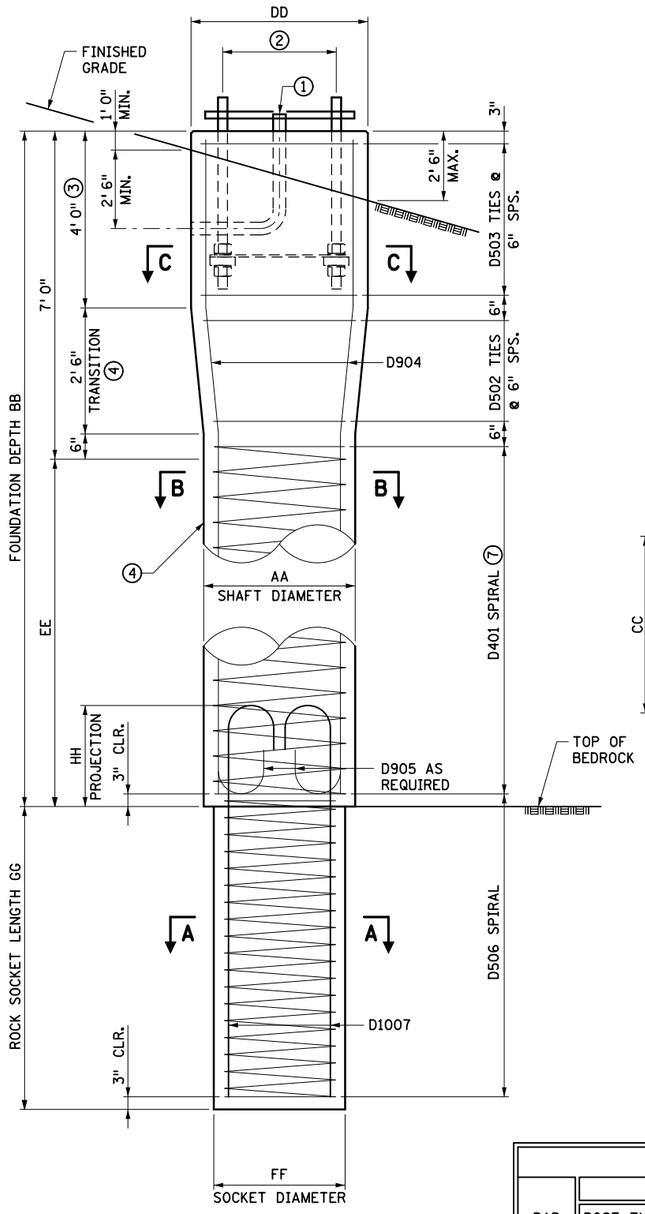
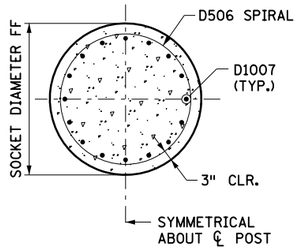
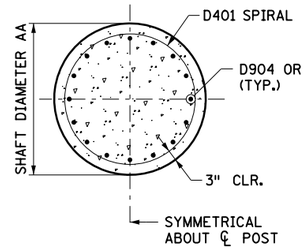



DRILLED SHAFT ELEVATION




ROCK SOCKET SECTION A-A

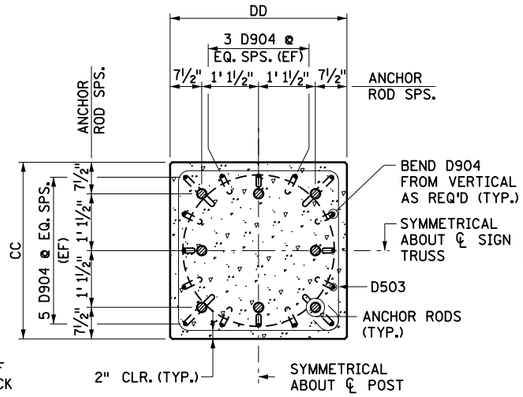
SECTION FOR POST TYPE 1-4 SHOWN
SECTION FOR POST TYPE 5-6 SIMILAR



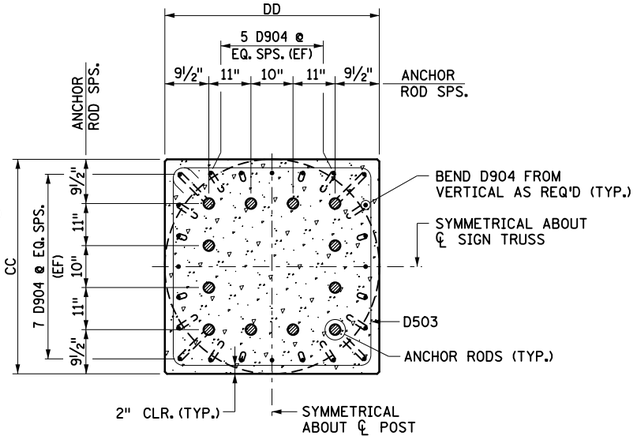

DRILLED SHAFT SECTION B-B

SECTION FOR POST TYPE 1-4 SHOWN
SECTION FOR POST TYPE 5-6 SIMILAR

| FOUNDATION DATA AND QUANTITIES | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| POST TYPE | DRILLED SHAFT DIMENSIONS | | | | | ROCK SOCKET DIMENSIONS | | | STRUCTURAL CONCRETE (3G52) | REINFORCEMENT BARS | ANCHORAGE ASSEMBLY |
| | AA | BB | CC | DD | EE | FF | GG | HH | CU YD | POUND | POUND |
| 1-4 | 3' 6" | 5'-7' | 3' 6" | 3' 6" | 0'-3' | 3' 0" | 6' 0" | 2' 0" | 1.57 + 0.45BB | 875 + 82BB | 799 |
| | | 7'-10' | | | 3'-8' | | 5' 6" | 3' 11" | 1.98 + 0.36BB | 890 + 75BB | |
| | | 10'-15' | | | 8'-13' | | 4' 6" | 3' 11" | 1.71 + 0.36BB | 795 + 77BB | |
| | | 15'-20' | | | 13'-18' | | 2' 6" | 3' 11" | 1.19 + 0.36BB | 610 + 78BB | |
| | | 20'-25' | | | --- | | 1' 6" | 3' 11" | 0.93 + 0.36BB | 515 + 80BB | |
| 5-6 | 4' 3" | 5'-7' | 4' 3" | 4' 3" | 0'-3' | 3' 6" | 7' 0" | 2' 0" | 2.49 + 0.67BB | 1390 + 115BB | 1392 |
| | | 7'-10' | | | 3'-8' | | 6' 6" | 3' 11" | 3.11 + 0.53BB | 1420 + 107BB | |
| | | 10'-15' | | | 8'-13' | | 6' 0" | 3' 11" | 2.93 + 0.53BB | 1355 + 110BB | |
| | | 15'-20' | | | 13'-18' | | 3' 6" | 3' 11" | 2.04 + 0.53BB | 1020 + 112BB | |
| | | 20'-25' | | | --- | | 2' 0" | 3' 11" | 1.50 + 0.53BB | 820 + 115BB | |




POST TYPE 1 THRU 4




POST TYPE 5 THRU 6

DRILLED SHAFT SECTION C-C

## GEOTECHNICAL PARAMETERS:

A SUBSURFACE INVESTIGATION IN THE FORM OF A STANDARD PENETRATION TEST (SPT) SHOULD BE PERFORMED WITHIN 30' HORIZONTALLY FROM EACH POST FOUNDATION. THE SOIL SPT BORING SHOULD EXTEND TO A MINIMUM DEPTH OF 35' IF BEDROCK IS ENCOUNTERED DURING THE DRILLING OPERATIONS, A MINIMUM OF 10' OF ROCK CORE SHOULD BE REMOVED. IN LIEU OF SPT BORINGS, CONE PENETRATION TEST SOUNDINGS MAY BE PUSHED TO A MINIMUM DEPTH OF 35' IF REFUSAL OR BEDROCK IS NOT ENCOUNTERED.

THE WATER TABLE SHALL BE 1.5' BELOW FINISHED GRADE OR LOWER.

THE FOUNDATION DIMENSIONS SHOWN ON THIS SHEET HAVE BEEN DESIGNED WITH THE FOLLOWING ASSUMED GEOTECHNICAL PROPERTIES:

DRILLED SHAFTS:

COHESIVE SOILS:

| | |
|---|---|
| MIN. SHEAR STRENGTH: | C = 1.0 ksf |
| UNIT WEIGHT OF SOIL: | γ = 125±10 pcf |

GRANULAR SOILS:

| | |
|---|---|
| MIN. ANGLE OF FRICTION: | Ø = 30° |
| UNIT WEIGHT OF SOIL: | γ = 125 pcf |
| MAX. COEFFICIENT OF FRICTION: | μ = 0.70 |

ROCK SOCKETS:

| | |
|---|---|
| MIN. UNIAXIAL COMPRESSIVE STRENGTH: | 700 psi |
| MIN. ROCK QUALITY DESIGNATION (RQD): | 50% |
| MIN. JOINT CONDITION RATING ($JCOND_{89}$): | 20 |

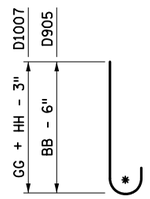
A SPECIAL FOUNDATION DESIGN IS REQUIRED IN CASES WHERE THE REQUIRED VALUES AND/OR CONDITIONS LISTED ABOVE ARE NOT MET.

| BILL OF REINFORCEMENT | | | | | | |
|---|---|---|---|---|---|---|
| BAR | POST TYPE 1-4 QTY. | POST TYPE 1-4 LENGTH | POST TYPE 5-6 QTY. | POST TYPE 5-6 LENGTH | SHAPE | LOCATION |
| ⑦ D401 | 1 | EE | 1 | EE | SPIRAL | DRILLED SHAFT SPIRAL |
| ⑤ D502 | 5 | 14' 1" | 5 | 17' 1" | ——— | TRANSITION TIES |
| D503 | 8 | 13' 7" | 8 | 16' 7" | ▭ | PEDESTAL TIES |
| ⑧ D904 | 16 | BB - 6" | 24 | BB - 6" | ——— | USE FOR BB ≤ 7' 0" |
| ⑧ D905 | 16 | BB + 9" | 24 | BB + 9" | ⊂——— | USE FOR BB = 7' 0" OR LESS |
| D506 | 1 | GG | 1 | GG | SPIRAL | ROCK SOCKET SPIRAL |
| ⑧ D1007 | 16 | GG + HH + 1' 2" | 24 | GG + HH + 1' 2" | ⊂——— | ROCK SOCKET VERTICALS |

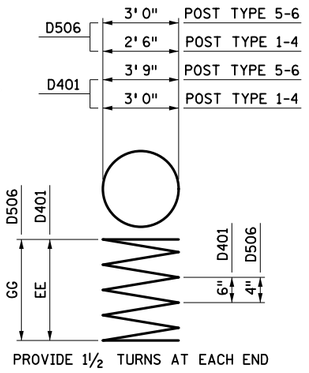
## BAR BENDING DIAGRAMS ⑥

BENT BAR DIMENSIONS GIVEN ARE OUT-TO-OUT. DETERMINE ACTUAL BAR LENGTHS BASED ON THE DETAIL DIMENSIONS SHOWN IN THE BAR BENDING DIAGRAMS.

* DENOTES STANDARD STIRRUP HOOK.




D905 & D1007




D401 & D506

## NOTES:

PERMANENT CASINGS ARE NOT ALLOWED FOR DRILLED SHAFT FOUNDATIONS.

USE PREFORMED JOINT FILLER BETWEEN THE FOUNDATION AND SIDEWALK OR OTHER CONCRETE AREAS.

COLD CONCRETE CONSTRUCTION JOINTS ARE NOT PERMITTED.

PROVIDE CONCRETE IN ACCORDANCE WITH SPEC. 2461, MIX 3G52.

(EF) DENOTES EACH FACE.

① 1½" AND 3" SERVICE CONDUITS. HOWEVER, IF DMS IS MOUNTED ON THE SPAN, FURNISH AND INSTALL CONDUIT PER PLAN.

② SEE STANDARD PLANS 5-297.763 FOR ANCHOR ROD ASSEMBLY DETAILS.

③ FORM A MINIMUM OF 6" BELOW THE GROUND SURFACE. BACKFILL AND TAMP THE EXCAVATIONS REQUIRED FOR FORMING IN ACCORDANCE WITH SPEC. 2106.3.F.2. BACKFILL MATERIAL AND COMPACTION TO BE EQUIVALENT TO THE SURROUNDING MATERIAL. PROVIDE 5' LENGTH IF BEDROCK IS ENCOUNTERED WITHIN THIS REGION.

④ EXCAVATE TO NEAT LINES AND PLACE CONCRETE AGAINST UNDISTURBED SOIL. ELIMINATE TRANSITION AND EXTEND SQUARE SECTION TO BOTTOM OF EXCAVATION IF BEDROCK IS ENCOUNTERED WITHIN THIS REGION.

⑤ BEND AS REQUIRED TO FORM A CLOSED LOOP.

⑥ SEE STANDARD PLANS 5-297.763 FOR REINFORCEMENT DETAILS NOT SHOWN.

⑦ NOT USED IF BEDROCK ENCOUNTERED LESS THAN 6' BELOW FINISHED GRADE.

⑧ USE FORMULA TO CALCULATE LENGTHS AND DIMENSIONS.

REVISION:

APPROVED: 01-15-2021
KEVIN WESTERN
STATE BRIDGE ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.773 | 1 OF 1

APPROVED: 01-15-2021
REVISED:
THOMAS STYRBICKI
STATE DESIGN ENGINEER

# STANDARD OVERHEAD SIGN STRUCTURES - DESIGN D

ROCK SOCKET FOUNDATION DETAILS

STATE PROJ. NO. (TH ) SHEET NO. OF SHEETS