

REVISION DATE 12/28/16

Sample Plan

DRAINAGE PROFILES AND TABULATIONS SHEET ----- NARRATIVE

General Information continued:

References:

Design Scene: Chapter 2 - Quantities and Tabulations
Chapter 12 - Drainage

Technical Memorandum: No. 12-01-B-01 Use of Plastic Pipe for Storm Sewer and Culverts on Trunk Highways

No. 14-04-B-02 Requirements for the Use of Metal Box Culverts

Road Design Manual: Chapter 8-1 to 8-4, 8-6 and Chapter 9-2 & 9-3
Drainage Manual

Standard Plate Manual: 3000 Series
4000 Series
5000 Series

Also Standard Plate Nos. 7111, 7112, 8150, 9101, and 9102

Standard Plans: 5-297.430 Subsurface Drains
5-297.431 Subsurface Drains
5-297.432 Subsurface Drains
5-297.433 Subsurface Drains - Outlet Pipes for Edge and Subcut Drains

Technical Manual: Culvert Treatments 5-292.510 thru 5-292.516

Miscellaneous:

http://i1hub.metro/design/coordination.html Design/WRE Responsibilities for Plan Preparation Activities

pw:\0TS\Design Standards\Design Details\rcpgrate_dd.dgn Vehicle Grates for Flared Ends Concrete Aprons

General Information:

To determine the structure pay height for a standard catch basin with a 2' square grate, the following may be used:

- 1) No. Sta. Loc.
2) Profile grade elevation
3) Elevation at edge of pavement
4) Gutter slope x (gutter width-1')
5) Elevation offset 1' from face of curb
6) Sump (0.1')
7) Top of Casting elevation
8) Casting type (thickness 1' from face of curb)
9) Bottom of Casting elevation
10) Outlet
11) Base thickness (0.7')
12) Pay height (Design)
13) Drains to No. x @
14) Inlet elevation
15) Remarks

----- See Spec. 2506 for structure pay height.

The Designer shall indicate on the Drainage Tabulation, Storm Sewer Summary and Culvert Summary the locations where pipe material options may be used.

For pipe culverts where pipe material options are used, the apron location for plastic pipe is the same as with steel pipes.

The sump for all catch basins in roadways shall be 0.1' except when located in shoulders to be used by buses. See Construction Plan Details on Sheet No. 32 of this Sample Plan.

The following guidelines are to be followed regarding location of coordinates and elevations at pipe aprons:

Concrete Pipe - Compute coordinates and elevations at the end of apron regardless of the type of apron used.

Metal Pipe - Compute coordinates and elevations at the end of safety apron, but at end of pipe barrel when a standard metal apron is used.

Determine structure size (diameter) for pipe accommodation.

Request a condition survey of Inplace pipes and structures from Water Resources Engineering.

If subsurface drains are required, show profiles where they are not parallel to the roadway profile.

If there is cost participation by Cities, Counties, or other Agencies, those items shall be split out in separate columns on the Drainage Tabulation. The Municipal Agreements Unit and State Aid can offer assistance.

Elbows, bends, increasers and decreaseers are included and paid for in the pipe length and subnoted on the Estimated Quantities.

When elbows are required for metal pipe, the number of elbows and the degree of elbow shall be shown in the drainage profile and tabulation for each line of pipe. Use one elbow for each alignment change of the metal pipe.

When bend sections are required for concrete pipe, the number of short radius bends or long radius bends shall be shown in the drainage profile and tabulation for each line of pipe.

Concrete pipe lengths should be to the even foot (in 2' increments for pipe culverts and 1' increments for pipe sewer). Metal pipe lengths should be to the even foot (1,2,3, etc.).

If the designer specifies either granular or geotextiles are to be used with riprap, then the Designer will provide a pay item for it in the Plan.

Use Aggregate Bedding on all arch pipes. See Spec. 2451.

Do not have a grate on the apron outlet without a grate on the inlet.

Note to tie joints for all bends and three joints in each direction from bends. Tie all joints for RCP culverts. Also tie last three joints at RCP storm sewer aprons. Tied joints are considered incidental.

Profile should include Inplace ground line, finished ground line, length and size of pipe, pipe grade, class of pipe and riprap and all pipe appurtenances (bends, elbows, reducers, increasers, anti-seepage diaphragms, etc.).

Consider temporary and permanent drainage for staged construction and bypasses.

Show utilities on profiles (water, sanitary, electric, gas, etc.) and label.

Show culvert profiles as well as storm sewer profiles.

Generally, use plastic pipe for temporary drainage. Consider adding additional plastic pipe to be used as directed by the Engineer.

When using 4020 structures or type B cones, designate the structure number at the center of casting and the corresponding center of structure (ie. center of casting 5313, center of structure 15313). Bracket these two structure numbers in the tabulation with a vertical bar to tie the information together.

General notes and the Casting Assembly Summary should appear on one of the Profiles and Tabulations Sheets. Additional Profiles and Tabulations Sheets should have a note stating where these items are located.

When there are multiple Drainage Profiles and Tabulations sheets, a Drainage Summary Tabulation should be provided and should be referenced on the Estimated Quantities.

Alignment, station and offset will be provided for each drainage structure on the Drainage Tabulation.

For footnotes that are repeated on several sheets, try to use the same footnote number for each of those notes on all sheets.

When connecting to an existing storm sewer pipe or existing drainage structure, provide appropriate pay item(s) as per the current Transport list. As an option, this can be incidental but must be consistent through out the Plan.

In Metro District, use only 3006 gasketed pipe for concrete circular pipe.

On large projects, it is helpful to provide a Storm Sewer Index.

26-JAN-2017 08:54

General Information continued:

For box culvert design, or box culvert extensions, contact the Bridge Office. (Obtain necessary request form from the Bridge Office.)

To improve the quality of our drainage structures, limit the use of masonry (block or sewer brick) field construction. Use pay items for precast drainage structures Design F or Design G without including the corresponding masonry alternatives Design A or Design C where feasible.

Sample Plan

DRAINAGE PROFILES AND TABULATIONS ----- CHECKLIST

- _____ 1. Culvert Treatments (Class I, II, III, or IV)
- _____ 2. Pipe Sewer Backfill
- _____ 3. Casting Assembly Summary
- _____ 4. Check cost split tab to make sure quantities are in the correct columns
- _____ 5. Class of proposed pipes and, if fill is added, in-place pipes
- _____ 6. Removals and plug, fill and abandon pipes and structures
- _____ 7. Water Resources notes for applicability
- _____ 8. Pipe options (such as PE, CS, CP, CVP, etc.)
- _____ 9. Note to use bent bolt with 816 grates
- _____ 10. Joint ties
- _____ 11. Note on steps for structures over 4.5'
- _____ 12. Bedding for pipes
- _____ 13. Sod, riprap, safety grates, trash guards and guide posts at inlets and outlets
- _____ 14. Geotextile filter under riprap
- _____ 15. Note to identify Design 3006 and provide proper pay item
- _____ 16. Note on slotted drain "includes pipe"
- _____ 17. Utilities shown on profiles
- _____ 18. Elevation references shown on profiles
- _____ 19. General Notes
- _____ 20. Structure Index
- _____ 21. Show class of pipe if other than Class II
- _____ 22. Cross references to other sheets (as applicable)
- _____ 23. Drawn by: and Checked by: Initials and Engineer's signature

REVISION DATE 12/28/16
 PLOTTED/REVISED: 26-JAN-2017 08:54

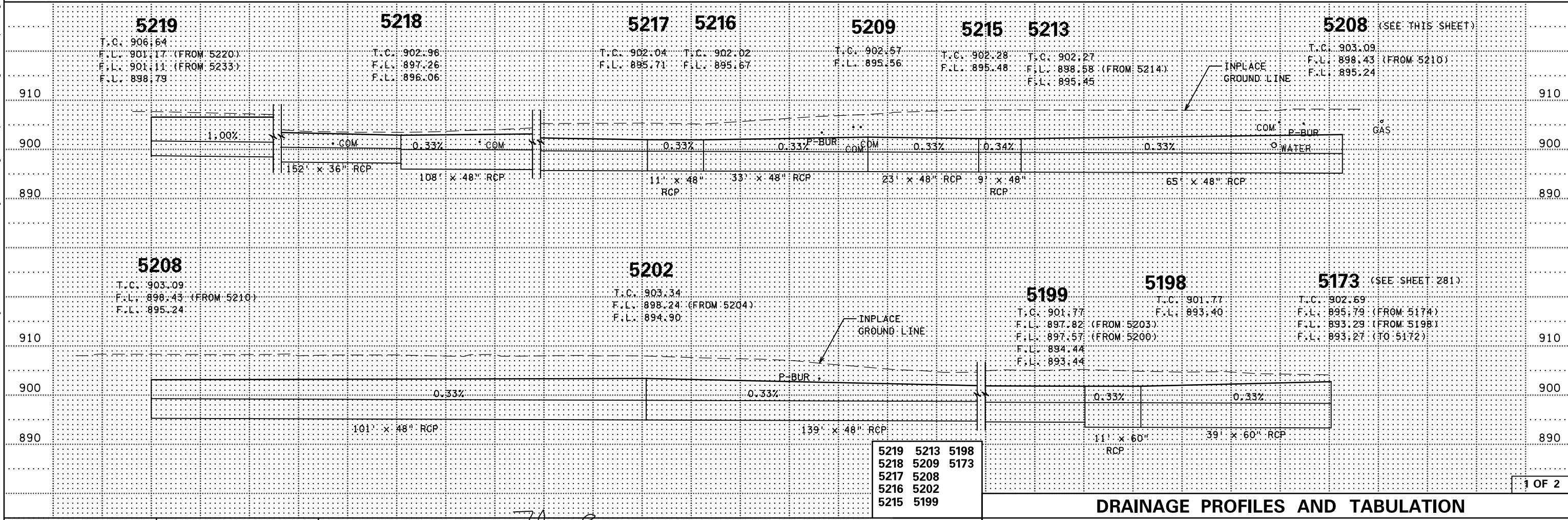
DRAINAGE TABULATION (THIS SHEET ONLY)

| STRUCTURE NO. | | STRUCTURE LOCATION | | | DRAINAGE STRUCTURES | | | | | | | | TOP OF CASTING ELEV. | OUTLET ELEV. | INLET ELEV. ② | 36" RCP CL II LIN FT | 48" RCP CL II LIN FT | 60" RCP CL II LIN FT | PLASTIC OPTION ⑤ | REMARKS |
|---------------|------|--------------------|----------|----------|---------------------|----------------|----------------|----------------|-----------------|-------------------------|-------------|---|----------------------|--------------|---------------|----------------------|----------------------|----------------------|------------------|---------|
| | | | | | PAY HEIGHT | | | | | CASTING ASSEMBLY TYPE ① | STEPS REQ'D | | | | | | | | | |
| | | | | | 66-4020 LIN FT | 72-4020 LIN FT | 78-4020 LIN FT | 96-4020 LIN FT | 120-4020 LIN FT | | | | | | | | | | | |
| 5219 | 5218 | SWRAMP | 20+39.75 | 7.0' RT | | | | | | | B-9 | Y | 906.64 | | | | | ③ | | |
| 15219 | 5218 | SWRAMP | 20+39.76 | 5.4' RT | CB | 7.8 | | | | | | | | 898.76 | 897.29 | 152 | | ④ | | |
| 5218 | 5217 | SWRAMP | 21+89.73 | 19.6' LT | | | | | | | B-9 | | 902.96 | | | | | ③ | | |
| 15218 | 5217 | SWRAMP | 21+89.79 | 17.8' LT | CB | | 6.8 | | | | | Y | | 896.05 | 895.72 | | 108 | ④ | | |
| 5217 | 5216 | SWCON | 12+90.16 | 11.5' RT | | | | | | | B-9 | | 902.04 | | | | | ③ | | |
| 15217 | 5216 | SWCON | 12+89.89 | 9.7' RT | CB | | 6.3 | | | | | Y | | 895.70 | 895.68 | | 11 | ④ | | |
| 5216 | 5209 | SWCON | 12+77.98 | 13.3' RT | | | | | | | B-9 | | 902.02 | | | | | ③ | | |
| 15216 | 5209 | SWCON | 12+77.64 | 11.5' RT | CB | | 6.3 | | | | | Y | | 895.66 | 895.57 | | 33 | ④ | | |
| 5209 | 5215 | SWCON | 12+49.44 | 9.6' LT | | | | | | | B-9 | | 902.57 | | | | | ③ | | |
| 15209 | 5215 | SWCON | 12+51.09 | 9.4' LT | CB | | 6.9 | | | | | Y | | 895.55 | 895.49 | | 23 | ④ | | |
| 5215 | 5213 | SWRAMP | 23+50.87 | 12.1' RT | | | | | | | B-9 | | 902.28 | | | | | ③ | | |
| 15215 | 5213 | SWRAMP | 23+48.83 | 11.1' RT | CB | | | 6.7 | | | | Y | | 895.47 | 895.46 | | 9 | ④ | | |
| 5213 | 5208 | SWRAMP | 23+60.91 | 11.8' RT | | | | | | | B-9 | | 902.27 | | | | | ③ | | |
| 15213 | 5208 | SWRAMP | 23+58.56 | 11.9' RT | CB | | | 6.7 | | | | Y | | 895.44 | 895.25 | | 65 | ④ | | |
| 5208 | 5202 | WB144 | 63+55.00 | 14.0' RT | | | | | | | B-9 | | 903.09 | | | | | ③ | | |
| 15208 | 5202 | WB144 | 63+55.02 | 16.9' RT | CB | | | | 7.8 | | | Y | | 895.22 | 894.92 | | 101 | ④ | | |
| 5202 | 5199 | EB144 | 63+18.97 | 14.0' LT | | | | | | | B-9 | | 903.34 | | | | | ③ | | |
| 15202 | 5199 | EB144 | 63+18.96 | 17.8' LT | CB | | | | | 8.4 | | Y | | 894.88 | 894.45 | | 139 | ④ | | |
| 5199 | 5198 | NWRAMP | 11+84.87 | 7.0' RT | | | | | | | B-9 | | 901.77 | | | | | ③ | | |
| 15199 | 5198 | NWRAMP | 11+84.90 | 4.1' RT | CB | | | | | 8.3 | | Y | | 893.43 | 893.42 | | 11 | ④ | | |
| 5198 | 5173 | NWRAMP | 11+94.87 | 7.0' RT | | | | | | | B-9 | | 901.77 | | | | | ③ | | |
| 15198 | 5173 | NWRAMP | 11+96.32 | 4.5' RT | CB | | | | | 8.3 | | Y | | 893.39 | 893.29 | | 39 | ④ | | |
| SHEET TOTALS | | | | | | 7.8 | 26.3 | 13.4 | 24.4 | 8.4 | | | | | | 152 | 489 | 50 | | |

SAMPLE PLAN

NOTES:
 STA. AND OFFSET IS AT
 - CENTER OF STRUCTURE UNLESS OTHERWISE NOTED.
 - END OF RC APRON, CS SAFETY APRON
 - END OF BARREL, CS PIPE
 FLOWLINE (F.L.) ELEVATIONS ARE AT CENTER OF STRUCTURE ON PROFILES.
 INLET AND OUTLET ELEVATIONS ON TABULATION ARE AT EDGE OF STRUCTURE.
 ALL CIRCULAR CONCRETE PIPE SEWER DESIGN 3006 GASKET JOINT PIPE.

- ① FOR CASTING ASSEMBLY KEY AND SUMMARY, SEE SHEET NO. 308.
- ② INLET ELEVATIONS AT DOWN-STREAM STRUCTURE.
- ③ CENTER OF CASTING.
- ④ CENTER OF STRUCTURE.
- ⑤ CP/PVC DENOTES CORRUGATED PLASTIC OR POLY VINYL CHLORIDE.
ALL JOINTS SHALL BE WATER TIGHT.



5219 5213 5198
 5218 5209 5173
 5217 5208
 5216 5202
 5215 5199

DRAINAGE PROFILES AND TABULATION

DISTRICT #: METRO
 IPLOT NAME: spdrnprof1
 FILENAME: Projects\DM_R0S\Non_Project\Design\SamplePlan\Eng\sh\drnprof.dgn

REVISION DATE 12/28/16
 PLOTTED/REVISED: 26-JAN-2017 08:55

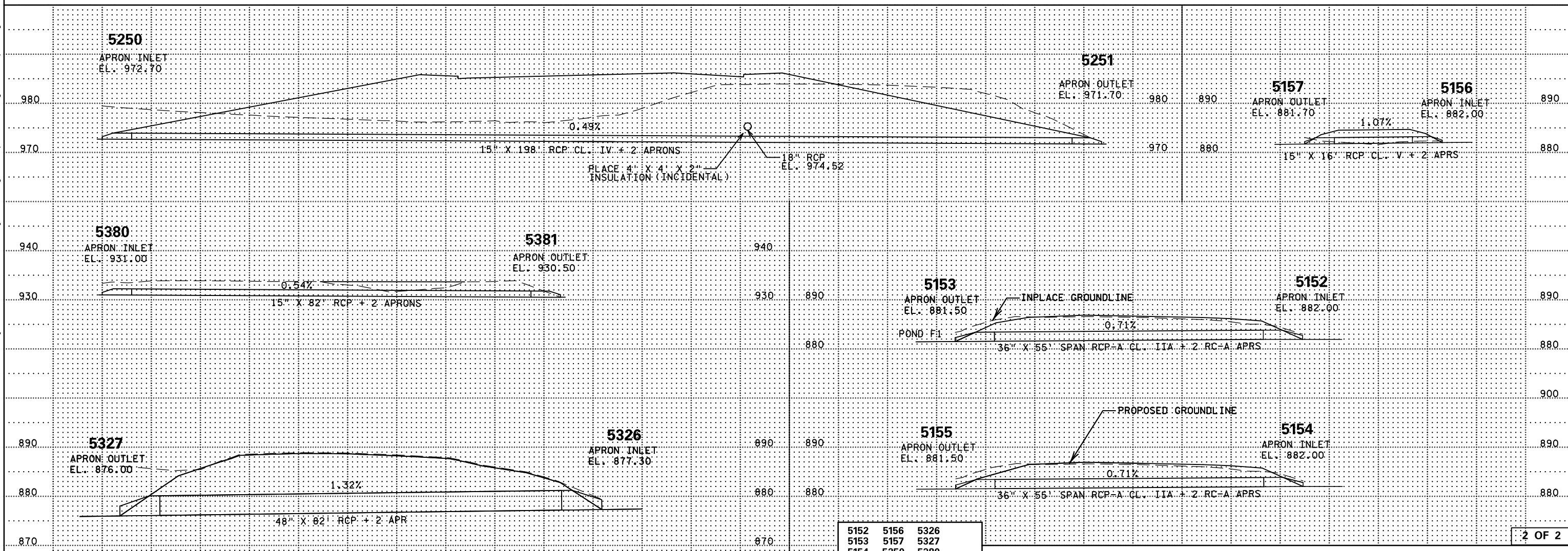
CULVERTS

GG

| STRUCTURE NO. | | LOCATION | | | ELEV. | 15" RCP CL II | 15" RCP CL V | 48" RCP CL II | 36" RCP-A CL IIA | APRON 1 | APRON TYPE | GUIDE POSTS TYPE B | REMARKS |
|---------------|----------|----------|-----------|-----------|--------|---------------|--------------|---------------|------------------|---------|-------------|--------------------|---------|
| FLows FROM | FLows TO | ALIGN. | STATION | OFFSET | | LIN FT | LIN FT | LIN FT | LIN FT | EACH | | EACH | |
| 5152 | 5153 | PSB10 | 680+38.65 | 32.4' RT | 882.00 | | | | 55 | 1 | RCP-A APRON | 1 | (2)(3) |
| 5153 | | PSB10 | 680+23.80 | 36.8' LT | 881.50 | | | | | 1 | RCP-A APRON | 1 | (1)(3) |
| 5154 | 5155 | PSB10 | 680+32.65 | 32.4' RT | 882.00 | | | | 55 | 1 | RCP-A APRON | 1 | (2)(3) |
| 5155 | | PSB10 | 680+17.80 | 36.8' LT | 881.50 | | | | | 1 | RCP-A APRON | 1 | (1)(3) |
| 5156 | 5157 | PSB10 | 681+00.00 | 42.0' LT | 882.00 | | 16 | | | 1 | RC APRON | 1 | (2) |
| 5157 | | PSB10 | 680+73.00 | 49.0' LT | 881.70 | | | | | 1 | RC SAFETY | 1 | (1)(3) |
| 5326 | 5327 | P694WB1 | 682+43.60 | 218.3' RT | 877.30 | | | 82 | | 1 | RC APRON | 1 | (2) |
| 5327 | | P694WB1 | 681+60.00 | 172.0' RT | 876.00 | | | | | 1 | RC APRON | 1 | (1) |
| 5380 | 5381 | PNBSNHAM | 20+83.00 | 122.6' RT | 931.00 | 82 | | | | 1 | RC APRON | 1 | (2) |
| 5381 | | PNBSNHAM | 20+38.55 | 200.3' RT | 930.50 | | | | | 1 | RC APRON | 1 | |
| TOTALS | | | | | | 82 | 16 | 82 | 110 | 10 | | 10 | |

SAMPLE PLAN

- NOTE: STA. AND OFFSET IS AT
 - END OF RC APRON, CS SAFETY APRON
 ALL CONCRETE CIRCULAR PIPE SEWER IS DESIGN 3006 GASKET JOINT PIPE.
- ① FOR APRON TREATMENT, SEE TABULATION ON SHEET NO. 29.
 - ② TIE ALL JOINTS.
 - ③ SAFETY APRON AND GRATE. SEE STANDARD PLATE 3128.
 - ④ STAGGER JOINTS AT CROSSING OF 2 PIPES. SEE SHEET NO. 363R FOR LOCATION. PROVIDE 4' X 4' X 2" INSULATION CENTERED ON PIPE CROSSING - INCIDENTAL.



| | | |
|------|------|------|
| 5152 | 5156 | 5326 |
| 5153 | 5157 | 5327 |
| 5154 | 5250 | 5380 |
| 5155 | 5251 | 5381 |

CULVERT TABULATION AND PROFILES

DISTRICT #: METRO
 IPLOT NAME: sdrnrprof2
 PATH & FILENAME: Projects\DM_ROS\Non-Project\Design\SamplePlan\English\drnrprof.dgn

REVISION DATE 12/28/16
 PLOTTED/REVISED: 26-JAN-2017 08:55

DISTRICT #: METRO
 IPLOT NAME: spdrnprof.sum
 PATH & FILENAME: Projects\DM_ROS\Non_Project\Design\SamplePlan\English\drnprof.dgn

STORM SEWER SUMMARY

U

| ITEM | UNIT | QUANTITIES FROM SHEET NO. | | | | | | | | | | | | | | TOTALS |
|------------------------------------------|--------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
| | | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | |
| 12" RC PIPE SEWER DESIGN 3006 | LIN FT | | 49 | | 187 | | | 37 | 257 | 241 | 120 | 267 | 104 | 344 | 169 | 1775 |
| 12" RC PIPE SEWER DESIGN 3006 CL III | LIN FT | | | | | | | | | | 89 | | 81 | | | 170 |
| 12" RC PIPE SEWER DESIGN 3006 CL IV | LIN FT | | | | | | | | | 56 | | 72 | | | | 128 |
| PLASTIC OPTION - 12" CP/PVC PIPE SEWER | LIN FT | | | | | | | | | | | | 81 | | | 81 |
| 15" RC PIPE SEWER DESIGN 3006 | LIN FT | 725 | 99 | 425 | 166 | 277 | 7 | 112 | 45 | 7 | | 474 | | 50 | 577 | 2964 |
| PLASTIC OPTION - 15" CP/PVC PIPE SEWER | LIN FT | | | 18 | | | | 61 | 45 | | | | | 40 | | 164 |
| 18" RC PIPE SEWER DESIGN 3006 | LIN FT | | 76 | 7 | | 279 | | | | | 121 | 260 | 203 | | 88 | 1034 |
| 18" RC PIPE SEWER DESIGN 3006 CL IV | LIN FT | | | | | | | | | | | | | | 13 | 13 |
| PLASTIC OPTION - 18" CP/PVC PIPE SEWER | LIN FT | | | 7 | | | | | | | | | | | 18 | 25 |
| 21" RC PIPE SEWER DESIGN 3006 | LIN FT | 107 | | 13 | 7 | | | 150 | | 33 | | | 180 | | | 490 |
| PLASTIC OPTION - 21" PVC PIPE SEWER | LIN FT | 107 | | | | | | | | 11 | | | | | | 118 |
| 24" RC PIPE SEWER DESIGN 3006 | LIN FT | 40 | | | 240 | | | 885 | 16 | | 287 | | | | | 1468 |
| 30" RC PIPE SEWER DESIGN 3006 | LIN FT | | | | | | | | 171 | | | | | | | 171 |
| 36" RC PIPE SEWER DESIGN 3006 | LIN FT | | | | | | | | 314 | | | | | | | 314 |
| 12" CP PIPE SEWER | LIN FT | | 78 | | | | | | | | | | | | | 78 |
| 12" RC PIPE APRON | EACH | | | | | | | | | 1 | 1 | | | | | 2 |
| 15" RC PIPE APRON | EACH | 2 | | | | | 1 | | | | | | | | | 3 |
| 18" RC PIPE APRON | EACH | | | | | | 1 | | | | 1 | | | | | 2 |
| 21" RC PIPE APRON | EACH | | | | 1 | | | | 1 | | | | | | | 2 |
| 24" RC PIPE APRON | EACH | 1 | | | | | | 1 | 1 | | 1 | | | | | 4 |
| 36" RC PIPE APRON | EACH | | | | | | | | 1 | | | | | | | 1 |
| 12" GS PIPE APRON | EACH | | 2 | | | | | | | | | | | | | 2 |
| GUIDE POST TYPE B | EACH | 3 | 2 | | 1 | 2 | 1 | 2 | 1 | 2 | 2 | | | | | 16 |
| CONNECT INTO EXISTING DRAINAGE STRUCTURE | EACH | | | | | | | | | | | 1 | 1 | | | 2 |
| CONNECT TO EXISTING STORM SEWER | EACH | | | | | | | | | | | | | | 1 | 1 |

DRAINAGE STRUCTURE SUMMARY

V

| ITEM | UNIT | QUANTITIES FROM SHEET NO. | | | | | | | | | | | | | | TOTALS |
|----------------------------------------|--------|---------------------------|------|------|------|------|-----|------|-----|------|------|------|------|------|------|--------|
| | | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | |
| CONST DRAINAGE STRUCTURE DES F | LIN FT | 5.8 | 18.4 | 16.6 | | 7.0 | | 16.3 | | | 8.3 | | | | 11.5 | 83.9 |
| CONST DRAINAGE STRUCTURE DES G | LIN FT | 9.8 | 8.1 | 10.3 | 13.2 | | | 8.2 | 3.4 | | 7.5 | 9.9 | | | | 70.4 |
| CONST DRAINAGE STRUCTURE DES H | LIN FT | | 6.4 | | | | | | | | | | | | | 6.4 |
| CONST DRAINAGE STRUCTURE DES SD-48 | LIN FT | 7.9 | 9.2 | | 15.7 | 14.0 | | 14.0 | 3.4 | 22.5 | 6.8 | 14.7 | 27.4 | 25.7 | 16.7 | 204.8 |
| CONST DRAINAGE STRUCTURE DES 48-4020 | LIN FT | | | 4.0 | | | | | | 6.5 | 19.5 | | 15.1 | 20.9 | 5.7 | 71.7 |
| CONST DRAINAGE STRUCTURE DES 54-4020 | LIN FT | 6.4 | | | 4.9 | 4.6 | | 5.0 | 5.1 | | | | | | | 26.0 |
| CONST DRAINAGE STRUCTURE DES 60-4020 | LIN FT | | | | 9.6 | | | 5.0 | 6.1 | | | | | | | 20.7 |
| CONST DRAINAGE STRUCTURE DES 66-4020 | LIN FT | | | | 4.5 | | | | 6.1 | | | | | | | 10.6 |
| CONST DRAINAGE STRUCTURE DES SPECIAL | EACH | | | | | | | | | | | 1 | | 2 | | 3 |
| CONST DRAINAGE STRUCTURE DES SPECIAL 1 | EACH | | | | | | | 1 | | | | | | | | 1 |
| CONST DRAINAGE STRUCTURE DES SPECIAL 2 | EACH | | | | | | | | 1 | | | | | | | 1 |
| CONST DRAINAGE STRUCTURE DES SPECIAL 3 | EACH | | | | | 1 | | | | | | | | | | 1 |
| CONST DRAINAGE STRUCTURE DES SPECIAL 4 | EACH | 1 | | | | | | | | | | | | | | 1 |
| CONST DRAINAGE STRUCTURE DES SPECIAL 5 | EACH | | | | | | | | | | | | | 1 | | 1 |
| CASTING ASSEMBLY | EACH | 7 | 9 | 7 | 12 | 6 | 7 | 7 | 7 | 6 | 7 | 10 | 10 | 6 | 9 | 110 |

SAMPLE PLAN

STORM SEWER & DRAINAGE STRUCTURE SUMMARIES

REVISION DATE 12/28/16
 PLOTTED/REVISED: 26-JAN-2017 08:55

DISTRICT #: METRO
 IPLOT NAME: spdrnprdfabs
 PATH & FILENAME: Projects\DM_ROS\Non_Project\Design\SamplePlan\English\drnprdf.dgn

CASTING ASSEMBLY KEY AND SUMMARY

| ASS'Y. | ASS'Y. REQ'D. | CASTING NUMBER | STANDARD PLATE |
|--------|---------------|------------------------------------------------|----------------|
| A-7D | 25 | RING CASTING NO. 700-7 COVER CASTING 715 | 4101 4110 |
| B-9 | 11 | FRAME CASTING NO. 805 GRATE CASTING NO. 816 | 4132 4154 |
| D-4 | 71 | FRAME CASTING NO. 805 GRATE CASTING NO. 816 | 4132 4154 |
| M-11 | 3 | FRAME AND GRATE CASTING NO. 731 | 4143 |

SAMPLE PLAN

| SLOTTED DRAIN | | | | W |
|------------------------|------------------------|----------------------|-----------------------|---------|
| STATION TO STATION | STRUCTURE TO STRUCTURE | LOCATION | 15" PVC SLOTTED DRAIN | REMARKS |
| | | | ① LIN FT | |
| LMWB494 | | | | |
| 502+50 TO 506+50 | 5597 TO 5603 | 25.3' LT TO 33.4' LT | 400 | |
| 506+50 TO 510+50 | 5603 TO 5594 | 33.4' LT TO 41.3' LT | 400 | |
| 510+50 TO 514+17.25 | 5594 TO 5591 | 41.3' LT TO 44.2' LT | 365 | ⑨ |
| 514+95 TO 517+37 | 5578 TO 5584 | 25.0' LT TO 28.4' LT | 242 | |
| 517+37 TO 519+16 | 5584 TO 5574 | 28.4' LT TO 34.4' LT | 179 | |
| 519+16 TO 521+50 | 5574 TO 5570 | 34.4' LT TO 41.0' LT | 234 | |
| 521+50 TO 524+43 | 5570 TO 5560 | 41.0' LT | 292 | |
| 525+50 TO 527+60.32 | 5556 TO 5552 | 41.0' LT TO 51.8' LT | 211 | |
| 534+29.84 TO 536+34.08 | 5541 TO 5527 | 84.0' LT TO 60.5' LT | 207 | ② |
| 536+34.08 TO 540+41 | 5527 TO 5526 | 60.5' LT TO 33.5' LT | 410 | |
| 545+35 TO 548+39.60 | 5520 TO 5519 | 33.0' LT | 305 | |
| 548+39.60 TO 551+75 | 5519 TO 5518 | 33.0' LT | 335 | |
| S.P. 2785-364 TOTALS | | | 3580 | |

| MISCELLANEOUS POND ITEMS ⑤ | | | | | | X |
|----------------------------|-----------------------|----------------------------|------------------------|----------------------------|-------------------------------|---------|
| LOCATION | FILTER TOPSOIL BORROW | COMMON BORROW SPECIAL (CV) | RANDOM RIPRAP CLASS II | GEOTEXTILE FILTER TYPE III | TURF REINFORCEMENT CATEGORY 1 | REMARKS |
| | CU YD | CU YD | CU YD | SQ YD | SQ YD | |
| UPPER POND | | 53 | | | | |
| LOWER POND | 82 | 160 | 22 | 69 | | |
| WEST DRY POND | | 334 | 15 | 40 | 1694 | |
| TOTALS | 82 | 547 | 37 | 109 | 1694 | |

| PERFORATED PVC PIPE DRAIN | | | | | Z |
|---------------------------|------------------|------------------------|-------------------------|---------|---|
| STATION TO STATION | LOCATION | 8" PERF PVC PIPE DRAIN | 12" PERF PVC PIPE DRAIN | REMARKS | |
| | | LIN FT | LIN FT | | |
| LMWB494 | | | | | |
| 578+95 TO 579+22 | 20' LT TO 27' LT | 27 | | ⑦ | |
| 579+15 TO 579+22 | 37' LT TO 20' LT | | 11 | ⑧ | |
| 579+22 | 48' LT TO 27' LT | | 21 | ⑧ | |
| S.P. 2785-364 TOTALS | | 27 | 32 | | |

| TREATMENT FOR APRON OUTLETS | | | | | | | | | | Y |
|-----------------------------|----------------|-----------|-----------|-----------|-------------------------|------------------------|-------------------------|---------------------------|-----------------------------|---------|
| APRON NO. | PIPE SIZE (IN) | ALIGNMENT | STATION | OFFSET | LOCATION | RANDOM RIPRAP CLASS II | RANDOM RIPRAP CLASS III | GEOTEXTILE FABRIC TYPE IV | SODDING TYPE SALT RESISTANT | REMARKS |
| | | | | | | ③ CU YD | ③ CU YD | ④ SQ YD | ⑥ SQ YD | |
| 5094 | 12 | STOWNDR | 21+24.23 | 108.2' LT | SOUTHWEST OF XERXES AVE | 3.0 | | 7.3 | | |
| 5462 | 12 | LMWB494 | 540+18.00 | 76.0' LT | TO WEST LOWER POND | | | | 9 | |
| 5465 | 12 | LMWB494 | 545+44.00 | 79.3' LT | TO EAST LOWER POND | | | | 9 | |
| 5100 | 21 | P-XERXES | 90+34.38 | 91.8' LT | TO UPPER POND | | 6.7 | 15.1 | | |
| 5502 | 12 | LMWB494 | 554+94.00 | 62.5' LT | TO DITCH | | | | 9 | |
| 5509 | 18 | LMWB494 | 557+00.00 | 59.5' LT | TO DITCH | | | | 11 | |
| 5515 | 36 | LMWB494 | 545+30.00 | 54.5' LT | TO LOWER POND | | 14.5 | 15.1 | | |
| 5537 | 18 | RAMPBB2 | 16+32.00 | 97.0' RT | TO FRANCE DRY POND | | | | 11 | |
| 5601 | 24 | LMWB494 | 507+58.02 | 87.5' LT | TO WEST DRY POND | | | | 15 | |
| 5608 | 15 | LMWB494 | 507+10.00 | 134.0' LT | OUT OF WEST DRY POND | | | | 9 | |
| TOTALS | | | | | | 3.0 | 21.2 | 37.5 | 73 | |

- ① INCLUDES BENDS, CONNECTIONS TO STRUCTURES AND SLOTTED VANE DRAIN GRATE ASSEMBLY TO BE PLACED AT 26' SPACING ON CENTER OF PIPE. FOR DETAILS, SEE SHEET NO. 143 AND STANDARD PLATE 3136.
- ② LOCATED IN LEFT GUTTER OF RAMPBB2.
- ③ FOR DETAILS, SEE STANDARD PLATE 3133. RIPRAP IS TO EXTEND 2 FEET UNDER THE PIPE APRON.
- ④ FOR DETAILS, SEE STANDARD PLATE NO. 3133.
- ⑤ FOR DETAILS, SEE SHEET NO. 144.
- ⑥ SEE STANDARD PLATE NO. 9102.
- ⑦ EXTEND EXISTING PIPE DRAIN FROM INPLACE STRUCTURE TO NEW STRUCTURE.
- ⑧ REPLACE EXISTING PIPE DRAIN WITH NEW. REMOVAL OF EXISTING PIPE DRAIN INCIDENTAL.
- ⑨ FOR DETAILS AND TABULATION OF WATERMAIN INSULATION UNDER SLOTTED DRAIN, SEE SHEET NO. 146.

MISC POND ITEMS
 CASTING ASSEMBLY KEY AND SUMMARY
 SLOTTED DRAIN
 TREATMENT FOR APRON OUTLETS
 PERFORATED PVC PIPE DRAIN

MISCELLANEOUS DRAINAGE TABULATIONS