

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII | HAW. | BR-H1-1 (226) | 2003 | 25 | 36 |

GENERAL:

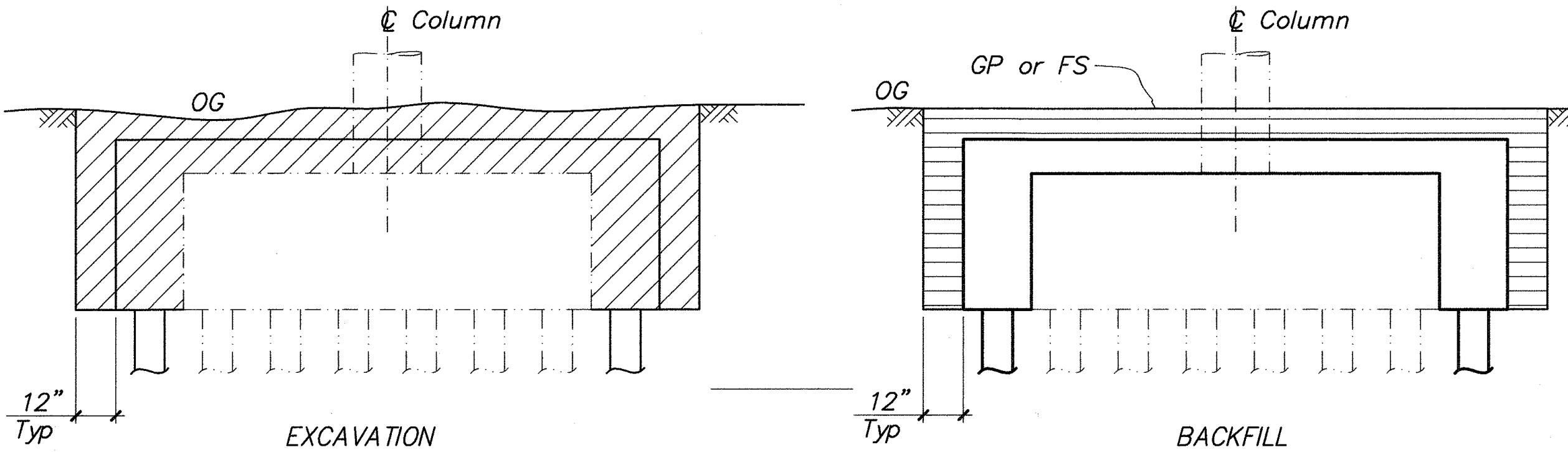
- The existing bridge information shown in these drawings was obtained from the original bridge drawings and is presented for reference purposes only. No responsibility is assumed for the accuracy of the existing information presented. It is the contractor's responsibility to verify independently all of the as-built information.
- The Contractor shall visit the construction site and shall verify all dimensions and conditions prior to starting any work and shall be responsible for coordination of all work and materials including those furnished by Sub-Contractors. The Hawaii Department of Transportation (D.O.T.) Representative shall be notified immediately of any discrepancies found.
- The Contract Structural Drawings and Specifications represent the finished structure. They do not indicate the method of construction. The Contractor shall provide all measures necessary to protect the structure during construction.
- The Contractor shall provide adequate Bracing for Excavations and Shoring for all existing adjacent structures and roadways. Bracing for Excavations and Shoring for construction loads shall be designed by a Hawaii licensed Civil or Structural Engineer experienced in this kind of work.

BASIS FOR SEISMIC RETROFIT:

- The intent of the project is to retrofit the structures to prevent collapse due to a seismic event with a maximum acceleration coefficient of 0.18g
- Abutment concrete blocking are provided to use the soil behind the back wall to resist longitudinal movement of the bridge during a seismic event. A small gap is provided to permit normal minor movements (completed in phase 1).
- Abutment creep blocks are provided to prevent large transverse movements of the bridge at the abutments (completed in phase 1).
- Pipe seat extenders are provided at hinges to permit separation of bridge sections (up to the length of extension) without loss of support (completed in phase 1).
- Cable restrainers are provided at hinges to limit the separation of bridge sections during a seismic event.
- Outrigger pier cap retrofits are provided to prevent torsional failure that could lead to collapse (completed in phase 1).
- Footing enlargement and new peripheral piles are provided to increase the footing overturning moment capacity such that it equals or exceeds the footing overturning moment demand.
- Footing thickening without lateral enlargement is provided to strengthen footings to prevent structural failure due to seismic movements. (completed in phase 1)

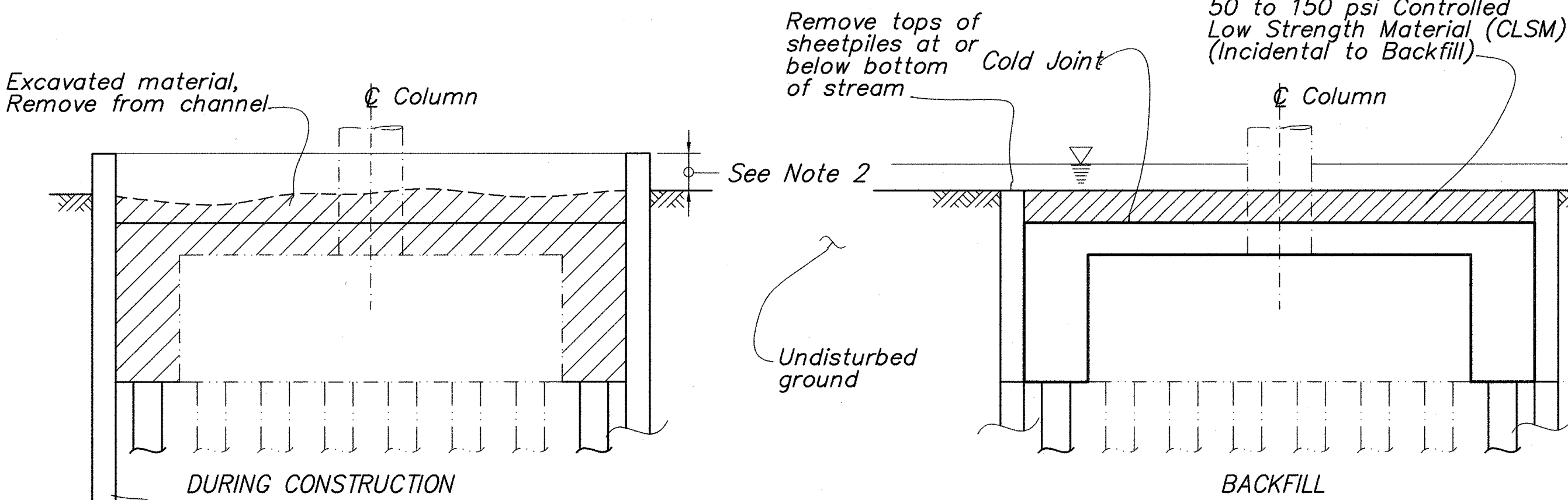
GENERAL NOTES:

- General Specifications: Hawaii Department of Transportation, Standard Specification for Road, Bridge and Public Works Construction, 1994 together with Special Provisions prepared for this contract.
- Design Specifications: AASHTO, Standard Specifications for Highway Bridges, 16th Edition (1996)
- Caltrans Memo To Designers 20-4.
- Seismic Loading:
 - Seismic Performance CategoryB
 - Acceleration Coefficient 0.18g
- Concrete Classes:
 - Existing:
 - Columns, Bent Cap Beams (Assumed).....f'c = 5,850 PSI
 - Footings (Assumed)f'c = 3,900 PSI
 - New:
 - Concrete fill for pilesf'c = 4,500 PSI
 - Footings, bolstersf'c = 4,000 PSI
 - Bolstersf'c = 3,000 PSI
- Reinforcing Steel:
 - Existing:
 - Column Main Reinf. & Dowels (Assumed)..... fy = 66,000 PSI
 - All others (Assumed)..... fy = 44,000 PSI
 - New:
 - All Bars, Dowels & Stirrups fy = 60,000 PSI
 - Welded Bars (ASTM A706) fy = 60,000 PSI
- Structural Steel:
 - Plates & Shapes - A36 fy = 36,000 PSI
 - 8" xx Strong Pipe - ASTM A53, Grade B fy = 35,000 PSI
 - Steel Pipe Pile - ASTM A252, Grade 3 fy = 45,000 PSI
- Cables - See Special Provisions



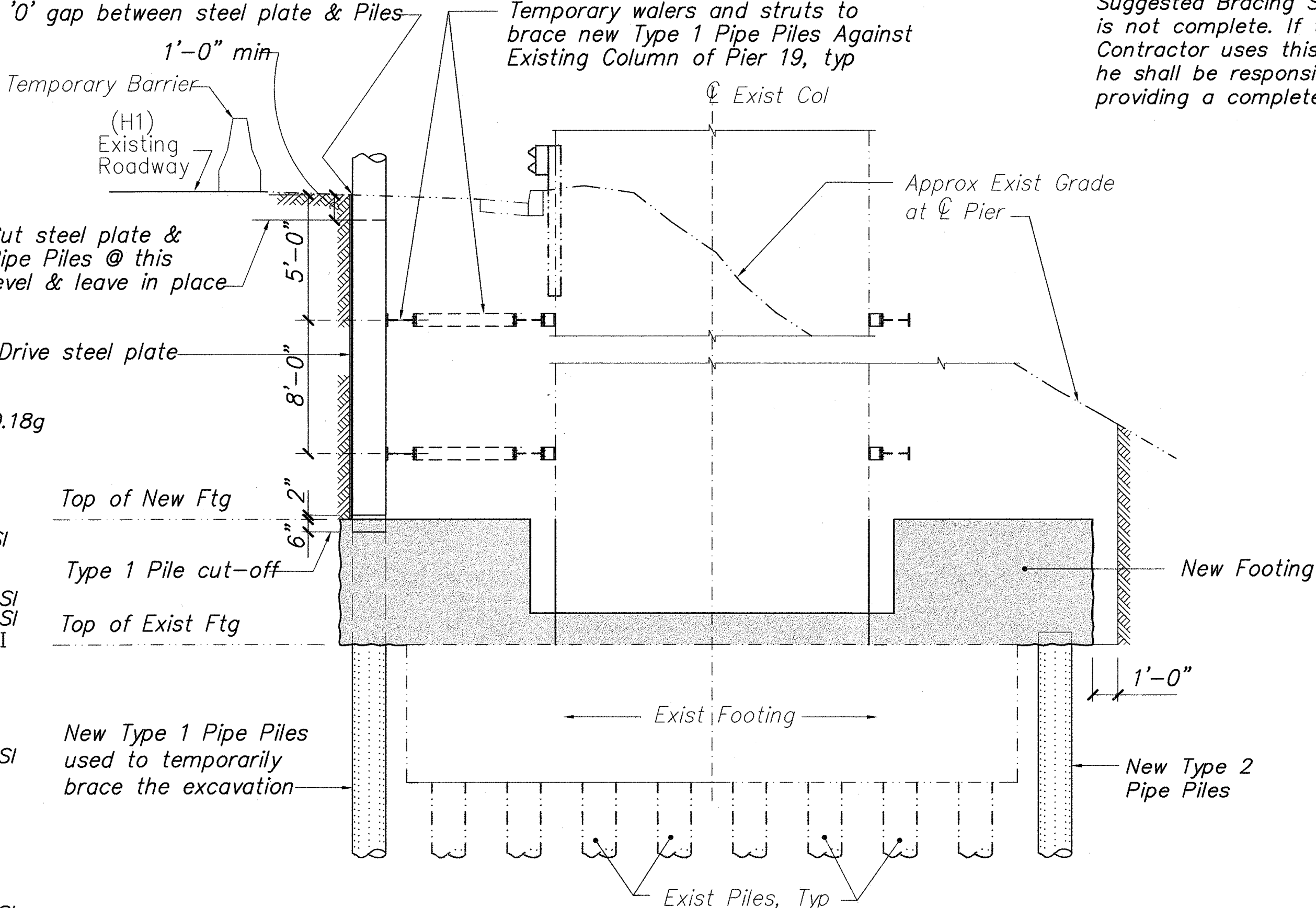
PIER 18 FOOTING RETROFIT

NO SCALE



PIER 21 FOOTING RETROFIT

NO SCALE



SUGGESTED EXCAVATION BRACING METHOD @ PIER 19 FOOTING RETROFIT

NO SCALE

LEGEND:

- Indicates exist structure
- Indicates new construction
- Indicates structure excavation
- Indicates structure backfill

ABBREVIATIONS

- OG Original Ground
- FS Planned Finish Surface
- GP Planned Graded Plane

LEGEND FOR AS-BUILT POSTINGS

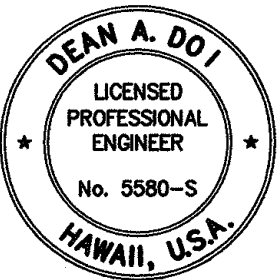
- Squiggly line for as-built deletion
- Double line for as-built deletion
- "X" for as-built deletion
- Roadway Text for as-built posting

NOTE: (for Pier 21 Ftg Retrofit)

- Contractor shall protect existing channel sides and bottom from damage by floods and other causes during the construction period.
- Contractor shall minimize constructing temporary barriers to Stormwater Flows. Contractor shall be responsible for removing those barriers before the occurrence of flow that may damage the Channel and Surrounding Property.

SUGGESTED BRACING/CONSTRUCTION SEQUENCE AT PIER 19 FOOTING RETROFIT

- Install New pipe piles.
- Perform Dynamic Load Tests.
- Drive steel plates down to top of new footing.
- Excavate to 7' below existing grade.
- Install top of bracing system (walers & struts)
- Excavate to 15' below existing grade.
- Install bottom bracing system.
- Excavate to top of existing footing.
- Cut & remove pipe piles 2 inches above & 6 inches below top of new footing.
- Weld stud shear connectors to pipe piles.
- Fill piles with concrete.
- Construct new footing on top of existing footing.
- Backfill to bottom brace.
- Remove bottom brace.
- Backfill top brace.
- Remove top brace.
- Backfill to 1' below finish grade.
- Cut steel plate & Type 1 pipe piles at least 1' below finish grade.
- Backfill to finish grade.



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 SATO & ASSOCIATES, INC.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

GENERAL BRIDGE RETROFIT NOTES & LIMITS OF PAYMENT FOR STRUCTURAL EXCAVATION & BACKFILL

INTERSTATE ROUTE H-1, SEISMIC RETROFIT
 KAPIOLANI INTERCHANGE, PHASE 2
 FEDERAL AID PROJECT NO. BR-H1-1(226)

SCALE: AS NOTED DATE: SEPT 2002
 SHEET No. S1 OF 9 SHEETS

"AS-BUILT"