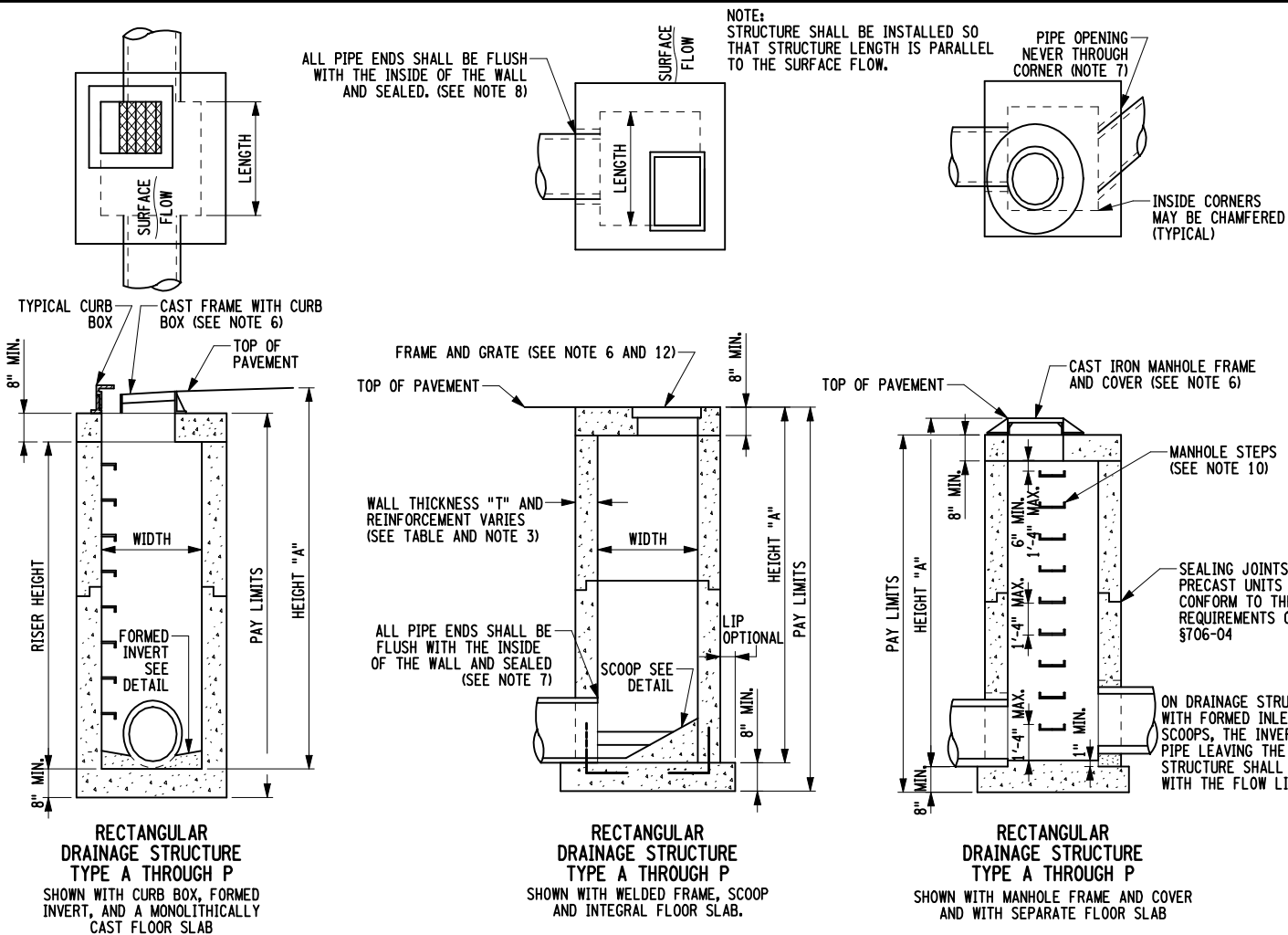


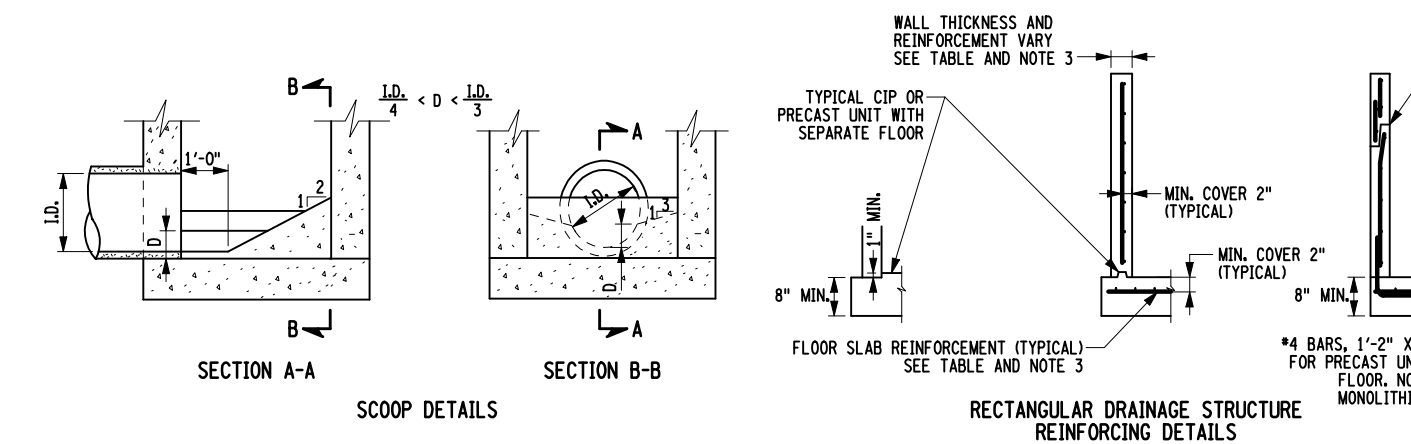
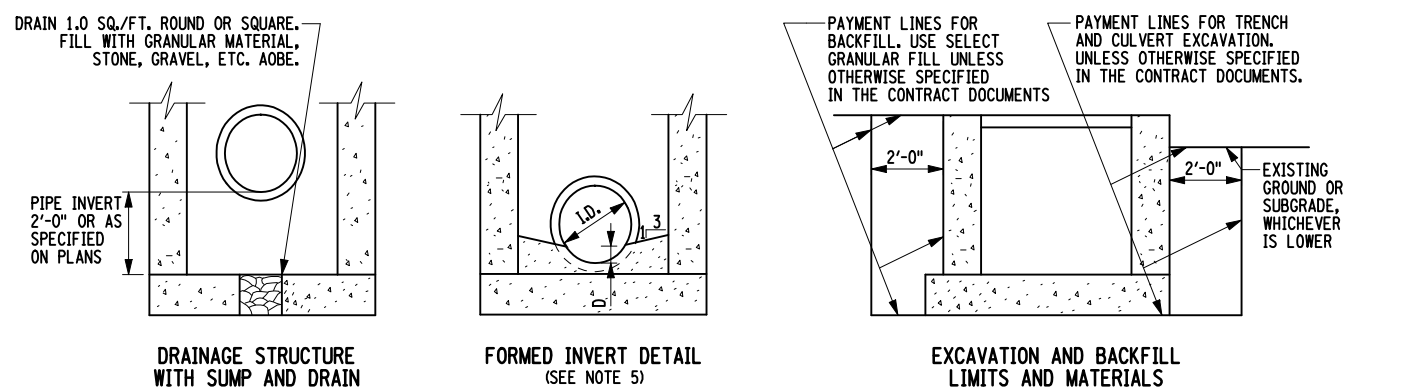
FILE NAME = 604-0201.dwg  
 DATE/TIME = 23-JUN-2005 10:12  
 USER = rlohse



GENERAL NOTES:

- DRAINAGE STRUCTURES SHALL BE CAST IN PLACE OR PRECAST UNITS. ROUND DRAINAGE STRUCTURES SHALL BE PRECAST ONLY. ALL CAST IN PLACE CONCRETE SHALL BE CLASS A. THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS FOR REVIEW AND APPROVAL OF ANY CHANGES TO THE STRUCTURES SHOWN ON THE STANDARD SHEETS OR CONTACT PLANS, OTHER THAN MINOR CHANGES APPROVED BY THE ENGINEER. USE OF FLAT SLAB TOPS ON ROUND PRECAST UNITS SHALL REQUIRE SUBMISSION OF WORKING DRAWINGS.
- SEE PLANS FOR ELEVATIONS, DRAINAGE STRUCTURE LOCATIONS, TYPE OF GRATE UTILIZED, LOCATION OF SCOOPS, FORMED INVERTS, SUMPS AND DRAINS.
- REINFORCEMENT FOR RECTANGULAR DRAINAGE UNITS (CAST IN PLACE OR PRECAST) BAR REINFORCEMENT INDICATED FOR RECTANGULAR TOP SLABS, RISERS AND BASES SHALL BE GRADE 60. WIRE FABRIC FOR CONCRETE REINFORCEMENT SHALL MEET THE REQUIREMENTS OF §709-02. RISER REINFORCEMENT SHALL BE PLACED SO IT WILL HAVE A MINIMUM COVER OF 2" BUT NO MORE THAN 4" FROM THE INSIDE FACE. THE REINFORCEMENT SHALL EXTEND COMPLETELY AROUND THE DRAINAGE STRUCTURE RISER AND SHALL BE LAPPED AND TIED. BASE REINFORCEMENT SHALL BE PLACED ABOVE THE MIDPOINT OF SLAB AND SHALL HAVE A MINIMUM CONCRETE COVER OF 2".
- ROUND ALTERNATIVE: WHEN SPECIFIED BY PAYMENT ITEM, THE CONTRACTOR MAY SUBSTITUTE ROUND, PRECAST DRAINAGE STRUCTURES IN PLACE OF RECTANGULAR STRUCTURES USING SIZES INDICATED IN THE "SELECTION TABLE FOR ALTERNATE ROUND DRAINAGE STRUCTURES" ON SHEET 4 OF 4. THE RISER, TOP SLAB, AND BOTTOM SLAB FOR THE ROUND ALTERNATE SHALL BE MANUFACTURED IN ACCORDANCE WITH THE PROVISIONS OF §706-04 OF THE STANDARD SPECIFICATIONS. WORKING DRAWINGS FOR THE ROUND ALTERNATES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL, UNLESS THE ROUND ALTERNATE PROPOSED HAS BEEN PREVIOUSLY APPROVED. FOR PREVIOUSLY APPROVED ROUND UNITS THE CONTRACTOR SHALL SUBMIT A COPY OF THE APPROVED DRAWINGS TO THE ENGINEER.
- FORMED INVERTS: SCOOP AND SUMPS SHALL BE PROVIDED AND INCLUDED IN THE PRICES BID FOR DRAINAGE STRUCTURES CALLED FOR IN THE CONTRACT DOCUMENTS. WHEN NON-CIRCULAR PIPES ARE USED, THE FORMED INVERT AND SUMP DETAILS SHALL BE MODIFIED TO FIT THE INVERTS.
- GRATES: CAST FRAMES MAY HAVE EITHER RECTICULINE OR PARALLEL BAR GRATES, AND WELDED FRAMES MAY HAVE EITHER RECTICULINE OR RECTANGULAR GRATES. IF NO GRATE IS SPECIFIED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR MAY FURNISH EITHER TYPE. GRATES SHALL BE INSTALLED SO THAT THE LENGTH OF THE GRATE IS PARALLEL TO THE SURFACE FLOW.
- WALL OPENINGS: RECTANGULAR DRAINAGE STRUCTURES SHOWN ON THESE STANDARD SHEETS SHOULD NEVER HAVE CORNER PIPE ENTRIES. IF PIPE ALIGNMENT WOULD REQUIRE A CORNER ENTRY, USE A ROUND DRAINAGE STRUCTURE OR USE A SPECIAL DRAINAGE STRUCTURE. ALL WALL OPENINGS SHALL BE FORMED COMPLETELY THROUGH THE WALL SECTION. CIRCULAR WALL OPENINGS SHALL BE FORMED FOR EACH CIRCULAR PIPE ENTERING PERPENDICULAR TO THE WALL. WHEN NON-CIRCULAR PIPES ARE SPECIFIED, OR ROUND PIPE ENTRIES ARE SKEWED, RECTANGULAR OPENINGS MAY BE USED. THE CLEARANCE BETWEEN THE OUTSIDE OF THE PIPE AND THE OPENING SHALL BE AT LEAST 2" BUT NO MORE THAN 3". THIS CLEARANCE SHALL BE MEASURED BETWEEN THE OUTSIDE OF THE PIPE AND NEAREST POINT ON THE RECTANGULAR OPENING. IF A CORNER HAS PIPE ENTRIES ON BOTH SIDES, AND THERE IS LESS THAN 2" BETWEEN EITHER OPENING AND THE CORNER, THEN THAT SECTION OF THE DRAINAGE STRUCTURE MUST HAVE 8" THICK WALLS.
- MONOLITHIC AND INTEGRAL BASES MAY HAVE A MAXIMUM VERTICAL DRAFT OF 1/2" ON ALL INTERIOR DIMENSIONS, TO FACILITATE FORM REMOVAL. FOR WALL OPENINGS THAT EXTEND THE FULL WIDTH OR LENGTH OF THE STRUCTURE, THE MINIMUM CLEARANCE BETWEEN THE OUTSIDE OF THE PIPE AND THE WALL OPENING SHALL BE 1/2".
- FINISHING PIPE ENTRIES: THE BELLS OF CONCRETE PIPE SHALL BE CUT OFF AT EVERY PIPE ENTRY WHERE THE BELL ENTERS A STRUCTURE. CONNECTIONS BETWEEN THE STRUCTURE AND PIPE SHALL BE MADE BY EITHER USING A RESILIENT CONNECTOR MEETING THE REQUIREMENTS OF ASTM C1478M OR BY COMPLETELY FILLING THE SPACE AROUND EACH PIPE WITH MORTAR FOR CONCRETE MASONRY, CONCRETE GROUTING MATERIAL, OR CONCRETE REPAIR MATERIAL. THE CONTRACTOR MAY USE ALTERNATE METHODS FOR SEALING THE SPACE AROUND THE PIPE, CONTINGENT UPON SATISFACTORY RESULTS BEING OBTAINED.

- TOP SLAB AND OR FRAME AND GRATE ADJUSTMENT A MINIMUM OF 1/2" OF BEDDING SHALL BE PLACED BETWEEN RISER AND PRECAST TOP SLABS. GRADE ADJUSTMENT FOR TOP SLABS AND/OR FRAME AND GRATE OF UP TO 2 1/2" SHALL BE MADE WITH BEDDING MATERIAL MEETING THE REQUIREMENTS OF MORTAR FOR CONCRETE MASONRY, CONCRETE GROUTING MATERIALS OR CONCRETE REPAIR MATERIAL. GRADE ADJUSTMENT FOR TOP SLABS AND/OR FRAME AND GRATES OF UP TO 6" SHALL BE MADE WITH COMBINATION OF PRECAST CONCRETE PAVERS AND BEDDING MATERIALS. GRADE ADJUSTMENT FOR TOP SLABS AND/OR FRAME AND GRATES OF UP TO 1'-0" SHALL BE MADE WITH CAST-IN-PLACE CONCRETE OR A COMBINATION OF PRECAST CONCRETE ADJUSTMENT ELEMENTS AND BEDDING MATERIALS. ALTERNATELY, GRADE ADJUSTMENTS FOR FRAMES AND GRATES OF UP TO 2" MAY BE MADE WITH RECYCLED RUBBER ELEMENTS OR UP TO 3" WITH HDPE ELEMENTS. RECYCLED RUBBER AND HDPE ELEMENTS SHALL BE PRODUCTS APPROVED BY THE MATERIALS BUREAU AND SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS. THE CONTRACTOR MAY USE ALTERNATE METHODS OF GRADE ADJUSTMENT, CONTINGENT UPON SATISFACTORY RESULTS BEING OBTAINED.
- MANHOLE STEPS SHALL BE REQUIRED IN ALL DRAINAGE STRUCTURES DEEPER THAN 4'-0".
- CORBELED OR CONICAL RISER SECTIONS AND FLAT SLAB REDUCERS. ROUND PRECAST DRAINAGE STRUCTURES OR MANHOLES (WHEN ALLOWED OR SPECIFIED) MAY BE FITTED WITH CONCENTRIC OR ECCENTRIC CONICAL SECTIONS TO REDUCE THEIR DIAMETERS. PROVIDED THE USE OF SUCH DEVICES IS COMPATIBLE WITH THE DRAINAGE SYSTEM DESIGN. THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS FOR REVIEW AND APPROVAL OF FLAT SLAB REDUCERS FOR ROUND OR RECTANGULAR STRUCTURES. A WALL SECTION WITH A HEIGHT LESS THAN 6" BETWEEN THE TOP OF THE HIGHEST PIPE ENTRY AND THE BOTTOM OF A CONICAL SECTION OR FLAT SLAB REDUCER SHALL NOT BE PERMITTED.
- WHEN PIPE LOCATIONS PROVIDE FOR LESS THAN 8" BETWEEN THE TOP OF THE UPPERMOST PIPE AND THE TOP OF THE RISER AND THE STRUCTURE MAY BE SUBJECTED TO HIGHWAY LOADS, CONTACT STRUCTURES DIVISION FOR A SPECIAL DESIGN.
- WHEN SITE CONDITIONS REQUIRE A DRAINAGE STRUCTURE TO BE INSTALLED TO A DEPTH GREATER THAN THAT SHOWN IN THE CONTRACT DOCUMENTS, AN INSTALLATION TOLERANCE OF 8" IS PERMITTED WITHOUT REQUIRING AN INCREASE IN WALL THICKNESS OR REINFORCING STEEL AS REQUIRED BY THE DRAINAGE STRUCTURE REINFORCEMENT TABLE.
- THE PAY ITEMS FOR DRAINAGE STRUCTURES SPECIFY THE STRUCTURE AND FRAME. DRAINAGE STRUCTURE ITEM NUMBERS: RECTANGULAR DRAINAGE STRUCTURE ITEM 604.30XXYY RECTANGULAR DRAINAGE STRUCTURE WITH ROUND OPTION ITEM 604.31XXYY RECTANGULAR DRAINAGE STRUCTURE WITH CONCRETE CAP ITEM 604.32XXYY SEE TABLES BELOW FOR XX AND YY CODES. EXAMPLE: 604.300706 - RECTANGULAR STRUCTURE TYPE G WITH TYPE 6 WELDED FRAME (SEE SHEET 4 OF 4 FOR ITEM NUMBERS FOR STRUCTURE TYPE Q, R, S, T, AND U)



| STRUCTURE TYPE | INSIDE WIDTH | INSIDE LENGTH | PAY ITEM XX CODE |
|----------------|--------------|---------------|------------------|
| A              | 3'-0"        | 3'-0"         | 01               |
| B              | 4'-0"        | 3'-0"         | 02               |
| C              | 5'-0"        | 3'-0"         | 03               |
| D              | 6'-8"        | 3'-0"         | 04               |
| E              | 3'-0"        | 4'-0"         | 05               |
| F              | 4'-0"        | 4'-0"         | 06               |
| G              | 5'-0"        | 4'-0"         | 07               |
| H              | 6'-8"        | 4'-0"         | 08               |
| I              | 3'-0"        | 5'-0"         | 09               |
| J              | 4'-0"        | 5'-0"         | 10               |
| K              | 5'-0"        | 5'-0"         | 11               |
| L              | 6'-8"        | 5'-0"         | 12               |
| M              | 3'-0"        | 6'-8"         | 13               |
| N              | 4'-0"        | 6'-8"         | 14               |
| O              | 5'-0"        | 6'-8"         | 15               |
| P              | 6'-8"        | 6'-8"         | 16               |

| FRAME TYPE         | PAY ITEM YY CODE |
|--------------------|------------------|
| WELDED 3           | 03               |
| WELDED 6           | 06               |
| WELDED 11          | 11               |
| WELDED 16          | 16               |
| WELDED 22          | 22               |
| MANHOLE 2'-8"      | 32               |
| CAST F1            | 71               |
| CAST F2            | 72               |
| CAST F3            | 73               |
| PARALLEL BAR 10PCB | 90               |
| PARALLEL BAR 11PCB | 91               |
| PARALLEL BAR 12PCB | 92               |

| DRAINAGE STRUCTURE REINFORCEMENT      |                |   |
|---------------------------------------|----------------|---|
| HEIGHT "A"                            | WALL THICKNESS | RISER REINFORCEMENT (SEE NOTE 3 AND 14)                   |
| UP TO 7'-0"                           | 6"             | 6"X6"- W6 X W6 OR #3 BARS AT 10" BOTH HORIZ. AND VERT.    |
|                                       | 8"             | UNREINFORCED  |
| 7'-0" TO 14'-0"                       | 8"             | 6"X6"- W8.5 X W8.5 OR #3 BARS AT 8" BOTH HORIZ. AND VERT. |
| 14'-0" TO 21'-0"                      | 8"             | 4"X4"- W8.5 X W8.5 OR #3 BARS AT 5" BOTH HORIZ. AND VERT. |
| FLOOR SLAB REINFORCEMENT (SEE NOTE 3) |                |   |
| UP TO 7'-0"                           |                | 6"X6"- W11 X W11 OR #3 BARS AT 6" IN BOTH DIRECTIONS      |
| 7'-0" TO 14'-0"                       |                | 4"X4"- W11 X W11 OR #3 BARS AT 4" IN BOTH DIRECTIONS      |
| 14'-0" TO 21'-0"                      |                | 4"X4"- W14 X W14 OR #3 BARS AT 3" IN BOTH DIRECTIONS      |

\*T MAY BE 6" OR 8" FOR THE FIRST 7'-0". EXCEPTIONS ARE SIZE S, T, AND U WITH CURB, RECTANGULAR STRUCTURES WITH ROUND MANHOLE OPENING, OR IF THERE IS LESS THAN 2" ON EITHER SIDE OF A CORNER. (NOTE 7) WHICH MUST HAVE 8" THICK WALLS.

STATE OF NEW YORK  
 DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY STANDARD SHEET

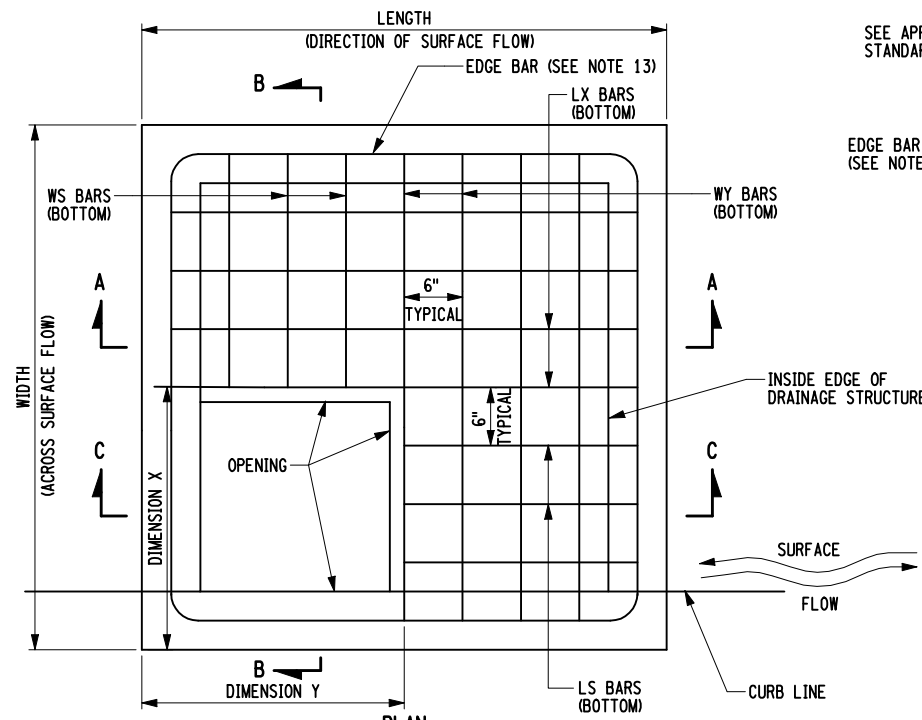
DRAINAGE STRUCTURE DETAILS  
 (SHEET 1 OF 4)

APPROVED SEPTEMBER 19, 2008 ISSUED UNDER EB 08-036

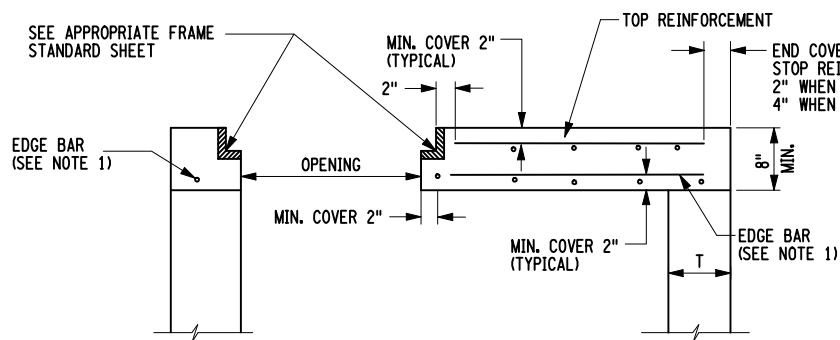
/S/ DANIEL D'ANGELO, P.E.  
 DEPUTY CHIEF ENGINEER (DESIGN)

604-02

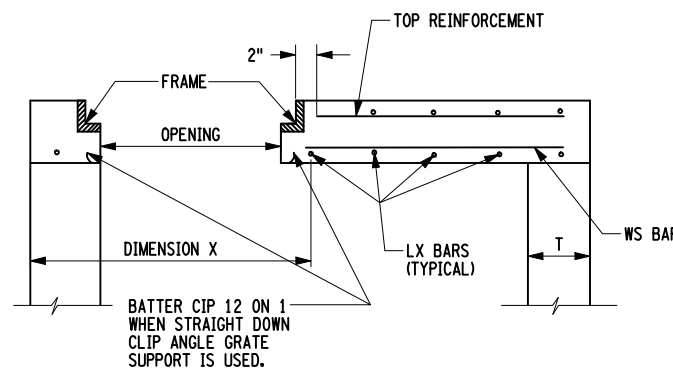
EFFECTIVE DATE: 01/08/09



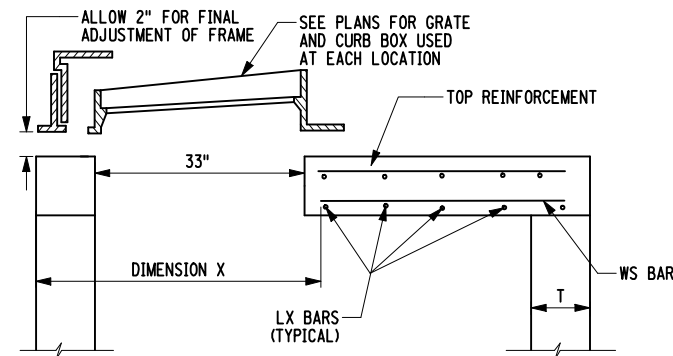
PLAN  
TOP SLAB BAR LAYOUT  
FOR WELDED, PARALLEL BAR  
AND CAST FRAMES  
SEE SHEET 3 OF 4 FOR BAR LIST AND TOP SLAB DIMENSIONS



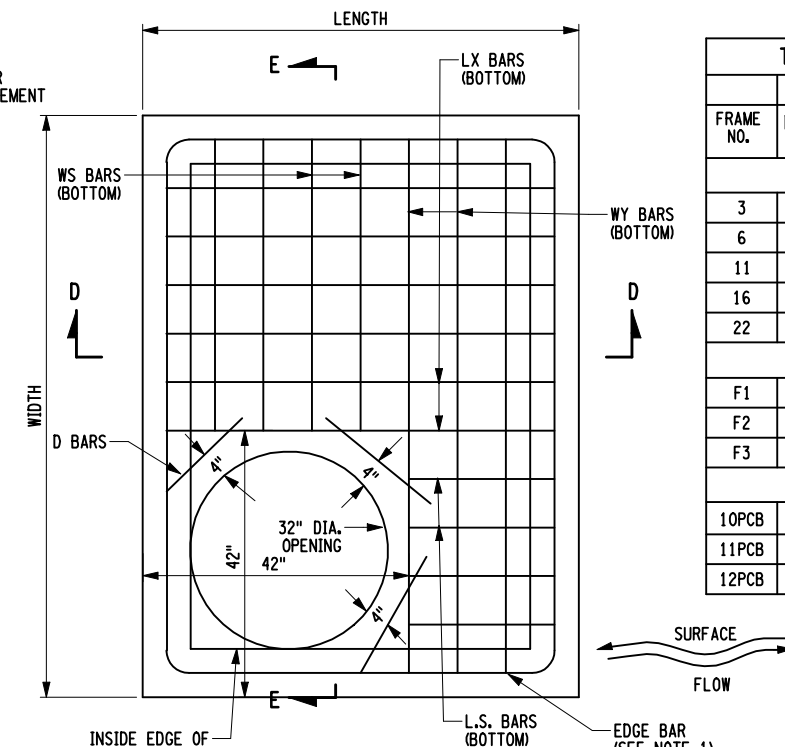
SECTION B-B  
TYPICAL FOR ALL TYPES OF FRAMES



SECTION B-B  
WELDED FRAME

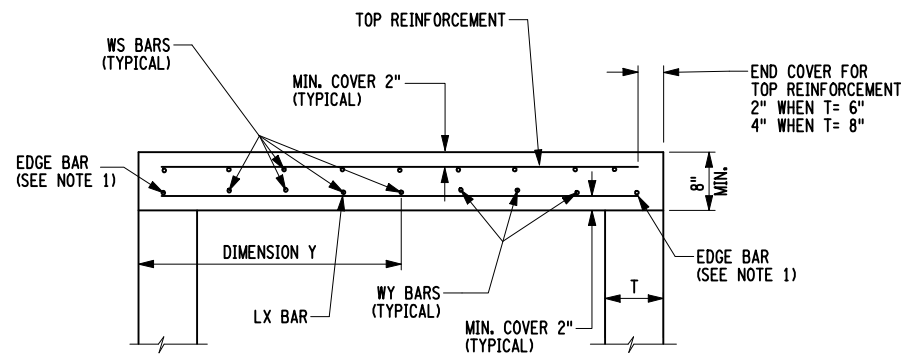


SECTION B-B  
CAST FRAME

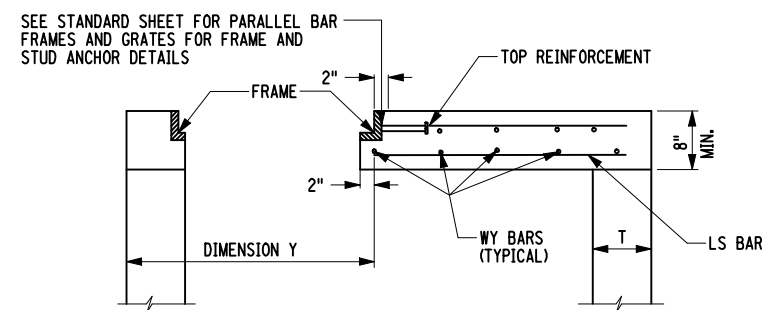


PLAN  
TOP SLAB BAR LAYOUT  
FOR ROUND MANHOLE COVER  
SEE SHEET 3 OF 4 FOR BAR LIST AND TOP SLAB DIMENSIONS.

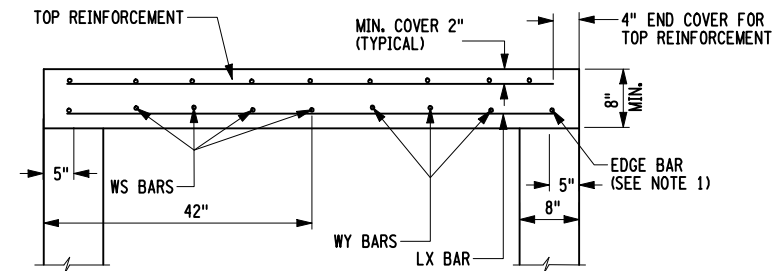
| TABLE OF "X" AND "Y" DIMENSIONS |                |             |                |             |
|---------------------------------|----------------|-------------|----------------|-------------|
| FRAME NO.                       | 6" THICK WALLS |             | 8" THICK WALLS |             |
|                                 | DIMENSION X    | DIMENSION Y | DIMENSION X    | DIMENSION Y |
| WELDED FRAMES                   |                |             |                |             |
| 3                               | 2'-3"          | 3'-4 1/2"   | 2'-5"          | 3'-6 1/2"   |
| 6                               | 2'-5 1/2"      | 2'-6 1/2"   | 2'-7 1/2"      | 2'-8 1/2"   |
| 11                              | 2'-8"          | 3'-4 1/2"   | 2'-10"         | 3'-6 1/2"   |
| 16                              | 2'-10 1/2"     | 4'-2 1/2"   | 3'-0 1/2"      | 4'-4 1/2"   |
| 22                              | 3'-6"          | 3'-9 1/2"   | 3'-8"          | 3'-11 1/2"  |
| CAST IRON FRAMES                |                |             |                |             |
| F1                              | 3'-5"          | 3'-0"       | 3'-7"          | 3'-2"       |
| F2                              | 3'-5"          | 3'-10"      | 3'-7"          | 4'-0"       |
| F3                              | 3'-5"          | 4'-8"       | 3'-7"          | 4'-10"      |
| PARALLEL BAR FRAMES             |                |             |                |             |
| 10PCB                           | 2'-8"          | 3'-4 1/2"   | 2'-10"         | 3'-6 1/2"   |
| 11PCB                           | 2'-10 1/2"     | 4'-2 1/2"   | 3'-0 1/2"      | 4'-4 1/2"   |
| 12PCB                           | 3'-6"          | 3'-9 1/2"   | 3'-8"          | 3'-11 1/2"  |



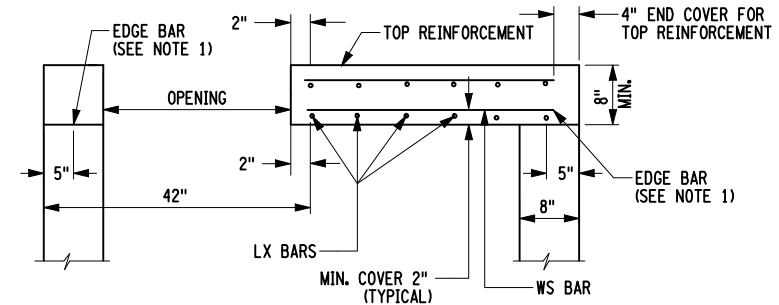
SECTION A-A  
TYPICAL FOR ALL TYPES OF FRAME



SECTION C-C  
PARALLEL BAR FRAME



SECTION D-D



SECTION E-E

| OUTSIDE<br>FRAME DIMENSIONS |                |                |
|-----------------------------|----------------|----------------|
| FRAME NO.                   | WIDTH          | LENGTH         |
| 3                           | 1'-11 15/16"   | 3'-1 1/2"      |
| 6                           | 2'-2 7/16"     | 2'-3 1/2"      |
| 11                          | 2'-4 15/16"    | 3'-1 1/2"      |
| 16                          | 2'-7 7/16"     | 3'-11 1/2"     |
| 22                          | 3'-2 15/16"    | 3'-6 1/2"      |
| 10PCB                       | 2'-0 7/8"      | 3'-2 1/2"      |
| 11PCB                       | 2'-3 3/8"      | 4'-0 1/2"      |
| 12PCB                       | 2'-10 7/8"     | 3'-7 1/2"      |
| F1                          | 3'-3 1/4" MIN. | 2'-11" MIN.    |
| F2                          | 3'-3 1/4" MIN. | 3'-9 1/4" MIN. |
| F3                          | 3'-3 1/4" MIN. | 4'-7 1/4" MIN. |

NOTES:

- THE E BARS (EDGE BARS) ARE PLACED 3" FROM THE OUTSIDE EDGE FOR TOP SLABS ON 6" WALLS, AND 5" FROM THE OUTSIDE EDGE FOR 8" WALLS.
- THE LX BARS ARE LOCATED USING THE X DIMENSION AND THE WY ARE LOCATED USING THE Y DIMENSIONS. ALL W AND L BARS SHALL BE EVENLY SPACED AT APPROXIMATELY 6" SO THAT THE DISTANCE BETWEEN THE LAST W OR L BAR AND THE ADJACENT EDGE BAR SHALL NOT EXCEED 10".
- TOP SLABS FOR TYPE A, B, C, D, E, F, G, I, J, K AND M DRAINAGE STRUCTURES ARE REINFORCED WITH #6 BARS ON THE BOTTOM, AND 6X6, W4 X W4 FABRIC ON THE TOP.
- TOP SLABS FOR TYPE H, L, N, O, AND P DRAINAGE STRUCTURES ARE REINFORCED WITH #7 BARS AND 6X6, W5 X W5 FABRIC. THE CONTRACTOR HAS THE OPTION OF USING #6 BARS AND A BAR SPACING OF 5" WHEN THIS OPTION IS USED. THE MAXIMUM DISTANCE BETWEEN THE LAST W OR L BAR AND THE EDGE BAR SHALL NOT EXCEED 8 3/4".

EFFECTIVE DATE: 01/08/09



STATE OF NEW YORK  
DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY STANDARD SHEET

DRAINAGE STRUCTURE DETAILS  
(SHEET 2 OF 4)

APPROVED SEPTEMBER 19, 2008

/S/ DANIEL D'ANGELO, P.E.  
DEPUTY CHIEF ENGINEER  
(DESIGN)

ISSUED UNDER EB 08-036

604-02

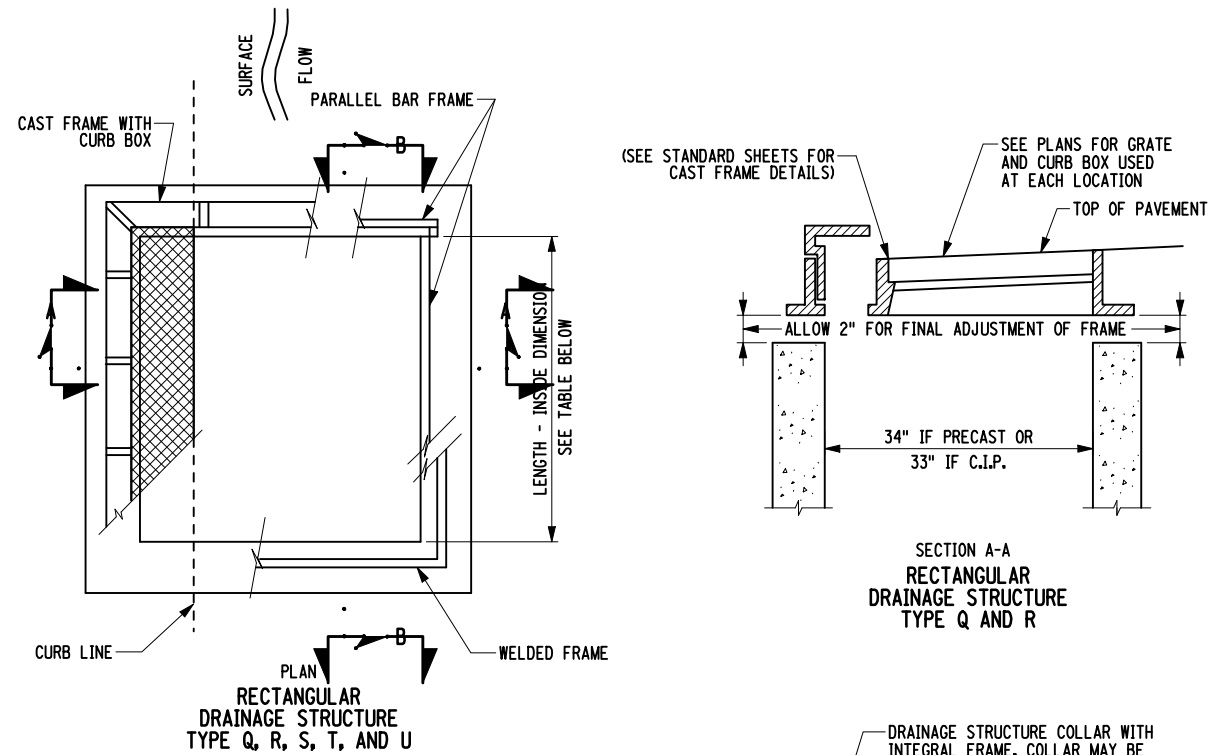
| BOTTOM REINFORCEMENT       |           |             |              |             |              |             |              |             |              |             |              |              |
|----------------------------|-----------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|--------------|
| TOP SLAB WITH WELDED FRAME |           |             |              |             |              |             |              |             |              |             |              |              |
| STR. TYPE                  | FRAME NO. | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | DESIG-NATION |
| A                          | 3         |             |              | 5           | 6LX1         | 5           | 6WS2         | 1           | 6WY1         | 4           | 6E1          |              |
| B                          | 3         |             |              | 5           | 6LX1         | 5           | 6WS11        | 1           | 6WY3         | 2           | 6E3          | 2 6E1        |
| B                          | 11        |             |              | 4           | 6LX1         | 5           | 6WS7         | 1           | 6WY3         | 2           | 6E3          | 2 6E1        |
| C                          | 3         |             |              | 7           | 6LX1         | 5           | 6WS19        | 1           | 6WY5         | 2           | 6E5          | 2 6E1        |
| C                          | 11        |             |              | 6           | 6LX1         | 5           | 6WS15        | 1           | 6WY5         | 2           | 6E5          | 2 6E1        |
| D                          | 3         |             |              | 10          | 6LX1         | 5           | 6WS27        | 1           | 6WY7         | 2           | 6E7          | 2 6E1        |
| D                          | 11        |             |              | 9           | 6LX1         | 5           | 6WS23        | 1           | 6WY7         | 2           | 6E7          | 2 6E1        |
| E                          | 3         | 3           | 6LS4         | 3           | 6LX3         | 5           | 6WS2         | 3           | 6WY1         | 2           | 6E1          | 2 6E3        |
| F                          | 3         | 3           | 6LS4         | 5           | 6LX3         | 5           | 6WS11        | 3           | 6WY3         | 4           | 6E3          |              |
| F                          | 6         | 3           | 6LS12        | 4           | 6LX3         | 3           | 6WS9         | 4           | 6WY3         | 4           | 6E3          |              |
| F                          | 11        | 3           | 6LS4         | 4           | 6LX3         | 5           | 6WS7         | 3           | 6WY3         | 4           | 6E3          |              |
| G                          | 3         | 3           | 6LS4         | 7           | 6LX3         | 5           | 6WS19        | 3           | 6WY5         | 2           | 6E5          | 2 6E3        |
| G                          | 6         | 3           | 6LS2         | 6           | 6LX3         | 3           | 6WS17        | 4           | 6WY5         | 2           | 6E5          | 2 6E3        |
| G                          | 11        | 3           | 6LS4         | 6           | 6LX3         | 5           | 6WS15        | 3           | 6WY5         | 2           | 6E5          | 2 6E3        |
| H                          | 3         | 3           | 7LS4         | 10          | 7LX3         | 5           | 7WS27        | 3           | 7WY7         | 2           | 7E7          | 2 7E3        |
| H                          | 6         | 3           | 7LS12        | 10          | 7LX3         | 3           | 7WS25        | 4           | 7WY7         | 2           | 7E7          | 2 7E3        |
| H                          | 11        | 3           | 7LS4         | 9           | 7LX3         | 5           | 7WS23        | 3           | 7WY7         | 2           | 7E7          | 2 7E3        |
| I                          | 3         | 3           | 6LS14        | 3           | 6LX5         | 5           | 6WS2         | 5           | 6WY1         | 2           | 6E1          | 2 6E5        |
| J                          | 3         | 3           | 6LS14        | 5           | 6LX5         | 5           | 6WS11        | 5           | 6WY3         | 2           | 6E3          | 2 6E5        |
| J                          | 6         | 3           | 6LS19        | 4           | 6LX5         | 3           | 6WS9         | 6           | 6WY3         | 2           | 6E3          | 2 6E5        |
| J                          | 11        | 3           | 6LS14        | 4           | 6LX5         | 5           | 6WS7         | 5           | 6WY3         | 2           | 6E3          | 2 6E5        |
| J                          | 16        | 4           | 6LS5         | 4           | 6LX5         | 7           | 6WS5         | 3           | 6WY3         | 2           | 6E3          | 2 6E5        |
| K                          | 3         | 3           | 6LS14        | 7           | 6LX5         | 5           | 6WS19        | 5           | 6WY5         | 4           | 6E5          |              |
| K                          | 6         | 3           | 6LS19        | 6           | 6LX5         | 3           | 6WS17        | 6           | 6WY5         | 4           | 6E5          |              |
| K                          | 11        | 3           | 6LS14        | 6           | 6LX5         | 5           | 6WS15        | 5           | 6WY5         | 4           | 6E5          |              |
| K                          | 16        | 4           | 6LS5         | 6           | 6LX5         | 7           | 6WS13        | 3           | 6WY5         | 4           | 6E5          |              |
| K                          | 22        | 5           | 6LS9         | 4           | 6LX5         | 6           | 6WS8         | 4           | 6WY5         | 4           | 6E5          |              |
| L                          | 3         | 3           | 7LS14        | 10          | 7LX5         | 5           | 7WS27        | 5           | 7WY7         | 2           | 7E7          | 2 7E5        |
| L                          | 6         | 3           | 7LS19        | 10          | 7LX5         | 3           | 7WS25        | 6           | 7WY7         | 2           | 7E7          | 2 7E5        |
| L                          | 11        | 3           | 7LS14        | 9           | 7LX5         | 5           | 7WS23        | 5           | 7WY7         | 2           | 7E7          | 2 7E5        |
| L                          | 16        | 4           | 7LS5         | 9           | 7LX5         | 7           | 7WS21        | 3           | 7WY7         | 2           | 7E7          | 2 7E5        |
| L                          | 22        | 5           | 7LS9         | 8           | 7LX5         | 6           | 7WS19        | 4           | 7WY7         | 2           | 7E7          | 2 7E5        |
| M                          | 3         | 3           | 6LS25        | 3           | 6LX7         | 5           | 6WS2         | 8           | 6WY1         | 2           | 6E1          | 2 6E7        |
| N                          | 3         | 3           | 7LS25        | 5           | 7LX7         | 5           | 7WS8         | 8           | 7WY3         | 2           | 7E3          | 2 7E7        |
| N                          | 6         | 3           | 7LS30        | 4           | 7LX7         | 3           | 7WS6         | 10          | 7WY3         | 2           | 7E3          | 2 7E7        |
| N                          | 11        | 3           | 7LS25        | 3           | 7LX7         | 5           | 7WS4         | 8           | 7WY3         | 2           | 7E3          | 2 7E7        |
| N                          | 16        | 4           | 7LS19        | 4           | 7LX7         | 7           | 7WS3         | 6           | 7WY3         | 2           | 7E3          | 2 7E7        |
| O                          | 3         | 3           | 7LS25        | 7           | 7LX7         | 5           | 7WS16        | 8           | 7WY5         | 2           | 7E5          | 2 7E7        |
| O                          | 6         | 3           | 7LS30        | 7           | 7LX7         | 3           | 7WS14        | 10          | 7WY5         | 2           | 7E5          | 2 7E7        |
| O                          | 11        | 3           | 7LS25        | 6           | 7LX7         | 5           | 7WS12        | 8           | 7WY5         | 2           | 7E5          | 2 7E7        |
| O                          | 16        | 4           | 7LS19        | 6           | 7LX7         | 7           | 7WS10        | 6           | 7WY5         | 2           | 7E5          | 2 7E7        |
| O                          | 22        | 5           | 7LS22        | 4           | 7LX7         | 6           | 7WS5         | 7           | 7WY5         | 2           | 7E5          | 2 7E7        |
| P                          | 3         | 3           | 7LS25        | 10          | 7LX7         | 5           | 7WS27        | 8           | 7WY7         | 4           | 7E7          |              |
| P                          | 6         | 3           | 7LS30        | 10          | 7LX7         | 3           | 7WS25        | 10          | 7WY7         | 4           | 7E7          |              |
| P                          | 11        | 3           | 7LS25        | 9           | 7LX7         | 5           | 7WS23        | 8           | 7WY7         | 4           | 7E7          |              |
| P                          | 16        | 4           | 7LS19        | 9           | 7LX7         | 7           | 7WS21        | 6           | 7WY7         | 4           | 7E7          |              |
| P                          | 22        | 5           | 7LS22        | 8           | 7LX7         | 6           | 7WS19        | 7           | 7WY7         | 4           | 7E7          |              |

| BOTTOM REINFORCEMENT             |           |             |              |             |              |             |              |             |              |             |              |              |
|----------------------------------|-----------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|--------------|
| TOP SLAB WITH PARALLEL BAR FRAME |           |             |              |             |              |             |              |             |              |             |              |              |
| STR. TYPE                        | FRAME NO. | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | DESIG-NATION |
| F                                | 11PCB     |             |              | 4           | 6LX3         | 7           | 6WS5         | 1           | 6WY3         | 4           | 6E3          |              |
| G                                | 11PCB     |             |              | 6           | 6LX3         | 7           | 6WS13        | 1           | 6WY5         | 2           | 6E5          | 2 6E3        |
| H                                | 11PCB     |             |              | 9           | 7LX3         | 7           | 7WS21        | 1           | 7WY7         | 2           | 7E7          | 2 7E3        |
| I                                | 12PCB     | 6           | 6LS9         | 1           | 6LX5         |             |              | 4           | 6WY1         | 2           | 6E1          | 2 6E5        |
| J                                | 10PCB     | 4           | 6LS14        | 4           | 6LX5         | 5           | 6WS7         | 5           | 6WY3         | 2           | 6E3          | 2 6E5        |
| K                                | 10PCB     | 4           | 6LS14        | 6           | 6LX5         | 5           | 6WS15        | 5           | 6WY5         | 4           | 6E5          |              |
| K                                | 12PCB     | 6           | 6LS9         | 5           | 6LX5         | 6           | 6WS8         | 4           | 6WY5         | 4           | 6E5          |              |
| L                                | 10PCB     | 4           | 7LS14        | 10          | 7LX5         | 5           | 7WS23        | 5           | 7WY7         | 2           | 7E7          | 2 7E5        |
| L                                | 12PCB     | 6           | 7LS9         | 8           | 7LX5         | 6           | 7WS19        | 4           | 7WY7         | 2           | 7E7          | 2 7E5        |
| M                                | 12PCB     | 6           | 7LS22        | 1           | 7LX7         |             |              | 7           | 6WY1         | 2           | 6E1          | 2 7E7        |
| N                                | 10PCB     | 4           | 7LS25        | 4           | 7LX7         | 5           | 7WS4         | 8           | 7WY3         | 2           | 7E3          | 2 7E7        |
| N                                | 11PCB     | 4           | 7LS19        | 4           | 7LX7         | 7           | 7WS3         | 6           | 7WY3         | 2           | 7E3          | 2 7E7        |
| O                                | 10PCB     | 4           | 7LS25        | 6           | 7LX7         | 5           | 7WS12        | 8           | 7WY5         | 2           | 7E5          | 2 7E7        |
| O                                | 11PCB     | 4           | 7LS19        | 6           | 7LX7         | 7           | 7WS10        | 6           | 7WY5         | 2           | 7E5          | 2 7E7        |
| O                                | 12PCB     | 6           | 7LS22        | 5           | 7LX7         | 6           | 7WS5         | 7           | 7WY5         | 2           | 7E5          | 2 7E7        |
| P                                | 10PCB     | 4           | 7LS25        | 10          | 7LX7         | 5           | 7WS23        | 8           | 7WY7         | 4           | 7E7          |              |
| P                                | 11PCB     | 5           | 7LS19        | 9           | 7LX7         | 7           | 7WS21        | 6           | 7WY7         | 4           | 7E7          |              |
| P                                | 12PCB     | 4           | 7LS22        | 8           | 7LX7         | 6           | 7WS19        | 7           | 7WY7         | 4           | 7E7          |              |

| BAR LIST    |           |      |              |             |        |      |             |  |  |  |  |
|-------------|-----------|------|--------------|-------------|--------|------|-------------|--|--|--|--|
| DESIGNATION | LENGTH    | SIZE | DESCRIPTION  | DESIGNATION | LENGTH | SIZE | DESCRIPTION |  |  |  |  |
| 6LS4        | 1'-6"     | #6   | SHORT L BAR  | 7LS4        | 1'-6"  | #7   | SHORT L BAR |  |  |  |  |
| 6LS5        | 1'-7"     | #6   | SHORT L BAR  | 7LS5        | 1'-7"  | #7   | SHORT L BAR |  |  |  |  |
| 6LS7        | 1'-9"     | #6   | SHORT L BAR  | 7LS7        | 1'-9"  | #7   | SHORT L BAR |  |  |  |  |
| 6LS8        | 1'-11"    | #6   | SHORT L BAR  | 7LS8        | 1'-11" | #7   | SHORT L BAR |  |  |  |  |
| 6LS9        | 2'-0"     | #6   | SHORT L BAR  | 7LS9        | 2'-0"  | #7   | SHORT L BAR |  |  |  |  |
| 6LS12       | 2'-3"     | #6   | SHORT L BAR  | 7LS12       | 2'-3"  | #7   | SHORT L BAR |  |  |  |  |
| 6LS14       | 2'-5"     | #6   | SHORT L BAR  | 7LS14       | 2'-5"  | #7   | SHORT L BAR |  |  |  |  |
| 6LS16       | 2'-9"     | #6   | SHORT L BAR  | 7LS16       | 2'-9"  | #7   | SHORT L BAR |  |  |  |  |
| 6LS19       | 3'-3"     | #6   | SHORT L BAR  | 7LS19       | 3'-3"  | #7   | SHORT L BAR |  |  |  |  |
| 6LS25       | 4'-0"     | #6   | SHORT L BAR  | 7LS21       | 3'-7"  | #7   | SHORT L BAR |  |  |  |  |
| 6LX1        | 3'-6"     | #6   | LONG L BAR   | 7LS22       | 3'-8"  | #7   | SHORT L BAR |  |  |  |  |
| 6LX3        | 4'-6"     | #6   | LONG L BAR   | 7LS25       | 4'-1"  | #7   | SHORT L BAR |  |  |  |  |
| 6LX5        | 5'-6"     | #6   | LONG L BAR   | 7LS27       | 4'-5"  | #7   | SHORT L BAR |  |  |  |  |
| 6LX7        | 7'-2"     | #6   | LONG L BAR   | 7LS30       | 4'-11" | #7   | SHORT L BAR |  |  |  |  |
| 6WS1        | 1'-4"     | #6   | SHORT W BAR  | 7LX3        | 4'-6"  | #7   | LONG L BAR  |  |  |  |  |
| 6WS2        | 1'-6"     | #6   | SHORT W BAR  | 7LX5        | 6'-5"  | #7   | LONG L BAR  |  |  |  |  |
| 6WS5        | 1'-11"    | #6   | SHORT W BAR  | 7LX7        | 7'-2"  | #7   | LONG L BAR  |  |  |  |  |
| 6WS7        | 2'-2"     | #6   | SHORT W BAR  | 7WS2        | 1'-5"  | #7   | SHORT W BAR |  |  |  |  |
| 6WS8        | 2'-3"     | #6   | SHORT W BAR  | 7WS3        | 1'-11" | #7   | SHORT W BAR |  |  |  |  |
| 6WS9        | 2'-4"     | #6   | SHORT W BAR  | 7WS4        | 2'-1"  | #7   | SHORT W BAR |  |  |  |  |
| 6WS10       | 2'-5"     | #6   | SHORT W BAR  | 7WS5        | 2'-3"  | #7   | SHORT W BAR |  |  |  |  |
| 6WS11       | 2'-7"     | #6   | SHORT W BAR  | 7WS6        | 2'-4"  | #7   | SHORT W BAR |  |  |  |  |
| 6WS13       | 2'-11"    | #6   | SHORT W BAR  | 7WS7        | 2'-5"  | #7   | SHORT W BAR |  |  |  |  |
| 6WS15       | 3'-2"     | #6   | SHORT W BAR  | 7WS8        | 2'-7"  | #7   | SHORT W BAR |  |  |  |  |
| 6WS17       | 3'-4"     | #6   | SHORT W BAR  | 7WS10       | 2'-11" | #7   | SHORT W BAR |  |  |  |  |
| 6WS19       | 3'-7"     | #6   | SHORT W BAR  | 7WS12       | 3'-2"  | #7   | SHORT W BAR |  |  |  |  |
| 6WS21       | 4'-1"     | #6   | SHORT W BAR  | 7WS14       | 3'-4"  | #7   | SHORT W BAR |  |  |  |  |
| 6WS23       | 4'-10"    | #6   | SHORT W BAR  | 7WS16       | 3'-6"  | #7   | SHORT W BAR |  |  |  |  |
| 6WS27       | 5'-3"     | #6   | SHORT W BAR  | 7WS19       | 4'-0"  | #7   | SHORT W BAR |  |  |  |  |
| 6WY1        | 3'-6"     | #6   | LONG W BAR   | 7WS20       | 4'-1"  | #7   | SHORT W BAR |  |  |  |  |
| 6WY3        | 4'-6"     | #6   | LONG W BAR   | 7WS21       | 4'-7"  | #7   | SHORT W BAR |  |  |  |  |
| 6WY5        | 5'-6"     | #6   | LONG W BAR   | 7WS23       | 4'-10" | #7   | SHORT W BAR |  |  |  |  |
| 6WY7        | 7'-2"     | #6   | LONG W BAR   | 7WS25       | 5'-0"  | #7   | SHORT W BAR |  |  |  |  |
| 6D1         | 1'-6"     | #6   | DIAGONAL BAR | 7WS27       | 5'-3"  | #7   | SHORT W BAR |  |  |  |  |
| 6E1         | 3'-3 3/8" | #6   | EDGE BAR     | 7WY3        | 4'-6"  | #7   | LONG W BAR  |  |  |  |  |
| 6E3         | 4'-3 3/8" | #6   | EDGE BAR     | 7WY5        | 5'-6"  | #7   | LONG W BAR  |  |  |  |  |
| 6E5         | 5'-3 3/8" | #6   | EDGE BAR     | 7WY7        | 7'-2"  | #7   | LONG W BAR  |  |  |  |  |
| 6E7         | 6'-4 3/8" | #6   | EDGE BAR     | 7E3         | 4'-3"  | #7   | EDGE BAR    |  |  |  |  |
|             |           |      |              | 7E5         | 5'-3"  | #7   | EDGE BAR    |  |  |  |  |
|             |           |      |              | 7E7         | 6'-11" | #7   | EDGE BAR    |  |  |  |  |

| BOTTOM REINFORCEMENT     |           |             |              |             |              |             |              |             |              |             |              |              |
|--------------------------|-----------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|--------------|
| TOP SLAB WITH CAST FRAME |           |             |              |             |              |             |              |             |              |             |              |              |
| STR. TYPE                | FRAME NO. | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | DESIG-NATION |
| F                        | F1        | 5           | 6LS7         | 3           | 6LX3         | 4           | 6WS2         | 4           | 6WY3         | 4           | 6E3          |              |
| F                        | F3        |             |              | 3           | 6LX3         | 8           | 6WS2         |             | 4            | 6E3         |              |              |
| G                        | F1        | 5           | 6LS7         | 5           | 6LX3         | 4           | 6WS9         | 4           | 6WY5         | 2           | 6E5          | 2 6E3        |
| G                        | F3        |             |              | 5           | 6LX3         | 8           | 6WS9         |             | 2            | 6E5         | 2 6E3        |              |
| H                        | F1        | 5           | 7LS7         | 8           | 7LX3         | 4           | 7WS19        | 4           | 7WY7         | 2           | 7E7          | 2 7E3        |
| J                        | F1        | 5           | 6LS16        | 3           | 6LX5         | 4           | 6WS1         | 5           | 6WY3         | 2           | 6E3          | 2 6E5        |
| J                        | F2        | 5           | 6LS8         | 3           | 6LX5         | 6           | 6WS1         | 4           | 6WY3         | 2           | 6E3          | 2 6E5        |
| K                        | F1        | 5           | 6LS16        | 5           | 6LX5         | 4           | 6WS9         | 5           | 6WY5         | 4           | 6E5          |              |
| K                        | F2        | 5           | 6LS8         | 5           | 6LX5         | 6           | 6WS9         | 4           | 6WY5         | 4           | 6E5          |              |
| L                        | F1        | 5           | 7LS16        | 8           | 7LX5         | 4           | 7WS19        | 5           | 7WY7         | 2           | 7E7          | 2 7E5        |
| L                        | F2        | 5           | 7LS8         | 8           | 7LX5         | 6           | 7WS19        | 4           | 7WY7         | 2           | 7E7          | 2 7E5        |
| N                        | F1        | 5           | 7LS27        | 3           | 7LX7         | 4           | 7WS2         | 9           | 7WY3         | 2           | 7E3          | 2 7E7        |
| N                        | F2        | 5           | 7LS21        | 3           | 7LX7         | 6           | 7WS2         | 7           | 7WY3         | 2           | 7E3          | 2 7E7        |
| N                        | F3        | 5           | 7LS16        | 3           | 7LX7         | 8           | 7WS2         | 6           | 7WY3         | 2           | 7E3          | 2 7E7        |
| O                        | F1        | 5           | 7LS27        | 5           | 7LX7         | 4           | 7WS6         | 9           | 7WY5         | 2           | 7E5          | 2 7E7        |
| O                        | F2        | 5           | 7LS21        | 5           | 7LX7         | 6           | 7WS6         | 7           | 7WY5         | 2           | 7E5          | 2 7E7        |
| O                        | F3        | 5           | 7LS16        | 5           | 7LX7         | 8           | 7WS6         | 6           | 7WY5         | 2           | 7E5          | 2 7E7        |
| P                        | F1        | 5           | 7LS27        | 8           | 7LX7         | 4           | 7WS19        | 9           | 7WY7         | 4           | 7E7          |              |
| P                        | F2        | 5           | 7LS21        | 8           | 7LX7         | 6           | 7WS19        | 7           | 7WY7         | 4           | 7E7          |              |
| P                        | F3        | 5           | 7LS16        | 8           | 7LX7         | 8           | 7WS19        | 6           | 7WY7         | 4           | 7E7          |              |

| BOTTOM REINFORCEMENT                   |             |              |             |              |             |              |             |              |             |              |             |              |
|--|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|
| TOP SLAB WITH ROUND CAST MANHOLE FRAME |             |              |             |              |             |              |             |              |             |              |             |              |
| STR. TYPE                              | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION | NO. OF BARS | DESIG-NATION |
| A                                      |             |              | 1           | 6LX1         |             | 1            | 6WY1        | 3            | 6D1         | 4            | 6E1         |              |
| B                                      |             |              | 3           | 6LX1         | 5           | 6WS2         | 1           | 6WY3         | 3           | 6D1          | 2           | 6E3 2 6E1    |
| C                                      |             |              | 5           | 6LX1         | 5           | 6WS10        | 1           | 6WY5         | 3           | 6D1          | 2           | 6E5 2 6E1    |
| D                                      |             |              | 8           | 6LX1         | 5           | 6WS21        | 1           | 6WY7         | 3           | 6D1          | 2           | 6E7 2 6E1    |
| E                                      | 5           | 6LS4         |             |              |             |              |             |              |             |              |             |              |

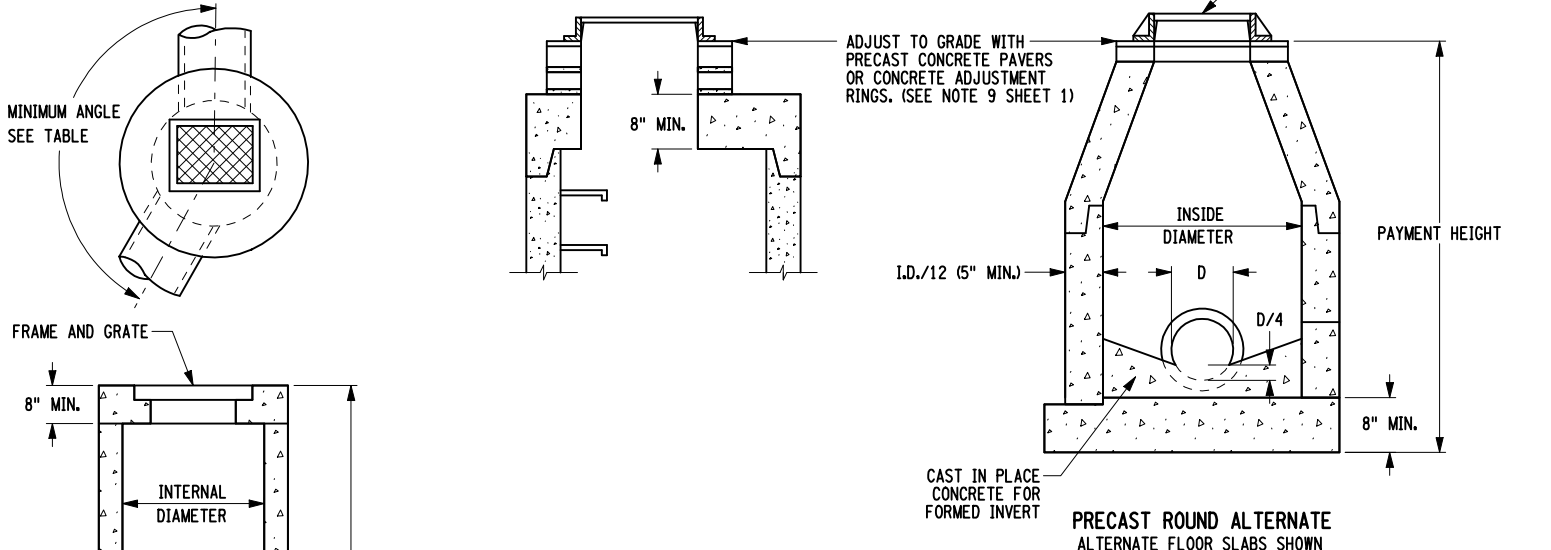
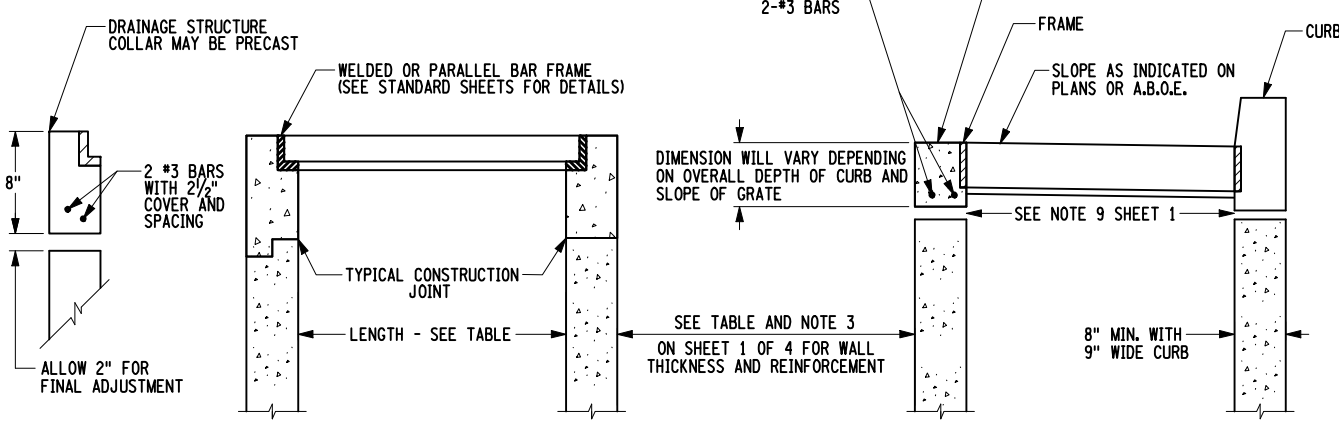


| SELECTION TABLES FOR ALTERNATE ROUND DRAINAGE STRUCTURES |                         |   |     |     |     |     |
|--|-------------------------|---|-----|-----|-----|-----|
| CONCRETE OR POLYETHYLENE PIPES                           |                         | STRUCTURE INTERNAL DIAMETER                 |     |     |     |     |
| RCP H.E. RISE X SPAN                                     | ROUND INTERNAL DIAMETER | 48"   | 60" | 72" | 84" | 96" |
|  |                         | MINIMUM ANGLE BETWEEN PIPE ENTRIES (NOTE 5) |     |     |     |     |
|  | 12"                     | 84  | 63  | 50  | 41  | 35  |
|  | 15"                     | 94  | 70  | 56  | 46  | 39  |
|  | 18"                     | 104   | 78  | 62  | 51  | 43  |
|  | 21"                     | 115   | 85  | 68  | 56  | 48  |
|  | 24"                     | 127   | 93  | 74  | 61  | 52  |
|  | 27"                     | 141   | 102 | 81  | 67  | 57  |
|  | 30"                     | 157   | 111 | 87  | 72  | 61  |
| 19" X 30"  |                         | 157   | 112 | 88  | 73  | 62  |
|  | 34"                     |   | 121 | 95  | 78  | 66  |
| 22" X 34"  |                         |   | 125 | 97  | 80  | 68  |
|  | 36"                     |   | 133 | 102 | 84  | 71  |
| 24" X 38"  |                         |   | 140 | 106 | 87  | 74  |
| 27" X 42"  |                         |   | 156 | 115 | 94  | 79  |
|  | 42"                     |   | 164 | 119 | 96  | 81  |
| 29" X 45"  |                         |   |     | 130 | 104 | 87  |
|  | 48"                     |   |     | 140 | 110 | 92  |
| 32" X 49"  |                         |   |     | 145 | 113 | 94  |
| 34" X 53"  |                         |   |     | 166 | 123 | 101 |
|  | 54"                     |   |     | 175 | 126 | 104 |
|  | 60"                     |   |     | 147 | 117 |     |

| SELECTION TABLES FOR ALTERNATE ROUND DRAINAGE STRUCTURES |                         |   |     |     |     |     |
|--|-------------------------|---|-----|-----|-----|-----|
| METAL PIPES  |                         | STRUCTURE INTERNAL DIAMETER                 |     |     |     |     |
| CMP ARCH SPAN AND RISE                                   | ROUND INTERNAL DIAMETER | 48"   | 60" | 72" | 84" | 96" |
|  |                         | MINIMUM ANGLE BETWEEN PIPE ENTRIES (NOTE 5) |     |     |     |     |
|  | 12"                     | 68  | 54  | 45  | 38  | 34  |
|  | 15"                     | 76  | 60  | 50  | 43  | 37  |
| 17" X 13"  |                         | 82  | 64  | 53  | 45  | 40  |
|  | 18"                     | 85  | 67  | 55  | 47  | 41  |
|  |                         | 91  | 71  | 59  | 50  | 43  |
| 21" X 15"  | 21"                     | 94  | 73  | 60  | 51  | 45  |
| 24" X 18"  | 24"                     | 103   | 80  | 66  | 56  | 49  |
| 28" X 20"  |                         | 116   | 89  | 73  | 62  | 54  |
|  | 30"                     | 124   | 94  | 76  | 65  | 56  |
| 35" X 24"  |                         | 145   | 106 | 86  | 72  | 63  |
|  | 36"                     | 152   | 110 | 88  | 74  | 64  |
| 42" X 29"  | 42"                     |   | 128 | 101 | 84  | 72  |
|  | 48"                     |   | 153 | 115 | 95  | 81  |
| 49" X 33"  |                         |   | 158 | 117 | 96  | 82  |
|  | 54"                     |   |     | 132 | 106 | 90  |
| 57" X 38"  |                         |   |     | 141 | 112 | 94  |
| 60" X 46"  |                         |   |     | 150 | 117 | 98  |
|  | 60"                     |   |     | 154 | 119 | 100 |
| 64" X 43"  |                         |   |     |     | 129 | 107 |
|  | 66"                     |   |     |     | 134 | 110 |
| 71" X 47"  |                         |   |     |     | 151 | 120 |
|  | 72"                     |   |     |     | 155 | 122 |

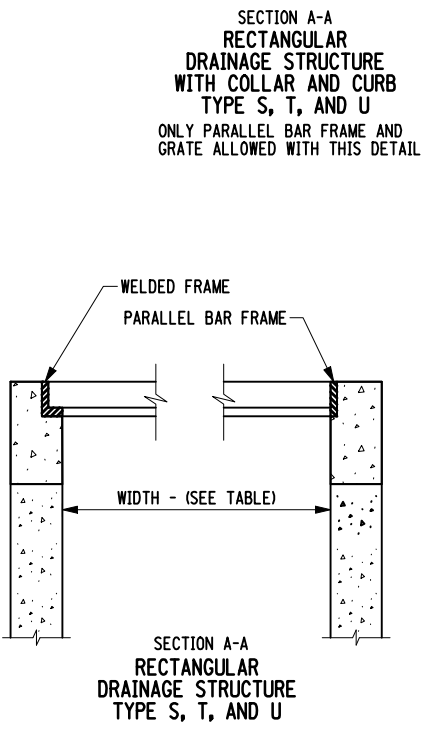
NOTES:

1. THE DIAMETER OF THE ALTERNATE ROUND UNIT SHALL NOT BE LESS THAN THE LARGER DIMENSION OF THE SPECIFIED RECTANGULAR UNIT IT REPLACES. IT SHALL ALSO BE LARGE ENOUGH TO HAVE THE SPECIFIED GRATE FIT WITHIN THE INSIDE DIAMETER OF THE ROUND ALTERNATE.
2. THE ABOVE VALUES ARE BASED ON THE CENTERLINE OF ALL PIPES INTERSECTING AT THE CENTER OF THE ROUND ALTERNATE.
3. THE ANGLE BETWEEN ADJACENT PIPE ENTRIES SHALL NOT BE LESS THAN THE MINIMUM SHOWN IN THE TABLE ABOVE. WHEN THE ADJACENT PIPES HAVE DIFFERENT SIZES, THE MINIMUM ANGLE SHALL BE THE VALUE FOR THE LARGER OF THE TWO PIPES.
4. THE SUM OF THE MINIMUM ANGLES BETWEEN PIPES AT THE SAME LEVEL SHALL NOT BE MORE THAN 360 DEGREES. THEY SHALL BE REGARDED AS BEING AT THE SAME LEVEL IF THEIR RISES OVERLAP.
5. A BLANK (NO ENTRY) IN TABLE INDICATES THAT THE STRUCTURE IS TOO SMALL FOR PIPE OF THAT SIZE.



| RECTANGULAR DRAINAGE STRUCTURE |      |                   |       |        |        |        |
|--------------------------------|------|-------------------|-------|--------|--------|--------|
| (TYPES Q THRU U)               |      | INSIDE DIMENSIONS |       |        |        |        |
| ITEM                           | TYPE | FRAME             | WIDTH | LENGTH | WIDTH  | LENGTH |
| 604.301772                     | Q    | F2*               | 34    | 36     | 33     | 36 1/2 |
| 604.301873                     | R    | F3*               | 34    | 46     | 33     | 46 1/2 |
| 604.301911                     | S    | 11                | 24    | 32     | 24     | 32 1/2 |
| 604.301990                     | S    | 10PCB             | 24    | 32     | 24     | 32 1/2 |
| 604.302016                     | T    | 16                | 26    | 42     | 26 1/2 | 42 1/2 |
| 604.302091                     | T    | 11PCB             | 26    | 42     | 26 1/2 | 42 1/2 |
| 604.302122                     | U    | 22                | 34    | 38     | 34     | 37 1/2 |
| 604.302192                     | U    | 12PCB             | 34    | 38     | 34     | 37 1/2 |

\* SEE CONTRACT DOCUMENTS FOR GRATE AND CURB BOX TYPE  
 \*\* PRECAST TYPES S, T, AND U REQUIRE THE FRAME TO BE CAST INTO A SEPARATE COLLAR. THE FRAME COLLAR SHALL HAVE INSIDE DIMENSIONS AS SHOWN FOR "CAST-IN-PLACE" IN THIS TABLE, OUTSIDE DIMENSIONS TO MATCH THE PRECAST RISER, AND BE 8" HIGH MIN.



| PRECAST ROUND MANHOLES |      |   |                 |
|------------------------|------|---|-----------------|
| ITEM                   | TYPE | CIRCUMFERENTIAL STEEL - SQUARE INCHES PER VERTICAL FOOT | INSIDE DIAMETER |
| 604.4048               | 48   | 0.12  | 48              |
| 604.4060               | 60   | 0.15  | 60              |
| 604.4072               | 72   | 0.18  | 72              |
| 604.4084               | 84   | 0.21  | 84              |
| 604.4096               | 96   | 0.24  | 96              |

PRECAST ROUND ALTERNATE  
 ROUND ALTERNATE MAY BE USED WHEN ALLOWED BY THE SPECIFICATIONS OR WHEN INDICATED ON PLANS  
 ROUND ALTERNATIVES MAY HAVE MONOLITHICALLY CAST, INTEGRAL, OR SEPARATE FLOOR SLABS. (SEE SHEET 1 OF 4)

EFFECTIVE DATE: 01/08/09

STATE OF NEW YORK  
 DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY STANDARD SHEET

DRAINAGE STRUCTURE DETAILS  
 (SHEET 4 OF 4)

APPROVED SEPTEMBER 19, 2008 ISSUED UNDER EB 08-036

/S/ DANIEL D'ANGELO, P.E.  
 DEPUTY CHIEF ENGINEER (DESIGN)

604-02