PUMP STATION #30
HYDRAULIC REPORT
2X2 DESIGN

INTERSTATE 55 (STEVENSON EXPRESSWAY)
AT HOMAN AVENUE
P-91-762-10

CHICAGO, COOK COUNTY, ILLINOIS

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CHAPTER 1 PROJECT OVERVIEW

1.1 INTRODUCTION

This Hydraulic Report summarizes the design and operation of the Illinois Department of Transportation's (IDOT) Pump Station No. 30 (PS 30). PS 30 is located on IDOT Right-of-Way (ROW) between Pulaski Road and Kedzie Avenue at the intersection of the north-bound lanes of Interstate 55 (I-55) (Adlai Stevenson Expressway) and the extension of Homan Avenue in Chicago, Cook County, Illinois as shown in Figure 1-1. Most of the drainage area to PS 30 is from the west. The outfall from PS 30 is to the north, discharging to the Chicago Sanitary and Ship Canal (Canal). There are several documented cases of pavement flooding in the I-55 subway located west of the pump station.

Figure 1-1 Project Location

The design of PS30 is based on providing storage and conveyance for runoff from the 50-year design storm event and providing edge of pavement protection (below lowest rim in sag) for the 100-year design storm event. The subway sag is located just west of the railroad crossing between Pulaski Road and PS 30. See Section 3.1 for the list of Design Criteria.

Analysis of the existing I-55 storm sewer network indicates that this system is not adequate to convey the 50-year runoff to PS 30 under gravity flow conditions. In addition, analysis of PS 30 indicates that the existing system provides the minimum of 2 feet of freeboard to the low edge of pavement elevation at the sag for the 50-year design storm event. The existing system fails to keep the peak water surface elevation below the lowest rim elevation at the sag for the 100-year design storm event.

Currently the pump station is operated with all four main pumps running, so that there is no dedicated stand-by pump.

The proposed I-55 roadway improvement is to increase traffic capacity by developing two "managed" lanes in each direction by converting the median to additional travel lanes and minimal widening to the outside. This is referred to as the “2x2” proposed design. The proposed work on the northern section of I-55 includes reconstructing the existing open grassed median to establish additional travel lanes and paved inside shoulder. The proposed added pavement will exacerbate the capacity problems at PS30. Therefore, several alternatives were investigated to mitigate the effects of the added pavement by adding storage, conveyance, or modifying the pumping capacity of the station. The selected alternative includes a new 72” RCP parallel storm sewer connected to the existing main drain upstream of the pump station. This parallel sewer is proposed to be located in the south ROW. The parallel system adds both storage and conveyance to the main drain system located in the median and allows the existing pumps to operate in accordance with IDOT preference for 3 main and 1 stand-by pump. No structural modifications to the pump station are proposed.

As the 2x2 configuration is anticipated to be carried through to Phase II, an Appendix is provided that includes analysis of the existing system and proposed design using current Bulletin 75 rainfall depths.

This study modeled the system in XP-SWMM 2014. Use of other versions of XP-SWMM may provide slightly different model results.

CHAPTER 2 SITE INFORMATION

2.1 EXISTING DRAINAGE CONDITIONS

The location of Pump Station 30 at STA 1215+50 is shown on Exhibit 1 in Section 2. The current Flood Insurance Rate Map (FIRM) panels 17031C0503J and 17031C0504J both dated August 19, 2008 indicate that there is no mapped floodplain within the I-55 corridor in this area. The adjacent Chicago Sanitary & Ship Canal (Canal) is mapped as unstudied Zone A floodplain. The FIRM panels are provided as Exhibits 8-1A and 8-1B in Section 8.

The Canal was studied in detail by the United States Army Corps of Engineers (USACE) in 2010. USACE developed the United States Environmental Protection Agency's (USEPA) Hydrological Simulation Program – FORTRAN (HSPF) hydrologic model and an unsteady HEC-RAS hydraulic model for the Canal. Peak water surface elevations at the pump station outlet for the 20-, 50-, 100-, and 500-year storm events are available from the USACE unsteady HEC-RAS model. The USACE elevations are summarized in Table 2-1.

Peak Water Surface Elevation (ft, NAVD 88)				
10-yr	20-yr	50-yr	100-yr	500-yr
582.57	583.55	584.21	585.86	587.46

Table 2-1 USACE Elevations

From these USACE elevations, the 10-year water surface elevation of 582.57 was extrapolated. Further discussion is provided in Chapter 3 of the narrative. The USACE 10-year water surface elevation was used as the tailwater condition on the pump station outfall sewer.

For the 50-year and 100-year design storm events, flow to the pump station consists of runoff from approximately 26.4 acres within the existing IDOT ROW and approximately 10.0 acres outside of the ROW for a total of 36.4 acres. PS 30 serves approximately 4,250 linear feet of the I-55 corridor from STA 1171+50 (Pulaski Road) to approximately STA 1214+00. The sag point in the I-55 roadway profile is located at approximately STA 1195+00.

There is also the potential for overflow from east (STA 1214+00 to 1229+00) and west (STA 1131+50 to 1171+50) of the area served by the pump station during intense storm events if the storm sewer system capacity is exceeded. The approximately 34.3 acre west overflow area is served by a storm sewer line that connects to a 10'x6' RCBC flowing north down Pulaski Avenue. The approximately 11.6 acre east overflow area is served by a storm sewer line that connects directly to the 54-inch diameter outlet storm sewer from PS 30.

The subbasins draining to Pump Station 30 are highlighted in blue on Table 3-3. Exhibits 9-1A and 9-1B provided in Section 9.G show the subbasin boundaries and existing drainage conditions. The potential overflow areas from the east and west described in the preceding paragraph are shown as not being directly tributary to the pump station, per the modeling. The existing drainage plan is provided in Section 6.

PS 30 provides a maximum pumping capacity of approximately 53,200 gpm (118 cfs) from 4 main pumps at 13,300 gpm (29.6 cfs) each, with no stand-by. There is a disconnected spare main pump stored within PS 30. Pumped flow is directed to the 54-inch diameter storm sewer line that outlets into the Canal as shown on Exhibit 6-1A. The 54-inch outlet sewer also conveys runoff from the east overflow area previously identified. Upstream storage within the drainage system consists of the pump wet well and storm sewer pipes. Pump Station Hydraulic Report Data Sheets are included in Section 1.

2.2 PREVIOUS STUDIES AND DESIGN PLANS

The portion of I-55 served by Pump Station 30 was studied by SPACECO, Inc. in August 1995 as part of a roadway rehabilitation project. According to the study, Pump Station 30 provided sufficient capacity to serve the I-55 subway. A comparison of existing conditions data from the SPACECO report and the CBBEL study is provided in Table 2-2 below.

Drainage Area to PS30 (ac)		Pump Station Capacity (gpm)		Available Storage Within System (ft^3)	
SPACECO	CBBEL	SPACECO	CBBEL	SPACECO (at EL 568)	CBBEL (at low pavement EL 577.3)
28.0	36.4	40,000	53,200	50,965	60,825

Table 2-2 Comparison of Existing Conditions

The drainage area to PS 30 in the SPACECO study was limited to only the area within the I-55 ROW boundary. Analysis of current 1-foot topographic data shows that there is also area outside of the ROW tributary to the pump station. The SPACECO "Available Storage Within System" was computed only to elevation 568 in the existing wet well, while the current analysis includes available storage to the low edge of pavement elevation of 577.3. The original pump station, built in 1963, had 4 pumps, 10,000 gpm each. They were replaced in the late 1990s with 4 pumps, 13,300 gpm each. At the time of replacement, the proposal was to increase the individual pumps' capacity in order to provide the same total output by 3 of the pumps, so that the 4th pump will serve as a standby. However, SPACECO report documentation indicates that the 4th main pump is set to turn on at a higher elevation and provides additional pumping capacity. This was verified by IDOT with supporting correspondence provided in Section 15.

CBBEL also reviewed several design plan sets for the pump station/main drain, I-55, and offsite areas.

- "F.A.I. Route 55 Section 1114-641 at (PT.II), Southwest Expressway Main Drain & Pumping Station Project I-55-7 (23)-281", dated September 18, 1962;
- "F.A.I. Route 55 (Stevenson Expressway) Section: (0711.2, Etc, 1314-638)RS-2, Harlem Avenue to Kedzie Avenue Resurfacing, Bridge Repairs and Surveillance, Project: IM-55-7(222)283, Cook County C-91-215-87", dated August 13, 1999;
- "F.A.I. Route 55 (Stevenson Expressway), Stevenson Expressway (I-55) at Homan Avenue, Rehabilitation of Pump Station No. 30", dated June 29, 1999;
- Two plan sheets (Sheet 8 of 9 and Sheet 9 of 9) titled "S. California Ave to S. Pulaski Rd, BNSF Railway Station Map, Chicago, IL, Cook County, Line Segment 7000, Formerly AT&SF RY", last revised December 2, 1999 (Sheet 8) and May 24, 2011 (Sheet 9).

The plan sets provide design information for the main drain and pump station structure. The wet well dimensions provided in the September 1962 plan set was used to calculate existing storage volume in the well. Site survey of the I-55 corridor was used to create the XP-SWMM model of the drainage system and is provided in Section 16. Storm sewer information from the August 1999 plans was used to supplement site survey in determining drainage west of Pulaski Road and the BNSF sheets were used to help determine drainage patterns for offsite areas.

The previous studies, design plans, and storm sewer survey used in this analysis are provided on the CD in Section 17. Selected hard copy excerpts of engineering plans are provided in Section 4. Existing topographic survey data is also provided on the EDP in Section 6.

2.3 FIELD INVESTIGATION

CBBEL performed a field investigation of off-site drainage areas along the northern ROW boundary on August 2, 2013. The off-site areas are located on Burlington Northern Santa Fe (BNSF) Railway property. The field investigation revealed that there are no visible local storm sewers or other drainage infrastructure on the BNSF property immediately north of the I-55 ROW. Cook County 1-foot topography shows that a portion of the BNSF property drains toward the I-55 corridor and ultimately to the pump station as shown on Exhibit 9-1A (Subbasins 25, 31, 32, 72, 43, and 45) in Section 9.G. Field investigation photos are included in Section 3 and on the CD in Section 17.

The field investigation also revealed that there are many shallow pockets on the BNSF property that collect stormwater during rain events. While the pockets do not create significant storage volume, they do slow the rate at which water enters the I-55 drainage system. Therefore, Time of Concentration (Tc) values for the off-site areas on the BNSF property were lengthened to reflect the attenuation of stormwater runoff by the pockets. The lengthening was achieved by reducing the sheet flow segment slopes for the subbasins where the pockets are present (Subbasins 25, 31, 32, 72, 43, 45 to Pump Station 30 and Subbasins 50, 77 to the downstream storm sewer system/East Overflow Area).

2.4 FLOODING INCIDENT REPORTS

A total of 22 historical flooding incident reports ranging from 1988 to 2020 within the I-55 corridor from Pulaski Road to Kedzie Avenue were made available by IDOT. The reports indicate several instances of flooding in southbound Lane 3 at the roadway sag during intense storm events. Flooding depth is unknown for all incidents except May 26, 2009 which indicates 4” at Pulaski entrance. Bulletin 75 tables were used with available time-based precipitation data collected at Midway Airport during the May 26, 2009 event to determine that the area experienced approximately the 20-year, 1-hour event when this flooding occurred. The flooding incident dated June 23, 2010 is noted to coincide with power loss at Pump Station 30 and resulted in a complete shutdown of southbound I-55 between Lake Shore Drive and Pulaski Road for several hours. During the October 22, 2020 event, time-based precipitation data indicate the area experienced the 100-year, 3-ho20ur storm, causing significant flooding that was still visible in an attached photo taken the next day. In all remaining reports, the roadway was noted to be passable. The rainfall event analysis is provided in Section 9.F. The flooding incident reports are provided in Section 15.

2.5 DATUM CORRELATION

In some cases, it may be necessary to convert elevations due to differences in vertical datum between FEMA flood elevations, IDOT plan data, and site survey data. FEMA flood elevations and historic IDOT plan data are tied to the NGVD 29 vertical datum while site survey data is tied to the NAVD 88 vertical datum. National Geodetic Survey (NGS) VERTCON software was used to determine a conversion factor that may be applied at the project site. The conversion is provided below and in Section 16.

(NAVD 88) = (NGVD 29) – 0.28 FEET

CHAPTER 3 HYDROLOGIC & HYDRAULIC ANALYSIS

This chapter presents a detailed description of the XP Software Stormwater and Wastewater Management Model (XP-SWMM) hydrologic and hydraulic modeling used for this analysis.

3.1 DESIGN CRITERIA

3.1.1 HYDRAULIC DESIGN

Criteria provided in Chapter 13 of the IDOT Drainage Manual were followed to evaluate the existing pump station:

- The design frequency for the pump station and storm sewer draining the depressed roadway is a 50-year return interval;
- The calculated Water Surface Elevation (WSEL) based on a 50-year return interval storm event has a minimum freeboard of 2-feet below the lowest existing rim elevation (577.31 ft);
- The calculated WSEL based on a 100-year return interval storm event is maintained below the lowest existing rim elevation at the roadway sag served by the pump station (577.31 ft).

3.1.2 PUMP STATION DETAILS

The following specifications were provided by IDOT regarding the existing pump station:

- Pump station plans (Southwest Expressway, Main Drain & Pumping Station, Project I-55-7) dated September 18, 1962 were used to determine existing pump pit dimensions and are provided on the CD in Section 17 and in Section 4;
- Pump Station 30 is a wet pit station with total square footage of 723 ft^2;
- There are two independent sources of power;
- The pumps are operated by a Supervisory Control and Data Acquisition (SCADA) control system with the following elevation information received from IDOT;

Feature *	Elev. NAVD88
High Water Alarm	567.2
Start Stand-By Pump	565.7
Start Lag 2 Pump	564.7
Start Lag 1 Pump	563.7
Start Lead Pump (Mixers/Low Flow Pump Off when Rising Water)	562.7
Start Mixers	561.0
Stop Main Pumps/Mixers (Low Flow Pump On when Falling Water)	558.2
Standby Pump Stop	556.2
Start Low Flow Pump	558.2
Stop Low Flow Pump	557.2
Low Level Alarm	556.2
Bottom of Wet Pit Sump	550.2

*See original IDOT SCADA Table in Section 5.

Table 3-1 IDOT SCADA Elevations

- The 4 main pumps are Flygt model #3531 170hp with a rated capacity of 13,300 gpm (29.6 cfs) each. A catalog cut for the main pumps is provided in Section 5. The pumps are currently operated as 4 main pumps with no dedicated standby;
- A June 5, 2013 email from Dan Vanderbilt (IDOT) provided in Section 15 indicates that the low flow pump is a Yeomans model #X32OTY 50hp with a rated capacity of 2,700 gpm (6.0 cfs). As-built plan sheet 18 of 40 (dated 1999, Section 4) shows a capacity of 2,800 gpm. Also, various listings from the IDOT electrical section show the capacity as 2,800 gpm. Considering that the 2,700 gpm capacity will provide a more conservative result, 2,700 gpm is used in the design calculations. A catalog cut for the low flow pump was not able to be located;
- A bar screen is installed in the wet well to prevent floatables from clogging pump intakes;
- The pump house access road is from Kedzie Avenue immediately south of I-294. The roadway and pump station finished grade is approximately 20 feet above the I-55 roadway sag.

3.1.3 STORM SEWER DESIGN

- The existing main drain storm sewer to Pump Station 30 was evaluated for a 50-year capacity under gravity flow conditions;
- The storm sewer HGL was taken from the XP-SWMM hydrologic and hydraulic model. HGL plots are provided in Section 14.

3.2 XP-SWMM INPUT DATA

The XP-SWMM analysis was performed for existing drainage conditions. Subbasin boundaries were delineated using 1-foot contour aerial topographic data provided by Cook County, site specific survey data, storm sewer information from historical plan sets, and field observation. The subbasin boundaries are shown on Exhibits 9-1A and 9-1B in Section 9.

Hydrologic parameters including Runoff Curve Number (RCN) and Time of Concentration (Tc) were calculated for each subbasin based on existing land use determined from aerial photography. Bulletin 70 rainfall isohyetal mapping data and Huff rainfall distributions were used. Design plans for the I-55 corridor were obtained from IDOT and are included on the CD in Section 17.

Peak water surface elevations at the pump station outlet for the 20-, 50-, 100-, and 500-year storm events were taken from Cross Section 318.90 of the USACE unsteady HEC-RAS model for the Chicago Sanitary and Ship Canal (CSSC). The 10-year water surface elevation was extrapolated based on the available USACE water elevations and was used as a tailwater condition on the pump station outlet. The extrapolation calculation is provided in Section 8. USACE HEC-RAS model output and a Cross Section Location Map (Exhibit 8-1) are also provided in Section 8. A summary of the peak elevations is provided in Table 3-2 below. Based on Cook County topography, the normal water elevation in the Canal at the outlet is approximately 577.0 feet (NAVD 88).

Chicago Sanitary and Ship Canal Cross Section ID	Peak Water Surface Elevation (ft) NAVD 88				
	10-yr*	20-yr	50-yr	100-yr	500-yr
318.81		583.55	584.20	585.87	587.46
318.85		583.55	584.21	585.86	587.46
318.90	582.57	583.55	584.21	585.86	587.46
318.94		583.56	584.21	585.86	587.46
318.98		583.56	584.21	585.86	587.46
319.02		583.56	584.21	585.86	587.46
319.07		583.56	584.21	585.86	587.46

* Extrapolated

Table 3-2 USACE HEC-RAS Summary

Using the Cook County topographic data, site survey, historical plans, and field observations, an XP-SWMM of the drainage system was developed. The project site is a long and deep subway condition and there are no significant overflow points out of this area. Internal overflow between nodes was modeled using channel sections to account for storm sewer bypass flow in the grassed median and roadside gutter/shoulders to the sag location. The grassed median was modeled as a “natural” channel with triangular or trapezoidal shape and available flow depth of 2-3 feet as appropriate based on the available survey and contour mapping. The gutter/shoulder was modeled as a paved trapezoidal channel with a 10’ bottom width and available flow depth of 1’. Channel slopes were based on surveyed topographic elevations at the ends of each channel link. Storage on the pavement was modeled as part of the overflow channels (gutters and median ditch) and not using stage-storage relationships at nodes (storm sewer structures) to avoid double counting storage volume. Typical cross sections are provided in Section 14. The electronic XP-SWMM input files are included on the CD in Section 17.

A summary of the existing condition XP-SWMM input data is provided in Table 3-3 below. The Subbasins highlighted in light blue (2-48, 72) drain directly through the existing storm sewer system to Pump Station 30. The drainage area from these subbasins is 36.4 acres. Subbasins 50-71 and 73-79 drain to the storm sewer system that includes the outfall pipe from Pump Station 30. Subbasins 80-82 drain to the storm sewer that runs northerly along Pulaski Road and are highlighted in tan. Runoff from Subbasins 80-82 that is not captured by storm sewer inlets may drain along the gutter and median and eventually reach the sag location near the railroad crossing, via overland flow paths in XP-SWMM.

The subbasin boundaries are shown on the Subbasin Map in Section 9.G. A table cross-referencing the XP-SWMM node names to the drainage structure names as surveyed and shown on the EDP and PDP is provided at the end of Section 6. A summary of the existing condition XP-SWMM input data is provided in Table 3-3 below.

Subbasin ID	XP-SWMM Node	Area (ac)	Curve Number	Time of Concentration (min)	Subbasin ID	XP-SWMM Node	Area (ac)	Curve Number	Time of Concentration (min)
2	N839	0.4	98	6	43	N874	1.4	95	11
3	N840	1.0	94	6	45	N873	1.4	93	10
4	N853	0.5	92	5	46	N922	1.3	83	5
5	N853	0.7	82	24	48	N876	0.6	91	9
7	N856	0.6	94	6	50	N907	0.8	92	29
7A	N839	0.5	98	6	51	N903	0.24	86	5
8	N856	0.3	98	6	52	N902	0.63	86	5
9	N857	1.1	91	5	53	N904	0.4	92	5
10	N855	0.5	93	5	54	N905	0.13	98	5
11	N854	1.0	84	5	55	N898	0.26	98	5
13	N858	0.7	77	6	56	N899	0.1	98	5
13A	N863	0.7	77	13	57	N926	0.5	86	5
14	N858	0.6	98	5	58	N893	0.2	98	5
15	N860	0.3	98	5	59	N894	0.16	98	5
16	N860	0.5	86	35	60	N896	0.22	98	5
17	N913	0.3	98	5	61	N895	0.67	78	20
18	N913	0.4	92	5	62	N900	0.53	85	7
19	N861	1.2	94	5	63	N891	0.26	98	5
21	N862	0.8	91	5	64	N892	0.1	98	5
23	N863	0.5	98	5	65	N897	0.28	98	5
25	N864	1.7	92	32	66	N928	0.27	98	5
26	N865	0.9	91	17	67	N883	0.12	98	5
27	N866	0.4	98	5	68	N901	0.34	85	8
28	N869	1.4	81	17	69	N929	0.18	98	5
29	N869	0.3	98	5	70	N895	0.31	75	9
30	SAG	0.5	90	9	71	N882	0.4	88	16
31	N867	1.7	95	44	72	N908	2.1	92	5
32	N923	3	93	43	73	N890	0.17	98	5
33	SAG	0.4	92	13	74	N895	0.7	81	22
34	N869	0.1	98	6	75	N882	0.2	98	5
35	N869	0.5	83	5	76	N925	0.4	90	8
36	N911	0.8	92	10	77	N925	1.9	93	14
37	N924	0.9	87	13	78	N925	0.7	87	13
39	N871	1.2	82	7	79	N881	0.4	98	5
40	N909	0.9	90	8	80	N914	12.9	89	49
41	N872	1.2	82	17	81	N918	8.0	91	49
42	N875	1.1	95	5	82	N919	13.4	86	50

Table 3-3 XP-SWMM Existing Condition Hydrologic Data

A summary of the existing main drain storm sewer is provided in Table 3-4 below.

XP-SWMM Node		Invert EL (ft, NAVD 88)		Diameter (in)	Length (ft)
Upstream	Downstream	Upstream	Downstream		
N841	N842	582.71	581.88	24	200
N842	N843	581.13	580.61	36	298
N843	N844	577.66	576.79	36	400
N844	N845	573.94	573.34	36	386
N845	N846	565.79	565.53	42	415
N846	N847	565.33	564.27	48	261
N847	N910	564.17	563.72	54	186
N910	N848	563.72	563.52	54	80
N848	N870	563.52	563.32	54	266
N870	N849	563.32	563.21	54	157
N849	N850	563.06	562.37	60	339
N850	N921	562.37	562.11	60	421
N921	N851	562.11	562.06	60	86
N851	WET WELL	562.06	561.17	60	478

Table 3-4 Main Drain Storm Sewer Summary

Bulletin 70 rainfall data is summarized in Table 3-5below. Supporting isohyetal maps are included in Section 9.

Storm Duration (hr)	Rainfall Depth (in)		Huff Quartile
	50-Year	100-Year	
0.25	1.78	2.03	1st
0.5	2.44	2.78	1st
1	3.10	3.53	1st
2	3.83	4.35	1st
3	4.22	4.80	1st
6	4.95	5.63	1st
12	5.74	6.53	2nd
18	6.20	7.05	3rd

Table 3-5 XP-SWMM Rainfall Data

3.3 EXISTING CONDITIONS

A critical duration analysis was performed to determine peak 50-year and 100-year flowrates to the existing pump station (‘Existing DISCONNECT Kinematic upsize pipe.xp’). The inflow hydrograph was taken immediately upstream of the proposed pump station. The critical duration was determined to be the 30-minute storm event. The disconnect model was run using kinematic wave routing to mitigate the effect of surface storage and pipe storage on the inflow hydrograph. Dynamic wave routing may produce a slightly lowered peak flow hydrograph because of system storage. This study modeled the system in XP-SWMM 2014. Use of other versions of XP-SWMM may provide slightly different model results.

For the Kinematic analysis, the “upsize pipe” portion of the file name indicates that the trunk sewer pipes were upsized in the model to sizes greater than the actual sizes of the pipes to eliminate pressure flow. The Kinematic model is set to use the “sealed” option for ponding so no adjustment to the spill crest is required to eliminate surface storage ponding. In the Kinematic model, all runoff is routed directly to the trunk sewer (i.e. no laterals are included in the model. Node and link summary Tables are provided in Section 14. Kinematic modeling is considered more conservative and is used for the mass routing procedure. The Kinematic model does not include pressure flow, ponding, or overflow channels, while the Dynamic model does include these options.

A summary of the existing Kinematic analysis results is provided in Table 3-6 below. The critical duration storm event is used to evaluate the existing pump station because it is the most conservative.

Storm Duration (hr)	Peak Flowrate (cfs)		Flow Volume (ft^3)	
	100-Year	50-Year	100-Year	50-Year
0.25	124.6	100.8		
0.5*	150.2	123.4	245,138	205,118
1	141.0	117.4		
2	112.3	93.8		
3	96.8	80.2		
6	75.4	62.9		
12	44.5	38.4		
18	37.1	32.2		

* Critical duration

Table 3-6 Existing Conditions DISCONNECT Kinematic Critical Duration Analysis Summary

3.3.1 XP-SWMM EXISTING CONDITION DYNAMIC RESULTS

The existing conditions XP-SWMM Existing Condition Dynamic analysis results are summarized in Table 3-7 below. The XP-SWMM models are provided on the CD in Section 17

Max Pump Rate		Storage (ft^3) (at elevation 577.3 ft)		Peak Elevation at Roadway Sag (NAVD88, ft)		Lowest Pavement Elevation (NAVD88, ft)	Freeboard (ft)	
cfs	gpm	Wet Well	Storm Sewers	50-yr	100-yr		50-yr	100-yr
118	53,200	13,806	47,019	573.76	577.91	577.31	3.55	-0.60

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Table 3-7 Existing Conditions Dynamic XP-SWMM Results

Based on the XP-SWMM modeling results, the following observations were made:

- In the Existing Conditions Dynamic model, multi-links are used to allow both storm sewer pipe flow and overland gutter or median flow. At storm sewer structures (nodes), the existing rim elevation is provided as the invert of the overland flow link. Therefore, spill crest elevations at the nodes are conceptual upper limits used to define the upper boundary of the hydraulic grade line (HGL) in the network.
- As expected, the Existing Conditions Dynamic model critical 100-year, 0.5-hour peak flow rate of 143.2 cfs entering the wet well is slightly lower than the rate of 150.2 cfs from the Kinematic model. The Existing Conditions Dynamic model critical 50-year, 0.5-hour peak flow rate of 121.5 cfs entering the wet well is slightly lower than the rate of 123.4 cfs from the Kinematic model. (See XP-SWMM Conduit N851 SS.)
- The lowest pavement elevation at the roadway sag was conservatively taken as 577.31 feet and is the lowest inlet along the edge of pavement (Structure 10559 on the survey);
- The existing pump station and main drain system meets freeboard requirements for the 50-year critical duration storm event, but does not meet edge of pavement protection requirements for the 100-year critical duration storm event;
- Based on the dynamic models results ('Existing FINAL 12_2021_v14.xp'), the existing main drain storm sewer line upstream of the pump station is inadequate to convey the peak 50-year or 100-year runoff rate under gravity flow conditions. Addition of the pump station does not improve the main drain capacity. Hydraulic gradient plots are provided in Section 14;
- The XP-SWMM models ('Existing FINAL 12_2021_v14.xp') show no overflow from the areas east and west of the subway (East Overflow Area and West Overflow Area as shown on Exhibits 9-1A and 9-1B in Section 9.G) for the 50-year and 100-year, critical duration storm events;
- The modeling results ('Existing FINAL 12_2021_v14.xp') indicate a peak 100-year water surface elevation of 577.91 feet at surveyed Structure 10559 (Node N867) which is located at the outer edge of southbound Lane 3 just west of the railroad tracks. Based on Cook County 1-foot topography, this would put standing water in southbound Lane

3 for an approximately 150 foot section of roadway. This is consistent with the flood incident reports discussed in Chapter 2.3.

- XP-SWMM modeling results '('Existing FINAL 12_2021_v14.xp') show that peak Hydraulic Grade Line (HGL) in the 54-inch diameter storm sewer downstream of the pump station is above the crown for the 50-year and 100-year storm events. The peak HGL is below existing ground elevations for the 50-year event. The 100-year HGL is slightly above the rim elevations at the I-55 median ditch and causes a small amount of overland flow down the median towards the pump station drainage system, which is reflected in the model by overland flow links.
- The gravity full flow capacity of the 54" discharge pipe out of the pump station is 100.3 cfs. See Manning's full flow analysis in Section 8.C. Maximum pump rate is 118 cfs. Analysis indicates that the HGL through the 54-inch storm sewer is due to pump outflow exceeding the gravity full flow pipe capacity, not due to the 10-year tailwater elevation in the Canal. Based on these results, it appears that the outfall storm sewer system has no capacity to provide additional flow conveyance to the canal.
- The peak HGLs for the 50-year and 100-year storm events (598.0 feet 50-yr, 598.4 feet 100-yr) are above the invert of the 24-inch diameter pump discharge pipes (Invert EL = 590.2 feet) in the discharge chamber. The main pumps were sized to operate between 13,300 gpm at 42 feet (pump "off") and 15,000 gpm at 35 feet of head (pump "on"). This rating takes into consideration static lift, friction losses in discharge pipe, and pressure heads (for the peak HGL for the 50-year and 100-year storm events). The pumps will not shut off when there is water in the discharge structure; these pumps are capable of pumping against headwater. The pumps will operate based on water elevations in the wet well, as shown on Pump Station 30 Control Elevations included under Section 5. (See XP-SWMM Node N878.)

3.3.2 MASS CURVE ROUTING

Mass curves were generated for the 50-year and 100-year design storm events and are included in Section 11. A separate Kinematic XP-SWMM model that disconnects the existing pump station and assumes a free flow outlet was created to determine the inflow hydrograph for each return interval ('Existing DISCONNECT Kinematic upsize pipe.xp'). The inflow hydrograph to the pump station was taken from the incoming storm sewer to the pump station for the 30-minute duration. The mass curve tabulations and plots use a 1-minute time interval to facilitate curve smoothness without generating excessive output data. The XP-SWMM Existing DISCONNECT Kinematic peak inflow rates to the pump station are 123.4 cfs and 150.2 cfs for the 50-year and 100-year storm events, respectively.

Comparison of the mass curves based on the Kinematic XP-SWMM model to the Dynamic XP-SWMM model output shows close correlation between pump on/off times. The pump flow rates in the Dynamic model use the nominal rates, which is a more conservative approach than using the performance curves. The calculated wet well elevation matches closely for the existing conditions 50-year event but is 4-feet different for the 100-year event. Previous experience has shown that an undersized main drain scenario such as this can produce model instability resulting in larger differences between XP-SWMM and mass routing results. However, the close correlation for the 50-year event demonstrates that the XP-SWMM model and the mass routing routine agree. Therefore, the XP-SWMM models provide verification of the output generated by the mass curves. A comparison summary is provided in Table 3-8.

	Wet Well EL (ft)	Lead on (min)	Lag #1 on (min)	Lag #2 on (min)	Standby On (min)
	50-yr				
XP-SWMM	565.9	15	15	16	17
Mass Route	565.8	14	17	19	27
	100-yr				
XP-SWMM	570.7	14	14	15	16
Mass Route	566.3	14	15	18	21

Table 3-8 Existing Conditions Dynamic Model vs. Mass Routing Summary

3.3.3 CYCLE TIME

The cycle time for the lead main pump and the low flow pump were calculated based on methodology presented in Chapter 13 of the IDOT Drainage Manual. Cycle times of 7.6 minutes and 7.8 minutes were calculated for the main pumps and low flow pump, respectively. The allowable minimum cycle time for each pump was determined from manufacturer requirements of 15 starts/hr, or a 4 minute cycle time. The calculation results show that the existing main pumps and low flow pump meet the minimum cycle times prescribed in IDOT Drainage Manual Table 13-402c. Supporting calculations and manufacturer documentation is provided in Section 12.

3.4 PROPOSED CONDITIONS

As part of the I-55 reconstruction project, new inner lanes are proposed within the center median. The median is currently vegetated and will be paved under proposed conditions, with the addition of crash investigation sites. In addition, minor widening to the outside of the existing pavement is proposed. Proposed roadway details are shown on the Typical Section and PDP in Section 7.

The existing typical section includes the following:

- Three 12 foot travel lanes in each direction
- One 10 foot paved inside shoulder in each direction
- 40' unpaved median
- Varies 10 foot to 12 foot outside shoulder in each direction

The proposed typical section includes the following:

- Three 12 foot travel lanes in each direction
- One 4 foot buffer between travel lanes and managed lane in each direction
- Two new 11 foot managed lanes in each direction, built in the existing median
- 10 foot paved median with concrete barrier in the center
- Varies 8 foot to 12 foot auxiliary lanes built outside of travel lanes in each direction
- Varies 6 foot to 12 foot outside shoulder in each direction

CBBEL calculated a revised CN for Subbasins 3, 9, 16, 21, 26, 30, 33, 36, 40, 41, 42, 46, 48, 51, 52, 57, 62, 68, 71, and 81 that will be affected by the added pavement. Drainage area boundaries do not change. The proposed conditions CN calculation sheets are included in Section 9. The changed CN values are indicated in red in Table 3-9.

The proposed added pavement will exacerbate the capacity problems at PS30. Therefore, several alternatives were investigated to mitigate the effects of the added pavement by adding storage, conveyance, or modifying the pumping capacity of the station. The selected alternative includes a new 72" RCP parallel storm sewer connected to the existing main drain upstream of the pump station. This parallel sewer is proposed to be located in the south ROW. The parallel system adds both storage and conveyance to the main drain system located in the median and allows the existing pumps to operate in accordance with IDOT preference for 3 main and 1 stand-by pump. No structural modifications to the pump station are proposed. No change to the outfall storm sewer system is proposed. The current SCADA start and stop elevations are maintained.

All proposed design alternatives assumed that the new pavement is in place. An XP-SWMM schematic is provided as Exhibit 13-1 in Section 13.

A summary of the proposed condition XP-SWMM input data is provided in Table 3-8 below.

Subbasin ID	XP-SWMM Node	Area (ac)	Curve Number	Time of Concentration (min)	Subbasin ID	XP-SWMM Node	Area (ac)	Curve Number	Time of Concentration (min)
2	N839	0.4	98	6	43	N874	1.4	95	11
3	N840	1.0	98	6	45	N873	1.4	93	10
4	N853	0.5	92	5	46	N922	1.3	87	5
5	N853	0.7	82	24	48	N876	0.6	98	9
7	N856	0.6	94	6	50	N907	0.8	92	29
7A	N839	0.5	98	6	51	N903	0.24	98	5
8	N856	0.3	98	6	52	N902	0.63	88	5
9	N857	1.1	98	5	53	N904	0.4	92	5
10	N855	0.5	93	5	54	N905	0.13	98	5
11	N854	1.0	84	5	55	N898	0.26	98	5
13	N858	0.7	77	6	56	N899	0.1	98	5
13A	N863	0.7	77	13	57	N926	0.5	98	5
14	N858	0.6	98	5	58	N893	0.2	98	5
15	N860	0.3	98	5	59	N894	0.16	98	5
16	N860	0.5	98	35	60	N896	0.22	98	5
17	N913	0.3	98	5	61	N895	0.67	78	20
18	N913	0.4	92	5	62	N900	0.53	98	7
19	N861	1.2	94	5	63	N891	0.26	98	5
21	N862	0.8	98	5	64	N892	0.1	98	5
23	N863	0.5	98	5	65	N897	0.28	98	5
25	N864	1.7	92	32	66	N928	0.27	98	5
26	N865	0.9	98	17	67	N883	0.12	98	5
27	N866	0.4	98	5	68	N901	0.34	98	8
28	N869	1.4	81	17	69	N929	0.18	98	5
29	N869	0.3	98	5	70	N895	0.31	75	9
30	SAG	0.5	98	9	71	N882	0.4	98	16
31	N867	1.7	95	44	72	N908	2.1	92	5
32	N923	3	93	43	73	N890	0.17	98	5
33	SAG	0.4	98	13	74	N895	0.7	81	22
34	N869	0.1	98	6	75	N882	0.2	98	5
35	N869	0.5	83	5	76	N925	0.4	90	8
36	N911	0.8	98	10	77	N925	1.9	93	14
37	N924	0.9	87	13	78	N925	0.7	87	13
39	N871	1.2	82	7	79	N881	0.4	98	5
40	N909	0.9	98	8	80	N914	12.9	89	49
41	N872	1.2	87	17	81	N918	8.0	98	49
42	N875	1.1	98	5	82	N919	13.4	86	50

Table 3-9 XP-SWMM Proposed Condition Hydrologic Data

A proposed conditions kinematic disconnect model (Proposed DISCONNECT Kinematic upsize pipe.xp) was developed by adjusting the CN values for the subbasins noted above in the existing conditions kinematic disconnect model. Peak flowrates for the previously identified critical duration storm event are summarized in Table 3-10. This study modeled the system in XP-SWMM 2014. Use of other versions of XP-SWMM may provide slightly different model results.

Storm Duration (hr)	Storm Duration (hr)	Peak Flowrate (cfs)		Flow Volume (ft^3)	
		100-Year	50-Year	100-Year	50-Year
Existing	0.5*	150.2	123.4	245,138	205,118
Proposed		169.6	141.2	267,448	226,504

* Critical duration

Table 3-10 Existing and Proposed Disconnect Kinematic Model Summary

3.4.1 FINALIST ALTERNATIVES

Three finalist alternatives were developed for the project. Finalist Alternative A provides increased storage and conveyance by installing a parallel median storm sewer system that would be interconnected with the existing main drain. Finalist Alternative B consists of constructing a new storage vault upstream of PS30 in the south ROW, with a single connection point to the existing main drain. Finalist Alternative C (selected alternative) consists of a parallel storm sewer located in the south ROW and interconnected to the existing main drain at the upstream and downstream ends. The finalist alternatives were evaluated at a concept level with cost estimates determined and constructability issues considered. Based on the PESA Report, there is the possibility of contaminated soil at any of the alternative locations. Therefore, conservative quantities and costs for excavation, contaminated soil removal, and backfill are included. From among the finalist alternatives, a selected alternative was chosen. Detailed output including mass routing, graphs, and output was generated for Finalist Alternative C and is provided in Sections 10 through 14. A discussion of each finalist alternative is provided below and model results are summarized in Table 3-11. For each finalist alternative, the 50-year freeboard and 100-year edge of pavement protection requirements are met.

3.4.1.1 FINALIST ALTERNATIVE A – PARALLEL MEDIAN SEWER

Finalist Alternative A is to install 1,013 feet of 84-inch diameter parallel storm sewer within the median between invert elevations 567.2 ft and 570.2 ft. The new storm sewer connects to the existing main drain at existing manholes located approximately at Station 1201+72 and at Station 1210+15. The most upstream extension allows the median system to pick up additional runoff from the median and north pavement. The new storage volume added under Finalist Alternative A is approximately 38,990 ft^3. PS30 operation is proposed to be updated to include three main pumps at 13,300 gpm (29.6 cfs) and one stand-by pump at 13,300 gpm (29.6 cfs). Currently all four pumps are required to run and there is no dedicated standby pump. The low flow pump remains unchanged. There are no updates to cycle times as the usable storage has remained unchanged.

A schematic of Finalist Alternative A is provided as Exhibit 13-2 in Section 13. The concept estimated construction cost is $2,300,000 for open cut construction. Installing the pipe by boring/tunneling increases the concept estimated construction cost to $3,600,000. Cost information is provided in Section 13.

3.4.1.2 *FINALIST ALTERNATIVE B – UPSTREAM STORAGE VAULT*

Finalist Alternative B is to construct an approximately 42,000 ft^3 vault within the south ROW at invert 563.0 ft. The 40 ft x 150 ft x 7 ft vault connects to the existing main drain just upstream of PS30. PS30 operation is proposed to be updated to include three main pumps at 13,300 gpm (29.6 cfs) and one stand-by pump at 13,300 gpm (29.6 cfs). Currently all four pumps are required to run and there is no dedicated standby pump. The low flow pump remains unchanged. There are no updates to cycle times as the usable storage has remained unchanged.

A schematic of Finalist Alternative B is provided as Exhibit 13-3 in Section 13. The concept estimated construction cost for a poured in place concrete vault is $2,200,000 for the structure and connecting storm sewer only. However, earth excavation, earth retention, dewatering, and the potential for haul off of contaminated soils and provision of furnished excavation and topsoil for backfill increases the estimated cost to $6,100,000. Savings may be realized by installing precast concrete storage structures (StormTrap or equivalent). The anticipated cost for the precast system is $4,800,000, and the footprint is increased to 40 ft x 190 ft. Cost information is provided in Section 13.

Alternative B does not provide the required edge of pavement protection for the 100-year event. This is due to the constrictions of the main drain.

3.4.1.3 *FINALIST ALTERNATIVE C – PARALLEL SEWER IN ROW (Selected Alternative)*

Finalist Alternative C is to install 1,200 feet of 72-inch diameter parallel storm sewer within the south ROW between inverts 564.8 ft and 565.0 ft. The parallel sewer is proposed to tie into the existing main drain at the upstream end through a 48-inch diameter storm sewer at approximately Station 1201+72. It will be necessary to bore/tunnel the 48-inch storm sewer under the pavement to connect to the existing main drain. The downstream end of the 72-inch storm sewer is proposed to tie back into the main drain just upstream of PS30. The new storage volume added under Finalist Alternative C is approximately 35,180 ft^3. PS30 operation is proposed to be updated to include three main pumps at 13,300 gpm (29.6 cfs) and one stand-by pump at 13,300 gpm (29.6 cfs). The individual pump rates remain unchanged. Currently all four pumps are required to run and there is no dedicated standby pump. The low flow pump remains unchanged. There are no updates to cycle times as the usable storage has remained unchanged.

Finalist Alternative C is recommended for ease of access, safety during construction, minimization of traffic disturbance, and ease of future maintenance. A schematic of Finalist Alternative C is provided as Exhibit 13-4 in Section 13. The concept estimated construction cost is $3,000,000 for open cut construction. Installing the pipe by boring/tunneling increases the concept estimated construction cost to $4,120,000. Cost information is provided in Section 13.

Alternative	# of Main Pumps	Pump Rate (cfs)	Peak Elevation at Roadway Sag (ft, NAVD 88) Node N867		Wet Well EL (ft, NAVD 88) Critical		Lowest Inlet Elevation (NAVD 88, ft)	Freeboard (ft)	
			100-year	50-year	100-year	50-year		100-year	50-year
FINAL 'A'	3 + 1 standby	88.8	576.89	573.70			577.31	0.42	3.61
FINAL 'B'			-	-				-	-
FINAL 'C'			576.96	573.82	572.9 (SWMM) 567.7 (mass)	567.7 (SWMM) 566.3 (mass)		0.35	3.49

Table 3-11 Finalist Alternatives XP-SWMM Results

3.4.2 PREVIOUS ADDITIONAL ALTERNATIVES

During the initial design of the pump station, several previous additional alternatives were developed and refined. These alternatives were previously analyzed and discarded as insufficient for an alternate geometry that included only one added lane in each direction and were not re-analyzed for the current 2x2 configuration. The alternatives presented below were developed to a concept level only. Detailed mass routing and output generation was not performed and estimates of probable cost were developed only to a concept level for some of the alternatives. A discussion of each improvement alternative is provided below. The XP-SWMM modeling results are summarized in Table 3-12. A Technical Memorandum provided to IDOT revised January 10, 2017 summarizing the earlier CBBEL alternative analyses and concept costs is included in Section 13.

3.4.2.1 <u>PREVIOUS ALTERNATIVE 1 – UPSIZE PUMP STATION CAPACITY</u>

Alternative 1 is to increase the capacity of the main pumps at PS30. The existing conditions XP-SWMM model was revised to upsize the three main pumps and one stand-by pump to 15,750 gpm (35 cfs) each for a total pump station capacity of 63,000 gpm (140 cfs). The operational parameters of the pump station (start elevation, stop elevation, etc) were not modified. The fourth pump acts as a main pump and turns on at a higher elevation consistent with the SPACECO report.

The results of the XP-SWMM analysis show that Alternative 1 meets IDOT freeboard requirements for the 50-year and 100-year storm events. A schematic of Alternative 1 is provided as Exhibit 13-5 in Section 13.

Alternative 1 requires upgrades to the existing PS30 infrastructure. CBBEL reviewed design plans for PS30 and determined that larger capacity pumps may be installed within the existing wet well to achieve the desired pumping rate. Additional information is provided in Section 13.

This alternative was not carried forward due to limited downstream system capacity and the design preference of utilizing the fourth pump as a true standby pump.

3.4.2.2 *PREVIOUS ALTERNATIVE 2 – RELIEF STORM SEWER*

Alternative 2 maintains existing pump station capacity and installs a maximum 36-inch diameter relief storm sewer within the north I-55 ROW. The new sewer collects stormwater runoff from identified tributary areas outside of the ROW and conveys it to the Canal by gravity through the existing 54-inch diameter pump station outlet storm sewer. A backflow preventer is installed at the outlet of the proposed storm sewer into the 54-inch sewer to prevent stormwater from backing into the new sewer line. A schematic of Alternative 2 is provided as Exhibit 13-6 in Section 13.

The results of the XP-SWMM analysis show that Alternative 2 meets IDOT freeboard requirements for the 50-year and 100-year storm events. The main drain under Alternative 2 has significantly greater remaining capacity to convey stormwater runoff to the pump station.

This alternative was not carried forward due constructability issues including construction under RR bridges, construction in RR easement north of crib wall from approximately STA 1188+00 to STA 1194+50, and possible utility conflicts including with light standards.

3.4.2.3 *PREVIOUS ALTERNATIVE 3 – UPSTREAM STORAGE VAULT*

Alternative 3 maintains existing pump station capacity and installs an approximately 30,500 ft^3 underground vault immediately upstream of PS30. The vault collects stormwater runoff from upstream areas and stores it below the roadway sag elevation. A schematic of Alternative 3 is provided as Exhibit 13-7 in Section 13.

The results of the XP-SWMM analysis show that Alternative 3 meets IDOT freeboard requirements for the 50-year and 100-year storm events.

This alternative was carried forward and refined as Finalist Alternative B, with the difference that only three pumps will run as main pumps.

3.4.2.4 *PREVIOUS ALTERNATIVE 4 – RELIEF SEWER + PARALLEL MEDIAN TRUNK*

Alternative 4 maintains existing pump station capacity and includes Alternative 2 plus a 36-inch diameter parallel trunk sewer within the median. The 36-inch diameter sewer is tied into the main drain laterals, is able to accept runoff directly and from main drain overflow, and is tied directly into the existing wet well. A schematic of Alternative 4 is provided as Exhibit 13-8 in Section 13.

The results of the XP-SWMM analysis show that Alternative 4 meets IDOT freeboard requirements for the 50-year and 100-year storm events.

This alternative was not carried forward due to the constructability issues of Alternative 2.

3.4.2.5 *PREVIOUS ALTERNATIVE 5 – PARALLEL MEDIAN TRUNK*

Alternative 5 maintains existing pump station capacity plus a 36-inch diameter parallel trunk sewer within the median. The parallel sewer setup is identical to Alternative 4. A schematic of Alternative 4 is provided as Exhibit 13-9 in Section 13.

The results of the XP-SWMM analysis show that Alternative 5 meets IDOT freeboard requirements for the 50-year and 100-year storm events.

This alternative was not carried forward due to constructability issues under the railroad bridges. See Previous Alternative 9 below for evolution of this alternative.

3.4.2.6 *PREVIOUS ALTERNATIVE 6 – PARALLEL MEDIAN TRUNK + UPSTREAM STORAGE VAULT*

Alternative 6 includes Alternative 3 + Alternative 5. The median trunk stops at the sag point in the roadway. The vault was assumed to be connected to the main drain with a 60-inch diameter storm sewer. A schematic of Alternative 6 is provided as Exhibit 13-10 in Section 13.

The results of the XP-SWMM analysis show that Alternative 6 meets IDOT freeboard requirements for the 50-year and 100-year storm events.

This alternative was not carried forward due to construction costs, and because either Alternative 3 or Alternative 5/9 could be carried forward to stand alone.

3.4.2.7 *PREVIOUS ALTERNATIVE 7 – UPSIZED PUMPS + DOWNSTREAM STORAGE VAULT*

Alternative 7 upsizes the pumps to 150 cfs maximum pumping capacity and mitigates the increased pump rate with a 42,000 cubic foot downstream storage vault. The vault is connected to the pump station outfall sewer via a 60-inch diameter storm sewer. A schematic of Alternative 7 is provided as Exhibit 13-11 in Section 13.

The results of the XP-SWMM analysis show that Alternative 7 meets IDOT freeboard requirements for the 50-year and 100-year storm events.

This alternative was not carried forward due to the preference for keeping the current pump configuration with one as standby, plus potential utility conflicts.

3.4.2.8 *PREVIOUS ALTERNATIVE 8 – UPSIZED PUMPS + PARALLEL OUTLET SEWER*

Alternative 8 upsizes the pumps to 150 cfs maximum pumping capacity and mitigates the increased pump rate with a 36-inch diameter parallel outlet sewer to the Sanitary & Ship Canal. The parallel outlet sewer is proposed to be constructed from the north I-55 ROW to the Canal and follows the existing outlet sewer alignment. A schematic of Alternative 8 is provided as Exhibit 13-12 in Section 13.

The results of the XP-SWMM analysis show that Alternative 8 meets IDOT freeboard requirements for the 50-year and 100-year storm events.

This alternative was not carried forward due to the preference for keeping the current pump configuration with one as standby and constructability issues, including the lack of easement or ROW for outfall sewer path to the CSSC, need for pipe jacking under the rail yard, probable utility conflicts, and associated high costs.

3.4.2.9 *PREVIOUS ALTERNATIVE 9 – SHORTENED PARALLEL MEDIAN TRUNK*

Alternative 9 includes a 48-inch diameter parallel median sewer from the eastern railroad spur to the existing main drain structure at approximately Station 1210+00. This is a shortened version of the parallel median trunk proposed in Alternative 5. The existing pump station parameters remain unchanged. A schematic of Alternative 9 is provided as Exhibit 13-13 in Section 13.

The results of the XP-SWMM analysis show that Alternative 9 meets IDOT freeboard requirements for the 50-year and 100-year storm events.

This alternative was carried forward and refined as Finalist Alternative A (Selected Alternative). The differences are that in Finalist Alternative A, only three pumps will run as main pumps and the parallel median trunk sewer is upsized.

3.4.2.10 *PREVIOUS ALTERNATIVE 10 – PARALLEL SEWER IN SOUTH ROW TIED INTO SHOULDER DRAINS*

Alternative 10 includes a 48-inch diameter parallel storm sewer within the south ROW from the eastern railroad spur to the existing main drain just upstream of PS30. The new storm sewer ties into existing shoulder drains on the outer shoulder of the eastbound lanes. The existing pump station parameters remain unchanged. A schematic of Alternative 10 is provided as Exhibit 13-14 in Section 13.

The results of the XP-SWMM analysis show that Alternative 10 does not meet IDOT freeboard requirements for the 50-year and 100-year storm events, and therefore was not carried forward.

3.4.2.11 *PREVIOUS ALTERNATIVE 11 – PARALLEL STORAGE SEWER IN SOUTH ROW*

Alternative 11 includes an 84-inch diameter parallel storm sewer from the eastern railroad spur to the existing main drain just upstream of PS30. The 84-inch sewer provides storage volume only and is not tied into the main drain at upstream locations. The existing pump station parameters remain unchanged. A schematic of Alternative 11 is provided as Exhibit 13-15 in Section 13.

The results of the XP-SWMM analysis show that Alternative 11 meets IDOT freeboard requirements for the 50-year and 100-year storm events.

This alternative was carried forward and refined as Finalist Alternative C. The differences are that in Finalist Alternative C only three pumps will run as main pumps and the south ROW trunk sewer is tied into the existing system at both the upstream and downstream ends.

Previous Alternative	# of Main Pumps	Pump Rate (cfs)	Peak Elevation at Roadway Sag (NAVD 88, ft)		Lowest Inlet Elevation (NAVD 88, ft)	Freeboard (ft)	
			100-year	50-year		100-year	50-year
1	4	150	575.43	573.76	577.31	1.88	3.55
2		118.4	575.43	573.08		1.88	4.23
3			575.18	573.76		2.13	3.55
4			573.12	573.08		4.19	4.23
5			574.59	573.76		2.72	3.55
6			574.18	573.47		3.13	3.84
7		150	575.43	573.76		1.88	3.55
8			575.45	573.76		1.86	3.55
9		118.4	575.06	573.76		2.25	3.55
10			578.24	574.15		-0.93	3.16
11			577.3	573.93		0.01	3.38

Table 3-12 Previous Additional Alternatives XP-SWMM Results

3.4.1 PROPOSED PUMP STATION OPERATION

CBBEL evaluated the potential benefit of revising the on-off set points of the existing pump station under proposed conditions to enhance overall efficiency. Based on the available information, it was determined that the ‘on’ elevation of the main pumps could be lowered approximately 1-foot. However, the benefit of doing so was found to be minimal and is not recommended. Additional information on this analysis is provided in Section 13. The parallel system adds both storage and conveyance to the main drain system located in the median and allows the existing pumps to operate in accordance with IDOT preference for 3 main and 1 stand-by pump. No structural modifications to the pump station are proposed.

CHAPTER 4 CONCLUSIONS

Based on the detailed evaluation of improvements presented in the previous chapters, conclusions are provided below.

4.1 DESIGN SUMMARY

The existing pump station and main drain system meets freeboard requirements at the sag for the 50-year critical duration storm event under existing pavement conditions, but does not meet freeboard requirements at the sag for the 100-year critical duration storm event under existing pavement conditions. The main drain does not provide 50-year capacity under gravity flow conditions.

The existing downstream 54" outfall sewer has limited capacity. Improvements to the downstream system were considered to allow increased pumping rates, but were not selected because no easement or ROW is known to be available for the outfall sewer path to the Chicago Sanitary and Ship Canal, construction would require jacking under rail yard, and there are probable utility conflicts. In addition, a new outfall to the Canal triggers additional permitting requirements.

Selected Alternative C presented in Chapter 3 meets the 50-year freeboard and 100-year edge of pavement protection requirements. This was demonstrated in the XP-SWMM computer modeling described in Chapter 3, HYDROLOGIC & HYDRAULIC ANALYSIS. All Finalist Alternatives were refined from earlier alternatives. The selected alternative provides improved storage and conveyance and allows the pump station to be operated with 3 main and 1 stand-by pump, without changes to the pump station building itself. Cost and constructability were considered in determining the finalist alternatives, and in the choice of Finalist Alternative C as the selected alternative. The proposed location for Alternative C provides a better location for maintenance and construction issues and avoids interrupting the median traffic.

Constructability issues in the median include room for open cut and boring/jacking pits, possibility of contaminated soils, proximity to bridge pier footings and sign supports, connections to the existing main drain at the upstream and downstream ends of the new sewer, and maintenance of traffic. Constructability issues in the south ROW are similar, and include open cut vs. boring/jacking, possibility of contaminated soils, proximity to light pole foundations, and connections to the existing main drain near the median. In all cases, updated hydraulic analysis and additional geotechnical and environmental studies are recommended during Phase II design.

4.2 RECOMMENDATION

Based on the results of the hydrologic and hydraulic analysis discussed in Chapter 3, the existing PS 30 does not provide edge of pavement protection for the 100-year, critical duration storm event. IDOT freeboard requirements are met for the 50-year, critical duration storm event for existing pavement conditions. The main drain is not adequate to convey the 50-year or 100-year design flowrate under gravity conditions as shown on the XP-SWMM storm sewer profiles provided in Section 14. Previous alternatives explored upsizing the main drain, upsizing the pump station capacity, increasing downstream outfall sewer capacity, and diverting runoff away from this system to improve conveyance capacity. Alternatively, system operation may be improved by construction of stormwater storage volume upstream of the pump station. The finalist alternatives provide variations of providing upstream storage volume and conveyance.

Finalist Alternative C is the selected alternative. The installation of a parallel storm sewer in the southern ROW allows the storage/pumping system to provide the I-55 subway with the necessary freeboard and edge of pavement protection. Construction of this new storm sewer may be accomplished by open cut or boring/tunneling. The new sewer will be connected to the existing main drain via 48” pipe at the upstream end and tie upstream of the wet well at the downstream end. The new storage volume added under Finalist Alternative C is approximately 35,180 ft^3. The existing pump station is also able to be reconfigured to provide a dedicated standby main pump. PS30 operation is proposed to be updated to include three main pumps at 13,300 gpm (29.6 cfs) and one stand-by pump at 13,300 gpm (29.6 cfs). The low flow pump remains unchanged. A schematic of Finalist Alternative C is provided as Exhibit 13-4 in Section 13. The estimated construction cost is $3,000,000 for open cut construction. Cost information is provided in Section 13.

N:\IDOT\110203.00001\Drain\Docs\Hydraulic Reports\Pump Station 30\2x2 Final April 2022\HR.Pump Station 30 Narrative 2x2.Final04042022.docx

Section 1
Hydraulic Report Data Sheets

Illinois Department of Transportation

Pump Station Hydraulic Report Data Sheets

Station Number: 30

Route: FAI Route 55

Location: Homan Avenue (FAI Route 55 STA 112+00)

County: Cook

Existing Site Data:

1. Drainage area to existing pump site within R.O.W. 26.4 acres, off R.O.W. 10.0 acres, total 36.4 acres.
2. Design Frequency 50 years.
3. Peak inflow rate 123.4 cfs (Kinematic) and 121.5 cfs (Dynamic)
4. Has high water ever forced road closure or serious traffic inconvenience? Yes

   If yes, how frequently? closed twice, 18 other flooding reports for vicinity since 1988

   Max. known high water N/A ft. Dates closed 6/23/10, 10/22/20. Lanes flooded but passable 11/9/88, 12/8/91, 6/8/93, 1/22/99, 6/10/02, 7/4/07, 12/24/08, 2/26/09, 4/07/09, 5/26/09, 5/25/11, 6/6/11,10/30/19, 4/27/20, 4/28/20, 5/14/20, 5/17/20, 10/23/20.

   Cause of flooding: Power failure at PS30 6/23/10, 100-yr flood 10/22/20. Other flooding incidents were due to clogged inlets or for unknown reasons. (pump malfunction, clogged inlets, etc.)
5. Does a pump station currently exist at site? Yes

   Number of main pumps 4. Pumping rate per pump 13,300 gpm (29.6 cfs.)

   Number of stand-by pumps 0. Pumping rate per pump n/a gpm (n/a cfs.)

   Number of low-flow pumps 1. Pumping rate per pump 2,700 gpm (6.0 cfs.)

   Existing storage in the pump station 12,510 (@ EL 575.3 ft NAVD 88) cu. ft.

   Existing storage in the storm sewer system 45,708 (@ EL 575.3 ft NAVD 88) cu. ft.

   Size of inlet pipe into well 60 in., invert elevation 561.17 (NAVD 88) ft.

   Size of outfall pipe from pump station to the receiving system 54 in

   Outfall pipe invert elevation at the pump house 585.47 (NAVD 88) ft.

   Outfall pipe elevation at the receiving system 576.98 (NAVD 88) ft.
6. Where is the discharge currently pumped to? Chicago Sanitary & Ship Canal

   If stream, provide the 10 year elevation 582.57 (NAVD 88) ft. *(Extrapolated. See item 19 for available information.)*

Proposed Site Data:

7. Is size of drainage area to proposed pump station to be significantly altered? No

   If so, what is the new drainage area? acres within R.O.W. and acres off R.O.W.
8. Design frequency 50 years.
9. Maximum inflow rate 141.2 cfs (Kinematic) 97.8 cfs (Dynamic)(Dynamic flow lower due to additional Storage).
10. Will the discharge be pumped to a new location? No

    If yes, what are documented highwater stages? . Where?
11. Allowable maximum discharge rate 88.8 cfs.

    Are there any restrictions on allowable pumping rate? Match existing conditions with a true standby pump.

Proposed Preliminary Pump Station Data:

12. Type of pump station proposed hybrid wet/dry

13. Number of pumps and pumping rate proposed:
    - Number of main pumps 3. Pumping rate per pump 13,300 gpm (29.6 cfs.)
    - Number of stand-by pumps 1. Pumping rate per pump 13,300 gpm (29.6 cfs.)
    - Number of low-flow pumps 1. Pumping rate per pump 2,700 gpm (6.0 cfs.)

14. Elevation of top of lowest inlet on pavement 577.31 ft (NAVD 88).

15. Elevation of highest allowable water at sag 575.31 ft (NAVD 88).

16. Design high water elevation at the pit when all pumps are on 567.4 (NAVD 88).

17. Size of proposed pump discharge pipe 2 ft., invert elevation at pump pit 555.2 ft (NAVD 88)., invert elevation at the discharge chamber 590.2 ft (NAVD 88).

Miscellaneous Data:

18. Special Considerations:

Construction of a 72” RCP storage pipe in the south ROW, that is connected to the existing 60” RCP main drain at the upstream end and near the wet well at the downstream end. This allows the pump operation to be reconfigured so that PS 30 operates with 3 main pumps and 1 stand-by pump.

The proposed design meets freeboard requirements for 50- and 100-year flood events with added median pavement.

19. Information regarding high water from streams, groundwater or other controls which may affect proposed pump station.

Chicago Sanitary & Ship Canal: 20-yr WSEL = 583.56, 50-yr WSEL = 584.21 ft, 100-yr WSEL = 585.86 ft (all NAVD 88)

(Information obtained from the 2010 USACE study of the Chicago Sanitary & Ship Canal)

See supporting documentation in Section 8.

Prepared by Edmund Burke Date 1/24/2021

Signed (QA/QC) A Dailey Date 1/26/2021

Section 2
General Location Map

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

DSGN. DEV	**CHKD.**		
CLIENT Illinois Department of Transportation	**JOB#** 11-0203		N W E S
TITLE LOCATION MAP			**DATE** 07/16/13
			EXHIBIT 2

Section 3
Photographs

OFFSITE FLOW AREA
PHOTOS

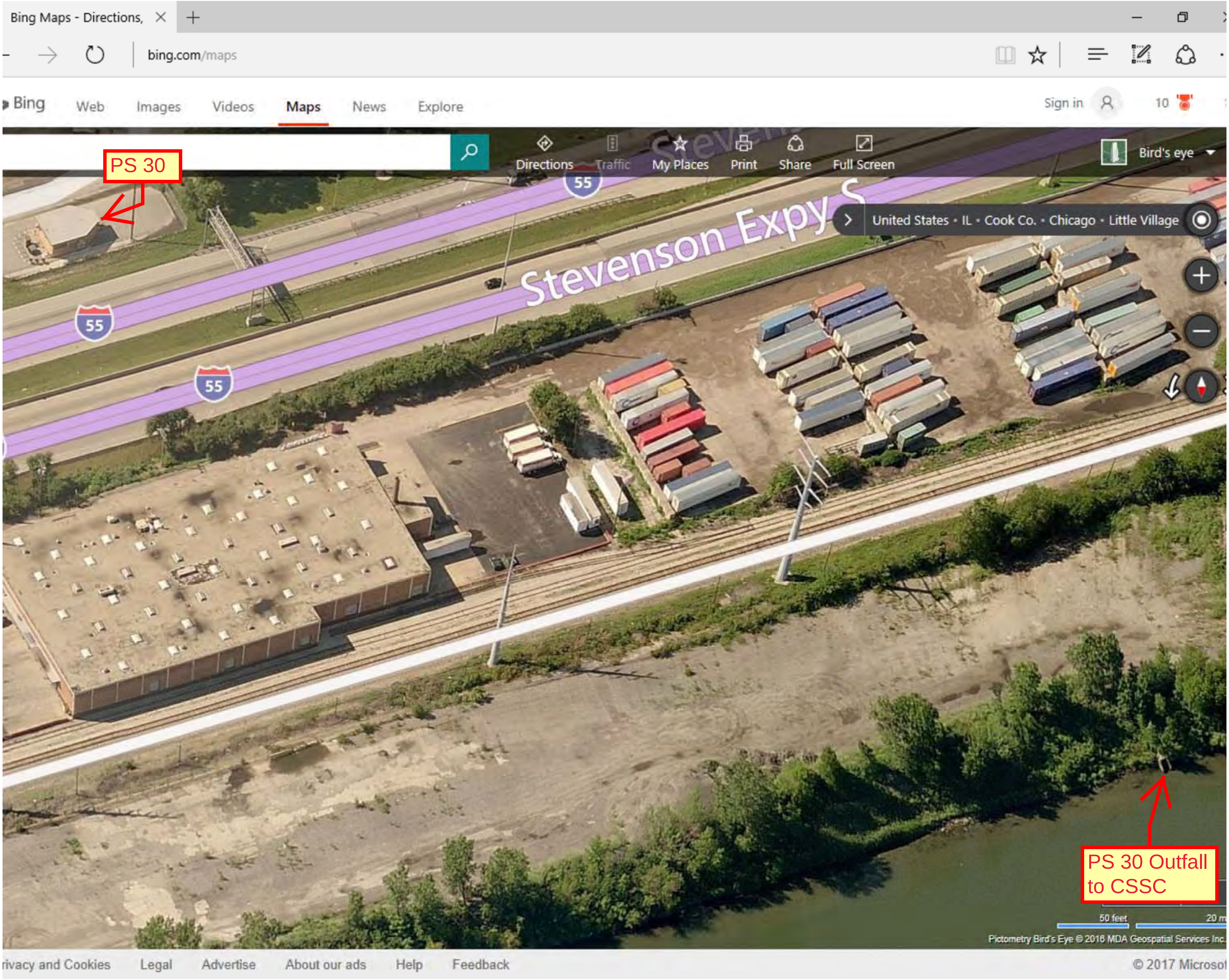
Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT **Illinois Department of Transportation**	JOB# **11-0203.00001**	DSGN. DEV	CHKD.	
TITLE **Photograph Location Map**		DATE 02-17-14		**EXHIBIT 3-1**

OFFSITE FLOW AREA PHOTO DESCRIPTIONS

Photo #	Photo ID	Photograph Direction	Items of Interest
1	IMG_2166	Facing west	
2	IMG_2167	Facing east	
3	IMG_2168	Facing northwest	
4	IMG_2169	Facing north	Typical low lying area on railroad property.
5	IMG_2170	Facing east	
6	IMG_2171	Facing southwest	Flattened vegetation pointing south indicating flow of water from the north towards IDOT ROW.
7	IMG_2172	Facing southeast	Flattened vegetation pointing south indicating flow of water from the north towards IDOT ROW.
8	IMG_2173	Facing south	Flattened vegetation pointing south indicating flow of water from the north towards IDOT ROW.
9	IMG_2174	Facing southeast	Eroded channel indicating runoff flow from the north towards IDOT ROW.
10	IMG_2175	Facing south	Eroded channel indicating runoff flow from the north towards IDOT ROW.
11	IMG_2176	Facing south	
12	IMG_2177	Facing southwest	Eroded channel on I-55 embankment indicating runoff flow from the north towards IDOT ROW.
13	IMG_2178	Facing south	Eroded channel indicating runoff flow from the north towards IDOT ROW.
14	IMG_2179	Facing east	Typical low lying area on railroad property.
15	IMG_2180	Facing west	Typical low lying area on railroad property.
16	IMG_2181	Facing east	
17	IMG_2182	Facing south	Typical low lying area.
18	IMG_2183	Facing west	
19	IMG_2184	Facing west	
20	IMG_2185	Facing east	
21	IMG_2186	Facing southeast	Eroded channel indicating runoff flow from the north towards IDOT ROW.
22	IMG_2187	Facing northwest	Truck loading dock pitched away from IDOT ROW.
23	IMG_2188	Facing west	Typical low lying area.

Note: Photos taken August 2, 2013.


Bing Maps - Directions,
bing.com/maps
Bing
Web
Images
Videos
Maps
News
Explore
Sign in
10
PS 30
Directions
Traffic
My Places
Print
Share
Full Screen
Bird's eye
55
Stevenson Expy S
United States • IL • Cook Co. • Chicago • Little Village
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55
PS 30 Outfall to CSSC
50 feet
20 m
Pictometry Bird's Eye © 2016 MDA Geospatial Services Inc.
rivacy and Cookies
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About our ads
Help
Feedback
© 2017 Microsof

①

IMG_2166

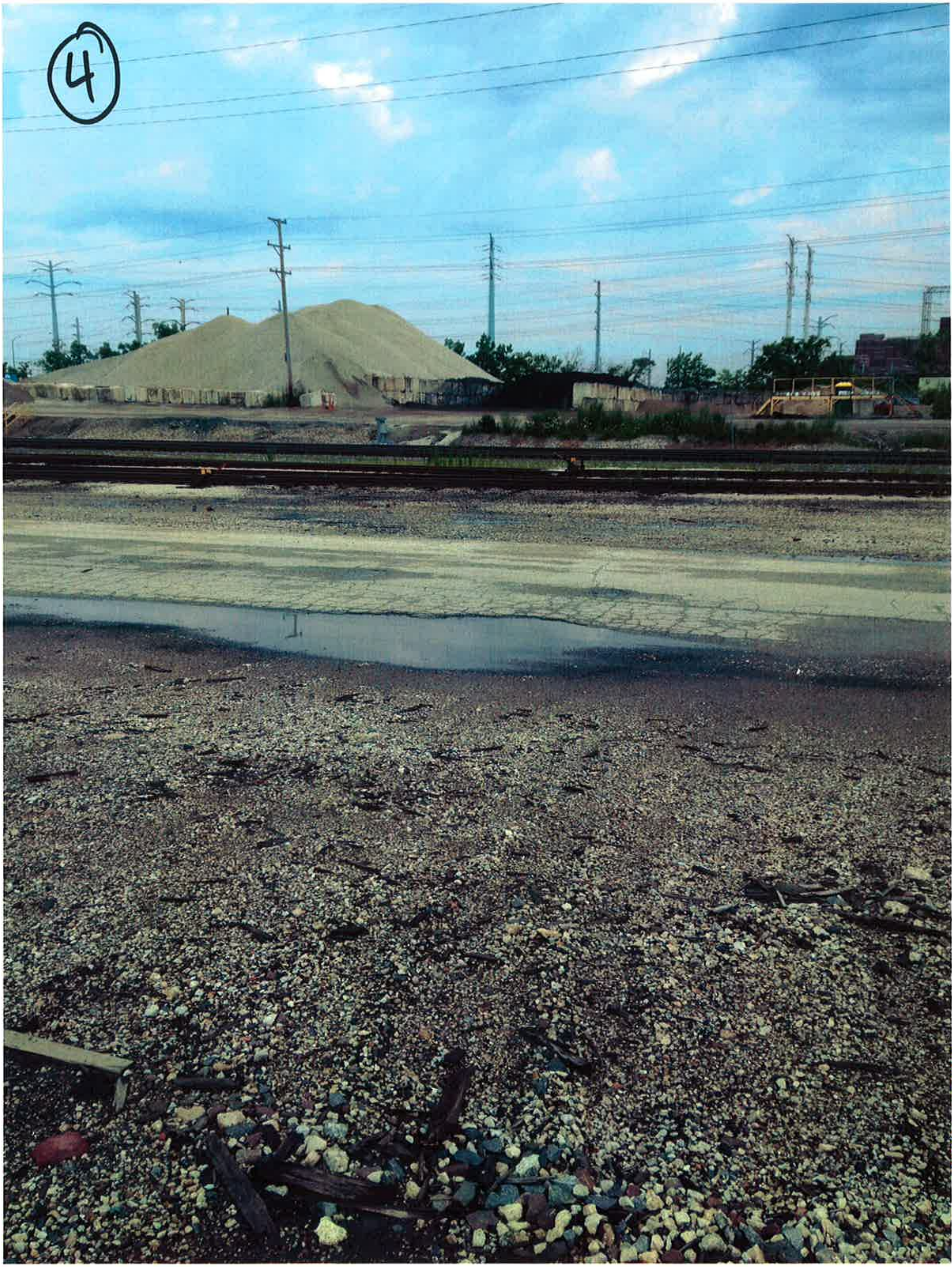
②

IMG_2167

③

IMG - 2168

④



IMG_2169

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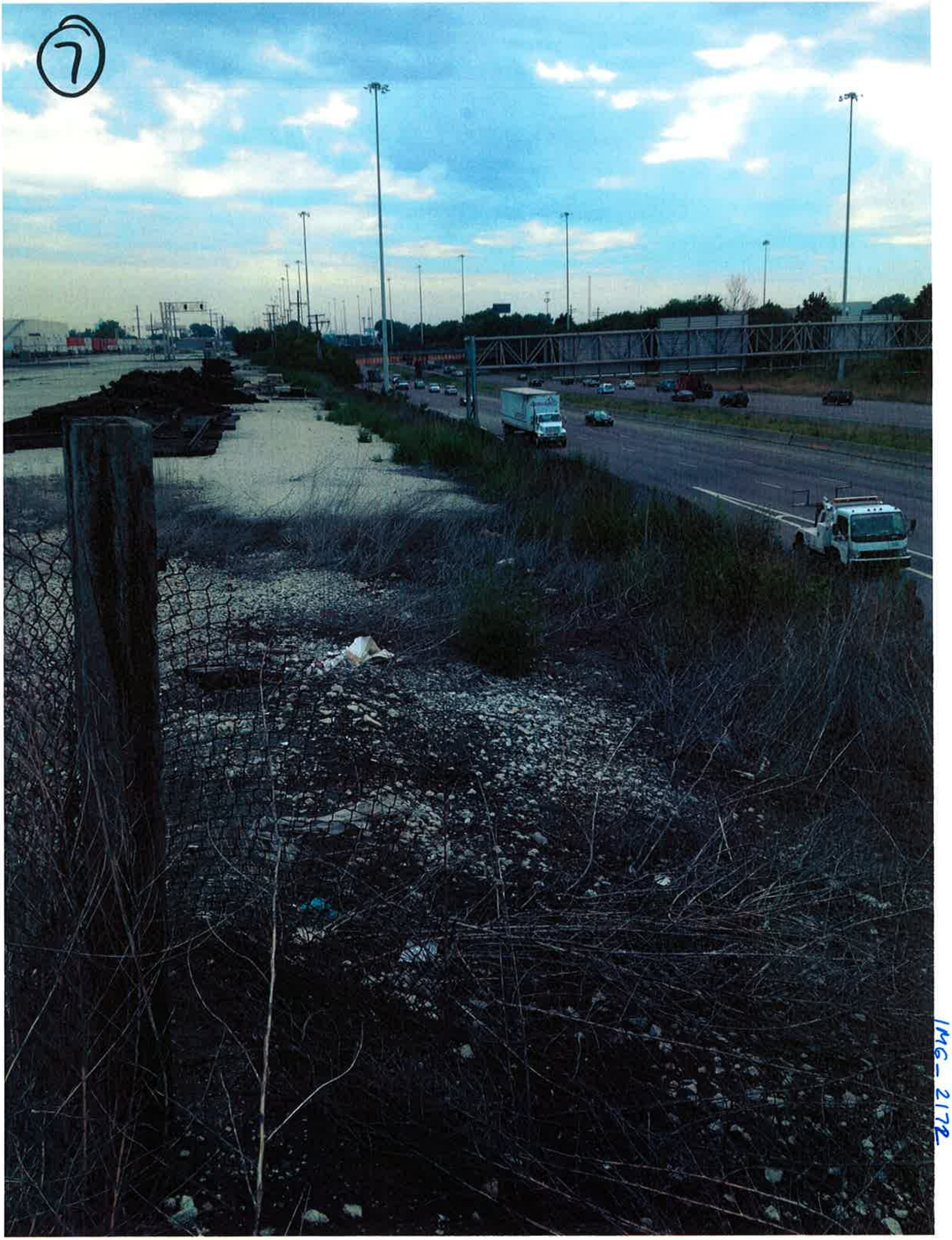
IMG-2170

⑥

IMG_2171

⑦



IMG-2172

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IMG_273

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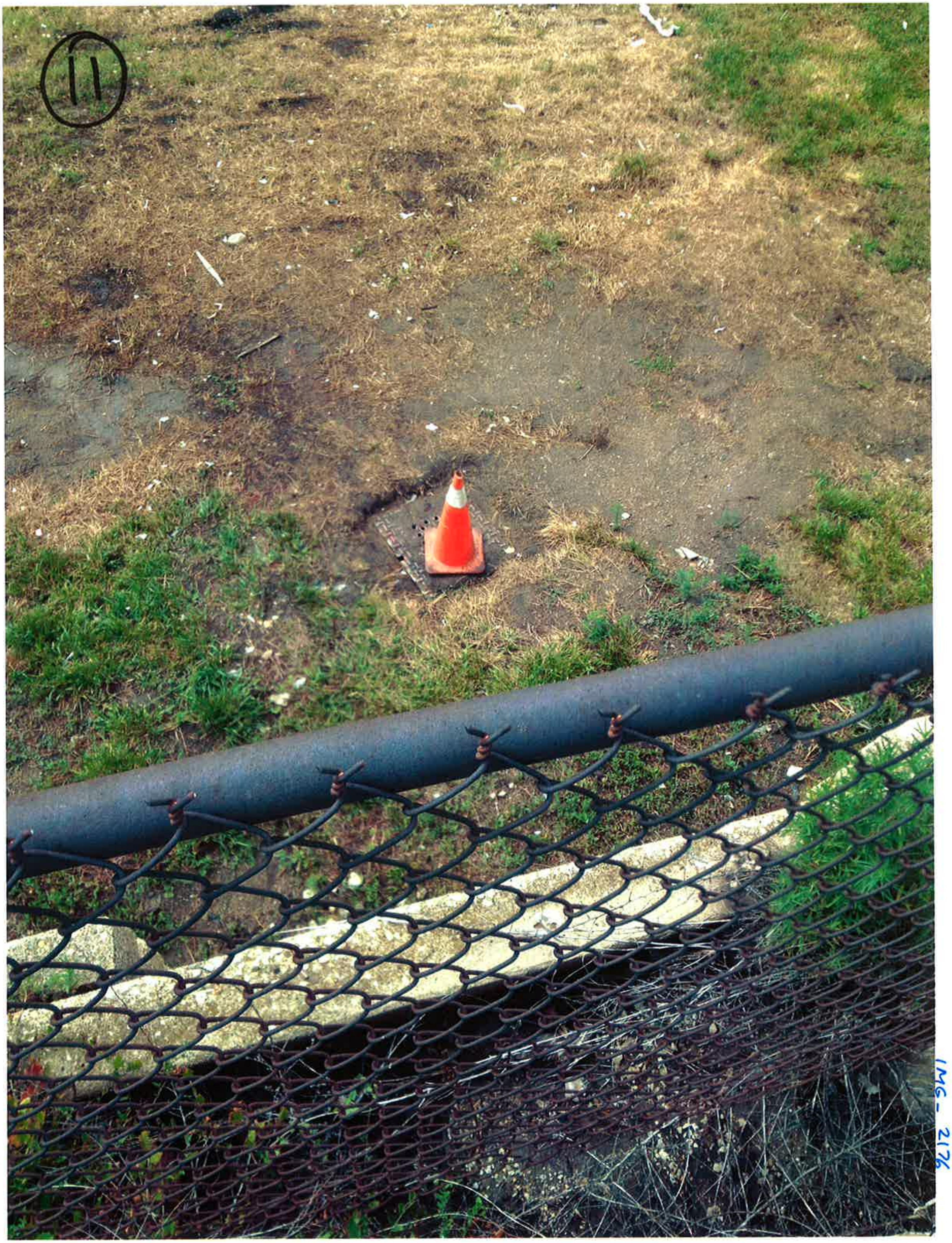
IMG_2174

10

IMG_2175

⑪



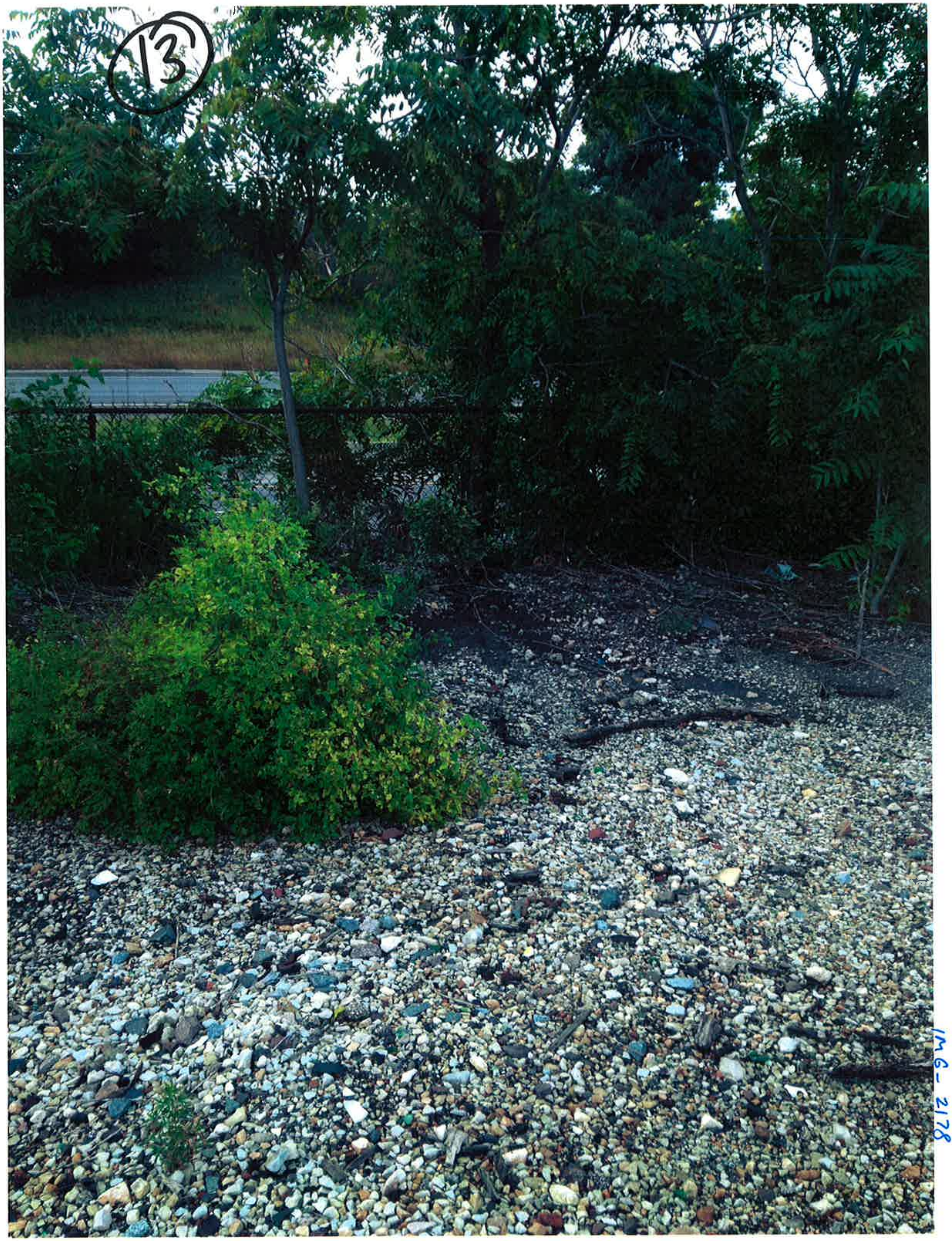
IMG- 2176

⑫


SHOULDER
BUSES ALLOWED
EXIT 286
50
Cicero Ave
1 mile
EXIT 287
Pulaski Rd
30

IMG_2117

13

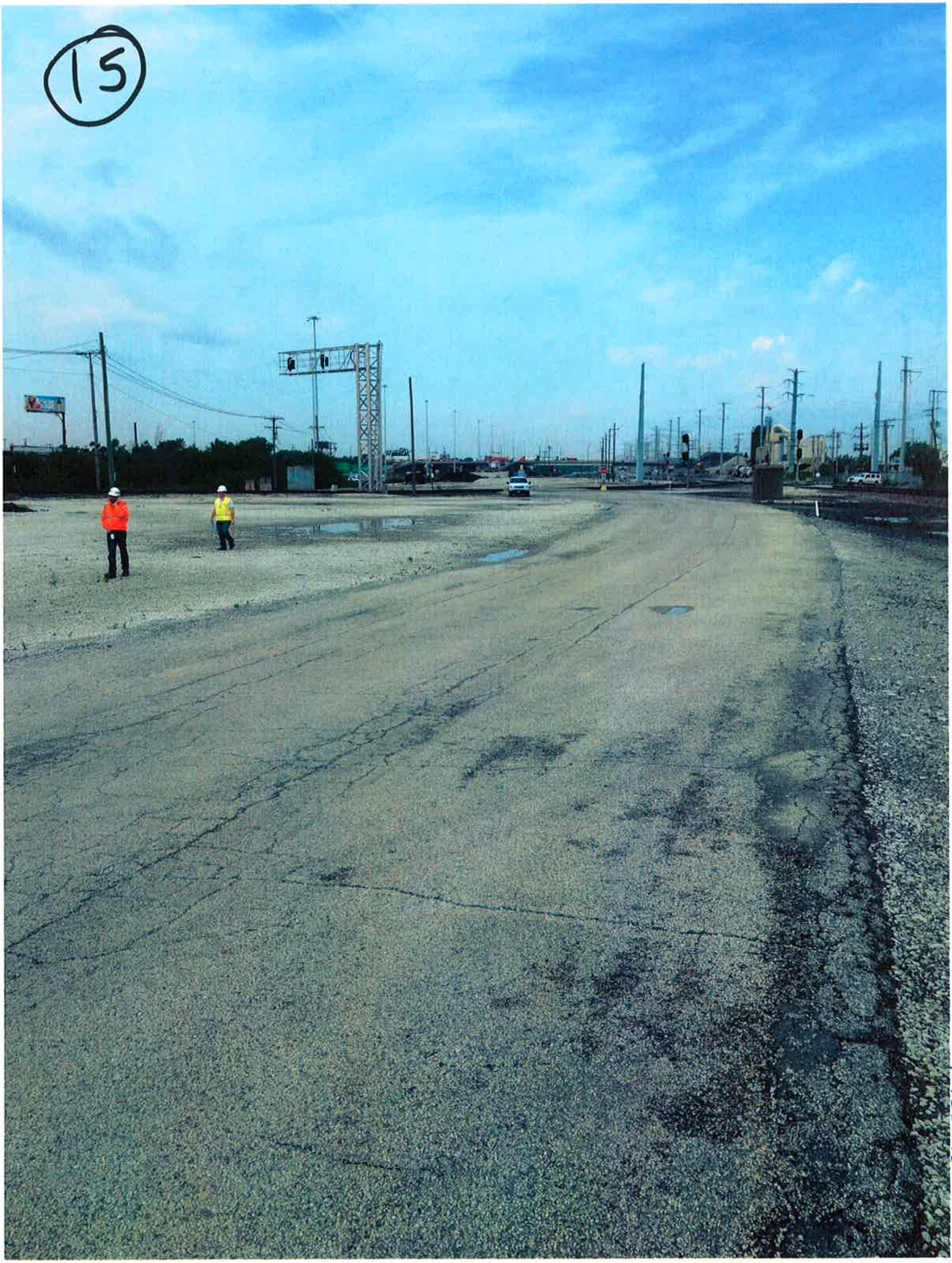


IMG- 2178

⑭

IMG_2179

⑮



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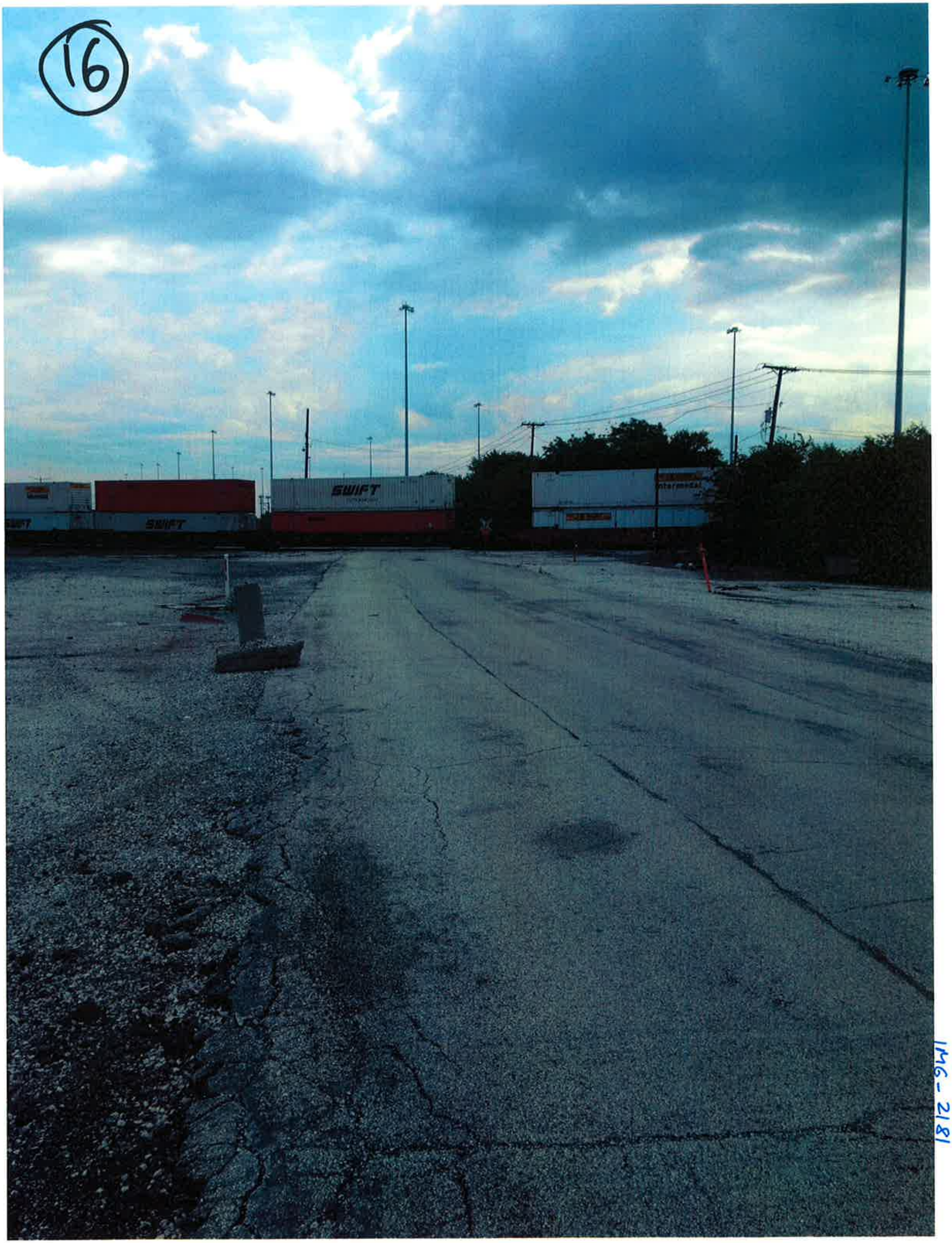
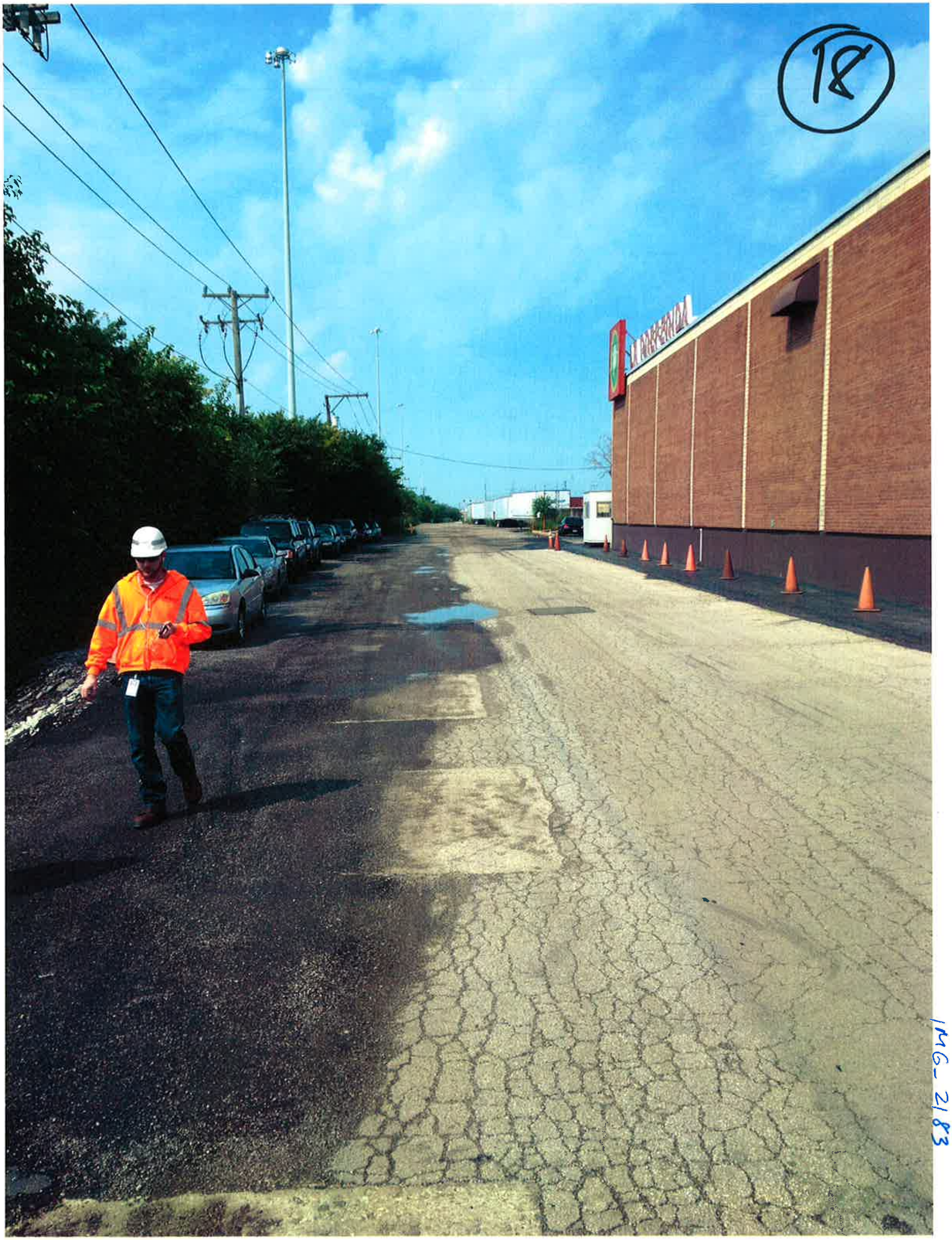


IMG-2181

⑰

IMG-2182



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IMG_2183

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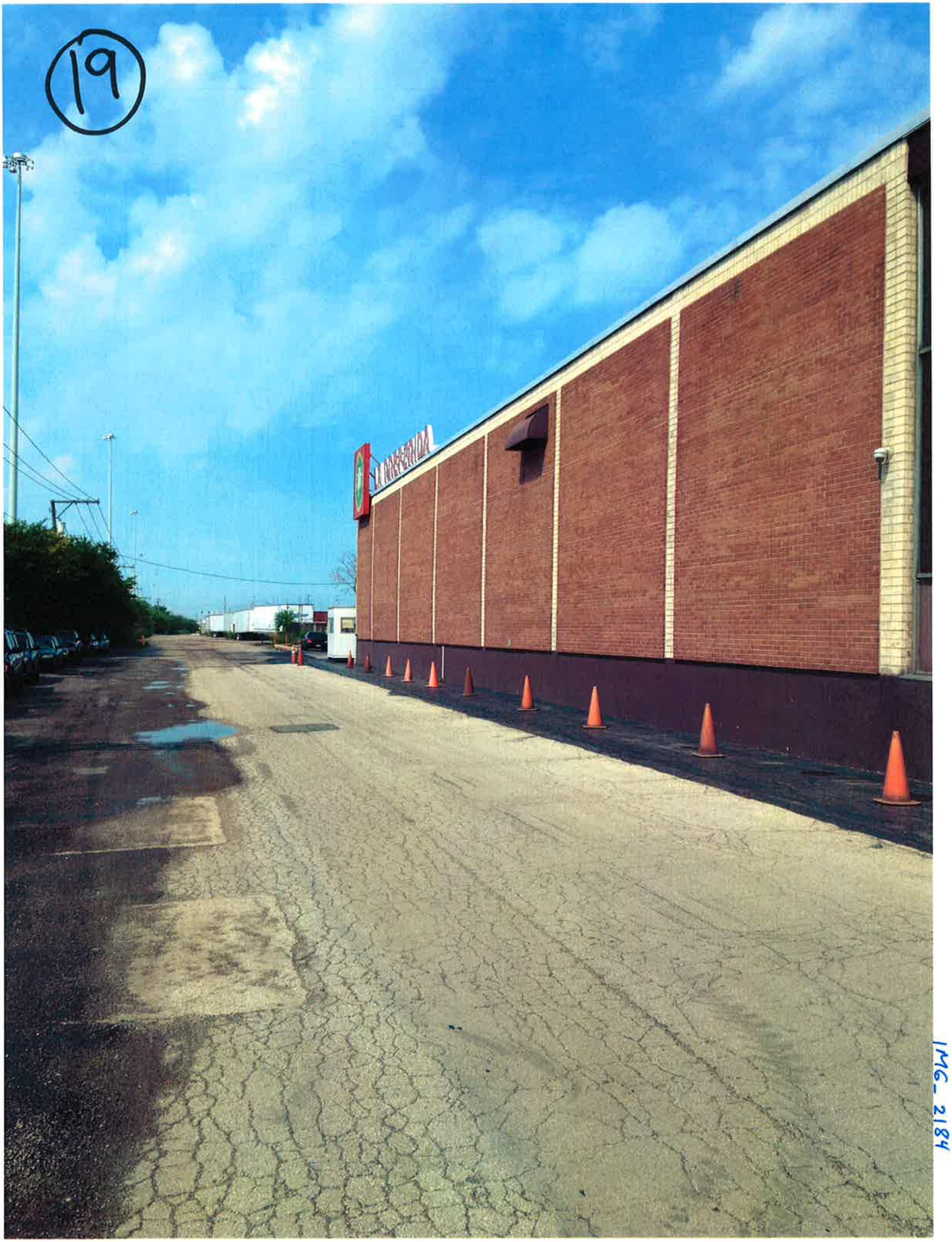


IMG_2184

20

IMG- 2185

21

IMG_2186

IMG- 2187

(22)


LA PREFERIDA
SHIPPING - RECEIVING
NOTICE DRIVERS
2
3
RJW TRANSPORT
www.rjwgroup.com
#1
WAREHOUSING
OT

23

IMG-2188

PS 30 BUILDING
PHOTOS

7/2/15 1103 FB #4

File: 070215BD

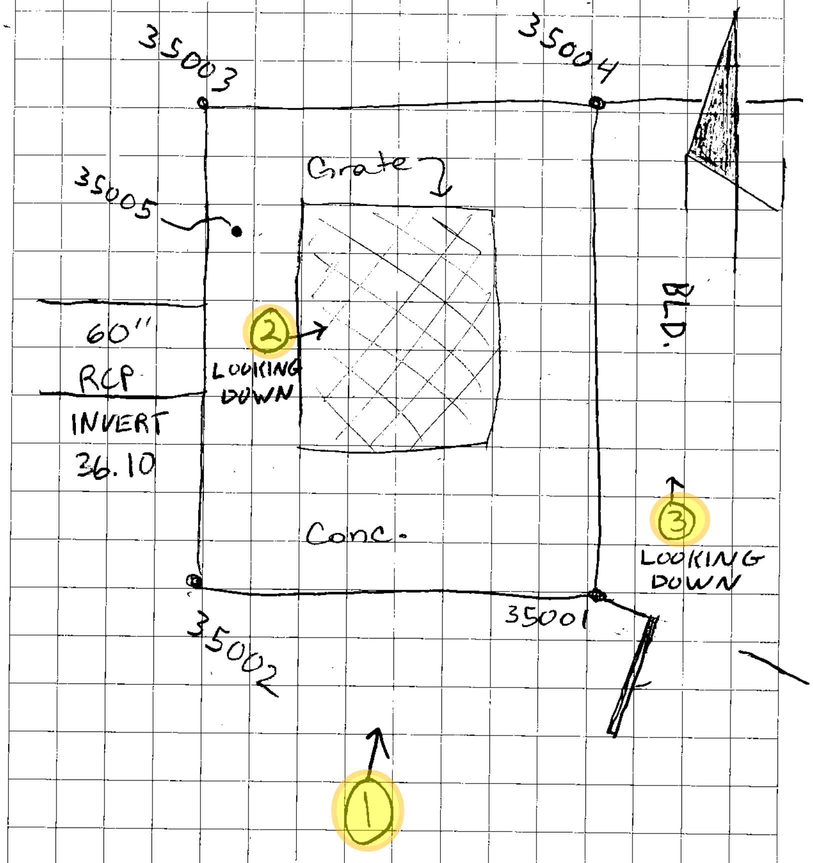
Set up GPS (VRS) R83 To Set Control For Survey of Kedzie Pump station #30

35000 ✓ 201277 ΔN=0.07 ΔE=-0.04 ΔV=-0.01

POINT RANGE 35000-35005

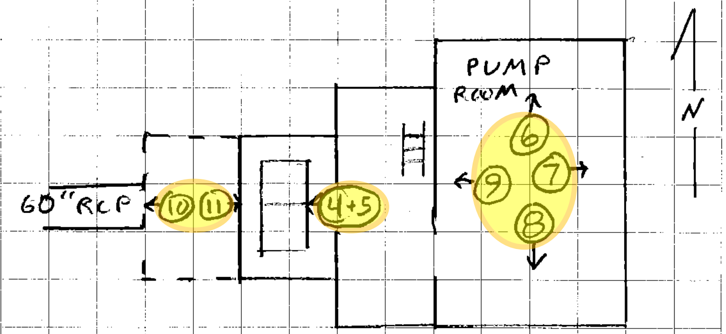
● = photo location

Drop Inlet at Pump Station #30



7/2/15 1103 FB 4

BOTTOM OF PUMP STATON #30



Pump Station 30, Lin Engineering, 7/02/2015

1. PS 30 Building, view from the southwest

2. PS 30, looking down air shaft at trash rack

3. PS 30 looking down toward wet well

4. PS 30 interior

5. PS 30, looking down toward wet well

6. PS 30, pump room, intermediate floor, looking north

7. PS 30, pump room, intermediate floor, looking east

8. PS 30, pump room, intermediate floor, looking south

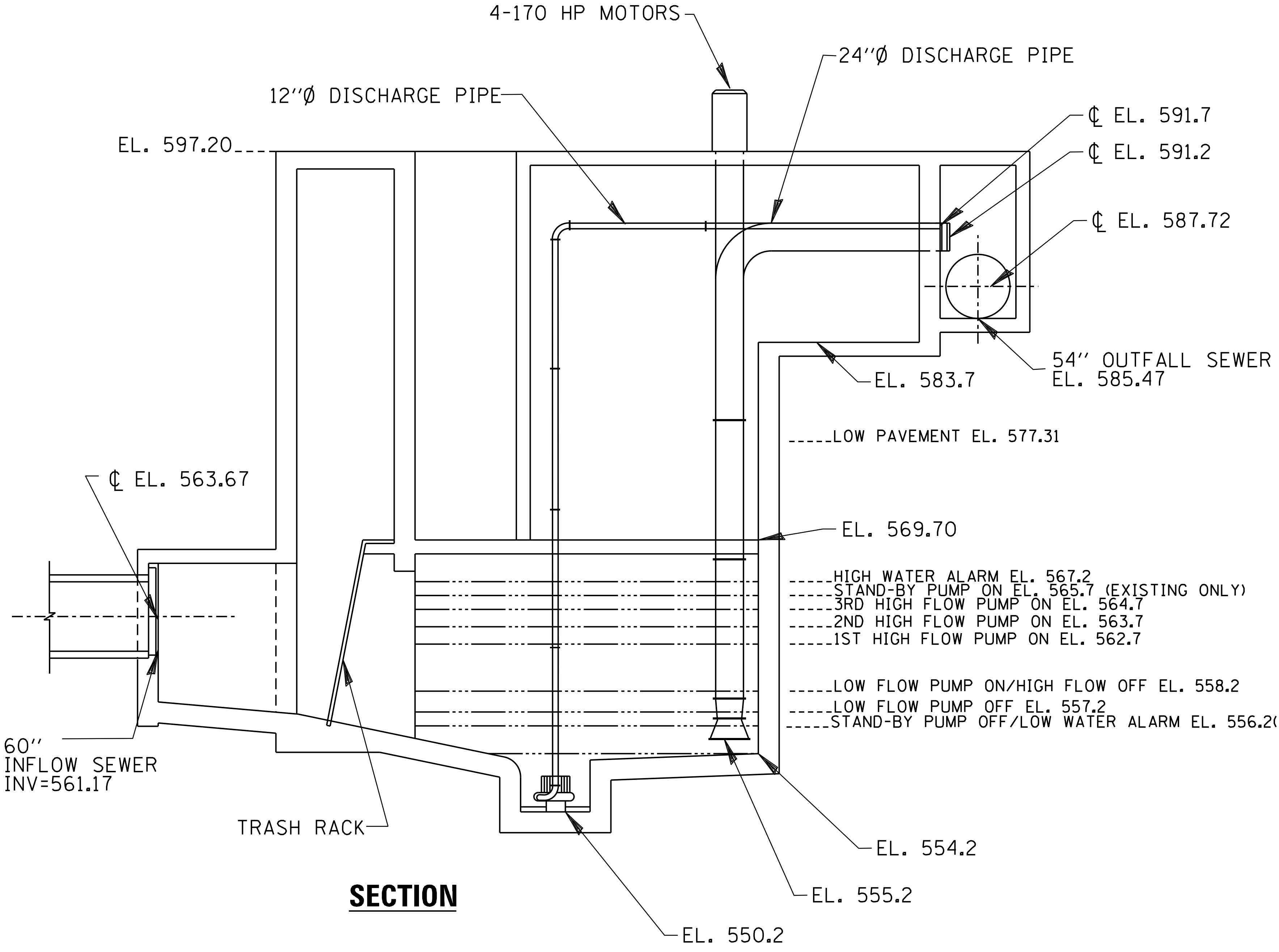
9. PS 30, intermediate floor, looking west

10. PS 30, 60” inflow pipe

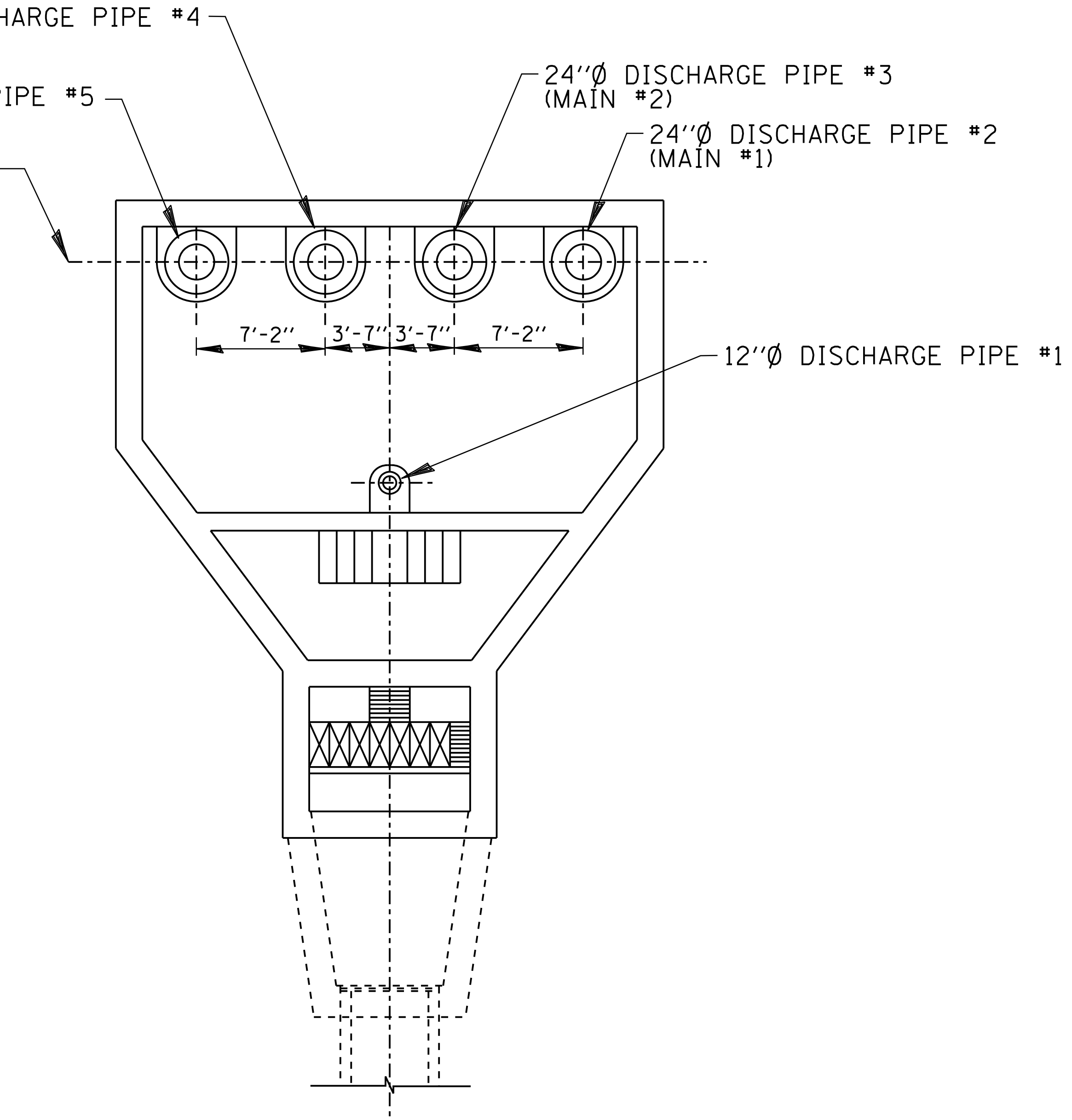
11. PS 30, trash rack and pumps in wet well

Section 4
As-Built Pump Station Plans

WET WELL AND DISCHARGE CHAMBER SCHEMATICS



SECTION



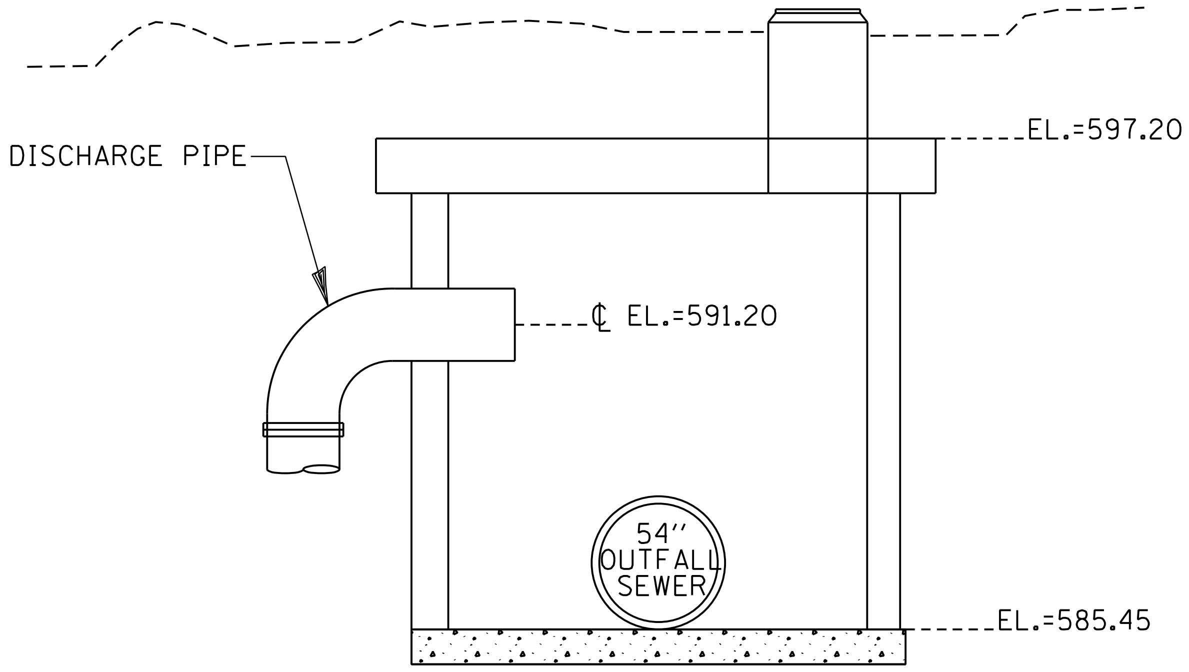
PLAN VIEW

NOTE:
PROPOSED/EXISTING WET WELL LAYOUT ARE THE SAME.
STANDBY PUMP DOES NOT TURN ON FOR PROPOSED CONDITIONS.

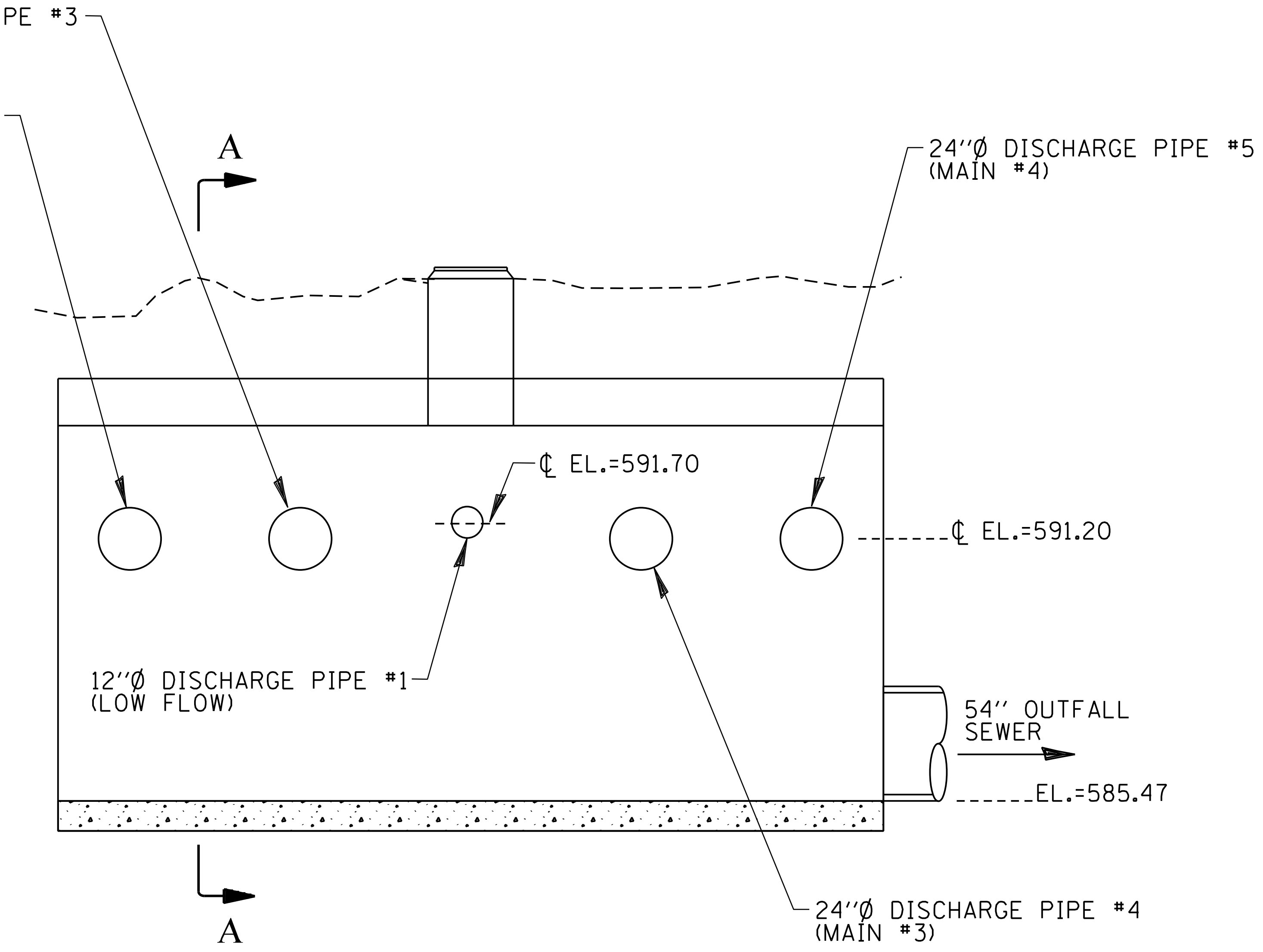
NOTE:
ALL ELEVATIONS ARE NAVD88

FILE NAME =	USER NAME = edburke	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	EXISTING WET WELL	F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN -	REVISED -							
	PLOT SCALE = N.T.S.	CHECKED -	REVISED -					EXHIBIT 4-1A		
	PLOT DATE = 3/24/2022	DATE -	REVISED -		SCALE: SHEET NO. OF SHEETS STA. TO STA.		ILLINOIS FED. AID PROJECT			

$FILE$



SECTION A–A PROFILE VIEW



FRONT VIEW

I&M CANAL ELEVATIONS

10 YEAR = 582.57
20 YEAR = 583.55
50 YEAR = 584.21
100 YEAR = 585.86
500 YEAR = 587.46

NOTE:
ALL ELEVATIONS ARE IN NAVD1988.

\\tbg.net\CBBEL\CBBELDFT\IDOT\110203.00001\Water\Exhibits\110203.00001exh Discharge Chamber.dgn

FILE NAME =	USER NAME = edburke	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = N.T.S.	CHECKED -	REVISED -
	PLOT DATE = 1/25/2022	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DISCHARGE CHAMBER

SCALE: SHEET NO. OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		EXHIBIT 4–1B		
		ILLINOIS FED. AID PROJECT		

1999 IDOT PS 30
MECHANICAL PLANS

39 PS 30

Nasir

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55	1114-641-I	COOK	40	1

FED. ROAD DIST. NO. | ILLINOIS | FED. AID PROJECT ACIM-55-7(232)287

D-91-009-94

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

FOR INDEX OF SHEETS / DRAWINGS, SEE SHEET NO. 2

PLANS FOR PROPOSED FEDERAL AID HIGHWAY

LIGHTING PLANS
☒ STATE MAINTENANCE
Loc: ____________
☐ NON-STATE MAINTENANCE

FAI RTE. 55 (STEVENSON EXPRESSWAY)
STEVENSON EXPRESSWAY (I-55) AT HOMAN AVENUE
REHABILITATION OF PUMP STATION NO. 30
SECTION: 1114-641-I
PROJECT: ACIM-55-7(232) 287
C-91-009-94
COOK COUNTY


LOCATION OF SECTION INDICATED THUS: -

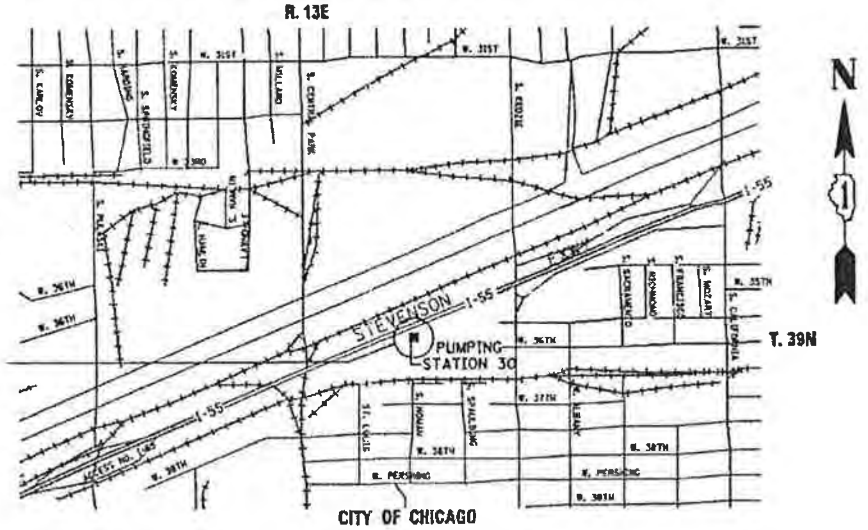
IDOT ELECTRICAL OPERATIONS SECTION CHIEF RAMESH GUPTA (847)705-4390
PLAN PREPARATION ENGINEER CARL BERGSTROM /DARYLE DREW (847)705-4867

SCALE: 0 5 10 15 30 M
SCALE: 0 25 50 100 FT.
SCALE: 0 1 2 3 m
SCALE: 0 4 8 FT.

IDOT STANDARDS

664001-01	CHAIN LINK FENCE
702001	TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES
~~701101~~	~~TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES~~
	~~TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES~~

PROJECT LOCATION



CITY OF CHICAGO

LOCATION MAP

SCALE: 0 125 250 500m
SCALE: 0 500 1000 2000 FT.

FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES, REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES IN MAKING MEASUREMENTS ON REDUCED PLANS.

ALL UTILITY LOCATION INFORMATION FOR EXCAVATION CALL DIGGER (312)744-7000

CONTRACT NO. 82648

PROJECT LOCATED IN CITY OF CHICAGO

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED June 29 19 99
John P. Ku
DISTRICT ENGINEER

________________ 19 ______

ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION

August 13 19 99
Bill Kinkey
ENGINEER OF DESIGN AND ENVIRONMENT

August 13 19 99
James P. Slifer
DIRECTOR, DIVISION OF HIGHWAYS

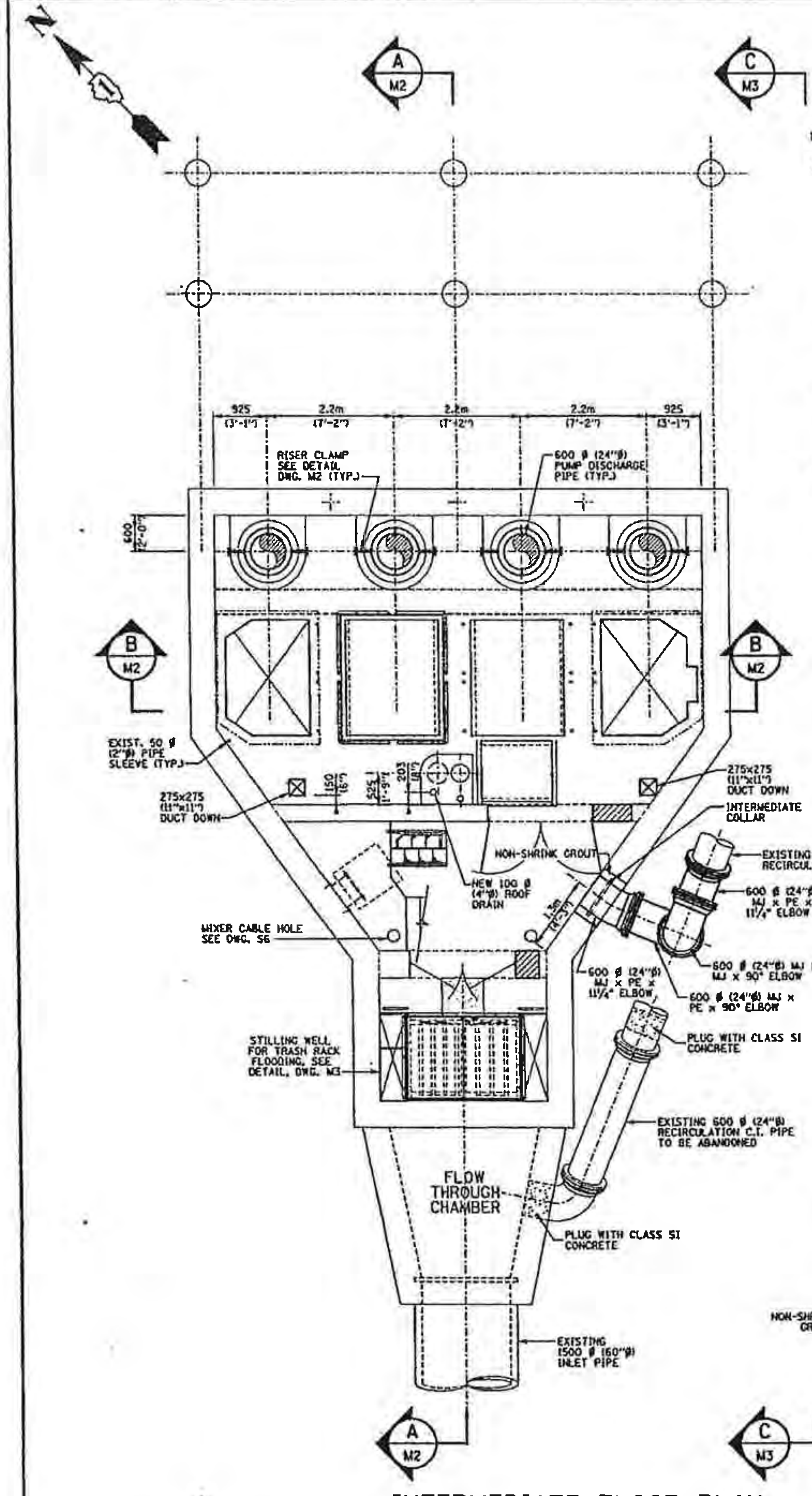
YA-TAI LIN
62-23805
Ya Tai Lin 4/1/99
SEAL

ALVORD, BURDICK & HOWSON, L.L.C.
ENGINEERS 1998 CHICAGO

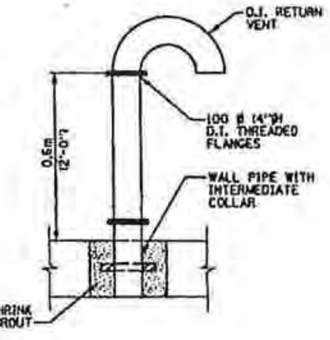
PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS

F.A.I RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55	1114 641 I	COOK	40	17

FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT

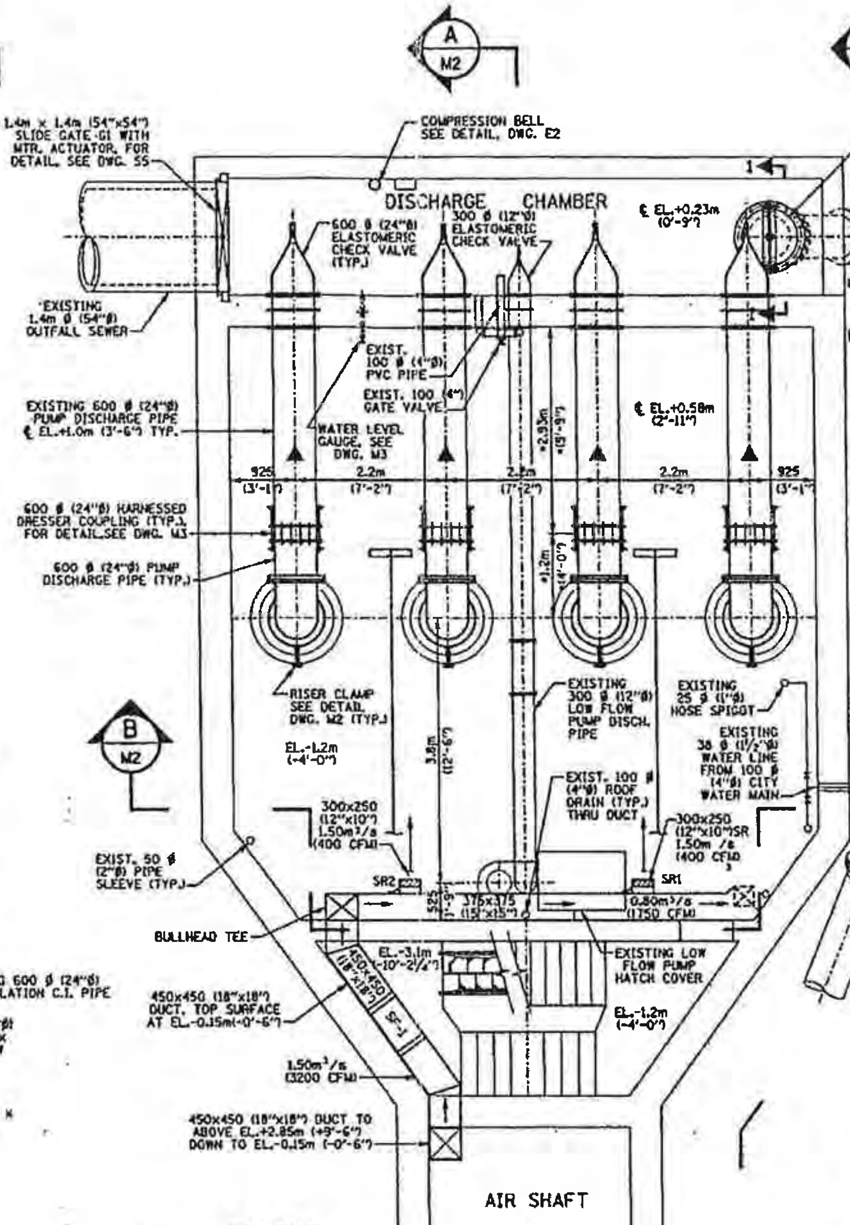


INTERMEDIATE FLOOR PLAN AT EL.-5.49m (-18.00')



VENT DETAIL

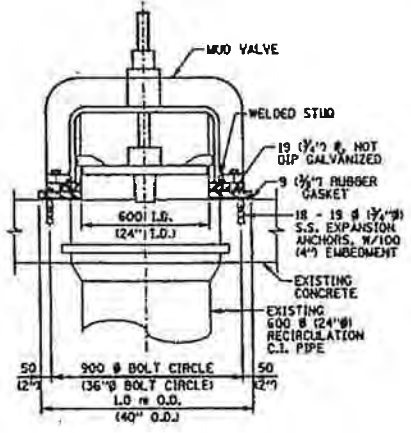
NOT TO SCALE



DISCHARGE FLOOR PLAN AT EL.+1.5m (+5.00')

NOTES:

1. ALL DIMENSIONS SHOWN WITH AN ASTERISK (*) SHALL BE VERIFIED IN THE FIELD, BY THE CONTRACTOR.
2. THE LOCATION OF THE MAIN PUMPS SHALL BE ESTABLISHED BASED ON THE CENTERLINE LOCATION OF THE PUMP DISCHARGE PIPING REMAINING FIXED AND ADJUSTING THE LOCATION OF THE CENTERLINE OF THE MAIN PUMPS BASED ON THE MANUFACTURER'S APPROVED SHOP DRAWINGS.
3. THE ACTUAL LOCATION OF THE MONORAIL SHALL BE ESTABLISHED BY THE CONTRACTOR TO BE DIRECTLY OVER THE CENTERLINE OF THE MAIN PUMPS.
4. THE LOCATION AND SIZE OF HATCH OPENINGS SHALL BE VERIFIED WITH MANUFACTURER'S APPROVED SHOP DRAWINGS, AND BE ADJUSTED AS REQUIRED.
5. ALL PIPE AND CONDUIT PENETRATIONS THROUGH WALLS AND SLABS TO CONTROL ROOM SHALL BE GROUTED GAS TIGHT.



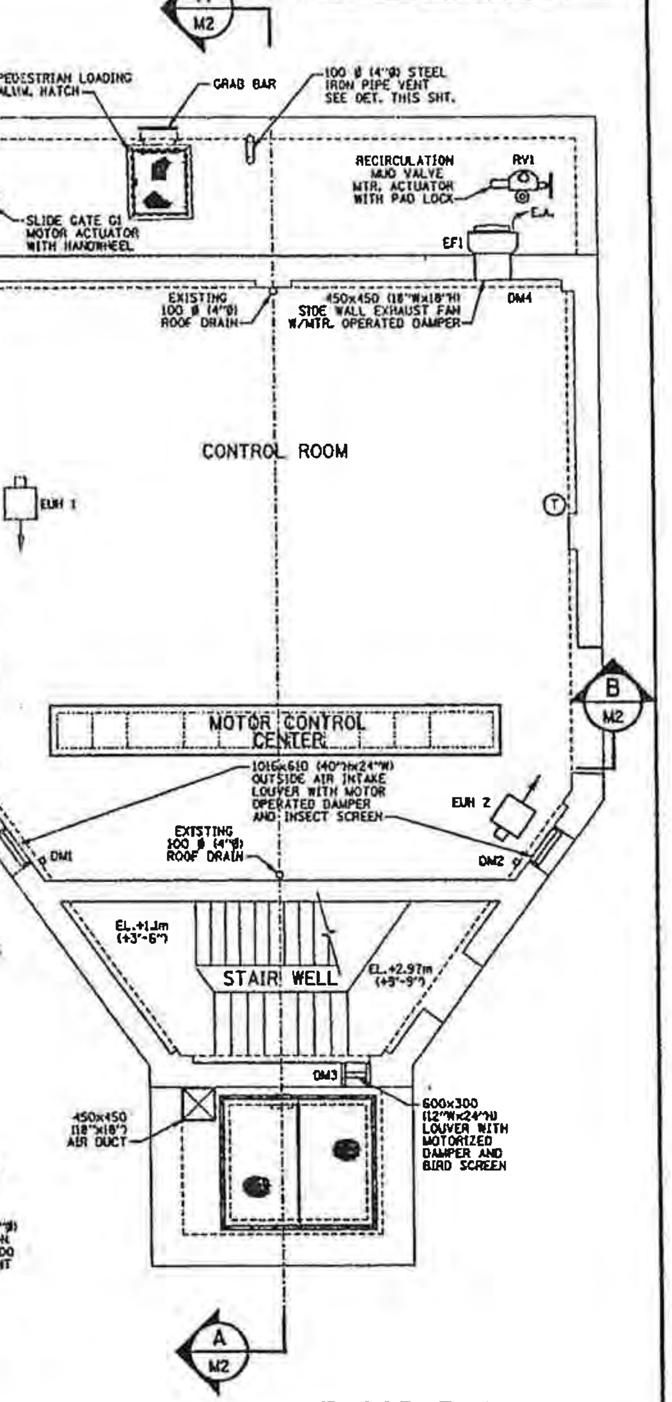
SECTION 1-1

MUD VALVE DETAIL

NOT TO SCALE

SCALE: 0 1 2 3 m

SCALE: 0 4 8 FT.



CONTROL ROOM FLOOR PLAN AT EL.+2.97m (+9.75')

ALVORD, BURDICK & HOWSON, L.L.C.
ENGINEERS
CHICAGO

M1

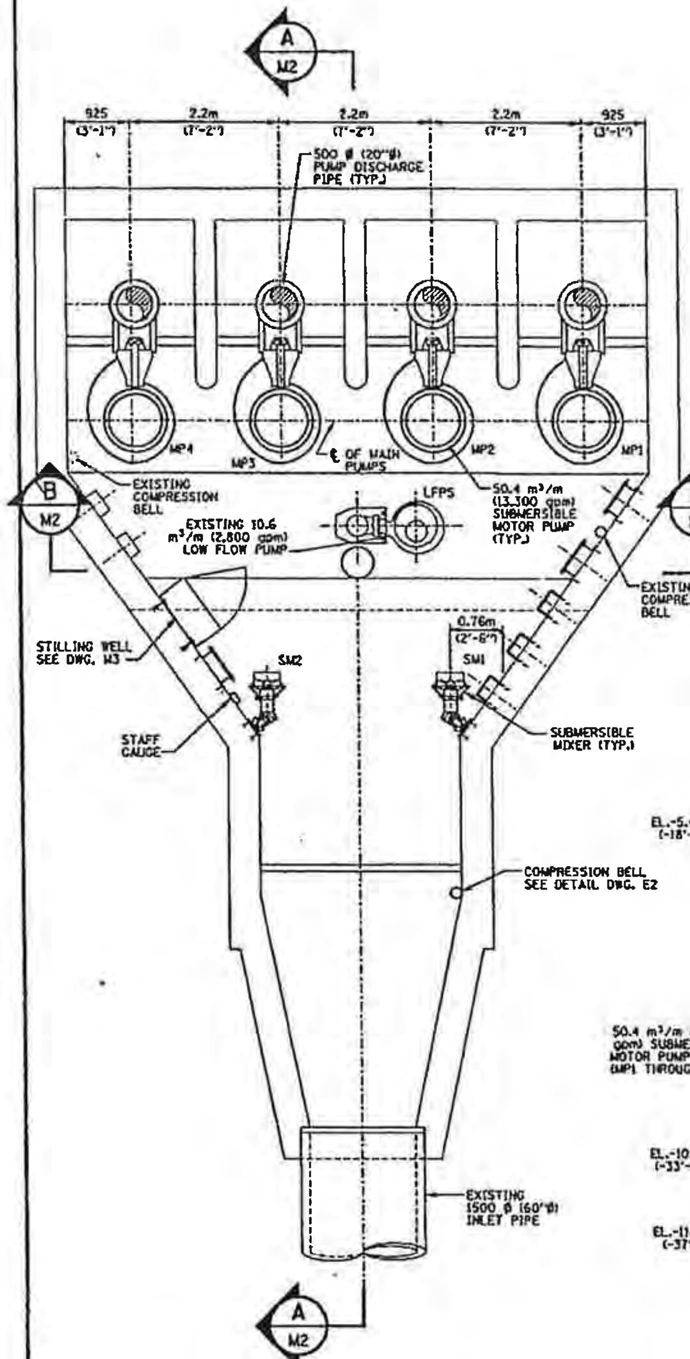
REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
PUMP STATION NO. 30
REHABILITATION
FAI-55 AT HOMAN AVENUE
MECHANICAL PLANS

SCALE: AS SHOWN
DRAWN BY: AP,LMJ,CM
DATE: 06-24-99
CHECKED BY: KC

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55	1114 641 AI	COOK	40	18

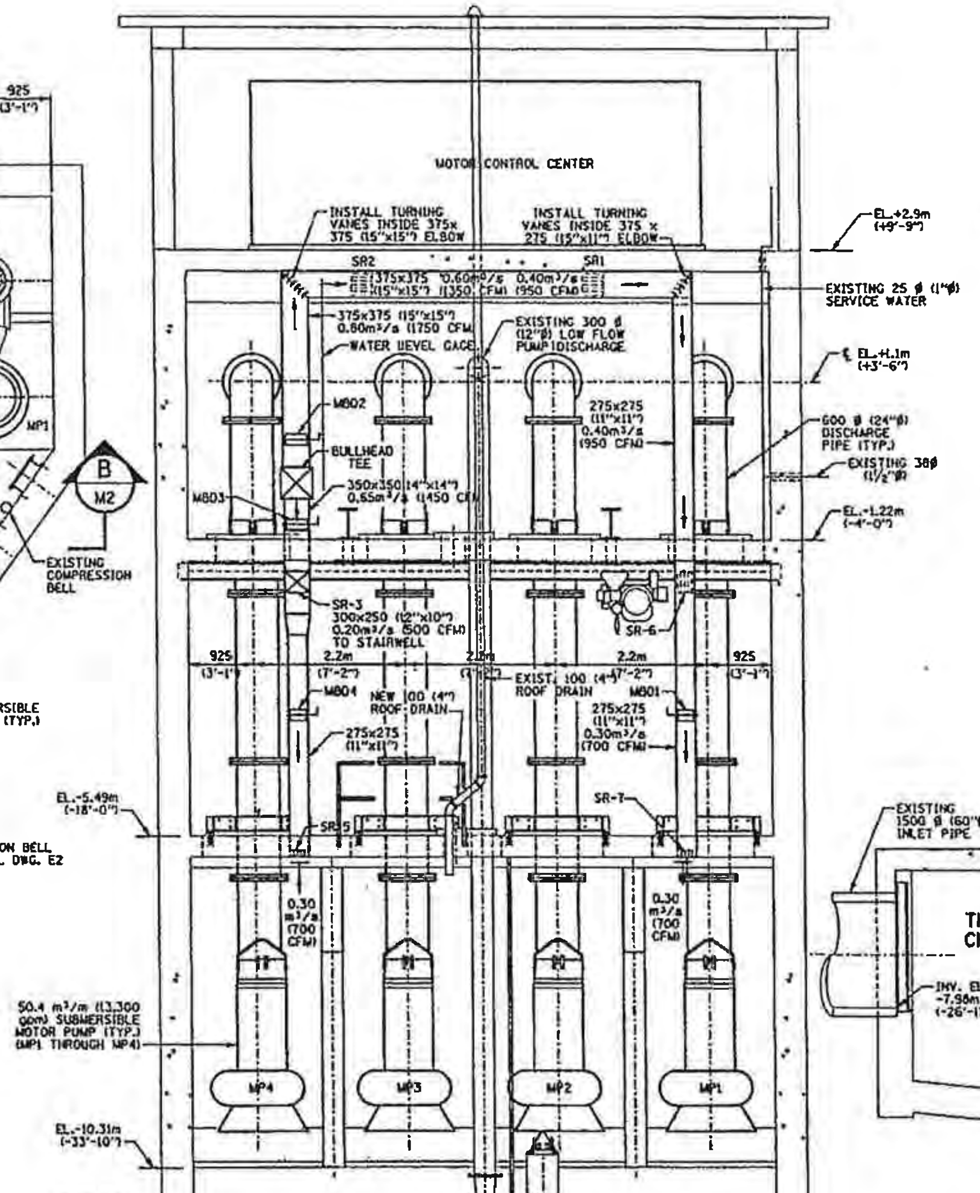
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT



PLAN AT EL.-8.7m± (-29.00'±)

SCALE: 0 1 2 3 m

SCALE: 0 4 8 FT.



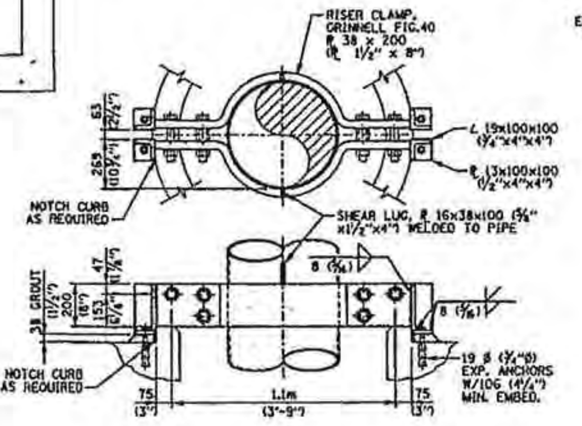
EL.-11.43m (-37'-6")

EXIST. 10.6 m³/m (2,800gpm) LOW FLOW PUMP (LFPS)

SECTION B/M1

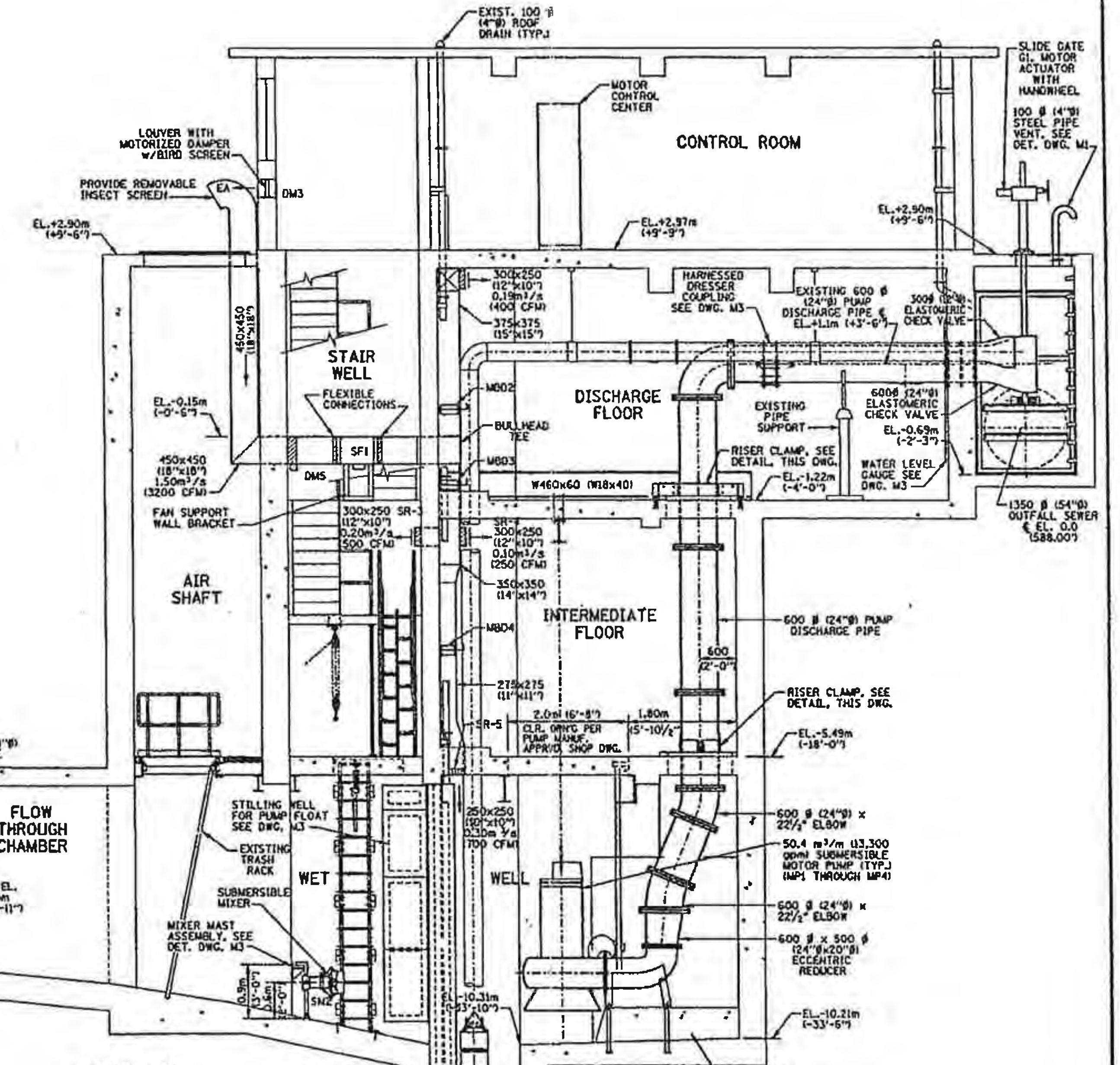
SCALE: 0 1 2 3 m

SCALE: 0 4 8 FT.



RISER CLAMP DETAIL

NOT TO SCALE



EXISTING 1500 ø (60"ø) INLET PIPE

FLOW THROUGH CHAMBER

INV. EL. -7.98m (-26'-11")

EL.-11.43m (-37'-6")

CONCRETE PUMP BASE. FOR DET. SEE DWG. S2

EXIST. 10.6m³/m (2,800gpm) LOW FLOW PUMP (LFPS)

SECTION A/M1

SCALE: 0 1 2 3 m

SCALE: 0 4 8 FT.

M2

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

PUMP STATION NO. 30
REHABILITATION
FAI-55 AT HOMAN AVENUE

MECHANICAL PLANS
AND SECTIONS

SCALE: AS SHOWN
DATE: 06-24-99
DRAWN BY: AP,LMJ,CM
CHECKED BY: KC

ALVORD, BURDICK & HOWSON, L.L.C.
ENGINEERS
CHICAGO

1962 IDOT I-55
(Southwest Expressway)
MAIN DRAIN AND
OUTFALL STORM SEWER PLANS

3-

F.A.I. ROUTE NO.	SEC.	EXPRESSWAYS	TOTAL SHEETS	SHEET NO.
FAI-55	1114-641AT	SOUTHWEST	48	1

STA. TO STA.

FED. ROAD DIST. NO. 7 | ILLINOIS | FED. AID PROJECT I-55-7(23)-28

INDEX OF SHEETS

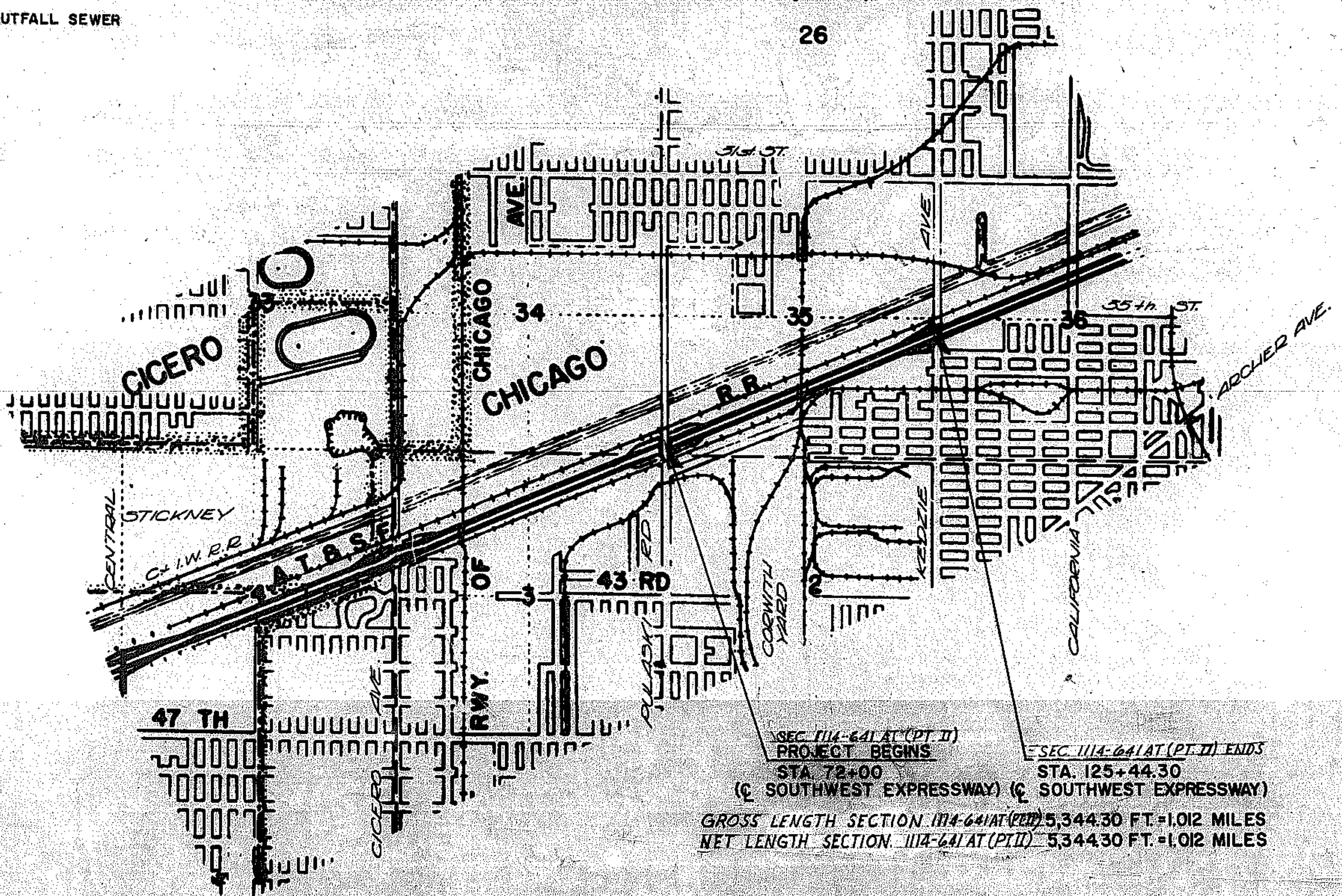
STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
DIVISION OF HIGHWAYS
PLANS FOR PROPOSED FEDERAL AID HIGHWAY

F.A.I. ROUTE 55 SECTION 1114-641 AT (PT.II)

SOUTHWEST EXPRESSWAY
MAIN DRAIN & PUMPING STATION
PROJECT I-55-7 (23)-281

DESCRIPTION OF IMPROVEMENT:

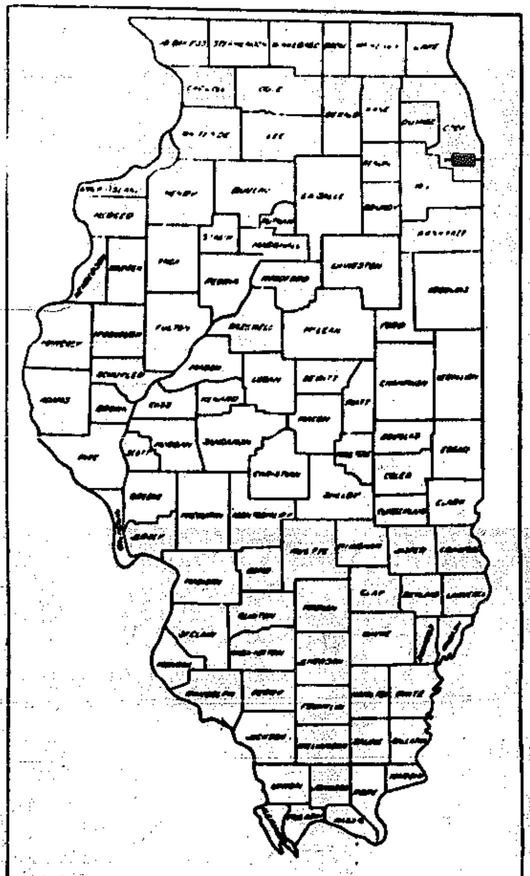
THE WORK UNDER THIS CONTRACT CONSISTS OF THE CONSTRUCTION OF A PUMPING STATION AND THE SERVICE DRIVE THERETO, THE CONSTRUCTION OF A MAIN DRAIN, THE CONSTRUCTION OF AN OUTFALL SEWER AND ALL INCIDENTAL AND COLLATERAL WORK NECESSARY TO COMPLETE THE PROJECT AS SHOWN ON THE PLANS AND DESCRIBED IN THE SPECIAL PROVISIONS.



SEC. 1114-641 AT (PT II) PROJECT BEGINS
STA. 72+00
(℄ SOUTHWEST EXPRESSWAY)

SEC. 1114-641 AT (PT II) ENDS
STA. 125+44.30
(℄ SOUTHWEST EXPRESSWAY)

GROSS LENGTH SECTION 1114-641 AT (PT II) 5,344.30 FT. = 1.012 MILES
NET LENGTH SECTION 1114-641 AT (PT II) 5,344.30 FT. = 1.012 MILES



LOCATION OF SECTION INDICATED THUS:—

STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
DIVISION OF HIGHWAYS

SUBMITTED 9-18 1962
DISTRICT ENGINEER
EXAMINED September 28, 1962
PASSED September 28, 1962
APPROVED September 1962
APPROVED September 1962
W. J. Mayes Jr

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
APPROVED
DIVISION ENGINEER DATE

PREPARED BY: Henry M. Yomanchy 9-18-62
EXPRESSWAY DESIGN ENGINEER
EXAMINED BY: E Bimke per HPP 9-18-62
DISTRICT CONSTRUCTION ENGR.
EXAMINED BY: Robert E. Kronf 9-18-62
EXPRESSWAY ENGINEER

ENTIRE SECTION INSPECTED AND APPROVED AS TO POLICY
BY:
DISTRICT ENGINEER

Job No. 22694

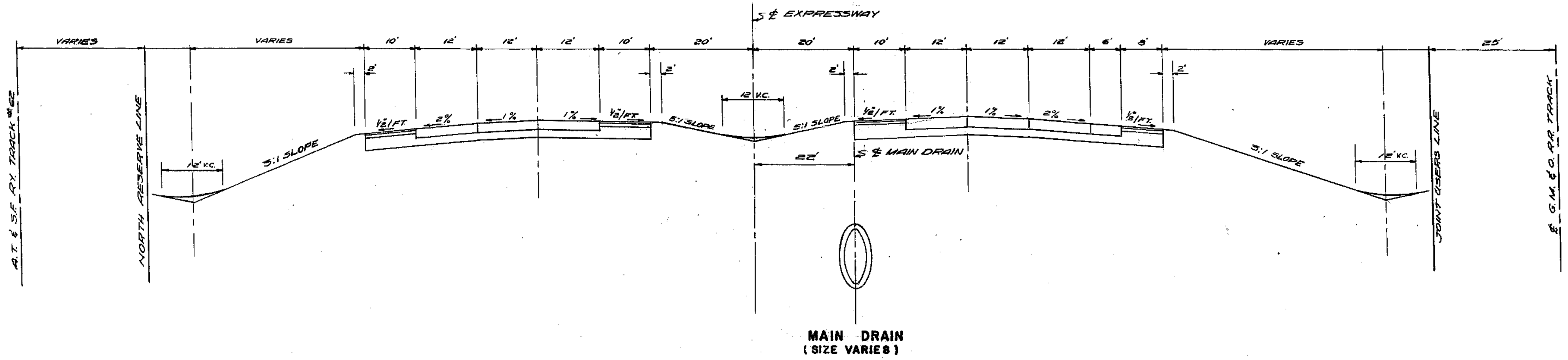
COUNTY SECTION F A ROUTE

Project Length revised H.L.L. 11-1-62

F.A.I. RTE.	SECTION	EXPRESSWAYS	TOTAL SHEETS	SHEET NO.
55	1114-641 AZ (Part B)	Southwest	48	2

STA. TO STA.

FED. ROAD DIST. NO. 7 | ILLINOIS | FED. AID PROJECT



TYPICAL CROSS SECTION

REVISIONS	
NAME	DATE

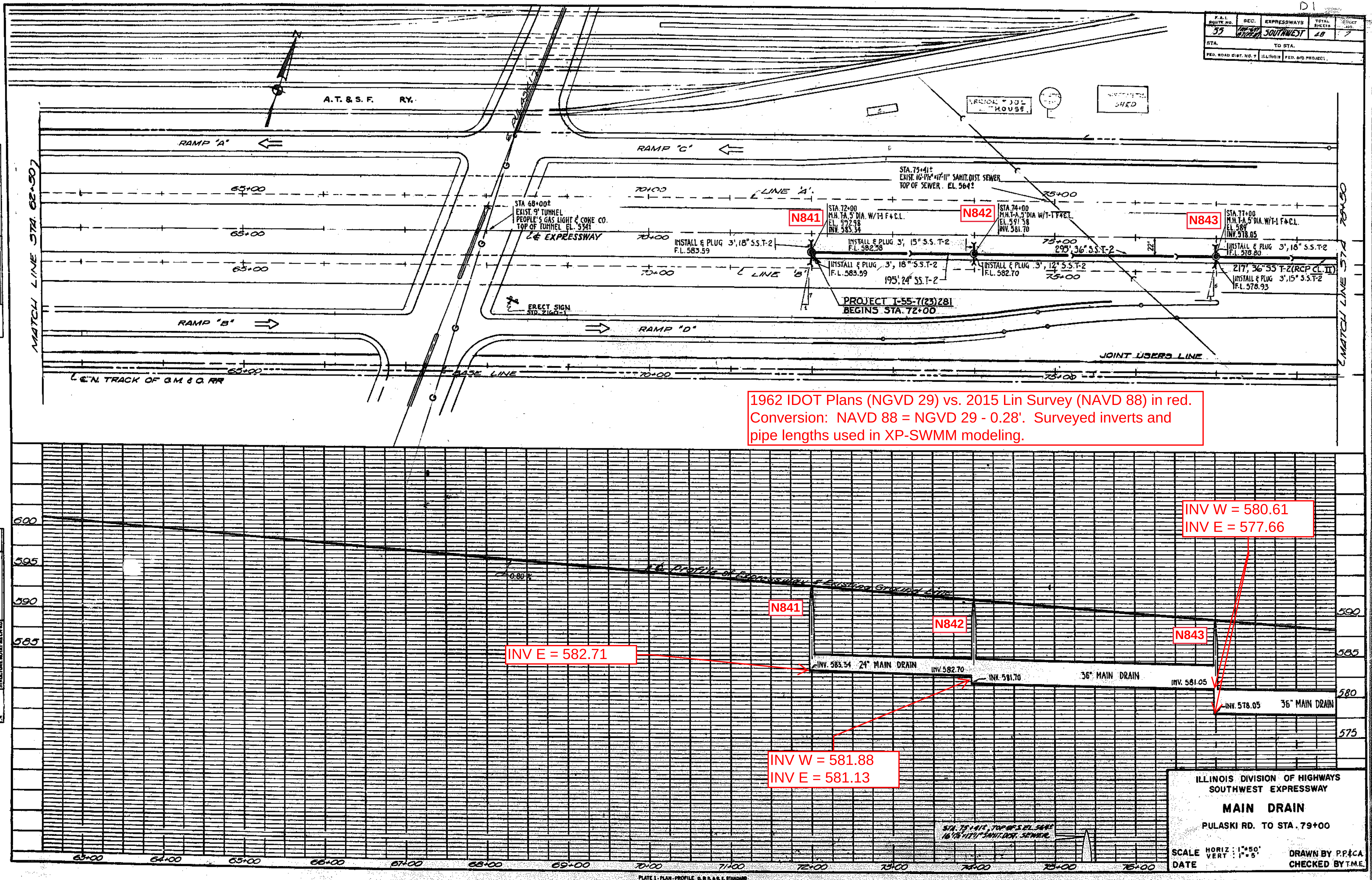
ILLINOIS DIVISION OF HIGHWAYS
SOUTHWEST EXPRESSWAY

TYPICAL CROSS SECTION

SCALE: HORIZ. 1" = 10'
VERT. NONE
DATE
DRAWN BY
CHECKED BY

F.A.I. ROUTE NO.	SEC.	EXPRESSWAYS	TOTAL SHEETS	SHEET NO.
55	[illegible]	SOUTHWEST	48	7

D1



1962 IDOT Plans (NGVD 29) vs. 2015 Lin Survey (NAVD 88) in red.
Conversion: NAVD 88 = NGVD 29 - 0.28'. Surveyed inverts and pipe lengths used in XP-SWMM modeling.

ILLINOIS DIVISION OF HIGHWAYS
SOUTHWEST EXPRESSWAY

MAIN DRAIN

PULASKI RD. TO STA. 79+00

SCALE HORIZ: 1" = 50'
VERT: 1" = 5'
DATE

DRAWN BY P.P. & C.A.
CHECKED BY T.M.E.

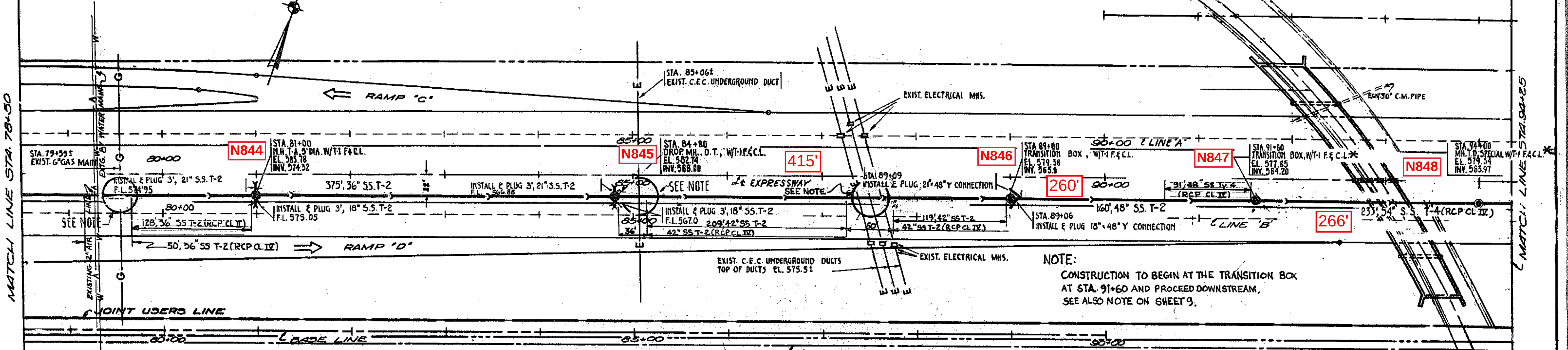
REV. 10-11-67 – JE CHANGED 395', SS T-2 TO 217 L.F., 36" SS Ty. 2 (RCP CL. II)

F.A.I. ROUTE NO.	SEC.	EXPRESSWAYS	TOTAL SHEETS	SHEET NO.
55	[illegible]	SOUTHWEST	48	8
STA.	TO STA.			
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

NOTE:
36" MAIN DRAIN UNDER THE 6" GAS MAIN, 8" WATER MAIN AND THE 2" AIRLINE SHALL BE INSTALLED BY JACKING OR BY TUNNELING.
COST OF JACKING OR TUNNELING SHALL NOT BE PAID FOR SEPARATELLY, BUT SHALL BE INCLUDED IN THE COST OF THE 36" STORM SEWER TYPE 2, (R.C.P. CL. IV).

NOTE:
THE CONTRACTOR IS ADVISED THAT THE EXISTING GROUND SHOWN ON THE PLANS IS COMPRISED OF FILL MATERIAL EXCAVATED FROM OTHER CONSTRUCTION PROJECTS AND MAY INCLUDE COMMON EARTH, CLAY, BROKEN CONC. AND OTHER EMBANKMENT MATERIALS!

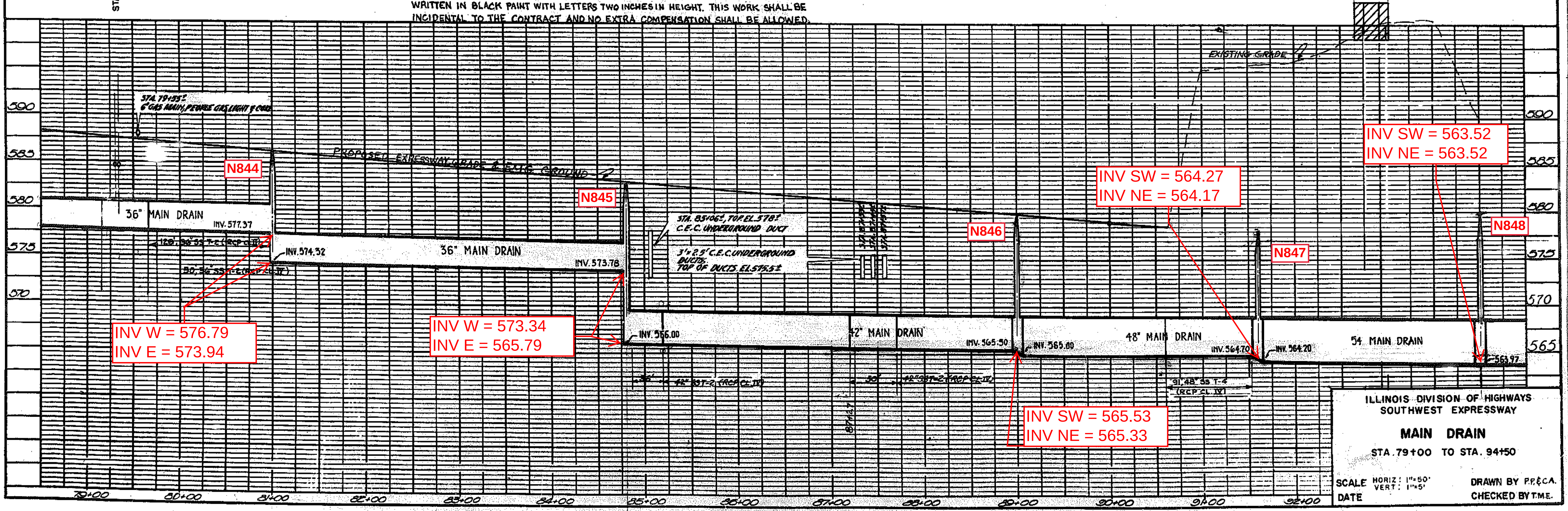
NOTE:
42" MAIN DRAIN UNDER EXISTING C.E.C. UNDERGROUND DUCTS SHALL BE INSTALLED BY JACKING OR BY TUNNELING.
COST OF JACKING OR TUNNELING SHALL NOT BE PAID FOR SEPARATELLY BUT SHALL BE INCLUDED IN THE COST OF THE 42" STORM SEWER TYPE 2, (R.C.P. CL. IV).



NOTE:
CONSTRUCTION TO BEGIN AT THE TRANSITION BOX AT STA. 91+60 AND PROCEED DOWNSTREAM.
SEE ALSO NOTE ON SHEET 9.

STA. 90+00
OFFSET BASE LINE
165' SOUTH OF EXP. ℄
170' NORTH OF EXP. ℄

* STRUCTURES INDICATED BY ASTERISKS SHALL BE SEALED IN A MANNER TO BE APPROVED BY THE ENGINEER AND BACKFILLED TO EXISTING GRADE. A 2" × 4" WOODEN MARKER SHALL BE PLACED, TO EXTEND FROM THE TOP OF THE CLOSED LID TO TWO FEET ABOVE EXISTING GRADE WITH THE WORDS "MAIN DRAIN". WRITTEN IN BLACK PAINT WITH LETTERS TWO INCHES IN HEIGHT. THIS WORK SHALL BE INCIDENTAL TO THE CONTRACT AND NO EXTRA COMPENSATION SHALL BE ALLOWED.



ILLINOIS DIVISION OF HIGHWAYS
SOUTHWEST EXPRESSWAY

MAIN DRAIN

STA. 79+00 TO STA. 94+50

SCALE HORIZ: 1" = 50'
VERT: 1" = 5'
DATE
DRAWN BY P.P.&C.A.
CHECKED BY T.M.E.

PLAN
SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
NOTE BOOK NO.
DATE
BY

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
B.M. NOTED
STRUCTURE NOTATIONS CHK'D.
NOTE BOOK NO.
DATE
BY

PLATE 3 PLAN-PROFILE. C.P.R.R. & R.E. STANDARD

F.A.I. ROUTE NO.	SEC.	EXPRESSWAYS	TOTAL SHEETS	SHEET NO.
55	1114-44/ 47(RTS)	SOUTHWEST	48	9

STA. TO STA.

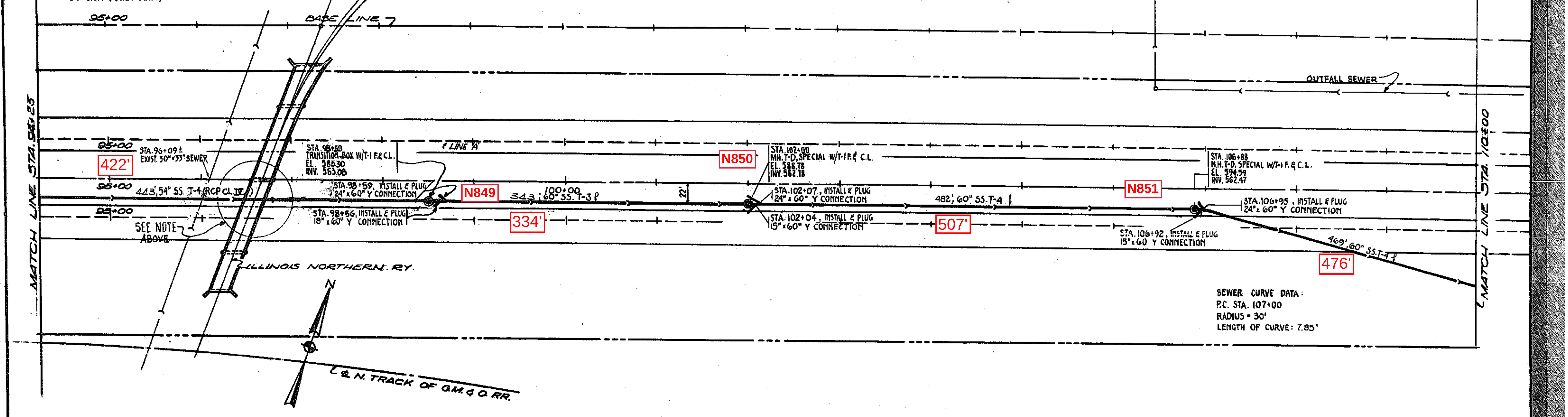
FED. ROAD DIST. NO. 7 | ILLINOIS | FED. AID PROJECT

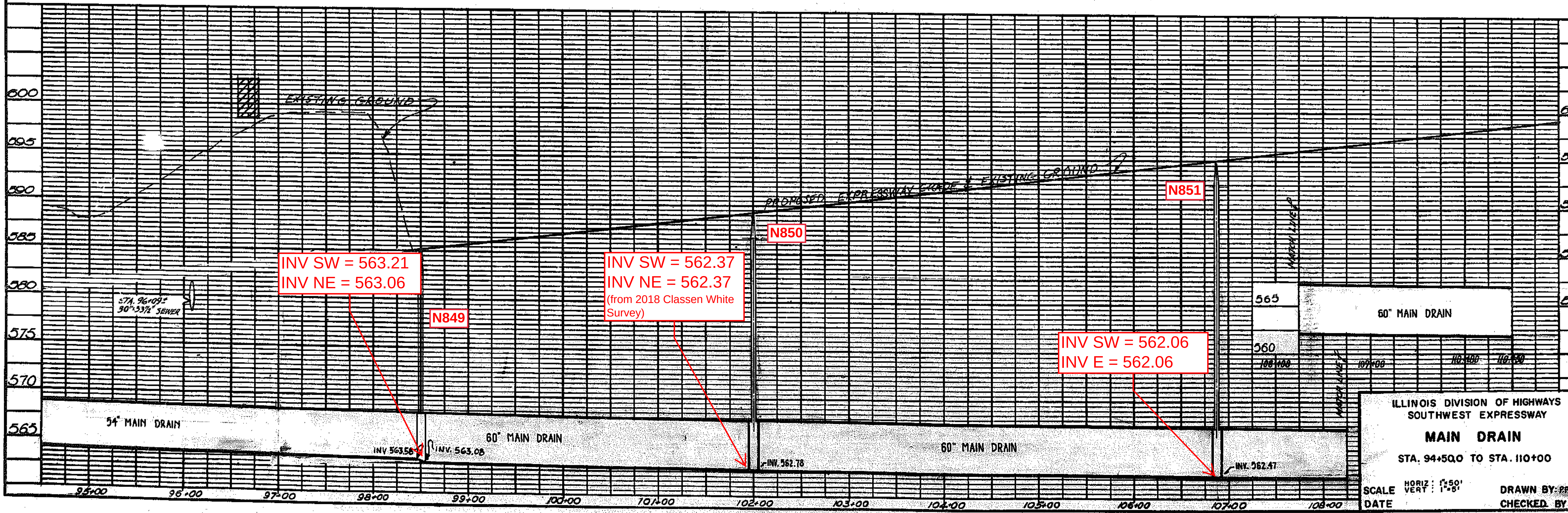
NOTE:

54" MAIN DRAIN S.S.T-4(RCP CL.IV) UNDER THE EXTG. 30"X33" SEWER, THE AT&SF AND ILLINOIS NORTHERN RAILROADS SHALL BE INSTALLED BY JACKING OR BY TUNNELING.

COST OF JACKING OR TUNNELING SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE 54" S.S.T-4 (RCP CL.IV)

NOTE:
THE CONTRACTOR IS ADVISED THAT THE EXISTING GROUND SHOWN ON THE PLANS IS COMPRISED OF FILL MATERIAL EXCAVATED FROM OTHER CONSTRUCTION PROJECTS AND MAY INCLUDE COMMON EARTH, CLAY, BROKEN CONCRETE AND OTHER EMBANKMENT MATERIALS.





ILLINOIS DIVISION OF HIGHWAYS
SOUTHWEST EXPRESSWAY

MAIN DRAIN

STA. 94+50.0 TO STA. 110+00

SCALE HORIZ: 1"=50'
VERT: 1"=5'
DATE

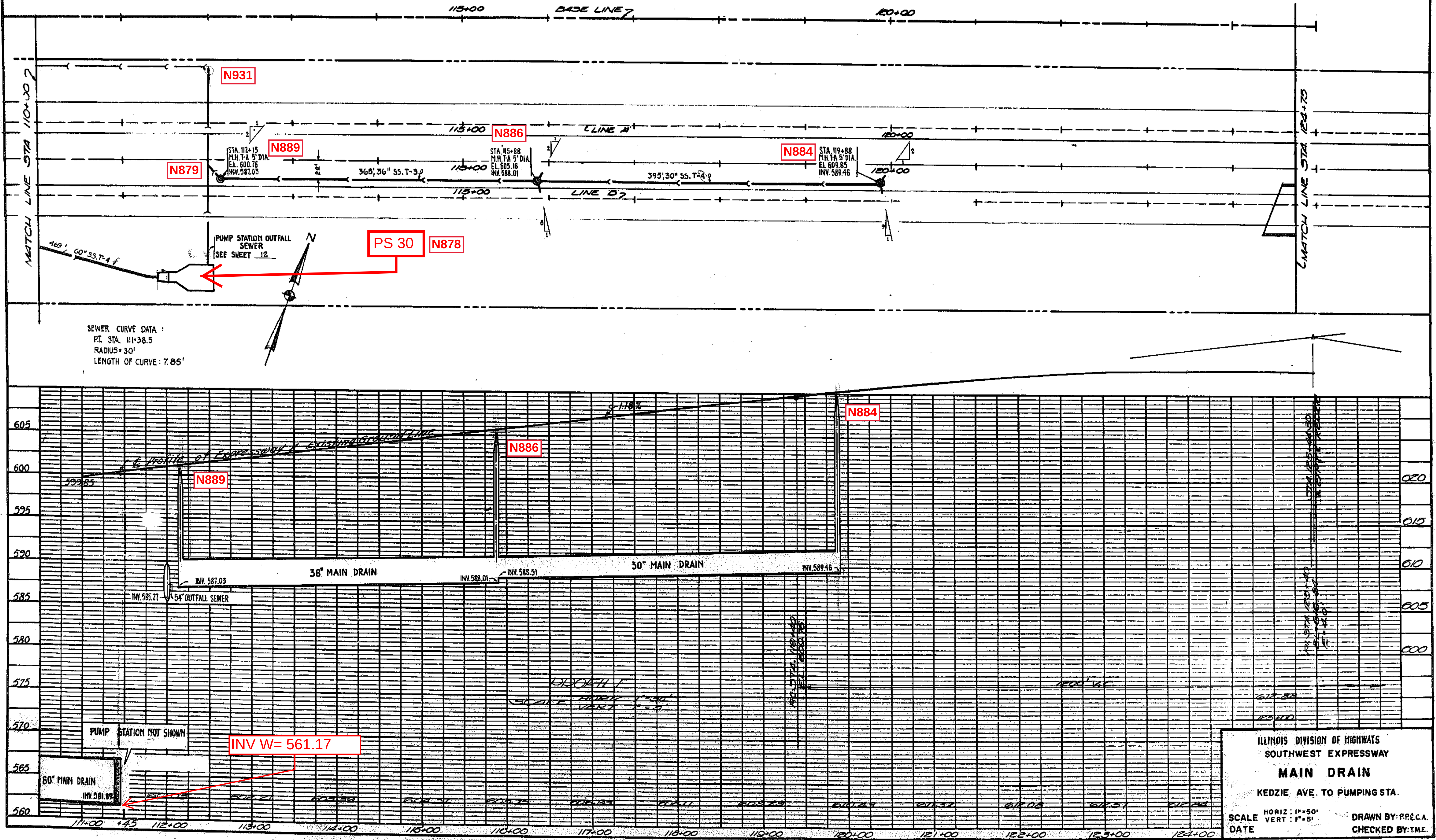
DRAWN BY: P.P. & C.A.
CHECKED BY: T.M.E.

F.A.I. ROUTE NO.	SEC.	EXPRESSWAYS	TOTAL SHEETS	SHEET NO.
55	1A(PTD)	SOUTHWEST	48	10

STA. TO STA.

FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT

NOTE:
THE CONTRACTOR IS ADVISED THAT THE EXISTING GROUND SHOWN ON THE PLANS IS COMPRISED OF FILL MATERIAL EXCAVATED FROM OTHER CONSTRUCTION PROJECTS AND MAY INCLUDE COMMON EARTH, CLAY, BROKEN CONCRETE AND OTHER EMBANKMENT MATERIALS.



ILLINOIS DIVISION OF HIGHWAYS
SOUTHWEST EXPRESSWAY

MAIN DRAIN

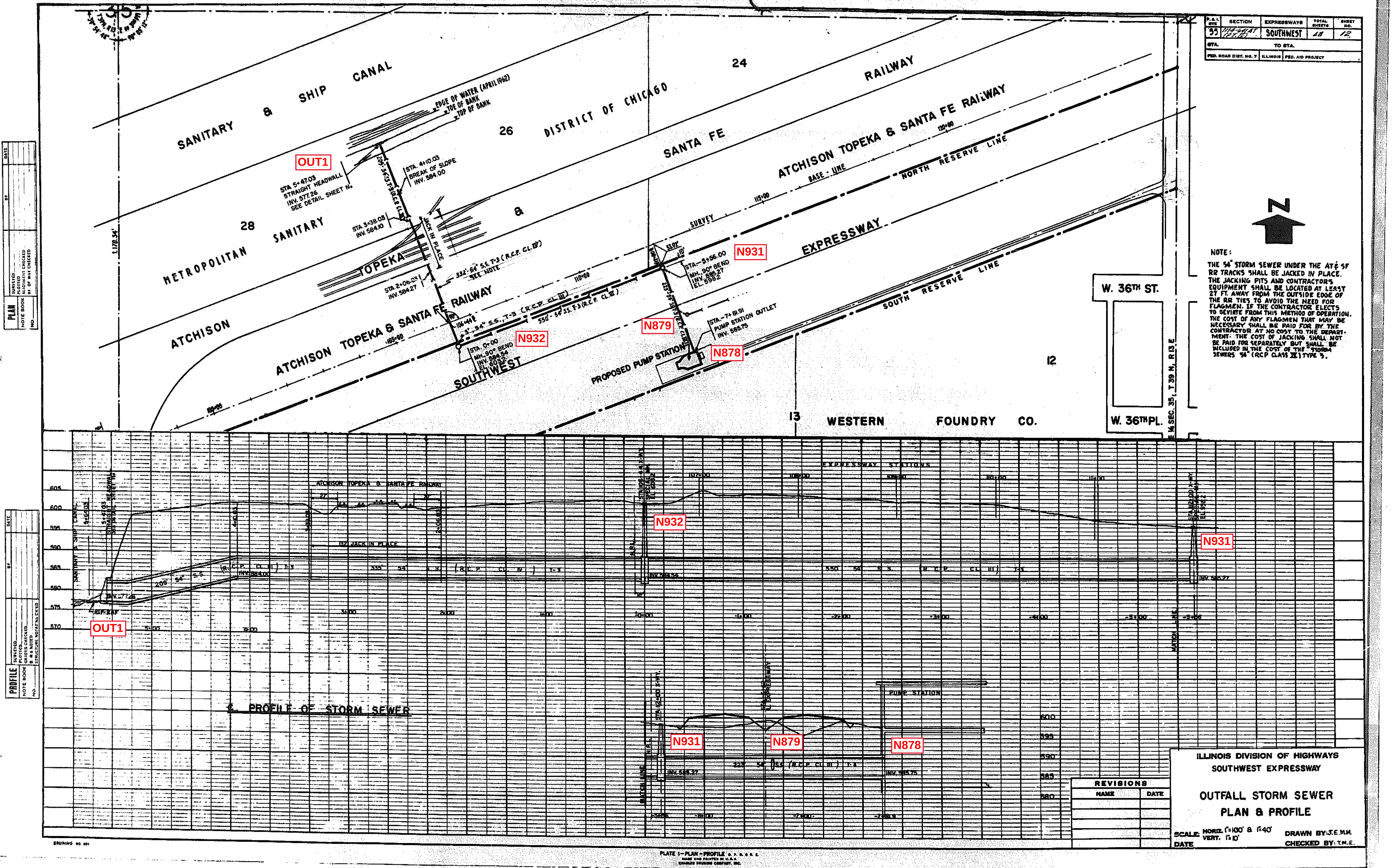
KEDZIE AVE. TO PUMPING STA.

SCALE HORIZ: 1"=50'
VERT: 1"=5'
DATE

DRAWN BY: P.P.&C.A.
CHECKED BY: T.M.E.

PLATE 1 - PLAN - PROFILE O.P.R.&R.E. STANDARD
KEUFFEL & ESSER CO., NEW YORK

REV. 10-11-62 - JE SEE DIST. LETTER & REV. PRINT SUBMITTED 10-10-62



F.A.I. RTE.	SECTION	EXPRESSWAYS	TOTAL SHEETS	SHEET NO.
55	1114-641AT (PT.II)	SOUTHWEST	48	12

STA. TO STA.

FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT

NOTE:

THE 54" STORM SEWER UNDER THE AT& SF RR TRACKS SHALL BE JACKED IN PLACE. THE JACKING PITS AND CONTRACTORS EQUIPMENT SHALL BE LOCATED AT LEAST 27 FT. AWAY FROM THE OUTSIDE EDGE OF THE RR TIES TO AVOID THE NEED FOR FLAGMEN. IF THE CONTRACTOR ELECTS TO DEVIATE FROM THIS METHOD OF OPERATION, THE COST OF ANY FLAGMEN THAT MAY BE NECESSARY SHALL BE PAID FOR BY THE CONTRACTOR AT NO COST TO THE DEPARTMENT. THE COST OF JACKING SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE "STORM SEWERS 54" (RCP CLASS III) TYPE 3.

REVISIONS	
NAME	DATE

ILLINOIS DIVISION OF HIGHWAYS
SOUTHWEST EXPRESSWAY

OUTFALL STORM SEWER
PLAN & PROFILE

SCALE: HORIZ. 1"=100' & 1"=40'
VERT. 1"=10'
DATE

DRAWN BY: J.E.M.M.
CHECKED BY: T.M.E.

REV. 12/27/62 ADDED NOTE PERTAINING TO S.S. 54" (RCP CL III) Ty 3 - JB

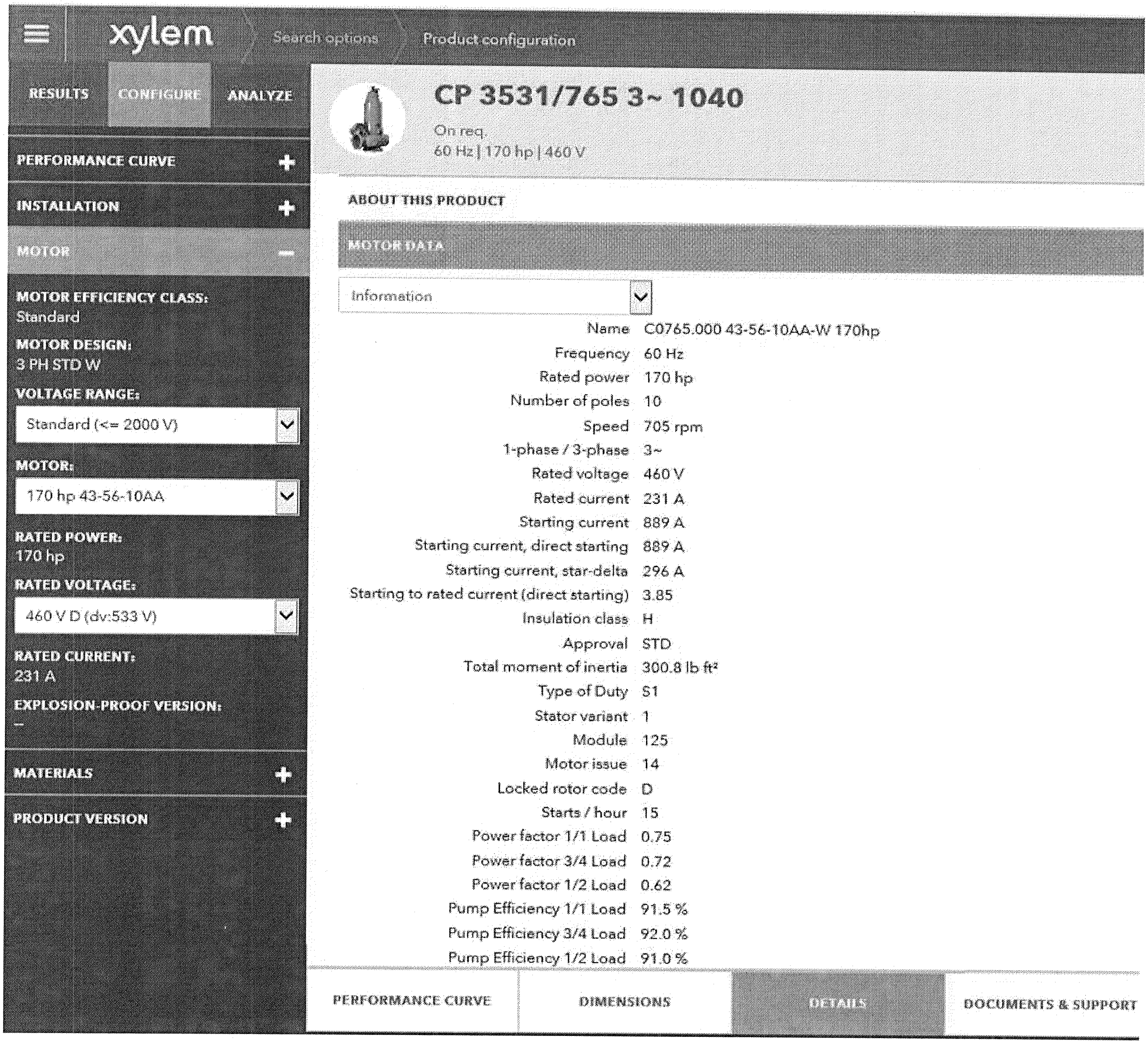
Section 5
Pump Station Operation Data and Catalog Cut

☆ EL 588.0 = 0.0

Pump Station 30 Control Elevations

	ELEVATION (NAVD88)	[✓ SCADA]	~~Float~~
Top of Grade Floor Slab (9.75'/47.25')			
Top of Discharge Floor Slab (-2.25'/35.25')			
Top of Upper Intermediate Floor Slab (-4.0'/33.5')			
Stevenson Expressway Lowpoint (@ RR crossing East of Pulaski Rd) (-9.75'/27.75')			
Top of Lower Intermediate Floor Slab (-18.0'/19.5')			
High Water Alarm	567.2	-20.5'/17.0'	~~-20.5'/17.0'~~
Start Stand-By Pump	565.7	-22.0'/15.5'	~~-21.5'/16.0'~~
Start Lag 2 Pump	564.7	-23.0'/14.5'	~~-22.5'/15.0'~~
Start Lag 1 Pump	563.7	-24.0'/13.5'	~~-23.5'/14.0'~~
Start Lead Pump (Mixers/Low Flow Pump Off when Rising Water)	562.7	-25.0'/12.5'	~~-24.5'/13.0'~~
Start Mixers	561.0	-26.7'/10.8'	~~-26.5'/11.0'~~
Stop Main Pumps/Mixers (Low Flow Pump On when Falling Water)	558.2	-29.5'/8.0'	~~-29.4'/8.1'~~
Standby Pump Stop	556.2	-31.5'/6.0'	~~-29.7'/8.1'~~
Start Low Flow Pump	558.2	-29.5'/8.0'	~~-29.0'/8.5'~~
Inflow Invert (-26.11'/11.39')			
Stop Low Flow Pump	557.2	-30.5'/7.0'	~~-30.1'/7.4'~~
Low Level Alarm	556.2	-31.5'/6.0'	~~-31.0'/6.5'~~
Bottom of Wet Pit @ Pump Intakes (-33.5/4.0') (slopes to -33.83.'/3.67' @ top of sump)			
Bottom of Wet Pit Sump (-37.5/0.0')	550.2		

Elevation as referenced on drawings
Feet of water in wet pit.



CP 3531/765 3~ 1040

On req.
60 Hz | 170 hp | 460 V

MOTOR EFFICIENCY CLASS:
Standard

MOTOR DESIGN:
3 PH STD W

VOLTAGE RANGE:
Standard (<= 2000 V)

MOTOR:
170 hp 43-56-10AA

RATED POWER:
170 hp

RATED VOLTAGE:
460 V D (dv:533 V)

RATED CURRENT:
231 A

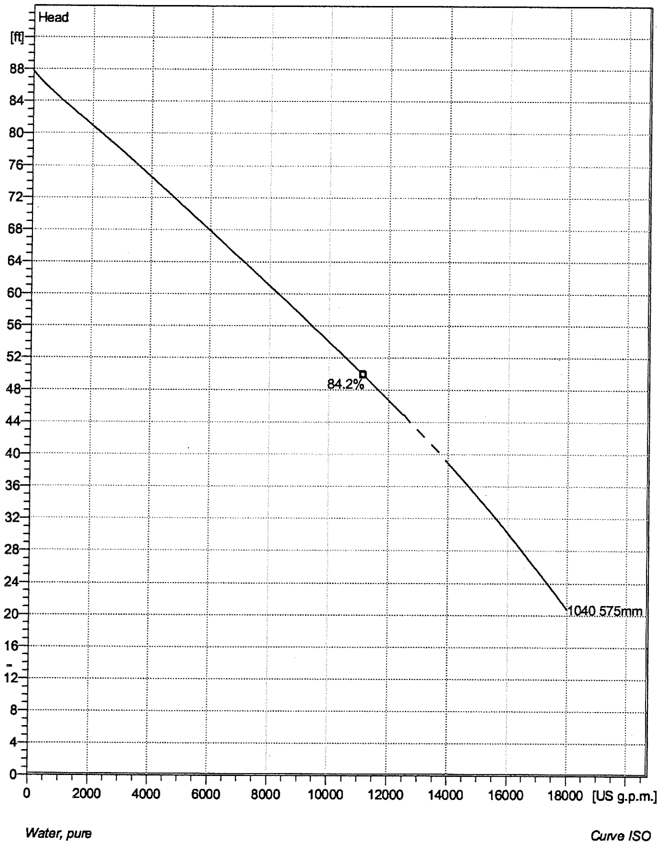
EXPLOSION-PROOF VERSION:
–

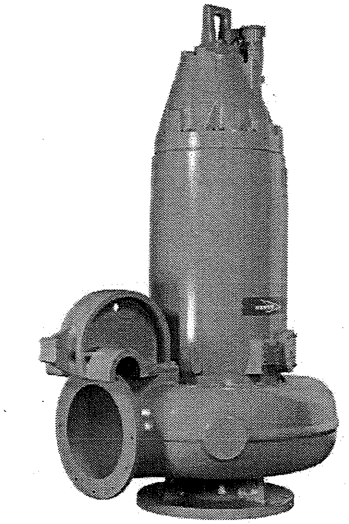
Information

Name	C0765.000 43-56-10AA-W 170hp
Frequency	60 Hz
Rated power	170 hp
Number of poles	10
Speed	705 rpm
1-phase / 3-phase	3~
Rated voltage	460 V
Rated current	231 A
Starting current	889 A
Starting current, direct starting	889 A
Starting current, star-delta	296 A
Starting to rated current (direct starting)	3.85
Insulation class	H
Approval	STD
Total moment of inertia	300.8 lb ft²
Type of Duty	S1
Stator variant	1
Module	125
Motor issue	14
Locked rotor code	D
Starts / hour	15
Power factor 1/1 Load	0.75
Power factor 3/4 Load	0.72
Power factor 1/2 Load	0.62
Pump Efficiency 1/1 Load	91.5 %
Pump Efficiency 3/4 Load	92.0 %
Pump Efficiency 1/2 Load	91.0 %

CP 3531/765 3~ 1040

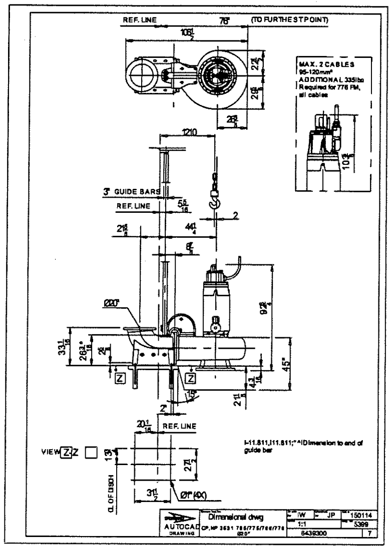
Technical specification





Note: Picture might not correspond to the current configuration.

Installation: P - Semi permanent, Wet



General

Shrouded single or multi-channel impeller pumps with large throughlets and single volute pump casing for liquids containing solids and fibres. Cast iron design with double sealing technology.

Impeller

Impeller material	Grey cast iron
Discharge Flange Diameter	19 11/16 inch
Inlet diameter	23 5/8 inch
Impeller diameter	575 mm
Number of blades	3
4 1/8 inch	4 1/8 inch

Motor

Motor #	C0765.000 43-56-10AA-W 170hp
Approval	Standard
Stator variant	1
Frequency	60 Hz
Rated voltage	460 V
Number of poles	10
Phases	3~
Rated power	170 hp
Rated current	231 A
Starting current	889 A
Rated speed	705 rpm
Power factor	
1/1 Load	0.75
3/4 Load	0.72
1/2 Load	0.62
Motor efficiency	
1/1 Load	91.5 %
3/4 Load	92.0 %
1/2 Load	91.0 %

Configuration

Project	Project ID	Created by	Created on	Last update
			2017-01-11	

xylem

CP 3531/765 3~ 1040

FLYGT

Performance curve

Pump

Discharge Flange Diameter	19 11/16 inch
Inlet diameter	600 mm
Impeller diameter	$22^{5}/_{8}$"
Number of blades	3
4 1/8 inch	4 1/8 inch

Motor

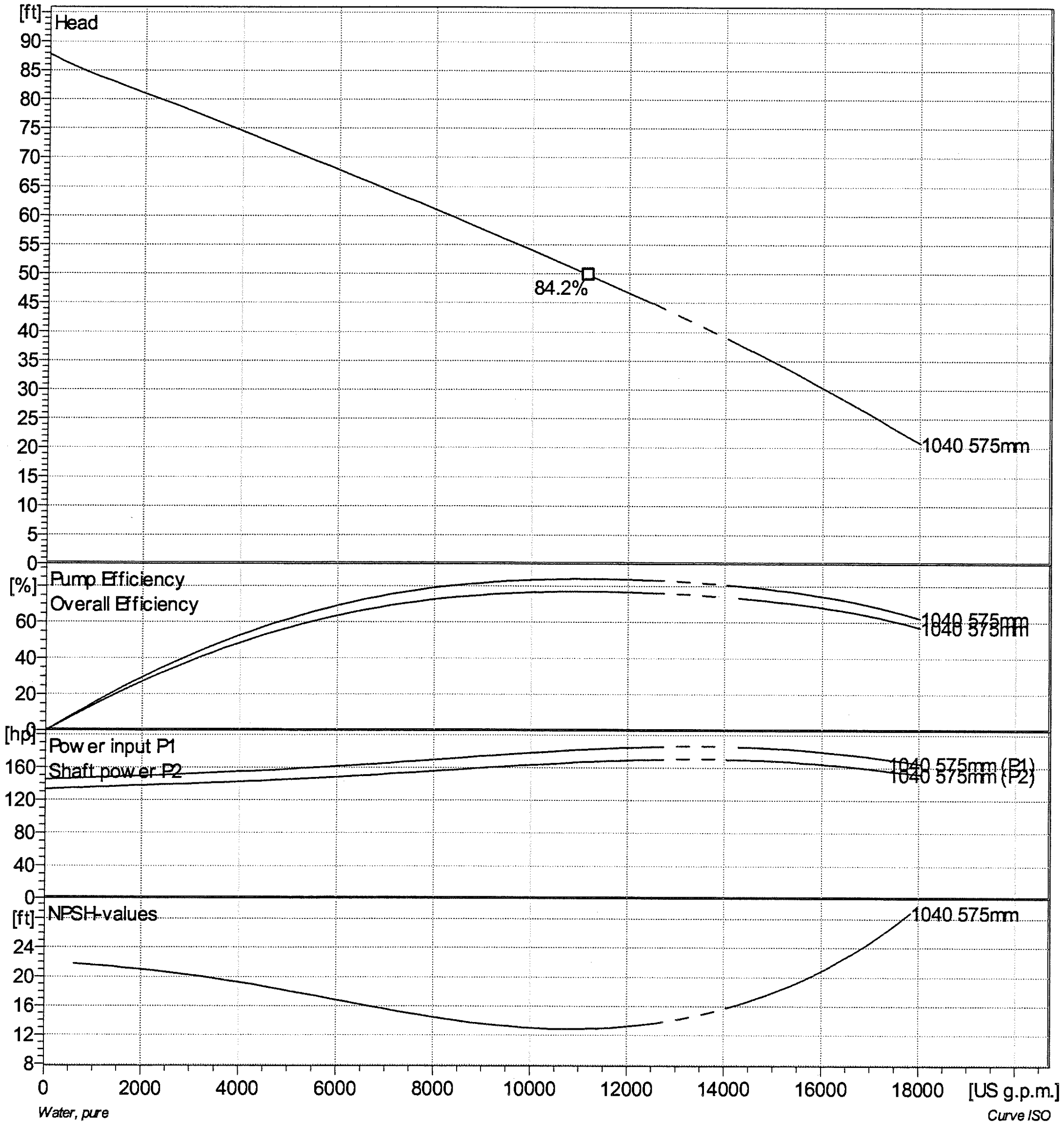
Motor #	C0765.000 43-56-10AA-W 170hp
Approval	Standard
Stator variant	1
Frequency	60 Hz
Rated voltage	460 V
Number of poles	10
Phases	3~
Rated power	170 hp
Rated current	231 A
Starting current	889 A
Rated speed	705 rpm

Power factor

1/1 Load	0.75
3/4 Load	0.72
1/2 Load	0.62

Motor efficiency

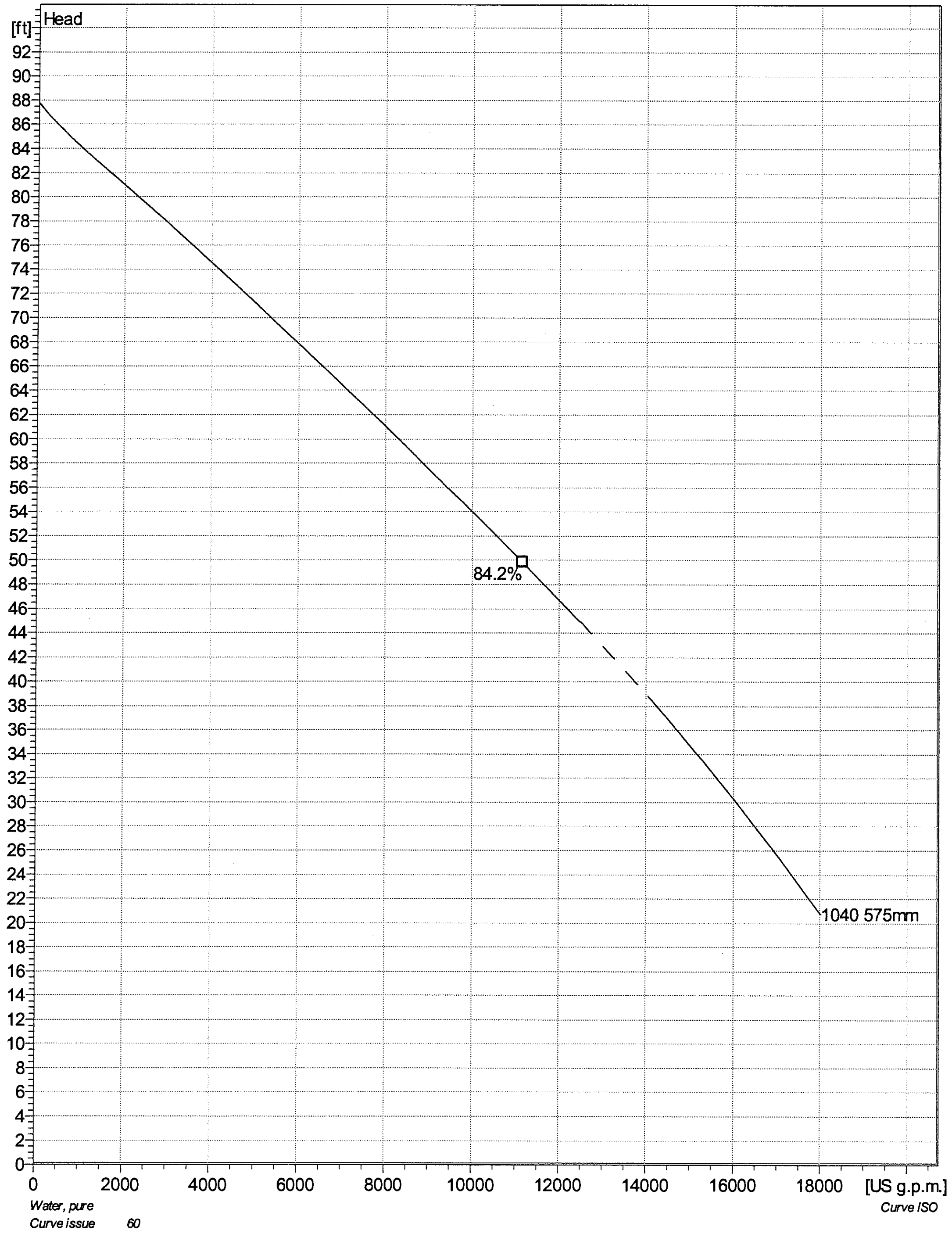
1/1 Load	91.5 %
3/4 Load	92.0 %
1/2 Load	91.0 %



Project	Project ID	Created by	Created on	Last update
			2017-01-11	

CP 3531/765 3~ 1040

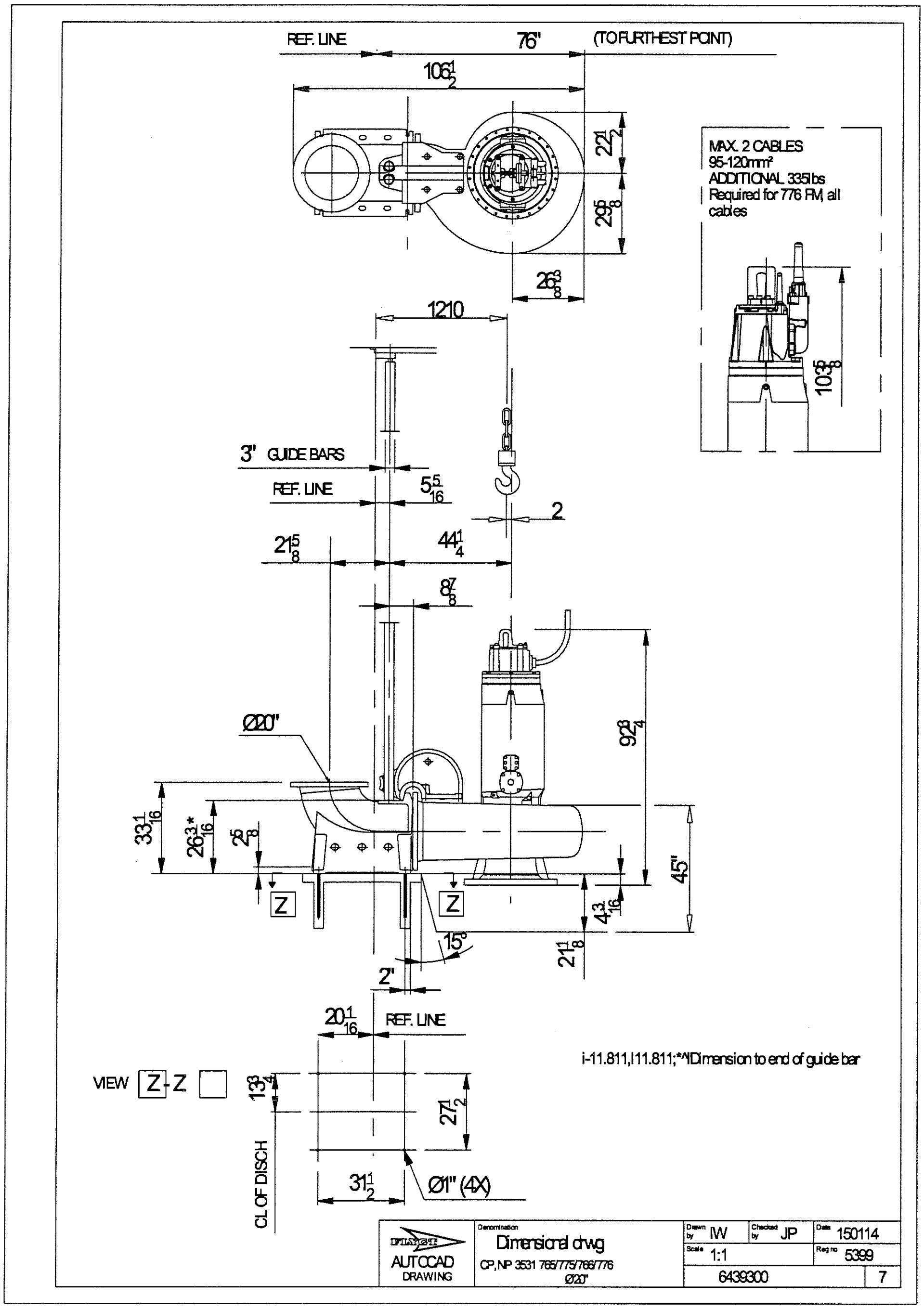
Duty Analysis



Project	Project ID	Created by	Created on	Last update
			2017-01-11	

CP 3531/765 3~ 1040

Dimensional drawing



Project	Project ID	Created by	Created on	Last update
			2017-01-11	

FLYGT

TEST REPORT

PRODUCT

Serial No.		Performance curve No.	Motor module/type	Voltage (V)
3531.775	0031020	63-1040	43-56-10AA	460

Base module	Impeller No.	Gear type	Gear ratio	Imp.diam/Blade angle	Water temp °C
000	591 57 33			575	22

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
88.07	0	108.73	464	193.8	0.00
72.83	4855	118.09	464	203.8	56.49
60.54	8422	127.83	464	217.9	75.24
51.40	10970	136.32	464	230.2	78.03
41.07	13515	138.23	464	232.6	75.76
29.81	16207	131.21	464	222.3	69.46
24.52	17143	126.21	464	215.0	62.84

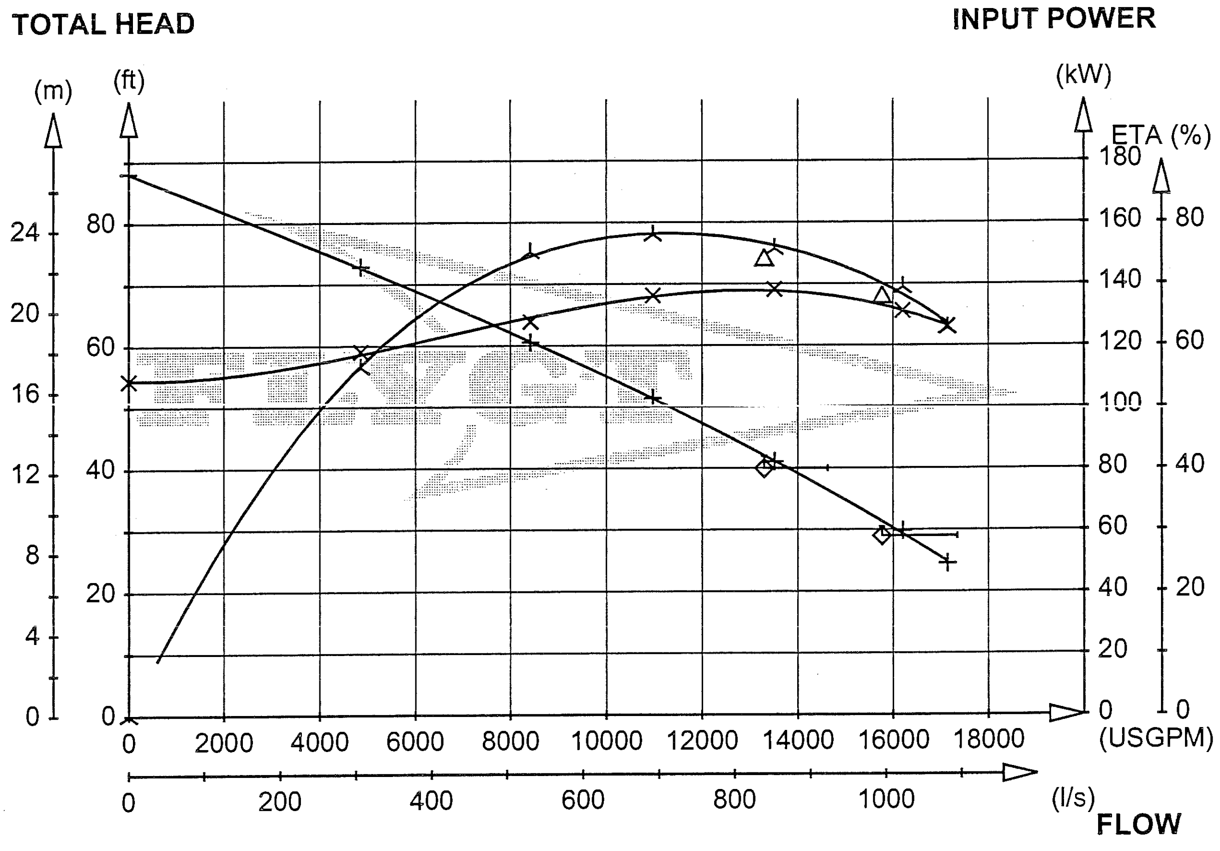
Accepted after	Test facility		Test date	Time	Chief tester
HI	LINDAS Sweden	Q2	00-04-17	14:20	1042

PLOTTED TEST RESULTS

Measured point : + = Q/H
× = Q/P

Duty point : ◇ = Q/H
□ = Q/P
△ = Q/ETA overall

Calculated point : ⅄ = Q/ETA overall
1



TEST REPORT

PRODUCT

Serial No.		Performance curve No.		Motor module/type	Voltage (V)
3531.775	0031021	63-1040		43-56-10AA	460
Base module	**Impeller No.**	**Gear type**	**Gear ratio**	**Imp.diam/Blade angle**	**Water temp °C**
000	591 57 33			575	23

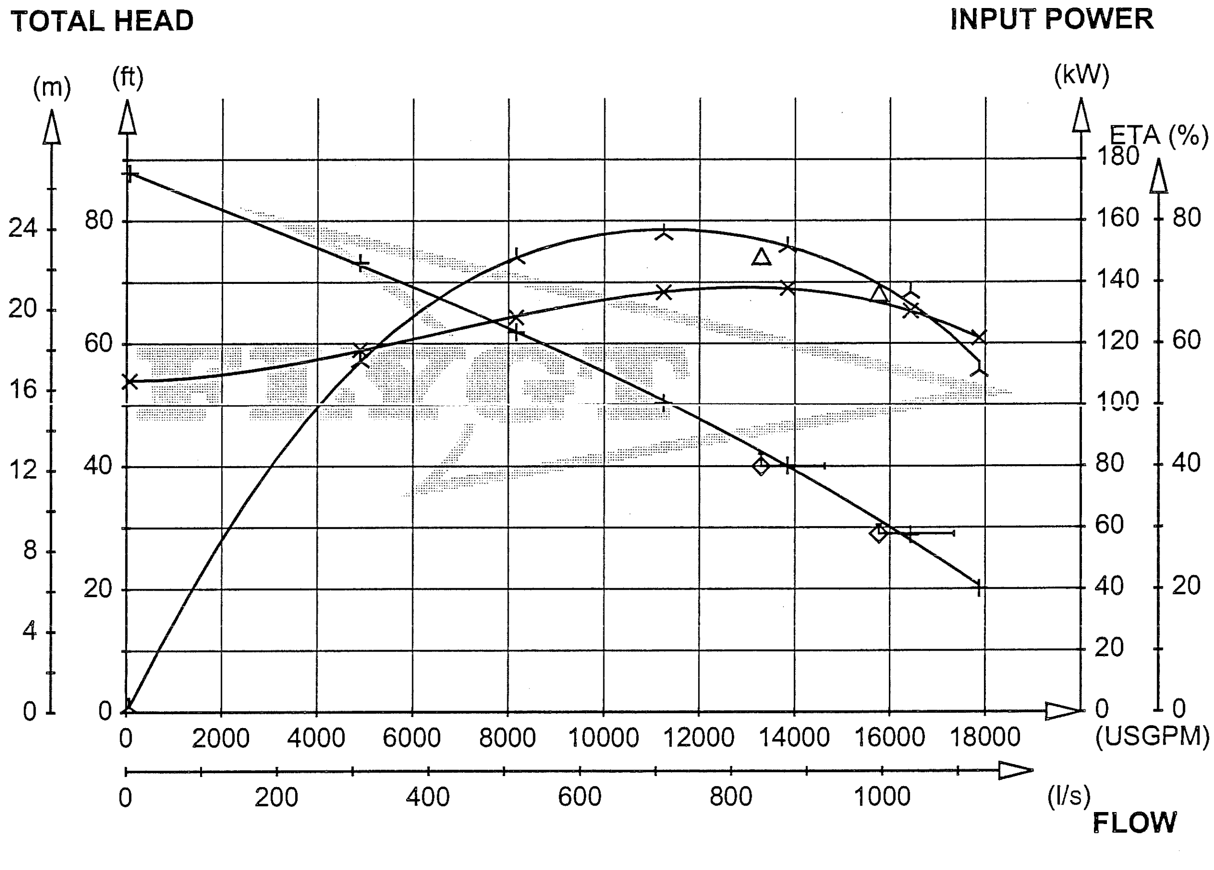
TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
87.84	61	107.92	461	193.9	0.94
73.15	4893	118.02	461	206.1	57.21
61.85	8168	128.64	462	220.1	74.08
50.26	11247	136.77	462	232.7	77.97
40.10	13853	138.13	462	234.3	75.86
28.81	16435	130.65	463	223.1	68.36
20.09	17869	121.79	463	211.0	55.61

Accepted after	Test facility		Test date	Time	Chief tester
HI	LINDAS Sweden	Q2	00-04-11	10:33	2050

PLOTTED TEST RESULTS

Measured point : + = Q/H × = Q/P   Duty point : ◇ = Q/H □ = Q/P △ = Q/ETA overall   Calculated point : ⅄ = Q/ETA overall 1



FLYGT

TEST REPORT

PRODUCT

Serial No.		Performance curve No.	Motor module/type	Voltage (V)
3531.775	0031022	63-1040	43-56-10AA	460

Base module	Impeller No.	Gear type	Gear ratio	Imp.diam/Blade angle	Water temp °C
000	591 57 33			575	22

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
89.08	0	108.34	464	197.6	0.00
71.70	5114	117.93	463	206.3	58.66
60.62	8592	129.88	463	221.7	75.66
49.92	11248	135.80	463	231.0	78.00
40.20	13665	136.35	463	231.8	76.01
29.37	16176	129.68	463	221.1	69.11
21.14	17684	121.25	463	209.9	58.17

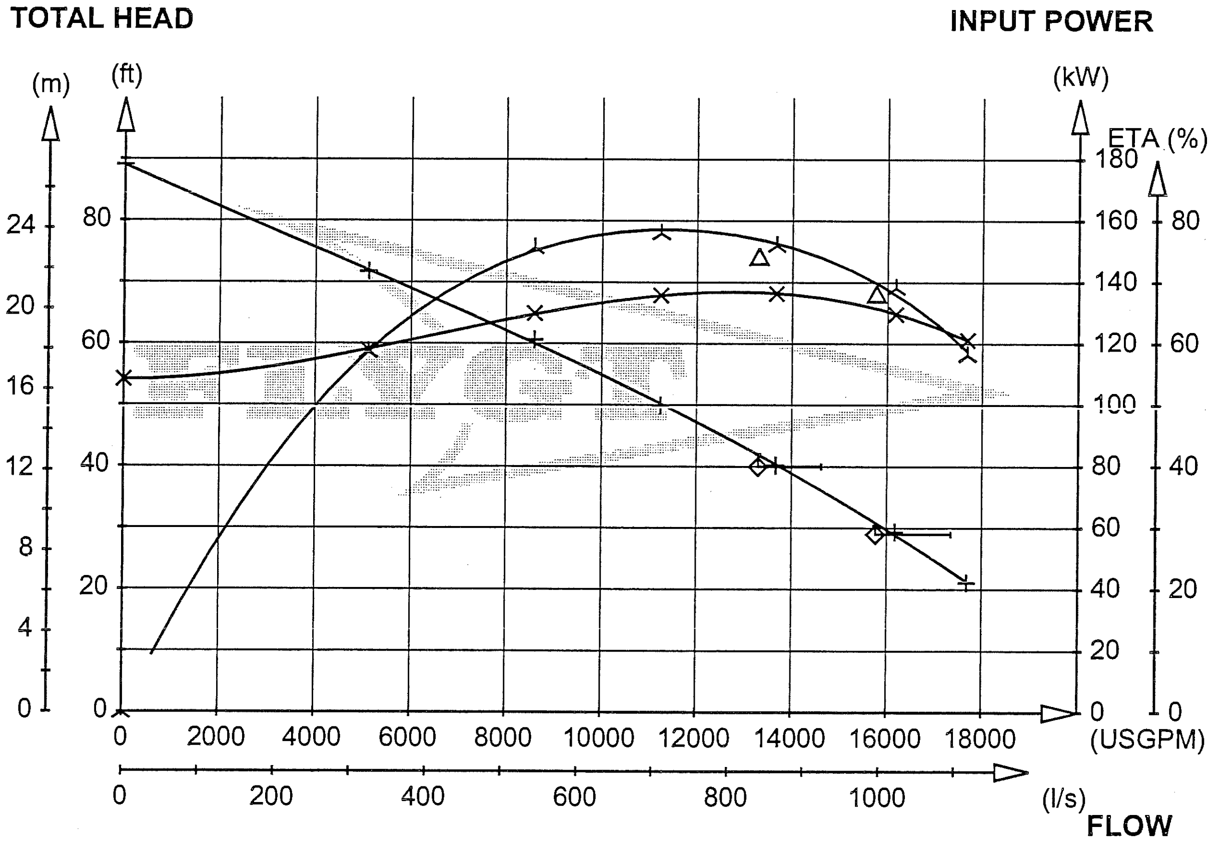
Accepted after	Test facility		Test date	Time	Chief tester
HI	LINDAS Sweden	Q2	00-04-18	08:48	1517

PLOTTED TEST RESULTS

Measured point : + = Q/H
× = Q/P

Duty point : ◇ = Q/H
□ = Q/P
△ = Q/ETA overall

Calculated point : ⅄ = Q/ETA overall
1



FLYGT

TEST REPORT

PRODUCT

Serial No.		Performance curve No.	Motor module/type	Voltage (V)
3531.775	0031092	63-1040	43-56-10AA	460

Base module	Impeller No.	Gear type	Gear ratio	Imp.diam/Blade angle	Water temp °C
000	591 57 33			575	27

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
86.52	0	107.91	461	196.6	0.00
73.73	4375	115.68	458	198.4	52.60
57.16	9020	131.27	457	222.9	74.10
47.70	11368	136.95	457	231.1	74.70
39.99	13542	137.19	458	230.4	74.46
29.80	15925	130.52	458	221.2	68.60
22.46	17341	124.89	458	212.9	58.84

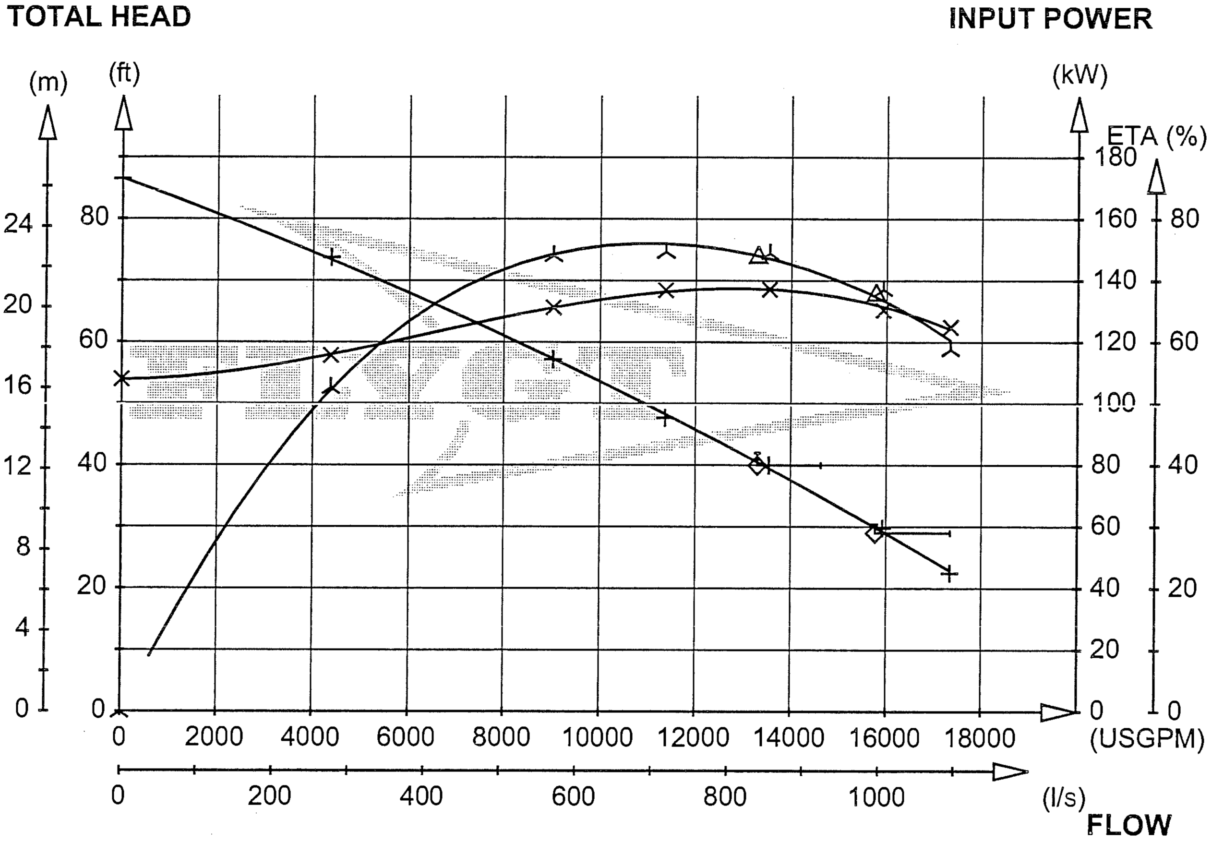
Accepted after	Test facility		Test date	Time	Chief tester
HI	LINDAS Sweden	Q2	00-05-12	13:00	5361

PLOTTED TEST RESULTS

Measured point : + = Q/H
× = Q/P

Duty point : ◇ = Q/H
□ = Q/P
△ = Q/ETA overall

Calculated point : ⅄ = Q/ETA overall
1



TEST REPORT

PRODUCT

Serial No. 3531.775 0031093	Performance curve No. 63-1040	Motor module/type 43-56-10AA	Voltage (V) 460

Base module 000	Impeller No. 591 57 33	Gear type	Gear ratio	Imp.diam/Blade angle 575	Water temp °C 24

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
87.00	0	107.21	462	192.7	0.00
71.99	4833	117.14	463	206.2	56.03
58.55	8681	128.82	462	221.9	74.43
49.49	11243	137.28	462	233.7	76.46
40.36	13496	138.36	462	234.9	74.27
29.52	16137	131.81	462	225.0	68.18
22.40	17435	125.24	463	215.6	58.81

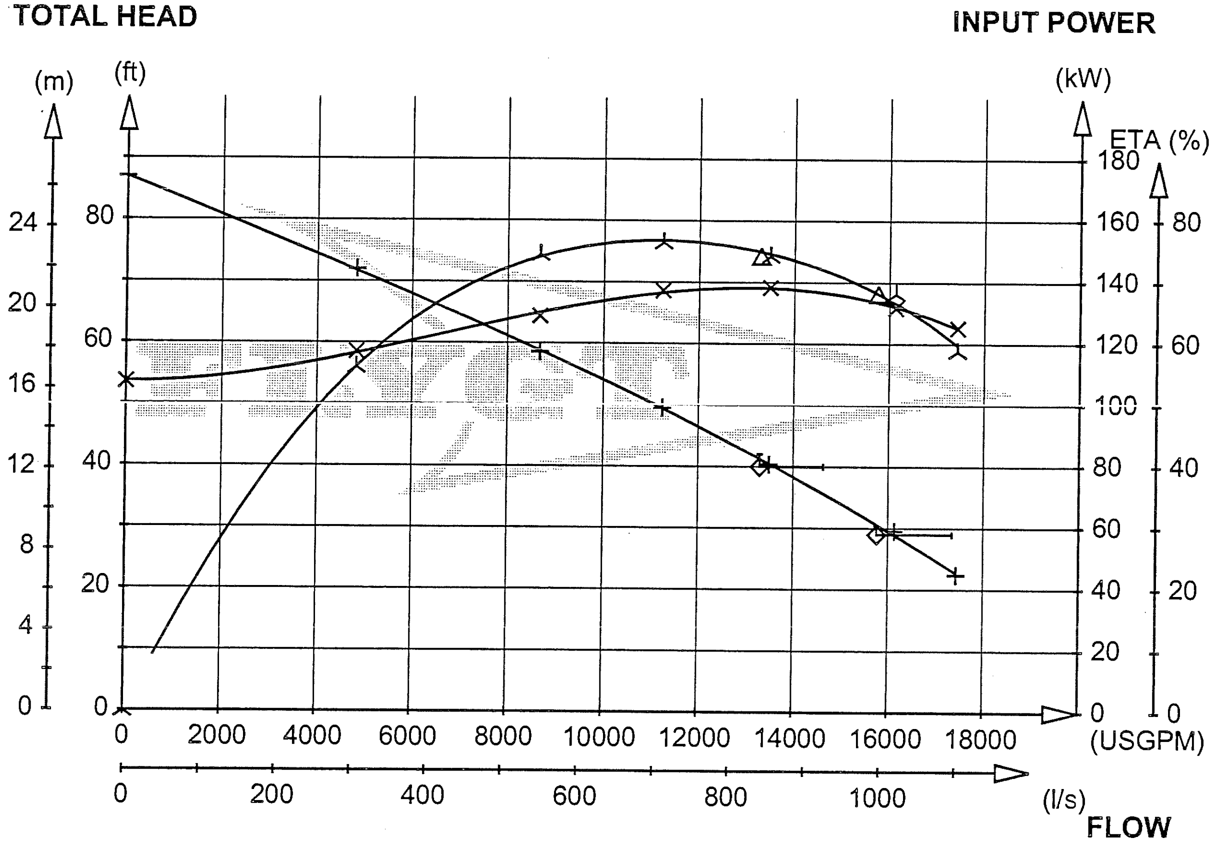
Accepted after HI	Test facility LINDAS Sweden Q2	Test date 00-05-12	Time 08:25	Chief tester 2050

PLOTTED TEST RESULTS

Measured point : + = Q/H
× = Q/P

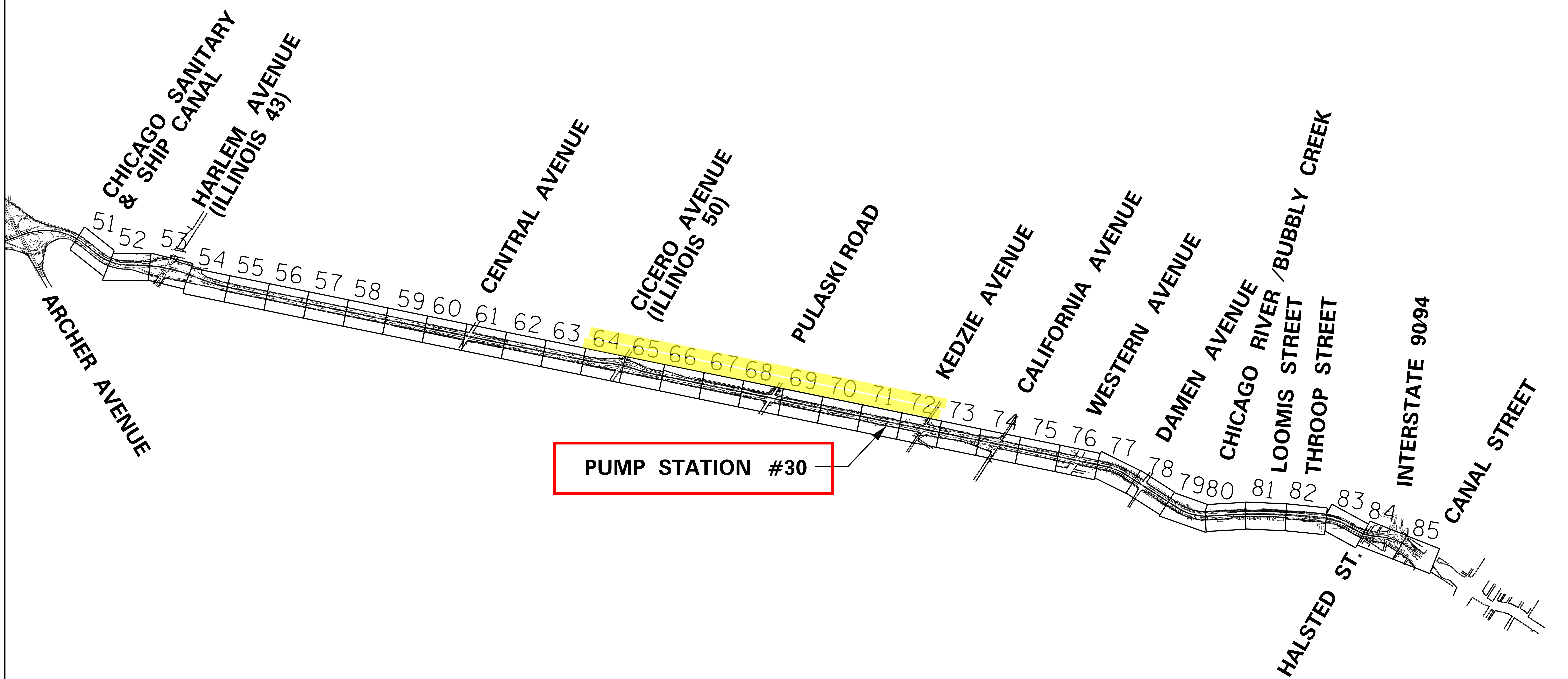
Duty point : ◇ = Q/H
□ = Q/P
△ = Q/ETA overall

Calculated point : ⅄ = Q/ETA overall
1



Section 6
Roadway EDP and Structure Name Correlation

EXISTING DRAINAGE PLAN EXHIBIT 1–00B.1
PROPOSED DRAINAGE PLAN EXHIBIT 2–00A.1



EXISTING DRAINAGE PLAN AND PROPOSED DRAINAGE PLAN LEGEND

* EXISTING SYMBOLS USED FOR THE EDP
** EXISTING AND PROPOSED SYMBOLS USED FOR THE PDP

SYMBOLS	EXISTING *	PROPOSED **
CENTERLINE AND STATIONING	— — ——— — —	——·——·——·——
RIGHT OF WAY LINE	—— —— —— ——	—— – – ———
INTERPRETED DRAINAGE AREA	⫡ ⫡ ⫡ ⫡ ⫡	⫡ ⫡ ⫡ ⫡ ⫡
FLOODPLAIN BOUNDARY	—— ——— ———	——— ——— ——
FLOODWAY BOUNDARY	— — — — — —	— — — — — —
SHALLOW CONC./GUTTER FLOW	SC →	SC →
SWALE	—+▷	—+►
DITCH	∼▷	∼►
SUMMIT	↔	↔
OUTLET	➡	➡
SHEET FLOW	⇨	⇨
OVERFLOW	↷	↷
CHANNEL	::=::=::=::=	::=::=::=::=
CULVERT SIZE – TYPE	2′ X 2′ BOX	2′ X 2′ BOX
PUMP STATION	PS	PS
STORM SEWER	→→→→→	→→→
CULVERT END SECTION	◁	◀
CATCH BASIN	○	●
HEADWALL/ENDWALL	–	⌒
INLET /DRAINAGE STRUCTURE	▭	▬
MANHOLE	◎	⊙
CLEAN EXISTING STRUCTURE (PROPOSED ONLY)		C
RECONSTRUCT EXISTING STRUCTURE (PROPOSED ONLY)		REC
ADJUST EXISTING STRUCTURE (PROPOSED ONLY)		ADJ
REMOVE EXISTING STRUCTURE (PROPOSED ONLY)		R
REMOVE EXISTING STORM SEWER (PROPOSED ONLY)		–/– –/– –/– –/
UNDETAINED DRAINAGE AREA (PROPOSED ONLY)		▧
DIVERTED AREA (PROPOSED ONLY)		▩
PROPOSED PAVEMENT AREA (PROPOSED ONLY)		▨

I-55 MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED -	DJB	REVISED -		
	DRAWN -	STANTEC	REVISED -		
PLOT SCALE = 2500.0000 ′ / in.	CHECKED -	JVO	REVISED -		
PLOT DATE = 1/5/2017	DATE -	1/5/2017	REVISED -		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I–55 MANAGED LANE STUDY
DRAINAGE PLAN – KEY MAP AND LEGEND

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	1

CONTRACT NO. P9176210

ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178600037_IDOT_I-55\civil\drainage_location drainage study\D1P9176210-KEYMAP.dgn

Default

EXISTING DRAINAGE PLAN LEGEND

OUTLET NO. / SUB-AREA NO.
D.A. 1-1
AREA = 1.59 AC
DRAINAGE AREA

OUTLET NO.
OUTLET # 1
AREA = 8.49 AC
AREA TRIBUTARY TO OUTLET

EXHIBIT 1-00B.64

I-55 MANAGED LANE PROJECT

USER NAME = dbook
PLOT SCALE = 50.0000 ' / in.
PLOT DATE = 1/31/2022

DESIGNED	DJB	REVISED	-
DRAWN	STANTEC	REVISED	-
CHECKED	JVO	REVISED	-
DATE	1/31/2022	REVISED	-

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	64
		CONTRACT NO. P9176210		
	ILLINOIS	FED. AID PROJECT		

FILE NAME = V:\1786\active\178620037_IDOT_I-55\civil\drainage\location drainage study\D1P9176210-EDP071.dgn

Default

MH LOCATIONS APPROXIMATED FROM HISTORICAL PLANS AND COULD NOT BE LOCATED IN THE FIELD.

STORM SEWER ROUTING IS APPROXIMATED FROM BEST AVAILABLE DATA.

EXISTING DRAINAGE PLAN LEGEND

OUTLET NO.
SUB-AREA NO.
D.A. 1-1
AREA = 1.59 AC
DRAINAGE AREA

OUTLET NO.
OUTLET # 1
AREA = 8.49 AC
AREA TRIBUTARY TO OUTLET

EXHIBIT 1-00B.65

I-55 MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -	
	DRAWN - STANTEC	REVISED -	
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -	
PLOT DATE = 1/6/2017	DATE - 1/6/2017	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	65
		CONTRACT NO. P9176210		
		ILLINOIS FED. AID PROJECT		

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Default

FILE NAME = V:\1786\active\178600037_IDOT_I-55\civil\drainage_location drainage study\D1P9176210-EDP073.dgn

MH LOCATIONS APPROXIMATED FROM HISTORICAL PLANS AND COULD NOT BE LOCATED IN THE FIELD.

STORM SEWER ROUTING IS APPROXIMATED FROM BEST AVAILABLE DATA.

EXISTING DRAINAGE PLAN LEGEND

OUTLET NO.
SUB-AREA NO.
D.A. 1-1
AREA = 1.59 AC
DRAINAGE AREA

OUTLET NO.
OUTLET # 1
AREA = 8.49 AC
AREA TRIBUTARY TO OUTLET

EXHIBIT 1-00B.66

I-55 MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -	
	DRAWN - STANTEC	REVISED -	
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -	
PLOT DATE = 1/6/2017	DATE - 1/6/2017	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	66
		CONTRACT NO. P9176210		
	ILLINOIS	FED. AID PROJECT		

Default

MH LOCATIONS APPROXIMATED FROM HISTORICAL PLANS AND COULD NOT BE LOCATED IN THE FIELD (TYP.)

STORM SEWER ROUTING IS APPROXIMATED FROM BEST AVAILABLE DATA.

EXISTING DRAINAGE PLAN LEGEND

OUTLET NO. — SUB-AREA NO.

D.A. 1-1
AREA = 1.59 AC

DRAINAGE AREA

OUTLET NO.

OUTLET # 1
AREA = 8.49 AC

AREA TRIBUTARY TO OUTLET

EXHIBIT 1–00B.67

I-55 | MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -
	DRAWN - STANTEC	REVISED -
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -
PLOT DATE = 1/6/2017	DATE - 1/6/2017	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I–55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	67
		CONTRACT NO. P9176210		
	ILLINOIS	FED. AID PROJECT		

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Default

EXISTING DRAINAGE PLAN LEGEND

OUTLET NO.
SUB-AREA NO.
D.A. 1-1
AREA = 1.59 AC
DRAINAGE AREA

OUTLET NO.
OUTLET = 1
AREA = 8.49 AC
AREA TRIBUTARY TO OUTLET

EXHIBIT 1-00B.68

I-55 MANAGED LANE PROJECT

USER NAME = dbook
PLOT SCALE = 50.0000 ' / in.
PLOT DATE = 1/6/2017

DESIGNED - DJB
DRAWN - STANTEC
CHECKED - JVO
DATE - 1/6/2017

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	68

CONTRACT NO. P9176210

ILLINOIS FED. AID PROJECT

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Default

EXISTING DRAINAGE PLAN LEGEND

OUTLET NO.
SUB-AREA NO.
D.A. 1-1
AREA = 1.59 AC
DRAINAGE AREA

OUTLET NO.
OUTLET # 1
AREA = 8.49 AC
AREA TRIBUTARY TO OUTLET

EXHIBIT 1-00B.69

I-55 MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -	
	DRAWN - STANTEC	REVISED -	
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -	
PLOT DATE = 1/6/2017	DATE - 1/6/2017	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	69

CONTRACT NO. P9176210

ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178600037_IDOT_I-55\civil\drainage_location drainage study\D1P9176210-EDP076.dgn

Default

EXISTING DRAINAGE PLAN LEGEND

OUTLET NO.
SUB-AREA NO.
D.A. 1-1
AREA = 1.59 AC
DRAINAGE AREA

OUTLET NO.
OUTLET = 1
AREA = 8.49 AC
AREA TRIBUTARY TO OUTLET

EXHIBIT 1-00B.70

FILE NAME = V:\1786\active\178620037_IDOT_I-55\civil\drainage\location drainage study\01P9176210-EDP077.dgn

I-55 MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -	
	DRAWN - STANTEC	REVISED -	
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -	
PLOT DATE = 1/6/2017	DATE - 1/6/2017	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	70

CONTRACT NO. P9176210

ILLINOIS FED. AID PROJECT

Default

EXISTING DRAINAGE PLAN LEGEND

OUTLET NO.
SUB-AREA NO.
D.A. 1-1
AREA = 1.59 AC
DRAINAGE AREA

OUTLET NO.
OUTLET # 1
AREA = 8.49 AC
AREA TRIBUTARY TO OUTLET

EXHIBIT 1-00B.71

FILE NAME = V:\1786\active\178600037_IDOT_I-55\civil\drainage_location drainage study\D1P9176210-EDP078.dgn

I-55 MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -
	DRAWN - STANTEC	REVISED -
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -
PLOT DATE = 1/6/2017	DATE - 1/6/2017	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	71
		CONTRACT NO. P9176210		
	ILLINOIS	FED. AID PROJECT		

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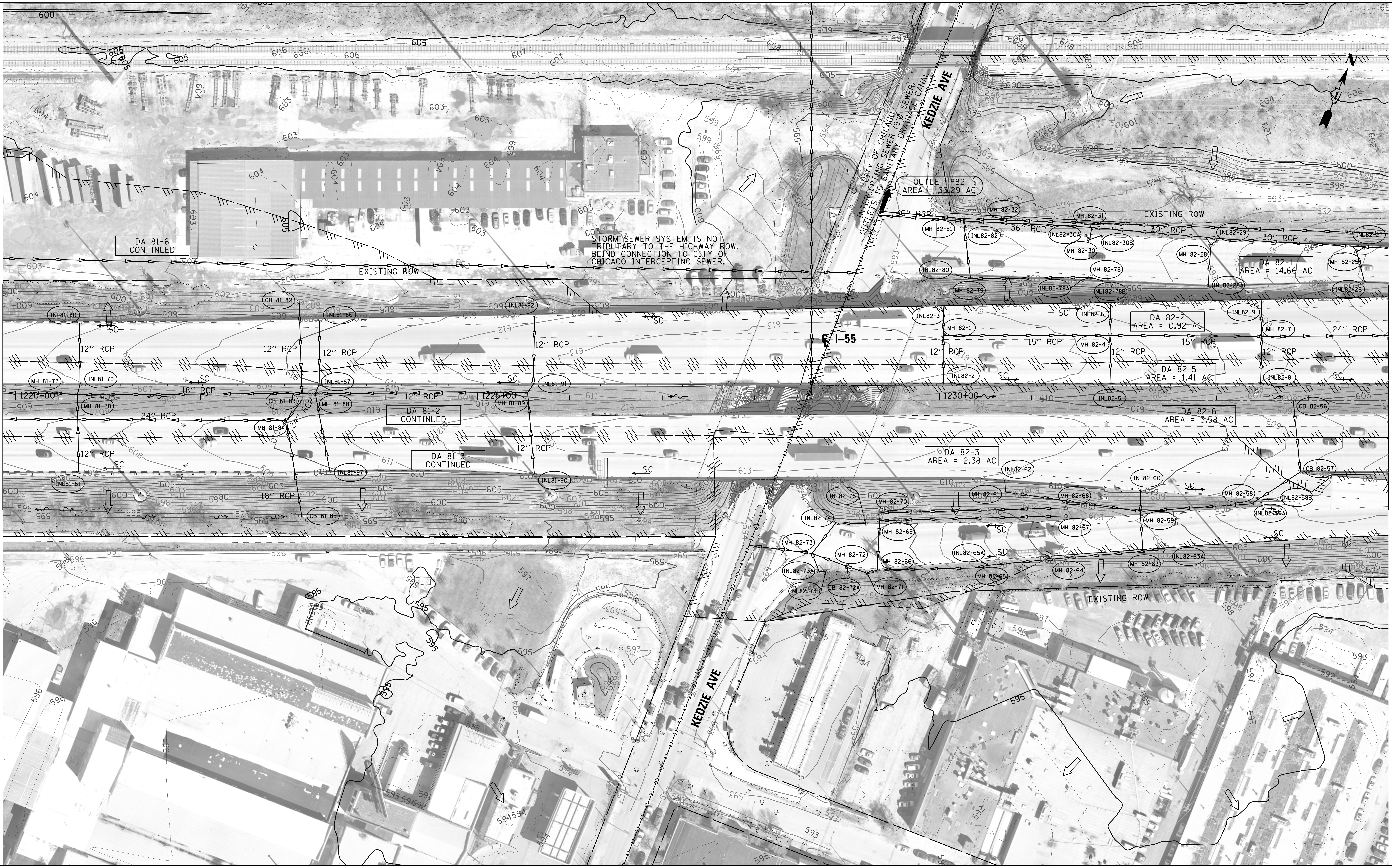

EXISTING DRAINAGE PLAN LEGEND

OUTLET NO. SUB-AREA NO.
D.A. 1-1
AREA = 1.59 AC
DRAINAGE AREA

OUTLET NO.
OUTLET # 1
AREA = 8.49 AC
AREA TRIBUTARY TO OUTLET

EXHIBIT 1-00B.72

I-55 MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -		
	DRAWN - STANTEC	REVISED -		
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -		
PLOT DATE = 1/6/2017	DATE - 1/6/2017	REVISED -		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	72
		CONTRACT NO. P9176210		
		ILLINOIS FED. AID PROJECT		

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Default

EXISTING DRAINAGE PLAN STRUCTURE TABLE

EXHIBIT 1-00B.61 (CONT'D)

MH 78-173	*MANHOLE* *RIM=621.17* *12"RCP-E=615.92* *12"RCP-W=616.15*
CB 78-174	*BASIN* *RIM=622.42* *12"RCP-E=617.17*
MH 78-175	*MANHOLE* *RIM=619.14* *12"RCP-E=613.89* *12"RCP-W=614.04*
CB 78-176	*BASIN* *RIM=619.76* *12"RCP-E=614.51*

EXHIBIT 1-00B.62

MH 78-113	12348-MANHOLE RIM=602.30 108"RCP-NE=573.68 108"RCP-SW=573.68
CB 78-114	54760-BASIN RIM=601.12 12"RCP-S=594.62 12"RCP-N=596.32 10"PVC-W=595.77
CB 78-114A	54759-BASIN RIM=599.23 12"RCP-S=596.93
CB 78-115	4344-BASIN RIM=599.90 18"RCP-N=589.50 18"RCP-S=589.55 10"RCP-NW=598.10
CB 78-116	4345-BASIN RIM=600.04 18"RCP-N=589.79 15"RCP-S=589.84
CB 78-117	12322-TYPE 8 RIM=599.01 10"RCP-NW=593.6
MH 78-118	*MANHOLE* *RIM=UNK* *12"RCP-W=591.00* *15"RCP-N=590.72*
MH 78-119	12345-MANHOLE RIM=600.20 108"RCP-NE=572.00 108"RCP-SW=572.00
CB 78-120	54758-BASIN RIM=597.73 12"RCP-S=593.08 6"PVC-S=593.28 10"PVC-SW=594.68
CB 78-121	4405-BASIN RIM=597.75 12"RCP-SE=593.95 18"RCP-N=590.45
CB 78-122	54745-BASIN RIM=598.14 12"RCP-N=594.54
MH 78-123	54757-MANHOLE RIM=598.17 108"RCP-NE=570.02 108"RCP-SW=570.02
CB 78-124	54756-BASIN RIM=595.9 10"RCP-SE=591.95
CB 78-125	4448-OPEN LID RIM=594.99 15"RCP-N=589.49 12"RCP-S=589.64
CB 78-126	54746-OPEN LID RIM=596.04 12"RCP-N=591.19

EXHIBIT 1-00B.63

CB 78-127	54755-BASIN RIM=594.33 6"UNK-S=592.23 10"RCP-SE=589.98
CB 78-128	9324-BASIN RIM=594.24 12"RCP-S=589.39 15"RCP-N=589.14
CB 78-129	54747-BASIN RIM=594.65 12"RCP-N=591.2
MH 78-130	54753-MANHOLE RIM=596.27 108"RCP-NE=567.97 108"RCP-SW=567.97
MH 78-134	54754-MANHOLE RIM=594.63 6"UNK-S=592.43 12"RCP-SW=589.58 10"RCP-NW=591.33
CB 78-135	70502-BASIN RIM=595.02 6"UNK-SE=592.02 12"RCP-SW=590.42
CB 78-136	54749-BASIN RIM=594.84 12"RCP-N=590.32
CB 78-137	9305-BASIN RIM=593.70 12"RCP-S=589.45 12"RCP-N=589.4
CB 78-138	70501-BASIN RIM=594.66 12"RCP-SW=577.86
CB 78-139	9288-BASIN RIM=592.93 12"RCP-S=587.08 12"RCP-N=586.78
CB 78-140	54750-BASIN RIM=593.28 12"RCP-N=591.28
CB 78-141	70500-BASIN RIM=593.72 15"RCP-SW=583.47
MH 78-142	70499-MANHOLE RIM=598.94 6"CPP-SE=596.29 48"RCP-W=579.34 42"RCP-E=579.34
CB 78-143	9261-BASIN RIM=595.38 15"RCP-N=589.58 15"RCP-S=589.58
CB 78-144	54763-BASIN RIM=594.04 6"UNK-NE=592.14 15"RCP-NW=591.69

EXHIBIT 1-00B.63

CB 78-131	9323-OPEN LID RIM=593.59 8" RCP-SE=590.84 8" RCP-N=590.49 12" RCP-N=589.09 8" RCP-NW=590.84 8" RCP-SW=590.94
CB 78-132	54748-OPEN LID RIM=594.65 12" RCP-S=589.65 6" DIP-NE=592.05 15" RCP-NE=589.55 12" RCP-NW=591.5 8" PVC-NW=591.4

EXHIBIT 1-00B.64

CB 78-145	70497-BASIN RIM=596.48 12"RCP-SW=582.13
MH 78-146	70498-MANHOLE RIM=600.13 42"RCP-W=580.63 36"RCP-E=580.63
CB 78-147	9232-BASIN RIM=597.85 15"RCP-N=591.85 15"RCP-S=591.85
MH 78-148	9189-MANHOLE RIM=603.30 12"RCP-NW=588.10 15"RCP-W=582.95 15"RCP-E=583.40 15"RCP-S=589.90
CB 78-149	12338-TYPE 8 RIM=595.85 12"RCP-SE=589.54
CB 78-150	9188-BASIN RIM=600.26 15"RCP-N=593.86
MH 78-151	9157-MANHOLE RIM=603.94 12"RCP-S=596.74 15"RCP-W=584.29 15"RCP-E=584.62

EXHIBIT 1-00B.64

CB 78-152	9142-OPEN LID RIM=606.25 15"RCP-W=585.15 12"RCP-S=589.95
CB 78-153	9143-OPEN LID RIM=604.12 12"RCP-NW=592.97 12"DIP-SE=593.18 12"RCP-NE=597.82
MH 78-159	9158-MANHOLE RIM=601.93 12"RCP-NW=597.43
INL79-1	12337-INLET RIM=598.29 12"RCP-NE=595.35
CB 79-2	12336-OPEN LID RIM=596.69 12"RCP-NE=593.89 12"RCP-SW=594.20
INL79-3	12334-INLET RIM=592.69 12"RCP-SE=589.68
MH 79-4	12333-MANHOLE RIM=595.16 12"RCP-SW=588.74 12"RCP-NE=587.96 12"RCP-NW=588.72
INL79-5	12331-INLET RIM=587.71 12"RCP-SW=584.58
MH 79-6	12332-MANHOLE RIM=589.77 12"RCP-SW=584.56 15"RCP-NE=584.22
CB 79-7	12330-TYPE 8 RIM=584.89 12"RCP-N=582.37 12"RCP-SE=581.11
INL79-7A	12329-INLET RIM=585.75 12"RCP-S=582.39
MH 79-8	12328-MANHOLE RIM=588.05 12"RCP-NW=581.19 18"RCP-E=581.14 15"RCP-W=581.32
INL79-21	12378-INLET RIM=586.25 12"RCP-NE=583.66
MH 79-22	12380-MANHOLE RIM=587.35 12"RCP-N=581.64 15"RCP-SW=581.67
MH 79-23	54765-MANHOLE RIM=589.02 12"RCP-SW=583.12 18"RCP-S=581.07 18"RCP-E=581.07 21"RCP-NE=580.92
CB 79-24	54767-OPEN LID RIM=586.51 12"RCP-SW=583.36
INL79-25	54766-INLET RIM=586.08 12"RCP-E=582.33 18"RCP-W=581.73
MH 79-26	55138-MANHOLE RIM=588.05 24"RCP-E=580.40 10"UNK-N=580.75 21"RCP-W=580.40
MH 79-29	12374-MANHOLE RIM=588.52 15"RCP-NE=583.01 15"RCP-SW=583.04 12"RCP-NW=583.15
INL79-30	12373-INLET RIM=588.10 12"RCP-SW=584.74 12"RCP-E=583.19
INL79-31	12372-INLET RIM=588.78 12"RCP-NE=586.22
INL79-32	12371-INLET RIM=590.52 10"RCP-NW=586.83
CB 79-33	12370-OPEN LID RIM=590.95 10"RCP-SE=585.93
CB 79-34	12368-OPEN LID RIM=591.74 12"RCP-NW=587.62 15"RCP-SW=586.16 15"RCP-NE=586.16
INL79-35	12367-INLET RIM=591.75 12"RCP-SE=589.03
CB 79-36	12366-OPEN LID RIM=593.76 15"RCP-SW=590.88 12"RCP-NW=591.37 15"RCP-NE=590.87
INL79-37	12365-INLET RIM=593.97 12"RCP-SE=591.76
MH 79-38	12361-MANHOLE RIM=596.54 12"RCP-NW=594.07 15"RCP-NE=593.55 15"RCP-SW=593.56
INL79-39	12360-INLET RIM=595.97 12"RCP-S=593.85
CB 79-40	12363-OPEN LID RIM=596.30 15"RCP-NE=593.78
INL79-41	12362-INLET RIM=598.68 12"RCP-S=596.67
INL79-42	12379-INLET RIM=585.95 12"RCP-SW=581.96 18"RCP-NW=581.56 12"RCP-E=581.94 12"RCP-S=581.59
INL79-43	12381-INLET RIM=585.89 12"RCP-SW=583.68
CB 79-44	56806-BASIN RIM=587.38 (FILLED WITH WATER)
MH 79-45	12326-MANHOLE RIM=588.43 10"RCP-N=581.22 18"RCP-E=579.24 10"RCP-S=580.91 18"RCP-W=579.55
INL79-46	12324-BASIN RIM=587.64 10"RCP-S=582.41
CB 79-47	12327-OPEN LID RIM=587.69 10"RCP-N=583.77
MH 79-50	*MANHOLE* *NO DATA AVAILABLE*
INL79-51	12300-INLET RIM=586.41 12"RCP-E=582.38 6"CPP-N=582.41 12"RCP-N=581.87
INL79-52	12299-INLET RIM=586.80 12"RCP-W=583.23

EXHIBIT 1-00B.65

CB 79-9	12287-OPEN LID RIM=587.70 12"RCP-NE=583.9 12"RCP-E=583.9 12"RCP-S=583.85
CB 79-9A	12288-OPEN LID RIM=588.00 12"RCP-S=585.64
INL79-9B	12289-INLET RIM=587.26 12"RCP-E=585.03 12"RCP-W=584.85
MH 79-10	12285-MANHOLE RIM=588.34 12"RCP-NE=579.61 36"RCP-E=576.76 12"RCP-SE=580.36 36"RCP-W=576.47
MH 79-11	12281-MANHOLE RIM=590.88 36"RCP-W=576.90 12"RCP-S=578.48 24"RCP-E=577.58 12"RCP-NE=579.58
CB 79-12	12280-TYPE 8 RIM=587.40 12"RCP-NE=582.68 12"RCP-SW=582.22 12"RCP-NW=581.7
CB 79-12A	12282-OPEN LID RIM=586.97 12"RCP-E=583.96
INL79-13	12279-INLET RIM=587.04 12"RCP-SW=584.06
CB 79-14	12321-TYPE 8 RIM=612.11 12"RCP-E=604.47 12"RCP-NW=590.27
CB 79-14A	12320-TYPE 8 RIM=612.33 6"PVC-N=610.79 6"PVC-NE=609.19 12"RCP-E=608.17 6"PVC-SE=609.66 12"RCP-W=607.1
INL79-15	12275-INLET RIM=596.62 12"RCP-S=594.62
CB 79-16	12276-TYPE 8 RIM=594.93 12"RCP-N=590.79 12"RCP-SE=590.21
MH 79-17	12277-MANHOLE RIM=599.60 12"RCP-NW=586.94 21"RCP-NE=587.3 24"RCP-SW=587.0
MH 79-18	12291-MANHOLE RIM=600.35 12"RCP-NE=592.47 21"RCP-S=588.66 18"RCP-NE=588.67 12"RCP-NW=592.99
CB 79-19	12290-OPEN LID RIM=599.60 12"RCP-E=593.68
CB 79-20	12292-TYPE 8 RIM=597.73 12"RCP-SW=593.46
MH 79-27	12319-MANHOLE RIM=617.43 12"RCP-E=614.83 12"RCP-W=614.62
MH 79-28	12318-MANHOLE RIM=622.51 6"PVC-NE=618.95 6"PVC-SE=618.82 6"PVC-S=620.71 12"RCP-W=618.62
INL79-48	12272-INLET RIM=612.90 (FILLED WITH WATER)
INL79-49	56820-INLET RIM=626.27 (FILLED WITH DEBRIS)
CB 79-53	12298-TYPE 8 RIM=593.63 (FILLED WITH WATER)
INL79-54	12297-INLET RIM=594.64 (FILLED WITH WATER)
INL79-55	12305-INLET RIM=607.77 12"RCP-N=602.23
INL79-56	54768-INLET RIM=616.21 (FILLED WITH WATER)
INL79-57	54769-INLET RIM=626.56 NO PIPES VISIBLE

ABBREVIATIONS:

UNK	INFORMATION UNABLE TO OBTAINED FROM SURVEY	RESTR	RESTRICTOR STRUCTURE	RCP	REINFORCED CONCRETE PIPE	ELIP	REINFORCED CONCRETE ELIPTICAL PIPE	DIP	DUCTILE IRON PIPE
ITALICS	INFORMATION REFERENCED FROM HISTORICAL PLANS	INV	INVERT ELEVATION	PVC	POLYVINYL CHLORIDE PIPE	CPP	CORRUGATED HIGH-DENSITTY POLYETHYLENE PIPE	RCBC	REINFORCED CONCRETE BOX CULVERT

EXHIBIT 1–00B.100

I-55 | MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -
	DRAWN - STANTEC	REVISED -
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -
PLOT DATE = 1/6/2017	DATE - 1/6/2017	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I–55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN – DRAINAGE STRUCTURE TABLES

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	100
		CONTRACT NO. P9176210		

ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178600037_IDOT_I-55\civil\drainage_location drainage study\D1P9176210-SCH001.dgn

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EXISTING DRAINAGE PLAN STRUCTURE TABLE

EXHIBIT 1-00B.66

MH 80-2	NO DATA AVAILABLE (COULD NOT LOCATE)
CB 80-3	6855-BASIN RIM=610.5 24"RCP-W=587.75 10"RCP-NW=606.4 24"RCP-E=587.69
MH 80-3A	6854-MANHOLE RIM=609.12 10"RCP-SE=606.61 6"PVC-SW=606.52
CB 80-4	12270-TYPE 8 RIM=606.78 27"RCP-NE=587.03 24"RCP-SW=587.06 12"RCP-NW=598.4
CB 80-4A	12269-OPEN LID RIM=603.70 12"RCP-SE=598.72
CB 80-19	9390-BASIN RIM=623.67 12"RCP-E=619.87
MH 80-21	9417-MANHOLE RIM=618.01 12"RCP-E=614.76 12"RCP-W=614.81
CB 80-30	NO DATA AVAILABLE (COULD NOT LOCATE)
CB 80-31	NO DATA AVAILABLE (COULD NOT LOCATE)
INL80-32	12312-INLET RIM=596.43 12"RCP-NW=592.75

EXHIBIT 1-00B.67

MH 80-5	6852-MANHOLE RIM=604.33 27"RCP-W=586.83 10"RCP-NW=597.04 10"RCP-NE=591.58 27"RCP-E=586.59	CB 80-36	NO DATA AVAILABLE
CB 80-5A	6853-BASIN RIM=601.95 10"RCP-SE=597.13		
MH 80-6	6850-MANHOLE RIM=604.33 12"RCP-SW=587.91 27"RCP-W=586.76 10"RCP-NW=588.13 12"RCP-SW=587.32 36"RCP-E=586.48		
CB 80-7	6851-BASIN RIM=601.05 10"RCP-SE=596.4		
CB 80-8	12268-OPEN LID RIM=600.52 12"DIP-SE=595.08		
MH 80-23	9450-MANHOLE RIM=612.89 12"RCP-E=609.09 12"RCP-W=609.14		
CB 80-24	9465-BASIN RIM=609.71 12"RCP-E=606.96 12"RCP-W=607.11		
CB 80-25	9465-OPEN LID RIM=609.71 12"RCP-N=606.94 12"RCP-W=606.94		
CB 80-26	9491-BASIN RIM=606.49 6"CPP-S=604.69 12"RCP-E=602.29 12"RCP-N=602.44 6"UNK-SW=602.64		
CB 80-26A	9490-BASIN RIM=606.28 12"RCP-S=602.63 6"CPP-N=604.68		
CB 80-27	9501-BASIN RIM=604.19 6"CPP-S=602.39 12"RCP-E=599.39 12"RCP-N=599.59 12"RCP-W=599.44 6"UNK-SW=599.84		
CB 80-27A	9502-BASIN RIM=603.93 12"RCP-S=599.78 6"CPP-N=601.83		
CB 80-33	NO DATA AVAILABLE		
CB 80-34	NO DATA AVAILABLE		
CB 80-35	NO DATA AVAILABLE		

EXHIBIT 1-00B.68

MH 80-9	6923-MANHOLE RIM=602.12 12"RCP-SE=596.52 36"RCP-E=585.32 36"RCP-W=585.32 12"RCP-SW=598.52	CB 80-29	9541-BASIN RIM=598.39 12"RCP-N=593.84 12"RCP-E=593.79 12"RCP-SW=593.89	CB 81-1B	12260-OPEN LID RIM=593.44 10"DIP-W=588.24 12"RCP-E=588.24
INL80-9A	6922-INLET RIM=601.94 (FILLED WITH WATER)	CB 80-29A	9542-BASIN FL=598.27 6"CPP-N=596.42 12"RCP-S=594.07		
INL80-10	12262-INLET RIM=603.99 (FILLED WITH DEBRIS)	INL80-37	54771-INLET RIM=604.24 12"RCP-E=600.64 8"PVC-NE=600.94 12"RCP-SW=598.99		
MH 80-11	6921-MANHOLE RIM=600.24 12"RCP-S=593.24 36"RCP-E=584.39 12"RCP-NE=593.02 36"RCP-W=584.39	INL80-37A	54770-INLET RIM=604.07 12"RCP-W=601.77		
INL80-11A	6920-INLET RIM=599.87 6"CPP-S=596.87 12"RCP-N=594.17	INL80-38	54772-INLET RIM=603.87 8"PVC-E=601.12 12"RCP-SW=598.87 12"RCP-NE=598.87		
CB 80-12	4462-OPEN LID RIM=595.60 6"CPP-N=587.85 12"RCP-SE=591.2 6"CPP-S=587.05	CB 80-39	54780-BASIN RIM=599.08 30"RCP-E=584.78 12"RCP-NW=591.88 30"RCP-W=584.83		
INL80-13	6926-INLET RIM=597.41 12"RCP-NE=592.66 12"RCP-E=592.66 12"RCP-S=592.51	INL80-40	54774-INLET RIM=602.89 12"RCP-E=598.54 6"PVC-W=600.04		
CB 80-15	4615-OPEN LID RIM=596.27 12"RCP-SE=587.37	INL80-41	54775-INLET RIM=601.52 15"RCP-E=596.97 12"RCP-W=597.37		
MH 80-16	NO DATA AVAILABLE	MH 80-42	12317-MANHOLE RIM=600.60 15"RCP-W=594.92 15"RCP-SE=594.79		
CB 80-17	6929-BASIN RIM=597.03 UNK PIPE-S=UNK (FILLED WITH WATER)	CB 80-44	54779-OPEN LID RIM=597.94 36"RCP-E=583.94 30"RCP-W=584.14 12"RCP-N=590.60		
INL80-17A	6928-INLET RIM=596.60 FULL OF DEBRIS	INL80-45	54778-INLET RIM=598.58 12"RCP-S=593.73		
INL80-17B	6927-INLET RIM=596.46 (FILLED WITH WATER)	CB 80-47	54988-OPEN LID RIM=596.05 12"RCP-E=587.85 10"RCP-E=591.2 36"RCP-NE=583.15 12"RCP-SW=587.05 36"RCP-SW=583.25		
MH 80-18	12259-MANHOLE RIM=596.08 36"RCP-NE=582.58 36"RCP-SW=583.08 12"RCP-NW=587.01 36"RCP-SW=582.58	CB 80-48	54989-BASIN RIM=595.74 12"RCP-NE=587.34 12"RCP-SW=588.54		
MH 80-28	9519-MANHOLE RIM=600.98 12"RCP-E=596.43 12"RCP-N=596.56 12"RCP-W=596.51	INL80-49	54987-INLET RIM=596.69 12"RCP-E=591.19 12"RCP-W=591.19		
CB 80-28A	9520-BASIN RIM=600.68 12"RCP-S=596.88 6"CPP-N=598.83	INL80-50	*54986-INLET* *RIM=595.9* *12"RCP-W=594.55* *(FILLED WITH WATER)*		

EXHIBIT 1-00B.69

INL81-1	10567-INLET RIM=592.8 18"RCP-S=587.6 12"RCP-E=587.7 12"RCP-NE=588.8 12"RCP-NW=589.7 12"RCP-W=587.55	MH 81-13	10566-MANHOLE RIM=588.61 15"RCP-S=585.11 12"RCP-NW=585.61 8"CMP-SW=585.41	MH 81-27	10562-MANHOLE RIM=582.26 15"RCP-S=578.06 6"CPP-SE=578.46 8"DIP-W=578.66 6"CMP-W=578.06
INL81-1A	10568-INLET RIM=592.38 12"RCP-SE=589.48	INL81-13A	10565-INLET RIM=588.64 12"RCP-SE=585.69		
CB 81-2	9561-BASIN FL=591.33 18"RCP-N=583.33 6"CPP-N=590.03 18"RCP-S=583.33	CB 81-14	52777-BASIN FL=586.09 21"RCP-N=574.09 36"RCP-E=573.94 18"RCP-S=574.34 36"RCP-W=576.79		
CB 81-2A	9560-BASIN FL=591.41 18"RCP-N=583.46 6"CPP-S=590.01 18"RCP-S=583.21 12"RCP-W=585.21	INL81-15	*6917-INLET* *RIM=587.63* *12"RCP-E=583.78* *(FILLED WITH WATER)*		
MH 81-3	52724-MANHOLE RIM=593.21 18"RCP-N=582.96 24"RCP-E=582.71 18"RCP-S=583.01	INL81-16	10564-INLET RIM=586.22 12"RCP-NW=583.42		
CB 81-4	54781-OPEN LID RIM=590.99 18"RCP-N=584.44 12"RCP-W=584.84 12"RCP-SW=584.54	MH 81-17	MANHOLE RIM=586.32 12"RCP-SE=582.51 12"RCP-W=582.68 12"RCP-S=583.15		
MH 81-5	52735-MANHOLE RIM=591.68 15"RCP-N=581.98 36"RCP-E=581.13 12"RCP-S=581.93 24"RCP-W=581.88	CB 81-18	10563-BASIN RIM=585.94 12"RCP-S=582.96		
MH 81-6	9570-MANHOLE RIM=590.70 15"RCP-NW=582.40 12"RCP-SE=582.65	CB 81-19	9600-BASIN FL=583.44 12"RCP-N=578.44 12"RCP-SE=578.44		
CB 81-7	*BASIN* *RIM=596.20* *12"RCP-E=587.91* *12"RCP-S=587.91*	CB 81-20	9601-BASIN FL=583.86 12"RCP-NW=578.26 21"RCP-SE=574.61 12"RCP-NW=578.01		
CB 81-8	*BASIN* *RIM=596.00* *12"RCP-W=192.25*	MH 81-21	54786-MANHOLE RIM=587.00 18"RCP-N=576.00 10"RCP-NW=579.7		
INL81-9	54782-INLET RIM=588.87 15"RCP-S=581.22 15"RCP-NE=579.47 8"CMP-W=584.37	INL81-22	54785-INLET RIM=585.19 10"RCP-SE=581.79		
CB 81-9A	54783-BASIN RIM=586.26 15"RCP-N=583.01 8"PVC-NW=584.01	CB 81-23	10563-BASIN RIM=585.94 15"RCP-N=568.95 12"RCP-NE=578.2		
CB 81-10	52756-BASIN FL=589.16 18"RCP-N=579.01 36"RCP-E=577.66 15"RCP-S=578.26 36"RCP-W=580.61	CB 81-24	54788-BASIN RIM=582.23 12"RCP-SE=579.33		
CB 81-11	9589-BASIN FL=587.46 15"RCP-N=580.76 18"RCP-S=579.41	MH 81-25	52798-MANHOLE RIM=583.14 36"RCP-W=573.34 42"RCP-E=565.79 18"RCP-N=565.89		
CB 81-12	9590-BASIN FL=587.30 15"RCP-N=581.05 15"RCP-S=581.00	CB 81-26	9626-BASIN FL=581.42 15"RCP-N=575.37 18"RCP-S=567.32		

ABBREVIATIONS:

UNK	INFORMATION UNABLE TO OBTAINED FROM SURVEY	RESTR	RESTRICTOR STRUCTURE	RCP	REINFORCED CONCRETE PIPE	ELIP	REINFORCED CONCRETE ELIPTICAL PIPE	DIP	DUCTILE IRON PIPE
ITALICS	INFORMATION REFERENCED FROM HISTORICAL PLANS	INV	INVERT ELEVATION	PVC	POLYVINYL CHLORIDE PIPE	CPP	CORRUGATED HIGH-DENSITTY POLYETHYLENE PIPE	RCBC	REINFORCED CONCRETE BOX CULVERT

EXHIBIT 1–00B.101

I-55 MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -
	DRAWN - STANTEC	REVISED -
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -
PLOT DATE = 1/6/2017	DATE - 1/6/2017	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I–55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN – DRAINAGE STRUCTURE TABLES

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	101
		CONTRACT NO. P9176210		
	ILLINOIS	FED. AID PROJECT		

FILE NAME = V:\1786\active\178600037_IDOT_I-55\civil\drainage_location drainage study\D1P9176210-SCH001.dgn

Default

EXISTING DRAINAGE PLAN STRUCTURE TABLE

EXHIBIT 1-00B.70

MH 81-28	54789-MANHOLE RIM=581.52 12"RCP-N=575.62 18"RCP-N=567.42
INL81-29	54790-INLET RIM=579.08 12"RCP-S=576.08
MH 81-30	52819-MANHOLE RIM=579.68 48"RCP-NE=565.33 42"RCP-SW=565.53
CB 81-31	9644-BASIN FL=578.52 12"RCP-N=572.37 18"RCP-S=566.62
INL81-32	10560-INLET RIM=579.03 8"CMP-NW=576.63 8"DIP-W=575.61 12"RCP-SW=575.22
INL81-33	54792-INLET RIM=577.40 8"PVC-N=575.00
INL81-33A	54793-INLET RIM=577.89 8"PVC-S=574.79 10"RCP-SE=574.99 6"CPP-N=575.64
CB 81-34	54791-BASIN RIM=580.17 10"RCP-N=573.57 18"RCP-N=566.42
MH 81-35	52830-MANHOLE RIM=578.27 54"RCP-NE=564.17 48"RCP-SW=564.27
MH 81-36	10558-MANHOLE RIM=577.7 12"RCP-E=574.86
INL81-37	10559-INLET RIM=577.31 12"RCP-W=573.26 15"RCP-S=572.71
CB 81-38	9652-BASIN FL=576.69 15"RCP-N=571.14 18"RCP-S=565.84
MH 81-39	52831-MANHOLE RIM=579.52 54"RCP-SW=563.52 54"RCP-NE=563.52
MH 81-40	10555-MANHOLE RIM=582.87 12"RCP-W=578.17
MH 81-41	10556-MANHOLE RIM=582.65 6"CPP-W=577.85 12"RCP-E=577.49 12"RCP-S=577.44
CB 81-42	9663-OPEN LID FL=580.62 6"CPP-N=577.87 15"RCP-W=576.77
MH 81-43	54797-MANHOLE RIM=584.78 12"RCP-N=576.13 12"RCP-NW=579.13 10"RCP-NW=577.08
INL81-44	54798-INLET RIM=582.64 12"RCP-SE=579.39
MH 81-45	52842-MANHOLE RIM=584.61 54"RCP-SW=563.21 60"RCP-NE=563.06
MH 81-47	54801-MANHOLE RIM=588.16 12"RCP-NE=581.56 12"RCP-N=582.56
INL81-47A	54800-INLET RIM=587.79 12"RCP-S=583.99 6"PVC-N=584.59
CB 81-94	9563-BASIN FL=577.31 12"RCP-SW=572.66
MH 81-95	10557-MANHOLE RIM=578.02 12"RCP-SE=575.01
INL81-96	54794-INLET RIM=578.89 12"RCP-NW=573.46

EXHIBIT 1-00B.71

MH 81-46	52858-MANHOLE RIM=588.64 60"RCP-NE=562.37 60"RCP-SW=562.37
INL81-48	9683-INLET FL=585.21 15"RCP-N=579.21 6"CPP-NE=582.31 24"RCP-S=563.71 12"RCP-SW=578.16
MH 81-49	10554-MANHOLE RIM=588.61 12"RCP-N=583.06 12"RCP-NE=583.01 15"RCP-S=582.98
INL81-50	10553-INLET RIM=587.79 12"RCP-S=583.65
INL81-51	10552-INLET RIM=588.44 12"RCP-E=584.34 12"RCP-SW=584.29
INL81-52	10551-INLET RIM=591.87 12"RCP-W=587.04 6"CPP-E=588.42
CB 81-53	54804-BASIN RIM=591.45 12"RCP-N=589.15
MH 81-54	9710-MANHOLE RIM=594.22 12"RCP-NE=590.37 12"RCP-SW=584.17
MH 81-55	52874-MANHOLE RIM=594.56 60"RCP-NE=562.06 60"RCP-SW=562.06
INL81-56	54805-INLET RIM=597.98 6"PVC-NE=593.13 12"RCP-N=592.98
MH 81-57	89801-MANHOLE RIM=596.90 12"RCP-N=592.00 15"RCP-E=591.65 12"RCP-S=592.10
INL81-58	53126-INLET FL=598.74 12"RCP-N=593.04 12"RCP-S=593.04
INL81-59	6916-INLET FL=598.03 12"RCP-S=593.13
INL81-60	6915-INLET FL=600.50 12"RCP-S=595.40
MH 81-61	*89813-MANHOLE* *RIM=600.13* *12"RCP-N=590.72* *54"RCP-S=586.91* *54"RCP-E=586.92* *15"RCP-W=590.07*
INL81-61A	52905-INLET INL=601.16 12"RCP-N=594.31 12"RCP-S=590.76 6"CPP-NE=597.16
MH 81-62	*52903/52904-MANHOLE* *RIM=601.20/601.46* *54"RCP-N=586.88* *12"RCP-S=591.52* *30"RCP-E=586.84* *30"RCP-W=586.84* *(JUNCTION CHAMBER)*
INL81-64	*54806-INLET* *RIM=600.81* *FILLED WITH SILT* *12"RCP-N=596.34*
MH 81-65	52902-MANHOLE RIM=600.91 36"RCP-NE=586.61 36"RCP-NW=586.51 18"RCP-N=588.11
INL81-66	89812-INLET FL=597.74 18"RCP-S=588.09
CB 81-67	12223-TYPE 8 RIM=597.16 54"RCP-S=584.86 54"RCP-W=584.86
MH 81-68	12224-MANHOLE RIM=600.65 54"RCP-E=584.35 54"RCP-NW=584.35
MH 81-69	*52913-MANHOLE* *RIM-602.68* *12"RCP-N=589.18* *12"RCP-S=589.91* *54"RCP-E=587.38* *54"RCP-W=587.38*
INL81-70	52914-INLET FL=604.15 12"RCP-N=591.45 12"RCP-S=590.05
INL81-71	6914-INLET FL=603.44 12"RCP-S=UNK (FILLED WITH WATER)
INL81-72	54807-INLET RIM=603.64 6"PVC-NE=598.84 12"RCP-N=598.64
MH 81-73	52918-MANHOLE RIM=605.16 18"RCP-N=589.46 24"RCP-E=588.21 18"RCP-S=589.51 24"RCP-W=588.17
INL81-74	89831-INLET RIM=602.09 18"RCP-S=589.38
CB 81-76	54808-BASIN RIM=593.84 18"RCP-N=589.94
MH 81-77	89842-MANHOLE RIM=605.19 24"RCP-NE=599.39 12"RCP-NE=588.79 54"RCP-SW=587.39

EXHIBIT 1-00B.72

MH 81-78	89843-MANHOLE RIM=605.44 12"RCP-N=600.84 18"RCP-E=600.64 12"RCP-S=600.59 24"RCP-W=599.34
INL81-79	52924-INLET FL=606.97 12"RCP-N=601.52 12"RCP-S=601.57 6"UNK-NE=601.62
INL81-80	6913-INLET FL=606.30 12"RCP-S=601.18
INL81-81	54809-INLET RIM=606.49 6"PVC-NE=601.74 12"RCP-N=601.69
CB 81-82	*BASIN* *RIM=599.0* *12"RCP-S=595.25*
CB 81-83	89852-BASIN FL=606.61 12"RCP-NE=592.56 24"RCP-SW=590.51
MH 81-84	52932-MANHOLE RIM=609.72 24"RCP-NE=590.62 18"RCP-S=590.58 24"RCP-W=590.19
CB 81-85	54810-OPEN LID RIM=594.17 6"PVC-N=591.72 18"RCP-NW=590.97
INL81-86	*6912-INLET* *FL=609.38* *12"RCP-S=605.34*
INL81-87	*52933-INLET* *FL=609.97* *12"RCP-SW=604.36* *12"RCP-N=604.60*
MH 81-88	89853-MANHOLE RIM=608.51 12"RCP-NE=603.95 12"RCP-E=603.09 12"RCP-S=603.31 18"RCP-W=602.96
MH 81-89	53127-MANHOLE RIM=610.78 12"RCP-NE=606.53 12"RCP-S=605.98 12"RCP-SW=606.08
INL81-90	54812-INLET RIM=611.91 12"RCP-N=606.86 6"PVC-W=607.31
INL81-91	52939-INLET RIM=612.32 6"PVC-NE=607.22 12"RCP-SW=606.32 12"RCP-N=606.42
INL81-92	6911-INLET FL=611.58 6"CPP-E=606.78 12"RCP-S=606.48
INL81-97	54811-INLET RIM=609.74 6"PVC-NE=605.04 12"RCP-N=604.69
MH 82-1	*6907-MANHOLE* *RIM=612.3* *12"RCP-N=607.00* *12"RCP-S=607.00* *15"RCP-E=606.73*
INL82-2	52962-INLET RIM=612.55 12"RCP-N=607.85
INL82-3	6910-INLET RIM=611.77 12"RCP-S=608.12
MH 82-4	6906-MANHOLE RIM=610.81 12"RCP-S=604.81 15"RCP-E=604.76 12"RCP-N=604.81 15"RCP-W=604.71
INL82-5	52969-INLET RIM=610.97 12"RCP-N=606.19
INL82-6	6909-INLET RIM=610.09 12"RCP-S=606.09 6"CPP-W=606.44
MH 82-7	*6905-MANHOLE* *RIM=608.62* *12"RCP-N=603.26* *12"RCP-S=603.26* *15"RCP-W=602.71* *24"RCP-E=602.22*
INL82-8	52984-INLET RIM=608.74 12"RCP-N=603.60
INL82-9	6908-INLET RIM=607.89 12"RCP-S=604.19 6"CPP-W=604.34
MH 82-25	12124-MANHOLE RIM=596.30 12"RCP-N=590.87 12"RCP-E=590.85 15"RCP-SW=590.34 12"RCP-SE=590.46
INL82-26	12125-INLET RIM=596.77 12"RCP-W=592.21
INL82-27	12123-INLET RIM=596.22 12"RCP-S=591.29
MH 82-28	12127-MANHOLE RIM=591.66 UNABLE TO OPEN
INL82-28A	12126-INLET RIM=591.30 12"RCP-NW=586.77
INL82-29	12128-INLET RIM=591.54 12"RCP-S=586.42 6"CPP-E=587.04
MH 82-30	12130-MANHOLE RIM=589.64 UNABLE TO OPEN
INL82-30A	12131-INLET RIM=589.65 12"RCP-E=584.68
CB 82-30B	12133-OPEN LID RIM=589.72 12"RCP-SW=584.57 6"CPP-E=585.59
MH 82-31	12132-MANHOLE RIM=590.70 36"RCP-NE=581.36 36"RCP-SW=580.63
MH 82-32	12141-MANHOLE RIM=592.22 36"RCP-NE=579.90 36"RCP-SW=579.54
CB 82-56	89896-BASIN RIM=605.51 12"RCP-S=602.81 6"PVC-SW=603.21
CB 82-57	54836-BASIN RIM=607.92 12"RCP-N=600.97 6"PVC-NW=602.32 12"RCP-SW=600.92
MH 82-58	54821-MANHOLE RIM=607.35 12"RCP-NE=600.7 12"RCP-W=600.7
INL82-58A	54819-INLET RIM=607.82 12"RCP-E=602.62 12"RCP-W=601.22
INL82-58B	54820-INLET RIM=607.66 6"PVC-NW=603.06 12"RCP-W=603.01
MH 82-59	54815-MANHOLE RIM=604.24 15"RCP-S=596.54 12"RCP-E=598.04 12"RCP-N=599.04 12"RCP-W=598.94
INL82-60	54814-INLET RIM=609.71 12"RCP-S=603.26 6"PVC-NW=605.66
MH 82-61	54818-MANHOLE RIM=606.54 12"RCP-E=602.44 12"RCP-N=602.09
INL82-62	54813-INLET RIM=611.34 12"RCP-S=603.34 6"UNK-N=607.84
MH 82-63	*MANHOLE* *RIM=598.88* *15"RCP-W=592.40* *15"RCP-N=595.63* *12"RCP-E=593.62*
INL82-63A	12198-INLET RIM=603.88 6"CCP-NE=598.36 12"RCP-SW=595.11
MH 82-64	12199-MANHOLE RIM=601.00 15CP-NE=591.00 15CP-SW=591.00
MH 82-65	12200-MANHOLE RIM=597.44 15CP-NE=588.46 15CP-SW=588.45 12"RCP-NW=591.12
INL82-65A	12201-INLET RIM=596.95 6"CPP-NE=592.57 12"RCP-SE=591.58
MH 82-66	12202-MANHOLE RIM=593.80 15RCP-NE=587.82 15"RCP-SW=585.91 48"RCP-NW=585.35 24"RCP BAFFLE=585.91
MH 82-67	*54817-MANHOLE* *RIM=601.33* *36"RCP-W=586.75*
MH 82-68	54816-MANHOLE RIM=601.89 36"RCP-W=586.79
MH 82-69	12211-MANHOLE RIM=594.89 36"RCP-E=585.39 48"RCP-SW=585.37 36"RCP-N=585.40
MH 82-70	12212-MANHOLE RIM=598.29 36"RCP-S=586.88 36"RCP-E=586.88
MH 82-71	12203-MANHOLE RIM=593.49 15"RCP-NE=588.61 15"RCP-SW=586.57
MH 82-72	12204-MANHOLE RIM=593.14 15"RCP-NE=586.04 12"RCP-SE=587.99 15"RCP-NW=585.14
CB 82-72A	12205-TYPE 8 RIM=592.74 12"RCP-NW=588.46
MH 82-73	12208-MANHOLE RIM=593.53 UNABLE TO OPEN
CB 82-73A	12207-OPEN LID RIM=592.83 12"RCP-E=586.81 12"RCP-NW=586.75
INL82-73B	12206-INLET RIM=592.76 6"CCP-NE=587.76 12"RCP-SW=586.78
CB 82-74	12209-OPEN LID RIM=593.23 12"RCP-SW=587.05 12"RCP-NE=587.05
INL82-75	12210-INLET RIM=593.25 6"CPP-S=589.09 12"RCP-SW=588.54
MH 82-78	12134-MANHOLE RIM=589.69 UNABLE TO OPEN
INL82-78A	12136-INLET RIM=589.59 12"RCP-NE=585.14 6"CPP-N=585.46
CB 82-78B	12135-OPEN LID RIM=589.63 12"RCP-SW=584.73 6"CPP-N=585.45
MH 82-79	12138-MANHOLE RIM=594.30 UNABLE TO OPEN STUCK SHUT
INL82-80	12139-INLET RIM=590.96 12"RCP-N=584.92 6"CPP-NW=585.51
MH 82-81	12143-MANHOLE RIM=592.30 36"RCP-NE=580.84 36"RCP-SW=580.80
INL82-82	12140-INLET RIM=590.99 12"RCP-NW=582.94

ABBREVIATIONS:

UNK	INFORMATION UNABLE TO OBTAINED FROM SURVEY	RESTR	RESTRICTOR STRUCTURE	RCP	REINFORCED CONCRETE PIPE	ELIP	REINFORCED CONCRETE ELIPTICAL PIPE	DIP	DUCTILE IRON PIPE
ITALICS	INFORMATION REFERENCED FROM HISTORICAL PLANS	INV	INVERT ELEVATION	PVC	POLYVINYL CHLORIDE PIPE	CPP	CORRUGATED HIGH-DENSITTY POLYETHYLENE PIPE	RCBC	REINFORCED CONCRETE BOX CULVERT

EXHIBIT 1-00B.102

I-55 MANAGED LANE PROJECT

USER NAME = dbook
PLOT SCALE = 50.0000 ' / in.
PLOT DATE = 1/6/2017

DESIGNED - DJB
DRAWN - STANTEC
CHECKED - JVO
DATE - 1/6/2017

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
EXISTING DRAINAGE PLAN - DRAINAGE STRUCTURE TABLES

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	110	102

CONTRACT NO. P9176210
ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178600037_IDOT_I-55\civil\drainage_location drainage study\D1P9176210-SCH001.dgn

Default

STRUCTURE NAME CORRELATION
XP-SWMM NODE vs.
EDP STRUCTURE NUMBER

NAME CORRELATION - MAIN DRAIN

XP-SWMM Node		EDP Structure No.		Invert EL per 2015 Survey (ft, NAVD 88)		Pipe Diameter (in)	Length (ft)
Upstream	Downstream	Upstream	Downstream	Upstream	Downstream		
N841	**N842**	MH 81-3	MH 81-5	582.71	581.88	24	200
N842	**N843**	MH 81-5	CB 81-10	581.13	580.61	36	298
N843	**N844**	CB 81-10	CB 81-14	577.66	576.79	36	400
N844	**N845**	CB 81-14	MH 81-25	573.94	573.34	36	386
N845	**N846**	MH 81-25	MH 81-30	565.79	565.53	42	415
N846	**N847**	MH 81-30	MH 81-35	565.33	564.27	48	261
N847	**N910**	MH 81-35	Blind Connect	564.17	563.72	54	186
N910	**N848**	Blind Connect	MH 81-39	563.72	563.52	54	80
N848	**N870**	MH 81-39	Blind Connect	563.52	563.32	54	266
N870	**N849**	Blind Connect	MH 81-45	563.32	563.21	54	157
N849	**N850**	MH 81-45	MH 81-46	563.06	562.37	60	339
N850	**N921**	MH 81-46	Blind Connect	562.37	562.11	60	421
N921	**N851**	Blind Connect	MH 81-55	562.11	562.06	60	86
N851	**WET WELL**	MH 81-55	WET WELL	562.06	561.17	60	478

NAME CORRELATION - MAIN DRAIN LATERALS

XP-SWMM Node		EDP Structure No.	
Upstream	Downstream	Upstream	Downstream
N839	**N840**	INL 81-1	CB 81-2
N840	**N841**	CB 81-2	MH 81-3
N853	**N841**	CB 81-4	MH 81-3
N854	**N855**	CB 81-9A	INL 81-9
N855	**N843**	INL 81-9	CB 81-10
N856	**N857**	CB 81-13	CB 81-11
N857	**N843**	CB 81-11	CB 81-10
N858	**N844**	MH 81-21	CB 81-14
N859	**N860**	CB 81-18	CB 81-20
N860	**N844**	CB 81-20	CB 81-14
N861	**N862**	INL 81-27	CB 81-26
N862	**N845**	CB 81-26	MH 81-25
N863	**N845**	CB 81-23	MH 81-25
N864	**N865**	INL 81-32	CB 81-31
N865	**N846**	CB 81-31	MH 81-30
N866	**N846**	MH 81-28	MH 81-30

XP-SWMM Node		EDP Structure No.	
Upstream	Downstream	Upstream	Downstream
N867	**SAG**	INL 81-37	CB 81-38
SAG	**N847**	CB 81-38	MH 81-35
N869	**N847**	CB 81-34	MH 81-35
N871	**N870**	MH 81-43	Blind Connect
N872	**N850**	MH 81-47	MH 81-46
N873	**N874**	INL 81-52	MH 81-49
N874	**N875**	MH 81-49	CB 81-48
N876	**N877**	Headwall	MH 81-54
N877	**N851**	MH 81-54	MH 81-55
N908	**N909**	MH 81-41	CB 81-42
N909	**N870**	CB 81-42	Blind Connect
N911	**N910**	CB 81-94	Blind Connect
N913	**N860**	MH 81-17	CB 81-20
N922	**N921**	CB 81-53	Blind Connect
N923	**N910**	MH 81-95	Blind Connect
N924	**N910**	INL 81-96	Blind Connect

NAME CORRELATION - EAST SS SYSTEM

XP-SWMM Node		EDP Structure No.	
Upstream	Downstream	Upstream	Downstream
N881	**N882**	INL 81-92	MH 81-89
N882	**N883**	MH 81-89	MH 81-88
N883	**N892**	MH 81-88	MH 81-78
N884	**N886**	MH 81-84	MH 81-73
N886	**N888**	MH 81-73	MH 81-62
N888	**N889**	MH 81-62	MH 81-65
N889	**N879**	MH 81-65	Blind Connect
N890	**N882**	INL 81-90	MH 81-89
N891	**N892**	INL 81-80	MH 81-78
N892	**N933**	MH 81-78	MH 81-77
N893	**N894**	INL 81-71	MH 81-69
N894	**N899**	MH 81-69	MH 81-61
N895	**N886**	CB 81-76	MH 81-73
N896	**N894**	INL 81-72	MH 81-69

XP-SWMM Node		EDP Structure No.	
Upstream	Downstream	Upstream	Downstream
N897	**N892**	INL 81-81	MH 81-78
N898	**N899**	INL 81-60	MH 81-61
N899	**N888**	MH 81-61	MH 81-62
N900	**N886**	CB 81-74	MH 81-73
N901	**N884**	CB 81-83	MH 81-84
N902	**N903**	INL 81-56	MH 81-57
N903	**N899**	MH 81-57	Blind Connect
N904	**N905**	CB 81-59	INL 81-58
N905	**N903**	INL 81-58	MH 81-57
N926	**N889**	INL 81-66	MH 81-65
N928	**N883**	INL 81-86	MH 81-88
N929	**N883**	INL 81-97	MH 81-88
N933	**N894**	MH 81-77	MH 81-69

NAME CORRELATION - OUTFALL SS

XP-SWMM Node		EDP Structure No.		Invert EL per 2015 Survey (ft, NAVD 88)		Pipe Diameter (in)	Length (ft)
Upstream	Downstream	Upstream	Downstream	Upstream	Downstream		
N878	**N879**	PS 30	Blind Connect	585.47	585.15	54	123
N879	**N931**	Blind Connect	CB 81-67	585.15	584.86	54	120
N931	**N906**	CB 81-67	Blind Connect	584.86	584.54	54	348
N906	**N932**	Blind Connect	MH 81-68	584.54	584.35	54	208
N932	**N934**	MH 81-68	Not Shown	584.35	584.00	54	255
N934	**OUT1**	Not Shown	Not Shown	584.00	577.26	54	137

Section 7
Typical Roadway Cross Sections and Proposed Roadway Plan & Profile (PDP)

NORTH OF ILLINOIS 43 (HARLEM AVENUE) TO CALIFORNIA AVENUE

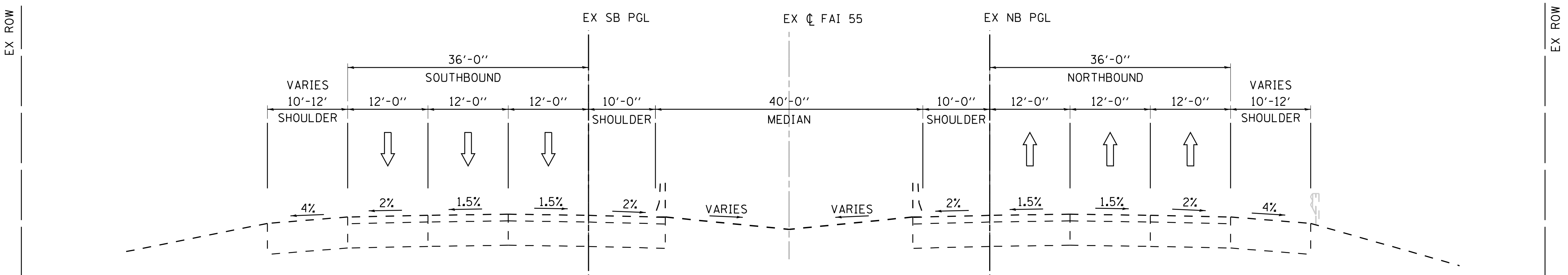
STA 970+00 - STA 1253+00

TANGENT SECTION ONLY

NOTES:

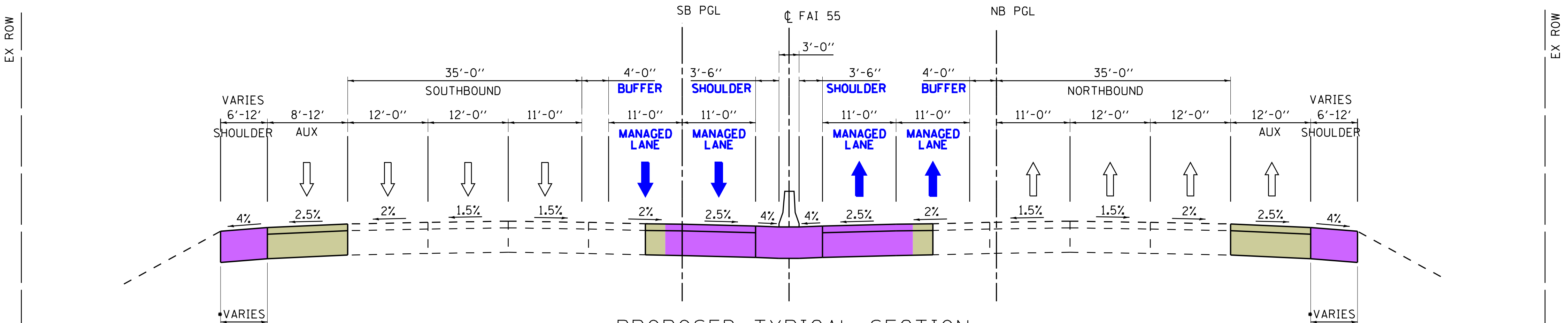
1. INGRESS AND EGRESS WEAVE LANES AND OUTSIDE PAVEMENT WIDENING IS NOT DEPICTED ON THE TYPICAL SECTIONS. SEE GEOMETRY PLANS FOR LIMITS.
2. REFER TO ROADWAY GEOMETRY FOR ADDITIONAL DETAILS.

- REFER TO GEOMETRIC PLANS FOR LIMITS.



EXISTING TYPICAL SECTION

(LOOKING NORTH)
N.T.S.



PROPOSED TYPICAL SECTION

(LOOKING NORTH)
N.T.S.

LEGEND

▨	WIDENING
▨	RECONSTRUCTION
⇨	TRAVEL DIRECTION
➡	MANAGED LANE
➡	WEAVE LANE
→	PAVEMENT CROSS SLOPE

09_STA. 970+00 - STA. 1253+00

FILE NAME = V:\1786\active\178600037_IDOT_I-55_2Lanes\civil\drawing\sht\exhibits\D1P9121917-exh_drn_typ_section.dgn

I-55 | MANAGED LANE PROJECT

USER NAME = Aericksen	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
PLOT DATE = 4/9/2019	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
PROPOSED TYPICAL SECTIONS

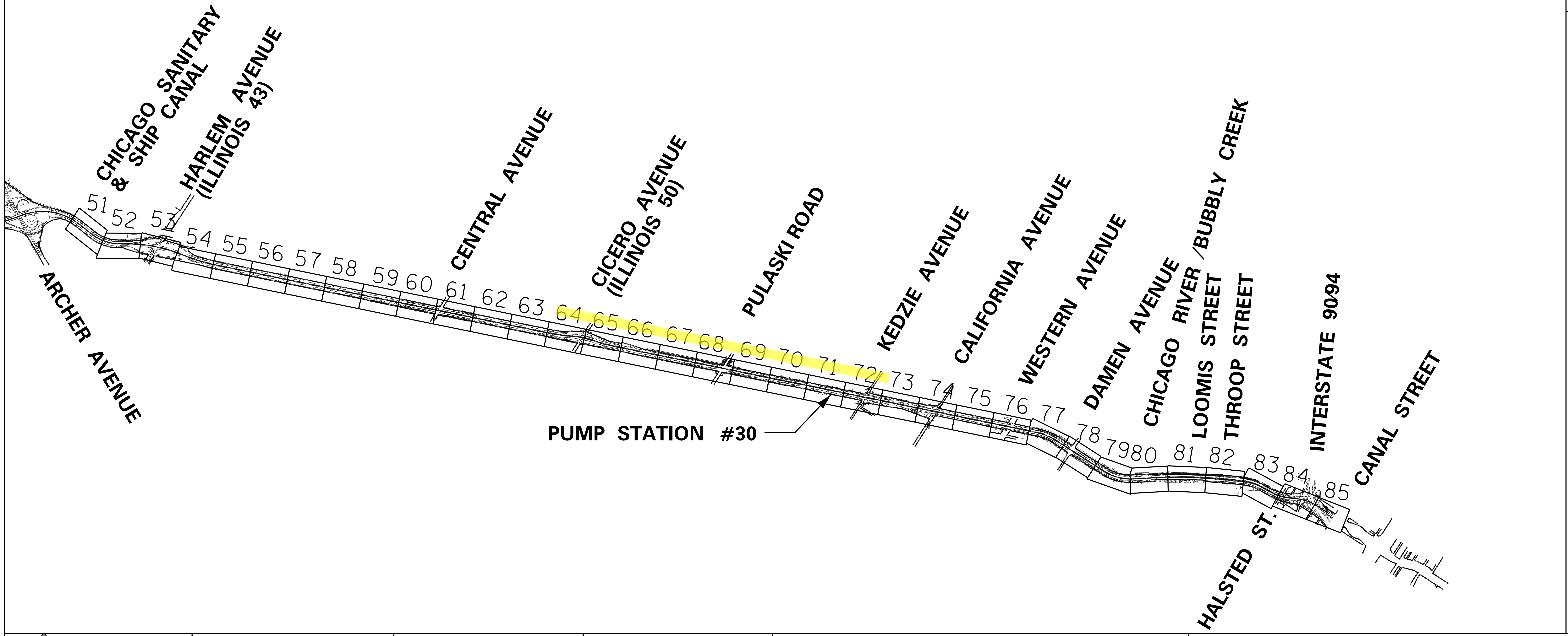
- SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			12	9

CONTRACT NO. P92917

ILLINOIS FED. AID PROJECT

EXISTING DRAINAGE PLAN EXHIBIT 1–00B.1
PROPOSED DRAINAGE PLAN EXHIBIT 2–00A.1



EXISTING DRAINAGE PLAN AND PROPOSED DRAINAGE PLAN LEGEND

* EXISTING SYMBOLS USED FOR THE EDP
** EXISTING AND PROPOSED SYMBOLS USED FOR THE PDP

SYMBOLS	EXISTING *	PROPOSED **
CENTERLINE AND STATIONING	— - — - —	—·—·—·—
RIGHT OF WAY LINE	— — — —	— - - —
INTERPRETED DRAINAGE AREA		
FLOODPLAIN BOUNDARY	— - - —	— - - —
FLOODWAY BOUNDARY	— — — —	— — — —
SHALLOW CONC./GUTTER FLOW	SC →	SC →
SWALE	→	→
DITCH	~→	~→
SUMMIT	↔	↔
OUTLET	➡	➡
SHEET FLOW	⇨	⇨
OVERFLOW	⇨	⇨
CHANNEL		
CULVERT SIZE – TYPE	2' X 2' BOX	2' X 2' BOX
PUMP STATION	PS	PS
STORM SEWER	→	→
CULVERT END SECTION	◁	◀
CATCH BASIN	○	●
HEADWALL/ENDWALL	—	⌒
INLET /DRAINAGE STRUCTURE	▭	▬
MANHOLE	◎	⊙
CLEAN EXISTING STRUCTURE (PROPOSED ONLY)		C
RECONSTRUCT EXISTING STRUCTURE (PROPOSED ONLY)		REC
ADJUST EXISTING STRUCTURE (PROPOSED ONLY)		ADJ
REMOVE EXISTING STRUCTURE (PROPOSED ONLY)		R
REMOVE EXISTING STORM SEWER (PROPOSED ONLY)		
UNDETAINED DRAINAGE AREA (PROPOSED ONLY)		▨
DIVERTED AREA (PROPOSED ONLY)		▨
PROPOSED PAVEMENT AREA (PROPOSED ONLY)		▨

I-55 MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -
	DRAWN - STANTEC	REVISED -
PLOT SCALE = 2500.0000 '/ in.	CHECKED - JVO	REVISED -
PLOT DATE = 1/5/2017	DATE - 1/5/2017	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
DRAINAGE PLAN – KEY MAP AND LEGEND

SCALE: SHEET OF SHEETS STA. TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	1

CONTRACT NO. P9176210
ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178600037_IDOT_I-55\civil\drainage_location drainage study\D1P9176210-KEYMAP.dgn

Default

DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
2. THE PROPOSED INLETS AND CATCH BASINS ARE SHOWN AS CONCEPTUAL. ACTUAL INLET SPACING WILL BE CONDUCTED AS PART OF THE PHASE II DESIGN. INLET SPACING SHALL BE BASED ON A 10-YEAR DESIGN AND SPREAD WILL BE LIMITED TO THE SHOULDER.
3. DITCH DESIGN SHALL BE COMPLETED AS PART OF THE PHASE II DESIGN. DITCHES SHALL BE AT LEAST 3-FT DEEP AND BE SIZED FOR THE 50-YEAR DESIGN. DITCHES SHALL PROVIDE 1-FT OF FREEBOARD BETWEEN THE 50-YEAR WATER SURFACE ELEVATION AT THE EDGE OF SHOULDER.
4. ALL PROPOSED STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP), UNLESS OTHERWISE NOTED.
5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2-00A.64

I-55 | MANAGED LANE PROJECT

USER NAME = dbook
PLOT SCALE = 50.0000 ' / in.
PLOT DATE = 8/2/2019

DESIGNED - DJB
DRAWN - STANTEC
CHECKED - JVO
DATE - 8/2/2019

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
2 X 2 MANAGED LANES - PROPOSED DRAINAGE PLAN
SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	64

CONTRACT NO. $CONTRACT
ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178600037_IDOT_I-55_2Lanes\civil\drainage\drawings\D1P9121917-sht-PDP063.dgn

Default

DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
2. THE PROPOSED INLETS AND CATCH BASINS ARE SHOWN AS CONCEPTUAL. ACTUAL INLET SPACING WILL BE CONDUCTED AS PART OF THE PHASE II DESIGN. INLET SPACING SHALL BE BASED ON A 10-YEAR DESIGN AND SPREAD WILL BE LIMITED TO THE SHOULDER.
3. DITCH DESIGN SHALL BE COMPLETED AS PART OF THE PHASE II DESIGN. DITCHES SHALL BE AT LEAST 3-FT DEEP AND BE SIZED FOR THE 50-YEAR DESIGN. DITCHES SHALL PROVIDE 1-FT OF FREEBOARD BETWEEN THE 50-YEAR WATER SURFACE ELEVATION AT THE EDGE OF SHOULDER.
4. ALL PROPOSED STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP), UNLESS OTHERWISE NOTED.
5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2-00A.65

	1115+00	1116+00	1117+00	1118+00	1119+00	1120+00	1121+00	1122+00	1123+00	1124+00	1125+00	1126+00	1127+00	1128+00	1129+00	1130+00
EX PGL	597.95	612.89	613.74	615.15	616.95	618.38	620.35	621.50	622.73	623.78	624.91	626.01	627.44	601.74	620.53	627.53
PR PGL	612.72	614.19	615.66	617.13	618.61	620.08	621.55	623.02	624.43	625.64	626.65	627.45	628.04	628.42	628.60	628.57

FILE NAME = V:\1786\active\178600037_IDOT_I-55_2Lanes\civil\drainage\drawings\D1P9121917-sht-PDP064.dgn

I-55 MANAGED LANE PROJECT

USER NAME = dbook
PLOT SCALE = 50.0000 ' / in.
PLOT DATE = 8/2/2019

DESIGNED - DJB
DRAWN - STANTEC
CHECKED - JVO
DATE - 8/2/2019

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
2 X 2 MANAGED LANES – PROPOSED DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	65

CONTRACT NO. $CONTRACT
ILLINOIS FED. AID PROJECT

Default

DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
2. THE PROPOSED INLETS AND CATCH BASINS ARE SHOWN AS CONCEPTUAL. ACTUAL INLET SPACING WILL BE CONDUCTED AS PART OF THE PHASE II DESIGN. INLET SPACING SHALL BE BASED ON A 10-YEAR DESIGN AND SPREAD WILL BE LIMITED TO THE SHOULDER.
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4. ALL PROPOSED STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP), UNLESS OTHERWISE NOTED.
5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2-00A.66

I-55 | MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -
	DRAWN - STANTEC	REVISED -
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -
PLOT DATE = 8/2/2019	DATE - 8/2/2019	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
2 X 2 MANAGED LANES - PROPOSED DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	66

CONTRACT NO. $CONTRACT

ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178600037_IDOT_I-55_2Lanes\civil\drainage\drawings\DIP91219\7-sht-PDP065.dgn

Default

DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
2. THE PROPOSED INLETS AND CATCH BASINS ARE SHOWN AS CONCEPTUAL. ACTUAL INLET SPACING WILL BE CONDUCTED AS PART OF THE PHASE II DESIGN. INLET SPACING SHALL BE BASED ON A 10-YEAR DESIGN AND SPREAD WILL BE LIMITED TO THE SHOULDER.
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4. ALL PROPOSED STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP), UNLESS OTHERWISE NOTED.
5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2-00A.67

FILE NAME = V:\1786\active\178620037_IDOT_I-55_2Lanes\civil\drainage\drawings\DIP91219\7-sht-PDP066.dgn

I-55 MANAGED LANE PROJECT

USER NAME = dbook
PLOT SCALE = 50.0000 ' / in.
PLOT DATE = 8/2/2019

DESIGNED - DJB
DRAWN - STANTEC
CHECKED - JVO
DATE - 8/2/2019

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
2 X 2 MANAGED LANES - PROPOSED DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	67

CONTRACT NO. $CONTRACT
ILLINOIS FED. AID PROJECT

Default

MH 80-2F
STA 1163+00, 8.0' LT
RIM = 602.40
15" INV = 597.05 (SE)
30" INV = 593.85 (SW)
30" INV = 593.85 (NE)

MH 80-2D (CONTROL STRUCTURE)
STA 1167+00, 0.0' LT
RIM = 598.85
15" INV = 593.40 (SE)
30" INV = 592.62
21" INV = 592.62
(15" DIA. ORIFICE PLATE)
(T/ WEIR ELEV. = 596.45)
(STORAGE PROVIDED = 3630 CF)

MH 80-2B
STA 1168+75, 8.0' LT
RIM = 597.80
15" INV = 592.45 (SE)
21" INV = 591.00 (SW)
21" INV = 591.00 (NE)

DS 80-2G
STA 1163+00, 0.0' LT
RIM = 602.25
15" INV = 597.25 (NW)

DS 80-2E
STA 1167+00, 0.0' LT
RIM = 593.60
15" INV = 593.60 (NW)

DS 80-2C
STA 1168+75, 0.0' LT
RIM = 597.65
15" INV = 592.65 (NW)

MH 80-2A
STA 1169+00, 0.0' LT
RIM = 597.55
21" INV = 590.78 (SW)
21" INV = 590.78 (NE)

DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
2. THE PROPOSED INLETS AND CATCH BASINS ARE SHOWN AS CONCEPTUAL. ACTUAL INLET SPACING WILL BE CONDUCTED AS PART OF THE PHASE II DESIGN. INLET SPACING SHALL BE BASED ON A 10-YEAR DESIGN AND SPREAD WILL BE LIMITED TO THE SHOULDER.
3. DITCH DESIGN SHALL BE COMPLETED AS PART OF THE PHASE II DESIGN. DITCHES SHALL BE AT LEAST 3-FT DEEP AND BE SIZED FOR THE 50-YEAR DESIGN. DITCHES SHALL PROVIDE 1-FT OF FREEBOARD BETWEEN THE 50-YEAR WATER SURFACE ELEVATION AT THE EDGE OF SHOULDER.
4. ALL PROPOSED STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP), UNLESS OTHERWISE NOTED.
5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2-00A.68

	1160+00	1161+00	1162+00	1163+00	1164+00	1165+00	1166+00	1167+00	1168+00	1169+00	1170+00	1171+00	1172+00	1173+00	1174+00	1175+00
EX PGL	603.76	603.20	602.25	601.45	600.70	600.00	599.23	598.17	597.20	596.32	596.38	599.25	594.82	594.12	592.98	591.39
PR PGL	605.68	604.88	604.08	603.28	602.48	601.68	600.88	600.09	599.29	598.49	597.69	596.89	596.09	595.29	594.49	593.70

I-55 | MANAGED LANE PROJECT

USER NAME = dbook	DESIGNED - DJB	REVISED -	
	DRAWN - STANTEC	REVISED -	
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -	
PLOT DATE = 8/2/2019	DATE - 8/2/2019	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
2 X 2 MANAGED LANES - PROPOSED DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	68

CONTRACT NO. $CONTRACT

ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178600037_IDOT_I-55_2Lanes\civil\drainage\drawings\DIP9121917-sht-PDP067.dgn

Default

OUTLET #81 (FROM PUMP STATION #30) DISCHARGES TO THE CHICAGO SANITARY AND SHIP CANAL AND IS CONSIDERED TO BE A SUITABLE OUTLET.

STORM SEWER TRIBUTARY TO PUMP STATION 30 (APPROX. STATION 1175+25 TO STATION 1210+13):

PUMP STATION 30 OPERATION IS PROPOSED TO BE UPDATED TO UTILIZE THREE (3) MAIN PUMPS WITH A DEDICATED STANDBY PUMP. THE LOW FLOW PUMP REMAINS UNCHANGED. THE INSTALLATION OF A PARALLEL STORM SEWER IN THE SOUTHERN ROW ALLOWS THE STORAGE AND PUMPING SYSTEM TO PROVIDE THE I-55 SUBWAY WITH THE 50-YR FREEBOARD AND 100-YR EDGE OF PAVEMENT PROTECTION REQUIREMENTS USING BULLETIN 70 RAINFALL DATA. THE DISCHARGE TO THE 54" OUTLET PIPE WITH LIMITED CAPACITY IS ALSO REDUCED. THE PROPOSED STORM SEWER AND DRAINAGE STRUCTURES SHALL BE DESIGNED TO CONNECT TO THE EXISTING STORM SEWER NETWORK AND PROPOSED INTAKE PIPE. CONCEPTUAL DRAINAGE LAYOUT IS PROVIDED AND FINAL DESIGN TO BE PREPARED IN PHASE II. ALSO, AN APPENDIX TO THE PUMP STATION HR WILL BE PROVIDED UTILIZING BULLETIN 75 RAINFALL DATA AND THE DETAILS DESIGN TO BE PERFORMED IN PHASE II. BY UTILIZING THE PROPOSED ALTERNATIVE RECOMMENDED IN THE APPENDIX, THE 50-YR AND 100-YR EDGE OF PAVEMENT PROTECTION REQUIREMENTS ARE ALSO MET USING BULLETIN 75 RAINFALL DATA.

STORM SEWER TRIBUTARY TO EXISTING PUMP STATION DISCHARGE PIPE:
(APPROX. STATION 1211+00 TO STATION 1225+60)

RATE CONTROL AND STORMWATER DETENTION IS REQUIRED FOR PROPOSED STORM SEWER DISCHARGING TO THE 54"Ø PUMP STATION OUTLET PIPE.

<u>DRAINAGE NOTES:</u>

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
2. THE PROPOSED INLETS AND CATCH BASINS ARE SHOWN AS CONCEPTUAL. ACTUAL INLET SPACING WILL BE CONDUCTED AS PART OF THE PHASE II DESIGN. INLET SPACING SHALL BE BASED ON A 10-YEAR DESIGN AND SPREAD WILL BE LIMITED TO THE SHOULDER.
3. DITCH DESIGN SHALL BE COMPLETED AS PART OF THE PHASE II DESIGN. DITCHES SHALL BE AT LEAST 3-FT DEEP AND BE SIZED FOR THE 50-YEAR DESIGN. DITCHES SHALL PROVIDE 1-FT OF FREEBOARD BETWEEN THE 50-YEAR WATER SURFACE ELEVATION AT THE EDGE OF SHOULDER.
4. ALL PROPOSED STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP), UNLESS OTHERWISE NOTED.
5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2-00A.69

NOTE: EXISTING MAIN DRAIN STORM SEWER IS SHOWN FOR REFERENCE

	1175+00	1176+00	1177+00	1178+00	1179+00	1180+00	1181+00	1182+00	1183+00	1184+00	1185+00	1186+00	1187+00	1188+00	1189+00	1190+00
EX PGL	591.39	590.83	590.34	589.69	588.74	587.69	587.45	586.44	585.55	584.53	583.90	583.58	582.95	581.53	580.99	580.00
PR PGL	593.70	592.90	592.10	591.30	590.50	589.70	588.90	588.11	587.31	586.51	585.71	584.91	584.11	583.31	582.51	581.72

FILE NAME = V:\1786\active\178620237_IDOT_I-55_2Lanes\civil\drainage\drawings\D1P9121917-sht-PDP068.dgn

I-55 MANAGED LANE PROJECT

USER NAME = dbook
PLOT SCALE = 50.0000 ' / in.
PLOT DATE = 3/22/2022

DESIGNED	- DJB	REVISED	-
DRAWN	- STANTEC	REVISED	-
CHECKED	- JVO	REVISED	-
DATE	- 3/22/2022	REVISED	-

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
2 X 2 MANAGED LANES - PROPOSED DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	69

CONTRACT NO. $CONTRACT

ILLINOIS FED. AID PROJECT

Default

OUTLET #81 (FROM PUMP STATION #30) DISCHARGES TO THE CHICAGO SANITARY AND SHIP CANAL AND IS CONSIDERED TO BE A SUITABLE OUTLET.

STORM SEWER TRIBUTARY TO PUMP STATION 30 (APPROX. STATION 1175+25 TO STATION 1210+13):

PUMP STATION 30 OPERATION IS PROPOSED TO BE UPDATED TO UTILIZE THREE (3) MAIN PUMPS WITH A DEDICATED STANDBY PUMP. THE LOW FLOW PUMP REMAINS UNCHANGED. THE INSTALLATION OF A PARALLEL STORM SEWER IN THE SOUTHERN ROW ALLOWS THE STORAGE AND PUMPING SYSTEM TO PROVIDE THE I-55 SUBWAY WITH THE 50-YR FREEBOARD AND 100-YR EDGE OF PAVEMENT PROTECTION REQUIREMENTS USING BULLETIN 70 RAINFALL DATA. THE DISCHARGE TO THE 54" OUTLET PIPE WITH LIMITED CAPACITY IS ALSO REDUCED. THE PROPOSED STORM SEWER AND DRAINAGE STRUCTURES SHALL BE DESIGNED TO CONNECT TO THE EXISTING STORM SEWER NETWORK AND PROPOSED INTAKE PIPE. CONCEPTUAL DRAINAGE LAYOUT IS PROVIDED AND FINAL DESIGN TO BE PREPARED IN PHASE II. ALSO, AN APPENDIX TO THE PUMP STATION HR WILL BE PROVIDED UTILIZING BULLETIN 75 RAINFALL DATA AND THE DETAILS DESIGN TO BE PERFORMED IN PHASE II. BY UTILIZING THE PROPOSED ALTERNATIVE RECOMMENDED IN THE APPENDIX, THE 50-YR AND 100-YR EDGE OF PAVEMENT PROTECTION REQUIREMENTS ARE ALSO MET USING BULLETIN 75 RAINFALL DATA.

STORM SEWER TRIBUTARY TO EXISTING PUMP STATION DISCHARGE PIPE:
(APPROX. STATION 1211+00 TO STATION 1225+60)

RATE CONTROL AND STORMWATER DETENTION IS REQUIRED FOR PROPOSED STORM SEWER DISCHARGING TO THE 54"Ø PUMP STATION OUTLET PIPE.

DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
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5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2-00A.70

NOTE: EXISTING MAIN DRAIN STORM SEWER IS SHOWN FOR REFERENCE

	1190+00	1191+00	1192+00	1193+00	1194+00	1195+00	1196+00	1197+00	1198+00	1199+00	1200+00	1201+00	1202+00	1203+00	1204+00	1205+00
EX PGL	580.00	578.93	578.10	577.60	577.21	576.83	577.70	577.45	578.64	579.73	600.75	581.90	583.47	584.64	585.66	585.53
PR PGL	581.72	580.92	580.12	579.32	578.68	578.44	578.60	579.17	580.14	581.31	582.49	583.67	584.84	586.02	587.19	588.37

I-55 MANAGED LANE PROJECT

USER NAME = dbook
PLOT SCALE = 50.0000 ' / in.
PLOT DATE = 3/22/2022

DESIGNED - DJB
DRAWN - STANTEC
CHECKED - JVO
DATE - 3/22/2022

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
2 X 2 MANAGED LANES - PROPOSED DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	70

CONTRACT NO. $CONTRACT
ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178620037_IDOT_I-55_2Lanes\civil\drainage\drawings\DIP91219\7-sht-PDP069.dgn
Default

OUTLET #81 (FROM PUMP STATION #30) DISCHARGES TO THE CHICAGO SANITARY AND SHIP CANAL AND IS CONSIDERED TO BE A SUITABLE OUTLET.

STORM SEWER TRIBUTARY TO PUMP STATION 30 (APPROX. STATION 1175+25 TO STATION 1210+13):

PUMP STATION 30 OPERATION IS PROPOSED TO BE UPDATED TO UTILIZE THREE (3) MAIN PUMPS WITH A DEDICATED STANDBY PUMP. THE LOW FLOW PUMP REMAINS UNCHANGED. THE INSTALLATION OF A PARALLEL STORM SEWER IN THE SOUTHERN ROW ALLOWS THE STORAGE AND PUMPING SYSTEM TO PROVIDE THE I-55 SUBWAY WITH THE 50-YR FREEBOARD AND 100-YR EDGE OF PAVEMENT PROTECTION REQUIREMENTS USING BULLETIN 70 RAINFALL DATA. THE DISCHARGE TO THE 54" OUTLET PIPE WITH LIMITED CAPACITY IS ALSO REDUCED. THE PROPOSED STORM SEWER AND DRAINAGE STRUCTURES SHALL BE DESIGNED TO CONNECT TO THE EXISTING STORM SEWER NETWORK AND PROPOSED INTAKE PIPE. CONCEPTUAL DRAINAGE LAYOUT IS PROVIDED AND FINAL DESIGN TO BE PREPARED IN PHASE II. ALSO, AN APPENDIX TO THE PUMP STATION HR WILL BE PROVIDED UTILIZING BULLETIN 75 RAINFALL DATA AND THE DETAILS DESIGN TO BE PERFORMED IN PHASE II. BY UTILIZING THE PROPOSED ALTERNATIVE RECOMMENDED IN THE APPENDIX, THE 50-YR AND 100-YR EDGE OF PAVEMENT PROTECTION REQUIREMENTS ARE ALSO MET USING BULLETIN 75 RAINFALL DATA.

STORM SEWER TRIBUTARY TO EXISTING PUMP STATION DISCHARGE PIPE:
(APPROX. STATION 1211+00 TO STATION 1225+60)

RATE CONTROL AND STORMWATER DETENTION IS REQUIRED FOR PROPOSED STORM SEWER DISCHARGING TO THE 54"Ø PUMP STATION OUTLET PIPE.

DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
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5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2–00A.71

I·55 MANAGED LANE PROJECT

USER NAME = dbook
PLOT SCALE = 50.0000 ' / in.
PLOT DATE = 3/22/2022

DESIGNED - DJB
DRAWN - STANTEC
CHECKED - JVO
DATE - 3/22/2022

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I–55 MANAGED LANE STUDY
2 X 2 MANAGED LANES – PROPOSED DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	71

CONTRACT NO. $CONTRACT
ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178600037_IDOT_I-55_2Lanes\civil\drainage\drawings\D1P9121917-sht-PDP070.dgn
Default

OUTLET #81 (FROM PUMP STATION #30) DISCHARGES TO THE CHICAGO SANITARY AND SHIP CANAL AND IS CONSIDERED TO BE A SUITABLE OUTLET.

STORM SEWER TRIBUTARY TO PUMP STATION 30 (APPROX. STATION 1175+25 TO STATION 1210+13):

PUMP STATION 30 OPERATION IS PROPOSED TO BE UPDATED TO UTILIZE THREE (3) MAIN PUMPS WITH A DEDICATED STANDBY PUMP. THE LOW FLOW PUMP REMAINS UNCHANGED. THE INSTALLATION OF A PARALLEL STORM SEWER IN THE SOUTHERN ROW ALLOWS THE STORAGE AND PUMPING SYSTEM TO PROVIDE THE I-55 SUBWAY WITH THE 50-YR FREEBOARD AND 100-YR EDGE OF PAVEMENT PROTECTION REQUIREMENTS USING BULLETIN 70 RAINFALL DATA. THE DISCHARGE TO THE 54" OUTLET PIPE WITH LIMITED CAPACITY IS ALSO REDUCED. THE PROPOSED STORM SEWER AND DRAINAGE STRUCTURES SHALL BE DESIGNED TO CONNECT TO THE EXISTING STORM SEWER NETWORK AND PROPOSED INTAKE PIPE. CONCEPTUAL DRAINAGE LAYOUT IS PROVIDED AND FINAL DESIGN TO BE PREPARED IN PHASE II. ALSO, AN APPENDIX TO THE PUMP STATION HR WILL BE PROVIDED UTILIZING BULLETIN 75 RAINFALL DATA AND THE DETAILS DESIGN TO BE PERFORMED IN PHASE II. BY UTILIZING THE PROPOSED ALTERNATIVE RECOMMENDED IN THE APPENDIX, THE 50-YR AND 100-YR EDGE OF PAVEMENT PROTECTION REQUIREMENTS ARE ALSO MET USING BULLETIN 75 RAINFALL DATA.

STORM SEWER TRIBUTARY TO EXISTING PUMP STATION DISCHARGE PIPE:
(APPROX. STATION 1211+00 TO STATION 1225+60)

RATE CONTROL AND STORMWATER DETENTION IS REQUIRED FOR PROPOSED STORM SEWER DISCHARGING TO THE 54"Ø PUMP STATION OUTLET PIPE.

DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
2. THE PROPOSED INLETS AND CATCH BASINS ARE SHOWN AS CONCEPTUAL. ACTUAL INLET SPACING WILL BE CONDUCTED AS PART OF THE PHASE II DESIGN. INLET SPACING SHALL BE BASED ON A 10-YEAR DESIGN AND SPREAD WILL BE LIMITED TO THE SHOULDER.
3. DITCH DESIGN SHALL BE COMPLETED AS PART OF THE PHASE II DESIGN. DITCHES SHALL BE AT LEAST 3-FT DEEP AND BE SIZED FOR THE 50-YEAR DESIGN. DITCHES SHALL PROVIDE 1-FT OF FREEBOARD BETWEEN THE 50-YEAR WATER SURFACE ELEVATION AT THE EDGE OF SHOULDER.
4. ALL PROPOSED STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP), UNLESS OTHERWISE NOTED.
5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2-00A.72

	EX PGL	PR PGL
1220+00	603.40	606.02
1221+00	604.68	607.19
1222+00	606.57	608.37
1223+00	606.90	609.55
1224+00	608.01	610.72
1225+00	609.33	611.79
1226+00	610.33	612.58
1227+00	611.18	613.09
1228+00	603.49	613.32
1229+00	593.55	613.26
1230+00	611.56	612.93
1231+00	610.10	612.32
1232+00	609.23	611.43
1233+00	607.25	610.26
1234+00	605.76	608.83
1235+00	604.18	607.35

I-55 MANAGED LANE PROJECT

USER NAME = dbook
PLOT SCALE = 50.0000 ' / in.
PLOT DATE = 3/22/2022

DESIGNED - DJB
DRAWN - STANTEC
CHECKED - JVO
DATE - 3/22/2022

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
2 X 2 MANAGED LANES - PROPOSED DRAINAGE PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	72

CONTRACT NO. $CONTRACT
ILLINOIS FED. AID PROJECT

FILE NAME = V:\1786\active\178600037_IDOT_I-55_2Lanes\civil\drainage\drawings\D1P9121917-sht-PDP071.dgn

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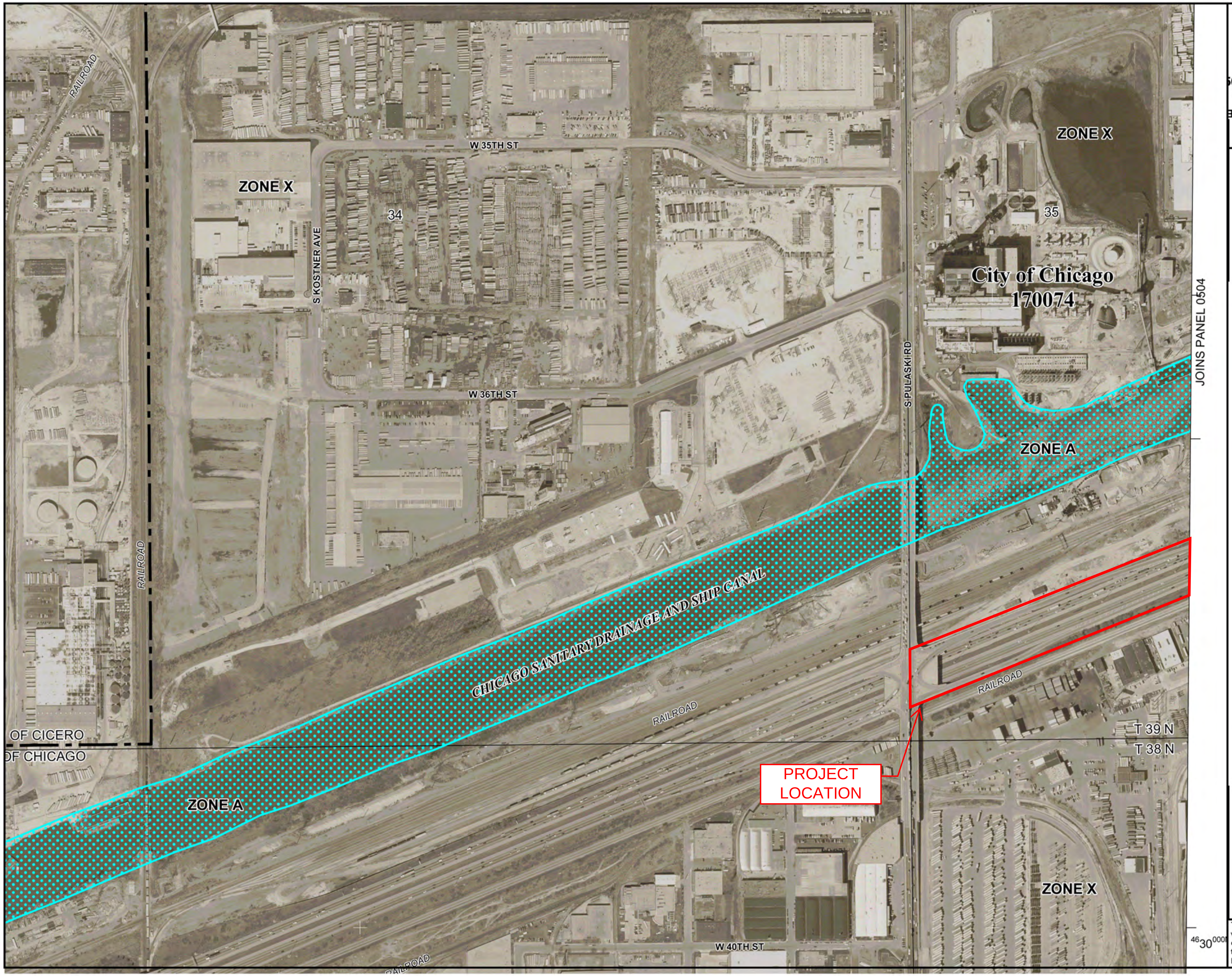
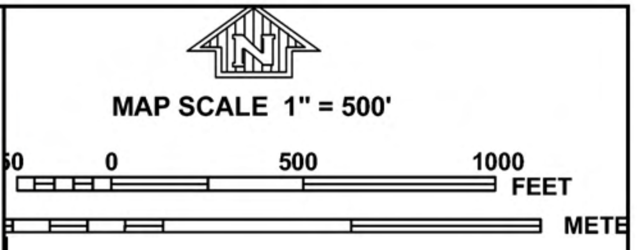
Section 8
Receiving Waterway Tailwater Analysis

1) Flood Insurance Rate Map (FIRM)
2) USACE CSSC Cross Section Location Map, HEC-RAS Output, and Flow Extrapolation
3) 54” Outflow Storm Sewer Manning’s Full Flow Capacity





NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 0503J

FIRM
FLOOD INSURANCE RATE MAP
COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

PANEL 503 OF 832

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CHICAGO, CITY OF	170074	0503	J
CICERO, TOWN OF	170077	0503	J
STICKNEY, VILLAGE OF	170164	0503	J

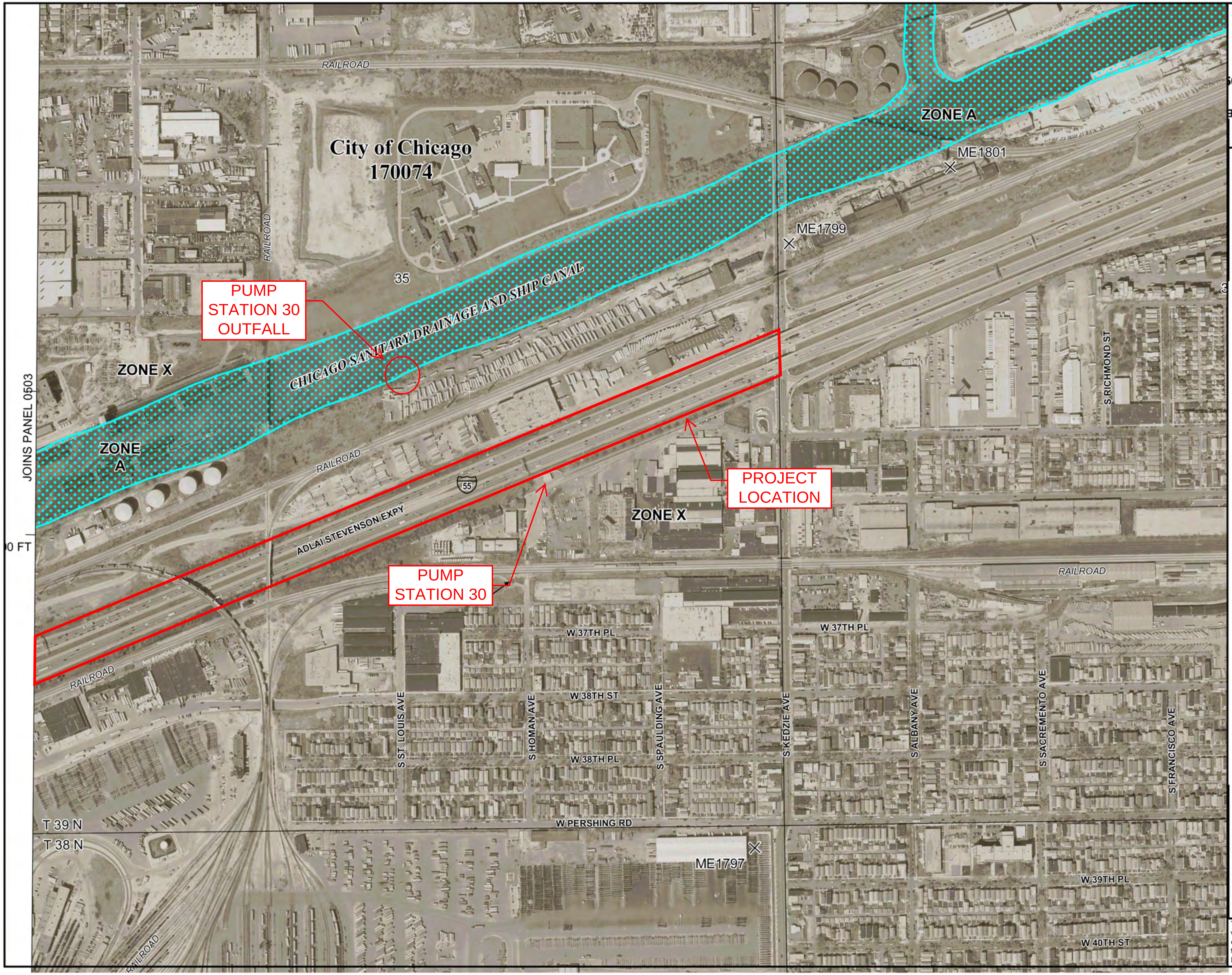
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
17031C0503J

MAP REVISED
AUGUST 19, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 500'

0 500 1000
FEET
METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0504J

FIRM
FLOOD INSURANCE RATE MAP

COOK COUNTY,
ILLINOIS
AND INCORPORATED AREAS

PANEL 504 OF 832

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CHICAGO, CITY OF	170074	0504	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
17031C0504J

MAP REVISED
AUGUST 19, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

B. USACE CSSC XS LOCATION MAP,
HEC-RAS EXCERPTS, AND
10-YEAR TAILWATER EXTRAPOLATION

DSGN.	DEV	CHKD.	

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT ILLINOIS DEPARTMENT OF TRANSPORTATION

PROJECT NO. 11-0203.00001

TITLE USACE HEC-RAS CROSS SECTION LOCATION MAP

DATE 09/14/15

EXHIBIT 8-1

USACE HEC-RAS

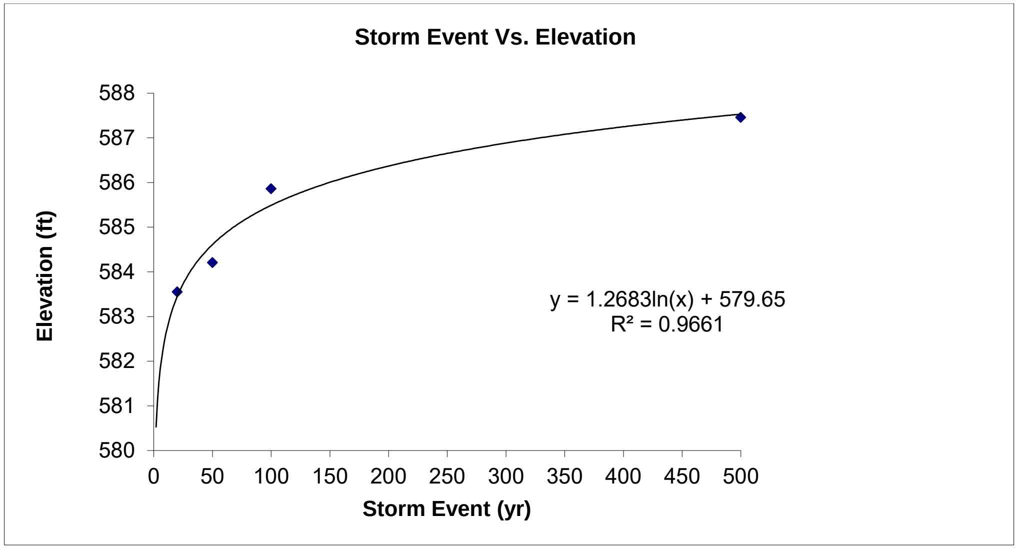
HEC-RAS Profile: Max WS

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	318.81	Max WS	500YR CRCW ON EX	889.19	558.82	587.46		587.46	0.000000	0.12	7265.18	354.87	0.00
2	318.81	Max WS	100YR CRCW ON EX	2359.58	558.82	585.87		585.87	0.000001	0.35	6702.66	349.49	0.01
2	318.81	Max WS	50YR CRCW ON EX	8204.96	558.82	584.20		584.23	0.000010	1.34	6126.97	343.74	0.06
2	318.81	Max WS	20YR CRCW ON EX	9142.26	558.82	583.55		583.59	0.000014	1.55	5902.46	341.48	0.07
2	318.85	Max WS	500YR CRCW ON EX	892.59	558.24	587.46		587.46	0.000000	0.13	7258.66	352.34	0.00
2	318.85	Max WS	100YR CRCW ON EX	2349.26	558.24	585.86		585.87	0.000001	0.36	6700.24	346.88	0.01
2	318.85	Max WS	50YR CRCW ON EX	8197.32	558.24	584.21		584.23	0.000009	1.36	6129.25	341.21	0.05
2	318.85	Max WS	20YR CRCW ON EX	9142.37	558.24	583.55		583.59	0.000013	1.58	5906.52	338.97	0.06
2	318.90	Max WS	500YR CRCW ON EX	889.30	557.37	587.46		587.46	0.000000	0.13	7061.99	346.18	0.00
2	318.90	Max WS	100YR CRCW ON EX	2359.77	557.37	585.86		585.87	0.000001	0.37	6514.01	339.76	0.01
2	318.90	Max WS	50YR CRCW ON EX	8205.36	557.37	584.21		584.24	0.000010	1.41	5955.82	333.09	0.06
2	318.90	Max WS	20YR CRCW ON EX	9127.61	557.37	583.55		583.59	0.000014	1.62	5738.54	330.46	0.07
2	318.94	Max WS	500YR CRCW ON EX	891.16	557.58	587.46		587.46	0.000000	0.13	7289.38	354.28	0.00
2	318.94	Max WS	100YR CRCW ON EX	2349.29	557.58	585.86		585.87	0.000001	0.36	6727.73	348.72	0.01
2	318.94	Max WS	50YR CRCW ON EX	8189.34	557.58	584.21		584.24	0.000009	1.36	6155.37	342.97	0.05
2	318.94	Max WS	20YR CRCW ON EX	9127.72	557.58	583.56		583.59	0.000013	1.57	5931.91	340.70	0.06
2	318.98	Max WS	500YR CRCW ON EX	891.30	557.71	587.46		587.46	0.000000	0.13	7014.68	334.74	0.00
2	318.98	Max WS	100YR CRCW ON EX	2370.57	557.71	585.86		585.87	0.000001	0.38	6484.12	329.26	0.01
2	318.98	Max WS	50YR CRCW ON EX	8205.71	557.71	584.21		584.24	0.000010	1.41	5943.93	323.58	0.06
2	318.98	Max WS	20YR CRCW ON EX	9113.22	557.71	583.56		583.60	0.000013	1.62	5733.14	321.33	0.07
2	319.02	Max WS	500YR CRCW ON EX	891.46	557.31	587.46		587.46	0.000000	0.13	7266.64	343.84	0.00
2	319.02	Max WS	100YR CRCW ON EX	2370.72	557.31	585.86		585.87	0.000001	0.36	6721.23	338.69	0.01
2	319.02	Max WS	50YR CRCW ON EX	8197.55	557.31	584.21		584.24	0.000009	1.35	6166.54	333.38	0.05
2	319.02	Max WS	20YR CRCW ON EX	9127.81	557.31	583.56		583.60	0.000013	1.56	5949.71	331.28	0.06
2	319.07	Max WS	500YR CRCW ON EX	893.74	557.42	587.46		587.46	0.000000	0.13	7206.45	348.18	0.00
2	319.07	Max WS	100YR CRCW ON EX	2360.09	557.42	585.86		585.87	0.000001	0.36	6655.38	341.41	0.01
2	319.07	Max WS	50YR CRCW ON EX	8197.63	557.42	584.21		584.24	0.000010	1.36	6098.16	334.42	0.06
2	319.07	Max WS	20YR CRCW ON EX	9127.88	557.42	583.56		583.60	0.000013	1.57	5880.98	331.66	0.06

50 YR = 584.21

100 YR = 585.86

Storm	USACE EL (ft)	Calculated EL (ft)
2		580.53
10		582.57
20	583.55	583.45
30		583.96
50	584.21	584.61
100	585.86	585.49
200		586.37
500	587.46	587.53



C. 54-INCH OUTFLOW STORM SEWER MANNING'S FULL FLOW CAPACITY

JOB NO. 11-0203.00001
PROJECT: IDOT I-55 PS30
DATE: 7-Jan-22

MANNING'S EQUATION

($Q = 1.486/n \times A \times R^{2/3} \times s^{1/2}$)

PIPE DIAMETER	=	54	in.
PIPE SLOPE, s	=	0.26	%
ROUGHNESS COEFF., n	=	0.013	
PIPE AREA, A	=	15.904	ft^2
WETTED PERIMETER, P	=	14.137	ft
HYDRAULIC RADIUS, R=A/P	=	1.125	ft
PIPE CAPACITY, Q	**=**	***100.27***	**cfs**
PIPE VELOCITY, V=Q/A	=	6.30	fps

N:\IDOT\110203.00001\Drain\Docs\Hydraulic Reports\Pump Station 30\Updated Pieces for Insert\[PS30 Outfall Pipe Mannings Eq.xls]Mannings

EMB
File: PS30 Outfall Pipe Mannings Eq.xls
Date Printed: 1/7/2022

Section 9
Hydrologic Analysis

A. XP-SWMM Subcatchment Input Parameters – Existing

B. Curve Number (CN) Calculation Sheets - Existing

C. Time of Concentration (Tc) Calculation Sheets – Existing

D. XP-SWMM Subcatchment Input Parameters – Proposed

E. Curve Number (CN) Calculation Sheets - Proposed

F. Bulletin 70 Rainfall Depths

G. PS 30 Subbasin Map

A. XP-SWMM
SUBCATCHMENT
INPUT PARAMETERS
- EXISTING

Hydro

EXISTING DISCONNECT
KINEMATIC UPSIZE PIPE

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration min	Node X	Node Y	Ponding Type	Area ac
N839	100-30min	1	98.000	6.000	1150664.639	1878961.327	Sealed	0.400
N839		2	98.000	6.000				0.500
N840	100-30min	1	94.000	6.000	1150692.188	1878894.831	Sealed	1.000
N840		2	98.000	6.000				0.400
N840		3	98.000	6.000				0.500
N840		4	92.000	5.000				0.500
N840		5	82.000	24.000				0.700
N841	100-30min	1	94.000	6.000	1150705.333	1878869.766	Sealed	1.000
N841		2	98.000	6.000				0.400
N841		3	98.000	6.000				0.500
N841		4	92.000	5.000				0.500
N841		5	82.000	24.000				0.700
N842	100-30min		0.000	0.000	1150889.586	1878948.893	Sealed	0.000
N843	100-30min	1	91.000	5.400	1151164.163	1879068.041	Sealed	1.100
N843		2	94.000	6.000				0.600
N843		3	98.000	6.000				0.300
N843		4	93.000	5.400				0.500
N843		5	84.000	5.000				1.000
N844	100-30min	1	98.000	5.000	1151529.952	1879221.882	Sealed	0.300
N844		2	86.000	35.400				0.500
N844		3	98.000	5.000				0.900
N844		4	92.000	5.000				0.400
N844		5	77.000	6.000				0.700
N845	100-30min	1	91.000	5.000	1151884.895	1879374.485	Sealed	0.800
N845		2	94.000	5.400				1.200
N845		3	77.000	13.200				0.700
N845		4	98.000	5.000				0.500
N846	100-30min	1	91.000	16.800	1152265.271	1879539.522	Sealed	0.900
N846		2	92.000	32.000				1.700
N846		3	98.000	5.000				0.400
N847	100-30min	1	90.000	9.000	1152505.479	1879638.431	Sealed	0.500
N847		2	92.000	12.600				0.400
N847		3	95.000	44.000				1.700
N847		4	81.000	17.400				1.400
N847		5	98.000	5.000				0.400

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of min Concentration	Node X	Node Y	Ponding Type	Area ac
N848	100-30min		0.000	0.000	1152748.513	1879748.644	Sealed	0.000
N849	100-30min		0.000	0.000	1153136.236	1879914.246	Sealed	0.000
N850	100-30min	1	95.000	5.000	1153445.387	1880047.175	Sealed	1.100
N850		2	95.000	11.000				1.400
N850		3	82.000	17.400				1.200
N851	100-30min	1	91.000	9.000	1153909.988	1880245.450	Sealed	0.600
WET WELL	100-30min		0.000	0.000	1154384.187	1880324.577	Sealed	0.000
N853	100-30min	1	92.000	5.000	1150721.380	1878806.630	Sealed	0.500
N853		2	82.000	24.000				0.700
N854	100-30min	1	84.000	5.000	1151177.027	1878974.081	Sealed	1.000
N855	100-30min	1	93.000	5.400	1151167.812	1879007.950	Sealed	0.500
N856	100-30min	1	94.000	6.000	1151124.272	1879158.722	Sealed	0.600
N856		2	98.000	6.000				0.300
N857	100-30min	1	91.000	5.400	1151150.210	1879092.779	Sealed	1.100
N857		2	94.000	6.000				0.600
N857		3	98.000	6.000				0.300
N857		4	93.000	5.400				0.500
N857		5	84.000	5.000				1.000
N858	100-30min	1	77.000	6.000	1151563.649	1879152.161	Sealed	0.700
N858		2	98.000	5.000				0.600
N859	100-30min		0.000	0.000	1151473.771	1879306.435	Sealed	0.000
N860	100-30min	1	98.000	5.000	1151515.975	1879246.207	Sealed	0.300
N860		2	86.000	35.400				0.500
N860		3	98.000	5.000				0.900
N860		4	92.000	5.000				0.400
N860		5	77.000	6.000				0.700
N861	100-30min	1	94.000	5.400	1151839.535	1879476.128	Sealed	1.200
N862	100-30min	1	91.000	5.000	1151875.145	1879395.678	Sealed	0.800
N862		2	94.000	5.400				1.200
N862		3	77.000	13.200				0.700
N862		4	98.000	5.000				0.500
N863	100-30min	1	77.000	13.200	1151912.952	1879305.116	Sealed	0.700
N863		2	98.000	5.000				0.500
N864	100-30min	1	92.000	32.000	1152224.643	1879632.194	Sealed	1.700
N865	100-30min	1	91.000	16.800	1152260.252	1879560.536	Sealed	0.900

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration min	Node X	Node Y	Ponding Type	Area ac
N865		2	92.000	32.000				1.700
N865		3	98.000	5.000				0.400
N866	100-30min	1	98.000	5.000	1152295.422	1879477.887	Sealed	0.400
N867	100-30min	1	95.000	44.000	1152469.512	1879737.263	Sealed	1.700
SAG	100-30min	1	90.000	9.000	1152501.165	1879666.924	Sealed	0.500
SAG		2	92.000	12.600				0.400
SAG		3	95.000	44.000				1.700
SAG		4	81.000	17.400				1.400
SAG		5	98.000	5.000				0.400
N869	100-30min	1	81.000	17.400	1152535.894	1879584.275	Sealed	1.400
N869		2	98.000	5.000				0.300
N869		3	98.000	6.000				0.100
N869		4	83.000	5.000				0.500
N870	100-30min	1	90.000	7.800	1152993.540	1879852.444	Sealed	0.900
N870		2	92.000	5.000				2.100
N870		3	82.000	7.200				1.200
N871	100-30min	1	82.000	7.200	1153016.840	1879793.095	Sealed	1.200
N872	100-30min	1	82.000	17.400	1153426.331	1879968.177	Sealed	1.200
N873	100-30min	1	93.000	10.000	1153692.259	1880261.565	Sealed	1.400
N874	100-30min	1	95.000	11.000	1153423.440	1880147.496	Sealed	1.400
N875	100-30min	1	95.000	5.000	1153452.421	1880074.005	Sealed	1.100
N875		2	95.000	11.000				1.400
N875		3	82.000	17.400				1.200
N876	100-30min	1	91.000	9.000	1153954.575	1880292.911	Sealed	0.600
N877	100-30min		0.000	0.000	1153903.315	1880266.317	Sealed	0.000
N878	100-30min		0.000	0.000	1154431.984	1880347.094	Sealed	0.000
N879	100-30min		0.000	0.000	1154374.609	1880455.568	Sealed	0.000
OUT1	100-30min		0.000	0.000	1153628.646	1880862.506	Sealed	0.000
N881	100-30min	1	98.000	5.000	1155302.250	1880965.100	Sealed	0.400
N882	100-30min	1	98.000	5.000	1155328.797	1880886.547	Sealed	0.200
N882		2	88.000	16.200				0.400
N883	100-30min	1	98.000	5.000	1155114.108	1880801.359	Sealed	0.100
N884	100-30min		0.000	0.000	1155100.256	1880755.625	Sealed	0.000
N886	100-30min		0.000	0.000	1154741.155	1880604.503	Sealed	0.000
N888	100-30min		0.000	0.000	1154433.439	1880469.677	Sealed	0.000

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of min Concentration	Node X	Node Y	Ponding Type	Area ac
N889	100-30min		0.000	0.000	1154398.368	1880454.692	Sealed	0.000
N890	100-30min	1	98.000	5.000	1155368.587	1880807.484	Sealed	0.200
N891	100-30min	1	98.000	5.000	1154852.531	1880763.812	Sealed	0.300
N892	100-30min	1	98.000	5.000	1154877.923	1880697.810	Sealed	0.100
N893	100-30min	1	98.000	5.000	1154626.750	1880667.555	Sealed	0.200
N894	100-30min	1	98.000	5.000	1154648.828	1880600.464	Sealed	0.200
N895	100-30min	1	81.000	22.200	1154786.707	1880519.630	Sealed	0.700
N895		2	75.000	9.000				0.300
N895		3	78.000	20.400				0.700
N896	100-30min	1	98.000	5.000	1154691.865	1880519.153	Sealed	0.200
N897	100-30min	1	98.000	5.000	1154914.107	1880612.348	Sealed	0.300
N898	100-30min	1	98.000	5.000	1154393.069	1880567.728	Sealed	0.300
N899	100-30min	1	98.000	5.000	1154422.292	1880507.599	Sealed	0.100
N900	100-30min	1	85.000	6.600	1154739.357	1880625.563	Sealed	0.500
N901	100-30min	1	85.000	8.400	1155105.993	1880782.597	Sealed	0.300
N902	100-30min	1	86.000	5.000	1154237.028	1880325.665	Sealed	0.600
N903	100-30min	1	86.000	5.000	1154219.065	1880408.992	Sealed	0.200
N904	100-30min	1	92.000	5.000	1154191.123	1880474.855	Sealed	0.400
N905	100-30min	1	98.000	5.000	1154212.579	1880418.472	Sealed	0.100
N906	100-30min		0.000	0.000	1154023.140	1880432.946	Sealed	0.000
N907	100-30min	1	92.000	29.000	1154028.550	1880412.049	Sealed	0.800
N908	100-30min	1	92.000	5.000	1152996.089	1879958.166	Sealed	2.100
N909	100-30min	1	90.000	7.800	1153012.432	1879886.108	Sealed	0.900
N909		2	92.000	5.000				2.100
N909		3	82.000	7.200				1.200
N910	100-30min	1	92.000	9.600	1152688.126	1879721.636	Sealed	0.800
N910		2	93.000	43.000				3.000
N910		3	87.000	13.200				0.900
N910		4	83.000	5.000				0.500
N911	100-30min	1	92.000	9.600	1152677.462	1879741.186	Sealed	0.800
N911		2	93.000	43.000				3.000
N911		3	87.000	13.200				0.900
N911		4	83.000	5.000				0.500
N913	100-30min	1	98.000	5.000	1151411.913	1879282.480	Sealed	0.300
N913		2	92.000	5.000				0.400

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration min	Node X	Node Y	Ponding Type	Area ac
N914	100-30min	1	89.000	45.000	1149836.717	1878613.265	Sealed	12.900
N915	100-30min		0.000	0.000	1150164.921	1878661.114	Sealed	0.000
N916	100-30min		0.000	0.000	1150308.759	1878714.482	Sealed	0.000
OUT2	100-30min		0.000	0.000	1150302.557	1879092.930	Sealed	0.000
N918	100-30min	1	91.000	45.000	1149708.861	1878464.850	Sealed	8.000
N919	100-30min	1	86.000	45.000	1150054.180	1878455.808	Sealed	13.400
N920	100-30min		0.000	0.000	1150136.386	1878733.269	Sealed	0.000
N921	100-30min	1	93.000	10.000	1153829.408	1880212.313	Sealed	1.400
N921		2	83.000	5.000				1.300
N922	100-30min	1	83.000	5.000	1153856.729	1880147.888	Sealed	1.300
N923	100-30min	1	93.000	43.000	1152558.247	1879771.162	Sealed	3.000
N924	100-30min	1	87.000	13.200	1152717.730	1879674.245	Sealed	0.900
N925	100-30min	1	90.000	7.800	1154617.457	1880691.227	Sealed	0.400
N925		2	93.000	14.000				1.900
N925		3	87.000	13.200				0.700
N926	100-30min	1	86.000	5.400	1154397.416	1880477.100	Sealed	0.500
N928	100-30min	1	98.000	5.000	1155089.448	1880868.249	Sealed	0.300
N929	100-30min	1	98.000	5.000	1155163.660	1880723.150	Sealed	0.200
N931	100-30min		0.000	0.000	1154323.410	1880558.467	Sealed	0.000
N932	100-30min		0.000	0.000	1153806.544	1880339.073	Sealed	0.000
N933	100-30min		0.000	0.000	1154841.187	1880684.971	Sealed	0.000
N934	100-30min		0.000	0.000	1154358.694	1880242.090	Sealed	0.000
N935	100-30min		0.000	0.000	1153689.329	1880692.785	Sealed	0.000

Hydro

EXISTING
DYNAMIC

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration min	Node X	Node Y	Area ac
N878	100-30min		0.000	0.000	1154432.373	1880347.694	0.000
N839	100-30min	1	98.000	6.000	1150664.639	1878961.327	0.400
N839		2	98.000	6.000			0.500
N840	100-30min	1	94.000	6.000	1150692.188	1878894.831	1.000
N841	100-30min		0.000	0.000	1150705.333	1878869.766	0.000
N842	100-30min		0.000	0.000	1150889.586	1878948.893	0.000
N843	100-30min		0.000	0.000	1151164.163	1879068.041	0.000
N844	100-30min		0.000	0.000	1151529.952	1879221.882	0.000
N845	100-30min		0.000	0.000	1151884.895	1879374.485	0.000
N846	100-30min		0.000	0.000	1152265.271	1879539.522	0.000
N847	100-30min		0.000	0.000	1152505.479	1879638.431	0.000
N848	100-30min		0.000	0.000	1152748.513	1879748.644	0.000
N849	100-30min		0.000	0.000	1153136.236	1879914.246	0.000
N850	100-30min		0.000	0.000	1153445.387	1880047.175	0.000
N851	100-30min		0.000	0.000	1153909.988	1880245.450	0.000
WET WELL	100-30min		0.000	0.000	1154384.187	1880324.577	0.000
N853	100-30min	1	92.000	5.000	1150721.380	1878806.630	0.500
N853		2	82.000	24.000			0.700
N854	100-30min	1	84.000	5.000	1151177.027	1878974.081	1.000
N855	100-30min	1	93.000	5.400	1151167.812	1879007.950	0.500
N856	100-30min	1	94.000	6.000	1151124.272	1879158.722	0.600
N856		2	98.000	6.000			0.300
N857	100-30min	1	91.000	5.400	1151150.210	1879092.779	1.100
N858	100-30min	1	77.000	6.000	1151563.649	1879152.161	0.700
N858		2	98.000	5.000			0.600
N859	100-30min		0.000	0.000	1151473.771	1879306.435	0.000
N860	100-30min	1	98.000	5.000	1151515.975	1879246.207	0.300
N860		2	86.000	35.400			0.500
N861	100-30min	1	94.000	5.400	1151839.535	1879476.128	1.200
N862	100-30min	1	91.000	5.000	1151875.145	1879395.678	0.800
N863	100-30min	1	77.000	13.200	1151912.952	1879305.116	0.700
N863		2	98.000	5.000			0.500
N864	100-30min	1	92.000	32.000	1152224.643	1879632.194	1.700
N865	100-30min	1	91.000	16.800	1152260.252	1879560.536	0.900
N866	100-30min	1	98.000	5.000	1152295.422	1879477.887	0.400

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of min Concentration	Node X	Node Y	Area ac
N867	100-30min	1	95.000	44.000	1152469.512	1879737.263	1.700
SAG	100-30min	1	90.000	9.000	1152501.165	1879666.924	0.500
SAG		2	92.000	12.600			0.400
N869	100-30min	1	81.000	17.400	1152535.894	1879584.275	1.400
N869		2	98.000	5.000			0.300
N869		3	98.000	6.000			0.100
N869		4	83.000	5.000			0.500
N870	100-30min		0.000	0.000	1152993.540	1879852.444	0.000
N871	100-30min	1	82.000	7.200	1153016.840	1879793.095	1.200
N872	100-30min	1	82.000	17.400	1153426.331	1879968.177	1.200
N873	100-30min	1	93.000	10.000	1153692.259	1880261.565	1.400
N874	100-30min	1	95.000	11.000	1153423.440	1880147.496	1.400
N875	100-30min	1	95.000	5.000	1153452.421	1880074.005	1.100
N876	100-30min	1	91.000	9.000	1153954.575	1880292.911	0.600
N877	100-30min		0.000	0.000	1153903.315	1880266.317	0.000
N879	100-30min		0.000	0.000	1154374.999	1880456.168	0.000
OUT1	100-30min		0.000	0.000	1153628.646	1880864.654	0.000
N881	100-30min	1	98.000	5.000	1155302.250	1880965.100	0.400
N882	100-30min	1	98.000	5.000	1155328.797	1880886.547	0.200
N882		2	88.000	16.200			0.400
N883	100-30min	1	98.000	5.000	1155114.108	1880801.359	0.100
N884	100-30min		0.000	0.000	1155100.256	1880755.625	0.000
N886	100-30min		0.000	0.000	1154741.155	1880604.503	0.000
N888	100-30min		0.000	0.000	1154433.439	1880469.677	0.000
N889	100-30min		0.000	0.000	1154398.368	1880454.692	0.000
N890	100-30min	1	98.000	5.000	1155368.587	1880807.484	0.200
N891	100-30min	1	98.000	5.000	1154852.531	1880763.812	0.300
N892	100-30min	1	98.000	5.000	1154877.923	1880697.810	0.100
N893	100-30min	1	98.000	5.000	1154626.750	1880667.555	0.200
N894	100-30min	1	98.000	5.000	1154648.828	1880600.464	0.200
N895	100-30min	1	81.000	22.200	1154786.707	1880519.630	0.700
N895		2	75.000	9.000			0.300
N895		3	78.000	20.400			0.700
N896	100-30min	1	98.000	5.000	1154691.865	1880519.153	0.200
N897	100-30min	1	98.000	5.000	1154914.107	1880612.348	0.300

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of min Concentration	Node X	Node Y	Area ac
N898	100-30min	1	98.000	5.000	1154393.069	1880567.728	0.300
N899	100-30min	1	98.000	5.000	1154422.292	1880507.599	0.100
N900	100-30min	1	85.000	6.600	1154739.357	1880625.563	0.500
N901	100-30min	1	85.000	8.400	1155105.993	1880782.597	0.300
N902	100-30min	1	86.000	5.000	1154237.028	1880325.665	0.600
N903	100-30min	1	86.000	5.000	1154219.065	1880408.992	0.200
N904	100-30min	1	92.000	5.000	1154191.123	1880474.855	0.400
N905	100-30min	1	98.000	5.000	1154212.579	1880418.472	0.100
N906	100-30min		0.000	0.000	1154023.140	1880432.946	0.000
N907	100-30min	1	92.000	29.000	1154028.550	1880412.049	0.800
N908	100-30min	1	92.000	5.000	1152996.089	1879958.166	2.100
N909	100-30min	1	90.000	7.800	1153012.432	1879886.108	0.900
N910	100-30min		0.000	0.000	1152688.126	1879721.636	0.000
N911	100-30min	1	92.000	9.600	1152677.462	1879741.186	0.800
N913	100-30min	1	98.000	5.000	1151411.913	1879282.480	0.300
N913		2	92.000	5.000			0.400
N914	100-30min	1	89.000	45.000	1149836.717	1878613.265	12.900
N915	100-30min		0.000	0.000	1150164.921	1878661.114	0.000
N916	100-30min		0.000	0.000	1150308.759	1878714.482	0.000
OUT2	100-30min		0.000	0.000	1150302.557	1879092.930	0.000
N918	100-30min	1	91.000	45.000	1149708.861	1878464.850	8.000
N919	100-30min	1	86.000	45.000	1150054.180	1878455.808	13.400
N920	100-30min		0.000	0.000	1150136.386	1878733.269	0.000
N921	100-30min		0.000	0.000	1153829.408	1880212.313	0.000
N922	100-30min	1	83.000	5.000	1153856.729	1880147.888	1.300
N923	100-30min	1	93.000	43.000	1152558.247	1879771.162	3.000
N924	100-30min	1	87.000	13.200	1152717.730	1879674.245	0.900
N925	100-30min	1	90.000	7.800	1154617.457	1880691.227	0.400
N925		2	93.000	14.000			1.900
N925		3	87.000	13.200			0.700
N926	100-30min	1	86.000	5.400	1154397.416	1880477.100	0.500
N928	100-30min	1	98.000	5.000	1155089.448	1880868.249	0.300
N929	100-30min	1	98.000	5.000	1155163.660	1880723.150	0.200
N931	100-30min		0.000	0.000	1154323.410	1880558.467	0.000
N932	100-30min		0.000	0.000	1153806.544	1880339.073	0.000

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration min	Node X	Node Y	Area ac
N933	100-30min		0.000	0.000	1154841.187	1880684.971	0.000
N934	100-30min		0.000	0.000	1153692.520	1880677.069	0.000

B. CURVE NUMBER (CN) CALCULATION SHEETS - EXISTING

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 2
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N839

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.4	39.2
C	Pervious (grass)	74			0	0
				Totals =	0.4	39.2

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{39.2}{0.4} = \underline{98}$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001
Location: subbasin 3
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

By: AMP Date: 2/21/2014
Checked: DEV Date: 2/21/2014

Circle One: [✓ EXISTING] PROPOSED Description: N840

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.84	82.32
C	Pervious (grass)	74			0.16	11.84
				Totals =	1	94.16

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{94.16}{1} = 94.16$

Use CN = **94**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 4
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N853

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.38	37.24
C	Pervious (grass)	74			0.12	8.88
				Totals =	0.5	46.12

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{46.12}{0.5} = \underline{92.24}$$

Use CN = **92**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 5
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N853

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.24	23.52
C	Pervious (grass)	74			0.46	34.04
				Totals =	0.7	57.56

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{57.56}{0.7} = \underline{82.229}$$

Use CN = **82**

Runoff Curve Number

Project: IDOT - 110203.00001
Location: subbasin 7
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

By: AMP Date: 2/21/2014
Checked: DEV Date: 2/21/2014

Circle One: [✓ EXISTING] PROPOSED

Description: N856

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.5	49
C	Pervious (grass)	74			0.1	7.4
				Totals =	0.6	56.4

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{56.4}{0.6} = 94$$

Use CN = **94**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]

Location: subbasin 7A

File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

By: AMP Date: 2/21/2014

Checked: DEV Date: 2/21/2014

Circle One: [✓ EXISTING] PROPOSED

Description: N839

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.5	49
C	Pervious (grass)	74			0	0
				Totals =	0.5	49

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{49}{0.5} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 8
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N856

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.3	29.4
C	Pervious (grass)	74			0	0
					Totals = 0.3	29.4

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{29.4}{0.3} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 9
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N857

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.8	78.4
C	Pervious (grass)	74			0.3	22.2
				Totals =	1.1	100.6

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{100.6}{1.1} = 91.455$$

Use CN = **91**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 10
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N855

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.4	39.2
C	Pervious (grass)	74			0.1	7.4
				Totals =	0.5	46.6

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{46.6}{0.5} = \underline{93.2}$$

Use CN = **93**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 11 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N854

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.4	39.2
C	Pervious (grass)	74			0.6	44.4
				Totals =	1	83.6

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = $\frac{83.6}{1}$ = 83.6

Use CN = **84**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 13
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N858

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.1	9.8
C	Pervious (grass)	74			0.6	44.4
				Totals =	0.7	54.2

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{54.2}{0.7} = \underline{77.429}$$

Use CN = **77**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 13A
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N863

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.1	9.8
C	Pervious (grass)	74			0.6	44.4
				Totals =	0.7	54.2

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{54.2}{0.7} = \underline{77.429}$$

Use CN = **77**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted] By: AMP Date: 2/21/2014
Location: subbasin 14 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N858

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.6	58.8
C	Pervious (grass)	74			0	0
				Totals =	0.6	58.8

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{58.8}{0.6} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001

By: AMP

Date: 2/21/2014

Location: subbasin 15

Checked: DEV

Date: 2/21/2014

File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED

Description: N860

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.3	29.4
C	Pervious (grass)	74			0	0
				Totals =	0.3	29.4

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{29.4}{0.3} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 16
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N860

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.25	24.5
C	Pervious (grass)	74			0.25	18.5
				Totals =	0.5	43

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{43}{0.5} = \underline{86}$$

Use CN = **86**

Runoff Curve Number

Project: IDOT - 110203.00001 [illegible]
By: AMP
Date: 2/21/2014
Location: subbasin 17
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N913

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.3	29.4
C	Pervious (grass)	74			0	0
				Totals =	0.3	29.4

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{29.4}{0.3} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001

By: AMP

Date: 2/21/2014

Location: subbasin 18

Checked: DEV

Date: 2/21/2014

File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED

Description: N913

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.3	29.4
C	Pervious (grass)	74			0.1	7.4
				Totals =	0.4	36.8

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{36.8}{0.4} = \underline{92}$$

Use CN = **92**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 19
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N861

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			1	98
C	Pervious (grass)	74			0.2	14.8
				Totals =	1.2	112.8

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{112.8}{1.2} = \underline{94}$$

Use CN = **94**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 21
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N862

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.55	53.9
C	Pervious (grass)	74			0.25	18.5
				Totals =	0.8	72.4

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{72.4}{0.8} = \underline{90.5}$$

Use CN = **91**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted] By: AMP Date: 2/21/2014
Location: subbasin 23 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N863

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number Table 2-2	Curve Number Fig. 2-3	Curve Number Fig. 2-4	Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
C	impervious (road)	98			0.5	49
C	Pervious (grass)	74			0	0
				Totals =	0.5	49

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{49}{0.5} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 25
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N864

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			1.3	127.4
C	Pervious (grass)	74			0.4	29.6
				Totals =	1.7	157

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{157}{1.7} = \underline{92.353}$$

Use CN = **92**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 26
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N865

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.64	62.72
C	Pervious (grass)	74			0.26	19.24
				Totals =	0.9	81.96

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{81.96}{0.9} = \underline{91.067}$$

Use CN = **91**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 27
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N866

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.4	39.2
C	Pervious (grass)	74			0	0
				Totals =	0.4	39.2

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{39.2}{0.4} =$ 98

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 28
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N869

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.4	39.2
C	Pervious (grass)	74			1	74
				Totals =	1.4	113.2

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{113.2}{1.4} = \underline{80.857}$$

Use CN = **81**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014

Location: subbasin 29 Checked: DEV Date: 2/21/2014

File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N869

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.3	29.4
C	Pervious (grass)	74			0	0
				Totals =	0.3	29.4

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{29.4}{0.3} = 98$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 30
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: SAG

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.33	32.34
C	Pervious (grass)	74			0.17	12.58
				Totals =	0.5	44.92

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{44.92}{0.5} = \underline{89.84}$$

Use CN = **90**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
Location: subbasin 31
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

By: AMP Date: 2/21/2014
Checked: DEV Date: 2/21/2014

Circle One: [✓ EXISTING] PROPOSED

Description: N867

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			1.5	147
C	Pervious (grass)	74			0.2	14.8
				Totals =	1.7	161.8

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{161.8}{1.7} =$ 95.176

Use CN = **95**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 32
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N923

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			2.4	235.2
C	Pervious (grass)	74			0.6	44.4
				Totals =	3	279.6

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{279.6}{3} = \underline{93.2}$$

Use CN = **93**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 33
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: SAG

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.3	29.4
C	Pervious (grass)	74			0.1	7.4
				Totals =	0.4	36.8

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{36.8}{0.4} =$ 92

Use CN = **92**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted] By: AMP Date: 2/21/2014
Location: subbasin 34 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N869

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.1	9.8
C	Pervious (grass)	74			0	0
			Totals =		0.1	9.8

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{9.8}{0.1} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 35
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N869

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.19	18.62
C	Pervious (grass)	74			0.31	22.94
				Totals =	0.5	41.56

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{41.56}{0.5} = \underline{83.12}$$

Use CN = **83**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 36 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N911

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.6	58.8
C	Pervious (grass)	74			0.2	14.8
				Totals =	0.8	73.6

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{73.6}{0.8} = \underline{92}$$

Use CN = **92**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 37 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N924

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.5	49
C	Pervious (grass)	74			0.4	29.6
				Totals =	0.9	78.6

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{78.6}{0.9} = \underline{87.333}$$

Use CN = **87**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 39 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N871

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.4	39.2
C	Pervious (grass)	74			0.8	59.2
				Totals =	1.2	98.4

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{98.4}{1.2} =$ 82

Use CN = **82**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 40 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N909

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.6	58.8
C	Pervious (grass)	74			0.3	22.2
				Totals =	0.9	81

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{81}{0.9} = \underline{90}$$

Use CN = **90**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 41
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N872

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.4	39.2
C	Pervious (grass)	74			0.8	59.2
				Totals =	1.2	98.4

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{98.4}{1.2} = \underline{82}$$

Use CN = **82**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]	By: AMP	Date: 2/21/2014
Location: subbasin 42	Checked: DEV	Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED	Description: N875

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.97	95.06
C	Pervious (grass)	74			0.13	9.62
				Totals =	1.1	104.68

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{104.68}{1.1} = \underline{95.164}$$

Use CN = **95**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 43
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N874

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			1.2	117.6
C	Pervious (grass)	74			0.2	14.8
				Totals =	1.4	132.4

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{132.4}{1.4} = 94.571$$

Use CN = **95**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP Date: 2/21/2014
Location: subbasin 45
Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N873

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number Table 2-2	Curve Number Fig. 2-3	Curve Number Fig. 2-4	Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
C	impervious (road)	98			1.1	107.8
C	Pervious (grass)	74			0.3	22.2
	Totals =				1.4	130

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{130}{1.4} =$ 92.857

Use CN = **93**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 46
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N922

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.5	49
C	Pervious (grass)	74			0.8	59.2
				Totals =	1.3	108.2

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{108.2}{1.3} = \underline{83.231}$$

Use CN = **83**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 48 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N876

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.42	41.16
C	Pervious (grass)	74			0.18	13.32
				Totals =	0.6	54.48

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{54.48}{0.6} = \underline{90.8}$$

Use CN = **91**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014

Location: subbasin 50
Checked: DEV
Date: 2/21/2014

File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED

Description: N907

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.6	58.8
C	Pervious (grass)	74			0.2	14.8
				Totals =	0.8	73.6

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{73.6}{0.8} = \underline{92}$$

Use CN = **92**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 51
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N903

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.12	11.76
C	Pervious (grass)	74			0.12	8.88
				Totals =	0.24	20.64

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{20.64}{0.24} = \underline{86}$$

Use CN = **86**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 52
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N902

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.32	31.36
C	Pervious (grass)	74			0.31	22.94
				Totals =	0.63	54.3

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{54.3}{0.63}$ = 86.19

Use CN = **86**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 53
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N904

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.3	29.4
C	Pervious (grass)	74			0.1	7.4
			Totals =		0.4	36.8

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{36.8}{0.4} = \underline{92}$

Use CN = **92**

Runoff Curve Number

Project:	IDOT - 110203.00001	By:	AMP	Date: 2/21/2014
Location:	subbasin 54	Checked:	DEV	Date: 2/21/2014
File:	N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\			

Circle One: [✓ EXISTING] PROPOSED

Description: N905

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.13	12.74
C	Pervious (grass)	74			0	0
				Totals =	0.13	12.74

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{12.74}{0.13} = \underline{98}$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 55 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N898

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.26	25.48
C	Pervious (grass)	74			0	0
		Totals =			0.26	25.48

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = $\frac{25.48}{0.26}$ = 98

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 56 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N899

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.1	9.8
C	Pervious (grass)	74			0	0
				Totals =	0.1	9.8

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{9.8}{0.1} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 57 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N926

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.25	24.5
C	Pervious (grass)	74			0.25	18.5
				Totals =	0.5	43

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{43}{0.5} = \underline{86}$$

Use CN = **86**

Runoff Curve Number

Project: IDOT - 110203.00001

By: AMP Date: 2/21/2014

Location: subbasin 58

Checked: DEV Date: 2/21/2014

File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED

Description: N893

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.2	19.6
C	Pervious (grass)	74			0	0
				Totals =	0.2	19.6

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = $\frac{19.6}{0.2}$ = 98

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 59
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N894

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.16	15.68
C	Pervious (grass)	74			0	0
				Totals =	0.16	15.68

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{15.68}{0.16} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 60
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N896

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.22	21.56
C	Pervious (grass)	74			0	0
			Totals =		0.22	21.56

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{21.56}{0.22} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001

Location: subbasin 61

File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

By: AMP Date: 2/21/2014

Checked: DEV Date: 2/21/2014

Circle One: [✓ EXISTING] PROPOSED

Description: N895

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.1	9.8
C	Pervious (grass)	74			0.57	42.18
				Totals =	0.67	51.98

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{51.98}{0.67} = \underline{77.582}$$

Use CN = **78**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 62 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N900

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.24	23.52
C	Pervious (grass)	74			0.29	21.46
				Totals =	0.53	44.98

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{44.98}{0.53}$ = 84.868

Use CN = **85**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted] By: AMP Date: 2/21/2014
Location: subbasin 63 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N891

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.26	25.48
C	Pervious (grass)	74			0	0
				Totals =	0.26	25.48

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{25.48}{0.26} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 (,
By: AMP
Date: 2/21/2014
Location: subbasin 64
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N892

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.1	9.8
C	Pervious (grass)	74			0	0
				Totals =	0.1	9.8

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{9.8}{0.1} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001

By: AMP Date: 2/21/2014

Location: subbasin 65

Checked: DEV Date: 2/21/2014

File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED

Description: N897

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.28	27.44
C	Pervious (grass)	74			0	0
				Totals =	0.28	27.44

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{27.44}{0.28} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001
Location: subbasin 66
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

By: AMP Date: 2/21/2014
Checked: DEV Date: 2/21/2014

Circle One: [✓ EXISTING] PROPOSED Description: N928

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.27	26.46
C	Pervious (grass)	74			0	0
				Totals =	0.27	26.46

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{26.46}{0.27}$ = 98

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 67
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N883

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.12	11.76
C	Pervious (grass)	74			0	0
				Totals =	0.12	11.76

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{11.76}{0.12} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 68
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N901

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.16	15.68
C	Pervious (grass)	74			0.18	13.32
				Totals =	0.34	29

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{29}{0.34} = \underline{85.294}$$

Use CN = **85**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
Location: subbasin 69
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

By: AMP Date: 2/21/2014
Checked: DEV Date: 2/21/2014

Circle One: [✓ EXISTING] PROPOSED

Description: N929

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.18	17.64
C	Pervious (grass)	74			0	0
				Totals =	0.18	17.64

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{17.64}{0.18} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014

Location: subbasin 70 Checked: DEV Date: 2/21/2014

File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N895

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.01	0.98
C	Pervious (grass)	74			0.3	22.2
		Totals =			0.31	23.18

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{23.18}{0.31} = \underline{74.774}$$

Use CN = **75**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 71 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N882

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.24	23.52
C	Pervious (grass)	74			0.16	11.84
				Totals =	0.4	35.36

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{35.36}{0.4} = 88.4$

Use CN = **88**

Runoff Curve Number

Project: IDOT - 110203.00001
Location: subbasin 72
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

By: AMP Date: 2/21/2014
Checked: DEV Date: 2/21/2014

Circle One: [✓ EXISTING] PROPOSED

Description: N908

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			1.61	157.78
C	Pervious (grass)	74			0.49	36.26
				Totals =	2.1	194.04

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{194.04}{2.1} = \underline{92.4}$$

Use CN = **92**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 73
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N890

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.17	16.66
C	Pervious (grass)	74			0	0
				Totals =	0.17	16.66

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{16.66}{0.17} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 74
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N895

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.2	19.6
C	Pervious (grass)	74			0.5	37
				Totals =	0.7	56.6

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{56.6}{0.7} = \underline{80.857}$$

Use CN = **81**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
Location: subbasin 75
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

By: AMP Date: 2/21/2014
Checked: DEV Date: 2/21/2014

Circle One: [✓ EXISTING] PROPOSED

Description: N882

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.2	19.6
C	Pervious (grass)	74			0	0
				Totals =	0.2	19.6

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{19.6}{0.2} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 76
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N925

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number Table 2-2	Curve Number Fig. 2-3	Curve Number Fig. 2-4	Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
C	impervious (road)	98			0.264	25.872
C	Pervious (grass)	74			0.14	10.36
				Totals =	0.404	36.232

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{36.232}{0.404} = \underline{89.683}$$

Use CN = **90**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 77
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N925

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			1.54	150.92
C	Pervious (grass)	74			0.36	26.64
				Totals =	1.9	177.56

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{177.56}{1.9} = \underline{93.453}$$

Use CN = **93**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 78
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N925

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.38	37.24
C	Pervious (grass)	74			0.32	23.68
				Totals =	0.7	60.92

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{60.92}{0.7} = \underline{87.029}$$

Use CN = **87**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 79
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N881

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.4	39.2
C	Pervious (grass)	74			0	0
				Totals =	0.4	39.2

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{39.2}{0.4} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 80
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N914

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			8	784
C	Pervious (grass)	74			4.9	362.6
				Totals =	12.9	1146.6

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{1146.6}{12.9}$ = 88.884

Use CN = **89**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted]
By: AMP
Date: 2/21/2014
Location: subbasin 81
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED
Description: N918

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			5.7	558.6
C	Pervious (grass)	74			2.3	170.2
				Totals =	8	728.8

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{728.8}{8} = \underline{91.1}$$

Use CN = **91**

Runoff Curve Number

Project: IDOT - 110203.00001 [redacted] By: AMP Date: 2/21/2014
Location: subbasin 82 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: [✓ EXISTING] PROPOSED Description: N919

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			6.9	676.2
C	Pervious (grass)	74			6.5	481
				Totals =	13.4	1157.2

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{1157.2}{13.4} = 86.358$$

Use CN = **86**

C. TIME OF CONCENTRATION (TC) CALCULATION SHEETS - EXISTING

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 , ,
Location: I-55 (From I-355 to I-94)
Subbasin: 2

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N839

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.0025				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.05	+	0.00	=	0.05 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		paved								
Flow Length, L	(ft)	338								
Watercourse slope, s	(ft/ft)	0.0074								
Average velocity, V	(ft/s)	1.75								
$T_t = L / 3600\ V$	(hr)	0.05	+	0.00	+	0.00	+	0.00	=	0.05 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.10 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 3

By: AMP Date: 7/16/2013
Checked: DEV Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED Description: N840

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.005				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.04	+	0.00	=	0.04 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I		II						
Surface Description (paved or unpaved)		paved		unp.						
Flow Length, L	(ft)	326		79						
Watercourse slope, s	(ft/ft)	0.009		0.025						
Average velocity, V	(ft/s)	1.93		2.55						
$T_t = L / 3600 V$	(hr)	0.05	+	0.01	+	0.00	+	0.00	=	0.06 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.10 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/16/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 4

Circle One: [✓ EXISTING] PROPOSED Description: N853

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.003				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.05	+	0.00	=	0.05 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I		II						
Surface Description (paved or unpaved)		paved		unp.						
Flow Length, L	(ft)	82		147						
Watercourse slope, s	(ft/ft)	0.014		0.017						
Average velocity, V	(ft/s)	2.41		2.10						
$T_t = L / 3600\ V$	(hr)	0.01	+	0.00	+	0.00	+	0.00	=	0.01 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.06 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 5

Circle One: [✓ EXISTING] PROPOSED
Description: N853

SHEET FLOW

Segment ID		I		II	
Surface Description (table 3-1)		grass			
Manning's roughness coeff., n		0.24			
Flow Length, L (total L ≤ 100')	(ft)	100			
Two-yr 24-hr rainfall, P2	(in)	2.80			
Land slope, s	(ft/ft)	0.01			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.34	+	0.00	= 0.34 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I		II					
Surface Description (paved or unpaved)		unp.		paved					
Flow Length, L	(ft)	147		35					
Watercourse slope, s	(ft/ft)	0.002		0.034					
Average velocity, V	(ft/s)	0.73		3.76					
$T_t = L / 3600\ V$	(hr)	0.06	+	0.00	+	0.00	+	0.00	= 0.06 hr

CHANNEL FLOW

Segment ID					
Cross-sectional flow area, a	(ft^2)				
Wetted perimeter, Pw	(ft)				
Hydraulic radius, r = a/Pw	(ft)				
Channel slope, s	(ft/ft)				
Manning's roughness coeff., n					
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)				
Flow length, L	(ft)				
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	= 0.00 hr

Watershed or subarea T_c or T_t = 0.40 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 7

By: AMP Date: 7/15/2013
Checked: DEV Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED Description: N856

SHEET FLOW

Segment ID		I			
Surface Description (table 3-1)		smooth surface			
Manning's roughness coeff., n		0.011			
Flow Length, L (total L ≤ 100')	(ft)	44			
Two-yr 24-hr rainfall, P2	(in)	2.80			
Land slope, s	(ft/ft)	0.057			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.01	+ 0.00	=	0.01 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I					
Surface Description (paved or unpaved)		unp.					
Flow Length, L	(ft)	498					
Watercourse slope, s	(ft/ft)	0.01					
Average velocity, V	(ft/s)	1.61					
$T_t = L / 3600\ V$	(hr)	0.09	+ 0.00	+ 0.00	+ 0.00	=	0.09 hr

CHANNEL FLOW

Segment ID					
Cross-sectional flow area, a	(ft^2)				
Wetted perimeter, Pw	(ft)				
Hydraulic radius, r = a/Pw	(ft)				
Channel slope, s	(ft/ft)				
Manning's roughness coeff., n					
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)				
Flow length, L	(ft)				
$T_t = L / 3600\ V$	(hr)	0.00	+ 0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.10 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 7A

Circle One: [✓ EXISTING] PROPOSED
Description: N839

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.01					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	337									
Watercourse slope, s	(ft/ft)	0.007									
Average velocity, V	(ft/s)	1.39									
$T_t = L / 3600\ V$	(hr)	0.07	+	0.00	+	0.00	+	0.00	=	0.07	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5})\ /\ n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.10 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: SAMPLE CALCULATION
Location:
Subbasin: 8

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N856

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.005					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.04	+	0.00	=	0.04	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I											
Surface Description (paved or unpaved)		paved											
Flow Length, L	(ft)	404											
Watercourse slope, s	(ft/ft)	0.0087											
Average velocity, V	(ft/s)	1.89											
$T_t = L / 3600\ V$	(hr)	0.06	+	0.00	+	0.00	+	0.00	=	0.06	hr		

CHANNEL FLOW

Segment ID		I					
Cross-sectional flow area, a	(ft^2)	63					
Wetted perimeter, Pw	(ft)	39.5					
Hydraulic radius, r = a/Pw	(ft)	1.5949					
Channel slope, s	(ft/ft)	0.03					
Manning's roughness coeff., n		0.035					
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)	10.07					
Flow length, L	(ft)	0					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0	hr

Watershed or subarea T_c or T_t = 0.10 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 [redacted]
Location: I-55 (From I-355 to I-94)
Subbasin: 9

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N857

SHEET FLOW

	Segment ID	I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.01					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I		II								
Surface Description (paved or unpaved)		paved		unp.								
Flow Length, L	(ft)	130		281								
Watercourse slope, s	(ft/ft)	0.012		0.014								
Average velocity, V	(ft/s)	2.23		1.91								
$T_t = L / 3600\ V$	(hr)	0.02	+	0.04	+	0.00	+	0.00	=	0.06	hr	

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.09 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 10

Circle One: [✓ EXISTING] PROPOSED
Description: N855

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.005					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.04	+	0.00	=	0.04	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	419									
Watercourse slope, s	(ft/ft)	0.011									
Average velocity, V	(ft/s)	2.13									
$T_t = L / 3600\ V$	(hr)	0.05	+	0.00	+	0.00	+	0.00	=	0.05	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.09 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 , ,
Location: I-55 (From I-355 to I-94)
Subbasin: 11

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N854

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.8					
Land slope, s	(ft/ft)	0.03					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.00	=	0.02	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	371									
Watercourse slope, s	(ft/ft)	0.0418									
Average velocity, V	(ft/s)	3.30									
$T_t = L / 3600\ V$	(hr)	0.03	+	0.00	+	0.00	+	0.00	=	0.03	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.05 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 13

Circle One: [✓ EXISTING] PROPOSED
Description: N858

SHEET FLOW

	Segment ID	I			
Surface Description (table 3-1)		smooth surface			
Manning's roughness coeff., n		0.011			
Flow Length, L (total L ≤ 100')	(ft)	100			
Two-yr 24-hr rainfall, P2	(in)	2.80			
Land slope, s	(ft/ft)	0.013			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+ 0.00	=	0.03 hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I	II				
Surface Description (paved or unpaved)		paved	unp.				
Flow Length, L	(ft)	130	221				
Watercourse slope, s	(ft/ft)	0.0015	0.052				
Average velocity, V	(ft/s)	0.80	3.68				
$T_t = L / 3600\ V$	(hr)	0.05	+ 0.02	+ 0.00	+ 0.00	=	0.07 hr

CHANNEL FLOW

	Segment ID				
Cross-sectional flow area, a	(ft^2)				
Wetted perimeter, Pw	(ft)				
Hydraulic radius, r = a/Pw	(ft)				
Channel slope, s	(ft/ft)				
Manning's roughness coeff., n					
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)				
Flow length, L	(ft)				
$T_t = L / 3600\ V$	(hr)	0.00	+ 0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.10 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/16/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 13A

Circle One: [✓ EXISTING] PROPOSED Description: N863

SHEET FLOW

	Segment ID	I					
Surface Description (table 3-1)		grass					
Manning's roughness coeff., n		0.24					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.064					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.16	+	0.00	=	0.16	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	282									
Watercourse slope, s	(ft/ft)	0.006									
Average velocity, V	(ft/s)	1.29									
$T_t = L / 3600\ V$	(hr)	0.06	+	0.00	+	0.00	+	0.00	=	0.06	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.22 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/16/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 14

Circle One: [✓ EXISTING] PROPOSED Description: N858

SHEET FLOW

Segment ID		I	
Surface Description (table 3-1)		smooth surface	
Manning's roughness coeff., n		0.011	
Flow Length, L (total L ≤ 100')	(ft)	100	
Two-yr 24-hr rainfall, P2	(in)	2.80	
Land slope, s	(ft/ft)	0.0075	
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+ 0.00

= 0.03 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I			
Surface Description (paved or unpaved)		paved			
Flow Length, L	(ft)	338			
Watercourse slope, s	(ft/ft)	0.008			
Average velocity, V	(ft/s)	1.85			
$T_t = L / 3600\ V$	(hr)	0.05	+ 0.00	+ 0.00	+ 0.00

= 0.05 hr

CHANNEL FLOW

Segment ID			
Cross-sectional flow area, a	(ft^2)		
Wetted perimeter, Pw	(ft)		
Hydraulic radius, r = a/Pw	(ft)		
Channel slope, s	(ft/ft)		
Manning's roughness coeff., n			
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)		
Flow length, L	(ft)		
$T_t = L / 3600\ V$	(hr)	0.00	+ 0.00

= 0.00 hr

Watershed or subarea T_c or T_t = 0.08 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/16/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 15

Circle One: [✓ EXISTING] PROPOSED Description: N860

SHEET FLOW

	Segment ID	I			
Surface Description (table 3-1)		smooth surface			
Manning's roughness coeff., n		0.011			
Flow Length, L (total L ≤ 100')	(ft)	100			
Two-yr 24-hr rainfall, P2	(in)	2.80			
Land slope, s	(ft/ft)	0.0075			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.03	+ 0.00	= 0.03	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I					
Surface Description (paved or unpaved)		paved					
Flow Length, L	(ft)	304					
Watercourse slope, s	(ft/ft)	0.007					
Average velocity, V	(ft/s)	1.70					
$T_t = L / 3600 V$	(hr)	0.05	+ 0.00	+ 0.00	+ 0.00	= 0.05	hr

CHANNEL FLOW

	Segment ID				
Cross-sectional flow area, a	(ft^2)				
Wetted perimeter, Pw	(ft)				
Hydraulic radius, r = a/Pw	(ft)				
Channel slope, s	(ft/ft)				
Manning's roughness coeff., n					
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)				
Flow length, L	(ft)				
$T_t = L / 3600 V$	(hr)	0.00	+ 0.00	= 0.00	hr

Watershed or subarea T_c or T_t = 0.08 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project:	IDOT - 01.R110203.00001	By:	AMP	Date:	7/16/2013
Location:	I-55 (From I-355 to I-94)	Checked:	DEV	Date:	8/20/2013
Subbasin:	16				

Circle One: [✓ EXISTING] PROPOSED Description: N860

SHEET FLOW

	Segment ID	I		II		
Surface Description (table 3-1)		grass				
Manning's roughness coeff., n		0.24				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.003				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.54	+		=	0.54 hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I								
Surface Description (paved or unpaved)		unp.								
Flow Length, L	(ft)	296								
Watercourse slope, s	(ft/ft)	0.012								
Average velocity, V	(ft/s)	1.75								
$T_t = L / 3600\ V$	(hr)	0.05	+	0.00	+	0.00	+	0.00	=	0.05 hr

CHANNEL FLOW

	Segment ID					
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.59 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 17

By: AMP Date: 7/16/2013
Checked: DEV Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED Description: N913

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.0075					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	217									
Watercourse slope, s	(ft/ft)	0.007									
Average velocity, V	(ft/s)	1.70									
$T_t = L / 3600\ V$	(hr)	0.04	+	0.00	+	0.00	+	0.00	=	0.04	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.07 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 18

By: AMP
Checked: DEV

Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N913

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.037					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.02	+	0.00	=	0.02	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I		II							
Surface Description (paved or unpaved)		paved		unp.							
Flow Length, L	(ft)	86		8							
Watercourse slope, s	(ft/ft)	0.042		0.2							
Average velocity, V	(ft/s)	4.17		7.22							
$T_t = L / 3600 V$	(hr)	0.01	+	0.00	+	0.00	+	0.00	=	0.01	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.03 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 19

By: AMP
Checked: DEV

Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N861

SHEET FLOW

Segment ID		I		II		
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.015				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+		=	0.02 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		paved								
Flow Length, L	(ft)	426								
Watercourse slope, s	(ft/ft)	0.0077								
Average velocity, V	(ft/s)	1.79								
$T_t = L / 3600\ V$	(hr)	0.07	+	0.00	+	0.00	+	0.00	=	0.07 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.09 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 21

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N862

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.01					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	306									
Watercourse slope, s	(ft/ft)	0.012									
Average velocity, V	(ft/s)	2.24									
$T_t = L / 3600\ V$	(hr)	0.04	+	0.00	+	0.00	+	0.00	=	0.04	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.07 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/16/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 23

Circle One: [✓ EXISTING] PROPOSED Description: N863

SHEET FLOW

	Segment ID	I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.01					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	297									
Watercourse slope, s	(ft/ft)	0.007									
Average velocity, V	(ft/s)	1.67									
$T_t = L / 3600\ V$	(hr)	0.05	+	0.00	+	0.00	+	0.00	=	0.05	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.08 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 25

Circle One: [✓ EXISTING] PROPOSED
Description: N864

SHEET FLOW

	Segment ID	I			
Surface Description (table 3-1)		grass			
Manning's roughness coeff., n		0.24			
Flow Length, L (total L ≤ 100')	(ft)	100			
Two-yr 24-hr rainfall, P2	(in)	2.80			
Land slope, s	(ft/ft)	0.004			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.48	+ 0.00	= 0.48	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I	II				
Surface Description (paved or unpaved)		unp.	paved				
Flow Length, L	(ft)	45	306				
Watercourse slope, s	(ft/ft)	0.33	0.0072				
Average velocity, V	(ft/s)	9.32	1.72				
$T_t = L / 3600\ V$	(hr)	0.001	+ 0.05	+ 0.00	+ 0.00	= 0.05	hr

CHANNEL FLOW

	Segment ID				
Cross-sectional flow area, a	(ft^2)				
Wetted perimeter, Pw	(ft)				
Hydraulic radius, r = a/Pw	(ft)				
Channel slope, s	(ft/ft)				
Manning's roughness coeff., n					
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)				
Flow length, L	(ft)				
$T_t = L / 3600\ V$	(hr)	0.00	+ 0.00	= 0.00	hr

Watershed or subarea T_c or T_t = 0.53 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 26

Circle One: [✓ EXISTING] PROPOSED
Description: N865

SHEET FLOW

	Segment ID	I		II			
Surface Description (table 3-1)		smooth surface		grass			
Manning's roughness coeff., n		0.011		0.24			
Flow Length, L (total L ≤ 100')	(ft)	37		63			
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8			
Land slope, s	(ft/ft)	0.03		0.015			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.01	+	0.20	=	0.21	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	339									
Watercourse slope, s	(ft/ft)	0.0067									
Average velocity, V	(ft/s)	1.32									
$T_t = L / 3600\ V$	(hr)	0.07	+	0.00	+	0.00	+	0.00	=	0.07	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.28 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 27

Circle One: [✓ EXISTING] PROPOSED
Description: N866

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.0125					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	324									
Watercourse slope, s	(ft/ft)	0.0096									
Average velocity, V	(ft/s)	1.99									
$T_t = L / 3600 V$	(hr)	0.05	+	0.00	+	0.00	+	0.00	=	0.05	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.08 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 [redacted]
Location: I-55 (From I-355 to I-94)
Subbasin: 28

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N869

SHEET FLOW

	Segment ID	I					
Surface Description (table 3-1)		grass					
Manning's roughness coeff., n		0.24					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.8					
Land slope, s	(ft/ft)	0.025					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.23	+	0.00	=	0.23	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	596									
Watercourse slope, s	(ft/ft)	0.03									
Average velocity, V	(ft/s)	2.79									
$T_t = L / 3600\ V$	(hr)	0.06	+	0.00	+	0.00	+	0.00	=	0.06	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.29 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 29

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N869

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.01					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	168									
Watercourse slope, s	(ft/ft)	0.006									
Average velocity, V	(ft/s)	1.57									
$T_t = L / 3600\ V$	(hr)	0.03	+	0.00	+	0.00	+	0.00	=	0.03	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.06 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 [redacted]
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 30

Circle One: [✓ EXISTING] PROPOSED
Description: SAG

SHEET FLOW

Segment ID		I		II			
Surface Description (table 3-1)		smooth surface		grass			
Manning's roughness coeff., n		0.011		0.24			
Flow Length, L (total L ≤ 100')	(ft)	68		32			
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8			
Land slope, s	(ft/ft)	0.015		0.05			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.07	=	0.09	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	178									
Watercourse slope, s	(ft/ft)	0.003									
Average velocity, V	(ft/s)	0.88									
$T_t = L / 3600\ V$	(hr)	0.06	+	0.00	+	0.00	+	0.00	=	0.06	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.15 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 31

Circle One: [✓ EXISTING] PROPOSED

Description: N867

SHEET FLOW

	Segment ID	I		II		III			
Surface Description (table 3-1)		grass							
Manning's roughness coeff., n		0.24							
Flow Length, L (total L ≤ 100')	(ft)	100							
Two-yr 24-hr rainfall, P2	(in)	2.80							
Land slope, s	(ft/ft)	0.0022							
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.61	+	0.00	+	0.00	=	0.61	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I		II		III		IV		
Surface Description (paved or unpaved)		unp.		paved		unp.		paved		
Flow Length, L	(ft)	172		44		140		203		
Watercourse slope, s	(ft/ft)	0.0044		0.0023		0.14		0.0025		
Average velocity, V	(ft/s)	1.07		0.97		6.04		1.02		
$T_t = L / 3600\ V$	(hr)	0.04	+	0.01	+	0.01	+	0.06	=	0.12 hr

CHANNEL FLOW

	Segment ID					
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.73 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 32

Circle One: [✓ EXISTING] PROPOSED
Description: N923

SHEET FLOW

	Segment ID	I		II			
Surface Description (table 3-1)		grass					
Manning's roughness coeff., n		0.24					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.002					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.64	+	0.00	=	0.64	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I		II							
Surface Description (paved or unpaved)		unp.		paved							
Flow Length, L	(ft)	55		501							
Watercourse slope, s	(ft/ft)	0.3		0.011							
Average velocity, V	(ft/s)	8.84		2.13							
$T_t = L / 3600\ V$	(hr)	0.00	+	0.07	+	0.00	+	0.00	=	0.07	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.71 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 , ,

Location: I-55 (From I-355 to I-94)

Subbasin: 33

By: AMP

Checked: DEV

Date: 7/15/2013

Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: SAG

SHEET FLOW

Segment ID		I		II		
Surface Description (table 3-1)		smooth surface		grass		
Manning's roughness coeff., n		0.011		0.24		
Flow Length, L (total L ≤ 100')	(ft)	63		37		
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8		
Land slope, s	(ft/ft)	0.016		0.014		
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.13	=	0.15 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		unp.								
Flow Length, L	(ft)	108								
Watercourse slope, s	(ft/ft)	0.001								
Average velocity, V	(ft/s)	0.51								
$T_t = L / 3600\ V$	(hr)	0.06	+	0.00	+	0.00	+	0.00	=	0.06 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.21 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 34

By: AMP
Checked: DEV

Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N869

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.0025					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.05	+	0.00	=	0.05	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	107									
Watercourse slope, s	(ft/ft)	0.001									
Average velocity, V	(ft/s)	0.64									
$T_t = L / 3600\ V$	(hr)	0.05	+	0.00	+	0.00	+	0.00	=	0.05	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.10 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 35
By: AMP
Date: 7/17/2013
Checked: DEV
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED
Description: N869

SHEET FLOW

		Segment ID	I		II		
Surface Description (table 3-1)			smooth surface		grass		
Manning's roughness coeff., n			0.011		0.24		
Flow Length, L (total L ≤ 100')	(ft)		30		70		
Two-yr 24-hr rainfall, P2	(in)		2.80		2.8		
Land slope, s	(ft/ft)		0.08		0.29		
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)		0.00	+	0.07	=	0.07 hr

SHALLOW CONCENTRATED FLOW

		Segment ID	I								
Surface Description (paved or unpaved)			unp.								
Flow Length, L	(ft)		7								
Watercourse slope, s	(ft/ft)		0.11								
Average velocity, V	(ft/s)		5.35								
$T_t = L / 3600\ V$	(hr)		0.00	+	0.00	+	0.00	+	0.00	=	0.00 hr

CHANNEL FLOW

		Segment ID					
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)		0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.07 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 36
By: AMP
Checked: DEV
Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N911

SHEET FLOW

Segment ID		I		II			
Surface Description (table 3-1)		smooth surface		grass			
Manning's roughness coeff., n		0.011		0.24			
Flow Length, L (total L ≤ 100')	(ft)	50		50			
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8			
Land slope, s	(ft/ft)	0.03		0.045			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.01	+	0.11	=	0.12	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	272									
Watercourse slope, s	(ft/ft)	0.011									
Average velocity, V	(ft/s)	1.69									
$T_t = L / 3600 V$	(hr)	0.04	+	0.00	+	0.00	+	0.00	=	0.04	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.16 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 , ,
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 37

Circle One: [✓ EXISTING] PROPOSED Description: N924

SHEET FLOW

Segment ID		I	
Surface Description (table 3-1)		grass	
Manning's roughness coeff., n		0.24	
Flow Length, L (total L ≤ 100')	(ft)	100	
Two-yr 24-hr rainfall, P2	(in)	2.8	
Land slope, s	(ft/ft)	0.035	
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.20	+ 0.00 = 0.20 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I	II		
Surface Description (paved or unpaved)		paved	unp.		
Flow Length, L	(ft)	174	70		
Watercourse slope, s	(ft/ft)	0.017	0.22		
Average velocity, V	(ft/s)	2.65	7.57		
$T_t = L / 3600 V$	(hr)	0.02	+ 0.00	+ 0.00	+ 0.00 = 0.02 hr

CHANNEL FLOW

Segment ID			
Cross-sectional flow area, a	(ft^2)		
Wetted perimeter, Pw	(ft)		
Hydraulic radius, r = a/Pw	(ft)		
Channel slope, s	(ft/ft)		
Manning's roughness coeff., n			
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)		
Flow length, L	(ft)		
$T_t = L / 3600 V$	(hr)	0.00	+ 0.00 = 0.00 hr

Watershed or subarea T_c or T_t = 0.22 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 39

By: AMP
Checked: DEV

Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED Description: N871

SHEET FLOW

Segment ID		I		II			
Surface Description (table 3-1)		smooth surface		grass			
Manning's roughness coeff., n		0.011		0.24			
Flow Length, L (total L ≤ 100')	(ft)	8		92			
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8			
Land slope, s	(ft/ft)	0.001		0.16			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.01	+	0.10	=	0.11	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	118									
Watercourse slope, s	(ft/ft)	0.013									
Average velocity, V	(ft/s)	2.32									
$T_t = L / 3600 V$	(hr)	0.01	+	0.00	+	0.00	+	0.00	=	0.01	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.12 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001

Location: I-55 (From I-355 to I-94)

Subbasin: 40

By: AMP

Date: 7/15/2013

Checked: DEV

Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N909

SHEET FLOW

Segment ID		I		II		
Surface Description (table 3-1)		smooth surface		grass		
Manning's roughness coeff., n		0.011		0.24		
Flow Length, L (total L ≤ 100')	(ft)	81		19		
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8		
Land slope, s	(ft/ft)	0.012		0.026		
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.06	=	0.08 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		unp.								
Flow Length, L	(ft)	386								
Watercourse slope, s	(ft/ft)	0.016								
Average velocity, V	(ft/s)	2.04								
$T_t = L / 3600\ V$	(hr)	0.05	+	0.00	+	0.00	+	0.00	=	0.05 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.13 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/16/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 41

Circle One: [✓ EXISTING] PROPOSED Description: N872

SHEET FLOW

Segment ID		I			
Surface Description (table 3-1)		grass			
Manning's roughness coeff., n		0.24			
Flow Length, L (total L ≤ 100')	(ft)	100			
Two-yr 24-hr rainfall, P2	(in)	2.8			
Land slope, s	(ft/ft)	0.02			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.25	+ 0.00	= 0.25	hr

SHALLOW CONCENTRATED FLOW

Segment ID		II	I				
Surface Description (paved or unpaved)		unp.	paved				
Flow Length, L	(ft)	202	177				
Watercourse slope, s	(ft/ft)	0.02	0.01				
Average velocity, V	(ft/s)	2.28	2.03				
$T_t = L / 3600\ V$	(hr)	0.02	+ 0.02	+ 0.00	+ 0.00	= 0.04	hr

CHANNEL FLOW

Segment ID					
Cross-sectional flow area, a	(ft^2)				
Wetted perimeter, Pw	(ft)				
Hydraulic radius, r = a/Pw	(ft)				
Channel slope, s	(ft/ft)				
Manning's roughness coeff., n					
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)				
Flow length, L	(ft)				
$T_t = L / 3600\ V$	(hr)	0.00	+ 0.00	= 0.00	hr

Watershed or subarea T_c or T_t = 0.29 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/15/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 42

Circle One: [✓ EXISTING] PROPOSED Description: N875

SHEET FLOW

	Segment ID	I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.02					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.02	+	0.00	=	0.02	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I		II							
Surface Description (paved or unpaved)		paved		unp.							
Flow Length, L	(ft)	332		116							
Watercourse slope, s	(ft/ft)	0.01		0.04							
Average velocity, V	(ft/s)	2.03		3.23							
$T_t = L / 3600 V$	(hr)	0.05	+	0.01	+	0.00	+	0.00	=	0.06	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.08 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 43
By: AMP
Checked: DEV
Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N874

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		gravel					
Manning's roughness coeff., n		0.018					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.002					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.08	+	0.00	=	0.08	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I		II		III					
Surface Description (paved or unpaved)		paved		unp.		paved					
Flow Length, L	(ft)	60		37		300					
Watercourse slope, s	(ft/ft)	0.005		0.27		0.002					
Average velocity, V	(ft/s)	1.44		8.38		0.91					
$T_t = L / 3600\ V$	(hr)	0.01	+	0.00	+	0.09	+	0.00	=	0.10	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.18 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 45

Circle One: [✓ EXISTING] PROPOSED
Description: N873

SHEET FLOW

	Segment ID	I					
Surface Description (table 3-1)		gravel					
Manning's roughness coeff., n		0.018					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.002					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.08	+	0.00	=	0.08	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I		II		III					
Surface Description (paved or unpaved)		paved		unp.		paved					
Flow Length, L	(ft)	53		38		248					
Watercourse slope, s	(ft/ft)	0.0047		0.19		0.002					
Average velocity, V	(ft/s)	1.39		7.03		0.91					
$T_t = L / 3600\ V$	(hr)	0.01	+	0.00	+	0.08	+	0.00	=	0.09	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.17 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 46

Circle One: [✓ EXISTING] PROPOSED

Description: N922

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.014					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.00	=	0.02	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I		II							
Surface Description (paved or unpaved)		paved		unp.							
Flow Length, L	(ft)	53		281							
Watercourse slope, s	(ft/ft)	0.023		0.016							
Average velocity, V	(ft/s)	3.08		2.04							
$T_t = L / 3600\ V$	(hr)	0.00	+	0.04	+	0.00	+	0.00	=	0.04	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.06 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 48

Circle One: [✓ EXISTING] PROPOSED
Description: N876

SHEET FLOW

Segment ID		I		II			
Surface Description (table 3-1)		smooth surface		grass			
Manning's roughness coeff., n		0.011		0.24			
Flow Length, L (total L ≤ 100')	(ft)	45		55			
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8			
Land slope, s	(ft/ft)	0.01		0.06			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.10	=	0.12	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	194									
Watercourse slope, s	(ft/ft)	0.01									
Average velocity, V	(ft/s)	1.61									
$T_t = L / 3600\ V$	(hr)	0.03	+	0.00	+	0.00	+	0.00	=	0.03	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.15 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 50
By: AMP
Checked: DEV
Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N907

SHEET FLOW

Segment ID		I		II		III			
Surface Description (table 3-1)		smooth surface		grass					
Manning's roughness coeff., n		0.011		0.24					
Flow Length, L (total L ≤ 100')	(ft)	35		65					
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8					
Land slope, s	(ft/ft)	0.019		0.002					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.01	+	0.45	+	0.00	=	0.46	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	188									
Watercourse slope, s	(ft/ft)	0.012									
Average velocity, V	(ft/s)	2.23									
$T_t = L / 3600\ V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.48 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/15/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 51

Circle One: [✓ EXISTING] PROPOSED Description: N903

SHEET FLOW

Segment ID		I		II	
Surface Description (table 3-1)		smooth surface		grass	
Manning's roughness coeff., n		0.011		0.24	
Flow Length, L (total L ≤ 100')	(ft)	78		22	
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8	
Land slope, s	(ft/ft)	0.018		0.068	
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.05	= 0.07 hr

SHALLOW CONCENTRATED FLOW

Segment ID		II							
Surface Description (paved or unpaved)		unp.							
Flow Length, L	(ft)	87							
Watercourse slope, s	(ft/ft)	0.023							
Average velocity, V	(ft/s)	2.45							
$T_t = L / 3600\ V$	(hr)	0.01	+	0.00	+	0.00	+	0.00	= 0.01 hr

CHANNEL FLOW

Segment ID					
Cross-sectional flow area, a	(ft^2)				
Wetted perimeter, Pw	(ft)				
Hydraulic radius, r = a/Pw	(ft)				
Channel slope, s	(ft/ft)				
Manning's roughness coeff., n					
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)				
Flow length, L	(ft)				
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	= 0.00 hr

Watershed or subarea T_c or T_t = 0.08 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 52

Circle One: [✓ EXISTING] PROPOSED
Description: N902

SHEET FLOW

	Segment ID	I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.014				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.00	=	0.02 hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I								
Surface Description (paved or unpaved)		paved								
Flow Length, L	(ft)	147								
Watercourse slope, s	(ft/ft)	0.014								
Average velocity, V	(ft/s)	2.41								
$T_t = L / 3600\ V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02 hr

CHANNEL FLOW

	Segment ID					
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 53

By: AMP   Date: 7/15/2013
Checked: DEV   Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED   Description: N904

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.007				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.03	+	0.00	=	0.03 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		paved								
Flow Length, L	(ft)	126								
Watercourse slope, s	(ft/ft)	0.013								
Average velocity, V	(ft/s)	2.32								
$T_t = L / 3600 V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.05 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 54
By: AMP
Checked: DEV
Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N905

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.0125					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	129									
Watercourse slope, s	(ft/ft)	0.015									
Average velocity, V	(ft/s)	2.49									
$T_t = L / 3600\ V$	(hr)	0.01	+	0.00	+	0.00	+	0.00	=	0.01	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 55

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N898

SHEET FLOW

	Segment ID	I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.017					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.00	=	0.02	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	166									
Watercourse slope, s	(ft/ft)	0.014									
Average velocity, V	(ft/s)	2.41									
$T_t = L / 3600\ V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5})\ /\ n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 56

By: AMP
Checked: DEV

Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N899

SHEET FLOW

Segment ID		I			
Surface Description (table 3-1)		smooth surface			
Manning's roughness coeff., n		0.011			
Flow Length, L (total L ≤ 100')	(ft)	100			
Two-yr 24-hr rainfall, P2	(in)	2.80			
Land slope, s	(ft/ft)	0.0075			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+ 0.00	=	0.03 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I					
Surface Description (paved or unpaved)		paved					
Flow Length, L	(ft)	152					
Watercourse slope, s	(ft/ft)	0.013					
Average velocity, V	(ft/s)	2.32					
$T_t = L / 3600\ V$	(hr)	0.02	+ 0.00	+ 0.00	+ 0.00	=	0.02 hr

CHANNEL FLOW

Segment ID					
Cross-sectional flow area, a	(ft^2)				
Wetted perimeter, Pw	(ft)				
Hydraulic radius, r = a/Pw	(ft)				
Channel slope, s	(ft/ft)				
Manning's roughness coeff., n					
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)				
Flow length, L	(ft)				
$T_t = L / 3600\ V$	(hr)	0.00	+ 0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.05 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 57

By: AMP
Checked: DEV

Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N926

SHEET FLOW

	Segment ID	I		II			
Surface Description (table 3-1)		smooth surface		grass			
Manning's roughness coeff., n		0.011		0.24			
Flow Length, L (total L ≤ 100')	(ft)	84		16			
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8			
Land slope, s	(ft/ft)	0.018		0.0625			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.04	=	0.06	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	II									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	271									
Watercourse slope, s	(ft/ft)	0.019									
Average velocity, V	(ft/s)	2.22									
$T_t = L / 3600\ V$	(hr)	0.03	+	0.00	+	0.00	+	0.00	=	0.03	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.09 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 58

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N893

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.02				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.00	=	0.02 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		paved								
Flow Length, L	(ft)	160								
Watercourse slope, s	(ft/ft)	0.014								
Average velocity, V	(ft/s)	2.41								
$T_t = L / 3600\ V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 59

Circle One: [✓ EXISTING] PROPOSED
Description: N894

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.013					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	149									
Watercourse slope, s	(ft/ft)	0.012									
Average velocity, V	(ft/s)	2.23									
$T_t = L / 3600\ V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.05 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 60

By: AMP
Checked: DEV

Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N896

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.015					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.00	=	0.02	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	151									
Watercourse slope, s	(ft/ft)	0.01									
Average velocity, V	(ft/s)	2.03									
$T_t = L / 3600\ V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5})\ /\ n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 61

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED Description: N895

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		grass					
Manning's roughness coeff., n		0.24					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.8					
Land slope, s	(ft/ft)	0.14					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.12	+	0.00	=	0.12	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	325									
Watercourse slope, s	(ft/ft)	0.0006									
Average velocity, V	(ft/s)	0.40									
$T_t = L / 3600\ V$	(hr)	0.22	+	0.00	+	0.00	+	0.00	=	0.22	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.34 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 62

By: AMP
Checked: DEV

Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N900

SHEET FLOW

	Segment ID	I		II			
Surface Description (table 3-1)		smooth surface		grass			
Manning's roughness coeff., n		0.011		0.24			
Flow Length, L (total L ≤ 100')	(ft)	81		19			
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8			
Land slope, s	(ft/ft)	0.019		0.026			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.06	=	0.08	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	295									
Watercourse slope, s	(ft/ft)	0.017									
Average velocity, V	(ft/s)	2.65									
$T_t = L / 3600\ V$	(hr)	0.03	+	0.00	+	0.00	+	0.00	=	0.03	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.11 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 63

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N891

SHEET FLOW

	Segment ID	I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.018				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.00	= 0.02	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	168									
Watercourse slope, s	(ft/ft)	0.014									
Average velocity, V	(ft/s)	2.41									
$T_t = L / 3600\ V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02	hr

CHANNEL FLOW

	Segment ID					
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5})\ /\ n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	= 0.00	hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 64

Circle One: [✓ EXISTING] PROPOSED
Description: N892

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.015				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.00	= 0.02	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I										
Surface Description (paved or unpaved)		paved										
Flow Length, L	(ft)	155										
Watercourse slope, s	(ft/ft)	0.012										
Average velocity, V	(ft/s)	2.23										
$T_t = L / 3600\ V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02	hr	

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	= 0.00	hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 65

Circle One: [✓ EXISTING] PROPOSED
Description: N897

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.015					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.00	=	0.02	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	174									
Watercourse slope, s	(ft/ft)	0.013									
Average velocity, V	(ft/s)	2.32									
$T_t = L / 3600\ V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 66

Circle One: [✓ EXISTING] PROPOSED
Description: N928

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.016					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.02	+	0.00	=	0.02	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I										
Surface Description (paved or unpaved)		paved										
Flow Length, L	(ft)	150										
Watercourse slope, s	(ft/ft)	0.016										
Average velocity, V	(ft/s)	2.57										
$T_t = L / 3600\ V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02	hr	

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 67

Circle One: [✓ EXISTING] PROPOSED
Description: N883

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.005				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.04	+	0.00	=	0.04 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		paved								
Flow Length, L	(ft)	135								
Watercourse slope, s	(ft/ft)	0.015								
Average velocity, V	(ft/s)	2.49								
$T_t = L / 3600 V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.06 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 [redacted]
Location: I-55 (From I-355 to I-94)
Subbasin: 68

By: AMP
Checked: DEV

Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N901

SHEET FLOW

Segment ID		I		II	
Surface Description (table 3-1)		smooth surface		grass	
Manning's roughness coeff., n		0.011		0.24	
Flow Length, L (total L ≤ 100')	(ft)	61		39	
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8	
Land slope, s	(ft/ft)	0.0008		0.05	
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.05	+	0.08	= 0.13 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I							
Surface Description (paved or unpaved)		paved							
Flow Length, L	(ft)	157							
Watercourse slope, s	(ft/ft)	0.022							
Average velocity, V	(ft/s)	3.02							
$T_t = L / 3600\ V$	(hr)	0.01	+	0.00	+	0.00	+	0.00	= 0.01 hr

CHANNEL FLOW

Segment ID					
Cross-sectional flow area, a	(ft^2)				
Wetted perimeter, Pw	(ft)				
Hydraulic radius, r = a/Pw	(ft)				
Channel slope, s	(ft/ft)				
Manning's roughness coeff., n					
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)				
Flow length, L	(ft)				
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	= 0.00 hr

Watershed or subarea T_c or T_t = 0.14 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 69

Circle One: [✓ EXISTING] PROPOSED
Description: N929

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.005				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.04	+	0.00	=	0.04 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		paved								
Flow Length, L	(ft)	124								
Watercourse slope, s	(ft/ft)	0.014								
Average velocity, V	(ft/s)	2.41								
$T_t = L / 3600\ V$	(hr)	0.01	+	0.00	+	0.00	+	0.00	=	0.01 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.05 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 [redacted]
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 70

Circle One: [✓ EXISTING] PROPOSED
Description: N895

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		grass				
Manning's roughness coeff., n		0.24				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.8				
Land slope, s	(ft/ft)	0.16				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.11	+	0.00	=	0.11 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		paved								
Flow Length, L	(ft)	141								
Watercourse slope, s	(ft/ft)	0.003								
Average velocity, V	(ft/s)	1.11								
$T_t = L / 3600\ V$	(hr)	0.04	+	0.00	+	0.00	+	0.00	=	0.04 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.15 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 71

By: AMP Date: 7/16/2013
Checked: DEV Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED Description: N882

SHEET FLOW

	Segment ID	I			
Surface Description (table 3-1)		grass			
Manning's roughness coeff., n		0.24			
Flow Length, L (total L ≤ 100')	(ft)	100			
Two-yr 24-hr rainfall, P2	(in)	2.80			
Land slope, s	(ft/ft)	0.02			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.25	+ 0.00	= 0.25	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I					
Surface Description (paved or unpaved)		unp.					
Flow Length, L	(ft)	91					
Watercourse slope, s	(ft/ft)	0.0093					
Average velocity, V	(ft/s)	1.56					
$T_t = L / 3600\ V$	(hr)	0.02	+ 0.00	+ 0.00	+ 0.00	= 0.02	hr

CHANNEL FLOW

	Segment ID				
Cross-sectional flow area, a	(ft^2)				
Wetted perimeter, Pw	(ft)				
Hydraulic radius, r = a/Pw	(ft)				
Channel slope, s	(ft/ft)				
Manning's roughness coeff., n					
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)				
Flow length, L	(ft)				
$T_t = L / 3600\ V$	(hr)	0.00	+ 0.00	= 0.00	hr

Watershed or subarea T_c or T_t = 0.27 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 72

Circle One: [✓ EXISTING] PROPOSED
Description: N908

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		gravel					
Manning's roughness coeff., n		0.018					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.02					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I		II		III					
Surface Description (paved or unpaved)		paved		unp.		paved					
Flow Length, L	(ft)	25		41		433					
Watercourse slope, s	(ft/ft)	0.04		0.29		0.013					
Average velocity, V	(ft/s)	4.07		8.69		2.32					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	+	0.05	+	0.00	=	0.05	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.08 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/16/2013

Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013

Subbasin: 73

Circle One: [✓ EXISTING] PROPOSED Description: N890

SHEET FLOW

Segment ID		I		
Surface Description (table 3-1)		smooth surface		
Manning's roughness coeff., n		0.011		
Flow Length, L (total L ≤ 100')	(ft)	100		
Two-yr 24-hr rainfall, P2	(in)	2.80		
Land slope, s	(ft/ft)	0.0085		
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+ 0.00	= 0.03 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I				
Surface Description (paved or unpaved)		paved				
Flow Length, L	(ft)	110				
Watercourse slope, s	(ft/ft)	0.014				
Average velocity, V	(ft/s)	2.41				
$T_t = L / 3600\ V$	(hr)	0.01	+ 0.00	+ 0.00	+ 0.00	= 0.01 hr

CHANNEL FLOW

Segment ID				
Cross-sectional flow area, a	(ft^2)			
Wetted perimeter, Pw	(ft)			
Hydraulic radius, r = a/Pw	(ft)			
Channel slope, s	(ft/ft)			
Manning's roughness coeff., n				
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)			
Flow length, L	(ft)			
$T_t = L / 3600\ V$	(hr)	0.00	+ 0.00	= 0.00 hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/15/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 74

Circle One: [✓ EXISTING] PROPOSED
Description: N895

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		grass				
Manning's roughness coeff., n		0.24				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.8				
Land slope, s	(ft/ft)	0.0095				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.34	+	0.00	=	0.34 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		unp.								
Flow Length, L	(ft)	239								
Watercourse slope, s	(ft/ft)	0.025								
Average velocity, V	(ft/s)	2.55								
$T_t = L / 3600\ V$	(hr)	0.03	+	0.00	+	0.00	+	0.00	=	0.03 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.37 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 75

By: AMP
Checked: DEV

Date: 7/16/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N882

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.011				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.008				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.03	+	0.00	=	0.03 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		paved								
Flow Length, L	(ft)	75								
Watercourse slope, s	(ft/ft)	0.004								
Average velocity, V	(ft/s)	1.29								
$T_t = L / 3600 V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.05 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 76

By: AMP
Checked: DEV

Date: 7/15/2013
Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED

Description: N925

SHEET FLOW

Segment ID		I		II		
Surface Description (table 3-1)		smooth surface		grass		
Manning's roughness coeff., n		0.011		0.24		
Flow Length, L (total L ≤ 100')	(ft)	39		61		
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8		
Land slope, s	(ft/ft)	0.012		0.044		
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.01	+	0.12	=	0.13 hr

SHALLOW CONCENTRATED FLOW

Segment ID		II								
Surface Description (paved or unpaved)		unp.								
Flow Length, L	(ft)	30								
Watercourse slope, s	(ft/ft)	0.017								
Average velocity, V	(ft/s)	2.10								
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	+	0.00	+	0.00	=	0.00 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00 hr

Watershed or subarea T_c or T_t = 0.13 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/15/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 77

Circle One: [✓ EXISTING] PROPOSED Description: N925

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		gravel					
Manning's roughness coeff., n		0.018					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.002					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.08	+	0.00	=	0.08	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I		II							
Surface Description (paved or unpaved)		paved		unp.							
Flow Length, L	(ft)	14		426							
Watercourse slope, s	(ft/ft)	0.029		0.002							
Average velocity, V	(ft/s)	3.46		0.72							
$T_t = L / 3600\ V$	(hr)	0.00	+	0.16	+	0.00	+	0.00	=	0.16	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.24 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/16/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 78

Circle One: [✓ EXISTING] PROPOSED Description: N925

SHEET FLOW

Segment ID		I		II			
Surface Description (table 3-1)		smooth surface		grass			
Manning's roughness coeff., n		0.011		0.24			
Flow Length, L (total L ≤ 100')	(ft)	41		59			
Two-yr 24-hr rainfall, P2	(in)	2.80		2.8			
Land slope, s	(ft/ft)	0.024		0.063			
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.01	+	0.11	=	0.12	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	346									
Watercourse slope, s	(ft/ft)	0.0038									
Average velocity, V	(ft/s)	0.99									
$T_t = L / 3600 V$	(hr)	0.10	+	0.00	+	0.00	+	0.00	=	0.10	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.22 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001 By: AMP Date: 7/16/2013
Location: I-55 (From I-355 to I-94) Checked: DEV Date: 8/20/2013
Subbasin: 79

Circle One: [✓ EXISTING] PROPOSED Description: N881

SHEET FLOW

Segment ID		I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.011					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.018					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.02	+	0.00	=	0.02	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I									
Surface Description (paved or unpaved)		paved									
Flow Length, L	(ft)	88									
Watercourse slope, s	(ft/ft)	0.0048									
Average velocity, V	(ft/s)	1.41									
$T_t = L / 3600 V$	(hr)	0.02	+	0.00	+	0.00	+	0.00	=	0.02	hr

CHANNEL FLOW

Segment ID							
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=	0.00	hr

Watershed or subarea T_c or T_t = 0.04 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 80

Circle One: [✓ EXISTING] PROPOSED

Description: N914

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.013				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.012				
$T_t = (0.007(nL)^{0.8})/(P_2^{0\ 5}\ s^{0.4})$	(hr)	0.03	+	0.00	= 0.03	hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		unp.								
Flow Length, L	(ft)	4092								
Watercourse slope, s	(ft/ft)	0.008								
Average velocity, V	(ft/s)	1.44								
$T_t = L / 3600\ V$	(hr)	0.79	+	0.00	+	0.00	+	0.00	= 0.79	hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	hr

Watershed or subarea T_c or T_t = 0.82 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
By: AMP
Date: 7/16/2013
Location: I-55 (From I-355 to I-94)
Checked: DEV
Date: 8/20/2013
Subbasin: 81

Circle One: [✓ EXISTING] PROPOSED

Description: N918

SHEET FLOW

	Segment ID	I					
Surface Description (table 3-1)		smooth surface					
Manning's roughness coeff., n		0.013					
Flow Length, L (total L ≤ 100')	(ft)	100					
Two-yr 24-hr rainfall, P2	(in)	2.80					
Land slope, s	(ft/ft)	0.01					
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5} s^{0.4})$	(hr)	0.03	+	0.00	=	0.03	hr

SHALLOW CONCENTRATED FLOW

	Segment ID	I									
Surface Description (paved or unpaved)		unp.									
Flow Length, L	(ft)	4042									
Watercourse slope, s	(ft/ft)	0.008									
Average velocity, V	(ft/s)	1.44									
$T_t = L / 3600 V$	(hr)	0.78	+	0.00	+	0.00	+	0.00	=	0.78	hr

CHANNEL FLOW

	Segment ID						
Cross-sectional flow area, a	(ft^2)						
Wetted perimeter, Pw	(ft)						
Hydraulic radius, r = a/Pw	(ft)						
Channel slope, s	(ft/ft)						
Manning's roughness coeff., n							
$V = (1.49 r^{0.667} s^{0.5}) / n$	(ft/s)						
Flow length, L	(ft)						
$T_t = L / 3600 V$	(hr)	0.00	+	0.00	=		hr

Watershed or subarea T_c or T_t = 0.81 hr

Time of Concentration (T_c) or Travel Time (T_t)

Project: IDOT - 01.R110203.00001
Location: I-55 (From I-355 to I-94)
Subbasin: 82

By: AMP　Date: 7/16/2013
Checked: DEV　Date: 8/20/2013

Circle One: [✓ EXISTING] PROPOSED　Description: N919

SHEET FLOW

Segment ID		I				
Surface Description (table 3-1)		smooth surface				
Manning's roughness coeff., n		0.013				
Flow Length, L (total L ≤ 100')	(ft)	100				
Two-yr 24-hr rainfall, P2	(in)	2.80				
Land slope, s	(ft/ft)	0.012				
$T_t = (0.007(nL)^{0.8})/(P_2^{0.5}\ s^{0.4})$	(hr)	0.03	+	0.00	=	0.03 hr

SHALLOW CONCENTRATED FLOW

Segment ID		I								
Surface Description (paved or unpaved)		unp.								
Flow Length, L	(ft)	4151								
Watercourse slope, s	(ft/ft)	0.008								
Average velocity, V	(ft/s)	1.44								
$T_t = L / 3600\ V$	(hr)	0.80	+	0.00	+	0.00	+	0.00	=	0.80 hr

CHANNEL FLOW

Segment ID						
Cross-sectional flow area, a	(ft^2)					
Wetted perimeter, Pw	(ft)					
Hydraulic radius, r = a/Pw	(ft)					
Channel slope, s	(ft/ft)					
Manning's roughness coeff., n						
$V = (1.49\ r^{0.667}\ s^{0.5}) / n$	(ft/s)					
Flow length, L	(ft)					
$T_t = L / 3600\ V$	(hr)	0.00	+	0.00	=	hr

Watershed or subarea T_c or T_t = 0.83 hr

Tc Supporting Calculations

Subbasin ID	Tc Segment	Upstream Elevation	Downstream Elevation	Flow Length (ft)	Slope (ft/ft)
2	Sheet flow	596.0	595.8	100	0.0025
	Shallow Conc	595.8	593.3	338	0.0074
3	Sheet flow	596.5	596.0	100	0.0050
	Shallow Conc I	596.0	593.1	326	0.0090
	Shallow Conc II	593.1	591.1	79	0.0250
4	Sheet flow	595.5	595.2	100	0.0030
	Shallow Conc I	595.2	594.1	82	0.0140
	Shallow Conc II	594.1	591.6	147	0.0170
5	Sheet flow I	598.5	597.5	100	0.0100
	Sheet flow II	597.5	597.2	147	0.0020
	Shallow Conc I	597.2	596.0	35	0.0340
7	Sheet flow	596.5	594.0	44	0.0570
	Shallow Conc I	594.0	589.0	498	0.0100
7A	Sheet flow	596.5	595.5	100	0.0100
	Shallow Conc I	595.5	593.1	337	0.0070
8	Sheet flow	593.0	592.5	100	0.0050
	Shallow Conc I	592.5	589.0	404	0.0087
9	Sheet flow	593.5	593.0	100	0.0050
	Shallow Conc I	593.0	591.4	130	0.0120
	Shallow Conc II	591.4	587.5	281	0.0140
10	Sheet flow	593.8	593.3	100	0.0050
	Shallow Conc I	593.3	588.7	419	0.0110
11	Sheet flow	606.0	603.0	100	0.0300
	Shallow Conc I	603.0	587.4	371	0.0420
13	Sheet flow	599.0	597.7	100	0.0130
	Shallow Conc I	597.7	597.5	130	0.0015
	Shallow Conc II	597.5	586.0	221	0.0520
13A	Sheet flow	592.0	585.6	100	0.0640
	Shallow Conc I	585.6	583.8	282	0.0064
14	Sheet flow	589.5	588.8	100	0.0075
	Shallow Conc I	588.8	586.0	338	0.0082
15	Sheet flow	589.5	588.8	100	0.0075
	Shallow Conc I	588.8	586.7	304	0.0070
16	Sheet flow I	586.8	586.5	100	0.0030
	Shallow Conc I	586.5	583.0	296	0.0118
17	Sheet flow	589.5	588.8	100	0.0075
	Shallow Conc I	588.8	587.3	217	0.0070
18	Sheet flow	597.0	593.3	100	0.0370
	Shallow Conc I	593.3	589.7	86	0.0420
	Shallow Conc II	589.7	588.1	8	0.2000
19	Sheet flow I	587.3	585.8	100	0.0150
	Shallow Conc I	585.8	582.5	426	0.0077

21	Sheet flow	586.5	585.5	100	0.0100
	Shallow Conc I	585.5	581.8	306	0.0120
23	Sheet flow	586.0	585.0	100	0.0100
	Shallow Conc I	585.0	583.0	297	0.0069
25	Sheet flow	599.0	597.0	100	0.0200
	Shallow Conc I	597.0	582.0	45	0.3333
	Shallow Conc II	582.0	579.9	306	0.0070
26	Sheet flow I	583.5	582.4	37	0.0300
	Sheet flow II	582.4	581.5	63	0.0150
	Shallow Conc I	581.5	579.2	339	0.0067
27	Sheet flow	583.5	582.3	100	0.0125
	Shallow Conc I	582.3	579.2	324	0.0096
28	Sheet flow	599.0	596.5	100	0.0250
	Shallow Conc I	596.5	578.6	596	0.0300
29	Sheet flow	579.5	578.5	100	0.0100
	Shallow Conc I	578.5	577.5	168	0.0060
30	Sheet flow I	579.5	578.5	68	0.0150
	Sheet flow II	578.5	576.9	32	0.0500
	Shallow Conc I	576.9	576.4	178	0.0030
31	Sheet flow I	600.0	598.8	100	0.0120
	Shallow Conc I	598.8	598.4	172	0.0023
	Shallow Conc II	598.4	598.3	44	0.0023
	Shallow Conc III	598.3	578.7	140	0.1400
	Shallow Conc IV	578.7	577.7	202	0.0050
32	Sheet flow I	602.0	599.0	100	0.0300
	Shallow Conc I	599.0	582.5	55	0.3000
	Shallow Conc II	582.5	577.5	501	0.0099
33	Sheet flow I	578.5	577.5	63	0.0160
	Sheet flow II	577.5	577.0	37	0.0140
	Shallow Conc I	577.0	576.9	108	0.0010
34	Sheet flow I	578.5	578.3	100	0.0025
	Shallow Conc I	578.3	578.2	107	0.0010
35	Sheet flow I	601.5	599.1	30	0.0800
	Sheet flow II	599.1	578.8	70	0.2900
	Shallow Conc I	578.8	578.0	7	0.1100
36	Sheet flow I	583.5	582.0	50	0.0300
	Sheet flow II	582.0	579.8	50	0.0450
	Shallow Conc I	579.8	576.8	272	0.0110
37	Sheet flow I	601.0	597.5	100	0.0350
	Shallow Conc I	597.5	594.5	174	0.0170
	Shallow Conc II	594.5	579.1	70	0.2200
39	Sheet flow I	600.0	600.0	8	0.0010
	Sheet flow II	600.0	585.3	92	0.1600
	Shallow Conc I	585.3	583.8	116	0.0130
40	Sheet flow I	589.0	588.0	81	0.0120
	Sheet flow II	588.0	587.5	19	0.0260
	Shallow Conc I	587.5	581.3	386	0.0160

41	Sheet flow I	596.0	594.0	100	0.0200
	Shallow Conc I	594.0	590.0	202	0.0200
	Shallow Conc II	590.0	588.2	177	0.0100
42	Sheet flow I	595.5	593.5	100	0.0200
	Shallow Conc I	593.5	590.2	332	0.0100
	Shallow Conc II	590.2	585.6	116	0.0400
43	Sheet flow I	603.5	602.5	100	0.0100
	Shallow Conc I	602.5	602.0	30	0.0160
	Shallow Conc II	602.0	592.0	37	0.2700
	Shallow Conc III	592.0	589.2	256	0.0110
45	Sheet flow I	603.5	603.3	100	0.0020
	Shallow Conc I	603.3	603.1	53	0.0047
	Shallow Conc II	603.1	595.9	38	0.1900
	Shallow Conc III	595.9	591.9	247	0.0160
46	Sheet flow I	598.5	597.1	100	0.0140
	Shallow Conc I	597.1	597.0	53	0.0023
	Shallow Conc II	597.0	592.5	281	0.0160
48	Sheet flow I	598.5	598.1	45	0.0100
	Sheet flow II	598.1	594.8	55	0.0600
	Shallow Conc I	594.8	592.9	194	0.0100
50	Sheet flow I	603.0	602.3	35	0.0190
	Sheet flow II	602.3	598.0	65	0.0660
	Shallow Conc I	598.0	596.0	187	0.0106
51	Sheet flow I	601.0	599.6	78	0.0180
	Sheet flow II	599.6	598.1	22	0.0680
	Shallow Conc I	598.1	596.1	87	0.0230
52	Sheet flow I	601.5	600.1	100	0.0140
	Shallow Conc I	600.1	598.0	147	0.0140
53	Sheet flow I	600.5	599.8	100	0.0070
	Shallow Conc I	599.8	598.2	126	0.0130
54	Sheet flow I	601.5	600.3	100	0.0125
	Shallow Conc I	600.3	598.4	129	0.0150
55	Sheet flow I	604.5	602.8	100	0.0170
	Shallow Conc I	602.8	600.5	166	0.0140
56	Sheet flow I	604.5	603.8	100	0.0075
	Shallow Conc I	603.8	601.8	152	0.0130
57	Sheet flow I	605.5	604.0	84	0.0180
	Sheet flow II	604.0	603.0	16	0.0625
	Shallow Conc I	603.0	597.9	271	0.0190
58	Sheet flow I	607.5	605.5	100	0.0200
	Shallow Conc I	605.5	603.3	160	0.0140
59	Sheet flow I	607.5	606.2	100	0.0130
	Shallow Conc I	606.2	604.4	149	0.0120
60	Sheet flow I	607.5	606.0	100	0.0150
	Shallow Conc I	606.0	604.5	151	0.0100
61	Sheet flow I	609.0	595.0	100	0.1400
	Shallow Conc I	595.0	594.8	325	0.0006

62	Sheet flow I	610.0	608.5	81	0.0190
	Sheet flow II	608.5	608.0	19	0.0260
	Shallow Conc I	608.0	603.0	295	0.0170
63	Sheet flow I	610.5	608.7	100	0.0180
	Shallow Conc I	608.7	606.3	168	0.0140
64	Sheet flow I	610.5	609.0	100	0.0150
	Shallow Conc I	609.0	607.1	155	0.0120
65	Sheet flow I	610.5	609.0	100	0.0150
	Shallow Conc I	609.0	606.7	174	0.0130
66	Sheet flow I	612.5	610.9	100	0.0160
	Shallow Conc I	610.9	608.5	150	0.0160
67	Sheet flow I	612.5	612.0	100	0.0050
	Shallow Conc I	612.0	610.0	135	0.0150
68	Sheet flow I	612.5	612.5	61	0.0008
	Sheet flow II	612.5	610.5	39	0.0500
	Shallow Conc I	610.5	607.0	157	0.0220
69	Sheet flow I	612.5	612.0	100	0.0050
	Shallow Conc I	612.0	610.3	124	0.0140
70	Sheet flow I	611.0	595.0	100	0.1600
	Shallow Conc I	595.0	594.6	141	0.0030
71	Sheet flow I	612.5	610.5	100	0.0200
	Shallow Conc I	610.5	609.7	91	0.0093
72	Sheet flow I	604.0	602.0	100	0.0200
	Shallow Conc I	602.0	601.0	25	0.0400
	Shallow Conc II	601.0	589.1	41	0.2900
	Shallow Conc III	589.1	583.5	433	0.0130
73	Sheet flow I	613.5	612.7	100	0.0085
	Shallow Conc I	612.7	611.2	110	0.0140
74	Sheet flow I	604.0	603.1	100	0.0095
	Shallow Conc I	603.1	597.1	239	0.0250
75	Sheet flow I	613.5	612.7	100	0.0080
	Shallow Conc I	612.7	612.4	75	0.0040
76	Sheet flow I	603.5	603.0	39	0.0120
	Sheet flow II	603.0	600.3	61	0.0440
	Shallow Conc I	600.3	599.8	30	0.0170
77	Sheet flow I	605.0	603.0	100	0.0200
	Shallow Conc I	603.0	602.6	14	0.0290
	Shallow Conc II	602.6	597.9	431	0.0110
78	Sheet flow I	603.0	602.0	41	0.0240
	Sheet flow II	602.0	598.3	59	0.0630
	Shallow Conc I	598.3	597.0	346	0.0038
79	Sheet flow I	613.5	611.7	100	0.0180
	Shallow Conc I	611.7	611.3	88	0.0048
80	Sheet flow I	628.0	626.8	100	0.0120
	Shallow Conc I	627.0	594.3	4092	0.0080
81	Sheet flow I	628.0	627.0	100	0.0100
	Shallow Conc I	627.0	594.7	4042	0.0080
82	Sheet flow I	628.0	626.8	100	0.0120
	Shallow Conc I	627.0	593.8	4151	0.0080

D. XP-SWMM
SUBCATCHMENT
INPUT PARAMETERS
- PROPOSED

Hydro

PROPOSED
DYNAMIC
2x2
DISCONNECT

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration (or Parameter 2) min	Node X	Node Y	Ponding Type	Area ac
N839	50-30min	1	98.000	6.000	1150664.639	1878961.327	Sealed	0.400
N839		2	98.000	6.000				0.500
N840	50-30min	1	94.000	6.000	1150692.188	1878894.831	Sealed	1.000
N840		2	98.000	6.000				0.400
N840		3	98.000	6.000				0.500
N840		4	92.000	5.000				0.500
N840		5	82.000	24.000				0.700
N841	50-30min	1	98.000	6.000	1150705.333	1878869.766	Sealed	1.000
N841		2	98.000	6.000				0.400
N841		3	98.000	6.000				0.500
N841		4	92.000	5.000				0.500
N841		5	82.000	24.000				0.700
N842	50-30min		0.000	0.000	1150889.586	1878948.893	Sealed	0.000
N843	50-30min	1	98.000	5.400	1151164.785	1879068.663	Sealed	1.100
N843		2	94.000	6.000				0.600
N843		3	98.000	6.000				0.300
N843		4	93.000	5.400				0.500
N843		5	84.000	5.000				1.000
N844	50-30min	1	98.000	5.000	1151529.952	1879221.882	Sealed	0.300
N844		2	98.000	35.400				0.500
N844		3	98.000	5.000				0.900
N844		4	92.000	5.000				0.400
N844		5	77.000	6.000				0.700
N845	50-30min	1	98.000	5.000	1151884.895	1879374.485	Sealed	0.800
N845		2	94.000	5.400				1.200
N845		3	77.000	13.200				0.700
N845		4	98.000	5.000				0.500
N846	50-30min	1	98.000	16.800	1152265.271	1879539.522	Sealed	0.900
N846		2	92.000	32.000				1.700
N846		3	98.000	5.000				0.400
N847	50-30min	1	98.000	9.000	1152505.479	1879638.431	Sealed	0.500
N847		2	98.000	12.600				0.400
N847		3	95.000	44.000				1.700

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration (or Parameter 2) min	Node X	Node Y	Ponding Type	Area ac
N847		4	81.000	17.400				1.400
N847		5	98.000	5.000				0.400
N848	50-30min		0.000	0.000	1152748.513	1879748.644	Sealed	0.000
N849	50-30min		0.000	0.000	1153136.236	1879914.246	Sealed	0.000
N850	50-30min	1	98.000	5.000	1153445.387	1880047.175	Sealed	1.100
N850		2	95.000	11.000				1.400
N850		3	87.000	17.400				1.200
N851	50-30min	1	98.000	9.000	1153909.988	1880245.450	Sealed	0.600
N853	50-30min	1	92.000	5.000	1150721.380	1878806.630	Sealed	0.500
N853		2	82.000	24.000				0.700
N854	50-30min	1	84.000	5.000	1151177.027	1878974.081	Sealed	1.000
N855	50-30min	1	93.000	5.400	1151167.812	1879007.950	Sealed	0.500
N856	50-30min	1	94.000	6.000	1151124.272	1879158.722	Sealed	0.600
N856		2	98.000	6.000				0.300
N857	50-30min	1	91.000	5.400	1151150.210	1879092.779	Sealed	1.100
N857		2	94.000	6.000				0.600
N857		3	98.000	6.000				0.300
N857		4	93.000	5.400				0.500
N857		5	84.000	5.000				1.000
N858	50-30min	1	77.000	6.000	1151563.649	1879152.161	Sealed	0.700
N858		2	98.000	5.000				0.600
N859	50-30min		0.000	0.000	1151473.771	1879306.435	Sealed	0.000
N860	50-30min	1	98.000	5.000	1151515.975	1879246.207	Sealed	0.300
N860		2	86.000	35.400				0.500
N860		3	98.000	5.000				0.900
N860		4	92.000	5.000				0.400
N860		5	77.000	6.000				0.700
N861	50-30min	1	94.000	5.400	1151839.535	1879476.128	Sealed	1.200
N862	50-30min	1	91.000	5.000	1151875.145	1879395.678	Sealed	0.800
N862		2	94.000	5.400				1.200
N862		3	77.000	13.200				0.700
N862		4	98.000	5.000				0.500
N863	50-30min	1	77.000	13.200	1151912.952	1879305.116	Sealed	0.700

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration (or Parameter 2) min	Node X	Node Y	Ponding Type	Area ac
N863		2	98.000	5.000				0.500
N864	50-30min	1	92.000	32.000	1152224.643	1879632.194	Sealed	1.700
N865	50-30min	1	91.000	16.800	1152260.252	1879560.536	Sealed	0.900
N865		2	92.000	32.000				1.700
N865		3	98.000	5.000				0.400
N866	50-30min	1	98.000	5.000	1152295.422	1879477.887	Sealed	0.400
N867	50-30min	1	95.000	44.000	1152469.512	1879737.263	Sealed	1.700
N869	50-30min	1	81.000	17.400	1152535.894	1879584.275	Sealed	1.400
N869		2	98.000	5.000				0.300
N869		3	98.000	6.000				0.100
N869		4	83.000	5.000				0.500
N870	50-30min	1	98.000	7.800	1152993.540	1879852.444	Sealed	0.900
N870		2	92.000	5.000				2.100
N870		3	82.000	7.200				1.200
N871	50-30min	1	82.000	7.200	1153016.840	1879793.095	Sealed	1.200
N872	50-30min	1	82.000	17.400	1153426.331	1879968.177	Sealed	1.200
N873	50-30min	1	93.000	10.000	1153692.259	1880261.565	Sealed	1.400
N874	50-30min	1	95.000	11.000	1153423.440	1880147.496	Sealed	1.400
N875	50-30min	1	95.000	5.000	1153452.421	1880074.005	Sealed	1.100
N875		2	95.000	11.000				1.400
N875		3	82.000	17.400				1.200
N876	50-30min	1	91.000	9.000	1153954.575	1880292.911	Sealed	0.600
N877	50-30min		0.000	0.000	1153903.315	1880266.317	Sealed	0.000
N878	50-30min		0.000	0.000	1154431.984	1880347.094	Sealed	0.000
N879	50-30min		0.000	0.000	1154374.609	1880455.568	Sealed	0.000
N881	50-30min	1	98.000	5.000	1155302.250	1880965.100	Sealed	0.400
N882	50-30min	1	98.000	5.000	1155328.797	1880886.547	Sealed	0.200
N882		2	88.000	16.200				0.400
N883	50-30min	1	98.000	5.000	1155114.108	1880801.359	Sealed	0.100
N884	50-30min		0.000	0.000	1155100.256	1880755.625	Sealed	0.000
N886	50-30min		0.000	0.000	1154741.155	1880604.503	Sealed	0.000
N888	50-30min		0.000	0.000	1154433.439	1880469.677	Sealed	0.000
N889	50-30min		0.000	0.000	1154398.368	1880454.692	Sealed	0.000

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration (or Parameter 2) min	Node X	Node Y	Ponding Type	Area ac
N890	50-30min	1	98.000	5.000	1155368.587	1880807.484	Sealed	0.200
N891	50-30min	1	98.000	5.000	1154852.531	1880763.812	Sealed	0.300
N892	50-30min	1	98.000	5.000	1154877.923	1880697.810	Sealed	0.100
N893	50-30min	1	98.000	5.000	1154626.750	1880667.555	Sealed	0.200
N894	50-30min	1	98.000	5.000	1154648.828	1880600.464	Sealed	0.200
N895	50-30min	1	81.000	22.200	1154786.707	1880519.630	Sealed	0.700
N895		2	75.000	9.000				0.300
N895		3	78.000	20.400				0.700
N896	50-30min	1	98.000	5.000	1154691.865	1880519.153	Sealed	0.200
N897	50-30min	1	98.000	5.000	1154914.107	1880612.348	Sealed	0.300
N898	50-30min	1	98.000	5.000	1154393.069	1880567.728	Sealed	0.300
N899	50-30min	1	98.000	5.000	1154422.292	1880507.599	Sealed	0.100
N900	50-30min	1	85.000	6.600	1154739.357	1880625.563	Sealed	0.500
N901	50-30min	1	85.000	8.400	1155105.993	1880782.597	Sealed	0.300
N902	50-30min	1	86.000	5.000	1154237.028	1880325.665	Sealed	0.600
N903	50-30min	1	86.000	5.000	1154219.065	1880408.992	Sealed	0.200
N904	50-30min	1	92.000	5.000	1154191.123	1880474.855	Sealed	0.400
N905	50-30min	1	98.000	5.000	1154212.579	1880418.472	Sealed	0.100
N906	50-30min		0.000	0.000	1154023.140	1880432.946	Sealed	0.000
N907	50-30min	1	92.000	29.000	1154028.550	1880412.049	Sealed	0.800
N908	50-30min	1	92.000	5.000	1152996.089	1879958.166	Sealed	2.100
N909	50-30min	1	90.000	7.800	1153012.432	1879886.108	Sealed	0.900
N909		2	92.000	5.000				2.100
N909		3	82.000	7.200				1.200
N910	50-30min	1	98.000	9.600	1152688.126	1879721.636	Sealed	0.800
N910		2	93.000	43.000				3.000
N910		3	87.000	13.200				0.900
N910		4	83.000	5.000				0.500
N911	50-30min	1	92.000	9.600	1152677.462	1879741.186	Sealed	0.800
N911		2	93.000	43.000				3.000
N911		3	87.000	13.200				0.900
N911		4	83.000	5.000				0.500
N913	50-30min	1	98.000	5.000	1151411.913	1879282.480	Sealed	0.300

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration (or Parameter 2) min	Node X	Node Y	Ponding Type	Area ac
N913		2	92.000	5.000				0.400
N914	50-30min	1	89.000	45.000	1149836.717	1878613.265	Sealed	12.900
N915	50-30min		0.000	0.000	1150164.921	1878661.114	Sealed	0.000
N916	50-30min		0.000	0.000	1150308.759	1878714.482	Sealed	0.000
N918	50-30min	1	91.000	45.000	1149708.861	1878464.850	Sealed	8.000
N919	50-30min	1	86.000	45.000	1150054.180	1878455.808	Sealed	13.400
N920	50-30min		0.000	0.000	1150136.386	1878733.269	Sealed	0.000
N921	50-30min	1	93.000	10.000	1153829.408	1880212.313	Sealed	1.400
N921		2	87.000	5.000				1.300
N922	50-30min	1	83.000	5.000	1153856.729	1880147.888	Sealed	1.300
N923	50-30min	1	93.000	43.000	1152558.247	1879771.162	Sealed	3.000
N924	50-30min	1	87.000	13.200	1152717.730	1879674.245	Sealed	0.900
N925	50-30min	1	90.000	7.800	1154617.457	1880691.227	Sealed	0.400
N925		2	93.000	14.000				1.900
N925		3	87.000	13.200				0.700
N926	50-30min	1	86.000	5.400	1154397.416	1880477.100	Sealed	0.500
N928	50-30min	1	98.000	5.000	1155089.448	1880868.249	Sealed	0.300
N929	50-30min	1	98.000	5.000	1155163.660	1880723.150	Sealed	0.200
N931	50-30min		0.000	0.000	1154323.410	1880558.467	Sealed	0.000
N932	50-30min		0.000	0.000	1153806.544	1880339.073	Sealed	0.000
N933	50-30min		0.000	0.000	1154841.187	1880684.971	Sealed	0.000
N934	50-30min		0.000	0.000	1154358.694	1880242.090	Sealed	0.000
N935	50-30min		0.000	0.000	1153689.329	1880692.785	Sealed	0.000
N936	50-30min		0.000	0.000	1153021.447	1879909.717	Allowed	0.000
N937	50-30min		0.000	0.000	1153123.628	1879950.589	Allowed	0.000
N938	50-30min		0.000	0.000	1153439.010	1880087.126	Allowed	0.000
N939	50-30min		0.000	0.000	1153889.382	1880280.995	Allowed	0.000
OUT1	50-30min		0.000	0.000	1153628.646	1880862.506	Sealed	0.000
OUT2	50-30min		0.000	0.000	1150302.557	1879092.930	Sealed	0.000
SAG	50-30min	1	90.000	9.000	1152501.165	1879666.924	Sealed	0.500
SAG		2	92.000	12.600				0.400
SAG		3	95.000	44.000				1.700
SAG		4	81.000	17.400				1.400

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration (or Parameter 2) min	Node X	Node Y	Ponding Type	Area ac
SAG		5	98.000	5.000				0.400
WET WELL	50-30min		0.000	0.000	1154384.187	1880324.577	Sealed	0.000

Hydro

PROPOSED
DYNAMIC
SELECTED
ALTERNATIVE C

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration (or Parameter 2) min	Node X	Node Y	Area ac
N839	50-30min	1	98.000	6.000	1150664.639	1878961.327	0.400
N839		2	98.000	6.000			0.500
N840	50-30min	1	98.000	6.000	1150692.949	1878894.831	1.000
N841	50-30min		0.000	0.000	1150706.094	1878869.766	0.000
N842	50-30min		0.000	0.000	1150889.586	1878948.893	0.000
N843	50-30min		0.000	0.000	1151164.163	1879068.041	0.000
N844	50-30min		0.000	0.000	1151529.952	1879221.882	0.000
N845	50-30min		0.000	0.000	1151884.895	1879374.485	0.000
N846	50-30min		0.000	0.000	1152265.271	1879539.522	0.000
N847	50-30min		0.000	0.000	1152505.479	1879638.431	0.000
N848	50-30min		0.000	0.000	1152748.513	1879748.644	0.000
N849	50-30min		0.000	0.000	1153136.236	1879914.246	0.000
N850	50-30min		0.000	0.000	1153443.702	1880046.501	0.000
N851	50-30min		0.000	0.000	1153909.988	1880245.450	0.000
WET WELL	50-30min		0.000	0.000	1154384.187	1880324.577	0.000
N853	50-30min	1	92.000	5.000	1150721.380	1878806.630	0.500
N853		2	82.000	24.000			0.700
N854	50-30min	1	84.000	5.000	1151177.027	1878974.081	1.000
N855	50-30min	1	93.000	5.400	1151167.812	1879007.950	0.500
N856	50-30min	1	94.000	6.000	1151124.272	1879158.722	0.600
N856		2	98.000	6.000			0.300
N857	50-30min	1	98.000	5.400	1151150.210	1879092.779	1.100
N858	50-30min	1	77.000	6.000	1151563.649	1879152.161	0.700
N858		2	98.000	5.000			0.600
N859	50-30min		0.000	0.000	1151473.771	1879306.435	0.000
N860	50-30min	1	98.000	5.000	1151515.975	1879246.207	0.300
N860		2	98.000	35.400			0.500
N861	50-30min	1	94.000	5.400	1151839.535	1879476.128	1.200
N862	50-30min	1	98.000	5.000	1151875.145	1879395.678	0.800
N863	50-30min	1	77.000	13.200	1151912.952	1879305.116	0.700
N863		2	98.000	5.000			0.500
N864	50-30min	1	92.000	32.000	1152225.862	1879632.194	1.700
N865	50-30min	1	98.000	16.800	1152260.252	1879560.536	0.900
N866	50-30min	1	98.000	5.000	1152295.422	1879477.887	0.400

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration (or Parameter 2) min	Node X	Node Y	Area ac
N867	50-30min	1	95.000	44.000	1152469.512	1879737.263	1.700
SAG	50-30min	1	98.000	9.000	1152501.165	1879666.924	0.500
SAG		2	98.000	12.600			0.400
N869	50-30min	1	81.000	17.400	1152535.894	1879584.275	1.400
N869		2	98.000	5.000			0.300
N869		3	98.000	6.000			0.100
N869		4	83.000	5.000			0.500
N870	50-30min		0.000	0.000	1152993.540	1879852.444	0.000
N871	50-30min	1	82.000	7.200	1153016.840	1879793.095	1.200
N872	50-30min	1	87.000	17.400	1153426.331	1879968.177	1.200
N873	50-30min	1	93.000	10.000	1153692.259	1880261.565	1.400
N874	50-30min	1	95.000	11.000	1153423.440	1880147.496	1.400
N875	50-30min	1	98.000	5.000	1153452.421	1880074.005	1.100
N876	50-30min	1	98.000	9.000	1153954.575	1880292.911	0.600
N877	50-30min		0.000	0.000	1153903.315	1880266.317	0.000
N878	50-30min		0.000	0.000	1154431.984	1880347.094	0.000
N879	50-30min		0.000	0.000	1154374.609	1880455.568	0.000
OUT1	50-30min		0.000	0.000	1153628.646	1880862.506	0.000
N881	50-30min	1	98.000	5.000	1155302.250	1880965.100	0.400
N882	50-30min	1	98.000	5.000	1155328.797	1880886.547	0.200
N882		2	98.000	16.200			0.400
N883	50-30min	1	98.000	5.000	1155114.108	1880801.359	0.100
N884	50-30min		0.000	0.000	1155100.256	1880755.625	0.000
N886	50-30min		0.000	0.000	1154741.155	1880604.503	0.000
N888	50-30min		0.000	0.000	1154433.439	1880469.677	0.000
N889	50-30min		0.000	0.000	1154398.368	1880454.692	0.000
N890	50-30min	1	98.000	5.000	1155368.587	1880807.484	0.200
N891	50-30min	1	98.000	5.000	1154852.531	1880763.812	0.300
N892	50-30min	1	98.000	5.000	1154877.923	1880697.810	0.100
N893	50-30min	1	98.000	5.000	1154626.750	1880667.555	0.200
N894	50-30min	1	98.000	5.000	1154648.828	1880600.464	0.200
N895	50-30min	1	81.000	22.200	1154786.707	1880519.630	0.700
N895		2	75.000	9.000			0.300
N895		3	78.000	20.400			0.700

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration (or Parameter 2) min	Node X	Node Y	Area ac
N896	50-30min	1	98.000	5.000	1154691.865	1880519.153	0.200
N897	50-30min	1	98.000	5.000	1154914.107	1880612.348	0.300
N898	50-30min	1	98.000	5.000	1154393.069	1880567.728	0.300
N899	50-30min	1	98.000	5.000	1154422.292	1880507.599	0.100
N900	50-30min	1	98.000	6.600	1154739.357	1880625.563	0.500
N901	50-30min	1	98.000	8.400	1155105.993	1880782.597	0.340
N902	50-30min	1	88.000	5.000	1154237.028	1880325.665	0.600
N903	50-30min	1	98.000	5.000	1154219.065	1880408.992	0.200
N904	50-30min	1	92.000	5.000	1154191.123	1880474.855	0.400
N905	50-30min	1	98.000	5.000	1154212.579	1880418.472	0.100
N906	50-30min		0.000	0.000	1154023.140	1880432.946	0.000
N907	50-30min	1	92.000	29.000	1154028.550	1880412.049	0.800
N908	50-30min	1	92.000	5.000	1152996.089	1879958.166	2.100
N909	50-30min	1	98.000	7.800	1153012.432	1879886.108	0.900
N910	50-30min		0.000	0.000	1152688.126	1879721.636	0.000
N911	50-30min	1	98.000	9.600	1152677.462	1879741.186	0.800
N913	50-30min	1	98.000	5.000	1151411.913	1879282.480	0.300
N913		2	92.000	5.000			0.400
N914	50-30min	1	89.000	45.000	1149836.717	1878613.265	12.900
N915	50-30min		0.000	0.000	1150164.921	1878661.114	0.000
N916	50-30min		0.000	0.000	1150308.759	1878714.482	0.000
OUT2	50-30min		0.000	0.000	1150302.557	1879092.930	0.000
N918	50-30min	1	98.000	45.000	1149708.861	1878464.850	8.000
N919	50-30min	1	86.000	45.000	1150054.180	1878455.808	13.400
N920	50-30min		0.000	0.000	1150136.386	1878733.269	0.000
N921	50-30min		0.000	0.000	1153827.723	1880211.639	0.000
N922	50-30min	1	87.000	5.000	1153856.729	1880147.888	1.300
N923	50-30min	1	93.000	43.000	1152558.247	1879771.162	3.000
N924	50-30min	1	87.000	13.200	1152717.730	1879674.245	0.900
N925	50-30min	1	90.000	7.800	1154617.457	1880691.227	0.400
N925		2	93.000	14.000			1.900
N925		3	87.000	13.200			0.700
N926	50-30min	1	98.000	5.400	1154397.416	1880477.100	0.500
N928	50-30min	1	98.000	5.000	1155089.448	1880868.249	0.300

Hydro

Name	Storm	Subcatchment	Pervious Area Curve Number	Time of Concentration (or Parameter 2) min	Node X	Node Y	Area ac
N929	50-30min	1	98.000	5.000	1155163.660	1880723.150	0.200
N931	50-30min		0.000	0.000	1154323.410	1880558.467	0.000
N932	50-30min		0.000	0.000	1153806.544	1880339.073	0.000
N933	50-30min		0.000	0.000	1154841.187	1880684.971	0.000
N100	50-30min	1	98.000	10.000	1151106.140	1879200.941	0.120
N101	50-30min	1	98.000	5.000	1151388.559	1879320.542	0.160
N102	50-30min	1	98.000	7.000	1151817.715	1879513.511	0.310
N103	50-30min	1	98.000	30.000	1152205.663	1879671.304	0.950
N104	50-30min	1	98.000	30.000	1152449.890	1879773.819	1.200
N105	50-30min	1	98.000	30.000	1152539.339	1879812.011	2.000
N106	50-30min	1	98.000	10.000	1152986.585	1879997.945	1.230
N107	50-30min	1	98.000	11.000	1153406.695	1880178.853	0.800
N108	50-30min	1	98.000	10.000	1153676.048	1880291.419	0.800
N945	50-30min		0.000	0.000	1153688.570	1880674.273	0.000
N946	50-30min		0.000	0.000	1154387.900	1880248.387	0.000
N947	50-30min		0.000	0.000	1154280.874	1880320.458	0.000
N948	50-30min		0.000	0.000	1154377.853	1880283.048	0.000
N949	50-30min		0.000	0.000	1154278.210	1880308.574	0.000
N950	50-30min		0.000	0.000	1153170.272	1879825.282	0.000

E. CURVE NUMBER (CN) CALCULATION SHEETS - PROPOSED

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 19 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: EXISTING [✓ PROPOSED] Description: N861

ALTERNATIVE 2

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.6	58.8
C	Pervious (grass)	74			0.2	14.8
		Totals =			0.8	73.6

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{73.6}{0.8} = $ 92

Use CN = **92**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 25 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: EXISTING [✓ PROPOSED] Description: N864
ALTERNATIVE 2

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			1	98
C	Pervious (grass)	74			0	0
				Totals =	1	98

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{98}{1} = \underline{98}$$

Use CN = **98**

Runoff Curve Number

Project: IDOT - 110203.00001 By: AMP Date: 2/21/2014
Location: subbasin 31 Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: EXISTING [✓ PROPOSED] Description:

ALTERNATIVE 2

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number Table 2-2	Curve Number Fig. 2-3	Curve Number Fig. 2-4	Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
C	impervious (road)	98			0.3	29.4
C	Pervious (grass)	74			0.2	14.8
				Totals =	0.5	44.2

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{44.2}{0.5} = \underline{88.4}$$

Use CN = **88**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 32
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: EXISTING [✓ PROPOSED]
Description: N923

ALTERNATIVE 2

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.4	39.2
C	Pervious (grass)	74			0.6	44.4
				Totals =	1	83.6

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{83.6}{1} = 83.6$$

Use CN = **84**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 43
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: EXISTING [✓ PROPOSED]
Description: N874

ALTERNATIVE 2

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.4	39.2
C	Pervious (grass)	74			0.2	14.8
				Totals =	0.6	54

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{54}{0.6} = $ 90

Use CN = **90**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP Date: 2/21/2014
Location: subbasin 45
Checked: DEV Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: EXISTING [✓ PROPOSED] Description: N873

ALTERNATIVE 2

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.3	29.4
C	Pervious (grass)	74			0.3	22.2
			Totals =		0.6	51.6

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{51.6}{0.6} = \underline{86}$$

Use CN = **86**

Runoff Curve Number

Project: IDOT - 110203.00001
By: AMP
Date: 2/21/2014
Location: subbasin 72
Checked: DEV
Date: 2/21/2014
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: EXISTING [✓ PROPOSED]
ALTERNATIVE 2
Description: N908

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.38	37.24
C	Pervious (grass)	74			0.49	36.26
				Totals =	0.87	73.5

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{73.5}{0.87} = \underline{84.483}$$

Use CN = **84**

Runoff Curve Number

Project: IDOT - 110203.00001
By: EMB
Date: 8/2/2019
Location: subbasin 41
Checked: IAD
Date: 8/2/2019
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: EXISTING [✓ PROPOSED]
Description: N872

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number			Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	impervious (road)	98			0.66	64.68
C	Pervious (grass)	74			0.54	39.96
				Totals =	1.2	104.64

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{104.64}{1.2} = 87.2$$

Use CN = **87**

Runoff Curve Number

Project: IDOT - 110203.00001 By: EMB Date: 8/2/2019
Location: subbasin 46 Checked: IAD Date: 8/2/2019
File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: EXISTING [✓ PROPOSED] Description: N922

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number Table 2-2	Fig. 2-3	Fig. 2-4	Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
C	impervious (road)	98			0.69	67.62
C	Pervious (grass)	74			0.61	45.14
				Totals =	1.3	112.76

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{112.76}{1.3} = \underline{86.738}$$

Use CN = **87**

Runoff Curve Number

Project: IDOT - 110203.00001 By: EMB Date: 8/20/2019

Location: subbasin 52 Checked: IAD Date: 8/20/2019

File: N:\Idot\110203.00001\Drain\Spreadsheets\Pump Station 30\

Circle One: EXISTING [✓ PROPOSED] Description: N902

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number Table 2-2	Curve Number Fig. 2-3	Curve Number Fig. 2-4	Area ☒ acres ☐ sq. mi. ☐ %	Product of Curve Number and Area
C	impervious (road)	98			0.36	35.28
C	Pervious (grass)	74			0.27	19.98
				Totals =	0.63	55.26

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{55.26}{0.63} = \underline{87.714}$$

Use CN = **88**

F. BULLETIN 70
RAINFALL
DEPTHS

SPACECO, INC.
Suite 700
9575 West Higgins Road
ROSEMONT, ILLINOIS 60018
(708) 696-4060

JOB E1495 IDOT PUMP STATION #30

SHEET NO. 1 OF 1

CALCULATED BY MB DATE 3/6/95

CHECKED BY JAD DATE 7/21/95

SCALE RAINFALL DEPTHS FOR PUMP STATION TR-20

RAINFALL DEPTHS FOR PUMP STATION CRITICAL DURATION ANALYSIS

50-YEAR, 24-HOUR DEPTH = 6.6"

100-YR, 24-HR = 7.50"

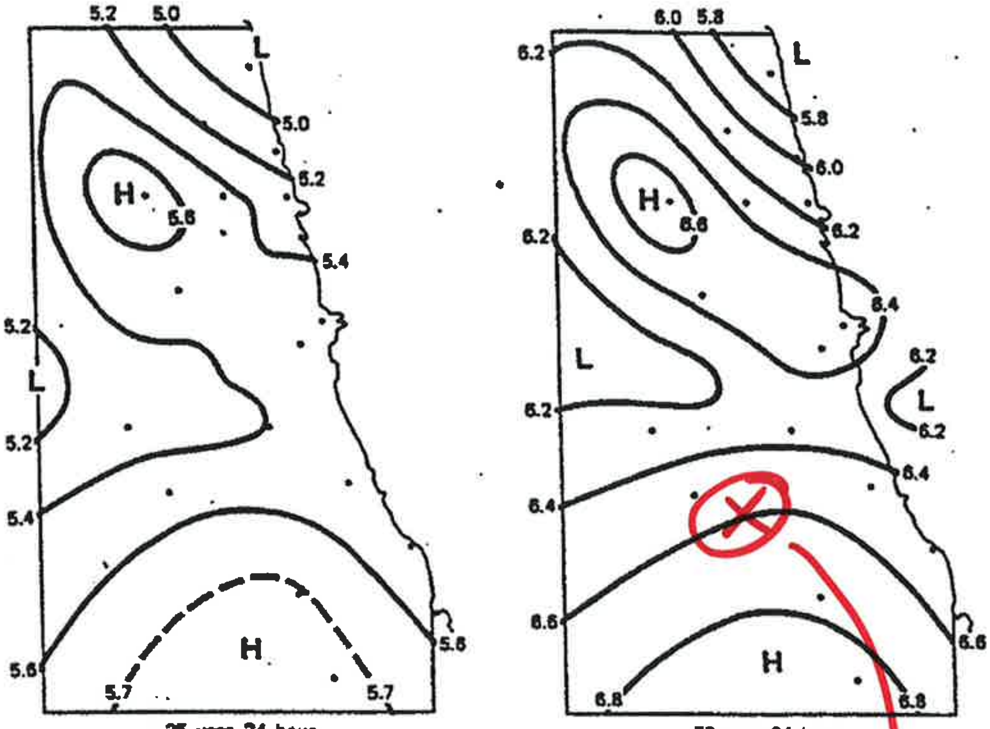
50-YR

STORM DURATION (HRS.)	RATIO XHR/24HR	RAINFALL DEPTH (IN.)	100-YR RAINFALL DEPTH (in.)
0.5	0.37	2.44	2.78
1	0.47	3.10	3.53
2	0.58	3.83	4.35
3	0.64	4.22	4.80
6	0.75	4.95	5.63
12	0.87	5.74	6.53
18	0.94	6.20	7.05
0.25	0.27	1.78	2.03

FOR 0.5 THROUGH 6 HOUR DURATION STORMS, USE 1ST QUARTILE DISTRIBUTION. FOR 12 HOUR DURATION STORM, USE 2ND QUARTILE DISTRIBUTION.

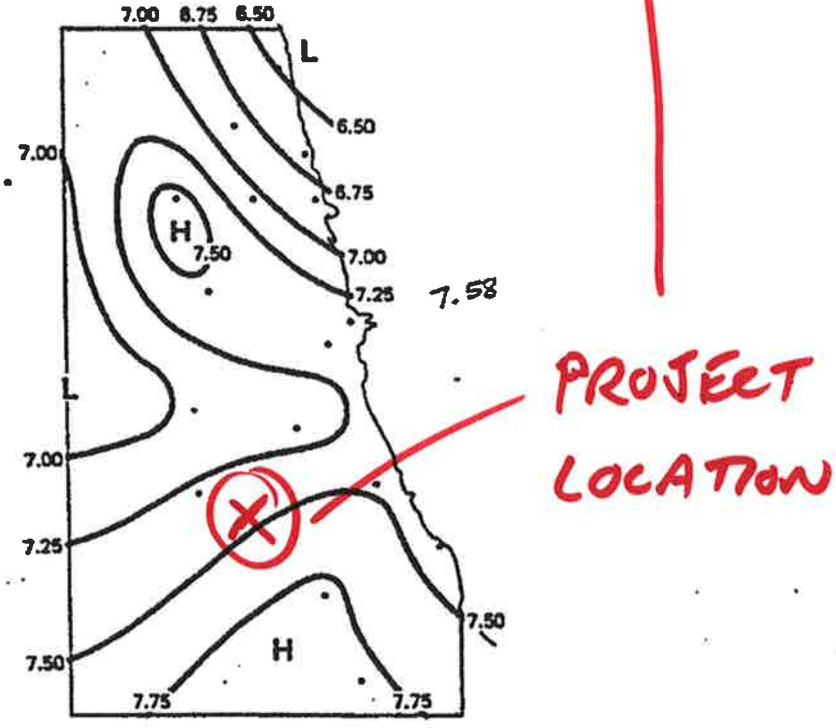
10-YEAR, 24-HOUR DEPTH = 4.5"

STORM DURATION (HRS.)	RATIO XHR/24HR	RAINFALL DEPTH (IN.)
0.5	0.37	1.67
1	0.47	2.12
2	0.58	2.61
3	0.64	2.88
6	0.75	3.38
12	0.87	3.92



25-year, 24-hour

50-year, 24-hour

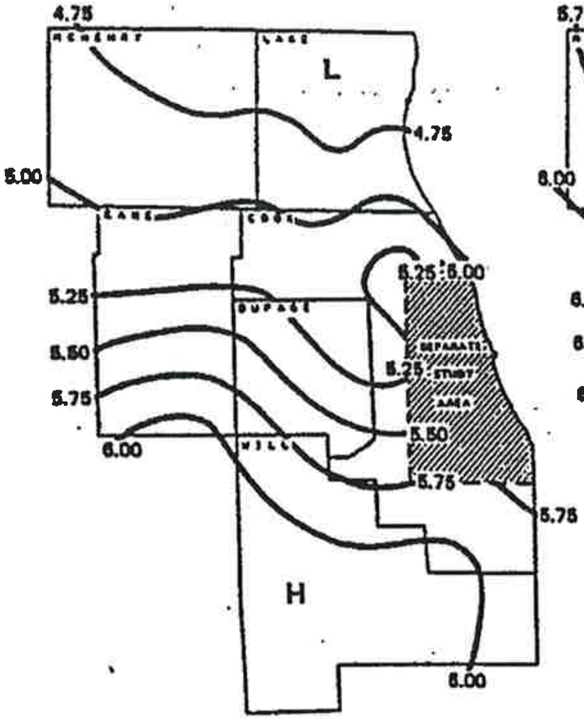


7.58

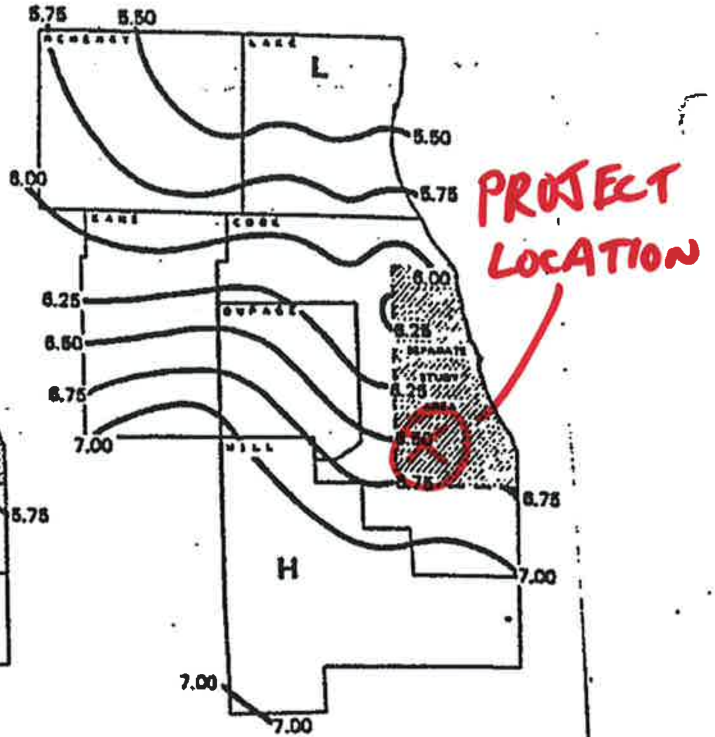
PROJECT LOCATION

100-year, 24-hour

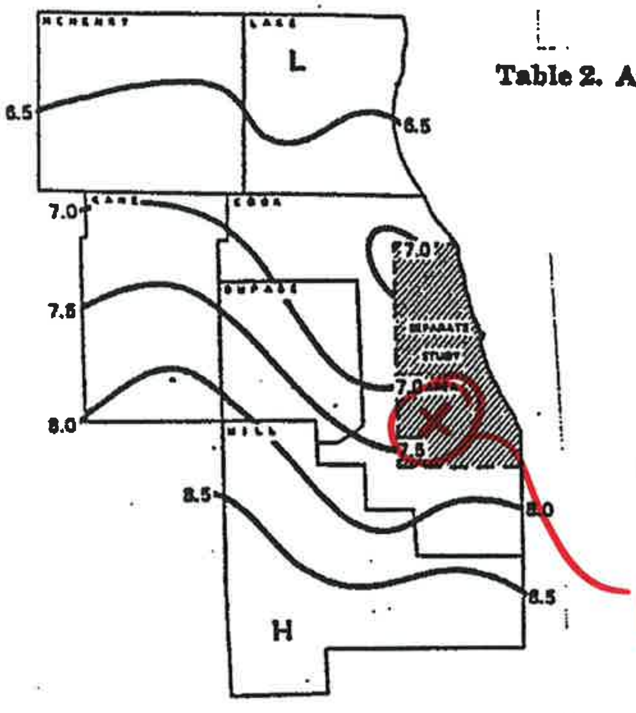
Figure 4-202f
Page 2



25-year, 24-hour



50-year, 24-hour



100-year, 24-hour

Table 2. Average Ratios of X-Hour/24-Hour Rainfall for Illinois

Storm period (hours)	*Ratio, x-hr/24-hr*
0.08 (5 min.)	0.12
0.17 (10 min.)	0.21
0.25	0.27
0.50	0.37
1	0.47
2	0.58
3	0.64
6	0.75
12	0.87
18	0.94
24	1.00
48	1.08
72	1.16

Figure 4-202f

100YR, 24-HR = 7.50 in

100YR, 1-HR = 3.53 in

Table 3. Median Time Distributions of Heavy Storm Rainfall at a Point

	Cumulative percent of storm rainfall for given storm type			
Cumulative percent of storm time	*First-quartile*	*Second-quartile*	*Third-quartile*	*Fourth-quartile*
5	16	3	3	2
10	33	8	6	5
15	43	12	9	8
20	52	16	12	10
25	60	22	15	13
30	66	29	19	16
35	71	39	23	19
40	75	51	27	22
45	79	62	32	25
50	82	70	38	28
55	84	76	45	32
60	86	81	57	35
65	88	85	70	39
70	90	88	79	45
75	92	91	85	51
80	94	93	89	59
85	96	95	92	72
90	97	97	95	84
95	98	98	97	92

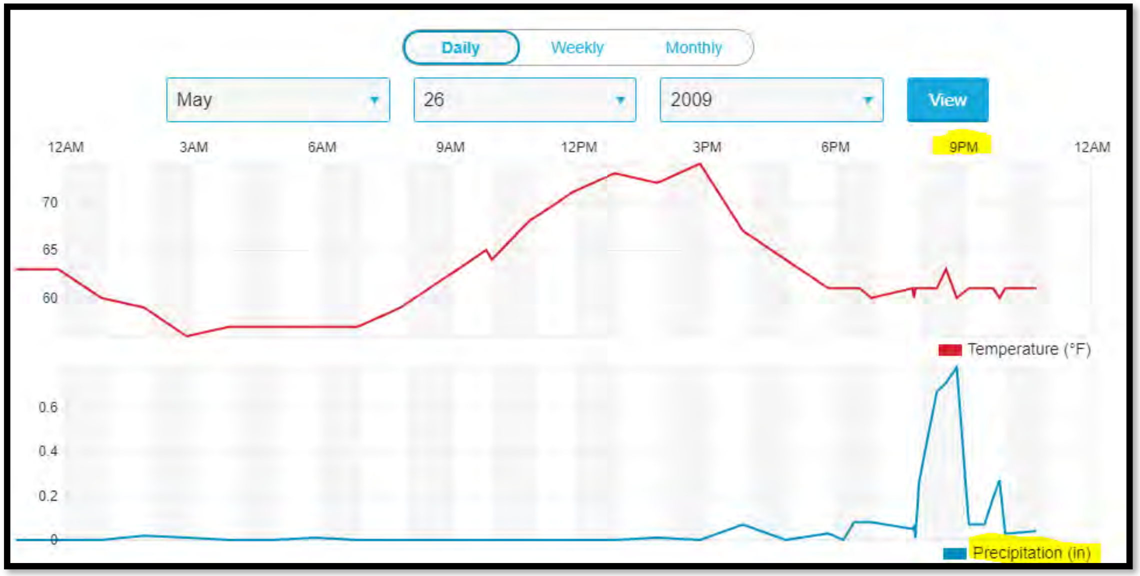
Table 4. Median Time Distributions of Heavy Storm Rainfall on Areas of 10 to 50 Square Miles

	Cumulative percent of storm rainfall for given storm type			
Cumulative percent of storm time	*First-quartile*	*Second-quartile*	*Third-quartile*	*Fourth-quartile*
5	12	3	2	2
10	25	6	5	4
15	38	10	8	7
20	51	14	12	9
25	62	21	14	11
30	69	30	17	13
35	74	40	20	15
40	78	52	23	18
45	81	63	27	21
50	84	72	33	24
55	86	78	42	27
60	88	83	55	30
65	90	87	69	34
70	92	90	79	40
75	94	92	86	47
80	95	94	91	57
85	96	96	94	74
90	97	97	96	88
95	98	98	98	95

Project Number: 110203
Project Name: I-55 Pump Station 30
Calc By: JMT Date: 12/6/2021
Check By: IAD Date: 12/6/2021

MAY 26, 2009 EVENT ANALYSIS

TIME	PRECIP (IN)
10:51 PM	0.0
11:51 PM	0.0
12:51 AM	0.0
1:51 AM	0.0
2:51 AM	0.0
3:51 AM	0.0
4:33 AM	0.0
4:51 AM	0.0
5:51 AM	0.0
6:51 AM	0.0
7:51 AM	0.0
8:51 AM	0.0
9:12 AM	0.0
9:51 AM	0.0
9:59 AM	0.0
10:51 AM	0.0
11:32 AM	0.0
11:51 AM	0.0
12:51 PM	0.0
1:51 PM	0.0
2:51 PM	0.0
3:51 PM	0.1
4:51 PM	0.0
5:51 PM	0.0
6:12 PM	0.0
6:27 PM	0.1
6:35 PM	0.1
6:51 PM	0.1
7:49 PM	0.1
7:51 PM	0.1
7:53 PM	0.0
7:56 PM	0.1
7:58 PM	0.3
8:23 PM	0.7
8:36 PM	0.7
8:51 PM	0.8
9:08 PM	0.1
9:30 PM	0.1
9:42 PM	0.2
9:51 PM	0.3
9:59 PM	0.0
10:01 PM	0.0
10:06 PM	0.0
10:43 PM	0.0



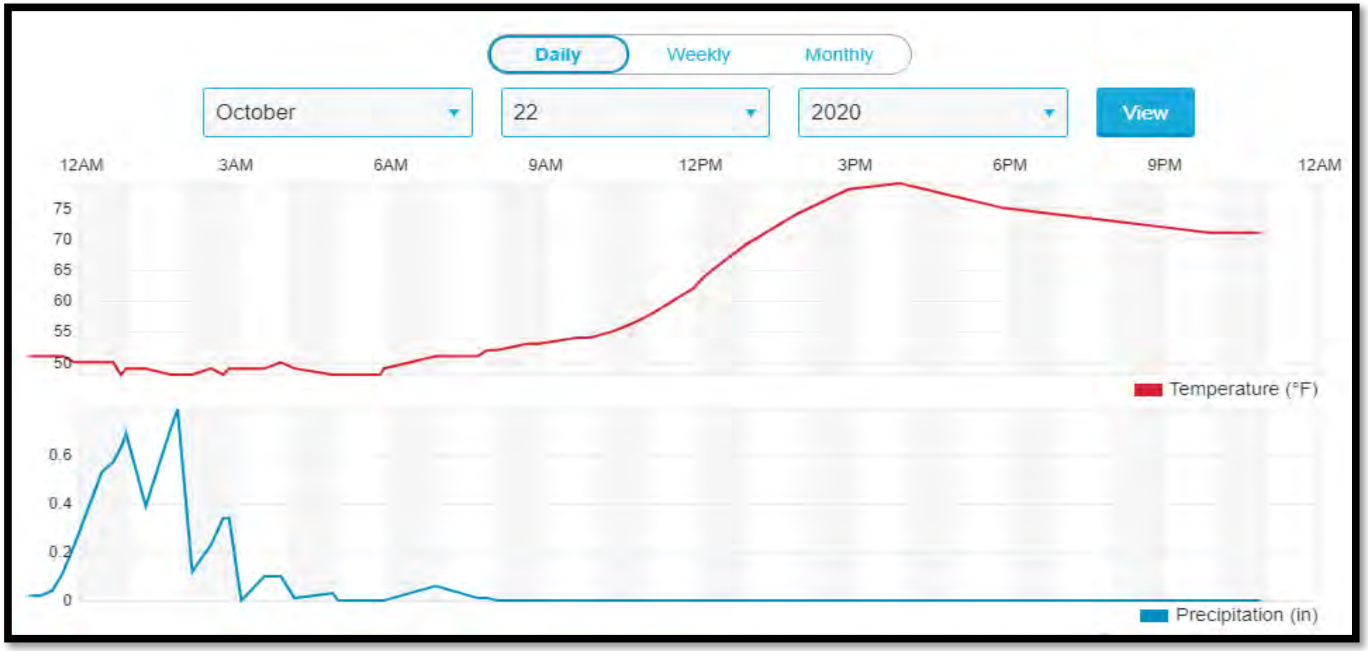
Source: https://www.wunderground.com/history/daily/us/il/chicago/KMDW/date/2009-5-26

PRECIPITATION DATA			
24-HR	3.9 IN	BULLETIN 75 EQUIVALENT STORM:	3.8 YR
PEAK 2HR	3.3 IN	BULLETIN 75 EQUIVALENT STORM:	16.2 YR
PEAK 1HR	2.7 IN	BULLETIN 75 EQUIVALENT STORM:	16.9 YR
PEAK 30MIN	1.5 IN	BULLETIN 75 EQUIVALENT STORM:	4.2 YR
PEAK 15MIN	0.8 IN	BULLETIN 75 EQUIVALENT STORM:	1.3 YR

Project Number: 110203
Project Name: I-55 Pump Station 30
Calc By: JMT Date: 12/9/2021
Check By: IAD Date: 12/9/2021

OCTOBER 22, 2020 EVENT ANALYSIS

TIME	PRECIP (IN)
11:00 PM	0.0
11:14 PM	0.0
11:27 PM	0.0
11:39 PM	0.1
11:53 PM	0.2
12:25 AM	0.5
12:38 AM	0.6
12:47 AM	0.6
12:53 AM	0.7
1:16 AM	0.4
1:45 AM	0.7
1:53 AM	0.8
2:10 AM	0.1
2:32 AM	0.2
2:46 AM	0.3
2:53 AM	0.3
3:07 AM	0.0
3:34 AM	0.1
3:53 AM	0.1
4:09 AM	0.0
4:53 AM	0.0
5:00 AM	0.0



Source: https://www.wunderground.com/history/daily/us/il/chicago/KMDW/date/2020-10-22

PRECIPITATION DATA			
24-HR	5.8 IN	BULLETIN 75 APPROXIMATE STORM:	15.0 YR
PEAK 3HR	5.4 IN	BULLETIN 75 APPROXIMATE STORM:	100.0 YR
PEAK 2HR	4.5 IN	BULLETIN 75 APPROXIMATE STORM:	75.0 YR
PEAK 1HR	2.6 IN	BULLETIN 75 APPROXIMATE STORM:	15.0 YR
PEAK 30MIN	1.9 IN	BULLETIN 75 APPROXIMATE STORM:	10.0 YR
PEAK 15MIN	1.5 IN	BULLETIN 75 APPROXIMATE STORM:	15.0 YR

G. PS 30
SUBBASIN
MAP

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT	Illinois Department of Transportation	JOB#	11-0203.00001
TITLE	Subbasin Map		

DSGN.	CHKD.	
DEV		
DATE		
12-09-21		EXHIBIT 9-1A

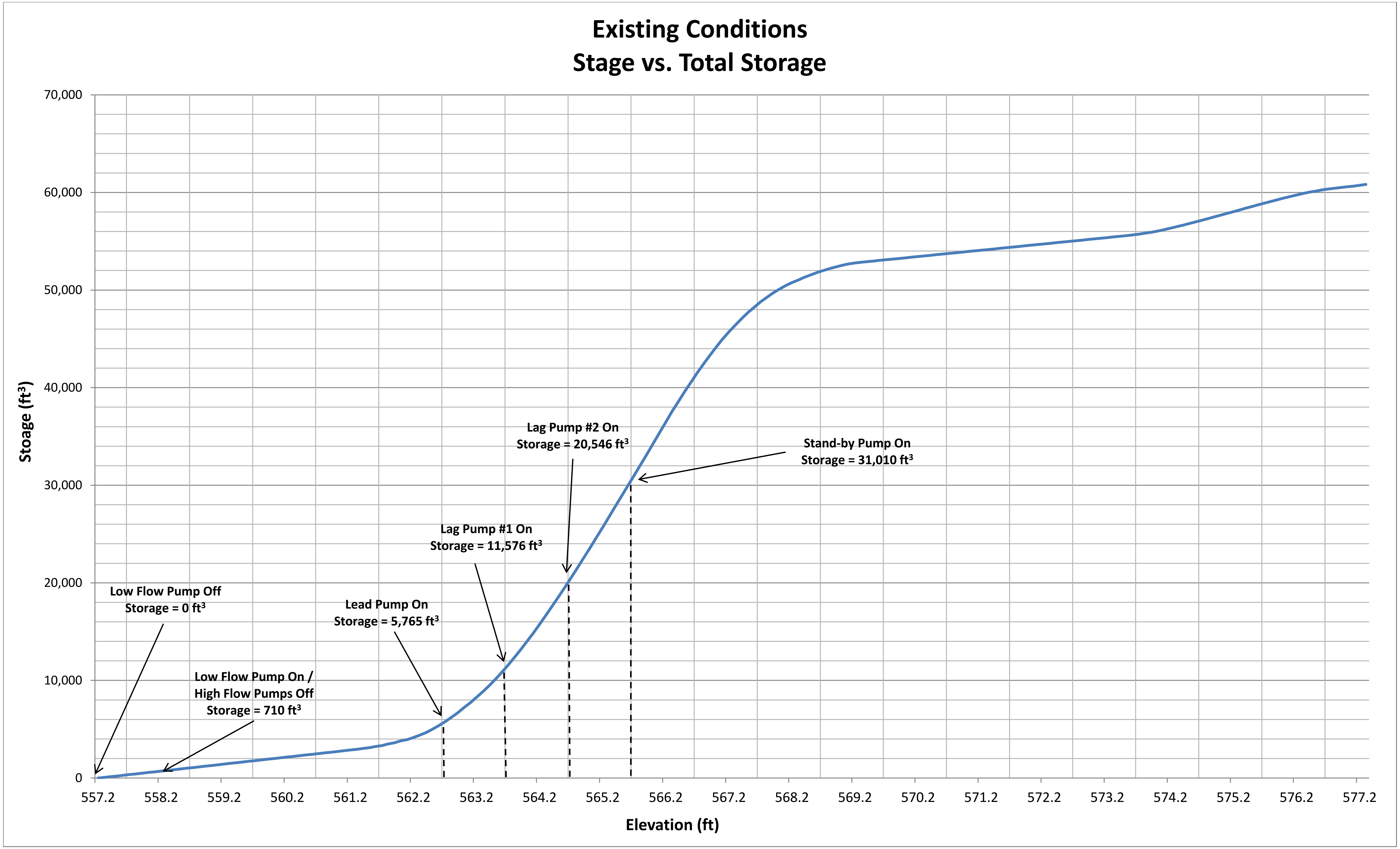
CBBE

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

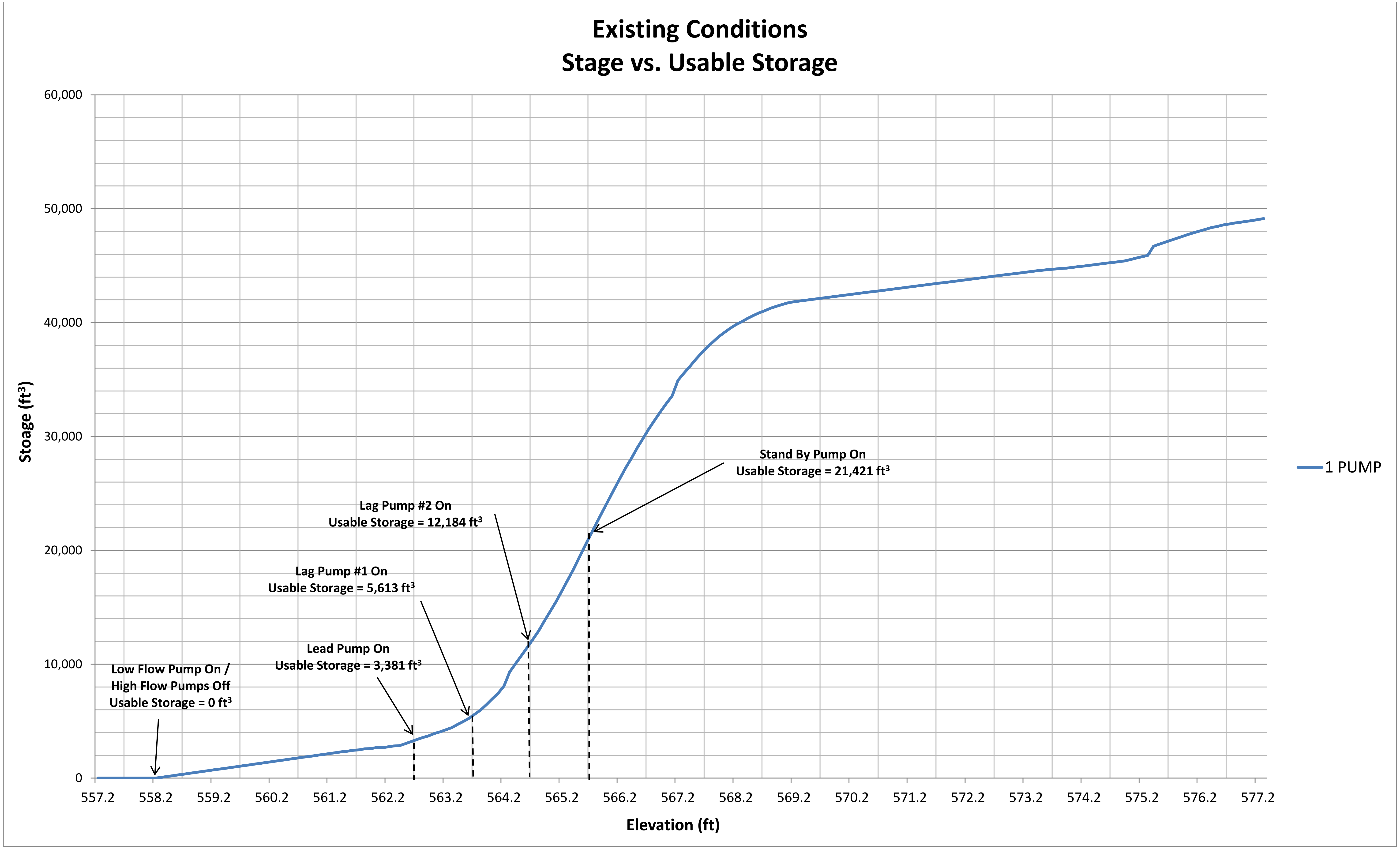
CLIENT	Illinois Department of Transportation	JOB# 11-0203.00001	DSGN. DEV	CHKD.	
TITLE	Subbasin Map		DATE 08-06-13		EXHIBIT 9-1B

Section 10
Storage Volume Calculations and Plots

EXISTING CONDITIONS



Existing Conditions
Stage vs. Total Storage



Existing Conditions
Stage vs. Usable Storage

Low Flow Pump On / High Flow Pumps Off Usable Storage = 0 ft³

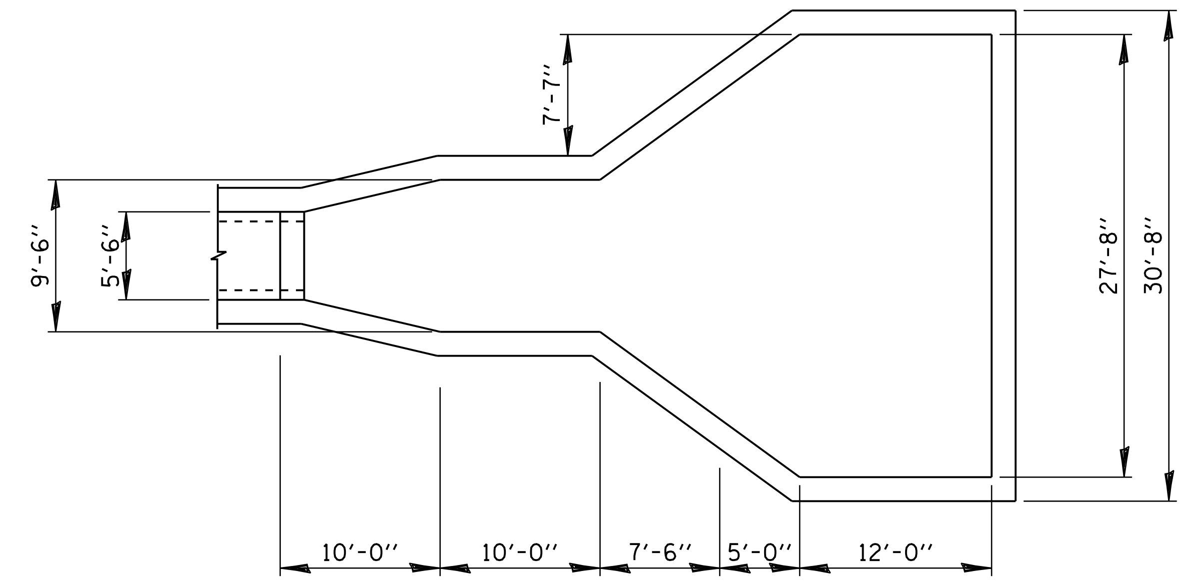
Lead Pump On Usable Storage = 3,381 ft³

Lag Pump #1 On Usable Storage = 5,613 ft³

Lag Pump #2 On Usable Storage = 12,184 ft³

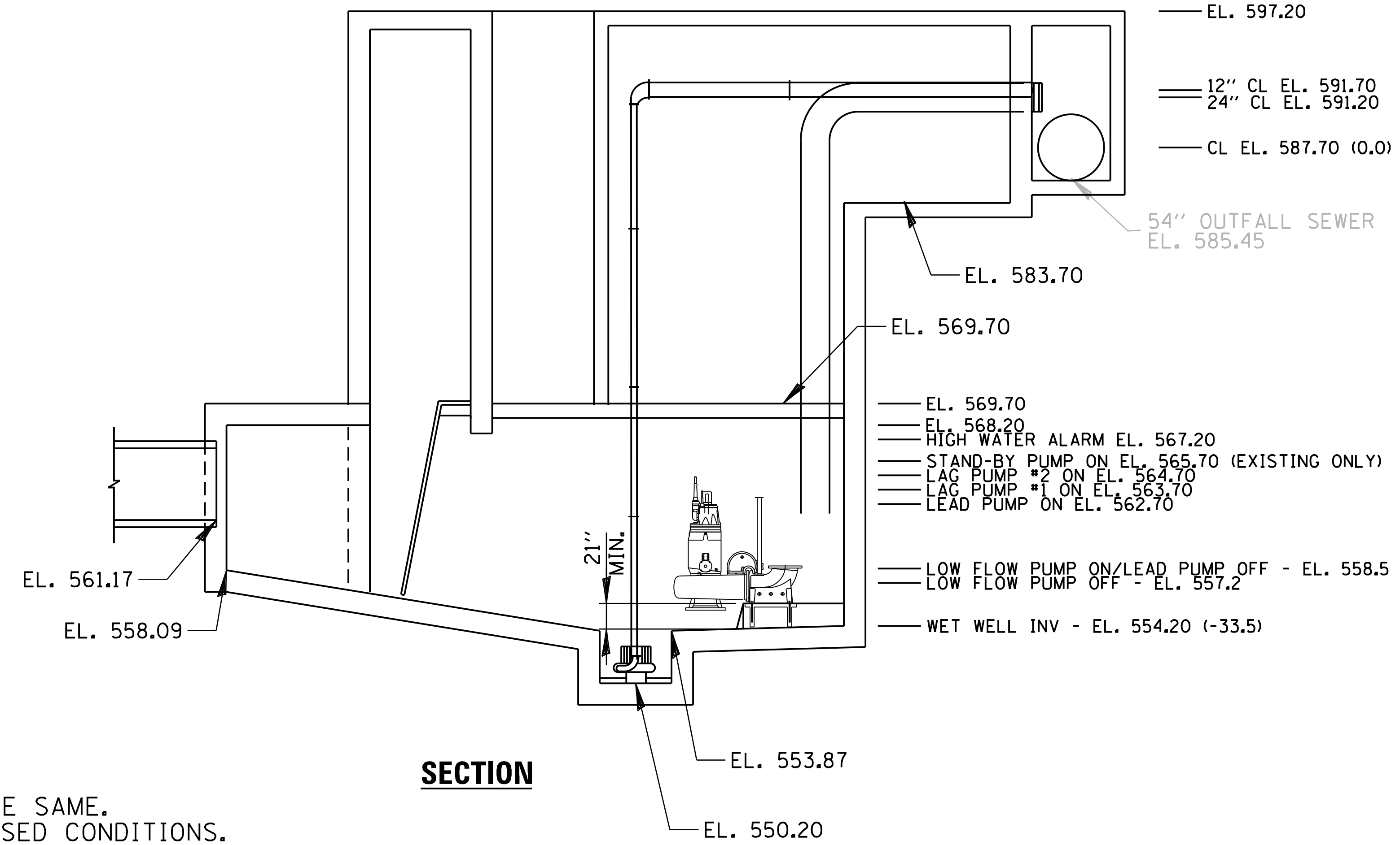
Stand By Pump On Usable Storage = 21,421 ft³

WET WELL VOLUME



PLAN VIEW

AREAS MEASURED IN CAD
ELEVATIONS IN NAVD88



SECTION

NOTE:
PROPOSED/EXISTING WET WELL LAYOUT ARE THE SAME.
STANDBY PUMP DOES NOT TURN ON FOR PROPOSED CONDITIONS.

FILE NAME =	USER NAME = edburke	DESIGNED -	REVISED -
N:\Idot\110203.00001\Water\Exhibits\110203.00001exh Existing Wet Well -area .dgn		DRAWN -	REVISED -
	PLOT SCALE = 12.0000 ' / in.	CHECKED -	REVISED -
Default	PLOT DATE = 3/24/2022	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

WET WELL VOLUME

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.

CONTRACT NO.

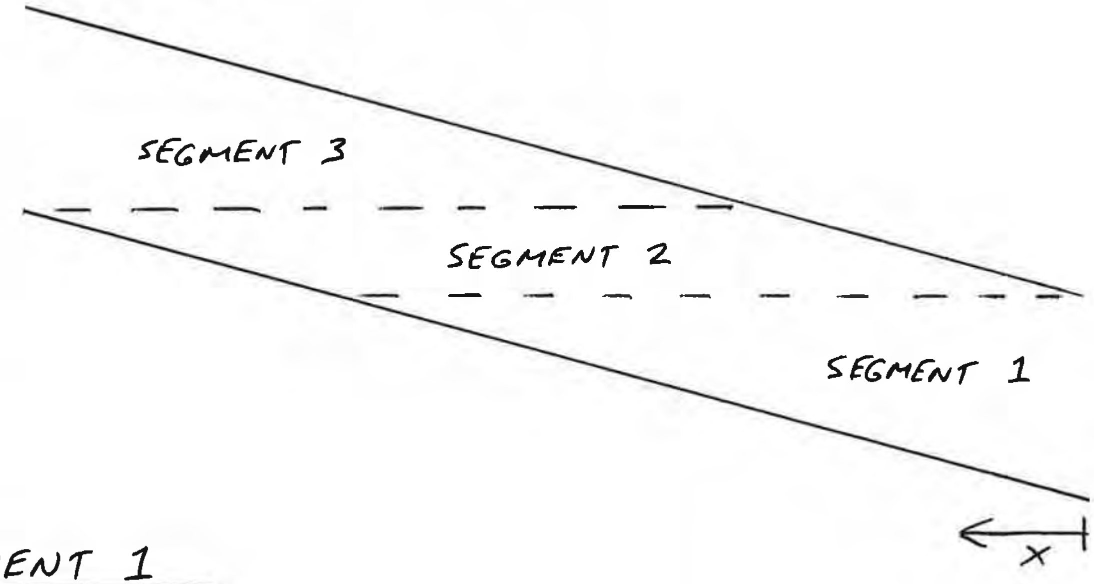
ILLINOIS FED. AID PROJECT

VOLUME CALCULATIONS

CHRISTOPHER B. BURKE
ENGINEERING, LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500 Fax (847) 823-0520

JOB PUMP STATION 30 11-0203.0001
SHEET NO. 1 OF 2
CALCULATED BY DEV DATE 2-17-14
CHECKED BY MJB DATE 2-17-14
SCALE

TOTAL STORAGE



SEGMENT 1

- CALCULATE AVERAGE END AREA

$$A = \frac{1}{8} (\theta - \sin \theta) d_o^2$$

where

$$\theta = 2 \cos^{-1} (1 - 2y/d_o)$$

(AVG END AREA) × (LENGTH ALONG PIPE) = VOLUME

JOB
SHEET NO. 2 OF 2
CALCULATED BY DATE
CHECKED BY DATE
SCALE

SEGMENT 2

- 'FULL PIPE VOLUME' SEGMENT
- IF UPSTREAM INVERT > DOWNSTREAM CROWN

  VOLUME = 0.1' × LENGTH ALONG PIPE

- IF UPSTREAM INVERT < DOWNSTREAM CROWN

  VOLUME = (AVG END AREA × LENGTH ALONG PIPE)

SEGMENT 3

- SEGMENT 3 IS MIRROR IMAGE OF SEGMENT 1

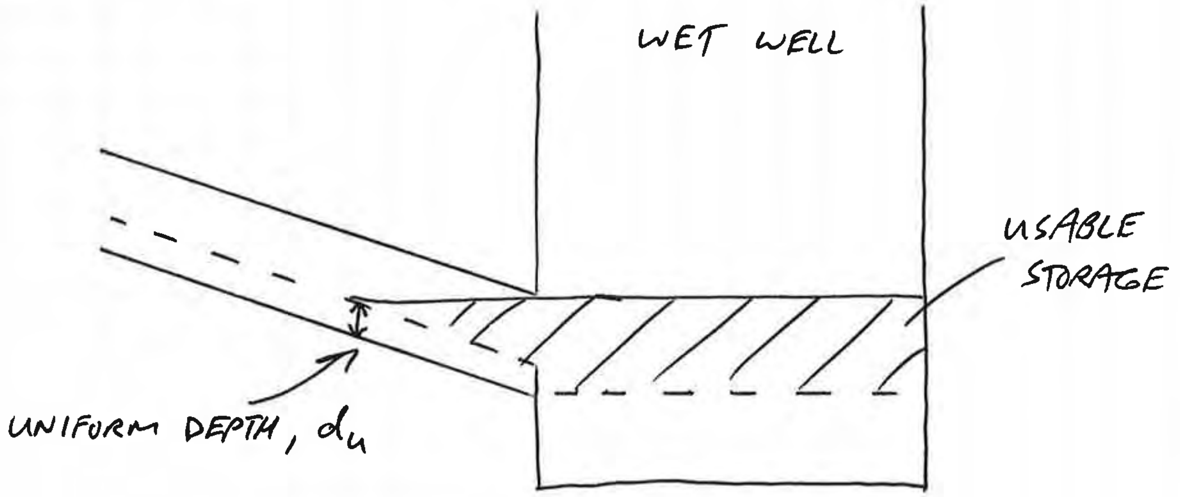
  VOLUME AT EACH SEGMENT 3 ELEVATION:

  = FULL PIPE VOLUME − CORRESPONDING SEGMENT 1 VOLUME

$$= \left(\frac{\pi \times d_0^2}{4}\right) - \text{SEG 1 VOLUME}$$

JOB 11-0203
SHEET NO. 1 OF 2
CALCULATED BY DEV DATE 2-17-14
CHECKED BY MJB DATE 2/17/14
SCALE

USABLE STORAGE



STEP 1: COMPUTE CRITICAL INFLOW

PUMP NO.	CRITICAL INFLOW
1	$0.5 Q_p$
2	$1.5 Q_p$
3	$2.5 Q_p$
4	$3.5 Q_p$

Q_p = INDIVIDUAL PUMP RATE

STEP 2: SOLVE EQN FOR UNIFORM DEPTH, d_u

$$Q_u = \frac{c}{n} A R^{2/3} S^{1/2}$$

Q_u = discharge (= CRITICAL INFLOW)
C = 1.486
n = Manning's roughness
A = area of flow at uniform depth
R = hydraulic radius
S = slope

CHRISTOPHER B. BURKE
ENGINEERING, LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500 Fax (847) 823-0520

JOB

SHEET NO. 2 OF 2

CALCULATED BY DATE

CHECKED BY DATE

SCALE

$$A = \frac{1}{8}(\theta - \sin\theta)d_o^2$$

$$\theta = 2\cos^{-1}(1 - 2d_u/d_o)$$

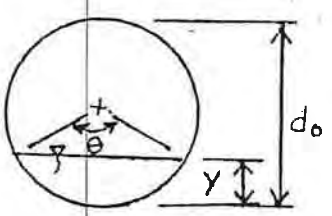
STEP 3: CALCULATE VOLUME OF d_u AT EACH INCREMENT

- USE SIMILAR PROCEDURE AS DETAILED FOR CALCULATING PIPE STORAGE VOLUME

STEP 4: SUBTRACT VOLUME OF d_u AT EACH INCREMENT FROM THE TOTAL VOLUME

ORIG

Chow, V.T. (1959). Open-
Channel Hydraulics. New
York: McGraw-Hill.

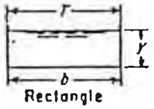
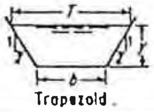
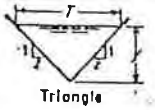
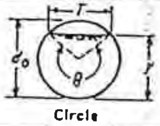
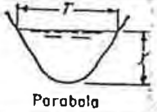
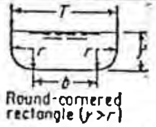
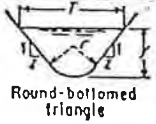


$$\frac{d_o}{2} - \frac{d_o}{2}\cos\left(\frac{\Theta}{2}\right) = Y$$

$$\boxed{\Theta = 2\cos^{-1}(1-2Y/d_o)} \quad \Theta = f(Y/d_o)$$

$$\frac{20.16}{\Phi} nQ d_o^{-8/3} S_o^{-1/2} - \Theta^{-2/3}(\Theta - \sin\Theta)^{5/3} = 0$$

TABLE 2-1. GEOMETRIC ELEMENTS OF CHANNEL SECTIONS

Section	Area A	Wetted perimeter P	Hydraulic radius R	Top width T	Hydraulic depth D	Section factor Z
 Rectangle	by	$b + 2y$	$\frac{by}{b + 2y}$	b	y	$by^{1.5}$
 Trapezoid	$(b + zy)y$	$b + 2y\sqrt{1 + z^2}$	$\frac{(b + zy)y}{b + 2y\sqrt{1 + z^2}}$	$b + 2zy$	$\frac{(b + zy)y}{b + 2zy}$	$\frac{[(b + zy)y]^{1.5}}{\sqrt{b + 2zy}}$
 Triangle	zy^2	$2y\sqrt{1 + z^2}$	$\frac{zy}{2\sqrt{1 + z^2}}$	$2zy$	$\frac{1}{2}y$	$\frac{\sqrt{2}}{2}zy^{2.5}$
 Circle	$\frac{1}{8}(\theta - \sin\theta)d_0^2$ *use radians	$\frac{1}{2}\theta d_0$	$\frac{1}{4}\left(1 - \frac{\sin\theta}{\theta}\right)d_0$	$(\sin\frac{1}{2}\theta)d_0$ or $2\sqrt{y(d_0 - y)}$	$\frac{1}{8}\left(\frac{\theta - \sin\theta}{\sin\frac{1}{2}\theta}\right)d_0$	$\frac{\sqrt{2}}{32}\frac{(\theta - \sin\theta)^{1.5}}{(\sin\frac{1}{2}\theta)^{0.5}}d_0^{2.5}$
 Parabola	$\frac{2}{3}Ty$	$T + \frac{8}{3}\frac{y^2}{T}$ *	$\frac{2T^2y}{3T^2 + 8y^2}$ *	$\frac{3}{2}\frac{A}{y}$	$\frac{2}{3}y$	$\frac{2}{9}\sqrt{6}\,Ty^{1.5}$
 Round-cornered rectangle ($y > r$)	$\left(\frac{\pi}{2} - 2\right)r^2 + (b + 2r)y$	$(\pi - 2)r + b + 2y$	$\frac{(\pi/2 - 2)r^2 + (b + 2r)y}{(\pi - 2)r + b + 2y}$	$b + 2r$	$\frac{(\pi/2 - 2)r^2}{b + 2r} + y$	$\frac{[(\pi/2 - 2)r^2 + (b + 2r)y]^{1.5}}{\sqrt{b + 2r}}$
 Round-bottomed triangle	$\frac{T^2}{4z} - \frac{r^2}{z}(1 - z\cot^{-1}z)$	$\frac{T}{z}\sqrt{1 + z^2} - \frac{2r}{z}(1 - z\cot^{-1}z)$	$\frac{A}{P}$	$2[z(y - r) + r\sqrt{1 + z^2}]$	$\frac{A}{T}$	$A\sqrt{\frac{A}{T}}$

in rads

* Satisfactory approximation for the interval $0 < x \leq 1$, where $x = 4y/T$. When $x > 1$, use the exact expression $P = (T/2)[\sqrt{1 + x^2} + 1$

Detailed Explanation of the Volume Calculator Spreadsheet

The Volume Calculator Spreadsheet Follows this Explanation

The "Volume Calculator" sheet calculates the available storage capacity for each main drain conduit, collector sewer conduit, and wet well at a given water elevation, differentiating between empty, partially-full, and full segments of each conduit. Volumes in partially-full segments are calculated using the prismoidal formula (IDOT Equation 12-15). Explanation is based on EX (Existing System) version.

There are three major sections in the sheet:
  Volumes (columns AQ-BL)
  Wetted Areas (columns Y-AO)
  Summary (columns A-V)

Volumes Section (Columns AQ-BL)

The Volumes section lists all of the main drain conduits and all of the included collector sewer conduits with their name, conduit size (height), length, upstream invert, and downstream invert (columns AQ-AU).

Columns AV-BK contain formulas used to calculate volumes:

"Up IE is above Down IE" (AV)
  Tests to see if the upstream IE is higher than the downstream IE, which is necessary for the subsequent calculations. If there is a FALSE value, it needs to be revised.

"Column # of Size" (AW)
  Uses the input conduit size to lookup the column from the Wetted Areas section that contains the cross-sectional area information for that conduit size.

"Size Output" (AX)
  Returns the size associated with the column number returned with the lookup above, to verify that the size from the Wetted Areas column matches the input size.

"Sizes Match" (AY)
  Tests to see if the input conduit sizes matches the size found through the above lookup process. A FALSE value indicates that there is no cross-sectional area data for the input size.

"Water Stage" (AZ)
  This is the water stage elevation used in the volume calculations. The value is the same for the entire column, representing a flat water surface.

"Up Wetted Depth" (BA)
  Determines the wetted depth at the upstream end of the conduit, based on the water stage elevation and the input upstream conduit invert. Negative depths indicate that the water stage is below the conduit's upstream invert.

"Down Wetted Depth" (BB)
  Determines the wetted depth at the downstream end of the conduit, based on the water stage elevation and the input downstream conduit invert. Negative depths indicate that the water stage is below the conduit's downstream invert.

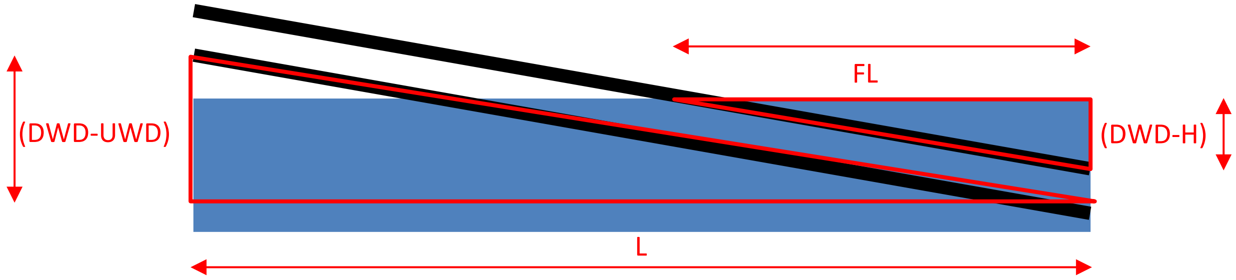
"Up Wetted Area" (BC)
  If upstream wetted depth is not less than zero, then uses the upstream wetted depth to lookup the wetted area for the upstream end of the conduit from the Wetted Areas section.

"Down Wetted Area" (BD)

If downstream wetted depth is not less than zero, then uses the downstream wetted depth to lookup the wetted area for the upstream end of the conduit from the Wetted Areas section.

"Full Length" (BE)

Determines the length of the portion of the conduit that is full. Uses the upstream and downstream wetted depths and input conduit size (height) to determine if all, none, or part of the conduit is full. If the upstream wetted depth is greater than the input conduit size (height), then it is known that all of the conduit is full. Otherwise, the concept of similar triangles is used to determine the portion of the conduit that is full. The equation L*(DWD-H)/(DWD-UWD)=FL determines the length that is full (see diagram below). If the downstream wetted depth is less than the input conduit size (height), the above equation returns a negative value and it is known that none of the conduit is full.



DWD = downstream wetted depth, UWD = upstream wetted depth, H = conduit height (size)
L = conduit length, FL = length of the full portion of the conduit

"Full Volume" (BF)

Calculates the volume of the portion of the conduit that is full, using the full cross-sectional area of the conduit and the "Full Length" calculated above.

"Empty Length" (BG)

Determines the length of the portion of the conduit that is empty. Uses the same method as for "Full Length."

"Partially-Full Length" (BH)

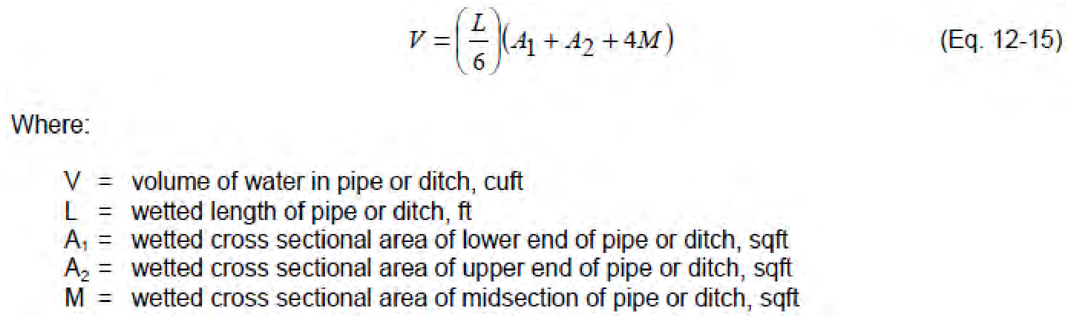
Calculates the length of the portion of the conduit that is partially-full. Subtracts the "Full Length" and "Empty Length" from the input conduit length.

"Partially-Full Midsection Wetted Area" (BI)

Calculates the depth of the partially-full midsection and uses it to lookup the wetted cross-sectional area of the partially-full midsection, which is equivalent to the variable "M" of IDOT Eq. 12-15 (the prismoidal formula). This variable has not always been included in previous hydraulic report stage-storage calculations, since it is approximately equal to the average of the upstream and downstream cross-sectional areas. It has been included here for thoroughness.

"Partially-Full Average Wetted Area" (BJ)

Calculates the prismoidal average wetted area, equal to:
(Upstream Wetted Area + Downstream Wetted Area + 4 * Midsection Wetted Area)*(1/6)



$$V = \left(\frac{L}{6}\right)(A_1 + A_2 + 4M) \qquad \text{(Eq. 12-15)}$$

Where:

V = volume of water in pipe or ditch, cuft
L = wetted length of pipe or ditch, ft
A_1 = wetted cross sectional area of lower end of pipe or ditch, sqft
A_2 = wetted cross sectional area of upper end of pipe or ditch, sqft
M = wetted cross sectional area of midsection of pipe or ditch, sqft

"Partially-Full Volume" (BK)

Calculates the volume of the portion of the conduit that is partially-full.

"Total Volume" (BL)

Sums the volumes of the full portion and partially-full portion of the conduit.

Wetted Areas Section (Columns Y-AO)

The Wetted Areas section contains wetted cross-sectional areas for each conduit size at 0.1-foot intervals. The section is used as a reference source for calculations in the Volumes section.

Circular conduits (Z-AH)

Wetted cross-sectional areas of circular conduits are calculated using the following equation borrowed from the text "Urban Drainage" by Butler and Davies:

$$A = \frac{D^2}{8}(\theta - sin\theta), \qquad where\ \theta = 2\cos^{-1}[1 - \frac{2d}{D}]$$

Semi-elliptical conduits (AI-AO)

Wetted cross-sectional areas of semi-elliptical conduits are based on area measurements for various depths using drawings of semi-elliptical conduit cross-sections. Cross-sectional areas for depths between those measured are interpolated. The cells of measured values are shaded orange.

For circular conduits and semi-elliptical conduits, rows below the full depth of the conduit are populated with the full cross-sectional area for purposes of the lookup function used for calculating volumes in the Volume section.

Summary Section (Columns B-V)

The Summary section displays aggregated stage-storage volumes for the following two groupings:

- Total System
  - Sub-Total 1
  - Sub-Total 2

Sub-Total 1 denotes the system of sewers that are within their own system
Sub-Total 2 denotes the system of sewers that are within their own system

The summary section contains the Active Water Stage Elevation, Active WSE Results Summary, Calculation Automation Area, and 0.1-Foot Interval Results Summaries.

Active Water Stage Elevation (M3)

This cell is the reference source of the water stage elevations used in the Volumes section. M3 controls the water stage elevation for which volumes are being calculated. For purposes of the automated calculation, the Active Water Stage Elevation cell contains a formula, so if the formula is removed the macro will no longer function properly.

Active WSE Results Summary (M5-M13)

These cells show the volumes of each grouping based on the Active Water Stage Elevation shown in cell M3. These summaries are considered "active" because they automatically update when the Active Water Stage Elevation is changed and when changes are made within the Volumes section.

Calculation Automation Area

Below row 14, columns B-K are used only for automation of volume calculations for each 0.1-foot iteration using a macro.

0.1-Foot Interval Results Summaries

Below row 14, columns M-V are where the results of the automated calculations are copied. The Interval Results Summaries are inactive because they do not automatically update. If changes are made in the spreadsheet that may affect the calculated volumes (such as changes to the conduit inputs in the Volumes section), the interval summaries must be recalculated.

Automation of 0.1-Foot Interval Calculations (the Macro)

Within the Summary section, a macro is used to automate the volume calculations for each 0.1-foot interval and tabulate the results. The macro "StageStorage" (CTRL+p) populates the cells for each of the nine groupings (columns N-V) for the selected 0.1-foot interval (rows 17-517) and then selects the next interval. By calculating the interval volumes and then selecting the next interval, the macro can be run repeatedly to rapidly populate all of the 500 intervals. The cell in column N ("Total Storage") of the desired interval (row) must be selected before running the macro; the macro will not run properly if a cell of any other column is selected.

How the Macro Works

Before running the macro, the cell of column N of the desired interval (row) must be selected. When the macro is run (CTRL-p), it begins by copying the stage elevation from column M to column B for the selected interval (row). The Active Water Surface Elevation is set to be equal to column B, so it recalculates accordingly, and in turn the Active WSE Results Summary recalculates. Columns C-K are set to be equal to the Active WSE Results Summary, so these also recalculate. The macro then copies the values from columns C-K into the Interval Results Summaries area columns N-V. Finally, the macro selects the cell in column N of the next interval (row) so that the macro can immediately be rerun to calculate the next interval.

The macro is relative, meaning it is based on the location of cells relative to the starting (selected) cell; this is why the cell of column N of the desired interval (row) must be selected for the macro to run properly, and is why the Calculation Automation Area is required. The macro is relative so that it can be used to calculate each interval (row).

To investigate the calculations within the Volumes section for a given water stage elevation, enter the desired elevation into the Active Water Stage Elevation, cell M3. The individual conduits and wet wells in the Volumes section show the calculations for the Active Water Stage Elevation. For purposes of the automated calculation, the Active Water Stage Elevation cell contains a formula, so if the formula is removed the macro will no longer function properly.

Volume Calculator Spreadsheet

Active Water Stage Elevation (ft, NAVD88)
0.0

Active Water Stage Elevation Results Summary			
	Total System Volume	0	
	Sub-Total Volume 1	0	See Column BM for Component Parts
	Sub-Total Volume 2	0	See Column BM for Component Parts

TRUE	Collectors Volume	0
TRUE	Wet Well Volume	0
	Collectors Volume	0
	PS26 Wet Well Volume	0
	Main Drain Volume 1	0
TRUE	Main Drain Volume 2	0

Columns B - K

Iteration Stage	*ITE RA TIO*	*ITE RA TIO*	*ITE RA TIO*	*ITE RA TIO*	*ITE RA TIO*	*ITE RA TIO*	*ITE RA TIO*	*ITE RA TIO*	*ITERATION PS26 Wet Well*
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0		0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0

Columns M - S

Stage	**Total Storage**	**Sub-Total 1**	**Main Drain**	**Collectors**	**Wet Well**	**Sub-Total 2**
561.2	0	0	0	0	0	0
561.3	1	1	1	0	0	0
561.4	13		13	0	0	0
561.5	25		25	0	0	0
561.6	69		69	0	0	0
561.7	98		98	0	0	0
561.8	184		184	0	0	0
561.9	235		235	0	0	0
562.0	369		369	0	0	0
562.1	426		426	0	0	0
562.2	560		560	0	0	0
562.3	743		743	0	0	0
562.4	931		931	0	0	0
562.5	1,188		1,188	0	0	0
562.6	1,489		1,489	0	0	0
562.7	1,817		1,817	0	0	0
562.8	2,197		2,197	0	0	0
562.9	2,584		2,584	0	0	0
563.0	3,040		3,040	0	0	0
563.1	3,468		3,468	0	0	0
563.2	3,958		3,958	0	0	0
563.3	4,474		4,474	0	0	0
563.4	5,015	5,015	5,015	0	0	0
563.5	5,605	5,605	5,605	0	0	0
563.6	6,238	6,238	6,238	0	0	0
563.7	6,906	6,906	6,906	0	0	0
563.8	7,611	7,611	7,611	0	0	0
563.9	8,339	8,339	8,339	0	0	0
564.0	9,115	9,115	9,115	0	0	0
564.1	9,895	9,895	9,895	0	0	0
564.2	10,728	10,728	10,728	0	0	0
564.3	11,574	11,574	11,574	0	0	0
564.4	12,441	12,441	12,441	0	0	0
564.5	13,329	13,329	13,329	0	0	0
564.6	14,230	14,230	14,230	0	0	0
564.7	15,156	15,156	15,156	0	0	0
564.8	16,085	16,085	16,085	0	0	0
564.9	17,042	17,042	17,042	0	0	0
565.0	17,990	17,990	17,990	0	0	0
565.1	18,974	18,974	18,974	0	0	0
565.2	19,935	19,935	19,935	0	0	0
565.3	20,939	20,939	20,939	0	0	0
565.4	21,934	21,934	21,934	0	0	0
565.5	22,924	22,924	22,924	0	0	0
565.6	23,913	23,913	23,913	0	0	0
565.7	24,900	24,900	24,900	0	0	0
565.8	25,908	25,908	25,908	0	0	0
565.9	26,931	26,931	26,931	0	0	0
566.0	27,955	27,955	27,955	0	0	0
566.1	28,975	28,975	28,975	0	0	0
566.2	30,001	30,001	30,001	0	0	0
566.3	31,028	31,028	31,028	0	0	0
566.4	31,957	31,957	31,957	0	0	0
566.5	32,921	32,921	32,921	0	0	0
566.6	33,806	33,806	33,806	0	0	0
566.7	34,696	34,696	34,696	0	0	0
566.8	35,528	35,528	35,528	0	0	0
566.9	36,341	36,341	36,341	0	0	0
567.0	37,106	37,106	37,106	0	0	0
567.1	37,851	37,851	37,851	0	0	0
567.2	38,538	38,538	38,538	0	0	0
567.3	39,143	39,143	39,143	0	0	0
567.4	39,724	39,724	39,724	0	0	0
567.5	40,279	40,279	40,279	0	0	0
567.6	40,753	40,753	40,753	0	0	0
567.7	41,225	41,225	41,225	0	0	0
567.8	41,616	41,616	41,616	0	0	0
567.9	42,001	42,001	42,001	0	0	0
568.0	42,314	42,314	42,314	0	0	0
568.1	42,613	42,613	42,613	0	0	0
568.2	42,850	42,850	42,850	0	0	0
568.3	43,054	43,054	43,054	0	0	0
568.4	43,281	43,281	43,281	0	0	0

Columns Y - AE

SIZE	5.00	4.50	4.00	3.50	3.00
COLUMN #	2	3	4	5	6
Depth	Circle Area	Circle Area	Circle Area	Circle Area	Circle Area
0.0	0.00	0.00	0.00	0.00	0.00
0.1	0.09	0.09	0.08	0.08	0.07
0.2	0.26	0.25	0.23	0.22	0.20
0.3	0.48	0.46	0.43	0.40	0.37
0.4	0.74	0.70	0.65	0.61	0.56
0.5	1.02	0.97	0.91	0.84	0.77
0.6	1.33	1.26	1.18	1.10	1.01
0.7	1.67	1.58	1.48	1.37	1.25
0.8	2.03	1.91	1.79	1.66	1.51
0.9	2.40	2.26	2.12	1.96	1.78
1.0	2.80	2.63	2.46	2.27	2.06
1.1	3.20	3.01	2.81	2.59	2.35
1.2	3.62	3.40	3.17	2.92	2.64
1.3	4.06	3.81	3.54	3.25	2.94
1.4	4.50	4.22	3.92	3.59	3.23
1.5	4.95	4.64	4.30	3.94	3.53
1.6	5.42	5.07	4.69	4.29	3.83
1.7	5.89	5.50	5.09	4.64	4.13
1.8	6.36	5.94	5.48	4.99	4.43
1.9	6.85	6.38	5.88	5.33	4.72
2.0	7.33	6.83	6.28	5.68	5.01
2.1	7.83	7.28	6.68	6.03	5.29
2.2	8.32	7.73	7.08	6.37	5.56
2.3	8.82	8.18	7.48	6.70	5.82
2.4	9.32	8.63	7.87	7.03	6.06
2.5	9.82	9.07	8.26	7.35	6.29
2.6	10.32	9.52	8.65	7.66	6.51
2.7	10.82	9.96	9.02	7.96	6.70
2.8	11.31	10.40	9.40	8.25	6.87
2.9	11.81	10.84	9.76	8.52	7.00
3.0	12.30	11.26	10.11	8.78	7.07
3.1	12.79	11.68	10.45	9.01	7.07
3.2	13.27	12.10	10.78	9.22	7.07
3.3	13.75	12.50	11.09	9.40	7.07
3.4	14.22	12.89	11.38	9.54	7.07
3.5	14.68	13.27	11.66	9.62	7.07
3.6	15.13	13.64	11.91	9.62	7.07
3.7	15.58	13.99	12.14	9.62	7.07
3.8	16.01	14.33	12.33	9.62	7.07
3.9	16.43	14.64	12.48	9.62	7.07
4.0	16.84	14.94	12.57	9.62	7.07
4.1	17.23	15.21	12.57	9.62	7.07
4.2	17.61	15.45	12.57	9.62	7.07
4.3	17.96	15.65	12.57	9.62	7.07
4.4	18.30	15.82	12.57	9.62	7.07
4.5	18.61	15.90	12.57	9.62	7.07
4.6	18.90	15.90	12.57	9.62	7.07
4.7	19.15	15.90	12.57	9.62	7.07
4.8	19.37	15.90	12.57	9.62	7.07
4.9	19.54	15.90	12.57	9.62	7.07
5.0	19.63	15.90	12.57	9.62	7.07
5.1	19.63	15.90	12.57	9.62	7.07
5.2	19.63	15.90	12.57	9.62	7.07
5.3	19.63	15.90	12.57	9.62	7.07
5.4	19.63	15.90	12.57	9.62	7.07
5.5	19.63	15.90	12.57	9.62	7.07
5.6	19.63	15.90	12.57	9.62	7.07
5.7	19.63	15.90	12.57	9.62	7.07
5.8	19.63	15.90	12.57	9.62	7.07
5.9	19.63	15.90	12.57	9.62	7.07
6.0	19.63	15.90	12.57	9.62	7.07
6.1	19.63	15.90	12.57	9.62	7.07
6.2	19.63	15.90	12.57	9.62	7.07
6.3	19.63	15.90	12.57	9.62	7.07
6.4	19.63	15.90	12.57	9.62	7.07
6.5	19.63	15.90	12.57	9.62	7.07
6.6	19.63	15.90	12.57	9.62	7.07
6.7	19.63	15.90	12.57	9.62	7.07
6.8	19.63	15.90	12.57	9.62	7.07
6.9	19.63	15.90	12.57	9.62	7.07
7.0	19.63	15.90	12.57	9.62	7.07
7.1	19.63	15.90	12.57	9.62	7.07
7.2	19.63	15.90	12.57	9.62	7.07
7.3	19.63	15.90	12.57	9.62	7.07
7.4	19.63	15.90	12.57	9.62	7.07
7.5	19.63	15.90	12.57	9.62	7.07
7.6	19.63	15.90	12.57	9.62	7.07
7.7	19.63	15.90	12.57	9.62	7.07
7.8	19.63	15.90	12.57	9.62	7.07
7.9	19.63	15.90	12.57	9.62	7.07
8.0	19.63	15.90	12.57	9.62	7.07

	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

568.5	43,456	43,456	43,456	0	0	0
568.6	43,637	43,637	43,637	0	0	0
568.7	43,771	43,771	43,771	0	0	0
568.8	43,911	43,911	43,911	0	0	0
568.9	44,015	44,015	44,015	0	0	0
569.0	44,113	44,113	44,113	0	0	0
569.1	44,189	44,189	44,189	0	0	0
569.2	44,216	44,216	44,216	0	0	0
569.3	44,228	44,228	44,228	0	0	0
569.4	44,229	44,229	44,229	0	0	0
569.5	44,229	44,229	44,229	0	0	0
569.6	44,229	44,229	44,229	0	0	0
569.7	44,229	44,229	44,229	0	0	0
569.8	44,229	44,229	44,229	0	0	0
569.9	44,229	44,229	44,229	0	0	0
570.0	44,229	44,229	44,229	0	0	0
570.1	44,229	44,229	44,229	0	0	0
570.2	44,229	44,229	44,229	0	0	0
570.3	44,229	44,229	44,229	0	0	0
570.4	44,229	44,229	44,229	0	0	0
570.5	44,229	44,229	44,229	0	0	0
570.6	44,229	44,229	44,229	0	0	0
570.7	44,229	44,229	44,229	0	0	0
570.8	44,229	44,229	44,229	0	0	0
570.9	44,229	44,229	44,229	0	0	0
571.0	44,229	44,229	44,229	0	0	0
571.1	44,229	44,229	44,229	0	0	0
571.2	44,229	44,229	44,229	0	0	0
571.3	44,229	44,229	44,229	0	0	0
571.4	44,229	44,229	44,229	0	0	0
571.5	44,229	44,229	44,229	0	0	0
571.6	44,229	44,229	44,229	0	0	0
571.7	44,229	44,229	44,229	0	0	0
571.8	44,229	44,229	44,229	0	0	0
571.9	44,229	44,229	44,229	0	0	0
572.0	44,229	44,229	44,229	0	0	0
572.1	44,229	44,229	44,229	0	0	0
572.2	44,229	44,229	44,229	0	0	0
572.3	44,229	44,229	44,229	0	0	0
572.4	44,229	44,229	44,229	0	0	0
572.5	44,229	44,229	44,229	0	0	0
572.6	44,229	44,229	44,229	0	0	0
572.7	44,229	44,229	44,229	0	0	0
572.8	44,229	44,229	44,229	0	0	0
572.9	44,229	44,229	44,229	0	0	0
573.0	44,229	44,229	44,229	0	0	0
573.1	44,229	44,229	44,229	0	0	0
573.2	44,229	44,229	44,229	0	0	0
573.3	44,229	44,229	44,229	0	0	0
573.4	44,229	44,229	44,229	0	0	0
573.5	44,230	44,230	44,230	0	0	0
573.6	44,243	44,243	44,243	0	0	0
573.7	44,254	44,254	44,254	0	0	0
573.8	44,297	44,297	44,297	0	0	0
573.9	44,324	44,324	44,324	0	0	0
574.0	44,388	44,388	44,388	0	0	0
574.1	44,458	44,458	44,458	0	0	0
574.2	44,539	44,539	44,539	0	0	0
574.3	44,626	44,626	44,626	0	0	0
574.4	44,720	44,720	44,720	0	0	0
574.5	44,819	44,819	44,819	0	0	0
574.6	44,923	44,923	44,923	0	0	0
574.7	45,029	45,029	45,029	0	0	0
574.8	45,139	45,139	45,139	0	0	0
574.9	45,251	45,251	45,251	0	0	0
575.0	45,364	45,364	45,364	0	0	0
575.1	45,478	45,478	45,478	0	0	0
575.2	45,593	45,593	45,593	0	0	0
575.3	45,708	45,708	45,708	0	0	0
575.4	45,823	45,823	45,823	0	0	0
575.5	45,936	45,936	45,936	0	0	0
575.6	46,048	46,048	46,048	0	0	0
575.7	46,157	46,157	46,157	0	0	0
575.8	46,264	46,264	46,264	0	0	0
575.9	46,367	46,367	46,367	0	0	0
576.0	46,466	46,466	46,466	0	0	0
576.1	46,560	46,560	46,560	0	0	0
576.2	46,648	46,648	46,648	0	0	0
576.3	46,728	46,728	46,728	0	0	0
576.4	46,814	46,814	46,814	0	0	0
576.5	46,852	46,852	46,852	0	0	0
576.6	46,908	46,908	46,908	0	0	0
576.7	46,927	46,927	46,927	0	0	0
576.8	46,950	46,950	46,950	0	0	0
576.9	46,957	46,957	46,957	0	0	0
577.0	46,965	46,965	46,965	0	0	0
577.1	46,973	46,973	46,973	0	0	0
577.2	47,000	47,000	47,000	0	0	0
577.3	47,019	47,019	47,019	0	0	0

Columns AQ - BM

VOLUME CALCULATOR

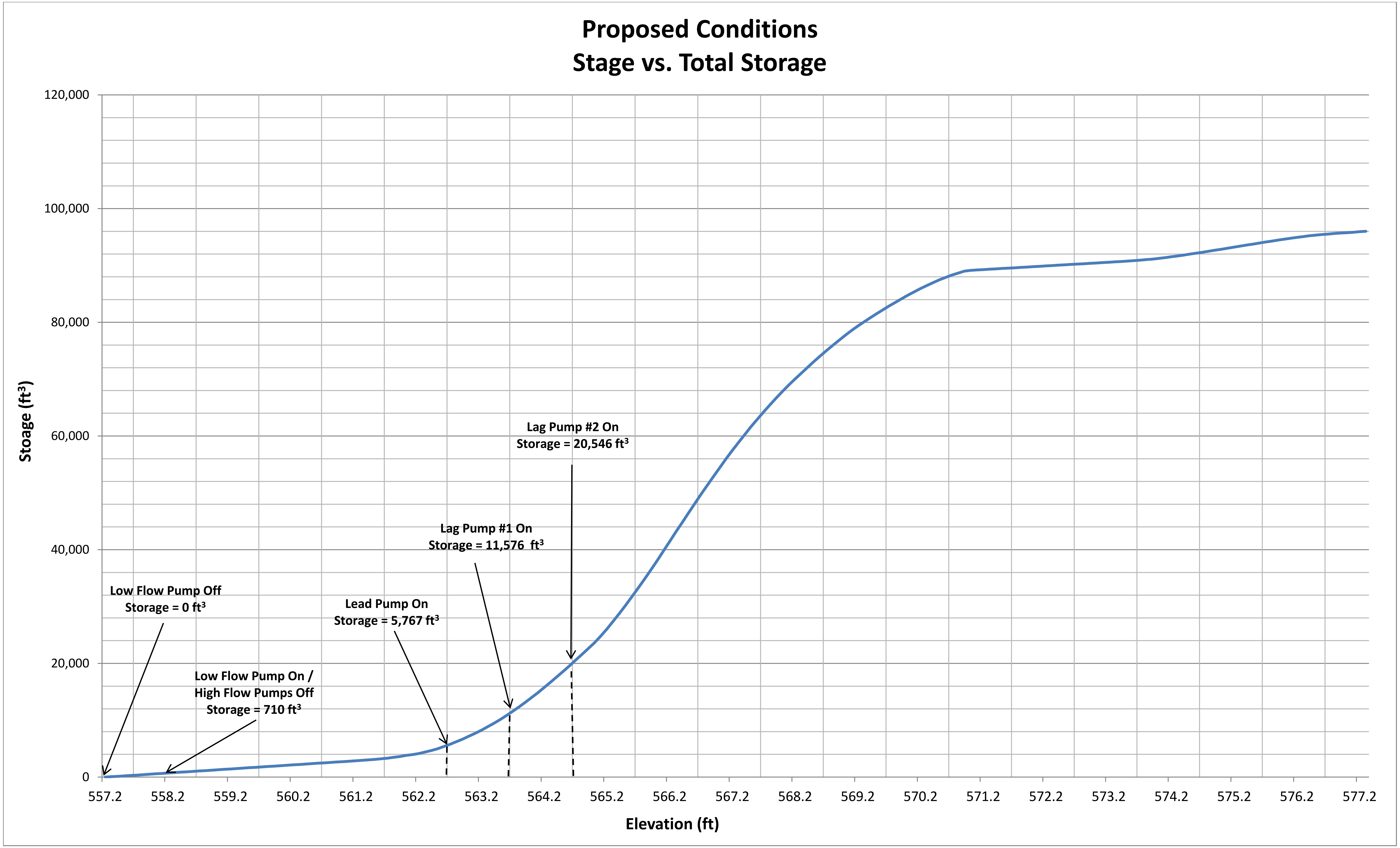
Conduit ID	**Conduit Size** (ft)	**Length** (ft)	**Up IE** (NAVD88)	**Down IE** (NAVD88)	Up IE is above Down IE	Column # of Size	Size Output (ft)	Sizes Match	Water Stage Elevation (NAVD88)	Up Wetted Depth	Down Wetted Depth (ft)	Up Wetted Area (sf)	Down Wetted Area (sf)	Full Length (ft)	Full Volume (cf)	Empty Length (ft)	Partially-Full Length (ft)	Partially-Full Midsection Wetted Area (sf)	Partially-Full Average Wetted Area (sf)	Partially-Full Volume (cf)	**Total Volume (cf)**	Sub-System (ft)
1.0	5.00	478	562.06	561.17	TRUE	2	5.00	TRUE	0.0	-562.06	-561.17	0.00	0.00	0	0	478	0	0.00	0.00	0	**0**	1
2.0	5.00	507	562.37	562.06	TRUE	2	5.00	TRUE	0.0	-562.37	-562.06	0.00	0.00	0	0	507	0	0.00	0.00	0	**0**	1
3.0	5.00	339	563.06	562.37	TRUE	2	5.00	TRUE	0.0	-563.06	-562.37	0.00	0.00	0	0	339	0	0.00	0.00	0	**0**	1
4.0	4.50	423	563.52	563.21	TRUE	3	4.50	TRUE	0.0	-563.52	-563.21	0.00	0.00	0	0	423	0	0.00	0.00	0	**0**	1
5.0	4.50	266	564.17	563.52	TRUE	3	4.50	TRUE	0.0	-564.17	-563.52	0.00	0.00	0	0	266	0	0.00	0.00	0	**0**	1
6.0	4.00	261	565.33	564.27	TRUE	4	4.00	TRUE	0.0	-565.33	-564.27	0.00	0.00	0	0	261	0	0.00	0.00	0	**0**	1
7.0	3.50	415	565.79	565.53	TRUE	5	3.50	TRUE	0.0	-565.79	-565.53	0.00	0.00	0	0	415	0	0.00	0.00	0	**0**	1
8.0	3.00	386	573.94	573.34	TRUE	6	3.00	TRUE	0.0	-573.94	-573.34	0.00	0.00	0	0	386	0	0.00	0.00	0	**0**	1
9.0	3.00	400	577.66	576.79	TRUE	6	3.00	TRUE	0.0	-577.66	-576.79	0.00	0.00	0	0	400	0	0.00	0.00	0	**0**	1
																						1

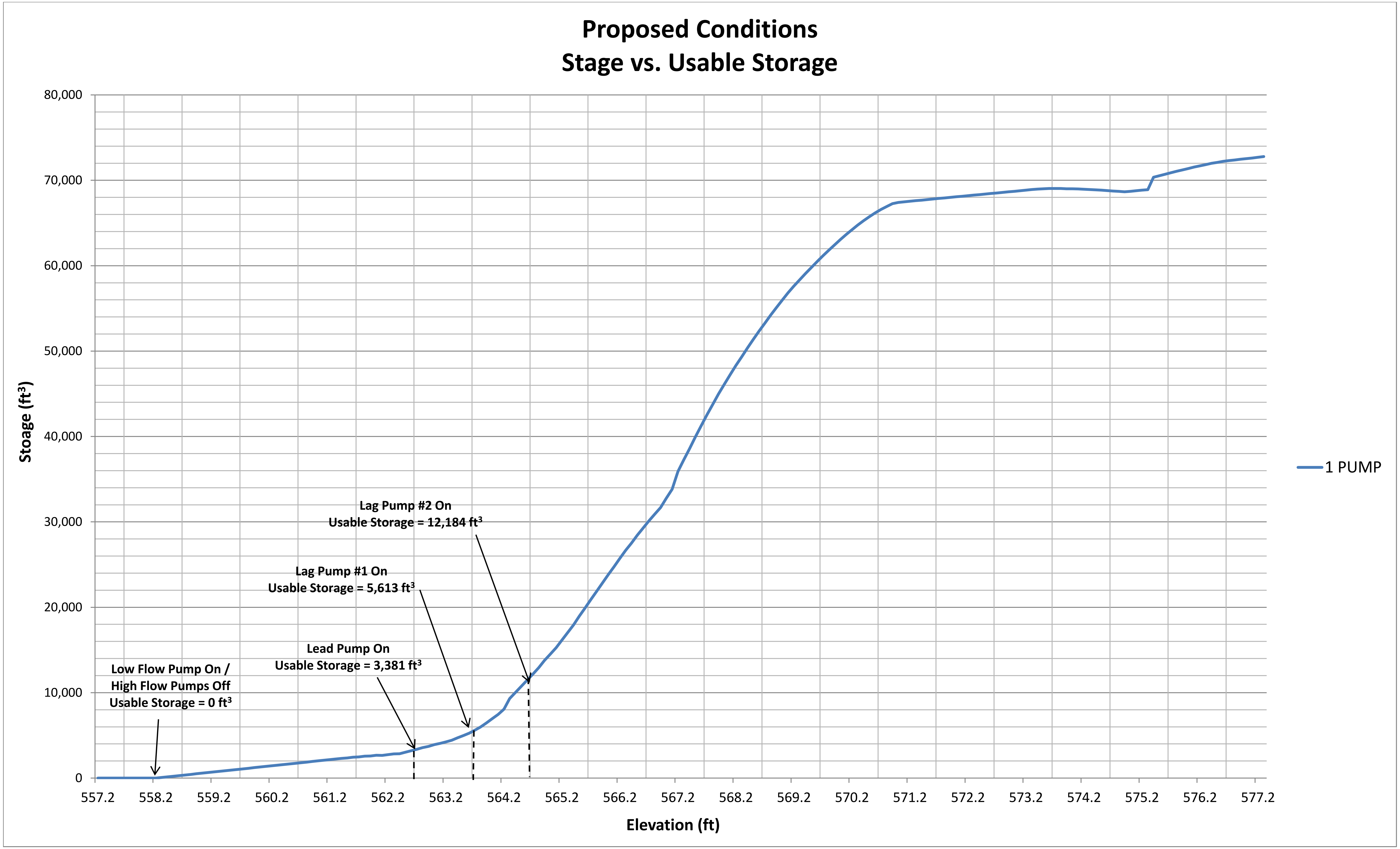
Flow On/Off		Elevation (ft)	Wet Well Volume (ft^3)	Pipe Volume (ft^3)	Total Available Storage (ft^3)	Uniform Depth Volume (ft^3) - Lead Pump								Uniform Depth Volume (ft^3) - Lag Pump #1								Uniform Depth Volume (ft^3) - Lag Pump #2								Total Usable Storage (ft^3)
Ascending	Descending					Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	
	Low flow off	557.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.3	69	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.4	139	0	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.5	209	0	209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.6	280	0	280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.7	351	0	351	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.8	422	0	422	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.9	494	0	494	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		558.0	566	0	566	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		558.1	638	0	638	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Low flow on	High flow off, low flow on	558.2	710	0	710	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		558.3	782	0	782	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
		558.4	854	0	854	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	144
		558.5	926	0	926	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	216
		558.6	998	0	998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	288
		558.7	1,070	0	1,070	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	360
		558.8	1,142	0	1,142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	432
		558.9	1,214	0	1,214	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	504
		559.0	1,286	0	1,286	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	576
		559.1	1,358	0	1,358	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	648
		559.2	1,430	0	1,430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	720
		559.3	1,502	0	1,502	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	792
		559.4	1,574	0	1,574	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	864
		559.5	1,646	0	1,646	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	936
		559.6	1,718	0	1,718	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,008
		559.7	1,790	0	1,790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,080
		559.8	1,862	0	1,862	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,152
		559.9	1,934	0	1,934	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,224
		560.0	2,006	0	2,006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,296
		560.1	2,078	0	2,078	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,368
		560.2	2,150	0	2,150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,440
		560.3	2,222	0	2,222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,512
		560.4	2,294	0	2,294	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,584
		560.5	2,366	0	2,366	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,656
		560.6	2,438	0	2,438	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,728
		560.7	2,510	0	2,510	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,800
		560.8	2,582	0	2,582	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,872
		560.9	2,654	0	2,654	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,944
		561.0	2,726	0	2,726	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,016
		561.1	2,798	0	2,798	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,088
		561.2	2,870	0	2,870	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,160
		561.3	2,942	1	2,943	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2,230
		561.4	3,014	13	3,027	14	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	2,303
		561.5	3,086	25	3,111	38	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	2,363
		561.6	3,158	69	3,227	79	0	0	0	0	0	0	0	79	0	0	0	0	0	0	0	79	0	0	0	0	0	0	0	2,438
		561.7	3,230	98	3,328	137	0	0	0	0	0	0	0	137	0	0	0	0	0	0	0	137	0	0	0	0	0	0	0	2,481
		561.8	3,302	184	3,486	211	0	0	0	0	0	0	0	211	0	0	0	0	0	0	0	211	0	0	0	0	0	0	0	2,565
		561.9	3,374	235	3,609	309	0	0	0	0	0	0	0	309	0	0	0	0	0	0	0	309	0	0	0	0	0	0	0	2,590
		562.0	3,446	369	3,815	434	0	0	0	0	0	0	0	434	0	0	0	0	0	0	0	434	0	0	0	0	0	0	0	2,671
		562.1	3,518	426	3,944	572	0	0	0	0	0	0	0	572	0	0	0	0	0	0	0	572	0	0	0	0	0	0	0	2,662
		562.2	3,590	560	4,150	686	8	0	0	0	0	0	0	686	8	0	0	0	0	0	0	686	8	0	0	0	0	0	0	2,746
		562.3	3,662	743	4,405	827	45	0	0	0	0	0	0	827	45	0	0	0	0	0	0	827	45	0	0	0	0	0	0	2,823
		562.4	3,734	931	4,665	983	122	0	0	0	0	0	0	983	122	0	0	0	0	0	0	983	122	0	0	0	0	0	0	2,850
		562.5	3,806	1,188	4,994	1,045	212	2	0	0	0	0	0	1,146	212	2	0	0	0	0	0	1,146	212	2	0	0	0	0	0	3,025
		562.6	3,878	1,489	5,367	1,114	329	13	0	0	0	0	0	1,321	329	13	0	0	0	0	0	1,321	329	13	0	0	0	0	0	3,201
Low flow off, lead pump on		562.7	3,950	1,817	5,767	1,184	457	35	0	0	0	0	0	1,502	457	35	0	0	0	0	0	1,502	457	35	0	0	0	0	0	3,381
		562.8	4,022	2,197	6,219	1,265	608	72	0	0	0	0	0	1,698	608	72	0	0	0	0	0	1,698	608	72	0	0	0	0	0	3,564
		562.9	4,094	2,584	6,678	1,356	778	125	0	0	0	0	0	1,895	778	125	0	0	0	0	0	1,895	778	125	0	0	0	0	0	3,709
		563.0	4,166	3,040	7,206	1,441	942	193	0	0	0	0	0	2,088	942	193	0	0	0	0	0	2,088	942	193	0	0	0	0	0	3,920
		563.1	4,238	3,468	7,706	1,532	1,125	281	0	0	0	0	0	2,304	1,125	281	0	0	0	0	0	2,304	1,125	281	0	0	0	0	0	4,058
		563.2	4,310	3,958	8,268	1,631	1,326	362	0	0	0	0	0	2,517	1,326	362	0	0	0	0	0	2,517	1,326	362	0	0	0	0	0	4,239
		563.3	4,382	4,474	8,856	1,737	1,528	451	6	0	0	0	0	2,738	1,528	451	6	0	0	0	0	2,738	1,528	451	6	0	0	0	0	4,424
		563.4	4,454	5,015	9,469	1,737	1,732	552	35	0	0	0	0	2,839	1,732	552	35	0	0	0	0	2,956	1,732	552	35	0	0	0	0	4,703
		563.5	4,526	5,605	10,131	1,737	1,949	666	95	0	0	0	0	2,945	1,949	666	95	0	0	0	0	3,181	1,949	666	95	0	0	0	0	4,974
		563.6	4,598	6,238	10,836	1,737	2,179	790	166	2	0	0	0	3,056	2,179	790	166	2	0	0	0	3,411	2,179	790	166	2	0	0	0	5,252
Lag pump 1 on		563.7	4,670	6,906	11,576	1,737	2,408	840	258	10	0	0	0	3,172	2,408	912	258	10	0	0	0	3,645	2,408	912	258	10	0	0	0	5,613
		563.8	4,742	7,611	12,353	1,737	2,632	897	364	26	0	0	0	3,277	2,632	1,044	364	26	0	0	0	3,870	2,632	1,044	364	26	0	0	0	5,987
		563.9	4,814	8,339	13,153	1,737	2,750	962	480	53	0	0	0	3,386	2,866	1,187	480	53	0	0	0	4,098	2,866	1,187	480	53	0	0	0	6,461
		564.0	4,886	9,115	14,001	1,737	2,872	1,022	608	92	0	0	0	3,511	3,121	1,329	608	92	0	0	0	4,342	3,121	1,329	608	92	0	0	0	6,960
		564.1	4,958	9,895	14,853	1,737	2,984	1,086	745	145	0	0	0	3,625	3,353	1,469	745	145	0	0	0	4,573	3,353	1,469	745	145	0	0	0	7,446
		564.2	5,030	10,728	15,758	1,737	2,984	1,157	887	209	0	0	0	3,740	3,591	1,616	887	209	0	0	0	4,688	3,591	1,616	887	209	0	0	0	8,074
		564.3	5,102	11,574	16,676	1,737	2,984	616	1,042	266	0	0	0	3,740	3,848	1,779	1,042	266	0	0	0	4,805	3,848	1,779	1,042	266	0	0	0	9,321
		564.4	5,174	12,441	17,615	1,737	2,984	616	1,196	333	1	0	0	3,740	4,095	1,932	1,196	333	1	0	0	4,924	4,095	1,932	1,196	333	1	0	0	10,038
		564.5	5,246	13,329	18,575	1,737	2,984	616	1,360	408	6	0	0	3,740	4,343	2,089	1,360	408	6	0	0	5,043	4,343	2,089	1,360	408	6	0	0	10,754
		564.6	5,318	14,230	19,548	1,737	2,984	616	1,534	494	17	0	0	3,740	4,594	2,168	1,534	494	17	0	0	5,162	4,594	2,251	1,534	494	17	0	0	11,456
Lag pump 2 on		564.7	5,390	15,156	20,546	1,737	2,984	616	1,700	581	34	0	0	3,740	4,846	2,249	1,700	581	34	0	0	5,281	4,846	2,416	1,700	581	34	0	0	12,184
		564.8	5,462	16,085	21,547	1,737	2,984	616	1,882	622	60	0	0	3,740	5,099	2,324	1,882	676	60	0	0	5,400	5,099	2,575	1,882	676	60	0	0	12,936
		564.9	5,534	17,042	22,576	1,737	2,984	616	1,972	662	92	0	0	3,740	5,351	2,401	2,062	772	92	0	0	5,519	5,351	2,737	2,062	772	92	0	0	13,803
		565.0	5,606	17,990	23,596	1,737	2,984	616	2,056	706	136	0	0	3,740	5,602	2,490	2,237	870	136	0	0	5,636	5,602	2,911	2,237	870	136	0	0	14,651

Flow On/Off		Elevation (ft)	Wet Well Volume (ft^3)	Pipe Volume (ft^3)	Total Available Storage (ft^3)	Uniform Depth Volume (ft^3) - Lead Pump								Uniform Depth Volume (ft^3) - Lag Pump #1								Uniform Depth Volume (ft^3) - Lag Pump #2								Total Usable Storage (ft^3)
Ascending	Descending					Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	
		565.1	5,678	18,974	24,652	1,737	2,984	616	2,153	752	186	0	0	3,740	5,851	2,571	2,427	976	186	0	0	5,636	5,851	3,076	2,427	976	186	0	0	15,514
		565.2	5,750	19,935	25,685	1,737	2,984	616	2,153	801	250	0	0	3,740	6,112	2,653	2,612	1,082	250	0	0	5,636	6,112	3,242	2,612	1,082	250	0	0	16,434
		565.3	5,822	20,939	26,761	1,737	2,984	616	2,153	854	319	0	0	3,740	6,237	2,653	2,799	1,192	319	0	0	5,636	6,355	3,408	2,799	1,192	319	0	0	17,388
		565.4	5,894	21,934	27,828	1,737	2,984	616	2,153	905	379	0	0	3,740	6,359	2,653	2,988	1,302	379	0	0	5,636	6,593	3,492	2,988	1,302	379	0	0	18,344
		565.5	5,966	22,924	28,890	1,737	2,984	616	2,153	905	398	0	0	3,740	6,495	2,653	3,179	1,416	445	0	0	5,636	6,854	3,576	3,179	1,416	445	0	0	19,387
		565.6	6,038	23,913	29,951	1,737	2,984	616	2,153	905	423	5	0	3,740	6,495	2,653	3,371	1,532	520	5	0	5,636	7,081	3,661	3,371	1,532	520	5	0	20,418
Stand-by pump on		565.7	6,110	24,900	31,010	1,737	2,984	616	2,153	905	453	31	0	3,740	6,495	2,653	3,552	1,585	596	31	0	5,636	7,314	3,746	3,552	1,646	596	31	0	21,421
		565.8	6,182	25,908	32,090	1,737	2,984	616	2,153	905	487	83	0	3,740	6,495	2,653	3,743	1,646	683	83	0	5,636	7,552	3,830	3,743	1,767	683	83	0	22,415
		565.9	6,254	26,931	33,185	1,737	2,984	616	2,153	905	521	143	0	3,740	6,495	2,653	3,933	1,702	767	143	0	5,636	7,780	3,914	3,933	1,884	767	143	0	23,416
		566.0	6,326	27,955	34,281	1,737	2,984	616	2,153	905	561	221	0	3,740	6,495	2,653	4,120	1,760	858	221	0	5,636	7,998	3,997	4,120	1,995	858	221	0	24,394
		566.1	6,398	28,975	35,373	1,737	2,984	616	2,153	905	599	312	0	3,740	6,495	2,653	4,304	1,819	947	312	0	5,636	8,216	3,997	4,304	2,113	947	312	0	25,357
		566.2	6,470	30,001	36,471	1,737	2,984	616	2,153	905	645	409	0	3,740	6,495	2,653	2,381	1,878	1,044	409	0	5,636	8,432	3,997	4,484	2,231	1,044	409	0	26,312
		566.3	6,542	31,028	37,570	1,737	2,984	616	2,153	905	686	517	0	3,740	6,495	2,653	2,475	1,938	1,138	517	0	5,636	8,631	3,997	4,679	2,356	1,138	517	0	27,262
		566.4	6,614	31,957	38,571	1,737	2,984	616	2,153	905	735	636	0	3,740	6,495	2,653	2,555	1,938	1,187	636	0	5,636	8,825	3,997	4,849	2,472	1,239	636	0	28,095
		566.5	6,686	32,921	39,607	1,737	2,984	616	2,153	905	735	755	0	3,740	6,495	2,653	2,555	1,938	1,234	755	0	5,636	9,008	3,997	5,023	2,588	1,338	755	0	29,012
		566.6	6,758	33,806	40,564	1,737	2,984	616	2,153	905	735	879	0	3,740	6,495	2,653	2,555	1,938	1,283	879	0	5,636	9,187	3,997	5,198	2,707	1,438	879	0	29,845
		566.7	6,830	34,696	41,526	1,737	2,984	616	2,153	905	735	1,012	0	3,740	6,495	2,653	2,555	1,938	1,330	1,012	0	5,636	9,348	3,997	5,363	2,811	1,536	1,012	0	30,674
		566.8	6,902	35,528	42,430	1,737	2,984	616	2,153	905	735	1,147	0	3,740	6,495	2,653	2,555	1,938	1,383	1,147	0	5,636	9,495	3,997	5,527	2,925	1,643	1,147	0	31,443
		566.9	6,974	36,341	43,315	1,737	2,984	616	2,153	905	735	1,284	0	3,740	6,495	2,653	2,555	1,938	1,432	1,284	0	5,636	9,632	3,997	5,681	3,035	1,741	1,284	0	32,191
		567.0	7,046	37,106	44,152	1,737	2,984	616	2,153	905	735	1,418	0	3,740	6,495	2,653	2,555	1,938	1,483	1,418	0	5,636	9,747	3,997	5,837	3,152	1,843	1,418	0	32,894
		567.1	7,118	37,851	44,969	1,737	2,984	616	2,153	905	735	1,564	0	3,740	6,495	2,653	2,555	1,938	1,534	1,564	0	5,636	9,832	3,997	5,984	3,257	1,939	1,564	0	33,565
High water alarm		567.2	7,190	38,538	45,728	1,737	2,984	616	2,153	905	735	959	0	3,740	6,495	2,653	2,555	1,938	1,586	1,706	0	5,636	9,889	3,997	6,116	3,357	2,042	1,706	0	34,929
		567.3	7,262	39,143	46,405	1,737	2,984	616	2,153	905	735	1,035	0	3,740	6,495	2,653	2,555	1,938	1,638	1,850	0	5,636	9,932	3,997	6,245	3,461	2,139	1,850	0	35,530
		567.4	7,334	39,724	47,058	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,994	0	5,636	9,955	3,997	6,366	3,555	2,236	1,994	0	36,113
		567.5	7,406	40,279	47,685	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	2,139	0	5,636	9,955	3,997	6,469	3,647	2,330	2,139	0	36,740
		567.6	7,478	40,753	48,231	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	2,283	0	5,636	9,955	3,997	6,560	3,735	2,423	2,283	0	37,286
		567.7	7,550	41,225	48,775	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	2,425	0	5,636	9,955	3,997	6,632	3,821	2,510	2,425	0	37,830
		567.8	7,622	41,616	49,238	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	2,571	0	5,636	9,955	3,997	6,674	3,896	2,602	2,571	0	38,293
		567.9	7,694	42,001	49,695	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	2,706	0	5,636	9,955	3,997	6,708	3,963	2,683	2,706	0	38,750
		568.0	7,766	42,314	50,080	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	2,847	0	5,636	9,955	3,997	6,727	4,020	2,763	2,847	0	39,135
		568.1	7,838	42,613	50,451	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	2,983	0	5,636	9,955	3,997	6,727	4,063	2,833	2,983	0	39,506
		568.2	7,910	42,850	50,760	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	3,111	0	5,636	9,955	3,997	6,727	4,101	2,904	3,111	0	39,815
		568.3	7,974	43,054	51,028	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,713	0	5,636	9,955	3,997	6,727	4,137	2,960	3,240	0	40,083
		568.4	8,039	43,281	51,320	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,770	0	5,636	9,955	3,997	6,727	4,170	3,005	3,363	0	40,375
		568.5	8,104	43,456	51,560	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,821	0	5,636	9,955	3,997	6,727	4,197	3,047	3,474	0	40,615
		568.6	8,169	43,637	51,806	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,869	0	5,636	9,955	3,997	6,727	4,218	3,088	3,582	0	40,861
		568.7	8,234	43,771	52,005	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,913	0	5,636	9,955	3,997	6,727	4,230	3,125	3,683	0	41,060
		568.8	8,298	43,911	52,209	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,951	0	5,636	9,955	3,997	6,727	4,230	3,162	3,772	0	41,264
		568.9	8,363	44,015	52,378	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,980	0	5,636	9,955	3,997	6,727	4,230	3,195	3,849	0	41,433
		569.0	8,428	44,113	52,541	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,223	3,909	0	41,596
		569.1	8,493	44,189	52,682	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,249	3,947	0	41,737
		569.2	8,558	44,216	52,774	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,269	3,977	0	41,829
		569.3	8,622	44,228	52,850	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	41,905
		569.4	8,687	44,229	52,916	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	41,971
		569.5	8,752	44,229	52,981	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,036
		569.6	8,817	44,229	53,046	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,101
		569.7	8,882	44,229	53,111	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,166
		569.8	8,946	44,229	53,175	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,230
		569.9	9,011	44,229	53,240	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,295
		570.0	9,076	44,229	53,305	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,360
		570.1	9,141	44,229	53,370	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,425
		570.2	9,206	44,229	53,435	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,490
		570.3	9,270	44,229	53,499	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,554
		570.4	9,335	44,229	53,564	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,619
		570.5	9,400	44,229	53,629	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,684
		570.6	9,465	44,229	53,694	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,749
		570.7	9,530	44,229	53,759	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,814
		570.8	9,594	44,229	53,823	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,878
		570.9	9,659	44,229	53,888	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	42,943
		571.0	9,724	44,229	53,953	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,008
		571.1	9,789	44,229	54,018	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,073
		571.2	9,854	44,229	54,083	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,138
		571.3	9,918	44,229	54,147	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,202
		571.4	9,983	44,229	54,212	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,267
		571.5	10,048	44,229	54,277	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,332
		571.6	10,113	44,229	54,342	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,397
		571.7	10,178	44,229	54,407	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,462
		571.8	10,242	44,229	54,471	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,526
		571.9	10,307	44,229	54,536	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,591
		572.0	10,372	44,229	54,601	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,656

Flow On/Off		Elevation (ft)	Wet Well Volume (ft^3)	Pipe Volume (ft^3)	Total Available Storage (ft^3)	Uniform Depth Volume (ft^3) - Lead Pump								Uniform Depth Volume (ft^3) - Lag Pump #1								Uniform Depth Volume (ft^3) - Lag Pump #2								Total Usable Storage (ft^3)
Ascending	Descending					Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	
		572.1	10,437	44,229	54,666	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,721
		572.2	10,502	44,229	54,731	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,786
		572.3	10,566	44,229	54,795	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,850
		572.4	10,631	44,229	54,860	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,915
		572.5	10,696	44,229	54,925	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	43,980
		572.6	10,761	44,229	54,990	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	44,045
		572.7	10,826	44,229	55,055	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	44,110
		572.8	10,890	44,229	55,119	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	44,174
		572.9	10,955	44,229	55,184	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	44,239
		573.0	11,020	44,229	55,249	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	44,304
		573.1	11,085	44,229	55,314	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	44,369
		573.2	11,150	44,229	55,379	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	44,434
		573.3	11,214	44,229	55,443	1,737	2,984	616	2,153	905	735	1,105	0	3,740	6,495	2,653	2,555	1,938	1,638	1,997	0	5,636	9,955	3,997	6,727	4,230	3,280	3,993	0	44,498
		573.4	11,279	44,229	55,508	1,737	2,984	616	2,153	905	735	1,105	2	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2	44,561
		573.5	11,344	44,230	55,574	1,737	2,984	616	2,153	905	735	1,105	13	3,740	6,495	2,653	2,555	1,938	1,638	1,997	13	5,636	9,955	3,997	6,727	4,230	3,280	3,993	13	44,616
		573.6	11,409	44,243	55,652	1,737	2,984	616	2,153	905	735	1,105	36	3,740	6,495	2,653	2,555	1,938	1,638	1,997	36	5,636	9,955	3,997	6,727	4,230	3,280	3,993	36	44,671
		573.7	11,474	44,254	55,728	1,737	2,984	616	2,153	905	735	1,105	73	3,740	6,495	2,653	2,555	1,938	1,638	1,997	73	5,636	9,955	3,997	6,727	4,230	3,280	3,993	73	44,710
		573.8	11,538	44,297	55,835	1,737	2,984	616	2,153	905	735	1,105	125	3,740	6,495	2,653	2,555	1,938	1,638	1,997	125	5,636	9,955	3,997	6,727	4,230	3,280	3,993	125	44,765
		573.9	11,603	44,324	55,927	1,737	2,984	616	2,153	905	735	1,105	193	3,740	6,495	2,653	2,555	1,938	1,638	1,997	193	5,636	9,955	3,997	6,727	4,230	3,280	3,993	193	44,789
		574.0	11,668	44,388	56,056	1,737	2,984	616	2,153	905	735	1,105	257	3,740	6,495	2,653	2,555	1,938	1,638	1,997	257	5,636	9,955	3,997	6,727	4,230	3,280	3,993	257	44,854
		574.1	11,733	44,458	56,191	1,737	2,984	616	2,153	905	735	1,105	330	3,740	6,495	2,653	2,555	1,938	1,638	1,997	330	5,636	9,955	3,997	6,727	4,230	3,280	3,993	330	44,916
		574.2	11,798	44,539	56,337	1,737	2,984	616	2,153	905	735	1,105	416	3,740	6,495	2,653	2,555	1,938	1,638	1,997	416	5,636	9,955	3,997	6,727	4,230	3,280	3,993	416	44,976
		574.3	11,862	44,626	56,488	1,737	2,984	616	2,153	905	735	1,105	506	3,740	6,495	2,653	2,555	1,938	1,638	1,997	506	5,636	9,955	3,997	6,727	4,230	3,280	3,993	506	45,037
		574.4	11,927	44,720	56,647	1,737	2,984	616	2,153	905	735	1,105	602	3,740	6,495	2,653	2,555	1,938	1,638	1,997	602	5,636	9,955	3,997	6,727	4,230	3,280	3,993	602	45,100
		574.5	11,992	44,819	56,811	1,737	2,984	616	2,153	905	735	1,105	703	3,740	6,495	2,653	2,555	1,938	1,638	1,997	703	5,636	9,955	3,997	6,727	4,230	3,280	3,993	703	45,163
		574.6	12,057	44,923	56,980	1,737	2,984	616	2,153	905	735	1,105	808	3,740	6,495	2,653	2,555	1,938	1,638	1,997	808	5,636	9,955	3,997	6,727	4,230	3,280	3,993	808	45,227
		574.7	12,122	45,029	57,151	1,737	2,984	616	2,153	905	735	1,105	917	3,740	6,495	2,653	2,555	1,938	1,638	1,997	917	5,636	9,955	3,997	6,727	4,230	3,280	3,993	917	45,289
		574.8	12,186	45,139	57,325	1,737	2,984	616	2,153	905	735	1,105	1,026	3,740	6,495	2,653	2,555	1,938	1,638	1,997	1,026	5,636	9,955	3,997	6,727	4,230	3,280	3,993	1,026	45,354
		574.9	12,251	45,251	57,502	1,737	2,984	616	2,153	905	735	1,105	1,139	3,740	6,495	2,653	2,555	1,938	1,638	1,997	1,139	5,636	9,955	3,997	6,727	4,230	3,280	3,993	1,139	45,418
		575.0	12,316	45,364	57,680	1,737	2,984	616	2,153	905	735	1,105	1,195	3,740	6,495	2,653	2,555	1,938	1,638	1,997	1,251	5,636	9,955	3,997	6,727	4,230	3,280	3,993	1,251	45,540
		575.1	12,381	45,478	57,859	1,737	2,984	616	2,153	905	735	1,105	1,252	3,740	6,495	2,653	2,555	1,938	1,638	1,997	1,363	5,636	9,955	3,997	6,727	4,230	3,280	3,993	1,363	45,662
		575.2	12,446	45,593	58,039	1,737	2,984	616	2,153	905	735	1,105	1,307	3,740	6,495	2,653	2,555	1,938	1,638	1,997	1,475	5,636	9,955	3,997	6,727	4,230	3,280	3,993	1,475	45,787
50-yr Max HWL		575.3	12,510	45,708	58,218	1,737	2,984	616	2,153	905	735	1,105	1,367	3,740	6,495	2,653	2,555	1,938	1,638	1,997	1,591	5,636	9,955	3,997	6,727	4,230	3,280	3,993	1,591	45,906
		575.4	12,575	45,823	58,398	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	1,700	5,636	9,955	3,997	6,727	4,230	3,280	3,993	1,700	46,711
		575.5	12,640	45,936	58,576	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	1,813	5,636	9,955	3,997	6,727	4,230	3,280	3,993	1,813	46,889
		575.6	12,705	46,048	58,753	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	1,922	5,636	9,955	3,997	6,727	4,230	3,280	3,993	1,922	47,066
		575.7	12,770	46,157	58,927	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,023	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,023	47,240
		575.8	12,834	46,264	59,098	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,125	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,125	47,411
		575.9	12,899	46,367	59,266	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,222	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,222	47,579
		576.0	12,964	46,466	59,430	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,312	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,312	47,743
		576.1	13,029	46,560	59,589	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,397	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,397	47,902
		576.2	13,094	46,648	59,742	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,474	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,474	48,055
		576.3	13,158	46,728	59,886	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,535	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,535	48,199
		576.4	13,223	46,814	60,037	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,579	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,579	48,350
		576.5	13,288	46,852	60,140	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,621	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,621	48,453
		576.6	13,353	46,908	60,261	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,658	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,658	48,574
		576.7	13,418	46,927	60,345	1,737	2,984	616	2,153	905	735	1,105	742	3,740	6,495	2,653	2,555	1,938	1,638	1,997	2,690	5,636	9,955	3,997	6,727	4,230	3,280	3,993	2,690	48,658
		576.8	13,482	46,950	60,432	1,737	2,984	616	2,153	905	735	1,105	742																	48,745
		576.9	13,547	46,957	60,504	1,737	2,984	616	2,153	905	735	1,105	742																	48,817
		577.0	13,612	46,965	60,577	1,737	2,984	616	2,153	905	735	1,105	742																	48,890
		577.1	13,677	46,973	60,650	1,737	2,984	616	2,153	905	735	1,105	742																	48,963
		577.2	13,742	47,000	60,742	1,737	2,984	616	2,153	905	735	1,105	742																	49,055
100-yr Max HWL		577.3	13,806	47,019	60,825	1,737	2,984	616	2,153	905	735	1,105	742																	49,138

PROPOSED CONDITIONS


Proposed Conditions
Stage vs. Total Storage
Stoage (ft³)
0
20,000
40,000
60,000
80,000
100,000
120,000
Elevation (ft)
557.2
558.2
559.2
560.2
561.2
562.2
563.2
564.2
565.2
566.2
567.2
568.2
569.2
570.2
571.2
572.2
573.2
574.2
575.2
576.2
577.2
Low Flow Pump Off
Storage = 0 ft³
Low Flow Pump On /
High Flow Pumps Off
Storage = 710 ft³
Lead Pump On
Storage = 5,767 ft³
Lag Pump #1 On
Storage = 11,576 ft³
Lag Pump #2 On
Storage = 20,546 ft³


Proposed Conditions
Stage vs. Usable Storage
Stoage (ft³)
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
557.2
558.2
559.2
560.2
561.2
562.2
563.2
564.2
565.2
566.2
567.2
568.2
569.2
570.2
571.2
572.2
573.2
574.2
575.2
576.2
577.2
Elevation (ft)
1 PUMP
Lag Pump #2 On
Usable Storage = 12,184 ft³
Lag Pump #1 On
Usable Storage = 5,613 ft³
Lead Pump On
Usable Storage = 3,381 ft³
Low Flow Pump On /
High Flow Pumps Off
Usable Storage = 0 ft³

Active Water Stage Elevation (ft, NAVD88)
0.0

Active Water Stage Elevation Results Summary	Total System Volume	**0**	
	Sub-Total Volume 1	**0**	See Column BM for Component Parts
	Sub-Total Volume 2	**0**	See Column BM for Component Parts

TRUE	Collectors Volume	**0**
TRUE	Wet Well Volume	**0**
	Collectors Volume	**0**
	PS26 Wet Well Volume	**0**
	Main Drain Volume 1	**0**
TRUE	Main Drain Volume 2	**0**

Iteration Stage	*ITERATIO*	*ITERATIO*	*ITERATIO*	*ITERATIO*	*ITERATIO*	*ITERATIO*	*ITERATIO*	*ITERATIO*	*ITERATION PS26 Wet Well*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0		*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Stage	Total Storage	Sub-Total 1	Main Drain	Collectors	Wet Well	Sub-Total 2
561.2	0		0	0	0	0
561.3	1		1	0	0	0
561.4	13		13	0	0	0
561.5	25		25	0	0	0
561.6	69		69	0	0	0
561.7	98		98	0	0	0
561.8	184		184	0	0	0
561.9	235		235	0	0	0
562.0	369		369	0	0	0
562.1	426		426	0	0	0
562.2	560		560	0	0	0
562.3	743		743	0	0	0
562.4	931		931	0	0	0
562.5	1,188		1,188	0	0	0
562.6	1,489		1,489	0	0	0
562.7	1,817		1,817	0	0	0
562.8	2,197		2,197	0	0	0
562.9	2,584		2,584	0	0	0
563.0	3,040		3,040	0	0	0
563.1	3,468		3,468	0	0	0
563.2	3,958		3,958	0	0	0
563.3	4,474		4,474	0	0	0
563.4	5,015	5,015	5,015	0	0	0
563.5	5,605	5,605	5,605	0	0	0
563.6	6,238	6,238	6,238	0	0	0
563.7	6,906	6,906	6,906	0	0	0
563.8	7,611	7,611	7,611	0	0	0
563.9	8,339	8,339	8,339	0	0	0
564.0	9,115	9,115	9,115	0	0	0
564.1	9,895	9,895	9,895	0	0	0
564.2	10,728	10,728	10,728	0	0	0
564.3	11,574	11,574	11,574	0	0	0
564.4	12,441	12,441	12,441	0	0	0
564.5	13,329	13,329	13,329	0	0	0
564.6	14,230	14,230	14,230	0	0	0
564.7	15,156	15,156	15,156	0	0	0
564.8	16,085	16,085	16,085	0	0	0
564.9	17,042	17,042	17,042	0	0	0
565.0	18,008	18,008	18,008	0	0	0
565.1	19,114	19,114	19,114	0	0	0
565.2	20,293	20,293	20,293	0	0	0
565.3	21,585	21,585	21,585	0	0	0
565.4	22,917	22,917	22,917	0	0	0
565.5	24,294	24,294	24,294	0	0	0
565.6	25,702	25,702	25,702	0	0	0
565.7	27,151	27,151	27,151	0	0	0
565.8	28,644	28,644	28,644	0	0	0
565.9	30,192	30,192	30,192	0	0	0
566.0	31,755	31,755	31,755	0	0	0
566.1	33,345	33,345	33,345	0	0	0
566.2	34,965	34,965	34,965	0	0	0
566.3	36,604	36,604	36,604	0	0	0
566.4	38,165	38,165	38,165	0	0	0
566.5	39,779	39,779	39,779	0	0	0
566.6	41,327	41,327	41,327	0	0	0
566.7	42,894	42,894	42,894	0	0	0
566.8	44,417	44,417	44,417	0	0	0
566.9	45,931	45,931	45,931	0	0	0
567.0	47,408	47,408	47,408	0	0	0
567.1	48,873	48,873	48,873	0	0	0
567.2	50,290	50,290	50,290	0	0	0
567.3	51,631	51,631	51,631	0	0	0
567.4	52,954	52,954	52,954	0	0	0
567.5	54,256	54,256	54,256	0	0	0
567.6	55,482	55,482	55,482	0	0	0
567.7	56,708	56,708	56,708	0	0	0
567.8	57,856	57,856	57,856	0	0	0
567.9	58,999	58,999	58,999	0	0	0
568.0	60,071	60,071	60,071	0	0	0
568.1	61,128	61,128	61,128	0	0	0
568.2	62,122	62,122	62,122	0	0	0
568.3	63,081	63,081	63,081	0	0	0
568.4	64,059	64,059	64,059	0	0	0

SIZE	5.00	4.50	4.00	3.50	3.00	7.00	6.50	6.00
COLUMN #	2	3	4	5	6	7	8	9
Depth	Circle Area	Circle Area	Circle Area	Circle Area	Circle Area	Circle Area	Circle Area	Circle Area
0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.09	0.09	0.08	0.08	0.07	0.11	0.11	0.10
0.2	0.26	0.25	0.23	0.22	0.20	0.31	0.30	0.29
0.3	0.48	0.46	0.43	0.40	0.37	0.57	0.55	0.53
0.4	0.74	0.70	0.65	0.61	0.56	0.88	0.84	0.81
0.5	1.02	0.97	0.91	0.84	0.77	1.22	1.17	1.13
0.6	1.33	1.26	1.18	1.10	1.01	1.60	1.54	1.47
0.7	1.67	1.58	1.48	1.37	1.25	2.00	1.93	1.84
0.8	2.03	1.91	1.79	1.66	1.51	2.44	2.34	2.24
0.9	2.40	2.26	2.12	1.96	1.78	2.89	2.78	2.66
1.0	2.80	2.63	2.46	2.27	2.06	3.37	3.24	3.10
1.1	3.20	3.01	2.81	2.59	2.35	3.87	3.72	3.55
1.2	3.62	3.40	3.17	2.92	2.64	4.39	4.21	4.03
1.3	4.06	3.81	3.54	3.25	2.94	4.93	4.72	4.51
1.4	4.50	4.22	3.92	3.59	3.23	5.48	5.25	5.01
1.5	4.95	4.64	4.30	3.94	3.53	6.05	5.79	5.53
1.6	5.42	5.07	4.69	4.29	3.83	6.63	6.35	6.05
1.7	5.89	5.50	5.09	4.64	4.13	7.22	6.91	6.59
1.8	6.36	5.94	5.48	4.99	4.43	7.83	7.49	7.13
1.9	6.85	6.38	5.88	5.33	4.72	8.45	8.08	7.69
2.0	7.33	6.83	6.28	5.68	5.01	9.07	8.67	8.25
2.1	7.83	7.28	6.68	6.03	5.29	9.71	9.28	8.82
2.2	8.32	7.73	7.08	6.37	5.56	10.36	9.89	9.39
2.3	8.82	8.18	7.48	6.70	5.82	11.01	10.51	9.98
2.4	9.32	8.63	7.87	7.03	6.06	11.67	11.13	10.56
2.5	9.82	9.07	8.26	7.35	6.29	12.34	11.76	11.15
2.6	10.32	9.52	8.65	7.66	6.51	13.01	12.39	11.74
2.7	10.82	9.96	9.02	7.96	6.70	13.69	13.03	12.34
2.8	11.31	10.40	9.40	8.25	6.87	14.38	13.68	12.94
2.9	11.81	10.84	9.76	8.52	7.00	15.06	14.32	13.54
3.0	12.30	11.26	10.11	8.78	7.07	15.75	14.97	14.14
3.1	12.79	11.68	10.45	9.01	7.07	16.45	15.62	14.74
3.2	13.27	12.10	10.78	9.22	7.07	17.14	16.27	15.34
3.3	13.75	12.50	11.09	9.40	7.07	17.84	16.92	15.93
3.4	14.22	12.89	11.38	9.54	7.07	18.54	17.57	16.53
3.5	14.68	13.27	11.66	9.62	7.07	19.24	18.21	17.12
3.6	15.13	13.64	11.91	9.62	7.07	19.94	18.86	17.71
3.7	15.58	13.99	12.14	9.62	7.07	20.64	19.51	18.30
3.8	16.01	14.33	12.33	9.62	7.07	21.34	20.15	18.88
3.9	16.43	14.64	12.48	9.62	7.07	22.04	20.79	19.46
4.0	16.84	14.94	12.57	9.62	7.07	22.73	21.42	20.02
4.1	17.23	15.21	12.57	9.62	7.07	23.42	22.05	20.59
4.2	17.61	15.45	12.57	9.62	7.07	24.11	22.68	21.14
4.3	17.96	15.65	12.57	9.62	7.07	24.79	23.30	21.69
4.4	18.30	15.82	12.57	9.62	7.07	25.47	23.91	22.22
4.5	18.61	15.90	12.57	9.62	7.07	26.15	24.51	22.75
4.6	18.90	15.90	12.57	9.62	7.07	26.81	25.11	23.26
4.7	19.15	15.90	12.57	9.62	7.07	27.47	25.69	23.76
4.8	19.37	15.90	12.57	9.62	7.07	28.13	26.27	24.25
4.9	19.54	15.90	12.57	9.62	7.07	28.77	26.84	24.72
5.0	19.63	15.90	12.57	9.62	7.07	29.41	27.39	25.18
5.1	19.63	15.90	12.57	9.62	7.07	30.04	27.93	25.61
5.2	19.63	15.90	12.57	9.62	7.07	30.66	28.46	26.03
5.3	19.63	15.90	12.57	9.62	7.07	31.26	28.97	26.43
5.4	19.63	15.90	12.57	9.62	7.07	31.86	29.47	26.80
5.5	19.63	15.90	12.57	9.62	7.07	32.44	29.95	27.15
5.6	19.63	15.90	12.57	9.62	7.07	33.01	30.40	27.46
5.7	19.63	15.90	12.57	9.62	7.07	33.56	30.84	27.75
5.8	19.63	15.90	12.57	9.62	7.07	34.09	31.26	27.99
5.9	19.63	15.90	12.57	9.62	7.07	34.61	31.65	28.17
6.0	19.63	15.90	12.57	9.62	7.07	35.11	32.01	28.27
6.1	19.63	15.90	12.57	9.62	7.07	35.59	32.34	28.27
6.2	19.63	15.90	12.57	9.62	7.07	36.05	32.63	28.27
6.3	19.63	15.90	12.57	9.62	7.07	36.48	32.88	28.27
6.4	19.63	15.90	12.57	9.62	7.07	36.89	33.08	28.27
6.5	19.63	15.90	12.57	9.62	7.07	37.26	33.18	28.27
6.6	19.63	15.90	12.57	9.62	7.07	37.61	33.18	28.27
6.7	19.63	15.90	12.57	9.62	7.07	37.91	33.18	28.27
6.8	19.63	15.90	12.57	9.62	7.07	38.17	33.18	28.27
6.9	19.63	15.90	12.57	9.62	7.07	38.37	33.18	28.27
7.0	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27
7.1	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27
7.2	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27
7.3	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27
7.4	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27
7.5	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27
7.6	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27
7.7	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27
7.8	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27
7.9	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27
8.0	19.63	15.90	12.57	9.62	7.07	38.48	33.18	28.27

	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
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	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
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	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
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	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
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	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

568.5	64,981	64,981	64,981	0	0	0
568.6	65,904	65,904	65,904	0	0	0
568.7	66,775	66,775	66,775	0	0	0
568.8	67,642	67,642	67,642	0	0	0
568.9	68,467	68,467	68,467	0	0	0
569.0	69,276	69,276	69,276	0	0	0
569.1	70,060	70,060	70,060	0	0	0
569.2	70,780	70,780	70,780	0	0	0
569.3	71,457	71,457	71,457	0	0	0
569.4	72,120	72,120	72,120	0	0	0
569.5	72,757	72,757	72,757	0	0	0
569.6	73,385	73,385	73,385	0	0	0
569.7	73,990	73,990	73,990	0	0	0
569.8	74,579	74,579	74,579	0	0	0
569.9	75,147	75,147	75,147	0	0	0
570.0	75,695	75,695	75,695	0	0	0
570.1	76,220	76,220	76,220	0	0	0
570.2	76,722	76,722	76,722	0	0	0
570.3	77,197	77,197	77,197	0	0	0
570.4	77,644	77,644	77,644	0	0	0
570.5	78,059	78,059	78,059	0	0	0
570.6	78,437	78,437	78,437	0	0	0
570.7	78,773	78,773	78,773	0	0	0
570.8	79,058	79,058	79,058	0	0	0
570.9	79,331	79,331	79,331	0	0	0
571.0	79,405	79,405	79,405	0	0	0
571.1	79,415	79,415	79,415	0	0	0
571.2	79,415	79,415	79,415	0	0	0
571.3	79,415	79,415	79,415	0	0	0
571.4	79,415	79,415	79,415	0	0	0
571.5	79,415	79,415	79,415	0	0	0
571.6	79,415	79,415	79,415	0	0	0
571.7	79,415	79,415	79,415	0	0	0
571.8	79,415	79,415	79,415	0	0	0
571.9	79,415	79,415	79,415	0	0	0
572.0	79,415	79,415	79,415	0	0	0
572.1	79,415	79,415	79,415	0	0	0
572.2	79,415	79,415	79,415	0	0	0
572.3	79,415	79,415	79,415	0	0	0
572.4	79,415	79,415	79,415	0	0	0
572.5	79,415	79,415	79,415	0	0	0
572.6	79,415	79,415	79,415	0	0	0
572.7	79,415	79,415	79,415	0	0	0
572.8	79,415	79,415	79,415	0	0	0
572.9	79,415	79,415	79,415	0	0	0
573.0	79,415	79,415	79,415	0	0	0
573.1	79,415	79,415	79,415	0	0	0
573.2	79,415	79,415	79,415	0	0	0
573.3	79,415	79,415	79,415	0	0	0
573.4	79,415	79,415	79,415	0	0	0
573.5	79,416	79,416	79,416	0	0	0
573.6	79,429	79,429	79,429	0	0	0
573.7	79,440	79,440	79,440	0	0	0
573.8	79,483	79,483	79,483	0	0	0
573.9	79,510	79,510	79,510	0	0	0
574.0	79,574	79,574	79,574	0	0	0
574.1	79,644	79,644	79,644	0	0	0
574.2	79,725	79,725	79,725	0	0	0
574.3	79,812	79,812	79,812	0	0	0
574.4	79,906	79,906	79,906	0	0	0
574.5	80,005	80,005	80,005	0	0	0
574.6	80,109	80,109	80,109	0	0	0
574.7	80,215	80,215	80,215	0	0	0
574.8	80,325	80,325	80,325	0	0	0
574.9	80,437	80,437	80,437	0	0	0
575.0	80,550	80,550	80,550	0	0	0
575.1	80,664	80,664	80,664	0	0	0
575.2	80,779	80,779	80,779	0	0	0
575.3	80,894	80,894	80,894	0	0	0
575.4	81,009	81,009	81,009	0	0	0
575.5	81,122	81,122	81,122	0	0	0
575.6	81,234	81,234	81,234	0	0	0
575.7	81,343	81,343	81,343	0	0	0
575.8	81,450	81,450	81,450	0	0	0
575.9	81,553	81,553	81,553	0	0	0
576.0	81,652	81,652	81,652	0	0	0
576.1	81,746	81,746	81,746	0	0	0
576.2	81,834	81,834	81,834	0	0	0
576.3	81,914	81,914	81,914	0	0	0
576.4	82,000	82,000	82,000	0	0	0
576.5	82,038	82,038	82,038	0	0	0
576.6	82,094	82,094	82,094	0	0	0
576.7	82,113	82,113	82,113	0	0	0
576.8	82,136	82,136	82,136	0	0	0
576.9	82,143	82,143	82,143	0	0	0
577.0	82,151	82,151	82,151	0	0	0
577.1	82,159	82,159	82,159	0	0	0
577.2	82,186	82,186	82,186	0	0	0
577.3	82,205	82,205	82,205	0	0	0

VOLUME CALCULATOR

Conduit ID	**Conduit Size** (ft)	**Length** (ft)	**Up IE** (NAVD88)	**Down IE** (NAVD88)	Up IE is above Down IE	Column # of Size	Size Output (ft)	Sizes Match	Water Stage Elevation (NAVD88)	Up Wetted Depth	Down Wetted Depth (ft)	Up Wetted Area (sf)	Down Wetted Area (sf)	Full Length (ft)	Full Volume (cf)	Empty Length (ft)	Partially-Full Length (ft)	Partially-Full Midsection Wetted Area (sf)	Partially-Full Average Wetted Area (sf)	Partially-Full Volume (cf)	**Total Volume (cf)**	Sub-System (ft)
1.0	5.00	478	562.06	561.17	TRUE	2	5.00	TRUE	0.0	-562.06	-561.17	0.00	0.00	0	0	478	0	0.00	0.00	0	**0**	1
2.0	5.00	507	562.37	562.06	TRUE	2	5.00	TRUE	0.0	-562.37	-562.06	0.00	0.00	0	0	507	0	0.00	0.00	0	**0**	1
3.0	5.00	339	563.06	562.37	TRUE	2	5.00	TRUE	0.0	-563.06	-562.37	0.00	0.00	0	0	339	0	0.00	0.00	0	**0**	1
4.0	4.50	423	563.52	563.21	TRUE	3	4.50	TRUE	0.0	-563.52	-563.21	0.00	0.00	0	0	423	0	0.00	0.00	0	**0**	1
5.0	4.50	266	564.17	563.52	TRUE	3	4.50	TRUE	0.0	-564.17	-563.52	0.00	0.00	0	0	266	0	0.00	0.00	0	**0**	1
6.0	4.00	261	565.33	564.27	TRUE	4	4.00	TRUE	0.0	-565.33	-564.27	0.00	0.00	0	0	261	0	0.00	0.00	0	**0**	1
7.0	3.50	415	565.79	565.53	TRUE	5	3.50	TRUE	0.0	-565.79	-565.53	0.00	0.00	0	0	415	0	0.00	0.00	0	**0**	1
8.0	3.00	386	573.94	573.34	TRUE	6	3.00	TRUE	0.0	-573.94	-573.34	0.00	0.00	0	0	386	0	0.00	0.00	0	**0**	1
9.0	3.00	400	577.66	576.79	TRUE	6	3.00	TRUE	0.0	-577.66	-576.79	0.00	0.00	0	0	400	0	0.00	0.00	0	**0**	1
10.0	6.00	1200	565.02	564.82	TRUE	9	6.00	TRUE	0.0	-565.02	-564.82	0.00	0.00	0	0	1200	0	0.00	0.00	0	**0**	1
11.0	4.00	100	566.00	565.02	TRUE	4	4.00	TRUE	0.0	-566.00	-565.02	0.00	0.00	0	0	100	0	0.00	0.00	0	**0**	1

Flow On/Off		Elevation (ft)	Wet Well Volume (ft^3)	Pipe Volume (ft^3)	Total Available Storage (ft^3)	Uniform Depth Volume (ft^3) - Pump 1											Uniform Depth Volume (ft^3) - Pump 2								Uniform Depth Volume (ft^3) - Pump 3								Total Usable Storage (ft^3)
Ascending	Descending					Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 9	Segment 10	Segment 11	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	
	Low flow off	557.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.3	69	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.4	139	0	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.5	209	0	209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.6	280	0	280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.7	351	0	351	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.8	422	0	422	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		557.9	494	0	494	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		558.0	566	0	566	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		558.1	638	0	638	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Low flow on	High flow off, low flow on	558.2	710	0	710	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		558.3	782	0	782	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
		558.4	854	0	854	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	144
		558.5	926	0	926	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	216
		558.6	998	0	998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	288
		558.7	1,070	0	1,070	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	360
		558.8	1,142	0	1,142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	432
		558.9	1,214	0	1,214	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	504
		559.0	1,286	0	1,286	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	576
		559.1	1,358	0	1,358	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	648
		559.2	1,430	0	1,430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	720
		559.3	1,502	0	1,502	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	792
		559.4	1,574	0	1,574	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	864
		559.5	1,646	0	1,646	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	936
		559.6	1,718	0	1,718	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,008
		559.7	1,790	0	1,790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,080
		559.8	1,862	0	1,862	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,152
		559.9	1,934	0	1,934	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,224
		560.0	2,006	0	2,006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,296
		560.1	2,078	0	2,078	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,368
		560.2	2,150	0	2,150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,440
		560.3	2,222	0	2,222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,512
		560.4	2,294	0	2,294	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,584
		560.5	2,366	0	2,366	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,656
		560.6	2,438	0	2,438	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,728
		560.7	2,510	0	2,510	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,800
		560.8	2,582	0	2,582	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,872
		560.9	2,654	0	2,654	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,944
		561.0	2,726	0	2,726	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,016
		561.1	2,798	0	2,798	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,088
		561.2	2,870	0	2,870	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,160
		561.3	2,942	1	2,943	3	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2,230
		561.4	3,014	13	3,027	14	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	2,303
		561.5	3,086	25	3,111	38	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	2,363
		561.6	3,158	69	3,227	79	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	0	0	0	79	0	0	0	0	0	0	0	2,438
		561.7	3,230	98	3,328	137	0	0	0	0	0	0	0	0	0	0	137	0	0	0	0	0	0	0	137	0	0	0	0	0	0	0	2,481
		561.8	3,302	184	3,486	211	0	0	0	0	0	0	0	0	0	0	211	0	0	0	0	0	0	0	211	0	0	0	0	0	0	0	2,565
		561.9	3,374	235	3,609	309	0	0	0	0	0	0	0	0	0	0	309	0	0	0	0	0	0	0	309	0	0	0	0	0	0	0	2,590
		562.0	3,446	369	3,815	434	0	0	0	0	0	0	0	0	0	0	434	0	0	0	0	0	0	0	434	0	0	0	0	0	0	0	2,671
		562.1	3,518	426	3,944	572	0	0	0	0	0	0	0	0	0	0	572	0	0	0	0	0	0	0	572	0	0	0	0	0	0	0	2,662
		562.2	3,590	560	4,150	686	8	0	0	0	0	0	0	0	0	0	686	8	0	0	0	0	0	0	686	8	0	0	0	0	0	0	2,746
		562.3	3,662	743	4,405	827	45	0	0	0	0	0	0	0	0	0	827	45	0	0	0	0	0	0	827	45	0	0	0	0	0	0	2,823
		562.4	3,734	931	4,665	983	122	0	0	0	0	0	0	0	0	0	983	122	0	0	0	0	0	0	983	122	0	0	0	0	0	0	2,850
		562.5	3,806	1,188	4,994	1,045	212	2	0	0	0	0	0	0	0	0	1,146	212	2	0	0	0	0	0	1,146	212	2	0	0	0	0	0	3,025
		562.6	3,878	1,489	5,367	1,114	329	13	0	0	0	0	0	0	0	0	1,321	329	13	0	0	0	0	0	1,321	329	13	0	0	0	0	0	3,201
Low flow off, lead pump on		562.7	3,950	1,817	5,767	1,184	457	35	0	0	0	0	0	0	0	0	1,502	457	35	0	0	0	0	0	1,502	457	35	0	0	0	0	0	3,381
		562.8	4,022	2,197	6,219	1,265	608	72	0	0	0	0	0	0	0	0	1,698	608	72	0	0	0	0	0	1,698	608	72	0	0	0	0	0	3,564
		562.9	4,094	2,584	6,678	1,356	778	125	0	0	0	0	0	0	0	0	1,895	778	125	0	0	0	0	0	1,895	778	125	0	0	0	0	0	3,709
		563.0	4,166	3,040	7,206	1,441	942	193	0	0	0	0	0	0	0	0	2,088	942	193	0	0	0	0	0	2,088	942	193	0	0	0	0	0	3,920
		563.1	4,238	3,468	7,706	1,532	1,125	281	0	0	0	0	0	0	0	0	2,304	1,125	281	0	0	0	0	0	2,304	1,125	281	0	0	0	0	0	4,058
		563.2	4,310	3,958	8,268	1,631	1,326	362	0	0	0	0	0	0	0	0	2,517	1,326	362	0	0	0	0	0	2,517	1,326	362	0	0	0	0	0	4,239
		563.3	4,382	4,474	8,856	1,737	1,528	451	6	0	0	0	0	0	0	0	2,738	1,528	451	6	0	0	0	0	2,738	1,528	451	6	0	0	0	0	4,424
		563.4	4,454	5,015	9,469	1,737	1,732	552	35	0	0	0	0	0	0	0	2,956	1,732	552	35	0	0	0	0	2,956	1,732	552	35	0	0	0	0	4,703
		563.5	4,526	5,605	10,131	1,737	1,949	666	95	0	0	0	0	0	0	0	3,063	1,949	666	95	0	0	0	0	3,181	1,949	666	95	0	0	0	0	4,974
		563.6	4,598	6,238	10,836	1,737	2,179	790	166	2	0	0	0	0	0	0	3,173	2,179	790	166	2	0	0	0	3,411	2,179	790	166	2	0	0	0	5,252
Lag pump 1 on		563.7	4,670	6,906	11,576	1,737	2,408	840	258	10	0	0	0	0	0	0	3,289	2,408	912	258	10	0	0	0	3,645	2,408	912	258	10	0	0	0	5,613
		563.8	4,742	7,611	12,353	1,737	2,632	897	364	26	0	0	0	0	0	0	3,394	2,632	1,044	364	26	0	0	0	3,870	2,632	1,044	364	26	0	0	0	5,987
		563.9	4,814	8,339	13,153	1,737	2,750	962	480	53	0	0	0	0	0	0	3,503	2,866	1,187	480	53	0	0	0	4,098	2,866	1,187	480	53	0	0	0	6,461
		564.0	4,886	9,115	14,001	1,737	2,872	1,022	608	92	0	0	0	0	0	0	3,628	3,121	1,329	608	92	0	0	0	4,342	3,121	1,329	608	92	0	0	0	6,960
		564.1	4,958	9,895	14,853	1,737	2,984	1,086	745	145	0	0	0	0	0	0	3,742	3,353	1,469	745	145	0	0	0	4,573	3,353	1,469	745	145	0	0	0	7,446
		564.2	5,030	10,728	15,758	1,737	2,984	1,157	887	209	0	0	0	0	0	0	3,857	3,591	1,616	887	209	0	0	0	4,804	3,591	1,616	887	209	0	0	0	8,074
		564.3	5,102	11,574	16,676	1,737	2,984	616	1,042	266	0	0	0	0	0	0	3,975	3,848	1,779	1,042	266	0	0	0	4,921	3,848	1,779	1,042	266	0	0	0	9,321
		564.4	5,174	12,441	17,615	1,737	2,984	616	1,196	333	1	0	0	0	0	0	3,975	4,095	1,932	1,196	333	1	0	0	5,040	4,095	1,932	1,196	333	1	0	0	10,038
		564.5	5,246	13,329	18,575	1,737	2,984	616	1,360	408	6	0	0	0	0	0	3,975	4,343	2,089	1,360	408	6	0	0	5,159	4,343	2,089	1,360	408	6	0	0	10,754
		564.6	5,318	14,230	19,548	1,737	2,984	616	1,534	494	17	0	0	0	0	0	3,975	4,594	2,168	1,534	494	17	0	0	5,278	4,594	2,251	1,534	494	17	0	0	11,456
Lag pump 2 on		564.7	5,390	15,156	20,546	1,737	2,984	616	1,700	581	34	0	0	0	0	0	3,975	4,846	2,249	1,700	581	34	0	0	5,397	4,846	2,416	1,700	581	34	0	0	12,184
		564.8	5,462	16,085	21,547	1,737	2,984	616	1,882	622	60	0	0	0	0	0	3,975	5,099	2,324	1,882	676	60	0	0	5,516	5,099	2,575	1,882	676	60	0	0	12,936
		564.9	5,534	17,042	22,576	1,737	2,984	616	1,972	662	92	0	0	0	29	0	3,975	5,351	2,401	2,062	772	92	0	0	5,635	5,351	2,737	2,062	772	92	0	0	13,774
		565.0	5,606	18,008	23,614	1,737	2,984	616	2,056	706	136	0	0	0	158	0	3,975	5,602	2,490	2,237	870	136	0	0	5,752	5,602	2,911	2,237	870	136	0	0	14,511
		565.1	5,678	19,114	24,792	1,737	2,984	616	2,153	752	186	0	0	0	378	0	3,975	5,851	2,571	2,427	976	186	0	0	5,867	5,851	3,076	2,427	976	186	0	0	15,276
		565.2	5,750	20,293	26,043	1,737	2,984	616	2,153	801	250	0	0	0	650	2	3,975	6,112	2,653	2,612	1,082	250	0	0	5,867	6,112	3,242	2,612	1,082	250	0	0	16,140
		565.3	5,822	21,585	27,407	1,737	2,984	616	2,153	854	319	0	0	0	989	7	3,975	6,237	2,653	2,799	1,192	319	0	0	5,867	6,355	3,408	2,799	1,192	319	0	0	17,038
		565.4	5,894	22,917	28,811	1,737	2,984	616	2,153	905	379	0	0	0	1,368	13	3,975	6,359	2,653	2,988	1,302	379	0	0	5,867	6,593	3,492	2,988	1,302	379	0	0	17,946
		565.5	5,966	24,294	30,260	1,737	2,984	616	2,153	905	398	0	0	0	1,770	23	3,975	6,495	2,653	3,179	1,416	445	0	0	5,867	6,854	3,576	3,179	1,416	445	0	0	18,964
		565.6	6,038	25,702	31,740	1,737	2,984	616	2,153	905	423	5	0	0	2,245	36	3,975	6,495	2,653	3,371	1,532	520	5	0	5,867	7,081	3,661	3,371	1,532	520	5	0	19,926

Flow On/Off		Elevation (ft)	Wet Well Volume (ft^3)	Pipe Volume (ft^3)	Total Available Storage (ft^3)	Uniform Depth Volume (ft^3) - Pump 1											Uniform Depth Volume (ft^3) - Pump 2								Uniform Depth Volume (ft^3) - Pump 3								Total Usable Storage (ft^3)
Ascending	Descending					Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 9	Segment 10	Segment 11	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	
		565.7	6,110	27,151	33,261	1,737	2,984	616	2,153	905	453	31	0	0	2,690	53	3,975	6,495	2,653	3,552	1,585	596	31	0	5,867	7,314	3,746	3,552	1,646	596	31	0	20,929
		565.8	6,182	28,644	34,826	1,737	2,984	616	2,153	905	487	83	0	0	3,209	73	3,975	6,495	2,653	3,743	1,646	683	83	0	5,867	7,552	3,830	3,743	1,767	683	83	0	21,869
		565.9	6,254	30,192	36,446	1,737	2,984	616	2,153	905	521	143	0	0	3,726	98	3,975	6,495	2,653	3,933	1,702	767	143	0	5,867	7,780	3,914	3,933	1,884	767	143	0	22,853
		566.0	6,326	31,755	38,081	1,737	2,984	616	2,153	905	561	221	0	0	4,252	106	3,975	6,495	2,653	4,120	1,760	858	221	0	5,867	7,998	3,997	4,120	1,995	858	221	0	23,836
		566.1	6,398	33,345	39,743	1,737	2,984	616	2,153	905	599	312	0	0	4,853	111	3,975	6,495	2,653	4,304	1,819	947	312	0	5,867	8,216	3,997	4,304	2,113	947	312	0	24,763
		566.2	6,470	34,965	41,435	1,737	2,984	616	2,153	905	645	409	0	0	5,422	118	3,975	6,495	2,653	2,381	1,878	1,044	409	0	5,867	8,432	3,997	4,484	2,231	1,044	409	0	25,736
		566.3	6,542	36,604	43,146	1,737	2,984	616	2,153	905	686	517	0	0	6,019	128	3,975	6,495	2,653	2,475	1,938	1,138	517	0	5,867	8,631	3,997	4,679	2,356	1,138	517	0	26,691
		566.4	6,614	38,165	44,779	1,737	2,984	616	2,153	905	735	636	0	0	6,652	139	3,975	6,495	2,653	2,555	1,938	1,187	636	0	5,867	8,825	3,997	4,849	2,472	1,239	636	0	27,512
		566.5	6,686	39,779	46,465	1,737	2,984	616	2,153	905	735	755	0	0	7,273	152	3,975	6,495	2,653	2,555	1,938	1,234	755	0	5,867	9,008	3,997	5,023	2,588	1,338	755	0	28,445
		566.6	6,758	41,327	48,085	1,737	2,984	616	2,153	905	735	879	0	0	7,916	165	3,975	6,495	2,653	2,555	1,938	1,283	879	0	5,867	9,187	3,997	5,198	2,707	1,438	879	0	29,285
		566.7	6,830	42,894	49,724	1,737	2,984	616	2,153	905	735	1,012	0	0	8,584	181	3,975	6,495	2,653	2,555	1,938	1,330	1,012	0	5,867	9,348	3,997	5,363	2,811	1,536	1,012	0	30,107
		566.8	6,902	44,417	51,319	1,737	2,984	616	2,153	905	735	1,147	0	0	9,228	195	3,975	6,495	2,653	2,555	1,938	1,383	1,147	0	5,867	9,495	3,997	5,527	2,925	1,643	1,147	0	30,909
		566.9	6,974	45,931	52,905	1,737	2,984	616	2,153	905	735	1,284	0	0	9,890	213	3,975	6,495	2,653	2,555	1,938	1,432	1,284	0	5,867	9,632	3,997	5,681	3,035	1,741	1,284	0	31,678
		567.0	7,046	47,408	54,454	1,737	2,984	616	2,153	905	735	1,418	0	0	10,222	213	3,975	6,495	2,653	2,555	1,938	1,483	1,418	0	5,867	9,747	3,997	5,837	3,152	1,843	1,418	0	32,761
		567.1	7,118	48,873	55,991	1,737	2,984	616	2,153	905	735	1,564	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,534	1,564	0	5,867	9,832	3,997	5,984	3,257	1,939	1,564	0	33,813
High water alarm		567.2	7,190	50,290	57,480	1,737	2,984	616	2,153	905	735	959	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,586	1,706	0	5,867	9,889	3,997	6,116	3,357	2,042	1,706	0	35,907
		567.3	7,262	51,631	58,893	1,737	2,984	616	2,153	905	735	1,035	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,850	0	5,867	9,932	3,997	6,245	3,461	2,139	1,850	0	37,244
		567.4	7,334	52,954	60,288	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,994	0	5,867	9,955	3,997	6,366	3,555	2,236	1,994	0	38,569
		567.5	7,406	54,256	61,662	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	2,139	0	5,867	9,955	3,997	6,469	3,647	2,330	2,139	0	39,943
		567.6	7,478	55,482	62,960	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	2,283	0	5,867	9,955	3,997	6,560	3,735	2,423	2,283	0	41,241
		567.7	7,550	56,708	64,258	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	2,425	0	5,867	9,955	3,997	6,632	3,821	2,510	2,425	0	42,539
		567.8	7,622	57,856	65,478	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	2,571	0	5,867	9,955	3,997	6,674	3,896	2,602	2,571	0	43,759
		567.9	7,694	58,999	66,693	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	2,706	0	5,867	9,955	3,997	6,708	3,963	2,683	2,706	0	44,974
		568.0	7,766	60,071	67,837	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	2,847	0	5,867	9,955	3,997	6,727	4,020	2,763	2,847	0	46,118
		568.1	7,838	61,128	68,966	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	2,983	0	5,867	9,955	3,997	6,727	4,063	2,833	2,983	0	47,247
		568.2	7,910	62,122	70,032	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	3,111	0	5,867	9,955	3,997	6,727	4,101	2,904	3,111	0	48,313
		568.3	7,974	63,081	71,055	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,713	0	5,867	9,955	3,997	6,727	4,137	2,960	3,240	0	49,336
		568.4	8,039	64,059	72,098	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,770	0	5,867	9,955	3,997	6,727	4,170	3,005	3,363	0	50,379
		568.5	8,104	64,981	73,085	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,821	0	5,867	9,955	3,997	6,727	4,197	3,047	3,474	0	51,366
		568.6	8,169	65,904	74,073	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,869	0	5,867	9,955	3,997	6,727	4,218	3,088	3,582	0	52,354
		568.7	8,234	66,775	75,009	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,913	0	5,867	9,955	3,997	6,727	4,230	3,125	3,683	0	53,290
		568.8	8,298	67,642	75,940	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,951	0	5,867	9,955	3,997	6,727	4,230	3,162	3,772	0	54,221
		568.9	8,363	68,467	76,830	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,980	0	5,867	9,955	3,997	6,727	4,230	3,195	3,849	0	55,111
		569.0	8,428	69,276	77,704	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,223	3,909	0	55,985
		569.1	8,493	70,060	78,553	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,249	3,947	0	56,834
		569.2	8,558	70,780	79,338	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,269	3,977	0	57,619
		569.3	8,622	71,457	80,079	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	58,360
		569.4	8,687	72,120	80,807	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	59,088
		569.5	8,752	72,757	81,509	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	59,790
		569.6	8,817	73,385	82,202	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	60,483
		569.7	8,882	73,990	82,872	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	61,153
		569.8	8,946	74,579	83,525	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	61,806
		569.9	9,011	75,147	84,158	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	62,439
		570.0	9,076	75,695	84,771	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	63,052
		570.1	9,141	76,220	85,361	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	63,642
		570.2	9,206	76,722	85,928	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	64,209
		570.3	9,270	77,197	86,467	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	64,748
		570.4	9,335	77,644	86,979	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	65,260
		570.5	9,400	78,059	87,459	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	65,740
		570.6	9,465	78,437	87,902	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	66,183
		570.7	9,530	78,773	88,303	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	66,584
		570.8	9,594	79,058	88,652	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	66,933
		570.9	9,659	79,331	88,990	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	67,271
		571.0	9,724	79,405	89,129	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	67,410
		571.1	9,789	79,415	89,204	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	67,485
		571.2	9,854	79,415	89,269	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	67,550
		571.3	9,918	79,415	89,333	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	67,614
		571.4	9,983	79,415	89,398	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	67,679
		571.5	10,048	79,415	89,463	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	67,744
		571.6	10,113	79,415	89,528	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	67,809
		571.7	10,178	79,415	89,593	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	67,874
		571.8	10,242	79,415	89,657	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	67,938
		571.9	10,307	79,415	89,722	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,003
		572.0	10,372	79,415	89,787	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,068
		572.1	10,437	79,415	89,852	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,133
		572.2	10,502	79,415	89,917	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,198
		572.3	10,566	79,415	89,981	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,262
		572.4	10,631	79,415	90,046	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,327
		572.5	10,696	79,415	90,111	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,392
		572.6	10,761	79,415	90,176	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,457
		572.7	10,826	79,415	90,241	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,522
		572.8	10,890	79,415	90,305	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,586
		572.9	10,955	79,415	90,370	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,651
		573.0	11,020	79,415	90,435	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,716
		573.1	11,085	79,415	90,500	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,781
		573.2	11,150	79,415	90,565	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,846

Flow On/Off		Elevation (ft)	Wet Well Volume (ft^3)	Pipe Volume (ft^3)	Total Available Storage (ft^3)	Uniform Depth Volume (ft^3) - Pump 1											Uniform Depth Volume (ft^3) - Pump 2								Uniform Depth Volume (ft^3) - Pump 3								Total Usable Storage (ft^3)
Ascending	Descending					Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 9	Segment 10	Segment 11	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7	Segment 8	
		573.3	11,214	79,415	90,629	1,737	2,984	616	2,153	905	735	1,105	0	0	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	0	5,867	9,955	3,997	6,727	4,230	3,280	3,993	0	68,910
		573.4	11,279	79,415	90,694	1,737	2,984	616	2,153	905	735	1,105	2	2	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2	68,971
		573.5	11,344	79,416	90,760	1,737	2,984	616	2,153	905	735	1,105	13	13	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	13	5,867	9,955	3,997	6,727	4,230	3,280	3,993	13	69,015
		573.6	11,409	79,429	90,838	1,737	2,984	616	2,153	905	735	1,105	36	37	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	36	5,867	9,955	3,997	6,727	4,230	3,280	3,993	36	69,046
		573.7	11,474	79,440	90,914	1,737	2,984	616	2,153	905	735	1,105	73	75	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	73	5,867	9,955	3,997	6,727	4,230	3,280	3,993	73	69,047
		573.8	11,538	79,483	91,021	1,737	2,984	616	2,153	905	735	1,105	125	129	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	125	5,867	9,955	3,997	6,727	4,230	3,280	3,993	125	69,048
		573.9	11,603	79,510	91,113	1,737	2,984	616	2,153	905	735	1,105	193	200	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	193	5,867	9,955	3,997	6,727	4,230	3,280	3,993	193	69,001
		574.0	11,668	79,574	91,242	1,737	2,984	616	2,153	905	735	1,105	257	266	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	257	5,867	9,955	3,997	6,727	4,230	3,280	3,993	257	69,000
		574.1	11,733	79,644	91,377	1,737	2,984	616	2,153	905	735	1,105	330	342	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	330	5,867	9,955	3,997	6,727	4,230	3,280	3,993	330	68,986
		574.2	11,798	79,725	91,523	1,737	2,984	616	2,153	905	735	1,105	416	431	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	416	5,867	9,955	3,997	6,727	4,230	3,280	3,993	416	68,957
		574.3	11,862	79,812	91,674	1,737	2,984	616	2,153	905	735	1,105	506	525	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	506	5,867	9,955	3,997	6,727	4,230	3,280	3,993	506	68,924
		574.4	11,927	79,906	91,833	1,737	2,984	616	2,153	905	735	1,105	602	624	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	602	5,867	9,955	3,997	6,727	4,230	3,280	3,993	602	68,888
		574.5	11,992	80,005	91,997	1,737	2,984	616	2,153	905	735	1,105	703	729	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	703	5,867	9,955	3,997	6,727	4,230	3,280	3,993	703	68,846
		574.6	12,057	80,109	92,166	1,737	2,984	616	2,153	905	735	1,105	808	837	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	808	5,867	9,955	3,997	6,727	4,230	3,280	3,993	808	68,802
		574.7	12,122	80,215	92,337	1,737	2,984	616	2,153	905	735	1,105	917	950	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	917	5,867	9,955	3,997	6,727	4,230	3,280	3,993	917	68,751
		574.8	12,186	80,325	92,511	1,737	2,984	616	2,153	905	735	1,105	1,026	1,064	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	1,026	5,867	9,955	3,997	6,727	4,230	3,280	3,993	1,026	68,702
		574.9	12,251	80,437	92,688	1,737	2,984	616	2,153	905	735	1,105	1,139	1,181	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	1,139	5,867	9,955	3,997	6,727	4,230	3,280	3,993	1,139	68,649
		575.0	12,316	80,550	92,866	1,737	2,984	616	2,153	905	735	1,105	1,195	1,238	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	1,251	5,867	9,955	3,997	6,727	4,230	3,280	3,993	1,251	68,714
		575.1	12,381	80,664	93,045	1,737	2,984	616	2,153	905	735	1,105	1,252	1,298	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	1,363	5,867	9,955	3,997	6,727	4,230	3,280	3,993	1,363	68,776
		575.2	12,446	80,779	93,225	1,737	2,984	616	2,153	905	735	1,105	1,307	1,354	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	1,475	5,867	9,955	3,997	6,727	4,230	3,280	3,993	1,475	68,845
50-yr Max HWL		575.3	12,510	80,894	93,404	1,737	2,984	616	2,153	905	735	1,105	1,367	1,417	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	1,591	5,867	9,955	3,997	6,727	4,230	3,280	3,993	1,591	68,901
		575.4	12,575	81,009	93,584	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	1,700	5,867	9,955	3,997	6,727	4,230	3,280	3,993	1,700	70,354
		575.5	12,640	81,122	93,762	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	1,813	5,867	9,955	3,997	6,727	4,230	3,280	3,993	1,813	70,532
		575.6	12,705	81,234	93,939	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	1,922	5,867	9,955	3,997	6,727	4,230	3,280	3,993	1,922	70,709
		575.7	12,770	81,343	94,113	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,023	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,023	70,883
		575.8	12,834	81,450	94,284	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,125	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,125	71,054
		575.9	12,899	81,553	94,452	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,222	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,222	71,222
		576.0	12,964	81,652	94,616	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,312	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,312	71,386
		576.1	13,029	81,746	94,775	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,397	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,397	71,545
		576.2	13,094	81,834	94,928	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,474	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,474	71,698
		576.3	13,158	81,914	95,072	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,535	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,535	71,842
		576.4	13,223	82,000	95,223	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,579	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,579	71,993
		576.5	13,288	82,038	95,326	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,621	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,621	72,096
		576.6	13,353	82,094	95,447	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,658	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,658	72,217
		576.7	13,418	82,113	95,531	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213	3,975	6,495	2,653	2,555	1,938	1,638	1,997	2,690	5,867	9,955	3,997	6,727	4,230	3,280	3,993	2,690	72,301
		576.8	13,482	82,136	95,618	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213																	72,388
		576.9	13,547	82,143	95,690	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213																	72,460
		577.0	13,612	82,151	95,763	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213																	72,533
		577.1	13,677	82,159	95,836	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213																	72,606
		577.2	13,742	82,186	95,928	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213																	72,698
100-yr Max HWL		577.3	13,806	82,205	96,011	1,737	2,984	616	2,153	905	735	1,105	742	769	10,561	213																	72,781