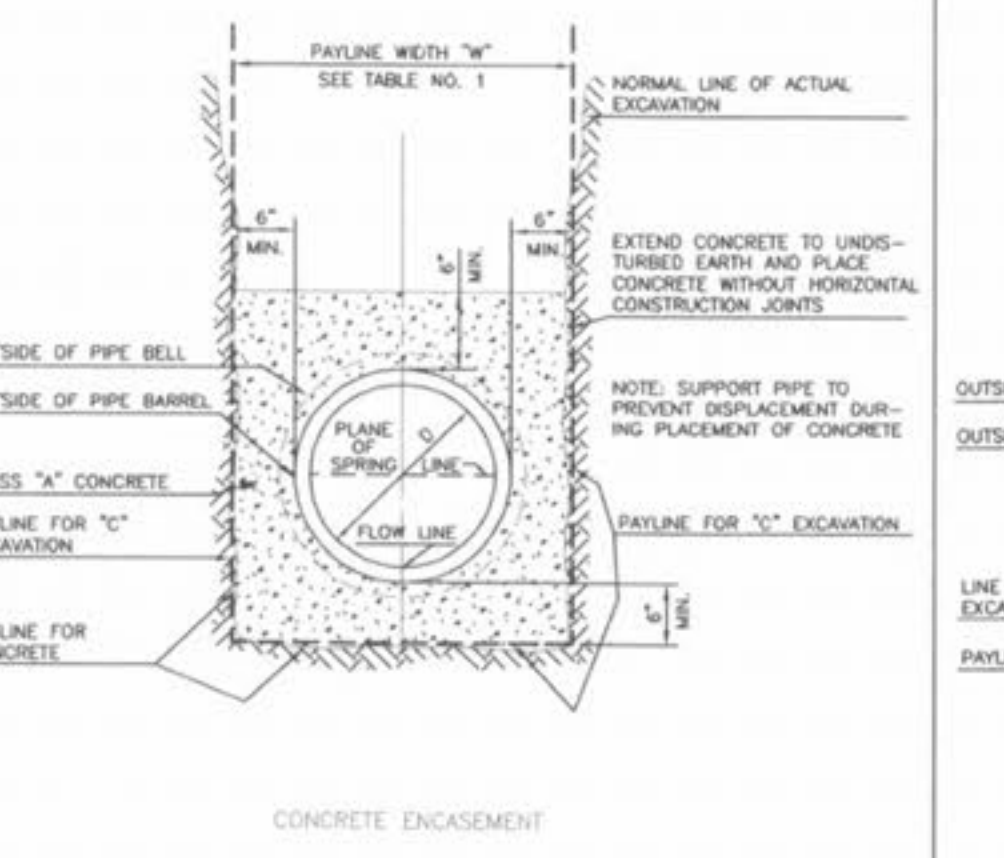
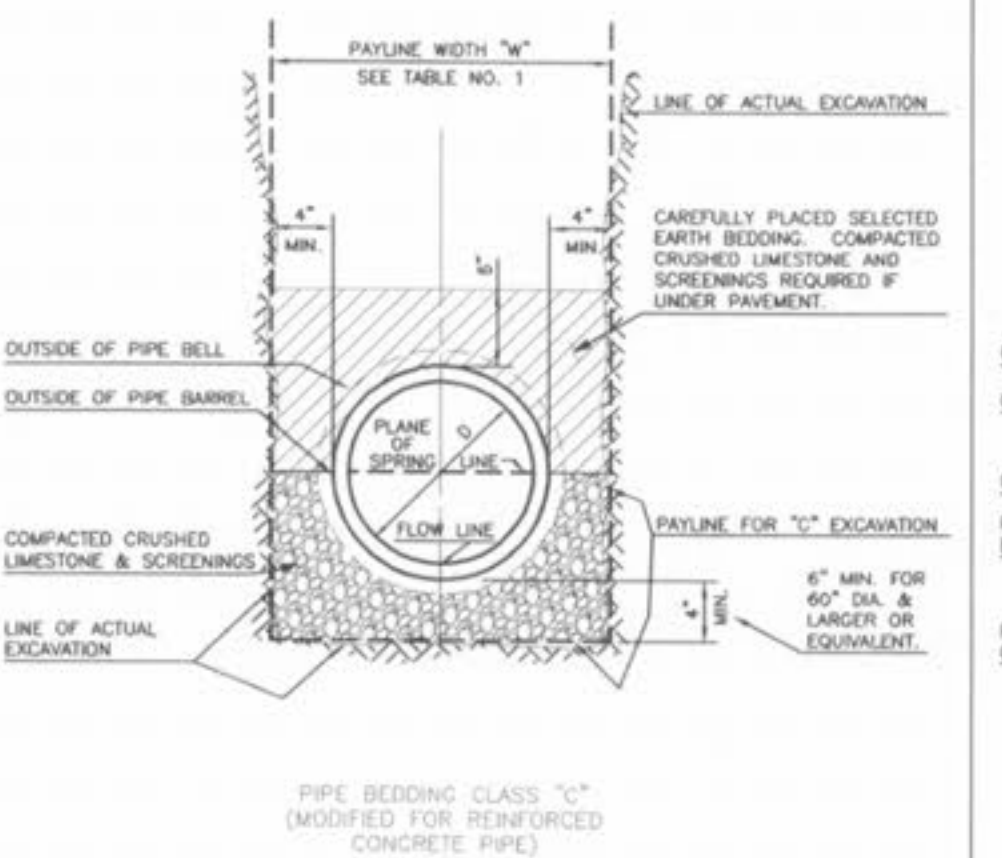
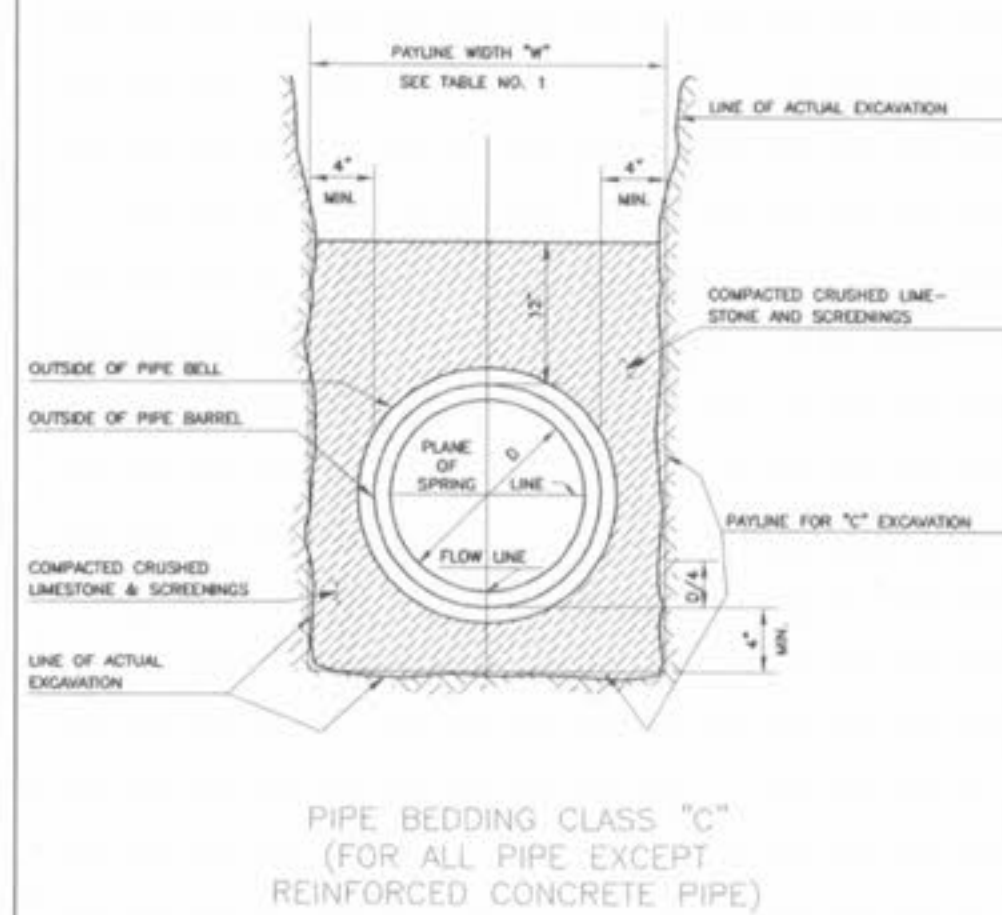
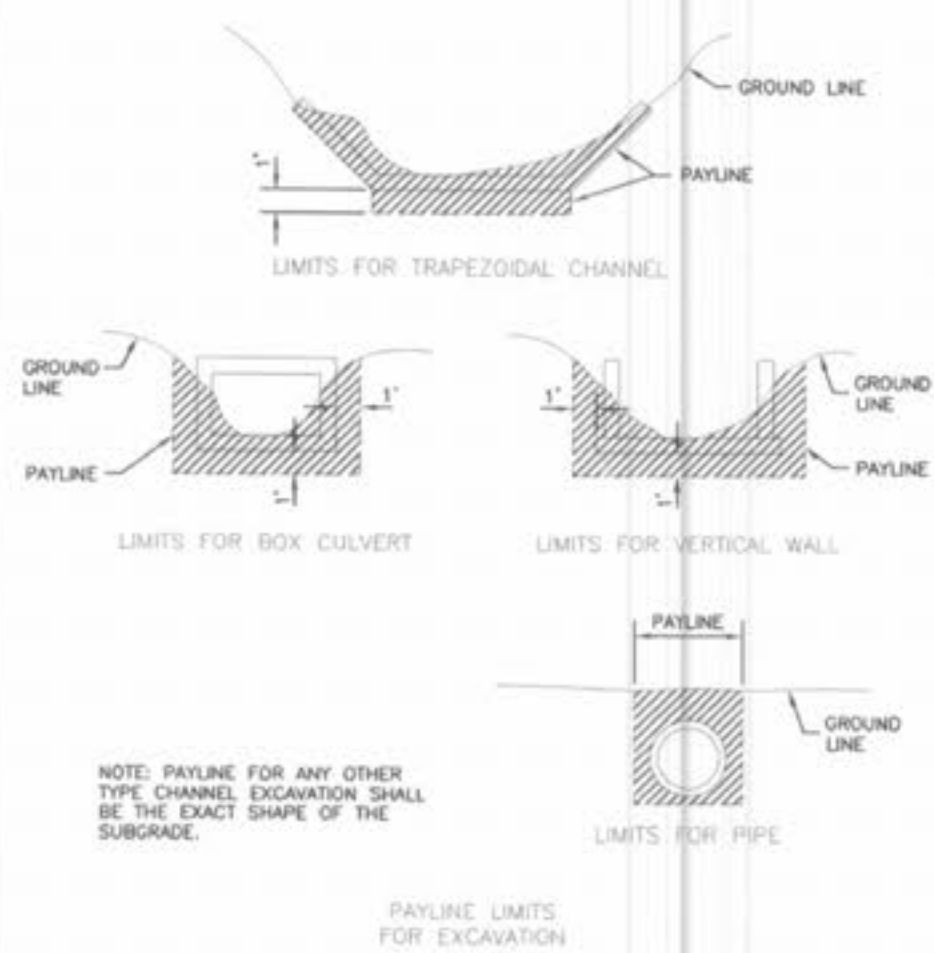
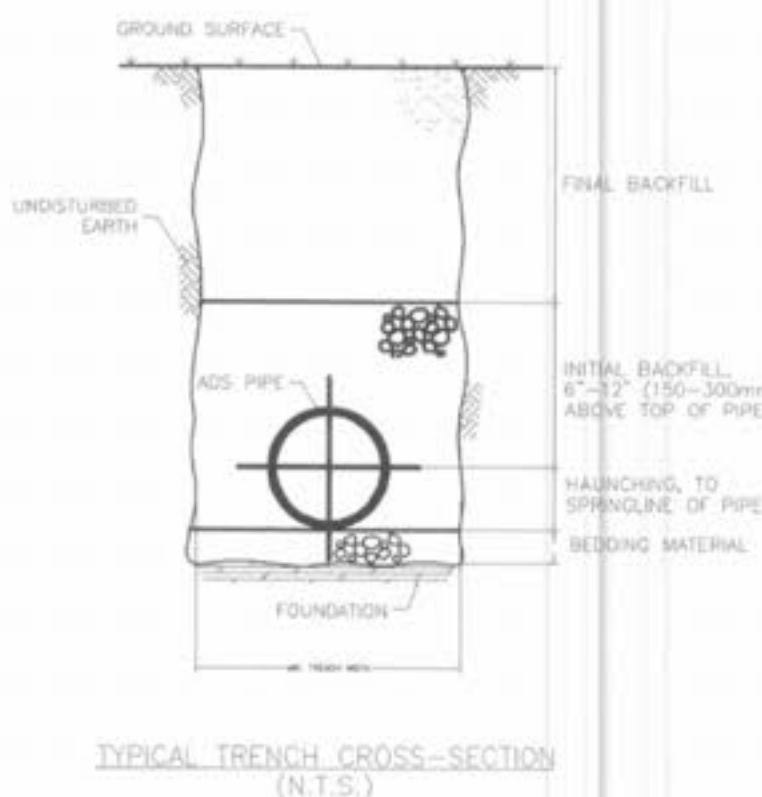


| ROUND PIPE                       |                                  |                                |                                      | HORIZONTAL ELLIPTICAL PIPE       |                                  |                                |                                      |
|----------------------------------|----------------------------------|--------------------------------|--------------------------------------|----------------------------------|----------------------------------|--------------------------------|--------------------------------------|
| Inside Diameter of Pipe (Inches) | Payline Width of Trench (Inches) | Payline Width of Trench (Feet) | Pay-volume (cu. ft. per ft. of Pipe) | Inside Diameter of Pipe (Inches) | Payline Width of Trench (Inches) | Payline Width of Trench (Feet) | Pay-volume (cu. ft. per ft. of Pipe) |
| 4                                | 30                               | 2.50                           | 3.28                                 |                                  |                                  |                                |                                      |
| 6                                | 30                               | 2.50                           | 2.98                                 |                                  |                                  |                                |                                      |
| 8                                | 30                               | 2.50                           | 3.87                                 |                                  |                                  |                                |                                      |
| 10                               | 30                               | 2.50                           | 4.09                                 |                                  |                                  |                                |                                      |
| 12                               | 30                               | 2.50                           | 4.25                                 |                                  |                                  |                                |                                      |
| 15                               | 36                               | 3.00                           | 5.55                                 |                                  |                                  |                                |                                      |
| 18                               | 36                               | 3.00                           | 5.77                                 | 14 X 23                          | 41                               | 3.42                           | 5.94                                 |
| 21                               | 39                               | 3.25                           | 6.61                                 |                                  |                                  |                                |                                      |
| 24                               | 42                               | 3.50                           | 7.39                                 | 19 X 30                          | 49                               | 4.08                           | 7.68                                 |
| 27                               | 45                               | 3.75                           | 8.18                                 | 22 X 34                          | 53                               | 4.42                           | 8.61                                 |
| 30                               | 49                               | 4.08                           | 9.30                                 | 24 X 38                          | 58                               | 4.83                           | 9.70                                 |
| 33                               | 53                               | 4.42                           | 10.53                                | 27 X 42                          | 62                               | 5.17                           | 10.71                                |
| 36                               | 56                               | 4.67                           | 11.43                                | 29 X 45                          | 66                               | 5.50                           | 11.72                                |
| 39                               | 59                               | 4.92                           | 12.33                                | 32 X 49                          | 71                               | 5.92                           | 13.14                                |
| 42                               | 63                               | 5.25                           | 13.38                                | 34 X 53                          | 75                               | 6.25                           | 14.05                                |
| 48                               | 70                               | 5.83                           | 15.87                                | 38 X 60                          | 83                               | 6.92                           | 16.18                                |
| 54                               | 77                               | 6.42                           | 18.15                                | 43 X 68                          | 92                               | 7.67                           | 18.81                                |
| 60                               | 84                               | 7.00                           | 20.73                                | 48 X 76                          | 101                              | 8.42                           | 21.59                                |
| 66                               | 91                               | 7.58                           | 23.45                                | 53 X 83                          | 109                              | 9.08                           | 24.35                                |
| 72                               | 98                               | 8.17                           | 26.37                                | 58 X 91                          | 118                              | 9.83                           | 27.45                                |
| 78                               | 105                              | 8.75                           | 29.39                                | 63 X 98                          | 126                              | 10.50                          | 30.50                                |
| 84                               | 112                              | 9.33                           | 32.57                                | 68 X 106                         | 135                              | 11.25                          | 33.91                                |
| 90                               | 119                              | 9.92                           | 35.90                                | 72 X 113                         | 143                              | 11.92                          | 36.99                                |
| 96                               | 126                              | 10.50                          | 39.37                                | 77 X 121                         | 152                              | 12.67                          | 40.69                                |
| 102                              | 133                              | 11.08                          | 42.99                                | 82 X 128                         | 160                              | 13.33                          | 44.45                                |
| 108                              | 140                              | 11.67                          | 46.75                                | 87 X 136                         | 168                              | 14.00                          | 47.79                                |
| 114                              | 147                              | 12.25                          | 50.66                                | 92 X 143                         | 176                              | 14.67                          | 51.70                                |
| 120                              | 154                              | 12.83                          | 54.72                                | 97 X 151                         | 185                              | 15.42                          | 56.01                                |
| 126                              | 161                              | 13.42                          | 58.92                                |                                  |                                  |                                |                                      |
| 132                              | 168                              | 14.00                          | 63.27                                | 106 X 166                        | 202                              | 16.83                          | 64.48                                |
| 144                              | 182                              | 15.17                          | 72.40                                | 116 X 182                        | 218                              | 18.17                          | 73.59                                |

TABLE NO. 1  
PAYLINE WIDTHS OF TRENCH AND  
PAY-QUANTITIES OF CONCRETE



## HDPE PIPE TRENCH INSTALLATION DETAIL



| SECTION OF MANHOLE |                        | DIMENSION      |
|--------------------|------------------------|----------------|
| TOP TRANSITION     | UPPER                  | 2'-2 1/2" DIA. |
|                    | LOWER                  | 3'-6" DIA.     |
| BOTTOM SECTION     | 8" THRU 24" DIA. PIPE  | 3'-6" DIA.     |
|                    | 27" THRU 36" DIA. PIPE | 3'-6" SQUARE   |

TABLE NO. 2  
STANDARD MANHOLE DIMENSIONS

NOTE TO THE ENGINEER: WHEN THIS DETAIL IS TO BE INCORPORATED INTO CONTRACT DOCUMENTS, PLEASE REFERENCE SECTION 5-2, RECOMMENDATIONS FOR INCORPORATION INTO CONTRACT DOCUMENTS OF ASTM SPECIFICATION D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS," SO THAT APPROPRIATE MODIFICATIONS CAN BE MADE TO ACCOMMODATE SITE SPECIFIC NEEDS.

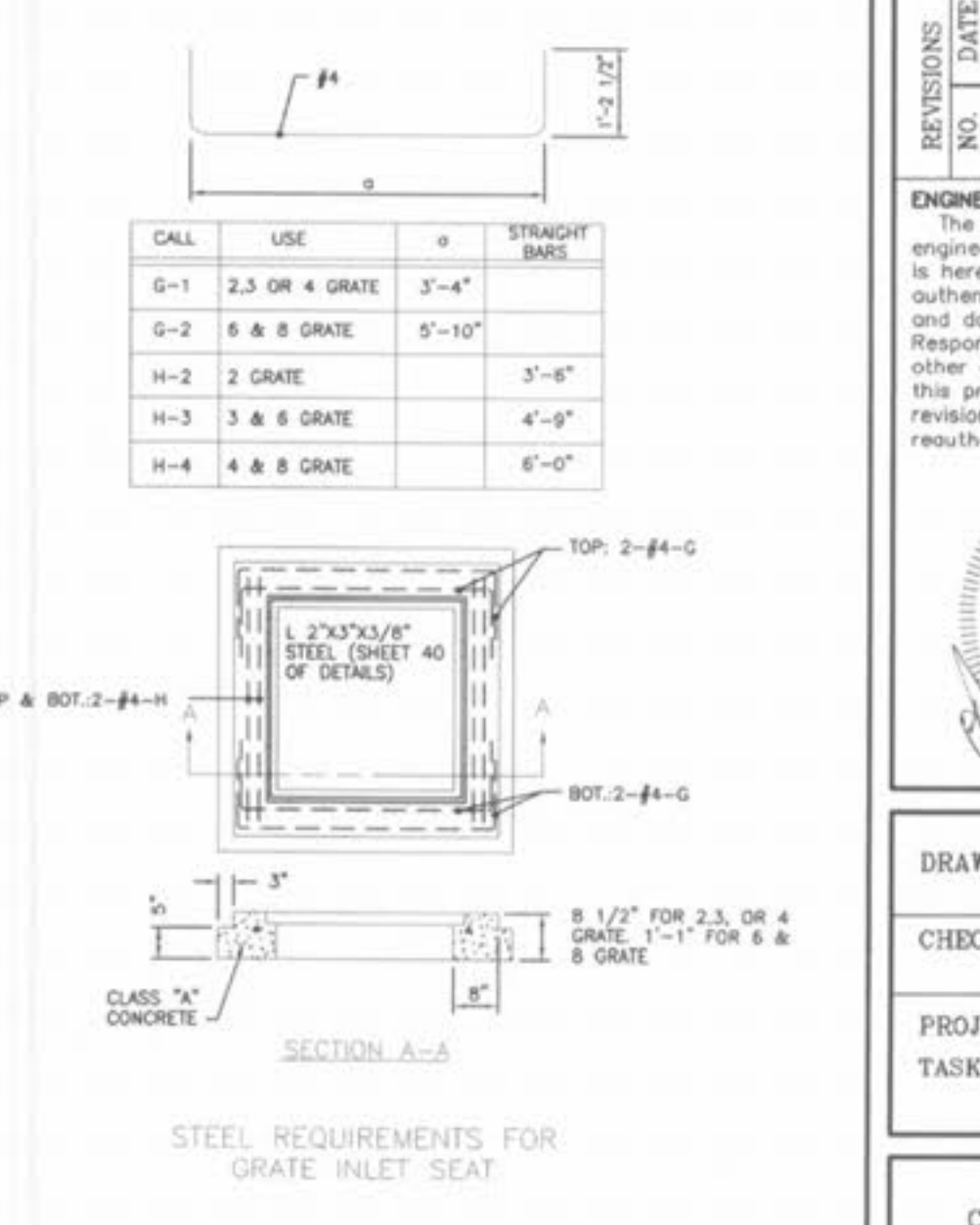
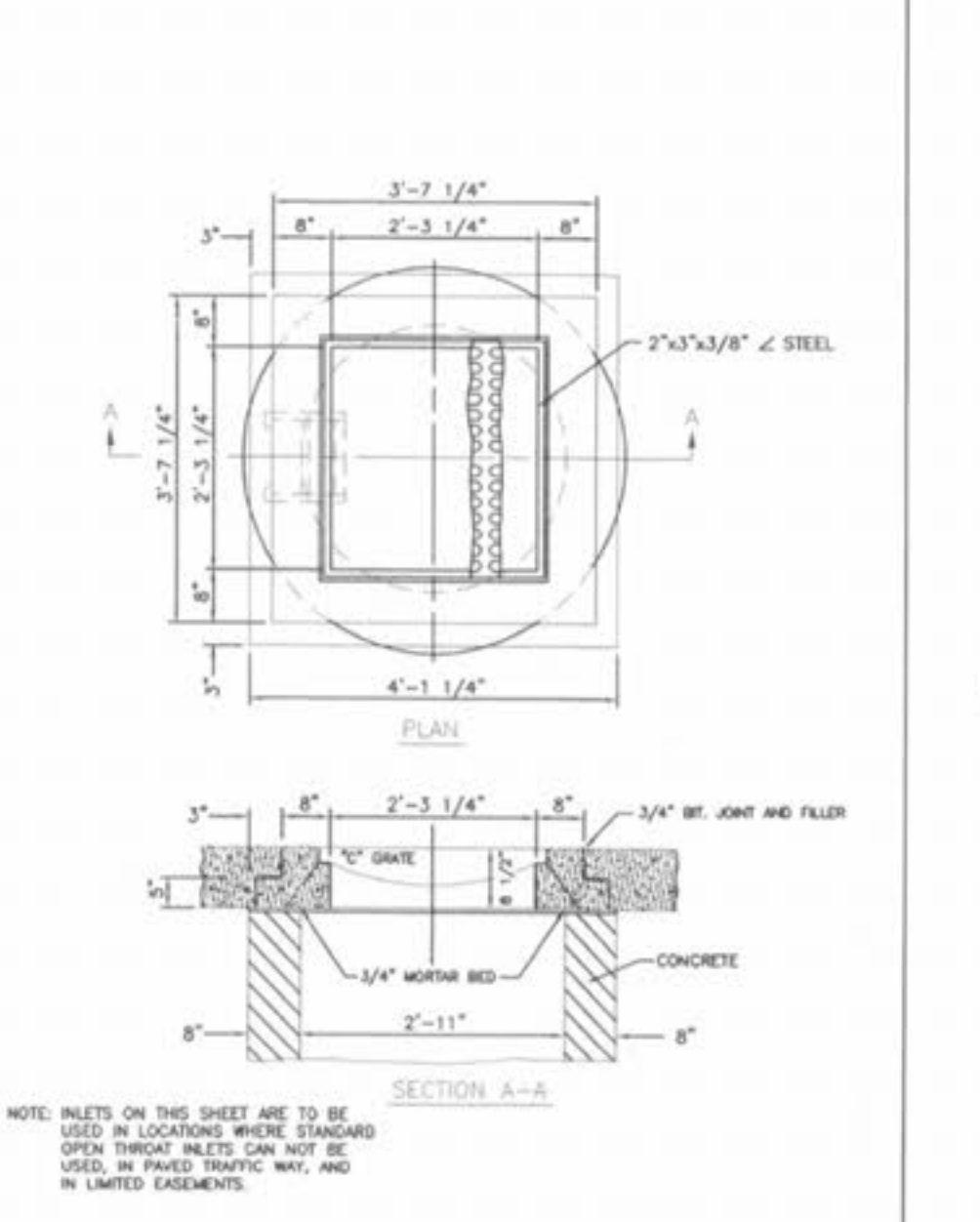
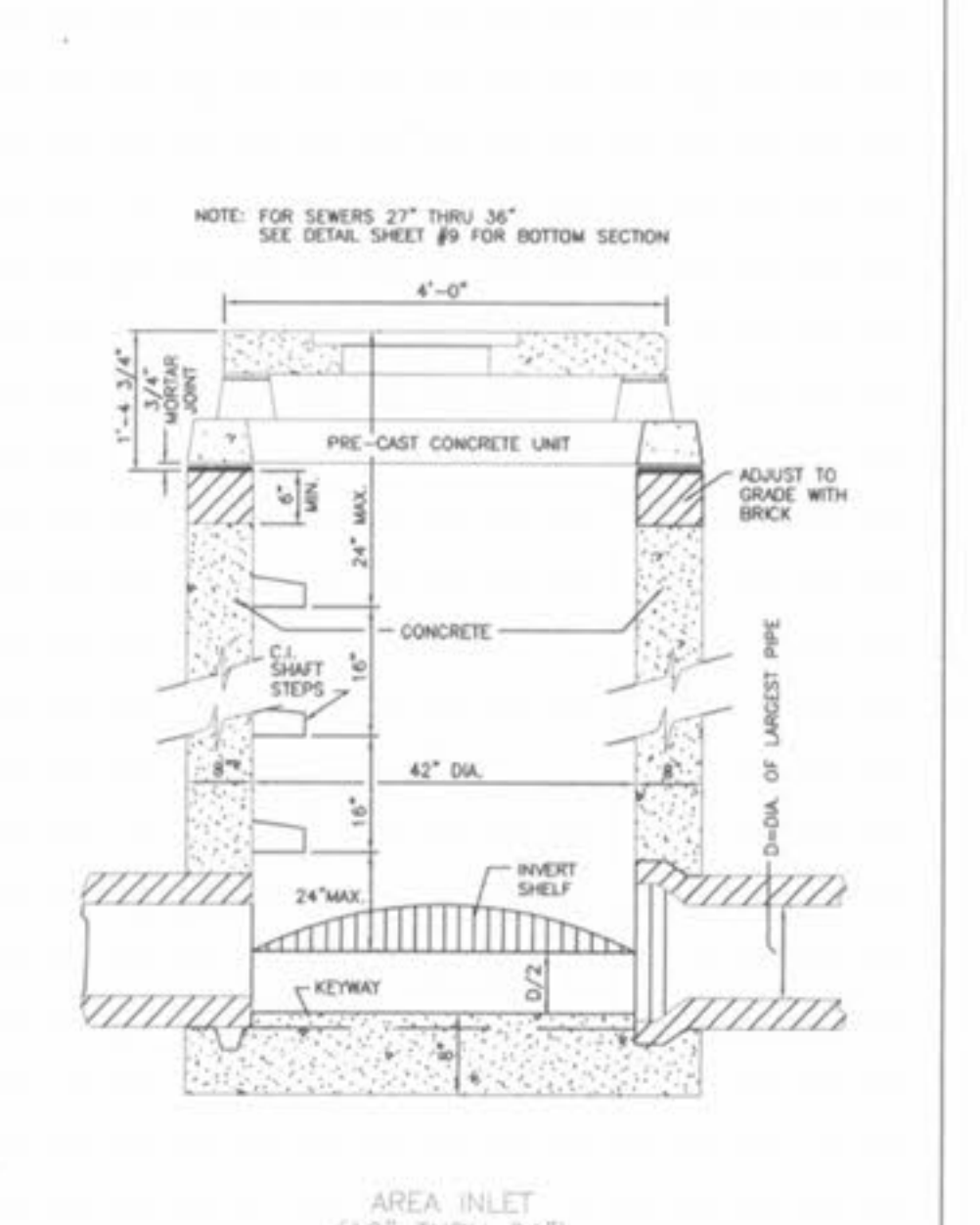
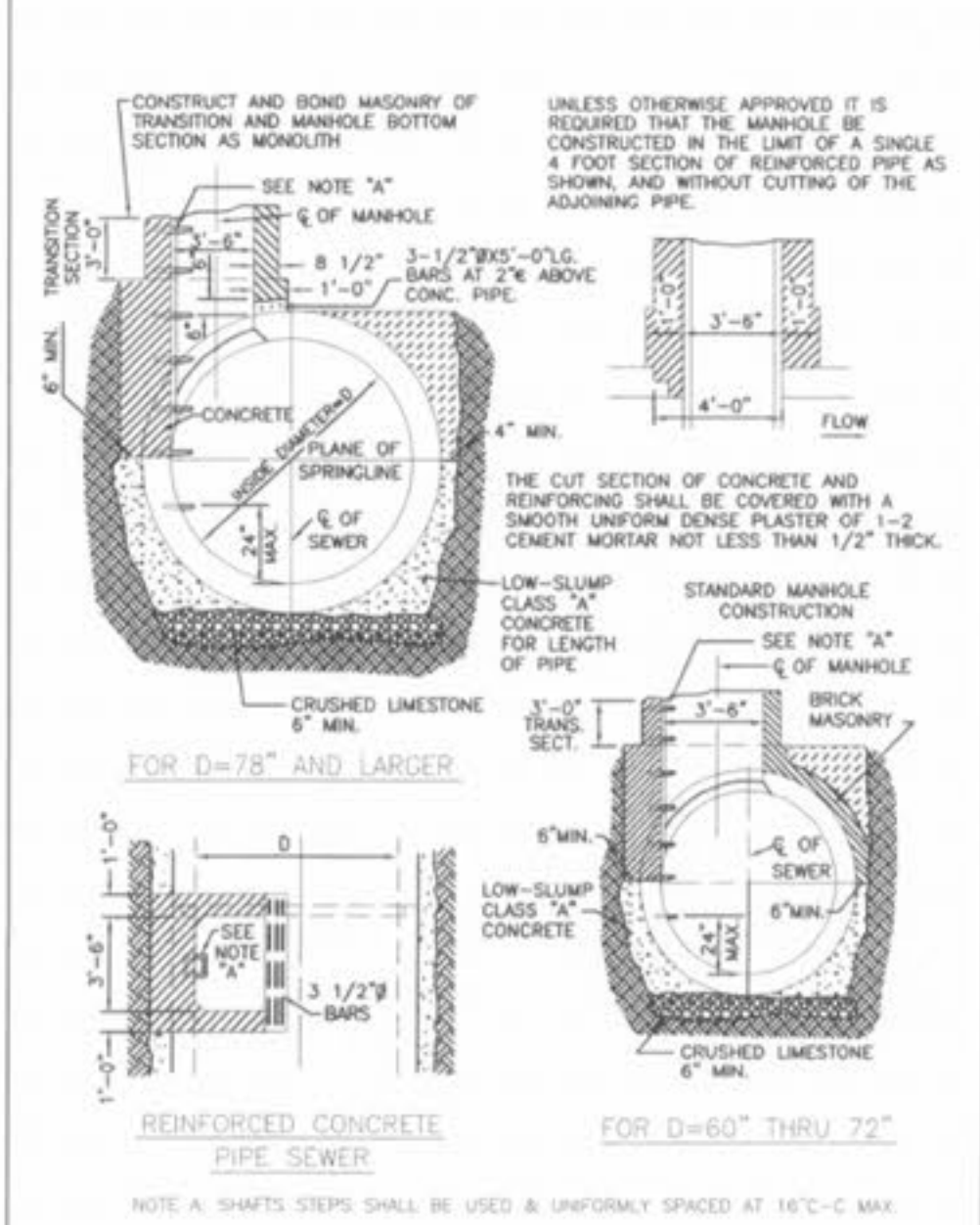
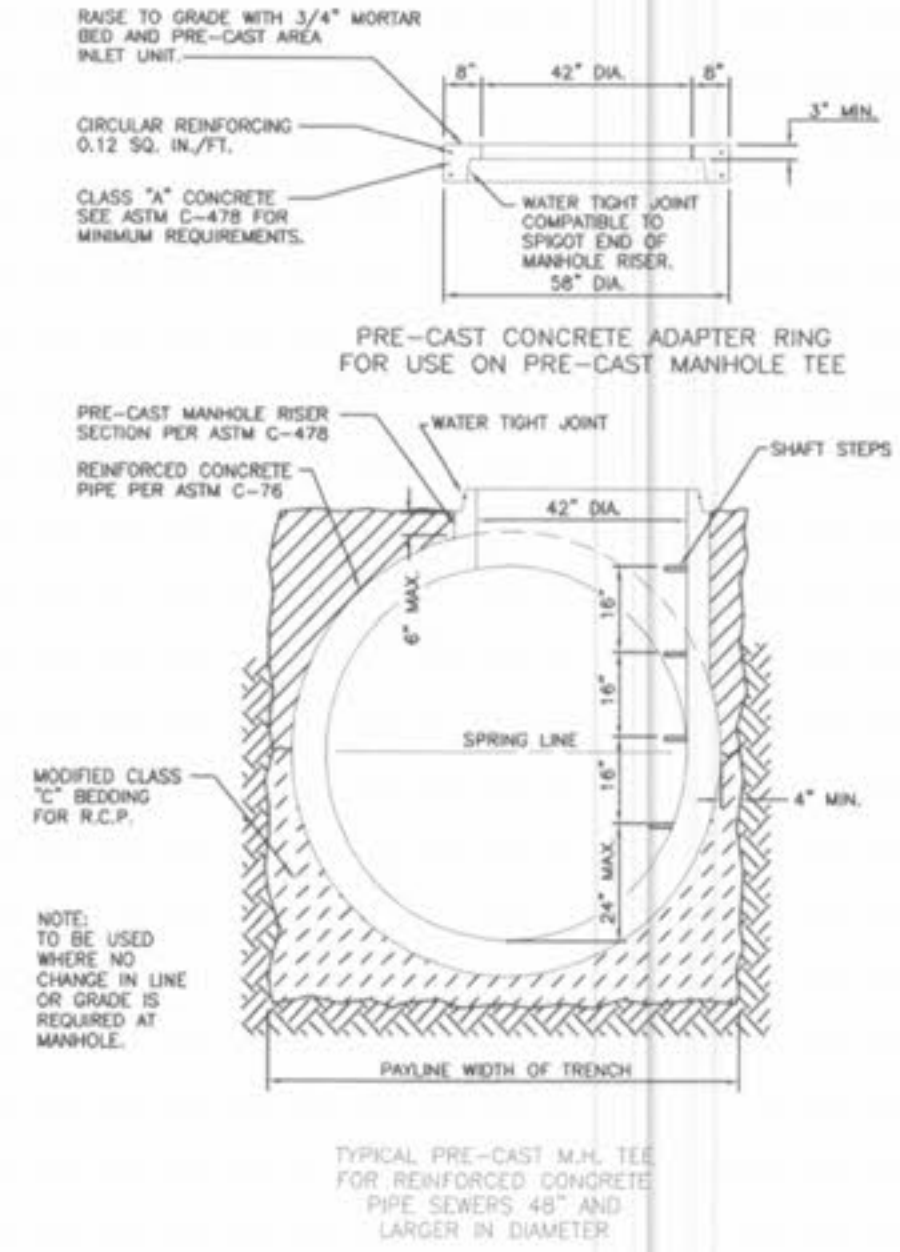
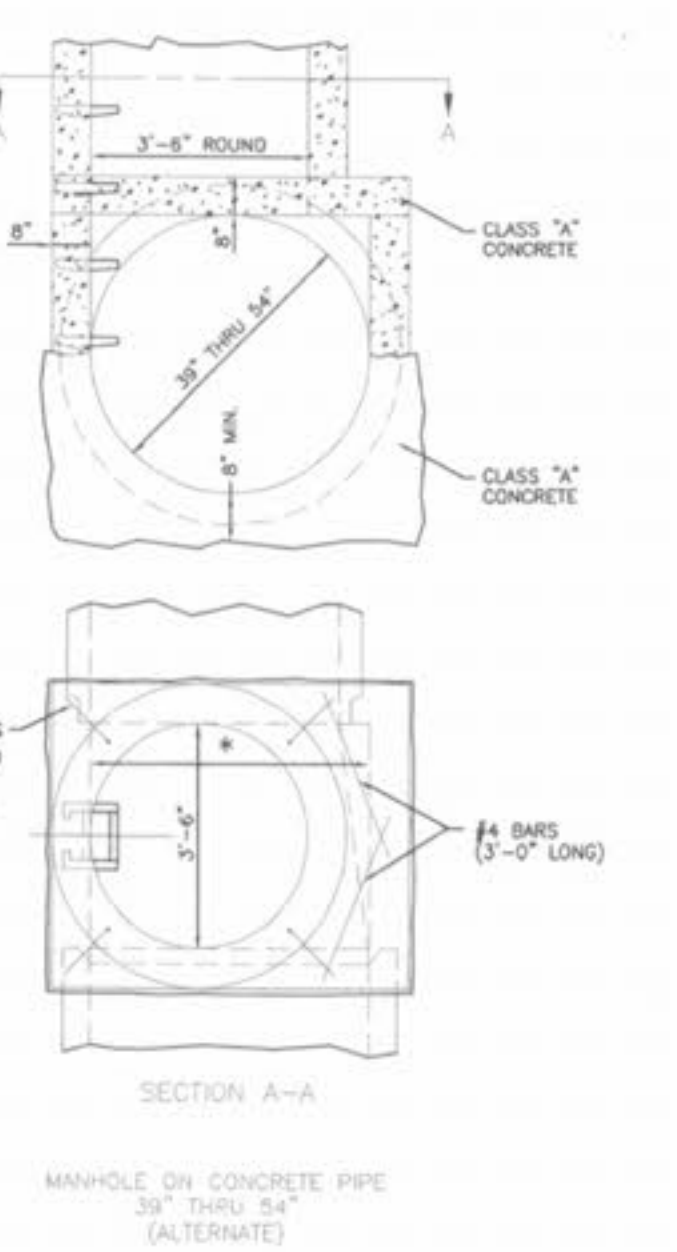
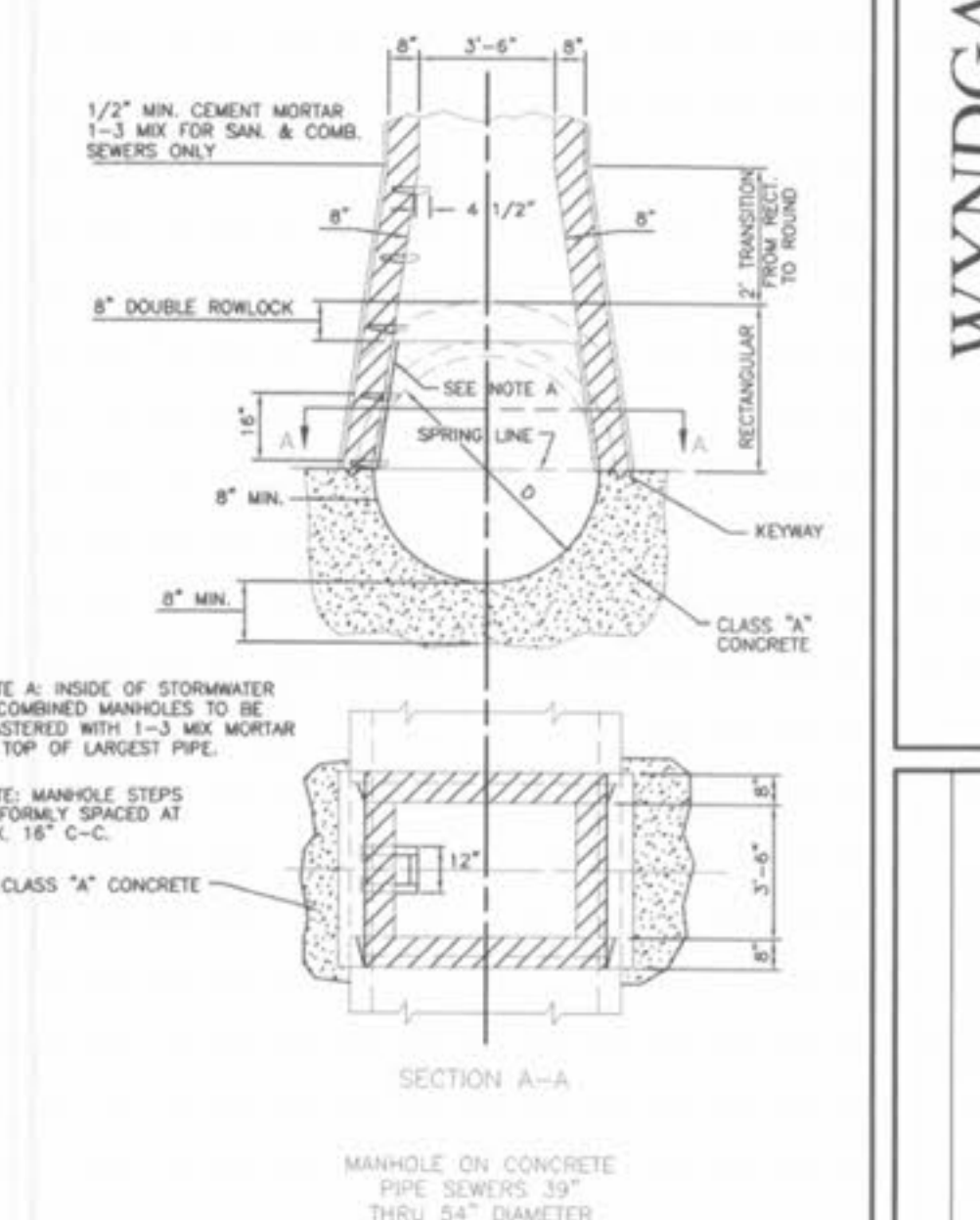
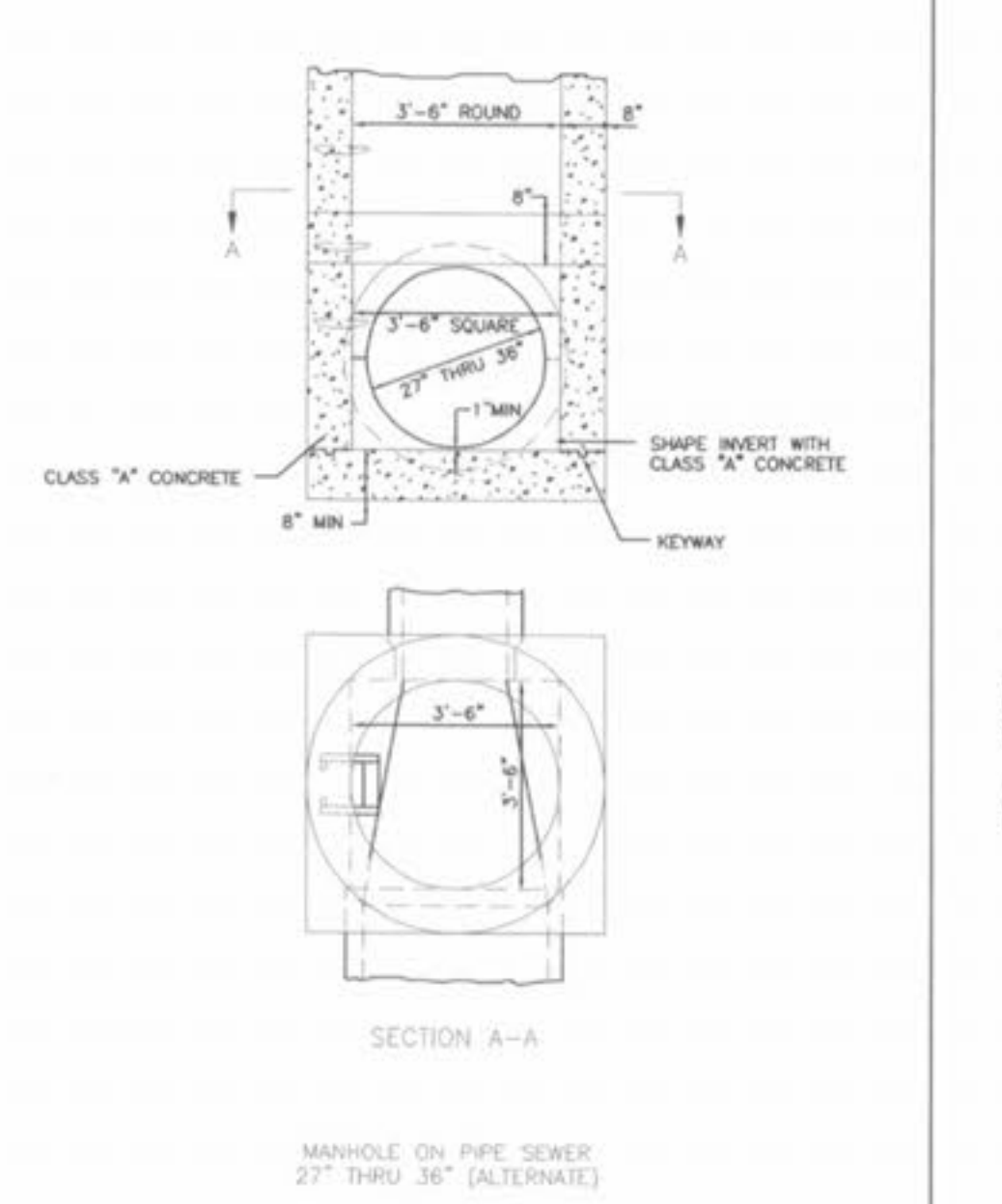
- NOTES:
- FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH A FOUNDATION OF CLASS I OR II MATERIAL AS DEFINED IN ASTM D2321, "STANDARD PRACTICE FOR INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS," LATEST EDITION, AS AN ALTERNATIVE AND AT THE DISCRETION OF THE ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A WOVEN GEOTEXTILE FABRIC.
  - BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.  
UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE:  
FOR 4"-24" (100-600mm) AND 42"-48" (1050-1200mm) CORRUGATED POLYETHYLENE PIPE (CPEP), 6" (150mm)  
FOR 30"-36" (750-900mm) CPEP.
  - HAUNCHING AND INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
  - UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM TRENCH WIDTHS SHALL BE AS FOLLOWS:
- | NOMINAL PIPE SIZE (INCHES) | MIN. RECOMMENDED TRENCH WIDTH (INCHES) |
|----------------------------|----------------------------------------|
| 4 (100)                    | 21 (530)                               |
| 6 (150)                    | 23 (580)                               |
| 8 (200)                    | 25 (630)                               |
| 10 (250)                   | 28 (710)                               |
| 12 (300)                   | 31 (790)                               |
| 15 (375)                   | 34 (860)                               |
| 18 (450)                   | 39 (990)                               |
| 24 (600)                   | 48 (1220)                              |
| 30 (750)                   | 66 (1680)                              |
| 36 (900)                   | 78 (1980)                              |
| 42 (1050)                  | 83 (2110)                              |
| 48 (1200)                  | 89 (2260)                              |
| 60 (1500)                  | 102 (2590)                             |
5. MINIMUM COVER: MINIMUM RECOMMENDED DEPTHS OF COVER FOR VARIOUS LIVE LOADS ARE SUMMARIZED IN THE FOLLOWING TABLE. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TAKEN FROM THE TOP OF PIPE TO THE GROUND SURFACE.
- | SURFACE LIVE LOADING CONDITION | MINIMUM RECOMMENDED COVER (INCHES) |
|--------------------------------|------------------------------------|
| H2S (FLEXIBLE PAVEMENT)        | 12 (300)                           |
| H2S (RIGID PAVEMENT)           | 12 (300)                           |
| HD RAILWAY                     | 24 (610)                           |
| HEAVY CONSTRUCTION             | 48 (1220)                          |
- \*TOP OF PIPE TO BOTTOM OF BITUMINOUS PAVEMENT SECTION

THIS STANDARD DETAIL, ORIGINALLY "ADVANCED PIPEWORK SYSTEMS, INC. (APSI)" WAS PROVIDED FOR THE DESIGNED APPLICATION. IN ADDITION TO THE RECOMMENDATIONS, THERE MAY BE OTHER NATIONAL, STATE OR LOCAL REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL SUCH REQUIREMENTS AND FOR MODIFYING THIS DETAIL TO ACCOMMODATE SUCH REQUIREMENTS PRIOR TO THE INSTALLATION OF ANY PRODUCTS. APSI HAS NOT AUTHORIZED AND IT REMAINS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ANY SUCH REQUIREMENTS FROM THE STANDARD DETAIL.



| REVISIONS |      |
|-----------|------|
| BY        | DATE |
|           |      |
|           |      |
|           |      |

DESIGNED BY: K.M.J. 5-7-99  
APPROVED BY: P.C.C. 5-7-99  
NUMBER: STD-101



**PICKETT RAY & SILVER**

CIVIL ENGINEERS  
PLANNERS  
LAND SURVEYORS

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Fax (636) 397-1104

**WYNDGATE**

CONSTRUCTION DETAILS

Prepared For:  
**SUMMIT POINTE L.C.**

239 FOX HILL ROAD  
ST. PETERS, MO 63301  
(636) 940-9300

| REVISIONS | DATE     | REVISIONS PER CITY | REVISIONS PER DSD | REVISIONS PER CITY OF FALLON |
|-----------|----------|--------------------|-------------------|------------------------------|
| 1         | 10/25/04 |                    |                   |                              |
| 2         | 02/03/05 |                    |                   |                              |
| 3         | 02/19/05 |                    |                   |                              |

**ENGINEERS AUTHENTICATION**

The responsibility for professional engineering liability on this project is hereby limited to the set of plans, specifications, and data hereunder attached. Responsibility is disclaimed for all other engineering plans involved in this project and specifically excludes revisions after this date unless reauthenticated.

PICKETT, RAY & SILVER, INC.

STATE OF MISSOURI  
HAROLD J. BARTCH  
REGISTERED PROFESSIONAL ENGINEER  
NUMBER 177751

|                          |            |
|--------------------------|------------|
| DRAWN                    | DATE       |
| W.F.F.                   | 6-29-04    |
| CHECKED                  | DATE       |
| D.W.D.                   | 6-29-04    |
| PROJECT # 01267.SUPO.02R |            |
| TASK # 2                 | FIELD BOOK |