WSB & Associates, Inc.
engineering • planning • environmental • construction

701 Xenia Avenue South
Suite 300
Minneapolis, MN 55416
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September 1, 2015

Ms. Laura Jester and Ms. Karen Chandler
Bassett Creek Watershed Commission
16145 Hillcrest Lane
Eden Prairie, MN 55346

Re: Honeywell Enhancement/Improvement Project - 50% Submittal

Dear Ms. Jester and Ms. Chandler:

We are currently in the final design phase of the Honeywell Pond Enhancement/Improvement Project. The 50% plans are consistent with the proposed design in the feasibility report, which was approved at the October 16, 2014 Board meeting. Refer to **Table 1** for key design aspects between exiting condition, the feasibility report, and the proposed design along with explanations for any differences.

1. **General Pond Design**
   The design of the Honeywell Pond is consistent with the improvements identified in the feasibility report. One slight change from the feasibility report to the 50% design is that the general design of the pond has more of an undulating edge then what was originally proposed. See the attached plan detail for more details. In addition, the existing XP-SWMM model was updated to reflect the proposed trunk storm sewer system and the outlet from Douglas Drive to Bassett Creek. A further comparison of the 50% design and the feasibility report are outlined in the table below.

Table 1: Pond Design

	Feasibility Report		Final Design	
	Existing Condition	Proposed Condition	Existing Condition	Proposed Condition
NWL (Outlet Elevation) (ft)	876.4	876.4	876.4	876.4
Pond Surface Area at NWL (ac)	1.5	2.4	1.5	2.4
100 Year HWL (Atlas 14) (ft)	884.2	884.2	884.6*	884.6
Peak Flow Rate to Bassett Creek (cfs)	103.5	102.9	85.7*	85.4
Pond Surface Area at HWL (ac)	3.6	3.6	3.6	3.6
Dead Pool Volume (ac-ft)	3.7	12.6	3.7	11.2
Live Pool Volume (ac-ft)	22	25.8	22	29.5
Honeywell Pond Drainage Area (ac)	725	785	702	768
TP removed (lb/yr)	36.3	51.6	36.3	60.9
Percent TP Removed (%)	17.3	23.4	17.3	24.1
Buffer	NA	10 foot 10:1 buffer around entire pond	NA	10 foot 10:1 buffer around entire pond
Undulating edge	slight	slight	slight	undulating

* The existing conditions XP-SWMM model was updated to better reflect the "actual conditions" from Douglas Drive to Bassett Creek. Two 42 inch links were added to the downstream end of link PQ29-MH127. The first link is 429 feet and placed at a 1.08 percent grade while the second link is 884 feet and placed at a 0.75 percent grade. Data for these two links was gathered from record drawings of the system from Douglas Drive to Bassett Creek. The model used in the feasibility did not contain this update.

2. **Low Flow Diversion Structure**
The design of the low flow diversion structure in the 50% plan is consistent with the feasibility report. See the attached plan detail for further information on the low flow diversion structure and weir.

3. **TP Removals (Expanding Pond and 48 inch Low Flow Diversion and 4 foot Weir)**
The September 2014 version of the feasibility report had a 48 inch low flow diversion system **without** a weir. The September P8 model demonstrated that the pond would remove 23.4% TP (51.6 lb/yr). The October 2014 version of the feasibility report had a 48 inch low flow diversion system **with** a 4 foot weir. The October P8 model demonstrated that the pond would remove 24.5% TP (61.9 lb/yr). The feasibility report included the 51.6 lb/yr value not the 61.9 lb/yr value. The feasibility report should have shown a 24.5% TP (61.9 lb/yr) for the 48 inch low flow diversion system **with** a 4 foot weir.

4. **Pumping for Irrigation of Sandburg Fields**
A water balance was developed using available volume in Honeywell Pond (first 1.5 feet below the NWL) and irrigation demand at Sandburg Fields. The water balance assumes 1 inch of irrigation will occur per week over 17 acres of fields. This results in an irrigation demand of 462,000 gallons per week. Analysis completed using 50 years of rainfall runoff data shows the proposed irrigation system and infiltration system will only have 6.0 days/year that the pond's pump will not be able to meet the estimated irrigation demand (the first 1.5 feet below the NWL are used). This allows for the following:

- Volume available to be pumped for approximately 2.5 weeks without rain
  - The drawdown from upstream storage basins following a rainfall event will extend the timeframe where volume is available for pumping
- The pumping volume will fully replenish (if down the full 1.5 feet) with a 0.35 inch rain event

Table 2: Irrigate Sandburg Learning Center Fields

	Feasibility Report	Final Design*
Pumping Below NWL (ft)	1.5	1.5
Volume of Water available to pump (ac-ft)	3.37	3.37
Acres of irrigation (ac)	14	17
Volume of water needed to irrigate per season (ac-ft)	13.25-26.52	28.3
TP removed (lb/yr)	5.77 - 11.54	12.3
Seed mix to be used in the 1.5 foot pond bounce zone	Not Stated in Report	33-261

* Assumes 1 inch per week

5. **Additional Stormwater Management with Douglas Drive**

Pumping for Douglas Drive Infiltration (Not Part of Honeywell Project)
90% plan submittal is anticipated to include the construction of an underground infiltration system at 1576 Douglas Drive N. It is currently proposed to pump water to the infiltration system from

Honeywell Pond. The infiltration system is proposed to be located (at 1576 Douglas Drive N) where a house was recently removed as part of the project's right-of-way acquisition. There are three main reasons for this change. This is feasible for the following reasons:

- The water balance calculations for Honeywell Pond shows the volume of water available to be pumped is more than adequate for both irrigating the Sandburg Fields and for the Douglas Drive Infiltration System.
- CenterPoint Energy is abandoning a conduit under the rail road tracks. This conduit can be used to house the force main under the tracks avoiding the need for drilling under the tracks.
- Using water from Honeywell Pond will utilize pretreated stormwater which will extend the life of the infiltration system and reduce maintenance time and cost.

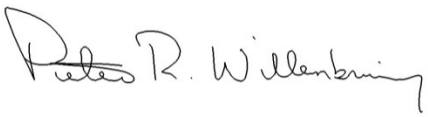
Table 3: Pump to Douglas Dr Infiltration System

	Feasibility Report	Final Design
Size of the Douglas Drive infiltration system (ac)	0.195	0.11
Storage volume of the Douglas Drive infiltration system (ac-ft)	Not Stated in Report	0.1
Assumed infiltration rate of Douglas Drive Infiltration System (in/hr)	0.4	0.4
Volume of water infiltrated at Douglas Drive Infiltration System per season (ac-ft)	Not Stated in Report	5-9
TP removed (lb/yr)	2.04 - 4.08	2-4

As outlined in this memo, we feel the 50% plan is fully consistent with the design expectations in the feasibility report. If you have any questions or concerns feel free to contact me at 763-287-7188 or at pwillenbring@wsbeng.com.

Sincerely,

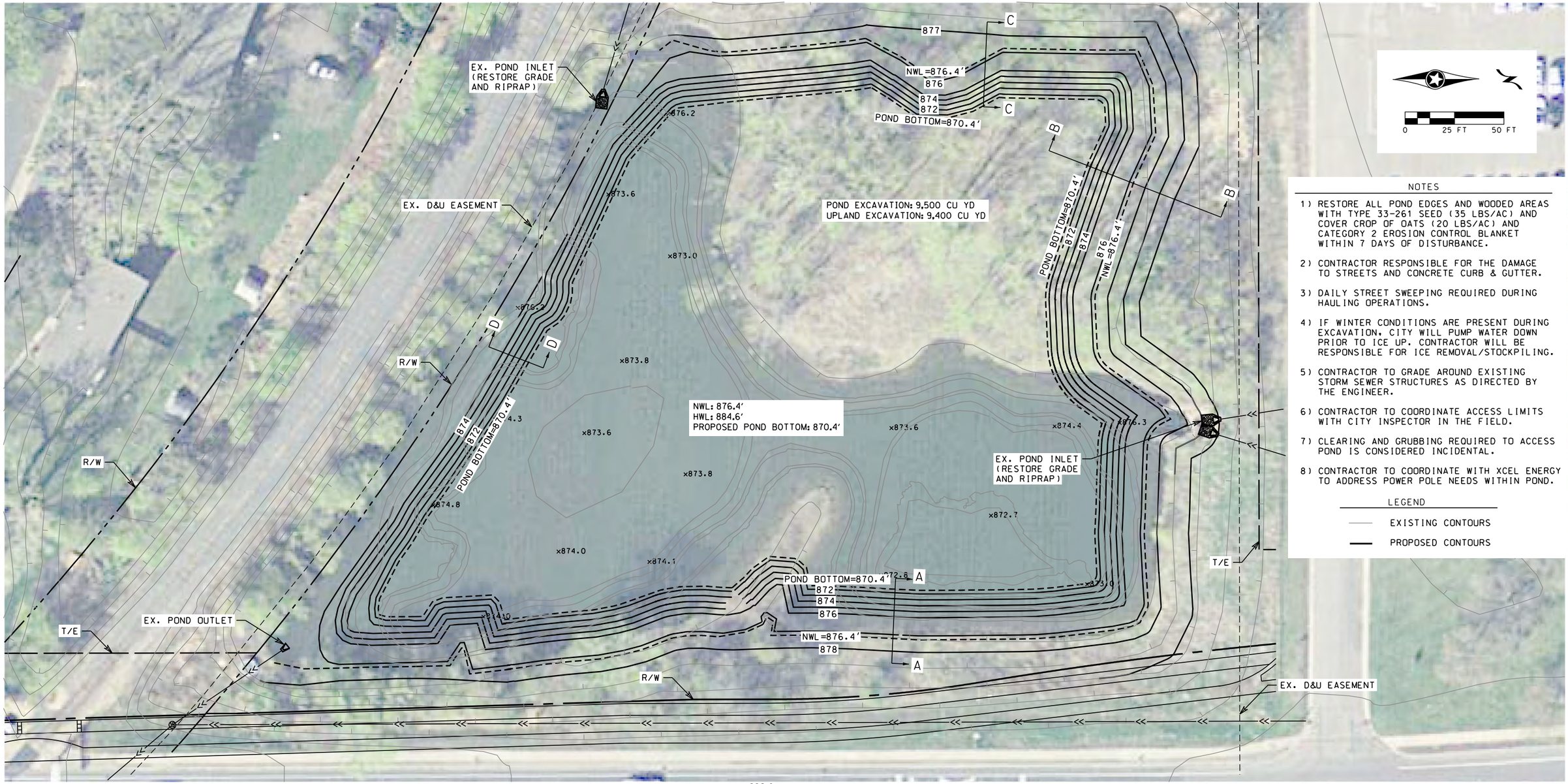
WSB & Associates, Inc.



Pete Willenbring, PE
Water Resources Vice President

Attachments

- 50% Plan (0701Honeywell.pdf)
- Existing Conditions XP-SWMM model – (Decola_UTM_Stor_Closed_EC_FINAL_Ex100114.xp)
- Proposed Conditions XP-SWMM model (Decola_UTM_Stor_Closed_EC_FINAL_Ex100114_ForFinalDesign_072815.xp)
- Existing Conditions P8 model (UpstreamEastWestwood_rev08142014__Existing.p8c)
- Proposed Conditions P8 model (UpstreamEastWestwood_rev073015__Proposed Pond Expansion +low flow 48in with weir_FINAL.p8c)



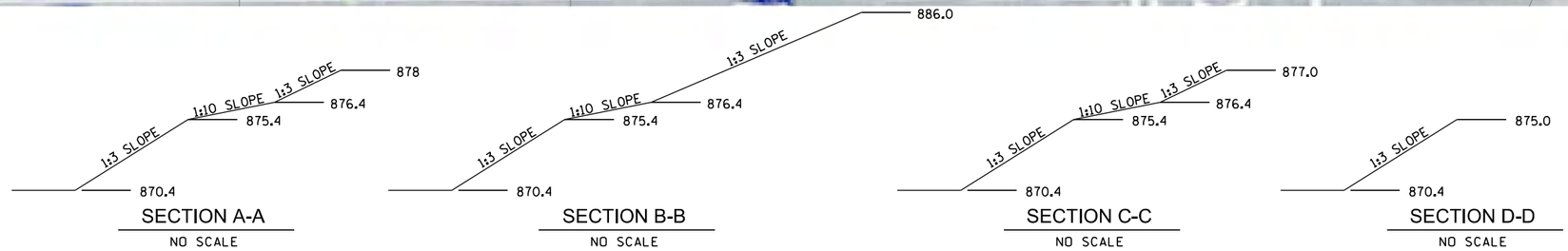
NOTES

1) RESTORE ALL POND EDGES AND WOODED AREAS WITH TYPE 33-261 SEED (35 LBS/AC) AND COVER CROP OF OATS (20 LBS/AC) AND CATEGORY 2 EROSION CONTROL BLANKET WITHIN 7 DAYS OF DISTURBANCE.
2) CONTRACTOR RESPONSIBLE FOR THE DAMAGE TO STREETS AND CONCRETE CURB & GUTTER.
3) DAILY STREET SWEEPING REQUIRED DURING HAULING OPERATIONS.
4) IF WINTER CONDITIONS ARE PRESENT DURING EXCAVATION. CITY WILL PUMP WATER DOWN PRIOR TO ICE UP. CONTRACTOR WILL BE RESPONSIBLE FOR ICE REMOVAL/STOCKPILING.
5) CONTRACTOR TO GRADE AROUND EXISTING STORM SEWER STRUCTURES AS DIRECTED BY THE ENGINEER.
6) CONTRACTOR TO COORDINATE ACCESS LIMITS WITH CITY INSPECTOR IN THE FIELD.
7) CLEARING AND GRUBBING REQUIRED TO ACCESS POND IS CONSIDERED INCIDENTAL.
8) CONTRACTOR TO COORDINATE WITH XCEL ENERGY TO ADDRESS POWER POLE NEEDS WITHIN POND.

LEGEND

EXISTING CONTOURS

PROPOSED CONTOURS



NO.	DATE	BY	CHK	REVISIONS

Design By: AJP
Plan By: ACJ
Checked By: DRS
Approved By: AJP

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DRAFT

CERTIFIED BY _____
LICENSED PROFESSIONAL ENGINEER - ANDREW PLOWMAN, PE
DATE: 1/27/15 LIC. NO: 44200

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city of golden valley

Douglas Drive Improvements
Golden Valley, Minnesota

GOLDEN VALLEY, MINNESOTA

GRADING PLAN
S.A.P. 128-020-016,ETC./CITY PROJECT NO. 10-04

SHEET **GP1** OF **220** SHEETS

Date Printed: 8/6/2015
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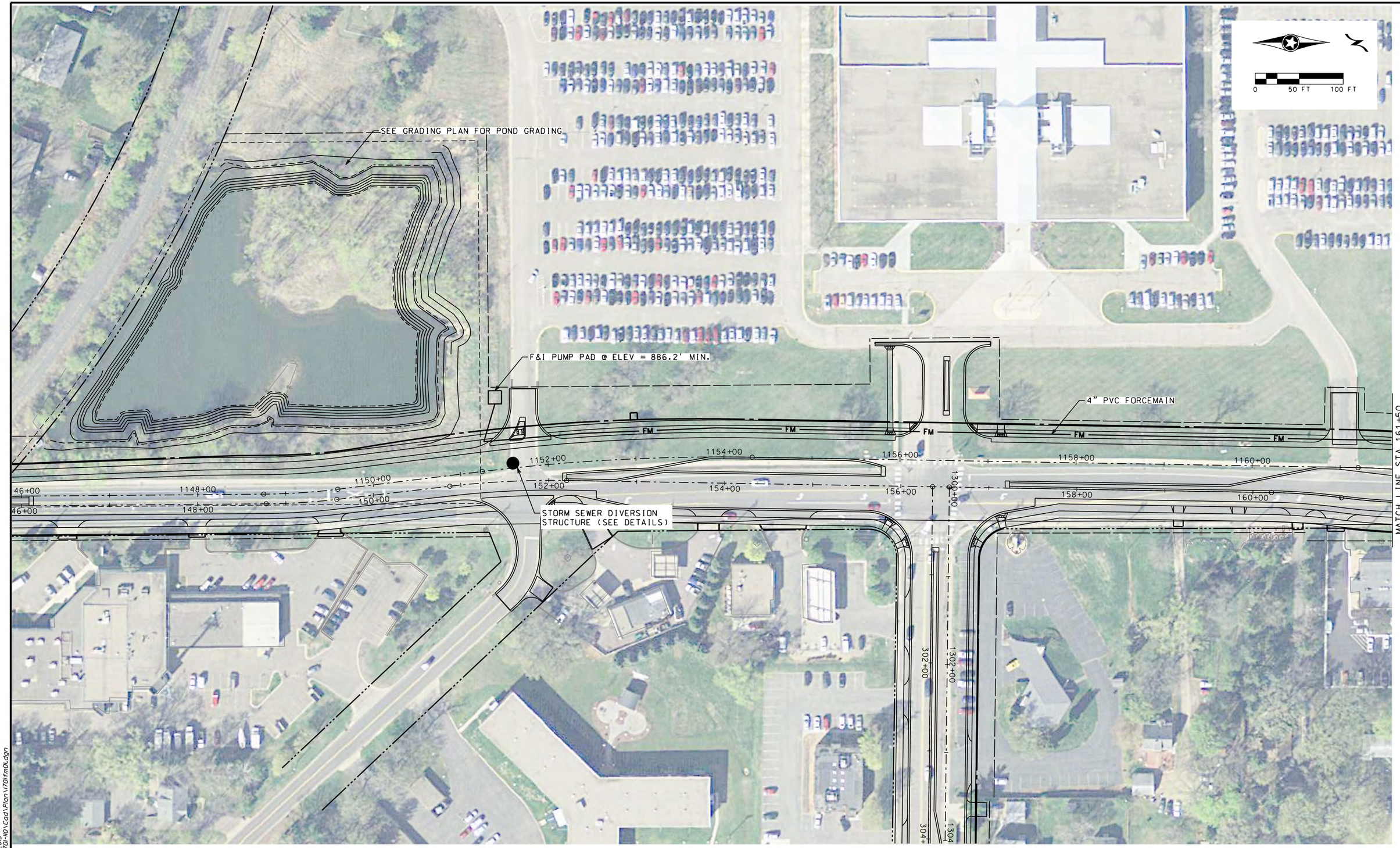

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FORCEMAIN PLAN
S.A.P. 128-020-016,ETC./CITY PROJECT NO. 10-04

SHEET **FM1** OF **220** SHEETS

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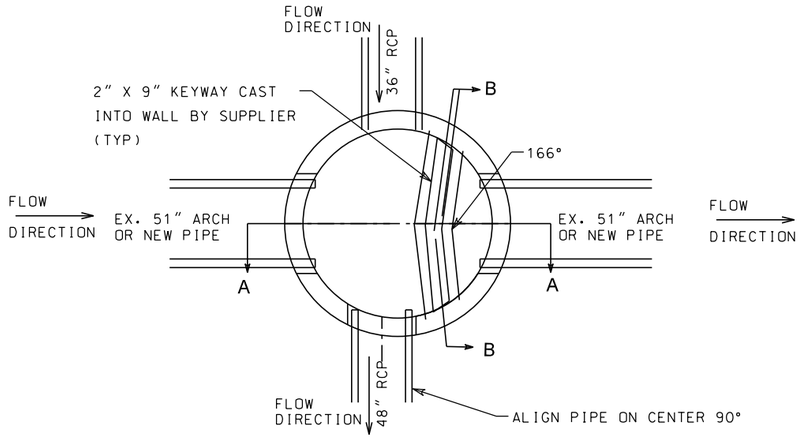
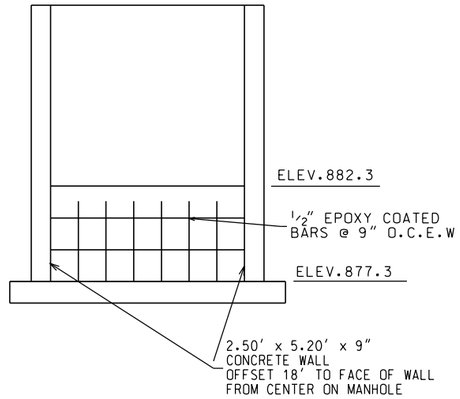
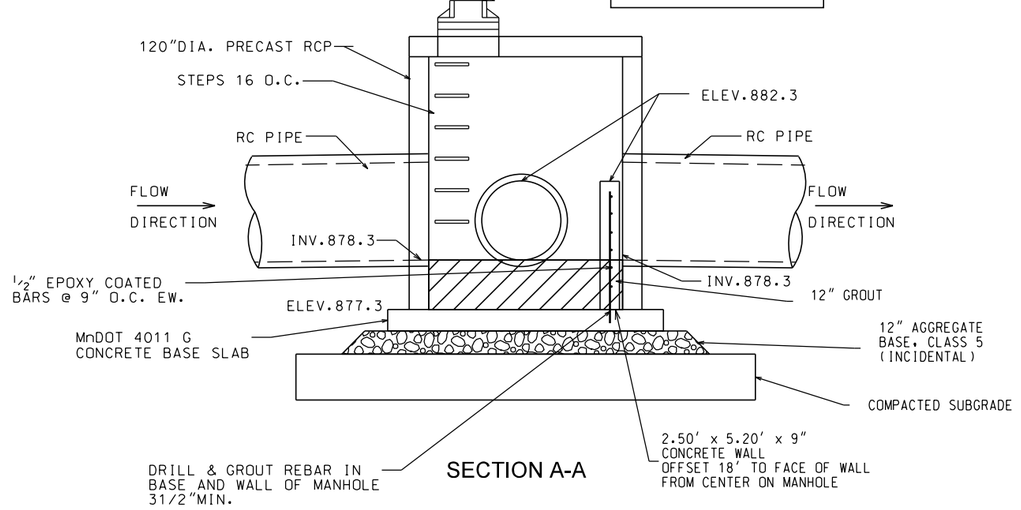
SHEET **FM2** OF **220** SHEETS



PLAN



SECTION B-B



SECTION A-A

NOTE: SEE DRAINAGE PLANS FOR PIPE PROFILES

STORM SEWER DIVERSION STRUCTURE
DESIGN SPECIAL 3

NOT TO SCALE

Date Printed: 8/6/2015
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NO.	DATE	BY	CHK	REVISIONS

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Plan By: ACJ
Checked By: DRS
Approved By: AJP

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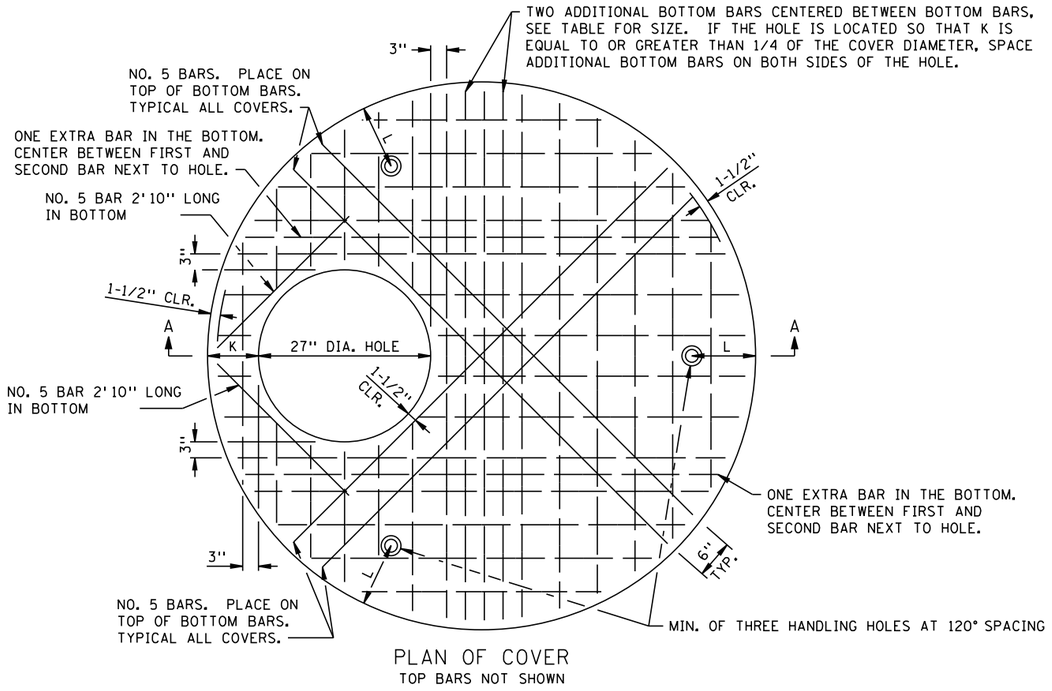
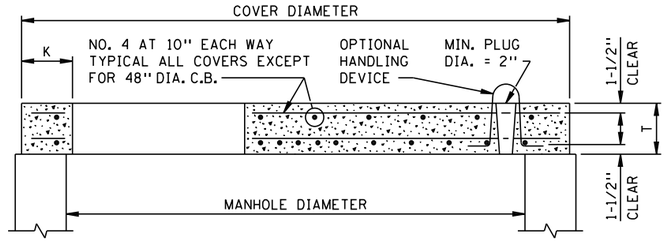
DRAINAGE DETAILS
S.A.P. 128-020-016,ETC./CITY PROJECT NO. 10-04

SHEET **DRD1** OF **220** SHEETS



PLAN OF COVER
TOP BARS NOT SHOWN



SECTION A-A

TABLE

	C.B. OR M.H. DIA.	COVER DIAMETER	WEIGHT OF SECTION	T	K	L	BOTTOM BARS EACH WAY
(1)	48"	58"	1140 LBS.	6"	6"	8"	NO. 5 AT 6"
	54"	65"	1990 LBS.	8"	6"	8"	NO. 5 AT 8"
	60"	72"	2510 LBS.	8"	7"	9"	NO. 5 AT 7"
	66"	79"	3090 LBS.	8"	7"	9"	NO. 5 AT 7"
	72"	86"	3720 LBS.	8"	8"	10"	NO. 5 AT 6"
	78"	93"	4400 LBS.	8"	8"	10"	NO. 5 AT 5"
	84"	100"	5140 LBS.	8"	9"	11"	NO. 5 AT 5"
	90"	107"	5930 LBS.	8"	9"	11"	NO. 5 AT 5"
	96"	114"	6770 LBS.	8"	9"	11"	NO. 6 AT 6"
	102"	121"	7670 LBS.	8"	9"	12"	NO. 6 AT 5"
	108"	126"	12520 LBS.	12"	10"	12"	NO. 5 AT 6"
	120"	140"	15560 LBS.	12"	11"	13"	NO. 5 AT 6"

(1) ONLY NECESSARY TO USE BOTTOM LAYER OF STEEL.

NOTES:

AASHTO HS 25 LOADING.

MAXIMUM FILL HEIGHT 15 FT.

THE NO. 4020 SHALL BE PERMANENTLY MARKED ON THE TOP OF THE COVER.

EQUIVALENT STEEL AREAS IN WIRE MESH MAY BE USED.

REINFORCEMENT PER SPEC. 3301, GRADE 60. ANY STEEL REINFORCEMENT THAT IS WELDED DURING FABRICATION SHALL MEET THE REQUIREMENTS OF ASTM A706.

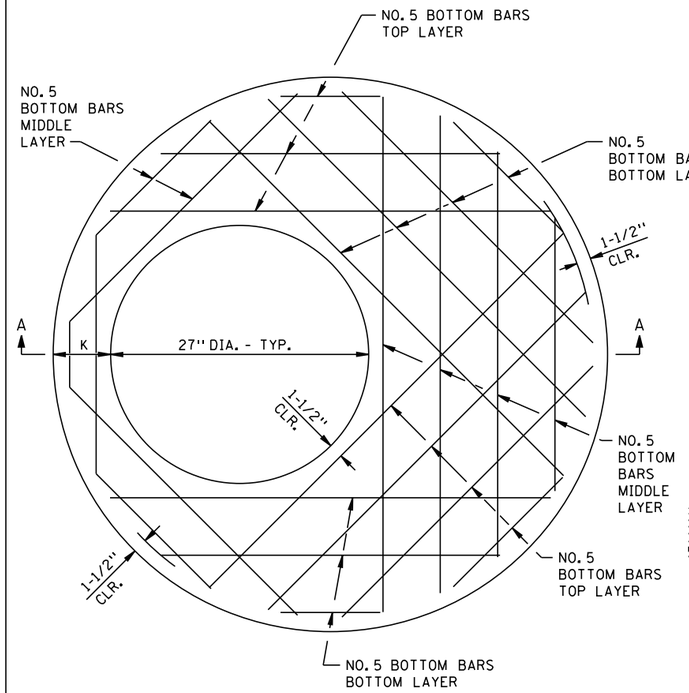
REFER TO PLANS FOR STEP REQUIREMENTS, HEIGHT, & DIAMETER.

SEE SHEET (2 OF 2) FOR INSTALLATION DETAILS.

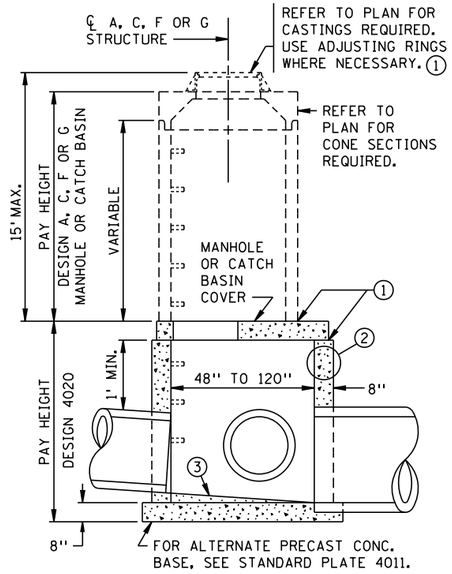
DESIGNER NOTE:
WHEN STRUCTURE IS USED AS A CATCH BASIN, GIVE X & Y COORDINATES OF BOTH THE CENTERLINE FOR A, C, F OR G STRUCTURE AND THE CENTERLINE FOR THE 4020 STRUCTURE.

DESIGNATION:
DESIGN DIA. - STANDARD PLATE EXAMPLE: DESIGN 66 - 4020

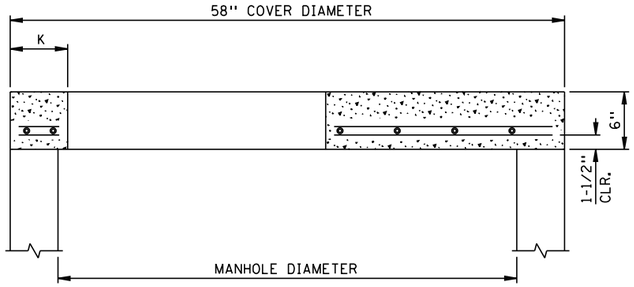
APPROVED NOV. 22, 2000	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE 2506	STANDARD PLATE NO.
Delbert W. Gerdes STATE DESIGN ENGINEER	MANHOLE OR CATCH BASIN FOR USE WITH OR WITHOUT TRAFFIC LOADS	REVISION DATE 3-22-2013 M.J.E.	4020J 1 OF 2



PLAN
(58" DIA. PRECAST COVER OPTION SHOWN)



SECTION VIEW - INSTALLATION



SECTION A-A

NOTES:

WHEN STRUCTURE IS USED AS A CATCH BASIN, GIVE X, Y COORDINATES OF BOTH THE CENTERLINE FOR A, C, F OR G STRUCTURE AND THE CENTERLINE FOR THE 4020 STRUCTURE.

SEE SHEET 1 OF 2 FOR HANDLING HOLE DETAILS AND ADDITIONAL INFORMATION.

(1) PROVIDE A FULL MORTAR BED.

(2) WALL CONSTRUCTION MAY BE: CLASS II PRECAST PIPE - STANDARD PLATE 3000 - REINFORCED CONCRETE PIPE; CAST-IN-PLACE CONCRETE MEETING THE REQUIREMENTS OF CLASS II PIPE; OR MASONRY CONSTRUCTION (BRICK OR BLOCK), STANDARD PLATE 4000 - MANHOLE OR CATCH BASIN MASONRY.

(3) PROVIDE MORTAR FILLETS TO FIT BOTTOM PORTIONS OF PIPE TO DIRECT FLOW TO OUTLET.

APPROVED NOV. 22, 2000	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE 2506	STANDARD PLATE NO.
Delbert W. Gerdes STATE DESIGN ENGINEER	MANHOLE OR CATCH BASIN FOR USE WITH OR WITHOUT TRAFFIC LOADS	REVISED 10-29-2013 M.J.E.	4020J 2 OF 2