PRELIMINARY CONSTRUCTION PLANS
FOR
THE CONSTRUCTION OF
RED LAKE WATERSHED DISTRICT DRAIN NO. 17
JANUARY 2019
PROJECT CONSISTS OF THE CONSTRUCTION OF 9.2 MILES OF RED LAKE
WATERSHED DISTRICT DRAIN NO. 17, CMP CULVERTS & INCIDENTALS

RED LAKE WATERSHED DRAIN NO. 17 PROJECT LOCATION

PROJECT NOTES
PROJECT DATUM/BENCHMARK: NAVD 1988 - HGS Benchmark 40718 located
east of Minnesota Highway No. 220 and north of 110th Street NW = 819.34
(NAVD 88)
PROJECT LENGTH = Approx. 9.2 miles
UTILITY LOCATIONS: All utility locations shown on this plan are approximate.
Contractor shall notify Gopher State One-Call for locations (1-800-252-1166) 48
hours, 2 working days, not including holidays or weekends prior to any
excavation on site.

I hereby certify that this plan, specification, or report was prepared by me or
under my direct supervision and that I am a duly Registered Engineer under
the laws of the State of Minnesota.

Gerald D. Pribula
Minnesota License No. 13448
Date: January 18, 2019
SURFACE WATER INLET INSTALLATION DATA

NOTES:
1. That part of the spoil which is directly above the structure shall be maintained at elevation "E".
2. Flared end sections are required on the ends of all surface water inlet pipes. Flared end sections shall be in accordance with the standards of the industry and shall be compatible with the shape and class of pipe used.
3. For pipes having a diameter of 24 inches or less the flared end section shall be attached to the pipe by a rod connection. For pipes having a diameter greater than 24 inches the flared end section shall be attached to the pipe by a connecting band.
4. All pipe lengths shown are nominal lengths.
5. After the pipe and fittings are placed, the initial backfill under the pipe haunch (lower third) free of rocks and soil clods over 3 inches shall be placed in 6 inch horizontal lifts before compaction. The backfill shall be compacted by hand tampering or by manually directed power tampers or plate vibrators to an elevation 2 feet above the top of pipe. Fill material over pipe haunch shall be free of rock and soil clods over 4 inches in diameter in lifts of 9 inches before compaction. Final fill material shall be compacted to a density equal to adjoining undisturbed ground. Dozer compaction will require at a minimum complete coverage of area with the track and lifts not to exceed 5 inches before compaction.
6. Fill material shall be placed alternately on each side of the pipe at equal elevations. Hand equipment or mechanical tampers are required for final fill compaction. The moisture content of the backfill material should form a ball when kneaded by hand and will not readily separate.
7. Connecting bands shall be free of soil during installation and tapped with a mallet while tightening to insure a tight joint.
8. Trench depths greater than 5 feet require OSHA approved trenching procedures.

TYPICAL SECTION ALONG CENTERLINE OF CMP CONDUIT

SECTION AA-AA

SECTION BB-BB

TYPICAL SECTION SHOWING EXCAVATION AND BACKFILL FOR FIELD INLET CULVERT

PIPE OUTLET CROSS SECTION
POLK CSAH 65

65' POLK CSAH 65
55' TO CENTER DITCH

STA 507+70 SWALE
INSTALL 18" FIELD INLET W/ EXT. FLAPGATE

65' POLK CSAH 65
55' TO CENTER DITCH

STA 497+50 SWALE
INSTALL 18" FIELD INLET W/ EXT. FLAPGATE

STA 491+70 SWALE
INSTALL 18" FIELD INLET W/ EXT. FLAPGATE

STA 514+40 SWALE
INSTALL 18" FIELD INLET W/ EXT. FLAPGATE

STA 510+00 SWALE
INSTALL 18" FIELD INLET W/ EXT. FLAPGATE

STA 502+40 SWALE
INSTALL 18" FIELD INLET W/ EXT. FLAPGATE

STA 500+40 SWALE
INSTALL 18" FIELD INLET W/ EXT. FLAPGATE

STA 478+00 SWALE
INSTALL 18" FIELD INLET W/ EXT. FLAPGATE

STA 360TH AVE SW
350TH AVE SW

STA 533+63 & 534+63
2 - 24" X 90' CMP CULVERT (N)
2 - 24" X 60' CMP CULVERT (S)
(2 X 12) 16 GA.
8 - 24" END SECTIONS
CULVERT NO. 13
STA 534+13 - 350TH AVE SW
2 - 53" X 41" X 70' CMAP (3X1)
CULVERTS W/ 2:1 STEP BEVELS
12 CY RIP-RAP

STA 281+24 - 360TH AVE SW
2 - 53" X 41" X 60' CMAP (3X1)
CULVERTS W/ 2:1 STEP BEVELS
12 CY RIP-RAP

ELEVATION
820
830
840
850
860

CHANNEL STA 481+24 TO 534+13
A = 6.25 SQUARE MILES
IN SLOPE = 1:5
BACK SLOPE = 1:4
BOTTOM = 10 FT
MANNING = 0.04
CHANNEL SLOPE = 0.0007
Q10 = 125 CFS
CHANNEL DEPTH AT Q10 = 3.25 FT
CHANNEL VELOCITY AT Q10 = 1.5 FT/S

CULVERT NO. 13 - 350TH AVE SW
INSTALL 2 - 53" X 41" X 70' CMAP - 140 LF W/ 2:1 STEP BEVELS
(OPEN CUT INSTALLATION)
W. INV. - 844.38
E. INV. - 844.43

CHANNEL SLOPE = 0.0007
Q10 = 125 CFS
CHANNEL DEPTH AT Q10 = 3.25 FT
CHANNEL VELOCITY AT Q10 = 1.5 FT/S
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<th>Total Volume</th>
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**Total Volume Table**

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**Cumulative Cut Vol**

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