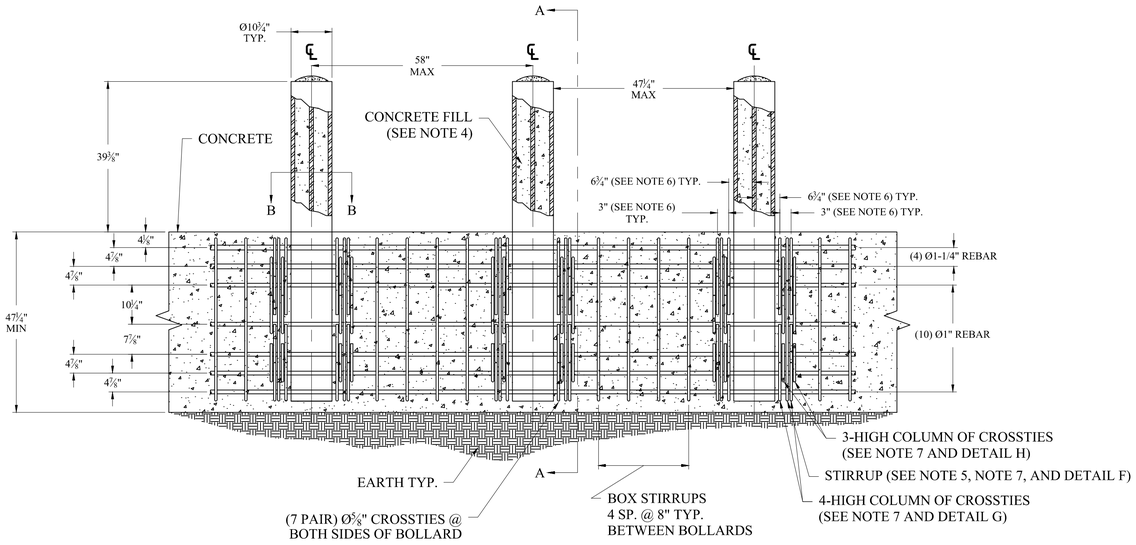
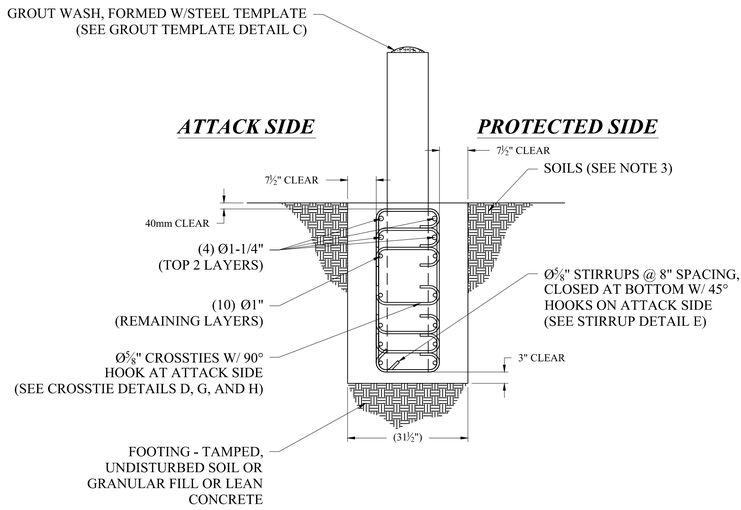
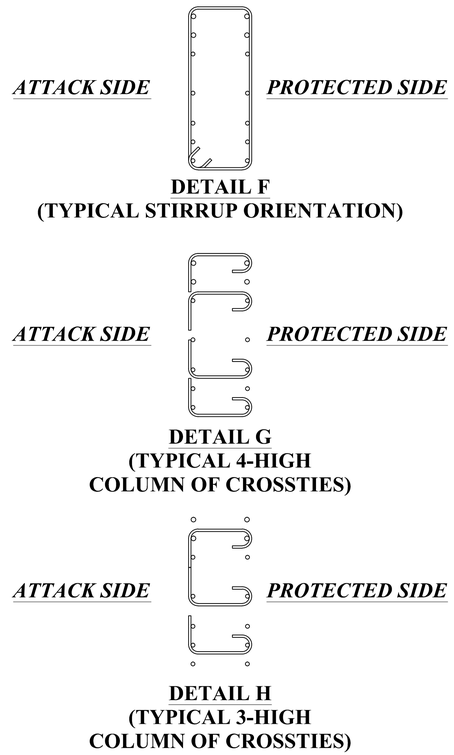
MATERIAL SPECIFICATIONS
REINFORCED STEEL: fy = 60,000 PSI (MIN)
CONCRETE: f'c = 4,000 PSI (MIN)



ATTACK SIDE VIEW



SECTION A-A



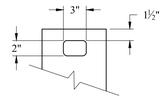
DETAIL F
(TYPICAL STIRRUP ORIENTATION)

DETAIL G
(TYPICAL 4-HIGH COLUMN OF CROSSTIES)

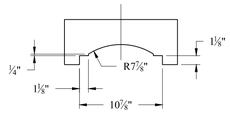
DETAIL H
(TYPICAL 3-HIGH COLUMN OF CROSSTIES)

NOTE: STEEL PLATE WITHIN STEEL PIPE MUST BE PARALLEL TO VEHICLE TRAVEL DIRECTION

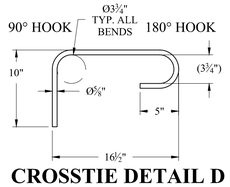
SECTION B-B



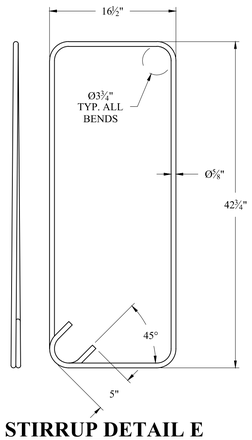
LIFT HOLE DETAIL



GROUT TEMPLATE DETAIL C



CROSSTIE DETAIL D



STIRRUP DETAIL E

NOTES:
1. REINFORCING STEEL - ASTM A-615M fy = 420 MPa (MIN) (60,000 PSI) EQUIVALENT INTERNATIONAL REINFORCING BARS ARE SHOWN IN PARENTHESIS. THE SUBSTITUTION OF NON ASTM BAR SIZES MUST BE APPROVED BY CONTRACTING OFFICER.
2. CONCRETE - Fc = 25 MPa @ 28 DAY (MIN) (4,000 PSI) IN ACCORDANCE WITH ASTM C31, C39, & C470.
3. SOILS - ALL BACKFILL SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF SD-STD-02.01, SECTION 7.2.2. IF THE LATERAL CAPACITY OF THE EXISTING SOILS IS NOT IN CONFORMANCE WITH THE REQUIREMENTS OF SD-STD-02.01, SECTION 7.2.2, THEN THE EXISTING SOIL SHALL BE REPLACED
4. STAGGERED, CLASS-A TENSION SPLICES SHALL BE ALLOWED FOR SPLICING OF HORIZONTAL BARS.
5. CROSSTIE: THE #5 CROSSTIE HAS A 90° AND 180° HOOK AT EACH END. (SEE DETAIL D). THE 90° HOOK SHOULD BE PLACED AT THE ATTACK SIDE OF THE FOOTING. PROVIDE 7-PAIR CROSSTIES COMBINING WITH THE FIRST ROW OF THE STIRRUP AT EACH SIDE OF THE BOLLARD. (SEE ELEVATION 1)
6. LOCATIONS OF 4-HIGH COLUMNS OF CROSSTIES.
7. EACH 4-HIGH COLUMN OF CROSSTIES HAS AN OFFSET 3-HIGH COLUMN OF CROSSTIES ADJACENT TO IT. A STIRRUP IS PLACED BETWEEN THESE (2) COMBINED DUAL COLUMS OF CROSSTIES.
8. SEE REBAR CHART

SOIL REQUIREMENTS:
TECH SOIL SHOULD BE LOW-COHESIVE, WELL GRADED CRUSHED OR BROKEN GRAVEL OF A PARTICLE SIZE DISTRIBUTION COMPARABLE TO TABLE 1. SOIL DEPTH SHOULD BE AT LEAST THE FOUNDATION DEPTH AND 1.5 TIMES THE EMBEDMENT DEPTH BEHIND THE INSTALLATION OR 0.6 METERS, WHICHEVER IS GREATER UP TO A MAXIMUM OF 2 METERS. SOIL SHOULD BE COMPACTED TO A DENSITY OF NOT LESS THAN 90 PERCENT MAXIMUM DRY DENSITY.

REBAR CHART		
A615 M-96a & A706M-96a METRIC SIZES	NOMINAL DIAMETER	A615 M-96a & A706M-96a INCH-POUND BAR SIZES
#16 #25 #32	Ø16mm / Ø⅝" Ø25mm / Ø1" Ø32mm / Ø1-¼"	#5 #8 #10

TABLE: RECOMMENDED SOIL FOUNDATION MATERIAL	
SIEVE SIZE	MASS PERCENT PASSING
50.0 mm (2 in.)	100
25.0 mm (1 in.)	75-95
9.5 mm (3/8 in.)	40-75
4.75 mm (No. 4)	30-60
2.00 mm (No. 10)	20-45
0.425 mm (No. 40)	15-30
0.075 mm (No. 200)	5-20

Unless Noted Otherwise
.x Decimal ± .040
.xx Decimal ± .030
.xxx Decimal ± .020
.xxxx Decimal ± .010
Angular ± 0.5°
DO NOT SCALE OFF DRAWING

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REVISION HISTORY

REV	ECN	AUTHOR	DATE	DESCRIPTION
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TITLE: FOUNDATION ASP DS22 K12 FIXED BOLLARD
DATE: 03/14/19
SHEET: 1 of 1
DRN BY: DM
REV: F
DRAWING NO: FOUNDATION ASP DS22