. The specified minimum yield strength of the WWR shall be limited to a maximum of 75 ksi. Alternative proposed substitutions shall be submitted in accordance with **Standard Specifications Section 6-20.3(1)A2**.
9. Unless otherwise noted, concrete cover to reinforcing shall be 2 inches.
10. All steel plates and shapes shall be **ASTM A36** or **ASTM A572 GR 50**. All steel plates and shapes shall be galvanized in accordance with **AASHTO M111** after fabrication, unless noted otherwise. Galvanizing shall be removed at any field welded zones. All galvanizing repairs shall be in accordance with **ASTM A780**. Galvanizing Repair Paint shall conform to **Standard Specifications Section 9-08.1(2)B**.
11. All joints on the backfill side of the wall stem and top of footing shall be sealed with a 12-inch wide external sealing band centered about the joint and adhesively bonded to the concrete surface.
12. Alternative joint types between precast units, other than those detailed herein, shall not be used unless submitted for acceptance by the Engineer in a Type 2 Working Drawing.
13. Worker fall protection shall be provided at top of Wall in accordance with **Standard Specification 6-20.3(1)F**.
14. These plans may be used in combination with the following **Standard Plans**, unless otherwise specified in the contract:
 - a. **L-5.10 Bridge Railing Type Chain Link Pipe Rail** (worker fall protection)
 - b. **L-5.15 Cable Fence** (worker fall protection)
15. Provide surface treatment in accordance with the Contract Documents. Alternate surface treatment shall be accepted by the State Bridge and Structures Architect.



TYPICAL SECTION FLAT BACKSLOPE

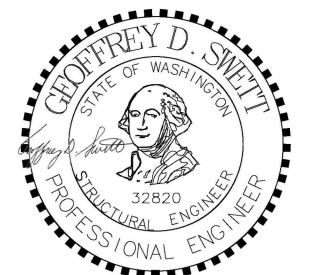
- KEY NOTES**
- 1 FOR WALL HEIGHTS, H > 10'-0" WITH SLOPES STEEPER THAN 2H:1V THE MIN. EMBEDMENT DEPTH SHALL BE H/5.
 - 2 $\frac{B-C-T}{3}$



TYPICAL SECTION SLOPING BACKSLOPE

(FOR DETAILS NOT SHOWN SEE TYPICAL SECTION FLAT BACKSLOPE)

CEMENT CONCRETE GUTTER DETAIL

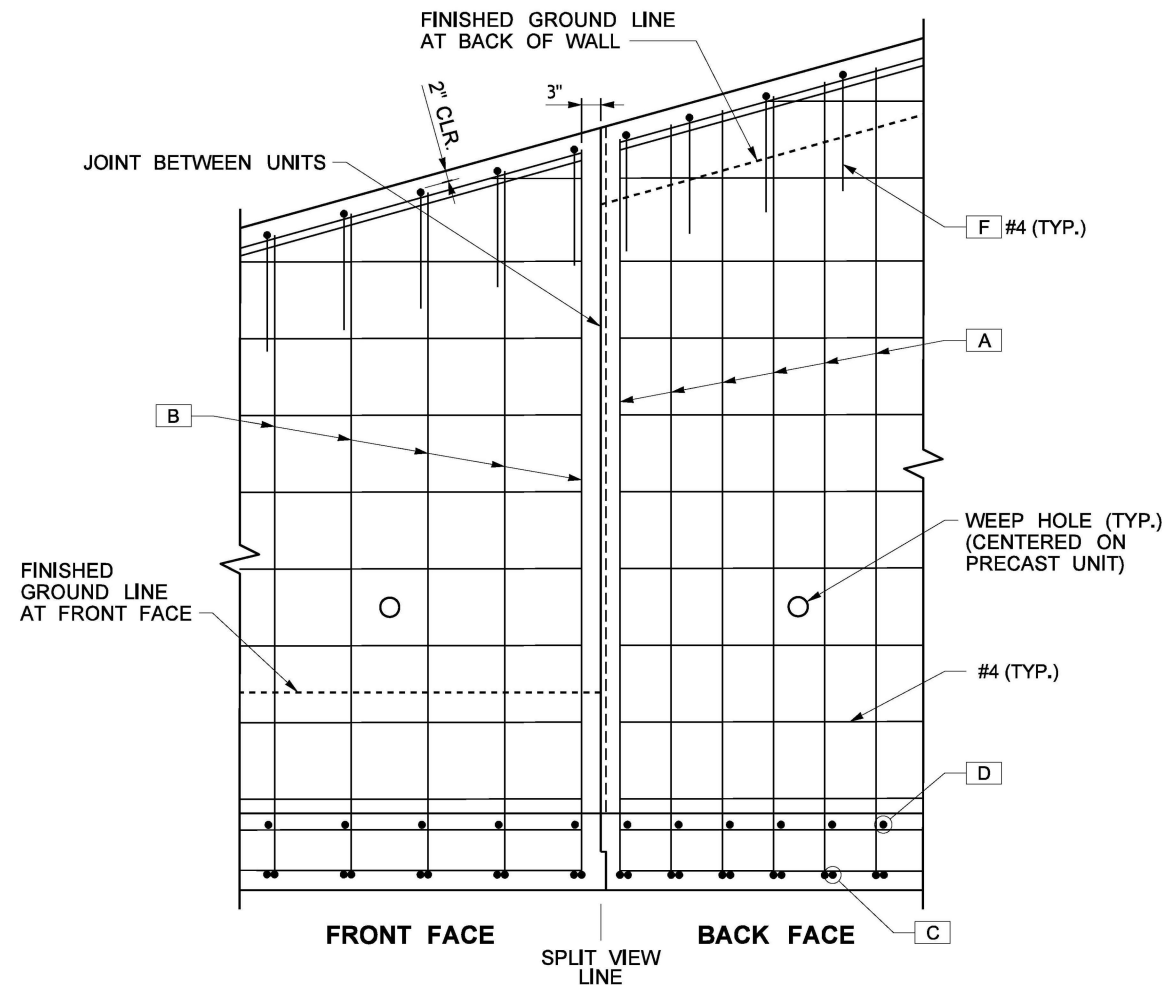
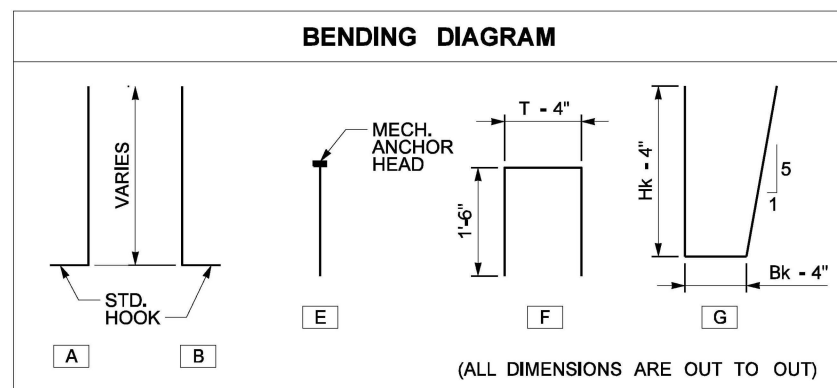
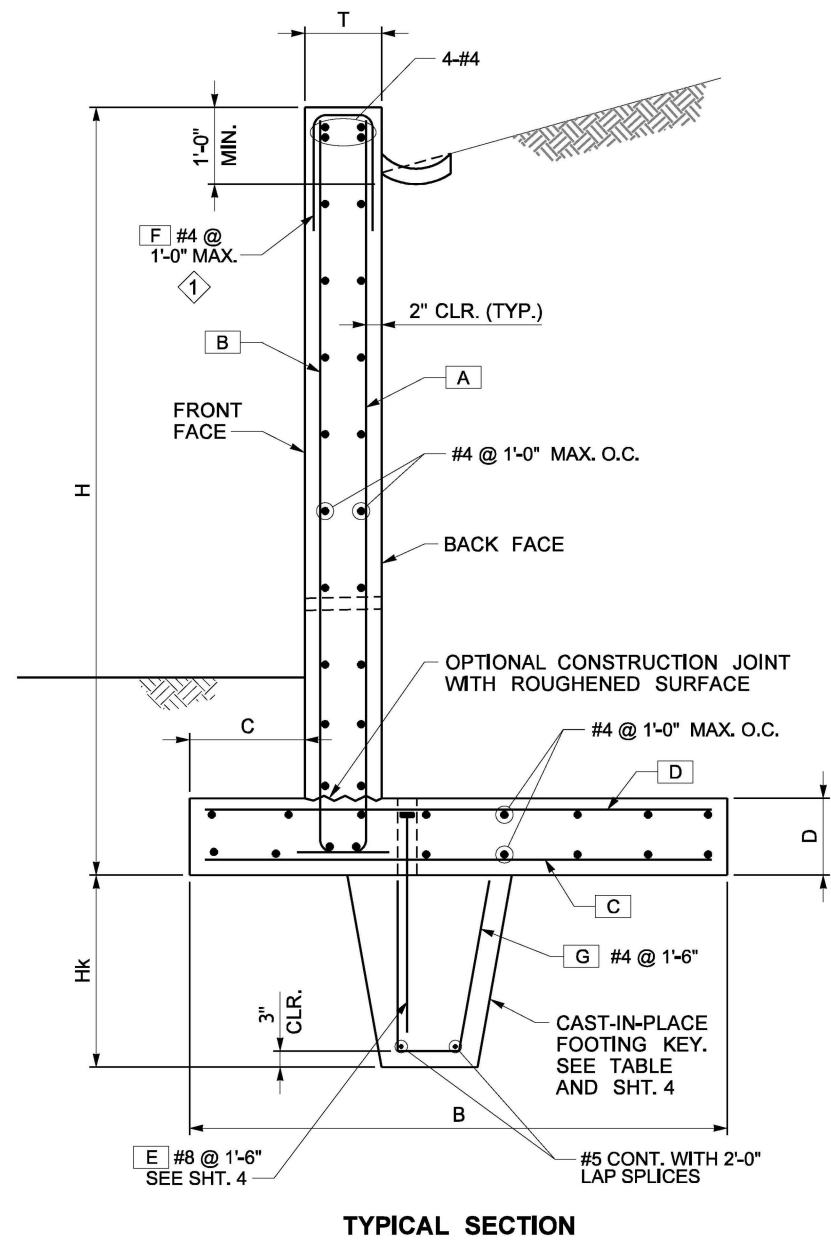


Oct 6, 2023

PRECAST REINFORCED CONCRETE RETAINING WALL
STANDARD PLAN D-20.10-00

SHEET 1 OF 6 SHEETS

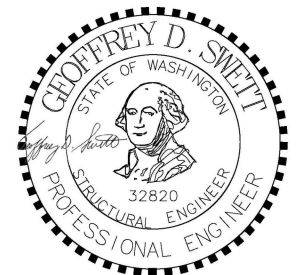
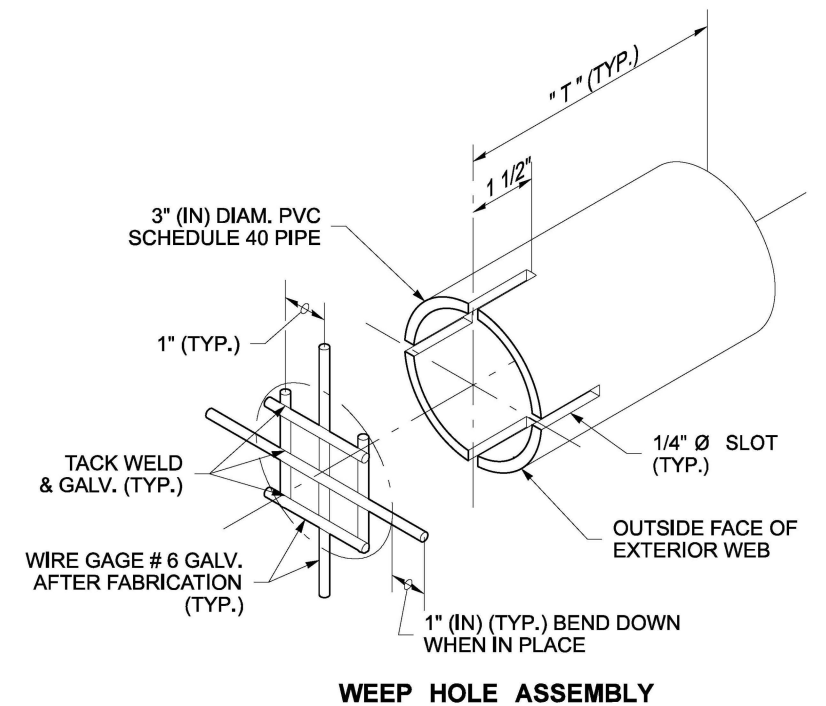
APPROVED FOR PUBLICATION
 Mark A. Davies Oct 9, 2023
 STATE DESIGN ENGINEER
 Washington State Department of Transportation



FOOTING KEY NOT SHOWN FOR CLARITY, SEE SHEET 4 FOR DETAILS

KEY NOTES

- ① BARS F SPACED AT 6" IN CASE OF TOP MOUNTED WORKER FALL PROTECTION FENCE



Oct 6, 2023

**PRECAST REINFORCED
CONCRETE RETAINING WALL
STANDARD PLAN D-20.10-00**

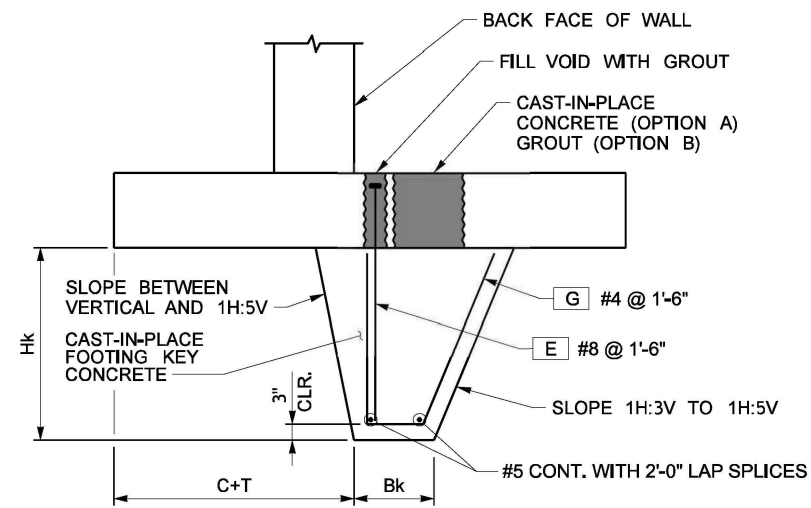
SHEET 2 OF 6 SHEETS

APPROVED FOR PUBLICATION

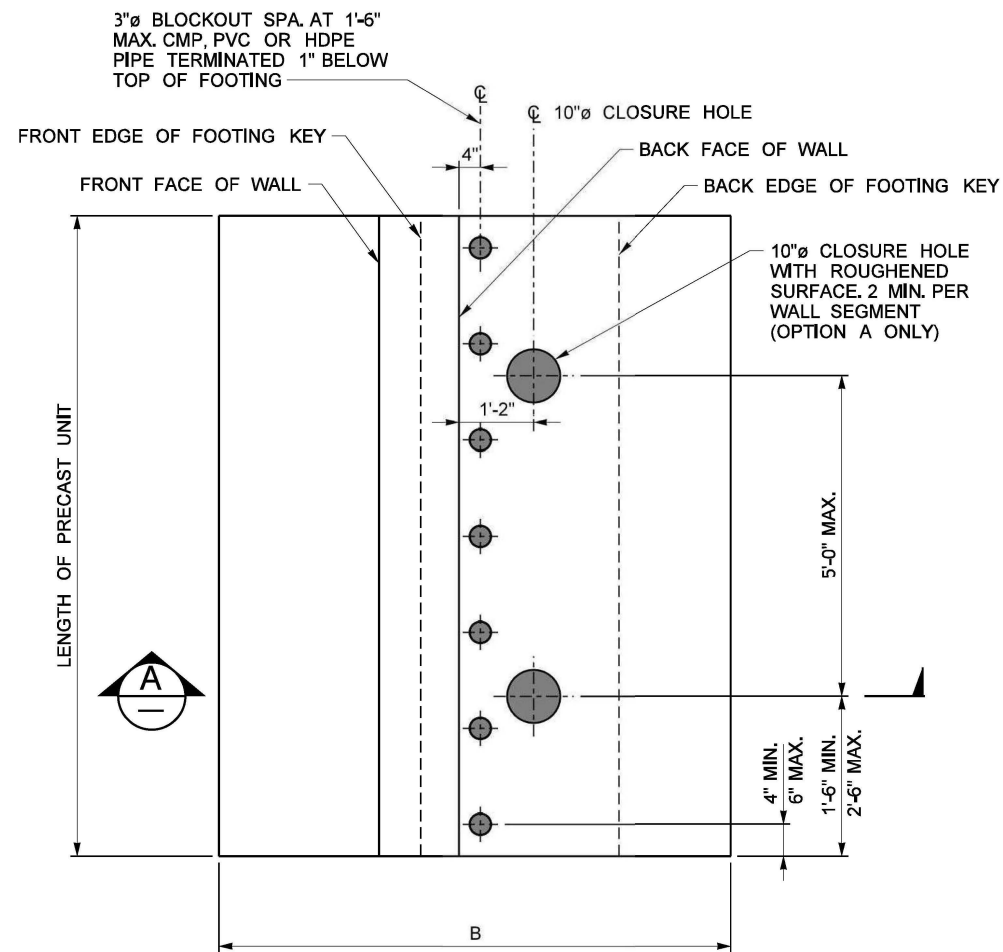
Mark A. Plaines Oct 9, 2023

STATE DESIGN ENGINEER





SECTION A
FOOTING KEY



PLAN
PRECAST WALL UNIT WITH FOOTING KEY

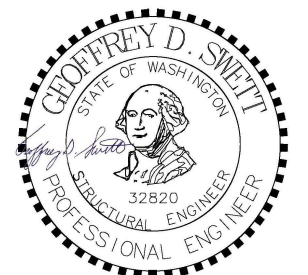
SUGGESTED CONSTRUCTION SEQUENCE FOR CAST-IN-PLACE FOOTING KEY

OPTION A:

1. EXCAVATE AND RETAIN TRENCH FOR FOOTING KEY. PROVIDE STAY-IN-PLACE SHORING AS NEEDED. ENSURE TRENCH IS DRY OR DEWATERED.
2. SET PRECAST WALL UNITS.
3. PLACE FOOTING KEY CONCRETE VIA CLOSURE HOLES.
4. WHILE FOOTING KEY CONCRETE IS STILL WET, INSERT HEADED REINFORCING BARS INTO 3" DIA. BLOCKOUTS. GROUT BLOCKOUTS.

OPTION B:

1. EXCAVATE AND RETAIN TRENCH FOR FOOTING KEY. PROVIDE STAY-IN-PLACE SHORING AS NEEDED. ENSURE TRENCH IS DRY OR DEWATERED.
2. PLACE FOOTING KEY CONCRETE. CONCRETE SHALL BE PLACED IN DRY TRENCH AND CONSOLIDATED.
3. SET PRECAST WALL UNITS WHILE FOOTING KEY CONCRETE IS STILL WET.
4. INSERT HEADED REINFORCEMENT BARS INTO 3" DIA. BLOCKOUTS, GROUT BLOCKOUTS. AS AN ALTERNATIVE, HEADED REINFORCEMENT BARS MAY BE POST-INSTALLED AFTER FOOTING KEY HAS SET. DRILL 1 1/4" DIAMETER HOLE HK-3" DEEP AND SET WITH EPOXY RESIN. GROUT BLOCKOUTS.



Oct 6, 2023

PRECAST REINFORCED CONCRETE RETAINING WALL
STANDARD PLAN D-20.10-00

SHEET 4 OF 6 SHEETS

APPROVED FOR PUBLICATION

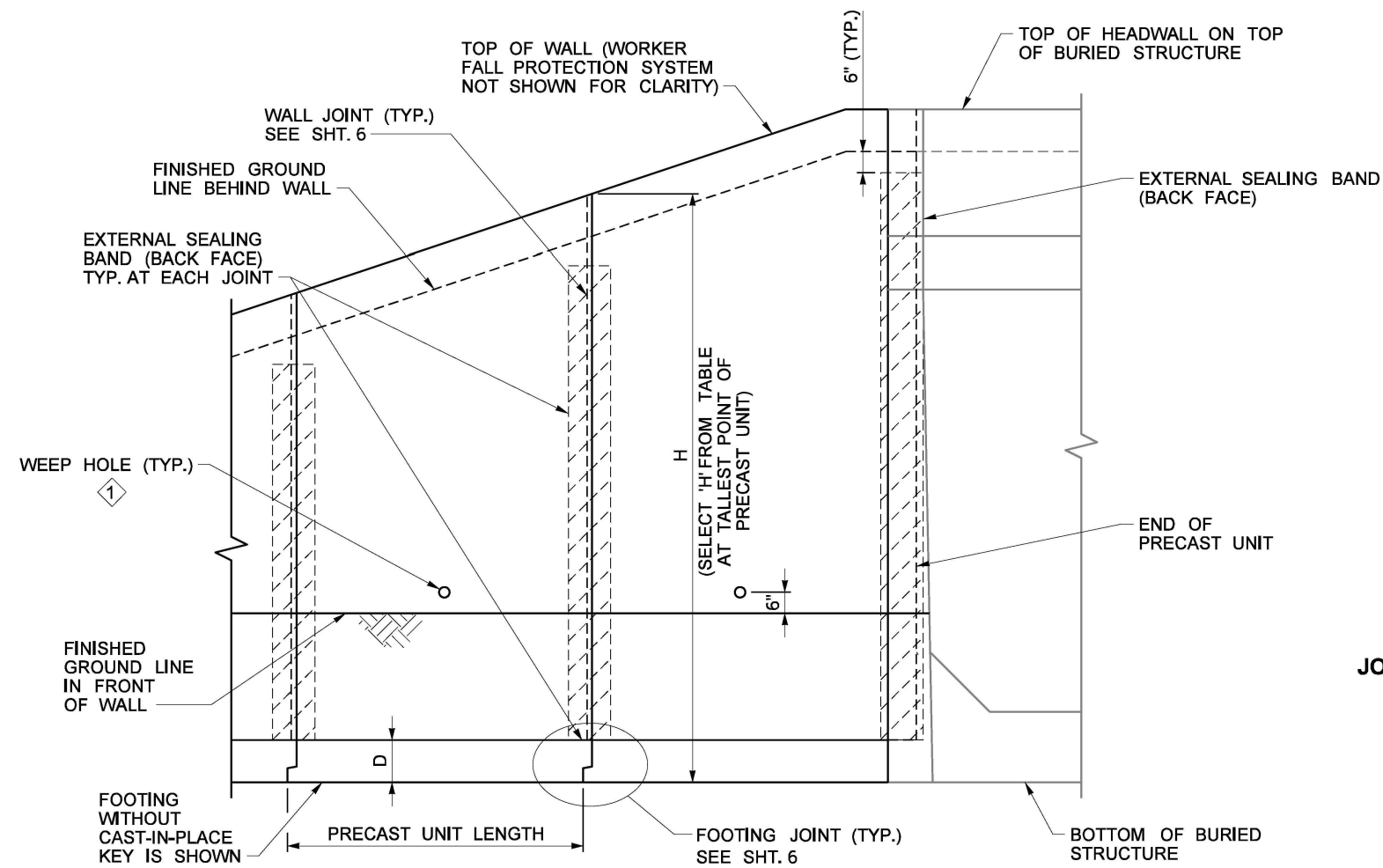
Mark A. Davis Oct 9, 2023

STATE DESIGN ENGINEER

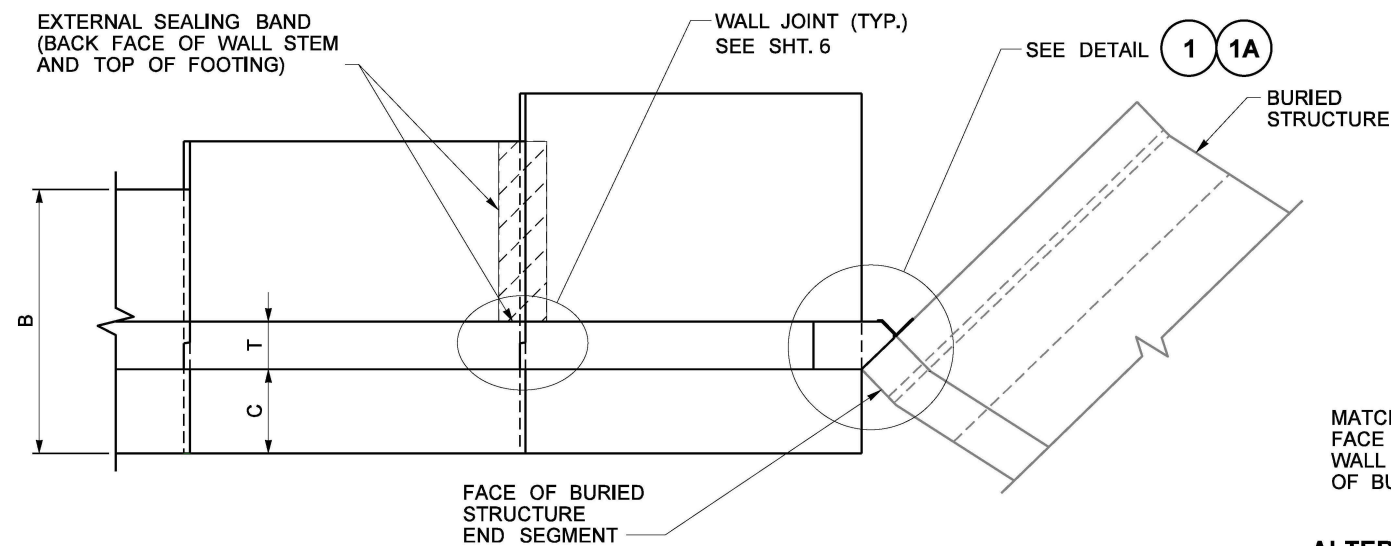


KEY NOTES

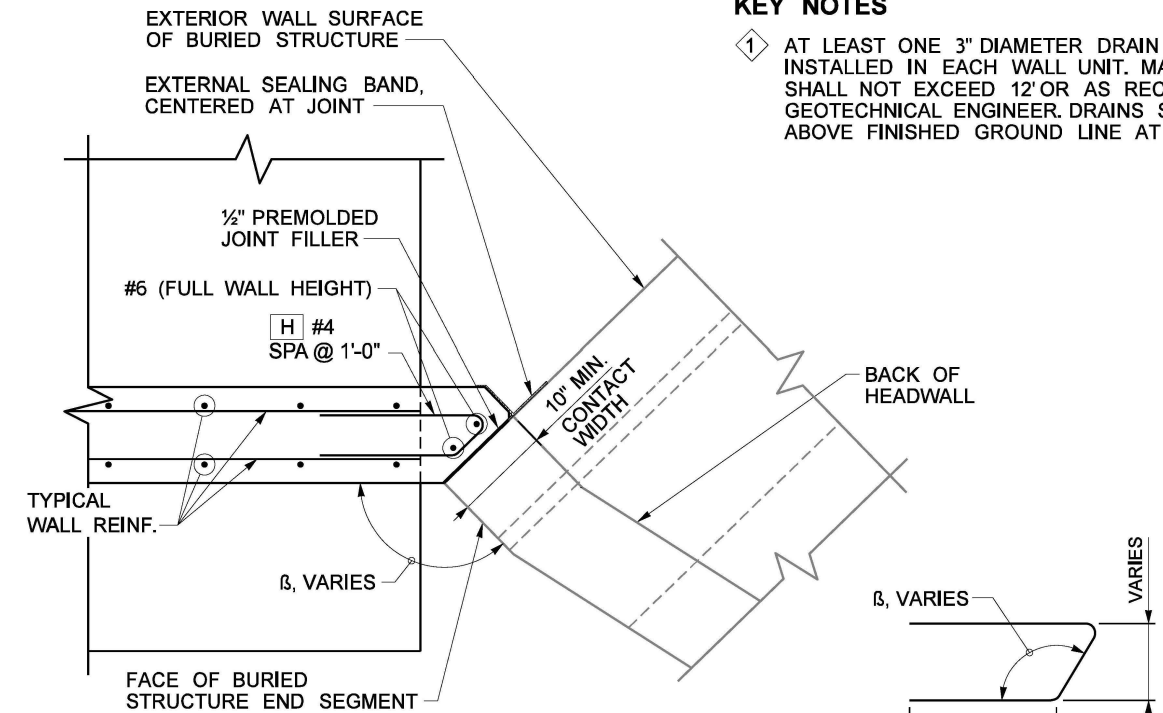
- 1 AT LEAST ONE 3" DIAMETER DRAIN SHALL BE INSTALLED IN EACH WALL UNIT. MAXIMUM SPACING SHALL NOT EXCEED 12' OR AS RECOMMENDED BY GEOTECHNICAL ENGINEER. DRAINS SHALL BE 6" ABOVE FINISHED GROUND LINE AT FRONT OF WALL.



DEVELOPED ELEVATION

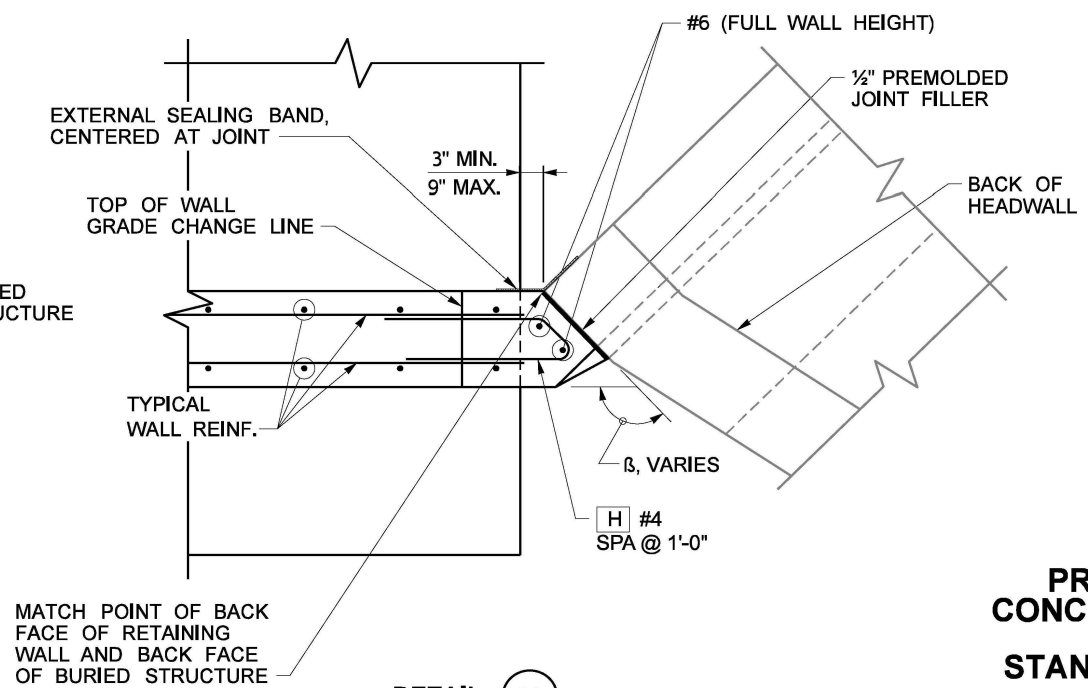


PLAN



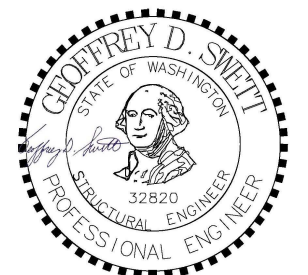
DETAIL 1

JOINT OF WALL WHEN USED WITH A BURIED STRUCTURE



DETAIL 1A

ALTERNATE JOINT OF WALL WHEN USED WITH A BURIED STRUCTURE



Oct 6, 2023

**PRECAST REINFORCED CONCRETE RETAINING WALL
STANDARD PLAN D-20.10-00**

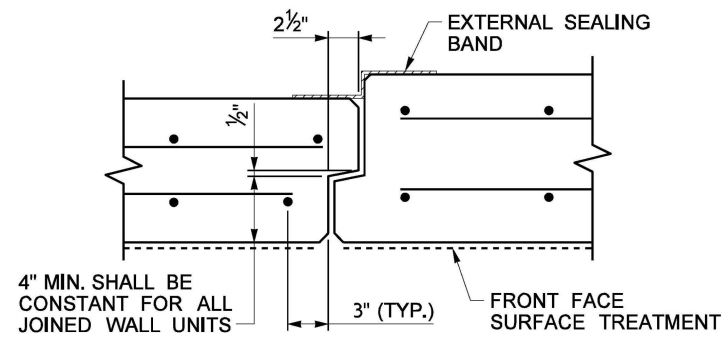
SHEET 5 OF 6 SHEETS

APPROVED FOR PUBLICATION

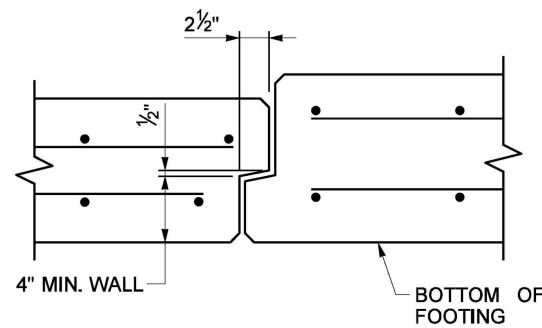
Mark A. Raines Oct 9, 2023

STATE DESIGN ENGINEER

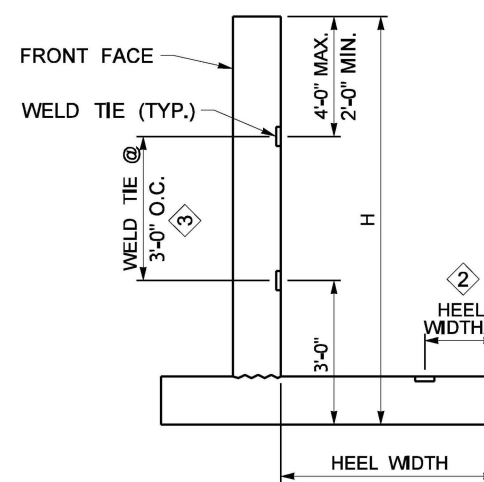




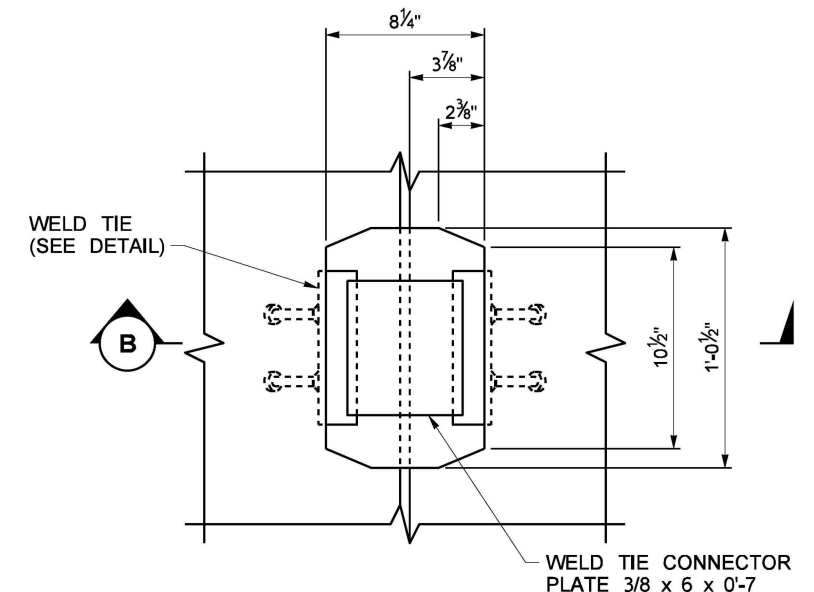
WALL JOINT TYPE 1



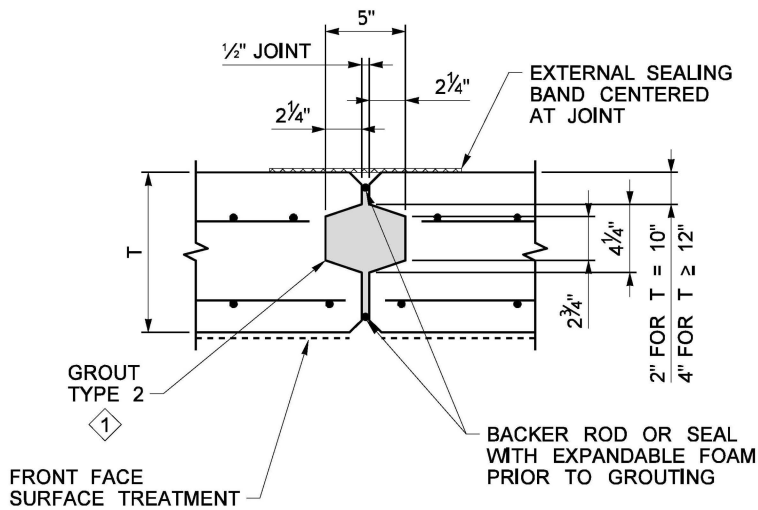
FOOTING JOINT TYPE 1



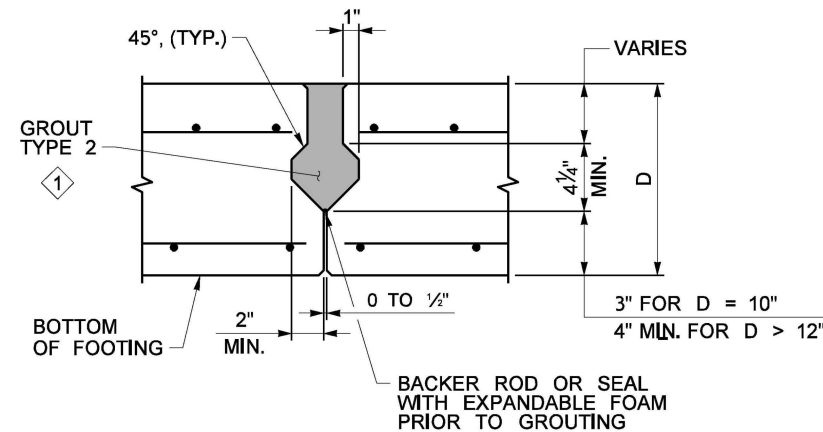
TYPICAL SECTION WELD TIE PLACEMENT



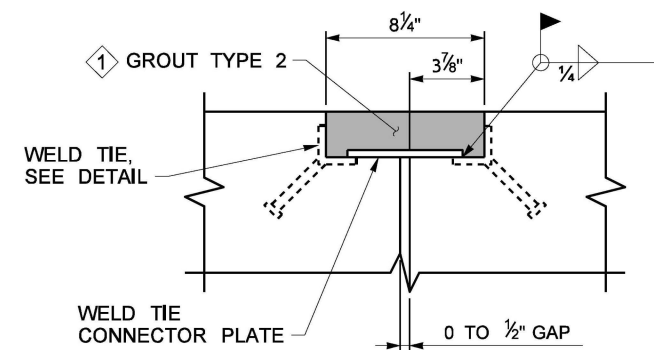
JOINT TYPE WELD TIE



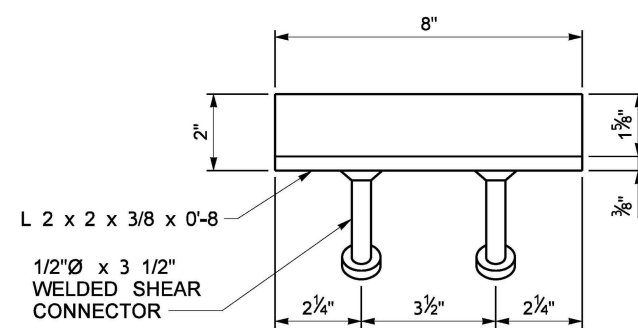
WALL JOINT TYPE 3



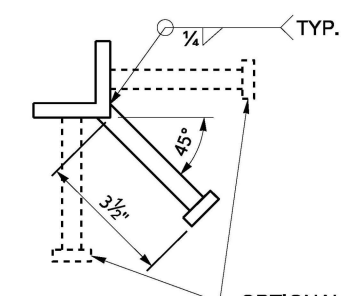
FOOTING JOINT TYPE 3



SECTION B



WELD TIE DETAIL



OPTIONAL ALT. WELDED SHEAR CONNECTOR CONFIGURATION

NOTES

1. Wall and footing joints selected shall be shown in the Shop Drawings.
2. The same joint type shall be used for each retaining wall location. The joint type shall not be interchanged within the precast units or retaining wall location.

KEY NOTES

- 1 THE CONTRACTOR SHALL PLACE THE GROUT BEFORE PLACING THE BACKFILL AGAINST THE STRUCTURE. GROUT SHALL CONFORM TO STANDARD SPEC. 9.20.3(2) AND SHALL ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI BEFORE BACKFILL PLACEMENT.
- 2 PROVIDE ONE WELD TIE IN THE FOOTING FOR EACH PRECAST UNIT LENGTH.
- 3 FOR $H < 6'-0"$ PROVIDE ONE WELD TIE.
- 4 WELD TIES AND ANGLES MAY BE INSTALLED UNCOATED AND COATED WITH ZINC RICH PRIMER AFTER INSTALLATION AND WELDING.

- 5 MANUFACTURER VARIATIONS OR NOMINAL ADJUSTMENTS TO THE DETAILED JOINT GEOMETRICS SHALL BE SHOWN IN THE SHOP DRAWINGS.



Oct 6, 2023

PRECAST REINFORCED CONCRETE RETAINING WALL

STANDARD PLAN D-20.10-00

SHEET 6 OF 6 SHEETS

APPROVED FOR PUBLICATION

Mark A. Daines Oct 9, 2023

STATE DESIGN ENGINEER

