REINFORCEMENT BAR FABRICATION DETAILS

CHIEF BRIDGE ENGINEER

BD-626M

ACCORDANCE WITH AN APPROVED WELD PROCEDURE SPECIFICATION.

ELECTRODES WHICH ARE COMPATIBLE WITH THE BASE METAL AS SPECIFIED, AND IN ACCORDANCE WITH SECTION 1001.3(q)2b OF PUB. 408.

BACKFILL AT STRUCTURES

USE QUALIFIED WELDERS IN ACCORDANCE WITH AWS D1.5 SECTION 5 PART B.

IN ACCORDANCE WITH SECTION 1105.03(m) OF PUB. 408 AND THE SPECIAL PROVISIONS.

BRIDGE DRAINAGE

APPLY SHEAR STUDS TO WEBS OF DRIVEN PILES AFTER DRIVING PILES TO REFUSAL.

28. WELDING SPECIFICATIONS: ANSI/AASHTO/AWS/D1.5 BRIDGE WELDING CODE AND WELD SHEAR STUDS IN ACCORDANCE WITH AASHTO/AWS D1.5 SECTIONS 7.5.5 AND 7.6.

MOMENT SLABS

CHECK WALL REDUNDANCY AS PER WALL REDUNDANCY PROCEDURE ON SHEET 2.

13. CHECK WALL COMPONENTS SUCH AS BEARING PLATE ASSEMBLY, CORBEL, AND WALER.

CENTERLINE GAGES/LOAD CELLS, DIALS TO MEASURE GROUTING PROCEDURE 

ANCHOR CORROSION PROTECTION SYSTEM

WHERE PROTECTIVE COATING IS REQUIRED, GALVANIZING IS PREFERRED.

ANCHORED WALL IN ACCORDANCE WITH THE SPECIAL PROVISION PERMANENT ANCHORED WALL.

9. SPECIFY  PROTECTIVE COATINGS FOR STEEL COMPONENTS IN ACCORDANCE WITH AASHTO/AWS D1.5 BRIDGE WELDING CODE AND THE SPECIAL PROVISIONS.

CONSIDERING POTENTIALLY CORROSIVE ENVIRONMENTS.

6. FOR ANALYSIS AND DESIGN OF WALL ELEMENTS, EMBEDMENT DEPTHS AND ANCHOR FORCES, CONSIDERING POTENTIALLY CORROSIVE ENVIRONMENTS.

3. ESTABLISH ANCHOR INCLINATION ANGLES. INCLINE ANCHORS TO MINIMIZE NOT EXCEED 0.6 GUARANTEED ULTIMATE TENSILE STRENGTH (GUTS) AND ANCHOR AS A MULTIPLIER (1.33) TIMES THE ANCHOR DESIGN LOAD. ANCHOR DESIGN LOAD WILL FOLLOW PROVIDE MINIMUM BEARING DISTANCE FOR PRECAST LAGGING AT 3 INCHES BEYOND THE WELD IN ALL DIRECTIONS.

2. SOLDIER PILES MAY BE DESIGNED USING H-PILES, WIDE FLANGE BEAMS OR CONCRETE AND ROCK SOCKET.

4. DETERMINE EARTH PRESSURE DISTRIBUTIONS, INCLUDING SURCHARGES, FOR WALL TO STAY WITHIN RIGHT-OF-WAY, AND TO OPTIMIZE ANCHOR FORCE.

PREDETERMINED BY THE ENGINEER FROM TEST PILES. THE STRUCTURE CONTROL ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF THE BEARING PILES WHICH ATTAIN ABSOLUTE REFUSAL INTO THE STRATUM DEFINED BY A TIP ELEVATION WHICH IS ACCORDANCE WITH DESIGN MANUAL PART 4.

2. PROVIDE MINIMUM BEARING DISTANCE FOR PRECAST LAGGING AT 3 INCHES BEYOND THE WELD IN ALL DIRECTIONS.

ANCHOR HEADS

ANCHOR TENDONS CONSISTING OF STEEL BARS CONFORMING TO AASHTO-M275, TYPE II.

15. PROVIDE ANCHOR TENDONS CONSISTING OF STEEL BARS CONFORMING TO AASHTO-M275, TYPE II.

ANCHORED WALL DESIGN METHODOLOGY

1. ESTABLISH PROJECT REQUIREMENTS, INCLUDING ALL GEOLOGY, EXTERNAL LOADING, AND PERFORMANCE CRITERIA IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

2. EVALUATE SITES CONDITIONS AND RELEVANT REGULATIONS OF AT SITE SOIL AND WATER.

3. EVALUATE ANCHOR INCLINATION ANGLES. INCLINE ANCHORS TO MINIMIZE NOT EXCEED 0.6 GUARANTEED ULTIMATE TENSILE STRENGTH (GUTS) AND ANCHOR AS A MULTIPLIER (1.33) TIMES THE ANCHOR DESIGN LOAD. ANCHOR DESIGN LOAD WILL FOLLOW PROVIDE MINIMUM BEARING DISTANCE FOR PRECAST LAGGING AT 3 INCHES BEYOND THE WELD IN ALL DIRECTIONS.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BID PACKET OF SPECIFICATION

ANCHORED WALLS

NOTES TO DESIGNERS

APPLICATIONS OF THIS STANDARD DRAWING

1. THIS STANDARD APPLIED TO ALL ANCHORED WALLS WITH CONCRETE BULKHEAD ELEMENTS.

2. THIS STANDARD APPLIED TO ANCHORS BONDED IN ROCK. ANCHORS BONDED IN SOIL ARE PERMITTED WITH ANCHOR DEVICE IN SOIL.

3. THIS STANDARD APPLIED TO DESIGNS VERTICAL ELEMENTS TERMINATING IN ON OR INTO ROCK. DESIGNS VERTICAL TERMINATING IN ARE PERMITTED WITH ANCHOR DEVICE IN SOIL.

4. PROVIDE MENOR SHANKS IN EXCESS OF THE REQUIRED SHANKS AS A WEDGE, DIRECTIONAL PLATE, OR OTHER ACCORDING WEDGE 

MOMENT SLABS

9. ESTIMATE NUMBER OF STRANDS OR BAR DIAMETER REQUIRED TO RESIST THAT FAIL TEST REQUIREMENTS, REPLACE ANCHORS OR MODIFY THE STRUCTURE TO MEET ALL

7. PROVIDE CONCRETE CAP OVER ANCHOR PLACED BELOW FINAL GRADE.

16. PROVIDE ANCHOR TENDONS CONSISTING OF STEEL BARS CONFORMING TO AASHTO-M275, TYPE II.

7. PROVIDE CONCRETE CAP OVER ANCHOR PLACED BELOW FINAL GRADE.

16. PROVIDE ANCHOR TENDONS CONSISTING OF STEEL BARS CONFORMING TO AASHTO-M275, TYPE II.

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16. PROVIDE ANCHOR TENDONS CONSISTING OF STEEL BARS CONFORMING TO AASHTO-M275, TYPE II.

7. PROVIDE CONCRETE CAP OVER ANCHOR PLACED BELOW FINAL GRADE.

16. PROVIDE ANCHOR TENDONS CONSISTING OF STEEL BARS CONFORMING TO AASHTO-M275, TYPE II.
SHAFT SECTION

T O P  O F  W A L L

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CHIEF BRIDGE ENGINEER

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(SEE TYPICAL SECTION AT PRECAST LAGGING ON SHEET 4. - WALL AND LAGGING NOT SHOWN FOR CLARITY

SELECTED ANCHORHEAD (WEDGE PLATE).

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RECOMMENDED

RECOMMENDED

SHEET 3 OF 9

11. HOLE DIAMETER WILL BE DEPENDENT ON THE

AASHTO/AWS 1.5 SECTION 6.7.2

- WELD PER DESIGN, NDT WELDS AS PER

NOT REQUIRED AND SHEATHING EXTENDS INTO TRUMPET.

W/PRECAST LAGGING

DETAILS ARE SIMILAR WHERE PERMANENT CASING IS

10. DETAILS WITH PERMANENT STEEL CASING ARE SHOWN.

DOUBLE PILE DESIGN

CONTINUOUSLY WELDED PILES

TIE PLATED PILES

WITHOUT PERMANENT STEEL CASINGS.

8. FOR WEEP HOLE AND AGGREGATE FILTER DETAILS AND ALTERNATE

FLOWABLE FILL CONCRETE OR

CONCRETE OR

LEAN CEMENT

7. USE CAST-IN-PLACE LAGGING WHERE TOP OF WALL IS SLOPED.

6. PROVIDE NO. 57 COARSE AGGREGATE TO FILL ANY GAPS BETWEEN

SOLDIER PILES TO RETAIN EXCAVATION FACE AS

REQUIRED AND SHEATHING EXTENDS INTO TRUMPET.

5. PROVIDE A WATERPROOF SEAL BETWEEN TRUMPET AND 

STEEL CASING FOR ANCHOR DETAILS WITH PERMANENT 

STEEL CASINGS. PROVIDE A WATERPROOF SEAL BETWEEN 

TRUMPET AND PLASTIC SHEATH FOR ANCHOR DETAILS 

WITHOUT PERMANENT STEEL CASINGS.

4. FOR ANCHOR DETAILS SEE SHEET 8.

3. FOR ADJACENT ROADWAY AND DRAINAGE DETAILS SEE SHEET 9.

1. FOR PRECAST CONCRETE LAGGING DETAILS SEE SHEET 4.

DETAILS ON

TOP OF ROCK

SECTION A-A

SECTION A-A

WALL ELEVATION

TOP DOWN INSTALLATION

BOTTOM UP INSTALLATION

DOUBLE PILE DESIGN W/PRECAST LAGGING

TOP DOWN & BOTTOM UP INSTALLATION

NOTES:

1. FOR PRECAST CONCRETE LAGGING DETAILS SEE SHEET 4.

2. FOR CONCRETE ENHANCEMENT DETAILS SEE SHEET 9.

3. FOR ADJACENT ROADWAY AND DRAINAGE DETAILS SEE SHEET 9.

4. FOR ANCHOR DETAILS SEE SHEET 9.

5. PROVIDE ADDITIONAL SHAPING TO LARGER LAGGING. REMOVAL

SOLDIER FILES TO RETAIN EXCAVATION FACE AS

EXCAVATION PROCEEDS.

6. PROVIDE NO. 57 COARSE AGGREGATE TO FILL ANY GAPS BETWEEN

TIERED LAGGING AND EXCAVATION FACE.

7. USE CAST-IN-PLACE LAGGING WHERE TOP OF WALL IS SLOPED.

PRECAST LAGGING MAY BE USED FOR STEPPED TOP OF WALL.

8. FOR WEEP HOLE AND AGGREGATE FILTER DETAILS AND ALTERNATE

FLOWABLE FILL CONCRETE OR

CONCRETE OR

LEAN CEMENT

9. PROVIDE A WATERTIGHT SEAL BETWEEN TRUMPET AND 

STEEL CASING FOR ANCHOR DETAILS WITH PERMANENT 

STEEL CASINGS. PROVIDE A WATERPROOF SEAL BETWEEN 

TRUMPET AND PLASTIC SHEATH FOR ANCHOR DETAILS 

WITHOUT PERMANENT STEEL CASINGS.

10. DETAILS WITH PERMANENT STEEL CASINGS AND SHEATHING ARE SIMILAR WHERE PERMANENT CASING IS

NEED REQUIRED AND SHEATHING EXTENDS INTO TRUMPET.

11. HOLE DIAMETER WILL BE DEPENDENT ON THE

SELECTION ANCHORING MIGHT PLATE).
ANCHORED WALLS

CHIEF BRIDGE ENGINEER

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STANDARD SHEET 4 OF 9

CAST-IN-PLACE CAP BEAM
FOR USE OF CAP BEAM FOR REDUNDANCY (SEE NOTE 2)

ELEVATION

SECTIONS D-D & E-E

WEEP HOLE REINFORCEMENT DETAIL
- REINFORCE WEEP HOLES WITH #4 ON EACH FACE
- LOCATION OF STRUCTURE FOUNDATION DRAINS AND WEEP HOLES MUST BE SHOWN ON THE CONTRACT PLANS.

NOTES:
1. PROVIDE A V-GROOVE MID-DEPTH IF DESIRED FOR APPEARANCE.
2. IF CAP BEAM IS USED FOR REDUNDANCY, DESIGN FOR REDUNDANCY FORces; OTHERWISE DESIGN FOR APPLICABLE EARTH PRESSURES.
3. IF PRECAST CONCRETE LAGGING IS NOT FULLY DETAILED ON THE DESIGN DRAWINGS, THE CONTRACTOR IS REQUIRED TO SUBMIT SHOP DRAWINGS FOR ACCEPTANCE PRIOR TO FABRICATION.
4. PROVIDE TIMBER FOR TIMBER LAGGING IN ACCORDANCE WITH SECTION 1031.2(a) OF PUB. 408.
5. ALL TIMBER LAGGING IS TO REMAIN IN PLACE FOR THE FINAL CONSTRUCTION.
6. USE CAST-IN-PLACE LAGGING WHERE TOP OF WALL IS SLOPED. PRECAST LAGGING MAY BE USED FOR STEPPED TOP OF WALL.

LEGEND:
1P EACH SIDE 
FP FRONT FACE
BP BACK FACE

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NOTE 1: PROVIDE A V-GROOVE MID-DEPTH IF DESIRED FOR APPEARANCE.
NOTE 2: IF CAP BEAM IS USED FOR REDUNDANCY, DESIGN FOR REDUNDANCY FORCES; OTHERWISE DESIGN FOR APPLICABLE EARTH PRESSURES.
NOTE 3: ALL TIMBER LAGGING IS TO REMAIN IN PLACE FOR THE FINAL CONSTRUCTION.
NOTE 4: PROVIDE TIMBER FOR TIMBER LAGGING IN ACCORDANCE WITH SECTION 1031.2(a) OF PUB. 408.
NOTE 5: ALL TIMBER LAGGING IS TO REMAIN IN PLACE FOR THE FINAL CONSTRUCTION.
NOTE 6: USE CAST-IN-PLACE LAGGING WHERE TOP OF WALL IS SLOPED. PRECAST LAGGING MAY BE USED FOR STEPPED TOP OF WALL.

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ANCHORED WALLS
SINGLE PILE DESIGN W/CIP WALL

NOTES:
1. FOR WEEP HOLE AND AGGREGATE FILTER DETAILS
2. FOR ADJACENT HUYWAY AND DRAINAGE DETAILS SEE SHEET 9.
3. FOR ANCHOR DETAILS SEE SHEET 8.
4. PLACE CLASS 4, TYPE A GEOTEXTILE BLANKET BETWEEN STRUCTURE EXCAVATION AND SUBGRADE IN ACCORDANCE WITH RC-12M.
5. PROVIDE SURFACE PERPENDICULAR TO CENTERLINE ANCHOR SELECTED ANCHORHEAD (WEDGE PLATE).
6. CONCRETE EMBEDMENT MAY BE USED INSTEAD OF DRIVEN PILES BASED ON SITE CONDITIONS AND ECONOMY.
7. PROVIDE SURFACE PERPENDICULAR TO CENTERLINE ANCHOR SELECTED ANCHORHEAD (WEDGE PLATE).
8. HOLE DIAMETER WILL BE DEPENDENT ON THE SELECTED ANCHORHEAD (WEDGE PLATE).
9. PROVIDE A WATERTIGHT SEAL BETWEEN TRUMPET AND STEEL CASING FOR ANCHOR DESIGNS WITH PERMANENT STEEL CASING.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

STANDARD
ANCHORED WALLS
SINGLE PILE DESIGN W/CIP WALL

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APR. 29, 2016

RECOMMENDED APR. 29, 2016
RECOMMENDED APR. 19, 2016
SHEET 6 OF 9

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