ILLINOIS STATE TOLL HIGHWAY AUTHORITY

2700 Ogden Ave., Downers Grove, IL 60515

CONCEPT DRAINAGE REPORT
FOR
CENTRAL TRI-STATE TOLLWAY (I-294)
MASTER PLAN

CERMAK ROAD (M.P. 29.5) TO
BALMORAL AVENUE (M.P. 40.0)

PART 1

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DATE: DECEMBER 22, 2017

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Concept Drainage Report Submittal Checklist

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1 EXECUTIVE SUMMARY

The Illinois State Toll Highway Authority is conducting a Master Plan Study, Contract RR-14-4224, for roadway widening and reconstruction of the Central Tri-State Tollway (I-294) from north of Cermak Road (M.P. 29.5) to south of Balmoral Avenue (M.P. 40.0) in Cook County, IL. This roadway study is part of a larger corridor study to reconstruct and widen I-294 from 95th Street to Balmoral Avenue under the Move Illinois Program. There is an omission in this study between M.P. 33.4 and M.P. 36.25 where the new Elgin O'Hare Western Access (EOWA), Contract I-15-4656, ties into I-294. Within these study limits, the I-294 right-of-way line shares a border with DuPage County for most of the portion between I-88 and Grand Avenue. This roadway is located within many Chicago suburban municipalities including Westchester, Hillside, Berkeley, Franklin Park, Schiller Park, and Rosemont, and also shares a border with Oak Brook and Elmhurst.

There are two major watersheds with this project that include Lower Des Planes River to the north of the EOWA omission and Salt Creek to the south of the EOWA omission, which are both part of the Des Planes River cataloguing unit. Within this roadway study, there are 50 existing outlets. The major tributary areas were delineated based on USGS Mapping, and the contours generated from LIDAR survey performed for this project and provided by Tollway as well as available Cook and DuPage contours provided by the Tollway.

The existing I-294 roadway drainage system consists of both open and closed drainage. There is a system of drainage structures along the median that collect runoff from the median shoulder and inside lane. The median drainage system outlets to a system of roadside ditches and closed drainage on the outside of the interstate. The outside lanes and shoulder sheet flow predominately to a closed drainage system with structures and pipe where gutter is present, however, there are limited areas where the flow outlets directly into open ditches. Due to regional stormwater management requirements, the storage volume of the Lower Elmhurst Reservoir north of St. Charles Avenue between I-290 and I-294 will not be impacted. Additionally, there are eleven drainage issues that are currently being studied as part of this Master Plan.

The recommended roadway alternative includes pavement reconstruction, rehabilitation, and widening in both directions and new shoulders. To the south of the EOWA omission, the roadway will be reconstructed and widened as required, with the exception of the Cermak Plaza. Profile adjustments will be made to meet minimum slope requirements, and accommodate existing drainage freeboard issues. In addition to proposed drainage work within the existing right-of-way, new right-of-way will be acquired to provide additional detention volumes along the east side of I-294. Notable changes to the proposed drainage will occur within the I-290/I-294 interchange footprint in order to accommodate the new geometry. To the north of the EOWA omission and at the Cermak Plaza, the roadway will be rehabilitated, widened as required, and the inside shoulder and median barrier will be reconstructed. Roadway profile adjustment will be limited to changes due to the nature of the rehabilitation work and final proposed pavement section.

The proposed roadway drainage system in reconstructed sections will predominately be a closed drainage system; however, there are isolated areas where an open system will be provided for the outside lanes. The proposed drainage system would generally consist of drainage structures along the center of the median that will collect runoff from the median shoulder and drainage structures in the outside gutter that collect runoff from the travel lanes and outside shoulder. The proposed system will have trunk sewer at some locations and laterals that outlet directly in other locations. Trunk sewers, when required, will be placed either in the median or underneath the outside shoulder.

The presence of either trunk sewer or laterals, and the location of trunk sewer, is determined by structure spacing required, maintenance of traffic, construction phasing, at the ultimate location of the outlet from the Tollway system. Storm sewer laterals from the median would be aligned in order to promote constructability and maintenance of existing drainage. Existing detention volume will be maintained and proposed detention will be provided in accordance with Tollway policy for new impervious areas. The existing major drainage patterns and existing outlets will all be maintained. Some minor diversions will occur within a larger catchment area in order to meet regional goals; however, this will not increase the existing peak flow rates at any given outlet. All existing corrugated metal pipe (CMP) storm sewer will be removed within the limits of pavement and replaced as required. Most reinforced concrete pipe (RCP) storm sewer will also be removed, with the exception of the IDOT Tunnel and associated pipes which outlet to Lower Salt Creek subwatershed. All proposed pipe within the pavement footprint will be RCP.

In areas where the roadway is rehabilitated and widened, existing RCP drainage infrastructure will be utilized as much as possible. Existing drainage structure locations that are not in conflict with the final footprint and where no flooding problems exist will generally be maintained. Pipe outlets and laterals will be extended within all widening sections. Additional pipes will be placed as required for both conveyance and storage. The existing drainage patterns and outlets will be maintained. All existing corrugated metal pipe will be removed within the limits of pavement and replaced. Most RCP storm sewer, however, will be cleaned and maintained. Major culvert crossings at Silver Creek, Crystal Creek, and a parallel culvert along the Unnamed Tributary to Crystal Creek will be rehabilitated, maintained, and extended as required. Any additional proposed pipe within the pavement footprint that is required will be RCP. In order to maintain the proposed work within the existing right-of-way near Wolf Road, the existing drainage system between Wolf Road and the Bensenville Bridge consisting of open ditches with multiple, shallow, cross-road culverts will be replaced by a closed storm sewer system. Detention will be provided for new impervious areas using an underground detention system and compensatory storage will be provided for fill within the floodways. North of the Bensenville Bridge, the proposed drainage system will be expanded to meet the current Tollway criteria for detention storage. Several existing restrictor structure types which are no longer accepted by the Tollway will be replaced. An underground storage facility will be placed near Plaza 33 to provide detention for new impervious area and to offset detention in an existing area that is also being utilized for compensatory storage. We do not assume any credit for the potential loss of impervious surface that may occur as future use of the Oasis, Toll Plaza or other existing infrastructure is determined. Due to known flooding concerns within the study area, we do not propose reduction to the existing detention volumes.

There will be a combination of wet, dry and underground detention based upon the context of the locations where proposed detention is provided. Above ground detention is provided in all locations where it is feasible. All existing detention volumes at a minimum will be maintained within the corridor when there are impacts to a detention facility and it needs to be reshaped or relocated. Some infield detention facilities will be expanded as feasible for additional proposed detention. Roadside ditches in select sections would be regraded to accommodate the increased roadway footprint and to provide additional conveyance, detention and water quality benefits when applicable. Determination and incorporation of Best Management Practices (BMPs) is still evolving and under study at the time of this submittal and will be a greater focus during detailed design.

2 EXISTING DRAINAGE CONDITIONS

2.1 GENERAL LOCATION DRAINAGE MAP

Please see Appendix A – Exhibits, Section 5.1 for the General Location Drainage Map.

This Concept Drainage Report covers the following major Phase II Engineering Design Contracts that will be further advanced by the Phase II Design Section Engineer (DSE). While there may be other improvements or Design Upon Request (DUR) within this corridor, the major Phase II DSE Contracts are as follows:

Table 1: Phase II Engineering Services Design Contracts

Tollway Contract Number	Description and Limits of Phase II Engineering Services Design Contracts
I-17-4299	Tri-State Tollway, Roadway Reconstruction, EW Connector (M.P. 29.1) to Roosevelt Road (M.P. 30.5).
I-17-4300	Tri-State Tollway, Roadway Reconstruction, Roosevelt Road (M.P. 30.5) to St Charles Road (M.P. 32.3).
I-17-4301	Tri-State Tollway, Roadway Reconstruction, St Charles Road (M.P. 32.3) to North Avenue / Lake Street (M.P. 33.5).
I-17-4302	Tri-State Tollway, Roadway Reconstruction and Bridge Rehabilitation, Wolf Road (M.P. 36.2) to O'Hare Oasis (M.P. 37.8).
I-17-4303	Tri-State Tollway, Roadway Reconstruction and Bridge Rehabilitation, O'Hare Oasis (M.P. 37.8) to Balmoral Avenue (M.P. 40.0).

2.2 EXISTING DRAINAGE PLANS

The existing I-294 roadway drainage system consists of both open and closed drainage that convey roadway drainage runoff. There is a system of drainage structures along the median that collect runoff from the median shoulder and inside lane. The median drainage system outlets to a system of roadside ditches and closed drainage on the outside of the interstate. At numerous locations, there are penetrations to and pipes underneath existing retaining walls that outlet storm water from I-294. The outside lanes and shoulder sheet flow predominately to a closed drainage system with structures and pipe where gutter is present; however there are limited areas where the flow outlets directly into open ditches.

This project is located within the Des Planes River cataloguing unit (HUC-8: 07120004), according to the hydrologic unit code and delineation from the Watershed Boundary Dataset by the US Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS), the US Geological Survey (USGS), and the Environmental Protection Agency (EPA).

The section located south of the Elgin O'Hare Western Access (EOWA) omission is tributary to the Salt Creek watershed (HUC-10: 0712000404), which includes the following subwatersheds: Addison Creek (HUC-12: 071200040403) and Lower Salt Creek (HUC-12: 071200040404).

The section located north of the EOWA omission is tributary to the Lower Des Plaines watershed (HUC-10: 0712000405), which includes the Bensenville Ditch – Des Plaines River subwatershed (HUC-12: 071200040506). Crystal Creek and Silver Creek catchments are tributary to the Bensenville Ditch – Des Plaines River subwatershed.

The Lower Salt Creek subwatershed outlets from this project area to Salt Creek, via an IDOT Tunnel that runs westerly along I-88 for approximately one mile. The Addison Creek subwatershed outlets to Addison Creek to the north and east of the project area. The Addison Creek crossing underneath I-294 is located within the EOWA omission. North of the EOWA omission, both Silver Creek and Crystal Creek cross underneath I-294 via culvert.

The drainage tributary areas within the project limits were delineated based on the contours and information generated from:

(i) LiDAR survey performed for this project, provided by the Tollway.
(ii) Cook and DuPage County contours provided by the Tollway.
(iii) Site survey performed by the Jacobs Team.
(iv) USGS Maps with watershed limits.

A composite set of contours have been provided that are depicted in the Existing Drainage Plans. These contours were established by first placing the DuPage and Cook county contours where available, then superimposing those areas with LiDAR survey. Finally, any applicable adjustments due to field survey we layered over the LiDAR. The watershed and subwatershed limits are also depicted, however, not all existing catchment areas match those boundaries.

Starting at the smallest catchment areas, the existing sub-divide areas are identified with a dash and number suffix following the outlet name (e.g., 30A-01, 30A-02,…). These areas are combined in outlets (e.g., 30A), and the outlets are named by the milepost of the outlet location. The outlets were further combined in major outfalls (see Section 2.5 Outlet Evaluation and Section 2.6 Outfall Summary). Please see Appendix A, Section 5.2 for the Existing Drainage Plans. For Floodplain information see Section 2.4 Identified Base Floodplains.

Existing stormwater detention is provided in dry ponds, most commonly located in the infield areas of interchanges, and in oversized underground storm sewers. Below Table 2 and Table 3 provide locations and volumes of existing stormwater detention facilities.

Table 2: Existing Detention - Summary

Watershed Subwatershed	Existing Detention (acre-ft)
Addison Creek	25.29
Lower Salt Creek	21.84
Silver Creek	0.00
Crystal Creek	6.22
Des Plaines River	0.24

Note: The total detention volume for Addison Creek subwatershed does not include Pond-32KL (Lower Elmhurst Reservoir) volume of 32.36 acre-ft. See Section2.2.2 Lower Elmhurst Reservoir.

Table 3: Existing Detention Volumes

Detention ID	Volume (acre-ft)	Outlet STA	Location	Watershed Subwatershed
Pond-30A	2.11	1589+40 RT	Hawthorne St., at Plaza 35 (Cermak)	Addison Creek
Pond-30FGP	4.35	1595+50 LT	Forest Glen Park, west of Plaza 35 (Cermak)	Addison Creek
Pond-30B	0.16	1613+50 LT	Ramp-D infield, at Roosevelt Rd.	Lower Salt Creek
Pond-30C	1.43	1617+40 LT	Ramp-C infield, at Roosevelt Rd.	Lower Salt Creek
Pond-30G	0.33	1622+00 RT	Ramp-B and Buck Rd. infield	Lower Salt Creek
Pond-30D	5.08	1618+70 RT	Ramp-B infield, at Roosevelt Rd.	Lower Salt Creek
Pond-30E	3.10	1620+00 LT	Ramp-C and -A(IDOT) infield, at Roosevelt Rd.	Lower Salt Creek
Pond-30F	2.01	1621+20 LT	IDOT Ramp-C and Ramp-A infield, north of Roosevelt Rd.	Lower Salt Creek
Pond-30K	0.25	1634+60 RT	Buck Rd, at the Mt. Carmel Cemetery	Addison Creek
Pond-31A	1.30	1641+25 RT	Ramp-B and -J infield, at I-88 EB	Lower Salt Creek
Pond-31B	2.77	1642+60 LT	Ramp-F infield, at I-88 WB	Lower Salt Creek
Pond-31C	5.56	1666+70 RT	I-290 infield, at CCPRR	Addison Creek
Pond-31D	12.06	1670+40 RT	Ramp-J infield, north of CCPRR	Addison Creek
Pond-31E	0.17	1678+65 RT	Ramp-K and Ramp-J infield, north of CCPRR	Addison Creek
Pond-31F	0.05	1682+00 LT	Ramp-H infield, S Electric Ave.	Addison Creek
Pond-32A	0.14	1707+20 LT	I-290 SE infield, wetland south of St. Charles Rd.	Lower Salt Creek
Pond-32F	4.91	1708+00 LT	Wetland south of St. Charles Rd.	Lower Salt Creek
Pond-32KL	*32.36*	*1744+50 LT*	*Lower Elmhurst Reservoir*	*Addison Creek*
Pipe (36" RCP)	0.05	1646+00 RT	West side of Ramp-E	Lower Salt Creek
Pipe (48" RCP)	0.27	1646+00 RT	East side of Ramp-J	Lower Salt Creek
Pipe (48" RCP)	0.11	1685+00 LT	West side of Ramp-H	Addison Creek
Pipe (48" RCP)	0.06	1702+00 RT	Behind the retaining wall, south of Electric Ave.	Lower Salt Creek
Pipe (36" RCP)	0.07	1714+50 RT	Behind the noise wall, south of St. Charles Rd.	Lower Salt Creek
Pipe (60" RCP)	0.37	1742+20 RT	Behind the retaining wall, south of the Union Pacific Yard	Addison Creek
Pipe (48" & 42" RCP)	0.13	1758+00 RT	Behind the retaining wall, north of the Union Pacific Yard	Addison Creek

Detention ID	Volume (acre-ft)	Outlet STA	Location	Watershed Subwatershed
Outlet 38D-03	2.74	2024+00 LT	Infield of EB Irving Park Rd/I-294 SB Off-Ramp	Crystal Creek
Outlet 38D-01	0.79	2024+45 RT	Infield of EB Irving Park Rd/I-294 NB On-Ramp	Crystal Creek
Outlet 38E-02	0.50	2027+70 RT	Infield of WB Irving Park Rd/I-294 NB On-Ramp	Crystal Creek
Outlet 38H	1.03	2032+40 LT	Behind the ret. wall, between Crystal Creek and Plaza 33	Crystal Creek
Pipe (36" RCP)	0.35	2030+70 RT	I-294 NB between Crystal Creek and Plaza 33	Crystal Creek
Pipe (36" & 42" RCP)	0.24	2055+80 RT	I-294 NB between Plaza 33 and Lawrence Avenue	Crystal Creek
Pipe (48" RCP)	0.27	2055+80 LT	I-294 SB between Plaza 33 and Lawrence Avenue	Crystal Creek
Pipe (36"& 30" RCP)	0.15	2066+80 RT	I-294 NB between Lawrence Avenue & Railroad Bridge	Crystal Creek
Pipe (36"& 30" RCP)	0.15	2066+80 LT	I-294 SB between Lawrence Avenue & Railroad Bridge	Crystal Creek
Pipe (18"& 30" RCP)	0.19	2105+75 RT	I-294 NB at Balmoral Avenue	Des Plaines River
Pipe (36" RCP)	0.05	2105+75 LT	I-294 SB at Balmoral Avenue	Des Plaines River

2.2.1 Existing Wetland Facilities

For further information regarding Wetlands, Waters of the US (WOUS), and Floodplains please reference Section 15 of the Advanced Engineering Studies Narrative.

2.2.2 Lower Elmhurst Reservoir

The Lower Elmhurst Reservoir is a facility that was constructed by the State of Illinois Department of Transportation Division of Water Resources between 1993 and 1995 (see Appendix C – Source Data Reviewed, Section 7.7 Lower Elmhurst Reservoir (FR-349, 1993). It provides an estimated 33 acre-feet of flood control within the Addison Creek subwatershed for the Villages of Elmhurst and Berkeley.

The facility consists of a lower basin (north side), which has a weir control structure that control the inflow (via the 2-60" RCPs) originated from the Elmhurst tributaries, and an upper basin (south side) that receives storm water from the lower basin via a pump station. The lower and upper basins are separated by a dam structure. The outfall from the reservoir flows under I-294 from west to east, via the two outflow culverts (48" RCP and 54" RCP) that were placed as part of an Intergovernmental Agreement (IGA) between the Tollway and the Village of Elmhurst, dated January 25, 1960. An access road surrounds the perimeter of the basins. The facility and pump station are maintained by the Village of Elmhurst. This facility accepts stormwater from Elmhurst, originating from west of I-294. The majority of the stormwater storage in this facility is not related to I-294 runoff; however, its estimated total storage volume is listed in Table 3: Existing

Detention Volumes. The proposed improvements to I-294 do not impact the facility's storage capacity, perimeter access roads, control structure or dam structure.

Figure 1: Lower Elmhurst Reservoir

A meeting was held with the Tollway, their General Engineering Consultant (GEC), and the 4224 design team on January 6, 2016 to discuss the Lower Elmhurst Reservoir and to understand better how this facility operates. Minutes from that meeting and all pertinent attachments are included in Appendix D - Correspondence, Section 8.1, including Special Issue 741 which dealt with the two outflow culverts (48" RCP and 54" RCP) from the Lower Elmhurst Reservoir.

The earth embankment surrounding the upper basin of the Lower Elmhurst Reservoir is a Class I Dam, and thus is covered under the IDNR Part 3702 – Construction and Maintenance of Dams overseen by IDNR-OWR Division of Water Resource Management (DWRM). Per conversation with IDNR dated August 23, 2016, Reed Panther (Tollway) spoke with the IDNR Dam Safety Section, Paul Mauer. IDNR indicated that excavation on the backslope of the berm surrounding the lower reservoir "would not be considered to be an impact to the dam, since the design would not be affecting the capacity or any of the structures". That being the case, a permit would not be required, but IDNR did indicate that they would like to review the Phase II plans.

Based upon initial guidance from the IDNR, design of roadside improvements shall neither impact storage capacity within the upper basin, nor shall encroach on the existing maintenance road that surrounds the reservoir. Further, any retaining walls shall be designed such that no tie backs, unsupported excavation, or added soil pressures be allowed that could potentially impact the stability of the berm surrounding the reservoir.

The lower basin of the reservoir performs under gravity flow. There is a weir control structure at the north end of the basin, which will not be impacted, that regulates the flow into (via 2-60" RCPs) and out from the basin (via 48" RCP and 54" RCP) through multiple orifices and weirs. The outlet portion of this structure is regulated by a 36" dia orifice (east side wall, invert at elevation 658.75) and a weir with an over-topping elevation of 664.00. Storage in this lower basin occurs at and below elevation 664.00. The capacity must be maintained and, if any fills are placed within this basin at or below elevation 664.00, an equal amount of embankment must be excavated below this elevation in order to maintain the capacity of the basin. A consistent linear encroachment for roadway embankments below elevation 664.00 is not anticipated, however, there is a possibility that, at spot locations, encroachment may occur for ComEd towers or other roadway appurtenances. In addition to maintaining the existing

capacity of the basin, the proposed drainage design will greatly reduce the contribution of I-294 runoff into the basin, with the tributary area reduced by over 80%. Since there is no impact to the function of the lower basin facility, no permits are anticipated.

2.2.3 Existing Storm Sewer and Ditch Locations

The Central Tri-State Tollway consists exclusively of closed median drainage for the inside lane and shoulder. The outside lanes and shoulder consist primarily of closed drainage within this projects study limits; however, there is open ditch drainage at the locations summarized in Table 4.

Table 4: Existing Ditch Locations

Start STA	End STA	Offset	Description
1602+00	1592+00	RT	Roadway ditch
1603+50	1593+50	LT	Roadway ditch, behind the noise wall
1603+50	1613+00	LT	Roadway ditch, behind the noise wall
1633+00	1622+00	RT	Roadway ditch, between Buck Rd. and Ramp A
1625+50	1629+50	RT	Roadway ditch, at Ramp A (east side)
1632+00	1625+50	LT	Roadway ditch
1643+00	1634+50	RT	Roadway ditch, between Buck Rd. and Ramp A
1651+00	1641+50	LT	Roadside ditch, at Ramp F
1651+00	1657+50	LT	Roadway ditch
1677+00	1669+50	RT	Roadway ditch, at Ramp K (west side)
1665+00	1669+50	RT	Roadway ditch, at Ramp K (east side)
1671+50	1669+50	RT	Roadway ditch, at Ramp K (east side)
1684+00	1690+00	LT	Roadway ditch
1695+50	1707+00	LT	Roadway ditch
1719+50	1725+00	LT	Roadway ditch
1730+50	1727+50	LT	Roadway ditch
1732+00	1742+50	RT	Swale, behind the retaining wall (Berkeley)
1751+50	1746+00	LT	Roadway ditch, between I-294 SB and I-290 NB
1762+00	1757+00	RT	Swale, behind the retaining wall (UP Yard)
1762+00	1767+50	RT	Roadway ditch
1765+50	1767+50	LT	Roadway ditch
1773+50	1770+50	LT	Roadway ditch; may be modified by EOWA

Start STA	End STA	Offset	Description
1769+00	1777+50	RT	Roadway ditch; may be modified by EOWA
1918+00	1948+25	RT	Roadway ditch; may be modified by EOWA
1918+00	1937+60	LT	Roadway ditch; may be modified by EOWA

2.3 IDENTIFIED DRAINAGE CONCERNS

The following drainage concerns have been identified within or adjacent to our study limits. For those concerns that were identified by the Tollway as Special Issues (SI) the assigned number follows the description. Other drainage concerns were discovered either via public outreach, study of existing conditions, or field investigation. For a summary of drainage concerns that were identified via one-on-one meetings with the local municipalities, reference Appendix C – Source Data Reviewed, Section 7.6. Any of the local concerns that required action by this Study are included in the Identified Drainage Concerns. Reference Appendix C – Source Data Reviewed, Section 7.5 for back-up information related to these Special Issues.

2.3.1 Cermak Road Flooding (SI 095)

Severe flooding was reported along I-294, between Cermak Road and 31st Street, on the morning of July 24, 2010. There was at least 6" of standing water across all eight lanes of I-294 for 10 hours (3:00 AM to 1:00 PM), with traffic backups several miles long.

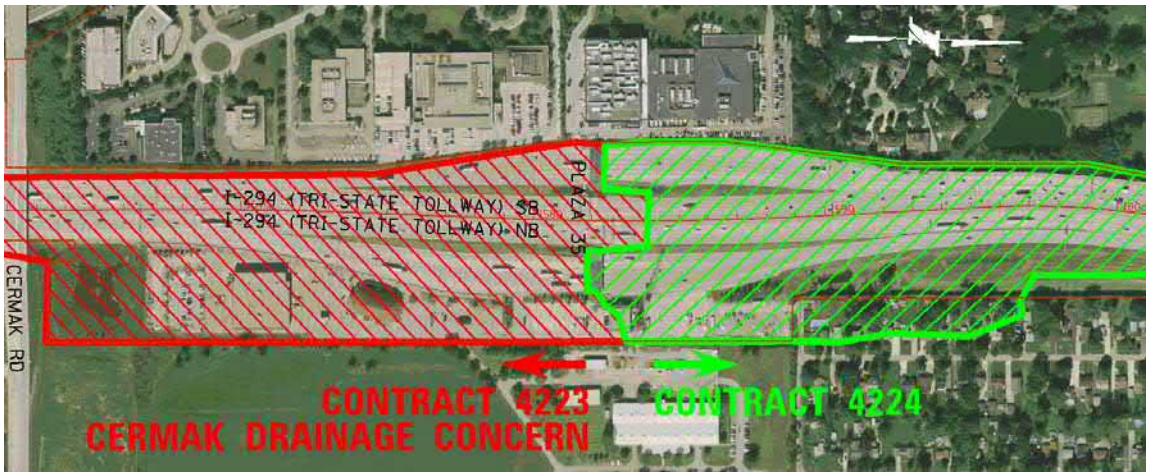

Figure 2: Cermak Road Flooding – Southern Project Limits

The adjacent IDOT and local road drainage systems were also reported to have severe flooding during this storm event. Per subsequent field investigations, it was determined that the I-294 mainline and the southbound Cermak exit ramp were completely flooded resulting in up to 32" of standing water on the pavement.

This drainage issue is within the limits of the adjacent study, Contract RR-14-4223, and is being evaluated as part of that study. The area where this issue exists currently flows south to Salt Creek via an existing 36" to 48" storm sewer. The southern project limits for this Master Plan (see Figure 2) are at the ridge of the drainage divide that is tributary to this area.

2.3.2 Flooding in Hillside MP 29 to MP 32 (SI 902)

In a letter to the Tollway from the Village of Hillside dated October 3, 2013, the Village reported that severe flooding occurred in 2013. The Village requested a meeting with the Tollway in regards to the Reagan Memorial Tollway (I-88), Contract RR-13-4116. Subsequently, a meeting was held on February 6, 2014 with 4224 drainage team, Village of Hillside, and K-Plus Engineers (Hillside's GEC). The area of flooding concern to be investigated was identified east of I-294, between Cermak Road (MP 29.5) and Electric Avenue (MP 32.0).

This drainage area is complex with outlets to both the Addison Creek and Lower Salt Creek subwatersheds. Storm water is received in this area from both Tollway and IDOT facilities, as well as from the City of Elmhurst and Village of Oak Brook to the west. The southern 2,200 feet of this area, from Cermak Road to north of the cash collection toll booths, is being studied under the Cermak Road Flooding Special Issue (SI 095). From north of the toll booths to Electric Avenue, there are portions that outlet to the Hillside storm sewer system, in the Addison Creek subwatershed, and portions that outlet to the Lower Salt Creek subwatershed via the IDOT tunnel and the Oak Brook storm sewer system. For a detailed map of the outlets in this area, reference Section 5.2 for Existing Drainage Plans.

In order to provide additional stormwater detention in this area, Village of Hillside is proposing to provide land and resources within the footprint of Buck Road, which is west of Mt. Carmel Cemetery. The Village intends to acquire this land from IDOT and provide use of this land to the Tollway via an Intergovernmental Agreement (IGA) for the Tollway to design and construct a detention facility. Discussion of this proposal has occurred in the initial and subsequent public outreach meeting with Hillside, and minutes of these meetings are included in Volume 9 of the Final Master Plan Report. The pre-concept design of this facility is comprised in the Proposed Drainage Plans and includes storage to meet Tollway requirements, as well as additional regional storage. Additional information regarding this detention facility is included in Section 4.5 Stormwater Detention Analysis, and Section 4.6 Regional Stormwater Detention.

Survey. It is noted that areas outside of the existing right-of-way that are utilized for detention were not surveyed, as access for was not feasible during the preparation of this report. Aerial mapping and county contours were relied upon in these areas for conceptual design. It is the responsibility of the DSE preparing the Phase II design to collect required survey at these locations (see Section 5.8 Detention Basin Layouts).

2.3.3 Drainage Issue at 491 E. Atwood Ct., Elmhurst IL

The Tollway received an email dated March 1, 2016 from the homeowner at 491 E. Atwood Ct. in Elmhurst, IL. The property owner's backyard is adjacent to the I-290 EB to I-294 SB ramp. The owner noted that their property is receiving water from the roadway (Ramp-G) embankment and that the swale at the bottom of the embankment may require regrading as storm water flows past the swale and onto the property owner's yard. Tollway maintenance staff performed a field inspection of this location and their photos have been included in Appendix C – Source Data Reviewed, Section 7.5.

The proposed roadway design for the Recommended Alternative of the I-290 interchange with I-294 will reconfigure the footprint of these ramps and move this ramp footprint further away from the existing right-of-way. In conjunction with the new configuration, proposed ditches will be designed to keep the runoff within the I-294 right-of-way at this location and channelize it to the proper outlet location.

Figure 3: 491 E. Atwood Ct., Elmhurst, IL

2.3.4 North Avenue Flooding

An extensive drainage investigation, project P-91-443-06, was performed for IDOT by Christopher B. Burke Engineering LTD in conjunction with the Elgin O'Hare Western Access (EOWA). The area studied was the North Avenue Underpass at I-290/I-294, approximately between Clinton Avenue and Railroad Avenue, in the City of Elmhurst and the City of Northlake. The study was prompted by recurring flooding of the underpasses and severe flooding resulting from the July 23-24, 2010 storm event.

Five alternatives were analyzed that evaluated protection from the 50- and 100-year storm events. Two alternatives provided for 10 acre-feet of storage for EOWA storage, while the two others did not, and a fifth option provided for the EOWA storage with modifications to the Doyle Reservoir. All options had common elements of eliminating a 60" siphon condition, rerouting the storm sewer outflow from Elmhurst, rerouting the IDOT Pump Station 34 outflow, and providing new storm sewers east and west of the flood area as well as at the roadway sag location. The recommended improvements, which includes 10-acre feet of stormwater detention storage, is being implemented under Elgin-O'Hare work package S01 (Tollway Contract I-11-4014), under the Cook County Department of Transportation and Highways Plans for Proposed Interstate 294 at Interstate 290 / IL Route 64 Interchange Pavement Reconstruction and Bridge Replacement Project.

On February 27, 2017, the 4224 drainage team had a meeting with the EOWA drainage team. The 4656 design team has been in contact and coordinating with the S01 Project. At the I-294 and Lake Street Interchange, approximately 10.0 acre-feet of detention will be provided. It has been determined that the 4656 team will utilize approximately 5-acre-feet, and the 4224 project will utilize 3.2 acre-feet. The S01 Contract will place a 36" outfall into their proposed Detention Pond #4, within the interior of Ramp J, which is the entrance ramp to I-294 NB from Lake Street. The 4656 Contract will place a 36" pipe underneath the ramp pavement that is reconstructed within that contract. The 4224 project will intercept this 36" pipe and connect our pipe and ditch grading to this pipe so we can utilize Pond #4 as this contracts ultimate outlet. These improvements are depicted in the Proposed Drainage Plans, Section 5.5 of this report, and the meeting minutes are included in Section 8.1. Construction of the EOWA S01 and 4656 project is currently anticipated in advance of the I-294 project.

2.3.5 St. Charles Road (SI 1107)

Tollway Special Issue 1107 noted that I-294 SB at St. Charles Road had two right lanes shut down due to standing water during a storm event that occurred on April 18, 2013.

Figure 4: St. Charles Flooding Location and Proposed Detention

This I-294 sag location outfalls to an existing wetland area, located south of the St. Charles Road interchange, which in turn outfalls into an IDOT 66" storm sewer and to Lower Elmhurst Reservoir. The storm event provided 5.5" of rainfall, per the official National Weather Service Station at Chicago O'Hare International Airport (KORD). This analysis has not concluded that there is a freeboard issue at this I-294 sag location,

however, in order to reduce the likelihood of recurring drainage issues at this location, two measures will be implemented. First, the proposed I-294 roadway profile will be adjusted so there is not a reduction in freeboard at the edge of pavement within this sag. Second, in order to provide additional storage and reduce the chances of water flooding onto the Tollway, a detention facility will be placed adjacent to this I-294 sag location, north and south of St. Charles Road and east of I-294. The new detention facility will eventually discharge into the Berkeley storm sewer system. Additional information regarding this detention site is included in Section 4.5 Stormwater Detention Analysis and Section 5.8 Detention Basin Layouts.

2.3.6 Flooding in Berkeley

Through community outreach, the Village of Berkeley has identified that chronic flooding along the I-294 corridor is a concern. An area of noted concern is the Berkeley Metra Station on the Union Pacific West Line to the east of I-294. The existing condition evaluation has determined that much of the storm water received in Berkeley originates west of I-294, bypasses I-294 through storm sewers and outlets to the east in Berkeley. The Village has indicated they are partnering with MWRD on several improvements, including a detention pond at the east end of McDermott Drive to accommodate an additional 30 acre-feet of storage. This facility at McDermott Drive would be downstream of the issues experienced at the Metra Station.

Figure 5: Berkeley Flooding Location and Proposed Detention

In order to provide additional stormwater detention in this area, a detention site is proposed along the east side of I-294 within the Berkeley section of this corridor, upstream of the Metra Station. One specific detention site is proposed to the south of the Union Pacific Railroad facility, immediately east of the I-294 embankment. This

will provide detention upstream of the Berkeley Metra Station to help alleviate issues at this location. Additional information regarding this detention facility is included in Section 4.5 Stormwater Detention Analysis and Section 5.8 Detention Basin Layouts. It is noted that survey within the Union Pacific yard has not occurred, and record drawings of stormwater infrastructure within the Union Pacific yard have not been received. The Phase II designer should request record drawings and perform field verification survey once a Right of Entry Agreement is in place between the Union Pacific Railroad and the Illinois Tollway.

2.3.7 Irving Park Road (SI 1127)

On September 4, 2014, southbound Lane 1 of I-294 was closed due to standing water observed around Irving Park Road. This was reported in a dispatch from 4:23 a.m. that morning. There were no photos available of this incident. Based on the nearest rainfall gauge at O'Hare Airport, only 0.01" of total rainfall was observed at the gauge in the 48 hours prior to the report from Tollway dispatch being made. Therefore, it was concluded that rainfall intensities did not exceed the grate capacity of the inlet.

Based upon follow-up communication between the 4224 design team and the GEC, it appears this issue may have simply been a clogged inlet. The dispatch email referred to maintenance crews cleaning the inlet and no reoccurrences of flooding has been documented in this location.

2.3.8 Balmoral Ramps (SI 1041)

On the night of June 30, 2014, the State Police reported that an intense rainfall created flooding on the ramp from Balmoral Avenue to I-294 SB. A subsequent review by the GEC resulted in the creation of this SI. It was determined that there was only a single inlet at the sag point in the ramp and it was overwhelmed in a high intensity, short duration rainfall event. The Balmoral Ramp record drawings also show a section of this area with a 0% profile grade for more than 50' in length. Survey for the 4224 project show sub-standard slopes elsewhere in the vicinity of the Balmoral Ramp as well.

The proposed improvements in this location will be a resurfacing rather than a full reconstruction, so no profile corrections are possible. Additional inlets are proposed to help relieve the loading on the existing inlets in heavy storms.

2.3.9 Flooding at Frontage Roads in Franklin Park

In a meeting on November 2, 2015 for the advance work related to the EOWA project, the Village of Franklin Park informed the 4224 design team that they have observed routine flooding along the frontage roads of King Street and Gage Avenue. No photographs or other documentation were available of this flooding.

During a field visit, vegetation consistent with regular standing water was observed between King Street and I-294. A few isolated areas of overflow of runoff from I-294 towards King Street were also observed. The observed overflow was minor, but the field visit was not during a significant storm event.

Along the east side of Wolf Road, there is a local 30"×48" elliptical culvert running beneath I-294. It was not apparent from the field inspection whether the ditch along the

east side of Wolf Road would convey flow away from this culvert in its current condition, resulting in standing water on both the upstream and downstream ends of this culvert. During the field visit, overflow from the standing water on the upstream end of this culvert was observed to discharge into the ditch I-294 NB. This culvert is slated to be replaced in the EOWA project.

As part of tangential work to the EOWA project, the Village of Franklin Park is doing significant storm sewer work in this area, including the replacement of the storm sewer beneath the Tri-State, west of Wolf Road. The work will include to grading and storm sewer work on the culvert listed in the previous paragraph to correct the noted deficiencies in flow. Final plans are still in development.

2.3.10 Televise I-294 Storm Sewer (SI 1004)

The Design Contract 5583 had National Power Rodding perform sewer televising in the I-294 section between 95th Street and Ogden Avenue within the 4223 Study Limits. Contract 5584 had Sheridan Plumbing & Sewer televise 17 sewer locations between Sta. 1650+40 to Sta. 1735+10, which covers an area from south of Butterfield Road to the Lower Elmhurst Reservoir. The log of this filming is included in Appendix C, Section 7.5, and videos in *.mpg format are available upon request.

Given the initial scope of reconstruction for this corridor, the 4224 project did not include sewer televising in its scope, as it is assumed that all storm sewer underneath pavement will be removed and replaced. Storm sewer that will remain must be televised prior to reconstruction, and this televising will be performed under a contract prepared by the Phase II Design Corridor Manager (DCM). Phase II DSEs should request available data from the Tollway through the DCM.

2.3.11 Pavement Failure at Slotted Drain – I-294 at Irving Park (SI 1142)

A 145’ section of slotted drain in the paved gore between I-294 and the westbound Irving Park to I-294 NB ramp has failing pavement around the inlet slot. In conjunction with the recommended improvements on I-294, this slotted drain will be removed and a new system will be proposed for the revised configuration.

2.3.12 CMPs under I-294 Bridge over UP Railroad Slopewall, MP 33 (SI 741)

The Corrugated Metal Pipes (CMPs) underneath I-294, adjacent to the railroad, require cleaning. In lieu of cleaning, these pipes will be replaced as part of the reconstruction. Reference Appendix D, Correspondence, Section 8.1, meeting minutes regarding the Lower Elmhurst Reservoir (January 6, 2016). The meeting attachments which follow the minutes include SI 741 and items pertaining to this issue.

2.4 IDENTIFIED BASE FLOODPLAINS

Please see Appendix A, Section 5.3 for floodplain mapping exhibits.

Zone AE Floodplain with associated floodways is identified along both Crystal and Silver Creeks in the most recent FEMA mapping (Map Number: 17031C0359J). The most recent map revision date is August 19, 2008. Since that time, the Metropolitan Water Reclamation District (MWRD) has created unsteady flow hydraulic models for both creeks as part of their Lower

Des Plaines River Watershed Plan. At this time, no Letters of Map Change have been applied for by the MWRD for this modeling. For the purposes of complying with Tollway criteria, the more conservative of the FEMA & MWRD models will be used.

On Silver Creek, flow runs from north to south in the culvert beneath I-294. A fairly well-defined channel conveys flow from a culvert beneath the Bensenville Railroad Yard to the Tollway, passing a railroad spur bridge along the way. To the south, after passing another railroad spur bridge, the flow continues in another well-defined channel. Both the FEMA and MWRD maps have a floodplain elevation of approximately 646.00, on both the upstream and downstream ends of the culvert.

Crystal Creek crosses I-294, with a flow direction from west to east, just north of Irving Park Road. To the west of I-294, a well-defined channel conveys flow from a culvert beneath Mannheim Road. To the east, the channel bends to the south and runs along the Irving Park Road westbound entrance ramp to I-294 NB before continuing further east towards the Des Plaines River. The FEMA floodplain elevation is 639.00 on both the upstream and downstream ends of this culvert. The MWRD elevations are approximately 1.5 feet lower.

Additionally, regulatory floodway and floodplain exists on side channels from Crystal Creek along both sides of the O'Hare Oasis. To the west, a channel, called the Motel Ditch on FEMA mapping, begins at the end of the southbound entrance ramp from the Oasis. From there the tributary flows north around the Oasis until it passes beneath the Oasis access road, and ultimately I-294, in a 60" culvert flowing to the east. Both FEMA and the MWRD modeling have the flood elevations in the Motel Ditch ranging from approximately 641.00 at the south to approximately 640.00 at the upstream face of the 60" culvert.

To the east of I-294, an Unnamed Tributary to Crystal Creek (also referred to as "Sister Stream" in the 1990 Design Concept Report for the Central Tri-State widening) conveys flow from south to north along the east side of the O'Hare Oasis. Flow enters the channel from the southwest from a culvert beneath the Bensenville Bridge. From there it flows in a well-defined channel along the Oasis until it merges with the flow from the 60" culvert north of the Oasis. This combined flow continues north through a triple box culvert until the ramp from eastbound Irving Park Road to I-294 NB, where it enters a concrete channel flowing around the outside of the ramp before continuing to a local culvert to the east and, eventually, under Irving Park Road and into the main channel of Crystal Creek. The FEMA floodplain elevation ranges from 639.00 to 643.00 in this channel. The MWRD elevations are approximately 1.5 feet lower.

2.5 OUTLET EVALUATION

Table 4 provides the drainage outlet number corresponding to the existing drainage plans, location, and brief description. These outlets have been further combined in major outfalls, as described in Section 2.6 Outfall Summary.

All existing major outfalls are suitable for continued use. South of the EOWA omission, the majority of the major outfalls discharges at local sewer systems (most of them with limited capacity or known flooding issues), and consequently are sensitive to increases in flow.

North of the EOWA all outfalls south of Plaza 33 are directly to named and unnamed tributaries to Crystal or Silver Creek. As these catchments are so much larger and with a substantially different time of concentration than the I-294 tributary areas, these outfalls are not sensitive to

runoff from within the I-294 right-of-way. North of Plaza 33, the outfalls are to municipally-owned storm sewers. By definition, these systems would be considered sensitive outfalls.

Table 5: Existing Outlet Evaluation

ID	M.P.	Station	Action	Outlet Description
Outfall: Hillside Sewer System (S)				
30A	30.04	1589+24 RT	Clean	Pond outlet is concrete headwall and 36" RCP that drains into Hillside sewer system.
30B	30.04	1589+17 LT	Clean	Forest Glen Park pond collects regional runoff and outlets into an existing 18" RCP which combines with the Tollway system. The combined flow outlets at 30A.
30C	30.32	1604+00 RT	Identify and clean	Flow over grass shoulder outlets at a low point in the noise wall into the local Hillside sewer system through an unidentified outlet point.
Outfall: Oak Brook Sewer System				
30D	30.49	1611+80 LT	Clean	On-site and off-site areas are discharged into a ditch that runs west along the south shoulder of Roosevelt Rd. The ditch outlets into the Oak Brook sewer system.
Outfall: IDOT Tunnel (Roosevelt)				
30E	30.59	1618+13 LT	Clean	Pond-30C and Pond-30E outlet the right-of-way through a 24" RCP. The outlet connects downstream outside of the right-of-way with the IDOT Tunnel.
30F	30.63	1620+00 RT	Replace w/ RCP	Pond-30D outlets north through a 15" PVC and combines with flow from Pond-30G to head west through a 30" RCP (underneath I-294) into Pond-30E and into the IDOT Tunnel.
30K	30.64	1621+00 RT	Clean	Pond-30G outlets through a 24" RCP and combines with flow from Pond-30D to head west through a 30" RCP (underneath I-294) into Pond-30E and into the IDOT Tunnel.
30H	30.64	1621+00 LT	Clean	Pond-30F outlets through a 12" PVC and flows southwest to eventually connect to the IDOT Tunnel.
Outfall: IDOT Tunnel (I-294)				
30J	30.88	1633+44 LT	Clean	I-294 and ditch flow from the south side of I-88 are discharged through a 24" RCP south into the IDOT Tunnel.
Outfall: IDOT Tunnel (Buck Rd.)				
31A	31.11	1645+82 RT	Replace w/ RCP	I-294, Ramp J and portions of Ramp E discharge through a 24" CMP (underneath I-88) into the IDOT Tunnel.

ID	M.P.	Station	Action	Outlet Description
Outfall: Hillside Sewer System (N)				
30K	30.90	1634+55 RT	Clean	Flow from Pond-31A enters a roadside ditch along the south side of Ramp A (IDOT). The flow combines with the outlet of a 42" CMP (HDPE) cross-culvert and outlets east through a short 60" RCP into the Hillside sewer system.
30L	30.99	1639+32 LT	Clean	A roadside ditch along the north side of Ramp F collects flow from Ramp F, I-294, Pond-31B and I-88 and discharges through a 42" CMP (HDPE) into the Hillside sewer system.
Outfall: Berkeley Sewer System (I-290)				
31B	31.54	1668+50 RT	Replace w/ RCP	Pond-31C discharges into an 18" RCP and flows north through unknown connections to outlet into the Berkeley sewer system.
31C	31.54	1668+44 RT	Clean	A 30" VCP collects flow from Pond-31D and Ramp K and discharges it east into the Berkeley sewer system.
Outfall: Berkeley Sewer System (S)				
32A	32.01	1693+00 RT	Clean	A 12" plastic pipe discharges flow from the Electric Avenue overpass east into the Berkeley sewer system.
32B	32.14	1700+00 RT	Clean	Flow originating behind the guardrail of I-294 NB and from the embankment along the right-of-way is collected along the slope and outletted into the Berkeley sewer system.
32C	32.20	1703+00 RT	Clean	Flow originating behind the guardrail of I-294 NB and from the embankment along the right-of-way is collected along the slope and outletted into the Berkeley sewer system.
32E	32.33	1710+00 RT	Clean	Flow originating behind the guardrail of I-294 NB and from the embankment along the right-of-way is collected along the slope and outletted into the Berkeley sewer system.
32G	32.44	1716+00 RT	Clean	Flow originating behind the retaining wall and in the west portion of the park flows into a drainage ditch running east parallel to St. Charles Road. The ditch outlets into the Berkeley sewer system.
Outfall: Berkeley Sewer System (N)				
32H	32.53	1720+50RT	Clean	Flow originating behind the guardrail of I-294 NB and from the embankment along the right-of-way is collected along the slope and outletted into the Berkeley sewer system.
32J	32.68	1728+50 RT	Clean	Flow originating behind the guardrail of I-294 NB and from the embankment along the right-of-way is collected along the slope and outletted into the Berkeley sewer system.

ID	M.P.	Station	Action	Outlet Description
Outfall: IDOT 66" RCP, St. Charles				
32D	32.29	1708+00 LT	Replace w/ RCP	A roadside ditch collects flow from the west infield and I-294 and outlets into the southeast corner of Pond 32F through a 30" RCP culvert. The wetland (Pond-32F) discharges west, via a 15" RCP, into the IDOT 66" RCP.
32F	32.29	1708+00 LT	Replace w/ RCP	Flow from I-294, the infield between I-290 and I-294, and the southeast portion of the St. Charles-I-290 interchange collects in Pond-32F. The wetland (Pond-32F) discharges west, via a 15" RCP, into the IDOT 66" RCP.
Outfall: Lower Elmhurst Reservoir				
32K	32.72	1730+50 LT	Replace in kind	Flow from I-294 outlets into a ditch along the west right-of-way of I-294. The ditch collects the flow and discharges into the Lower Elmhurst Reservoir through a 18" RCP.
32L	32.90	1740+00 LT	Replace in kind	Flow from the west embankment is collected at an inlet located at the south end of the retaining wall. The inlet discharges at Lower Elmhurst Reservoir through a 12" RCP.
Outfall: Union Pacific Yard				
32M	32.94	1742+40 RT	Replace w/ RCP	A 36" RCP headwall discharges flow from I-294 and a 60" RCP embankment detention pipe into an unidentified inlet. The unidentified inlet is assumed to outlet into triple 24" CMPs at the south side of the Union Pacific Yard.
33A	33.01	1746+00 RT	Replace w/ RCP	A roadside ditch at the base of the embankments between I-290 and I-294 collects flow into a 48" CMP which heads east along the north edge of the Union Pacific Yard. The 48" CMP then collects flow from the east embankment of I-294 at an unidentified point and outlets the combined flow through the yard.
33B	33.18	1755+00 RT	Clean	South of the Union Pacific tracks, a 12" CMP invert discharges flow from I-294 through the retaining wall. North of the tracks, I-294 flow passes through a 48" RCP detention pipe and is discharged through a 15" RCP invert in the retaining wall. The flow combines with a ditch outside the retaining wall and is outletted into the Union Pacific Yard through an 18" CMP.
Outfall: Doyle Reservoir				
33C	33.47	1770+00 LT	n/a	Flow from I-294 discharges into a roadside ditch alongside the I-290 exit ramp through a 24" CMP. The ditch and flow heads north to a 36" RCP flowing east along North Avenue. The 36" RCP combines with a 42" RCP and flows to the Doyle Reservoir through a 72" RCP.

ID	M.P.	Station	Action	Outlet Description
33D	33.60	1777+00 LT	n/a	Flow from I-294 discharges into an infield ditch through a 12" CMP. The ditch heads west to a 36" RCP flowing east along North Avenue. The 36" RCP combines with a 42" RCP and flows to the Doyle Reservoir through a 72" RCP.
33E	33.61	1777+50 RT	n/a	A roadside ditch collects flow from the ramp embankment and directs it north to a paved channel. The paved channel redirects the flow into a gutter flowing north. An inlet at Lake Street collects and outlets at the Doyle Reservoir.
33F	33.61	1777+40 RT	Replace w/ RCP	The ramp infield area collects flow from the ramps and I-294 into two ditches. The ditches collect flow from a 15" RCP invert and 24" RCP invert at the south end of the infield as well as a 15" RCP invert at 1772+80. A 24" RCP at the north end of the infield which collects the ditch flow and outlets it to the Doyle Reservoir through a 72" RCP.
Outfall: Silver Creek				
36A	36.84	1948+31 RT	Remove/ replace	A roadside ditch located along the south side right-of-way collects flow from I-294 and the north side right-of-way ditch. This ditch conveys the flow through a 54” RCP and discharges into Silver Creek.
36B	36.84	1948+45 RT	Clean	A roadside ditch located along the south side right-of-way collects flow from I-294 and discharges into Silver Creek at the downstream end of the twin 12’×8’ culverts.
Outfall: Sister Stream				
37A	37.68	1992+52 RT	n/a	Flow from I-294 is conveyed through a 15” RCP and joins flow from the east roadway embankment to discharge to the unnamed Crystal Creek tributary.
37B	37.74	1995+62 RT	n/a	Flow generated by the northbound oasis ramp is collected and conveyed to the unnamed Crystal Creek tributary through a 15” CMP.
37C	37.76	1996+25 LT	n/a	Flow from the southbound oasis ramp is collected and conveyed through a 12” RCP. This flow is joined by flow from I-294 and conveyed to the Motel Ditch which ultimately discharges to the Sister Stream.

ID	M.P.	Station	Action	Outlet Description
38A	37.98	2008+33 RT	Clean	Flow generated by the southern portion of the east oasis parking lot is conveyed to a detention storage unit and discharged through a 6" PVC pipe. This flow, joined by embankment generated flow, enters the Sister Stream and is conveyed through a 36" CMP and then a 7'×4' box culvert. Separately, flow generated by the northern portion of the east oasis parking lot is conveyed to a detention storage unit and discharged through an 8" PVC pipe. This flow joins together with additional embankment flow and flow from I-294, which is conveyed through a 42"RCP, and discharges to the Sister Stream.
38B	38.04	2011+28 RT	Clean	A 42" RCP headwall and a 30" RCP discharge flow from the northbound oasis ramp and a 64"×168" arch CMP conveys flow from the upstream system. A 60" RCP conveys flow from west oasis ditch and flow from I-294. These three systems join together at Outlet 38B and ultimately discharge to the Sister Stream.
38C	38.23	2021+28 RT	Remove/ replace	A triple 6.5'×5.5' box culvert conveys flows from the upstream system along the easterly right-of-way. An 18" CMP, a 15" RCP and a 12" RCP that collect flow from I-294 also connect to this triple box culvert. These flows will ultimately discharge to the Sister Stream.
38D	38.33	2026+59 RT	Clean	The southwest infield area collects flow from the ramp and conveys it through a 12" RCP to a ditch located at the northwest quadrant of I-294/Irving Park Road. This ditch also receives flow from the ditch adjacent to Irving Park Road. Flow is conveyed across I-294 by a 24" RCP. The southeast infield area collects flow from the ramp and is discharged through a 36" RCP. Both flows discharge into a 20' wide concrete paved channel that conveys the upstream flow around the Irving Park Road ramp. Together these flows are conveyed through a 7'x4'/10'×4' box culvert and ultimately across Irving Park Road to Crystal Creek.
Outfall: Crystal Creek				
38E	38.35	2028+03 RT	Clean	Flow from Irving Park Road, the southbound ramp, and the embankment discharge to an 18" PVC pipe that conveys flow across I-294. The northeast infield area collects flow from the ramp and from I-294 and is discharged through a 12" RCP. Both flows are conveyed through a 24" RCP and discharge to Crystal Creek.

ID	M.P.	Station	Action	Outlet Description
38F	38.36	2028+10 LT	Clean	Flow from the southbound ramp is conveyed through a 15" CMP to a ditch that discharges to Crystal Creek.
38G	38.40	2030+55 RT	Clean	Flows from the ditches adjacent to I-294 SB right-of-way are conveyed to Crystal Creek. Crystal Creek is conveyed across I-294 by a twin 10'×7' box culvert. Flow generated by I-294 is conveyed by a 36" RCP and discharges into the twin box culvert.
38H	38.46	2033+80 LT	Clean	Flow generated from I-294 is conveyed by a 30" RCP. This pipe punches through the retaining wall to the adjacent ditch and ultimately discharges to Crystal Creek.
38I	38.49	2034+99 LT	Clean	Flow generated from I-294 and the toll plaza is conveyed by a 48" RCP. This pipe punches through the retaining wall to the adjacent ditch and ultimately discharges to Crystal Creek.
Outfall: Schiller Park Storm System (S)				
38J	38.88	2055+77 RT	Clean	A 38"×24" elliptical pipe discharges flows generated between the Toll Plaza and Lawrence Avenue to the Schiller Park sewer system (south). A portion of land west of I-294 also discharges to this elliptical pipe. Adjacent to the toll plaza service road and north and south of the elliptical pipe, 48" RCPs with 12" restrictors are used to convey flow. Along northbound I-294 and north of the elliptical pipe, a 42" RCP with a 10" restrictor is used to convey flow and south of the elliptical pipe, a 36" RCP with a 10" restrictor is used to convey flow.
Outfall: Schiller Park Storm System (N)				
39A	39.08	2066+77 RT	Clean	Flow generated between Lawrence Avenue and the railroad bridge is conveyed across I-294 by a 36" RCP and discharges into the Schiller Park sewer system (N). Along southbound I-294, 36" RCPs with 12" restrictors are used both to the north and south of the culvert. Along northbound I-294 and north of the culvert, 36" RCP with a 12" restrictor is used to convey flow and south of the culvert, 30" RCP with a 12" restrictor is used to convey flow.
Outfall: Rosemont Storm System				
39B	39.83	2105+99 RT	Clean	Flow generated between the railroad bridge and approximately Sta. 2114+00 is conveyed through a 48" RCP and discharges to the Village of Rosemont sewer system.

2.6 OUTFALL SUMMARY

There are 22 major outfalls within the project limits. All existing major outfalls are suitable for continued use.

Table 6: Outfall Summary

Outfall	Outlets	Watershed Subwatershed	EX Q_2 (cfs)	EX Q_{100} (cfs)
Hillside, Sewer System (S)	30A, 30B, 30C	Addison Creek	23	57
Oak Brook, Sewer System	30D	Lower Salt Creek	6	24
IDOT Tunnel (Roosevelt)	30E, 30F, 30G, 30H	Lower Salt Creek	17	25
IDOT Tunnel (I-294)	30J	Lower Salt Creek	12	32
IDOT Tunnel (Buck Rd.)	31A	Lower Salt Creek	13	30
Hillside, Sewer System (N)	30K, 30L	Addison Creek	15	38
Berkeley, Sewer System (I-290)	31B, 31C	Addison Creek	24	36
Berkeley, Sewer System (S)	32A, 32B, 32C, 32E, 32G	Addison Creek	4	10
IDOT 66” RCP, St. Charles	32D, 32F	Lower Salt Creek	3	5
Berkeley, Sewer System (N)	32H, 32J	Addison Creek	1	5
Lower Elmhurst Reservoir	32K, 32L	Addison Creek	1	20
Union Pacific Yard	32M, 33A, 33B	Addison Creek	22	57
Doyle Reservoir	33C, 33D, 33E, 33F	Addison Creek	n/a	n/a
Silver Creek	36A, 36B	Silver Creek	39	98
Unnamed Crystal Creek Trib	37A, 37B	Crystal Creek	9	23
Motel Ditch	37C	Crystal Creek	8	19
Sister Stream (S)	38A	Crystal Creek	35	87
Sister Stream (N)	38B, 38C, 38D	Crystal Creek	38	96
Crystal Creek	38E, 38F, 38G, 38H, 38I	Crystal Creek	52	130
Schiller Park, Storm System (S)	38J	Crystal Creek	36	91
Schiller Park, Storm System (N)	39A	Crystal Creek	21	54
Rosemont, Storm System	39B	Des Plaines River	66	164

2.6.1 Hillside, Sewer System (S)

The Hillside Sewer System South outfall consists of areas 30A, 30B, and 30C. Regional flow from area 30B collects in Pond-30FGP in Forest Glen Park. Pond-30FGP outlets south through an 18" RCP. The 18" RCP combines with the system collecting flow from 30A and crosses I-294 to the east through a 48" RCP. The 48" RCP combines with a 36" RCP as a 60" RCP that flows north into the Pond-30A.

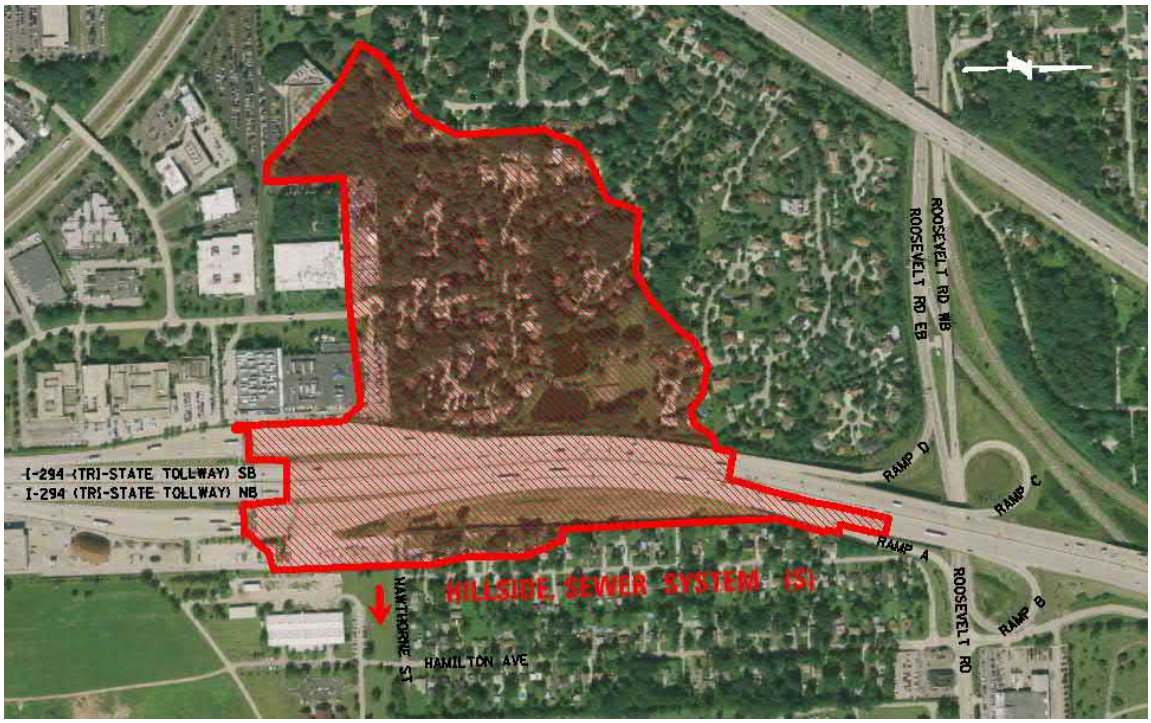

Figure 6: Hillside, Sewer System (S) Drainage Area

The outlet of Pond-30A is a 36" RCP at the south end, flowing east along Hawthorne Street into the Hillside sewer system. Additionally, area 30C collects along the noise and retaining wall and outlets into an assumed structure at an unidentified location north of Dickens Avenue. This flow is assumed to enter the Hillside sewer system in the Addison Creek subwatershed.

2.6.2 Oak Brook, Sewer System

The Oak Brook Sewer System outfall consists of area 30D. A roadside ditch along the west right-of-way of I-294 and Ramp D collects flow from mainline I-294 and Ramp D. The infield between Ramp D and Roosevelt Road joins the roadside ditch through a pipe culvert under Ramp D providing detention in Pond-30G. The roadside ditch flows west along the south side of Roosevelt Road into the Oak Brook sewer system outfall of the Lower Salt Creek subwatershed.

Figure 7: Oak Brook Sewer System Drainage Area

2.6.3 IDOT Tunnel (Roosevelt)

The IDOT Tunnel (Roosevelt) system consists of areas 30E, 30F, 30K, and 30H. Area 30F collects flow from I-294 NB, Ramp A, Roosevelt Road, and Ramp B into Pond-30D. Pond-30D outlets to the north through a 15" PVC pipe. Area 30K collects flow from I-294 NB and Buck Road into Pond-30G.

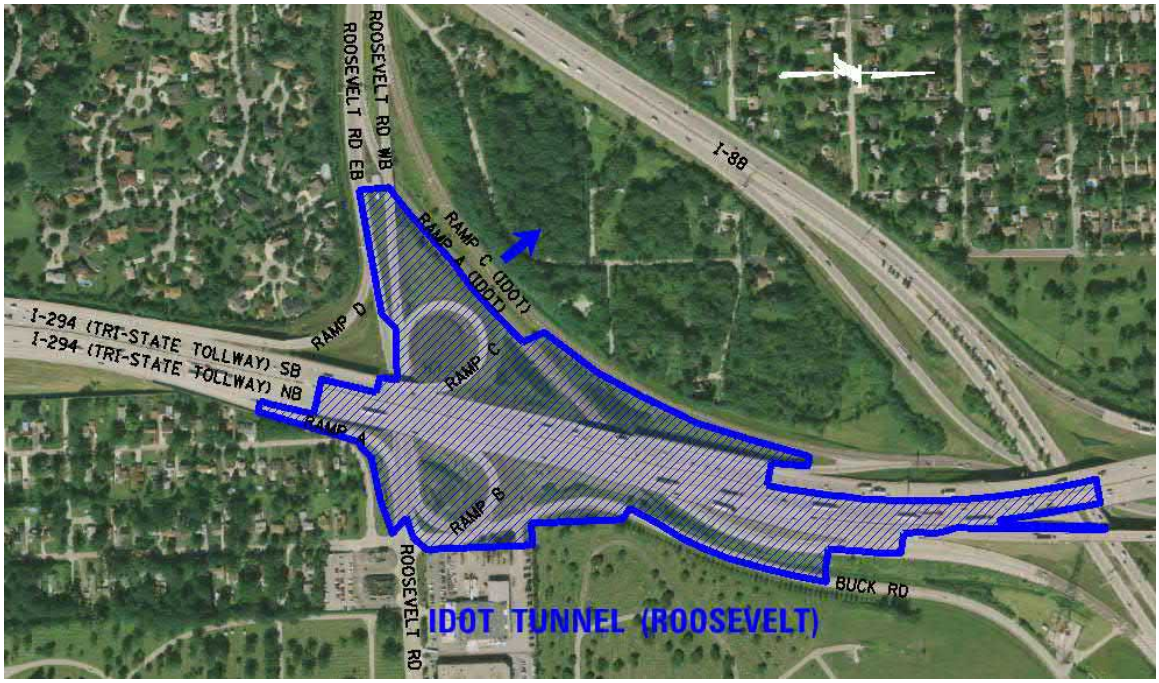

Figure 8: IDOT Tunnel (Roosevelt) Drainage Area

Pond-30G outlets to the southwest through a 24" RCP. Flow from Pond-30D and Pond-30G combine and cross I-294 heading west in a 30" RCP. The 30" RCP outlets into Pond-30E, which also collects flow from I-294 SB and the infield between Ramp C (IDOT) and Ramp A (IDOT). Pond-30E outlets to the southwest through a 24" RCP. Pond-30C outlets flow from Ramp C (IDOT) and Roosevelt Road WB to the northwest through a 15" RCP pipe. The 24" RCP and 15" RCP combine and cross Ramp A (IDOT) and Ramp C (IDOT). Area 30H collects flow from portions of I-294 NB, I-294 SB and Ramp C (IDOT). The entirety of this area collects in Pond-30F in the infield of Ramp C (IDOT) and Ramp A (IDOT).

Pond-30F outlets to the southwest through a 15" RCP. The Pond-30F outlet combines with the flow from Pond-30C and Pond-30E approximately 260' southwest of Pond-30F. A 36" CMP carries the pond outlet flow approximately 405' west-northwest to the IDOT Tunnel. Outlet IDOT Tunnel (Roosevelt) joins with the combined flow of outlets IDOT Tunnel (I-294) and IDOT Tunnel (Buck Road) and eventually discharges to Salt Creek (Lower Salt Creek subwatershed), approximately one mile to the southwest.

2.6.4 IDOT Tunnel (I-294)

The IDOT Tunnel (I-294) system consists of area 30J. Area 30J collects flow from I-294 SB, Ramp C (IDOT), Ramp D, Ramp E, and portions of I-88 EB into the infield of Ramp D and Ramp E.

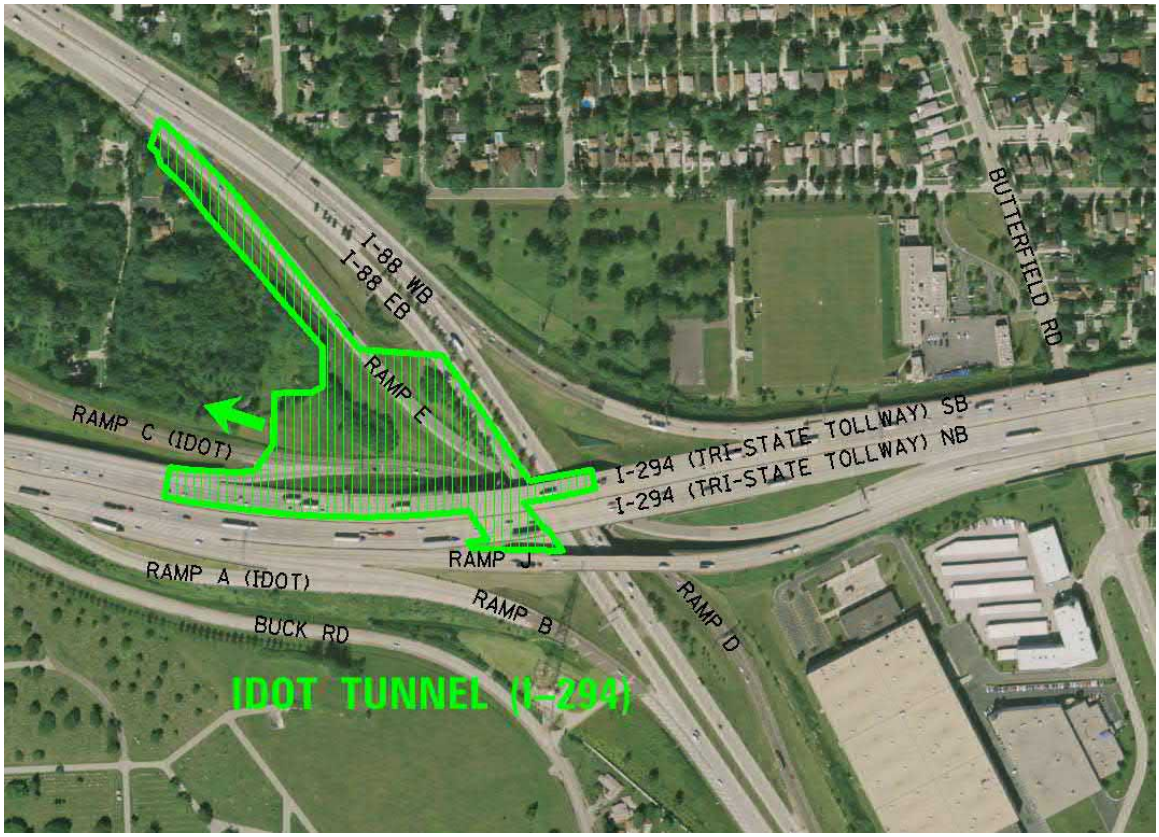

Figure 9: IDOT Tunnel (I-294) Drainage Area

An inlet between Ramp D and Ramp E distributes flow through a 24" RCP south. The 24" RCP connects with the IDOT Tunnel flowing southwest. At this connection, the flow from IDOT Tunnel (I-294) combines with the flow from IDOT Tunnel (Buck Road) from the northeast and continues southwest. Approximately 1,480' downstream, the combined flow of outlets IDOT Tunnel (I-294) and IDOT Tunnel (Buck Road) joins with outlet IDOT Tunnel (Roosevelt) and flows to Salt Creek (Lower Salt Creek subwatershed), approximately one mile to the southwest.

2.6.5 IDOT Tunnel (Buck Road)

The IDOT Tunnel (Buck Road) system consists of area 31A. Area 31A collects flow from I-294 NB, Ramp E, and Ramp J. A 36" RCP runs south along the west shoulder of Ramp E and collects flow from Ramp E and a single 15" CMP lateral from northbound I-294. A 48" RCP runs south along the east shoulder of Ramp J and collects flow from Ramp J as well as two trench drains along Ramp E. The 36" RCP restricts to 24" and the 48" RCP restricts to 18". The restricted flow combines to a 24" CMP. The 24" CMP flows southeast beneath I-88, Pond-31A, and Ramp B where it outfalls to the IDOT Tunnel in the infield between Buck Road and Ramp B. The outlet IDOT Tunnel (Buck Road) flow travels southwest and connects with the outlet IDOT Tunnel (I-294) flow approximately 1,175' downstream.

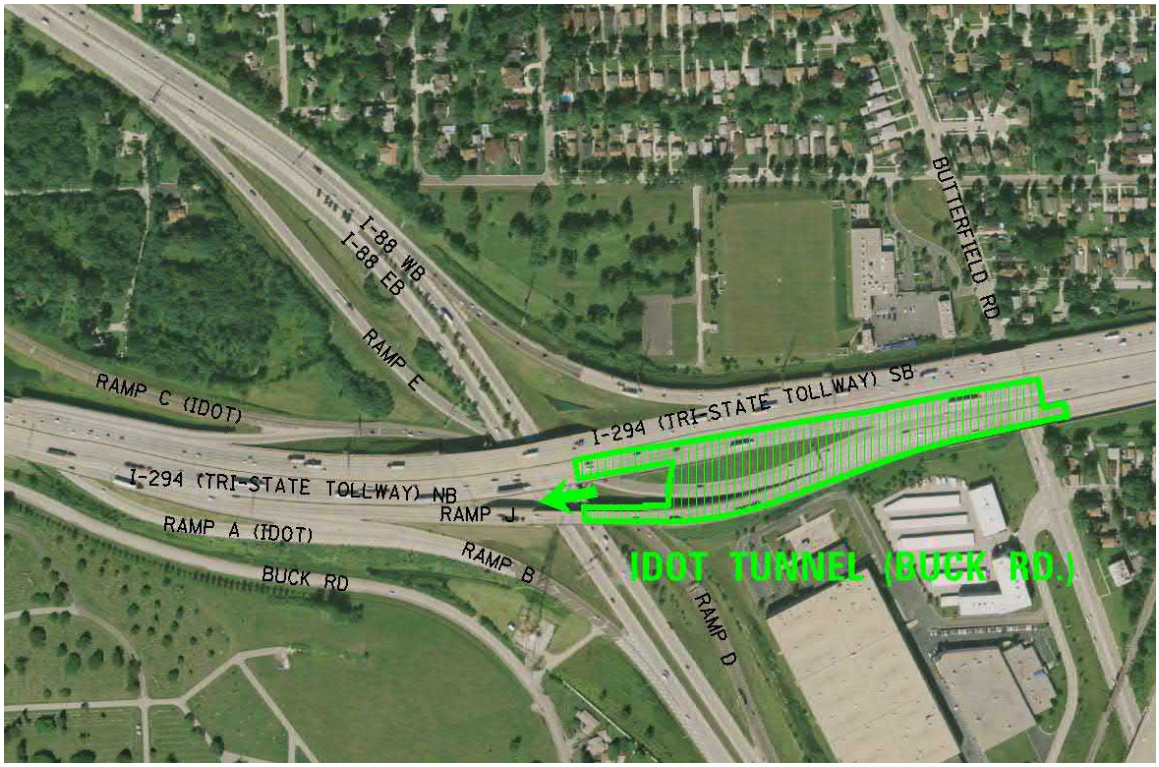

Figure 10: IDOT Tunnel (Buck Road) Drainage Area

Approximately 1,480' downstream, the combined flow of outlet IDOT Tunnel (I-294) and outlet IDOT Tunnel (Buck Road) joins with outlet IDOT Tunnel (Roosevelt) and flows to Salt Creek (Lower Salt Creek subwatershed), one mile to the southwest.

2.6.6 Hillside, Sewer System (N)

The Hillside sewer system (N) consists of areas 30K and 30L. Area 30K collects flow from northbound I-294, Ramp B, and Buck Road into Pond-31A and a roadside ditch along Buck Road. A 15" RCP outlets flow from the top of I-294 and Ramp B into Pond-31A. Pond-31A outlets southeast through a 24" RCP culvert underneath Ramp B. The Ramp B and Buck Road infield exit the right-of-way approximately 685' south through a 60" RCP. Southbound I-294 and Ramp F outlet into Pond-31B through a 24" RCP and a 15" RCP. Pond-31B outlets to the southwest through an 18" RCP which crosses Ramp F into a roadside ditch. The roadside ditch is assumed to flow approximately 350' southwest to a 42" HDPE-lined CMP culvert.

Figure 11: Hillside, Sewer System (N) Drainage Area

The 42" culvert crosses I-88 and I-294 to outlet into a Buck Road roadside ditch and aforementioned 60" RCP approximately 1,110' southeast.

The 60" RCP outfalls the Buck Road roadside ditch into the Mount Carmel Cemetery sewer system. The cemetery system feeds directly into the Village of Hillside sewer system of the Addison Creek subwatershed.

2.6.7 Berkeley, Sewer System (I-290)

The Berkeley sewer system (I-290) consists of areas 31B and 31C. Area 31B collects flow from northbound and southbound I-294 as well as the outside flow south of I-290.

Southbound I-294 drains into a 36" RCP running parallel to the roadway. The 36" RCP restricts into an 18" RCP and crosses underneath I-294 to the east embankment. Northbound I-294 drains into an 18" RCP underneath the outside shoulder. The 18" RCP flows north and combines with the east-west crossing 18" RCP. The combined flow outlets into Pond-31C through a 30" RCP. Overland flow west of I-294 is presumed to enter a 15" RCP north of the railroad tracks at Calvin Avenue. The 15" RCP outlets into Pond-31C adjacent to the 30" RCP.

Overland flow east of I-294 enters Pond-31C at an unidentified point between the pond and eastbound I-290. This overland flow follows slopes through several culverts underneath the Chicago Central and Pacific Railroad and/or an access road from I-290 into Pond-31C.

Figure 12: Berkeley, Sewer System (I-290) Drainage Area

Pond-31C outlets along the west edge through a short 12" DIP to 18" RCP. The 18" RCP is assumed to flow north approximately 230', where it changes direction and heads east for approximately 300'. Pending the results of additional survey, the Pond-31C is believed to combine with the outlet of Pond-31D before reaching the Berkeley sewer system outfall through a 30" VCP. The Berkeley sewer system (I-290) outfall is a part of the Addison Creek subwatershed.

2.6.8 Berkeley, Sewer System (S)

The Berkeley sewer system (S) consists of areas 32A, 32B, 32C, 32E, and 32G.

Area 32A collects flow from the Electric Avenue overpass via a substructure drainage system and scuppers. The bridge deck and immediate area drain into a 12" PVC pipe flowing east into the local sewer system.

Areas 32B, 32C, 32E, and 32G consist of the area located east of the retaining wall. Each area drains into the local sewer system. Area 32B and area 32C enter the local system through inlets along Coolidge Avenue.

Figure 13: Berkeley, Sewer System (S) Drainage Area

Area 32E enters the local storm sewer system at Bohlander Avenue, and Area 32G follows a ditch along the retaining wall west of the park, at which point it enters a larger roadside ditch flowing east along St. Charles Road. The Berkeley sewer system (S) outfall is a part of the Addison Creek subwatershed.

2.6.9 Berkeley, Sewer System (N)

The Berkeley sewer system (N) consists of areas 32H, and 32J.

Figure 14: Berkeley, Sewer System (N) Drainage Area

North of St. Charles Road, areas 32H and 32J, similar to Berkeley sewer system (S), consist of flow outside and east of the I-294 NB retaining wall. The flow from both areas outlet into the local sewer system through drainage structures along Victoria Avenue. This outfall is part of the Addison Creek subwatershed.

2.6.10 IDOT 66" RCP, St. Charles

IDOT 66" RCP, St. Charles system consists of areas 32D and 32F and is part of the Lower Salt Creek watershed.

In area 32D, the runoff from I-294 NB and I-294 SB, the infield area north of Electric Avenue and south of the EB I-290 St. Charles Road ramp outlet into Pond-32F.

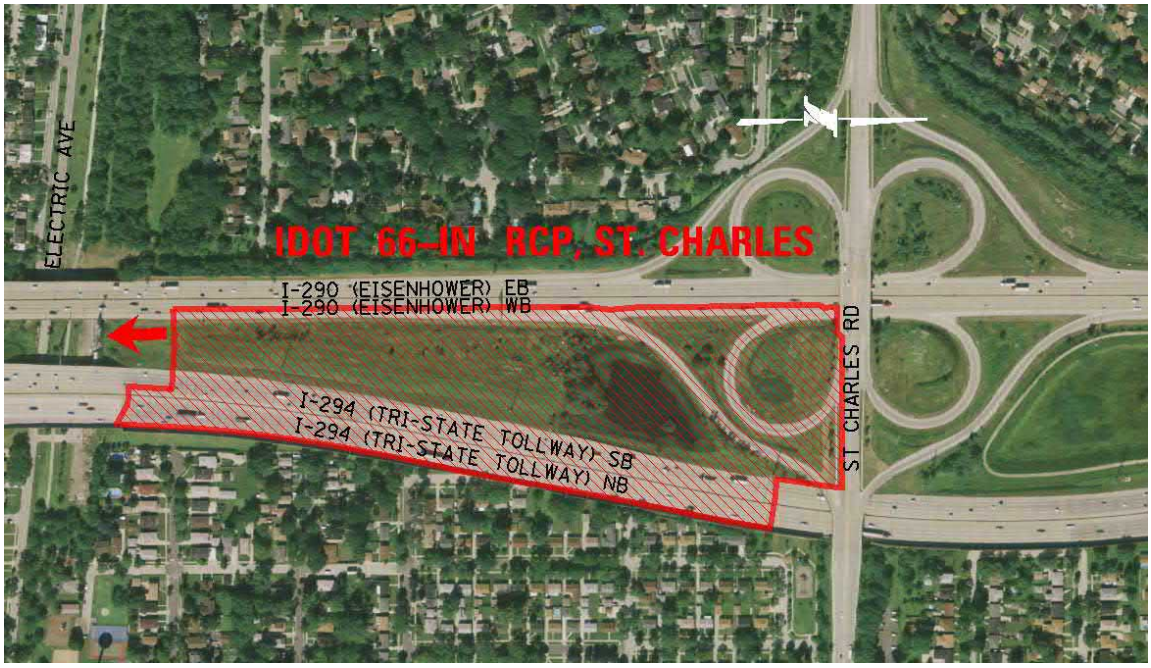

Figure 15: IDOT 66" RCP, St. Charles Drainage Area

In area 32D, flow from I-294 NB and I-294 SB drains west into a roadside ditch through multiple 18" RCP laterals. The ditch flows north into Pond-32F. In area 32F, an 18" RCP flows north along the outside northbound shoulder. The 18" RCP collects flow from I-294 NB and the inside lanes of I-294 SB. The 18" RCP enters a 36" RCP detention pipe underneath the shoulder. The 36" RCP is restricted into a 30" RCP which crosses I-294 and drains into the northeast corner of Pond-32F.

The St. Charles Road EB ramp drains openly into Pond-32F. The infield of the I-290 NB loop ramp empties into an inlet that has not been surveyed at this time. The inlet is believed to connect directly to a 66" RCP flowing south along the I-290 median. Pond-32F outfalls into the aforementioned 66" RCP, through a 15" RCP (to be surveyed), at the southeast end of the pond. The 66" RCP flow south along I-290, following I-290 east to Pump Station 20 and eventually discharges into Salt Creek.

2.6.11 Lower Elmhurst Reservoir

The Lower Elmhurst Reservoir system consists of areas 32K and 32L. Area 32K collects flow from approximately 3,300' of southbound I-294, 1,850' of northbound I-294, and 2,200' of the west embankment and ditch. Two median inlets collect flow from northbound and southbound I-294 south of the Lower Elmhurst Dam and discharge into a roadside ditch through a 24" RCP. North of the Lower Elmhurst Dam, three drop inlets discharge flow from southbound I-294 into a roadside ditch through 15" RCPs.

Figure 16: Lower Elmhurst Reservoir Drainage Area

The roadside ditches enter 18" RCP headwalls. The 18" RCPs are believed to connect at a tee with a 15" RCP. A median inlet on I-294 north of the Lower Elmhurst Dam collects flow from I-294 NB and portions of southbound I-294 and discharges it directly into a 15" RCP. The combined flow of the 18" RCPs and 15" RCP is believed to enter the Lower Elmhurst Reservoir at an unidentified location.

Area 32L consists of the west embankment of I-294 SB along the retaining wall at the north end of the Lower Elmhurst Reservoir. Open flow from this area is collected in an inlet at the base of the retaining wall. The inlet discharges the flow into the Lower Elmhurst Reservoir through a 12" RCP.

The Lower Elmhurst Reservoir (for details, see Section 2.2.2 Lower Elmhurst Reservoir) stores water in the upper basin. Lower Elmhurst Dam controls the release rate from the upper basin into the lower basin. At the north end of the Lower Elmhurst Reservoir, dual 60" RCPs flow east along the Union Pacific Railroad. The dual culverts enter a weir structure. The weir structure discharges standard flow through a 36" wall outlet. The wall outlet leads to parallel 48" and 54" RCP culverts. The dual culverts combine into a 72" CMP approximately 320' east of the wall outlet. The 72" CMP flows east approximately 70' into triple 24" CMPs. The triple CMPs flow approximately 95' north before combining and heading east. The Lower Elmhurst Reservoir discharges into the

weir structure is controlled by a 24" wall outlet. Overflow in the weir structure spills back into the Lower Elmhurst Reservoir at a lower height before spilling into the outlet system consisting of parallel 48" and 54" RCP culverts. The Lower Elmhurst Reservoir outfall is a part of the Addison Creek subwatershed.

2.6.12 Union Pacific Yard

The Union Pacific Yard outfall is divided into two systems, Union Pacific Yard (S) and Union Pacific Yard (N). The two systems discharge onto Union Pacific property; however, they discharge at different points and combine downstream as one outfall through a combination of storage facilities.

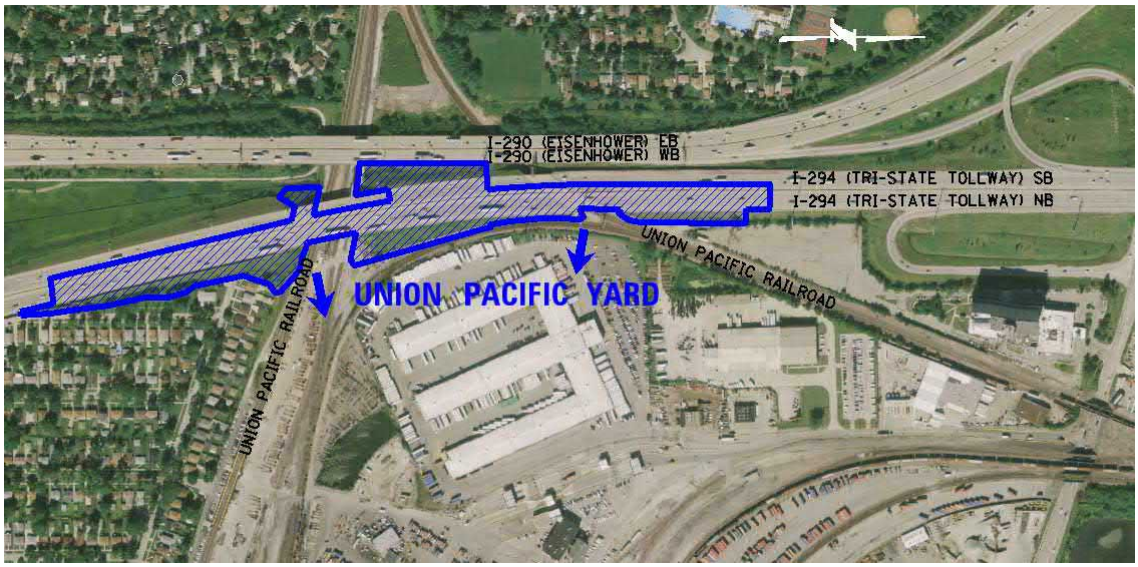

Figure 17: Union Pacific Yard Drainage Area

Union Pacific Yard (S) The Union Pacific Yard (S) system consists of areas 32M and 33A. Area 32M collects flow from the median of I-294, northbound I-294, the east embankment of northbound I-294 and the underpass of the Union Pacific Railroad beneath I-294. At the south end of 32M, a 12" CMP pipe discharges flow east from a median inlet to combine with a shoulder inlet into a 12" RCP flowing north. The 12" RCP enters a 60" RCP for detention purposes. The 60" RCP flows north approximately 290' where it collects flow from a shoulder and embankment inlet. The embankment inlet collects flow from a ditch outside of the retaining wall along northbound I-294. Approximately 305' north, a 15" RCP discharges into the detention pipe from the median of I-294. The detention pipe then combines with a 15" PVC approximately 205' north and outlets into the hillside through a 36" headwall. Additionally, flow collected along the base of the retaining wall outlets through a drop inlet and a 12" RCP into a ditch. The ditch directs the flow from the 12" RCP and the 36" headwall into an unidentified inlet south of the triple 24" CMPs. Area 33A collects flow from northbound and southbound I-294 as well as the east and west embankments. A median and shoulder inlet collects flow and distributes it into a pipe system along the west embankment through 15" RCPs. The 15" RCPs are believed to combine and flow south to the north side of the tracks. Through an unidentified structure, the flow is believed to

travel approximately 285' east. Along northbound I-294, a 12" RCP invert outlets flow into a ditch along the east embankment. The east embankment then drains into an unidentified inlet. Awaiting further survey of unidentified structures, the Union Pacific Yard (S) system is believed to enter a storage pond on the yard approximately 745' east of I-294. The storage pond is believed to be a part of the Addison Creek subwatershed.

Union Pacific Yard (N) The Union Pacific Yard (N) system consists of area 33B. Area 33B collects of the I-294 median and NB as well as the east embankment. All median flow of area 33B enters an inlet at the north end of 33B. This inlet outlets east into a 48" RCP via a 15" RCP. The 48" pipe provides detention along the east embankment and collects flow from one other inlet along I-294 NB and an inlet at the base of the retaining wall. Both inlets provide inflow through 15" CMPs. At the north end of the retaining wall, an inlet discharges flow into a ditch outside of the wall through a 12" RCP. The ditch flows south for 420' where it meets with the outlet of the 48" detention pipe, a 15" RCP through the retaining wall. The combined ditch flow then enters a culvert crossing beneath the tracks and flowing for 150' south into an inlet.

The inlet combines the culvert flow with flow collected from I-294 NB into the Union Pacific Yard (N) outfall. Pending survey, the inlet is believed to direct the discharge into a storage pond within the yard, as part of the Addison Creek subwatershed.

2.6.13 Doyle Reservoir

The Doyle Reservoir system consists of areas 33C to 33G. In area 33C, flow from I-294 SB enters a series of inlets along the shoulder. The combined flow of these inlets exits the roadway through an 18" RCP, which flows approximately 240' north where it combines with a 24" RCP collecting ditch flow south of the I-290 WB ramp.

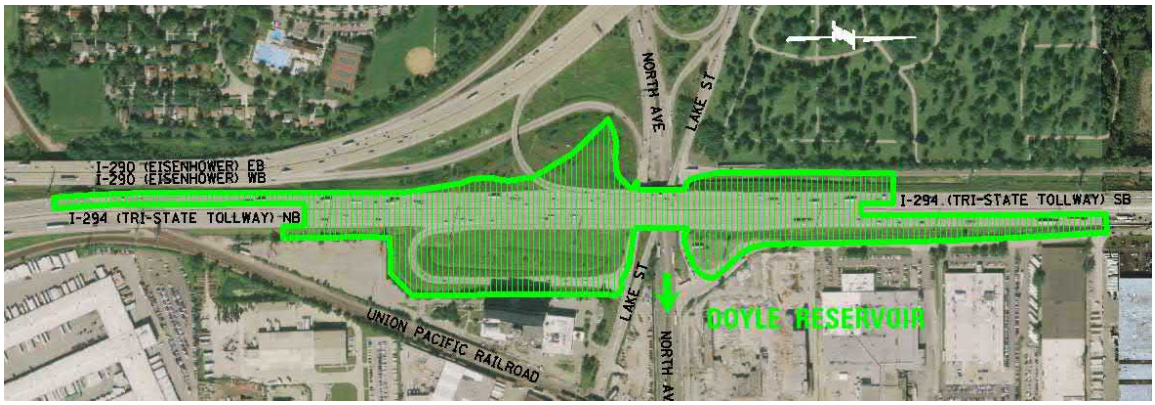

Figure 18: Doyle Reservoir Drainage Area

The combined 33C flow discharges into a ditch approximately 71' west through a 24" CMP. The ditch flows 225' north to a 36" RCP culvert which outlets into the westbound I-290 ramp infield. At the north end of the infield, the flow enters a 36" RCP. Area 33D outlets all flow into a ditch flowing west within the ramp infield. The ditch directly enters the aforementioned 36" RCP. The combined flow of 33C and 33D enters the 36" RCP and heads approximately 345' east, before combining with a 42" RCP into a 72" RCP. Area 33E consists of the east embankment of the I-294 NB on ramp from Lake

Street. The embankment drains into a curb inlet at Lake Street, approximately 1,140' north of the start of the ditch.

Area 33F consists of the infield of the I-294 NB ramp from Lake Street, I-294 NB, and median. The east embankment of northbound I-294, south of the northbound on ramp, discharges into a ditch through sheet flow and a 15" CMP. The ditch flows north for 525'. At this point, an inlet from the entrance ramp gore area discharges south into the ditch through a 15" CMP. The combined ditch flow and 15" CMP flow enter a 24" RCP culvert beneath the entrance ramp and into the loop ramp infield. Median flow within 33F discharges east into the loop ramp infield. Within the infield, two ditches flow north along the east and west sides. At the north end of the infield, the ditches merge together and combine with 15" RCP outlet of a shoulder inlet. The infield flow enters a 24" headwall and combines with the east-flowing 72" RCP approximately 88' north of the headwall. The 72" RCP then flows approximately 1,200' east to the Doyle Reservoir. The Doyle Reservoir is a part of the Addison Creek subwatershed.

2.6.14 Silver Creek

The Silver Creek outfall consists of areas 36A and 36B. In area 36A, flow from the roadway collects in ditches parallel to I-294 on both sides of the road and ultimately heads east towards Silver Creek.

Figure 19: Silver Creek Drainage Area

Flow along the median shoulder moves towards Silver Creek as shallow concentrated flow until it reaches one of many inlets that discharge into the adjacent ditches or a piped system. In general, the ditch along I-294 NB continually drains towards the east. The ditch along I-294 SB collects runoff into several cross-culverts that discharge into the I-294 NB ditch. In order to flow past the abutment of the Wolf Road bridge, the I-294 NB ditch flows into twin 30"×45" RCP before continuing in an open ditch on the other side. Approximately 700' west of Silver Creek, a 54" pipe has been installed parallel to the ditch and outlets directly into Silver Creek. East of Silver Creek (area 36B), the ditch heads west in order to capture the flow between Silver Creek and the Bensenville Bridge. At Silver Creek, a twin 12'×8' box cross-culvert conveys runoff along with the main channel across I-294.

2.6.15 Unnamed Crystal Creek Tributary

This Unnamed Crystal Creek Tributary consists of areas 37A and 37B.

Figure 20: Unnamed Crystal Creek Tributary Drainage Area

These areas consist of I-294 SB inside shoulder and median, all of the I-294 NB, and the unnamed Crystal Creek Tributary channel running along I-294 NB. Just north of the Bensenville Bridge, the channel along I-294 NB begins and runs north towards Crystal Creek along the outside edge of the Oasis area and ramps.The channel collects all flows generated by the shoulder of I-294 NB and outside the roadway. Flow generated by the median roadway areas north of the Bensenville Bridge flows in the median gutters until it discharges to the piped system which in turn discharges to the channel.

2.6.16 Motel Ditch

The Motel Ditch system consists of area 37C. Area 37C collects flow generated by I-294 SB with the exception of the inside shoulder and median.

Figure 21: Motel Ditch Drainage Area

Stormwater flows as shallow concentrated flow across the road and along the outside retaining wall until it reaches a gutter along the ramp. This flow continues north until it reaches a 12" RCP and discharges to a gutter along the outside of the I-294 SB entrance ramp from the Oasis. This channel continues around the perimeter of the Oasis.

2.6.17 Sister Stream (South)

This Sister Stream (South) system consists of area 38A. Area 38A includes the entire mainline roadway under the O'Hare Oasis, the four grassy areas between the Oasis, the Oasis ramps, and the mainline; a portion of the I-294 SB mainline extending towards Irving Park Road; and part of the I-294 NB entrance ramp from the Oasis and the adjacent channel.

Figure 22: Sister Stream (South) Drainage Area

Along the I-294 mainline at the south end of the tributary area, the flow travels along the median gutter north for approximately 560' until it reaches a piped system. This pipe flows along the median for about 250' until two 18" RCP cross-pipes connect the grassy areas adjacent to the Oasis to the system. Approximately 255' to the north, two more 18" cross-pipes connect the grassy areas adjacent to the Oasis. The median pipe continues until it reaches a 42" RCP cross-pipe approximately 450' to the north. The 42" RCP cross-pipe then flows approximately 220' east and discharges through a headwall into the channel outside of the Oasis area, adjacent to the I-294 NB entrance ramp. From here, flow in the channel continues to head north towards Crystal Creek.

2.6.18 Sister Stream (North)

This Sister Stream (North) system consists of areas 38B, 38C, and 38D. These areas include both the I-294 NB and SB ramps from the Oasis, most of the mainline I-294 pavement between the ramps and Irving Park Road, some drainage areas outside of the roadway, and both ramps and ramp infield areas south of Irving Park Road. At the south end of the tributary, the I-294 SB exit ramp drains into the main channel around the perimeter of the Oasis. This flow travels through a 60" RCP cross-culvert for approximately 255'. This flow combines with the channel around the I-294 NB side of the Oasis perimeter as well as with flow from the so-called Sexton Ditch.

Figure 23: Sister Stream (North) Drainage Area

From here, the channel discharges through a triple 6.5'×5.5' box culvert and outlets into a paved channel approximately 880' farther north, which proceeds around the Irving Park Road entrance ramp to I-294 NB. Most of the mainline runoff between the Oasis and Irving Park Road Bridge flows into the box culvert through one of three connecting cross pipes: 18" CMP, 15" RCP, or 12" RCP. The infield of the I-294 SB to eastbound Irving Park Road exit ramp infield outlets through a 400' long 24" RCP cross-culvert to the SE ramp infield, which discharges into the paved channel (approximately 600' from the start of the channel). The paved channel outlets through a 7'×4' box culvert beneath Wehrman Avenue. About 150 feet past this culvert, the flow outlets into Crystal Creek through a twin 10'×4' / 7'×4' box culvert beneath Irving Park Road.

2.6.19 Crystal Creek

This Crystal Creek outfall consists of areas 38E, 38F, 38G, 38H, and 38I. The I-294 SB to westbound Irving Park Road exit ramp grassy area flows through an 18" PVC cross-culvert for approximately 365' and combines with the entrance ramp in the northeast quadrant and detention area flows. This enters a 64' long 24" RCP culvert under the ramp, outleting directly into Crystal Creek. Flow from the exit ramp in the northwest quadrant outlets through a 40' long 15" CMP after about 375' of shallow concentrated flow into a ditch flowing north towards a twin 10'×7' box cross-culvert that outlets into Crystal Creek. This flow combines with flow to the west outside of the I-294 right-of-way as well as with flow from south of the plaza. In the I-294 SB plaza area, an 18" RCP along the outside shoulder combines with a pipe system from the plaza parking lot and service road. This system flows south into a 48" RCP that is oversized for detention storage. After approximately 485', a small piping system which contains flow from the outside of the I-294 SB mainline and the inside of the I-294 SB plaza area connects to the 48" RCP detention storage pipe through an 18" RCP. The 48" RCP then continues

flowing south for another 245' until another piping system along the median brings flows from the inside of the I-294 NB and the I-294 SB mainlines through a 145' long 18" RCP. Approximately 700' south, an 18" RCP cross-pipe flows from the median and connects to a piping system along the I-294 SB mainline outside shoulder / Irving Park Road exit ramps.

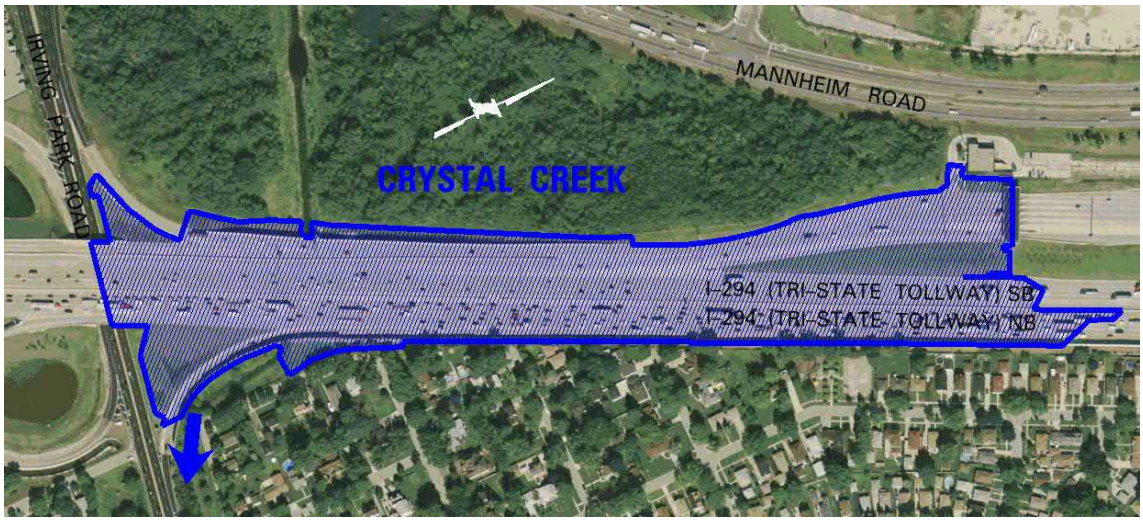

Figure 24: Crystal Creek Drainage Area

These flows all combine and flow into a 24" RCP which connects to the 48" RCP and outlets through the retaining wall into an existing detention storage area. This detention facility is controlled by an outlet structure with 9"/10" staged restrictors, which discharges into Crystal Creek near the twin 10'×7' box cross-culverts. I-294 NB runoff flows into 36" RCP oversized detention pipes flowing south towards Crystal Creek. This enters an 18" RCP restrictor pipe before discharging into the same twin 10'×7' box culverts.

2.6.20 Schiller Park, Sewer System (S)

The Schiller Park Sewer System South outfall consists of area 38J. The area between the plaza access road beyond the I-294 SB plaza and the noise wall for I-294 NB flows to a 38"×24" elliptical cross-pipe. The plaza access road and the area between the access road and the I-294 SB plaza area all flow into oversized detention pipes which drain to the elliptical cross-pipe. This flow combines with flow from I-294 NB and I-294 SB.

The I-294 SB plaza has 48" RCP oversized detention pipes with 12" restrictors on both sides of the elliptical pipe, while I-294 NB has 36"/42" RCP oversized detention pipes with 10" restrictors. This detention system outlets into the Schiller Park sewer system in the Crystal Creek subwatershed. At the time of the field visit, the downstream sewer could not be located in the survey, but subsequent coordination with the Tollway and Village of Schiller Park confirmed its presence.

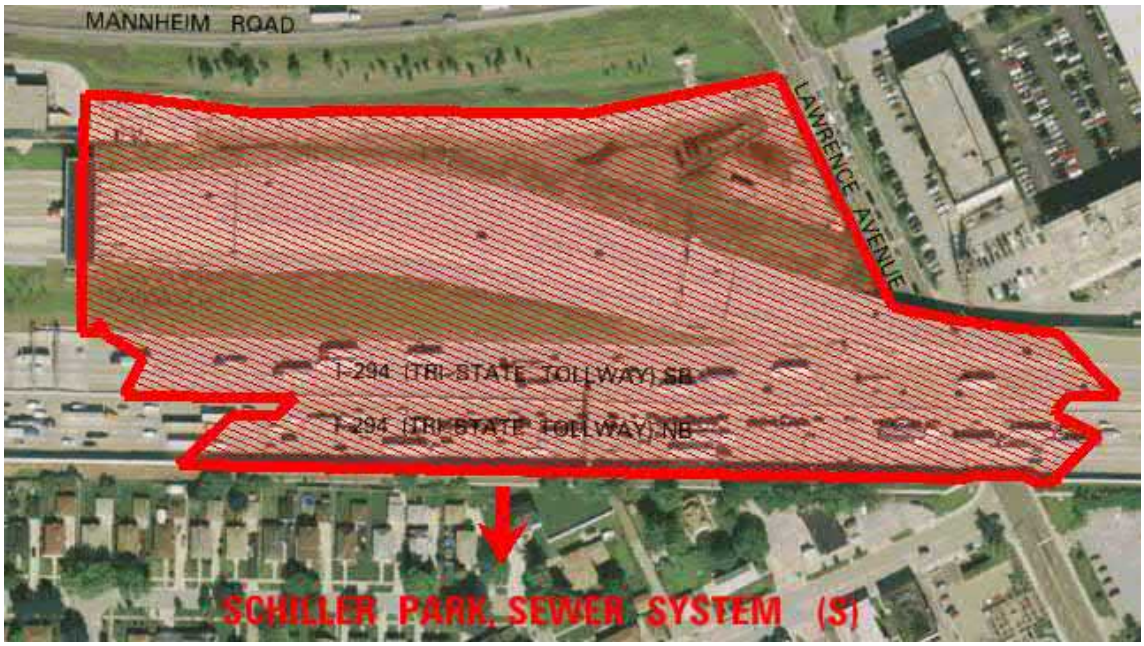

Figure 25: Schiller Park, Sewer System (S) Drainage Area

2.6.21 Schiller Park, Sewer System (N)

The Schiller Park Sewer System (N) outfall consists of area 39A. This area includes the pavement area of I-294 and flows through one of two piping systems along I-294 NB or SB parallel to the roadway under the outside shoulder.

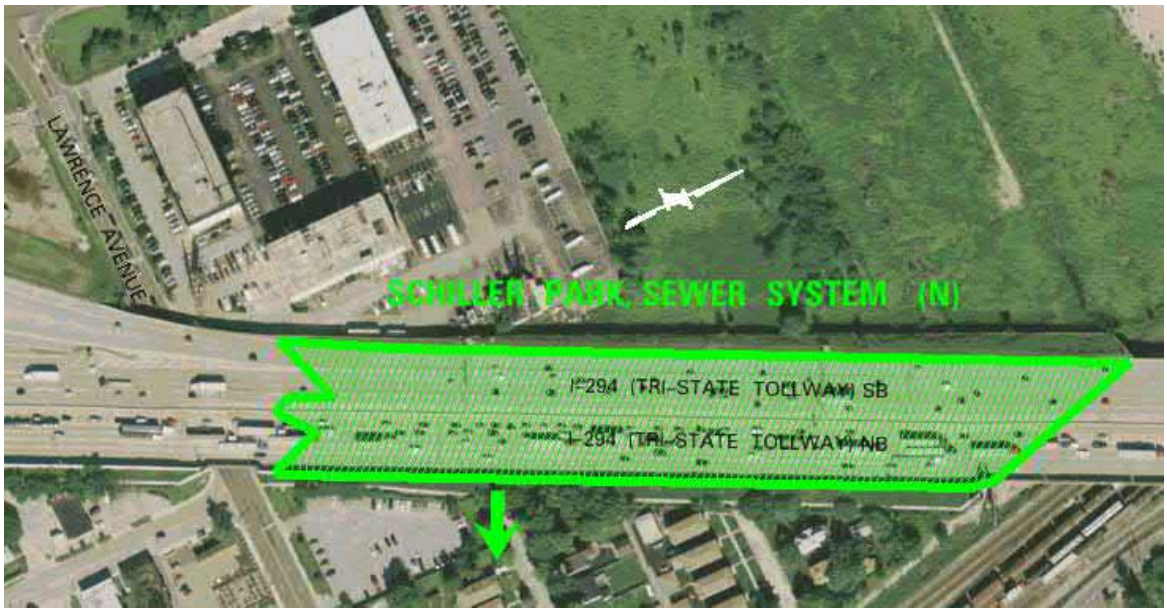

Figure 26: Schiller Park, Sewer System (N) Drainage Area

These piping systems flow both north and south, on each side of the road, into a 36" RCP cross-culvert. I-294 SB has 36" RCP oversized detention pipes with 12" restrictors on both sides of the culvert. I-294 NB has 30" RCP oversized detention pipes south of

the culvert and 36" RCP oversized detention pipes north of the culvert with 12" restrictors on both sides.

There are also two 15" RCP cross pipes that bring flow from the median shoulders area into the pipe system along I-294 NB. This pipe outlets into the Schiller Park sewer system in the Crystal Creek subwatershed.

2.6.22 Rosemont, Sewer System

The Rosemont Sewer System outfall consists of area 39B. This area consists of the entire I-294 pavement as well as both Balmoral Avenue ramps. North of the bridge over the railroad tracks, there is a piped system heading north under the outside shoulder on both sides of the roadway. On I-294 NB, this system includes 30"/18" oversized detention pipe. Near the Balmoral Avenue exit ramp, the pipe cuts across the ramp in order to remain under the mainline shoulder. On the ramp, there are laterals that transport the flow from the ramp pavement to the oversized detention pipes. This detention pipe ends at a 60" cross-culvert with a 15" restrictor heading east parallel to Balmoral Avenue. The I-294 SB piping system also flows into this pipe, in a similar manner, through a piped system without detention. These flows all combine in the 60" RCP which outlets to the Rosemont Sewer System in the Des Plaines River watershed.

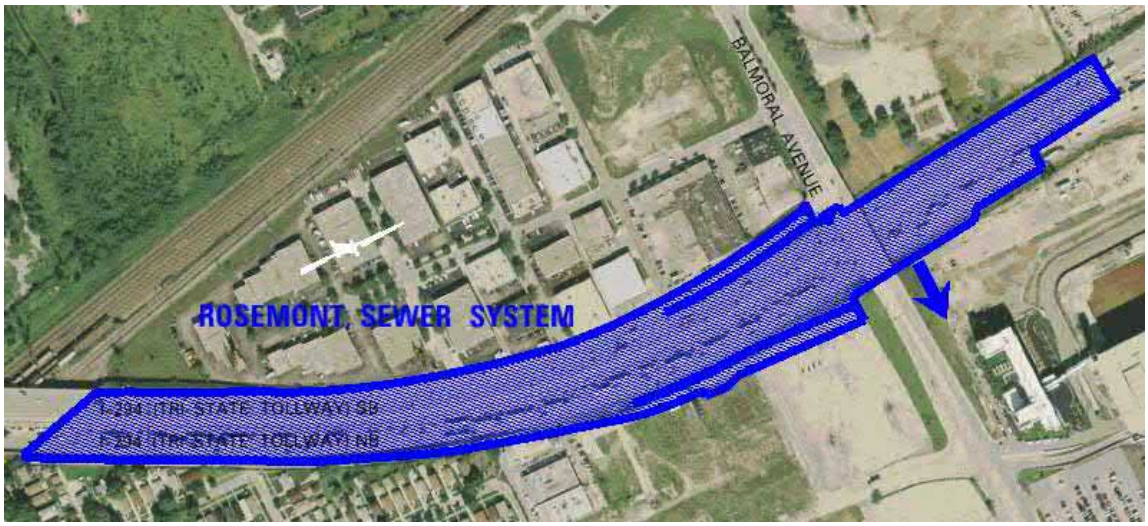

Figure 27: Rosemont, Sewer System Drainage Area

2.7 CULVERTS

There are four major Waters of the U.S. (WOUS) culverts within the limits of this study. Additionally, there are four existing non-WOUS culverts within the study limits that are included in this section. Non-WOUS culverts that are included in this section are those with a single barrel with a cross-sectional opening greater than 7.5 square feet, any multi-barrel culverts, or those draining more than 20 acres within this project area.

For proposed culvert crossings, see Section 4.10 Culverts.

2.7.1 Waters of the US Culverts (WOUS)

There are three crossing culverts in the project limits beneath I-294 within the area of known WOUS, as well as another culvert running parallel to the I-294 NB lanes between the O'Hare Oasis and Irving Park Road. These are all in the Crystal Creek watershed and Silver Creek watershed. There is another crossing culvert at Addison Creek, but this lies within the EOWA exclusion area. There are several other culverts in WOUS locations within the I-294 right-of-way, most notably a crossing culvert beneath the Bensenville Bridge and several smaller ones associated with the O'Hare Oasis. These are not within the affected limits of the roadway improvements nor are there any known deficiencies in these locations, so no additional study of these locations was performed.

2.7.1.1 Addison Creek (Not in Scope)

The Addison Creek Culvert Crossing is located within the EOWA design section. The 4224 drainage team is coordinating with the EOWA design team as there are flows from I-294 contributing to Addison Creek and this crossing.

2.7.1.2 Silver Creek (Bensenville Ditch)

The culvert crossing at Silver Creek consists of twin 12'×8' box culverts. These culverts were installed in the T-7A contract and extended in the CIP-665 contract. Based on Panel 359 of 832 of the FIRM for Cook County and the corresponding FIS, the base flood elevation upstream and downstream of this culvert is 646.00. The most recent flood mapping at this location was performed by MWRD as part of their Lower Des Plaines River Detailed Watershed Plan. The results of their mapping gave upstream and downstream base flood elevations of 646.05 and 645.64, respectively.

2.7.1.3 Crystal Creek

The culvert crossing at Crystal Creek consists of twin 10'×7' box culverts. These culverts were installed in the T-7A contract and extended in the CIP-666 contract. Based upon the previously-cited FEMA documents, the upstream and downstream base flood elevations are 639.00. In the MWRD study, these elevations are 637.42 and 637.24, respectively.

The culvert crossing to Sister Stream at Sta. 2010+87 consists of a 60" circular pipe. It connects the Industrial Tributary and Motel Ditch to the west of I-294 with the Sister Stream to the east. This culvert was installed in the T-7A contract and extended in the CIP-665 contract. Based upon the previously-cited FEMA documents, the upstream and downstream base flood elevations are 641.00 and 640.00, respectively. In the MWRD study, these numbers are 640.24 and 638.35, respectively.

The culvert conveying the Sister Stream, between the O'Hare Oasis and the Irving Park EB entrance ramp to I-294 NB, consists of three 6.5'×5.5' box culverts. These three box culverts were installed in the CIP-665 contract. Based upon the previously-cited FEMA documents, the upstream and downstream base flood elevations are 640.00 and 639.00, respectively. In the MWRD study, these elevations are 638.35 and 637.86.

2.7.2 Major Non-WOUS Culverts

The major non-WOUS culverts within the project area are summarized below.

Table 7: Major non-WOUS Culverts

STA	Location	Type	EX Size	Replacement Description
1923+10	Due east of Wolf Road	RCP	30" × 48"	Culvert to be replaced in the EOWA contract
2055+80	~ 600' south of Lawrence Ave.	RCP	38" × 24"	Clean and maintain in place
2066+75	~ 500' north of Lawrence Ave.	RCP	36" dia	Clean and maintain in place
2106+00	Due North of Balmoral Ave.	RCP	2 - 48" dia	Clean and maintain in place

3 DRAINAGE DESIGN CRITERIA

The Drainage Criteria is based upon the criteria established in the Tollway Drainage Design Manual dated March 2017. For items within the Tollway right-of-way, these criteria will govern unless there is an identified specific local criterion that is more stringent. Additionally, the Tollway criteria will govern over the MWRD criteria, per coordination with the Tollway and MWRD.

Table 8: Drainage Design Criteria

	Task	Description
	A - HYDROLOGY	
A-1	Rainfall Intensity and Distribution	ISWS Bulletin 70 (Isohyetal Values) with Huff Distributions will be used for bridges, culverts, channels, and detention basin design. ISWS Bulletin 70 (Sectional Values) will be used for storm sewers and roadway ditch design. If a hydrograph method is used, rainfall should be distributed using the appropriate ISWS Circular 173 Huff rainfall distribution (Huff, 1990) and a critical duration analysis must be utilized.
A-2	Peak Discharge for Major Waterway Crossings	FIS and MWRD discharge will be used for major waterway structures when available. If storm gage data are available, they may be used for design purposes. Otherwise, a hydrograph method shall be used to calculate peak flows. Regression equations may be used for watersheds ≥ 450-ac in urban area.
A-3	Peak Discharge for Storm Sewers, Ditches, and Minor Culverts	Rational Method for watersheds less than 200-ac. However, a hydrograph method is preferred for complex facilities and larger watersheds.
A-4	Runoff coefficient C	C = 0.95 (impervious), C = 0.30 (pervious)
A-5	Runoff curve numbers CN	CN = 74 (open spaces with grass cover on 75% - lawns, parks, golf courses, cemeteries, for hydrologic soil group C)
	B - HYDRAULICS	
B-1	Bridge	Design frequency is 50-yr storm; the calculated design headwater elevation (HW) shall be minimum 3 ft. below the low edge of pavement. The low chord shall be at least 2 ft. above the 50-yr natural highwater surface elevation and also above recorded high water at site. Check for the 500-yr storm, HW shall not encroach onto the roadway edge of pavement on the low side of the roadway. If the structure is located in designated floodway or floodplain, see item B-2 below for additional design criteria.
B-2	Major Waterway Crossings Located in Designated Floodway or Floodplains	Required for all designated floodways and floodplains with greater than 1 sq.mile (640-ac) watershed area. For structures in designated floodways, the structure shall meet the 17 ILL. ADM. CODE-Part 3708 rules for Bridge and Culvert Reconstruction or Modification, which may involve determining the feasibility of reducing the created head to 0.1 ft. over natural for events up to and including the 100-yr storm, if the structure is a source of flood damage. If the structure is not a source of flood damage, minimum design criteria is to not increase the flood profile by more than 0.1 ft. over existing, for flood profiles up to and including the 100-yr storm. When no designated floodway exists, the proposed structure shall meet the Part 3700 rules for Bridge and Culvert Reconstruction. In general, replacement

	Task	Description
		structures should reduce created head to 0.5 ft. for floods up to and including the 100-yr event. See also App. K to the Tollway's Drainage Manual Dated March 2016.
B-3	Storm Sewers	Design frequency is 50-yr storm; the maximum highwater elevation shall be kept at least 2 ft. below the manhole/inlet rim elevation. Zero encroachment on traveled way and no closer than 3 ft. from the edge of the traveled way. Maximum water depth on pavement of 0.35 ft. Minimum size shall be 15" dia. RCP under traveled way, or 12" dia. RCP outside of traveled way. Minimum 6-in cover between bottom of subbase and crest of the pipe. Maximum structure spacing is 350 ft. (15" to 24" dia.), 400 ft. (27" to 36" dia.), 500 ft. (42" to 54" dia.) and 1,000 ft. (over 60" dia.). Maximum inlet spacing is 1,000 ft. The first inlet spacing may be as great as 1,200 ft. from crest vertical curve. Minimum three structures at sag locations.
B-4	Cross Road Culvert	Design frequency is 50-yr storm; the calculated design headwater shall be minimum 3 ft. below the low edge of pavement, HW/D $\leq$ 1 ratio or maximum 0.5 ft. of created head. Check for 100-yr storm, no encroachment on any adjacent properties. Check for 500-yr storm, no overtopping of roadway. Minimum size for roadway or ramp crossings is 24" dia. RCP for lengths less than 200 ft. and 30" dia. RCP for longer than 200 ft. Minimum size for ditch culverts is 18" dia. RCP. No CMP will be allowed. Use HY-8 for non floodplain areas and HECRAS for floodplain areas.
B-5	Ditch Design Requirements	Design frequency is 50-yr storm. The ditch depth shall be a minimum of 3 ft., or the water surface elevation (WSEL) in the ditch shall be 2 ft. below the edge of pavement, or 1 ft. below the adjacent right-of-way, whichever is controlling. The minimal longitudinal slope shall be 0.3% (with 0.5% preferred by IDOT District One). Longitudinal slope less than 0.3% is allowable with the approval of the Tollway, if special consideration is provided. The velocities shall be generally between 3 to 5 fps. Ditches with more than 5-fps will need to be lined. Ditch lining recommendations will consider velocity and soil types. Check for 100-yr storm, the WSEL shall not encroach onto the roadway.
B-6	Ditch Cross Section Requirements	For new ditches, 6:1 foreslopes, 4–ft. bottom and 4:1 backslopes are desirable, but 4:1 foreslopes, 2-ft bottom and 3:1 backslopes are acceptable. When existing ditches are to remain or to be re-established, use 4:1 foreslopes, 2-ft bottom, and 3:1 backslopes. The ditch check crest must be a minimum of 1 ft. above grated inlets and 2 ft. below the edge of pavement.
B-7	Pump Station	Design frequency is 50-yr storm; the design hydraulic gradeline shall have a 2 ft. freeboard below the top of the inlet. Check for 100-yr, the hydraulic gradeline shall not be above the top of the inlet.

	Task	Description
B-8	Interchange and Expressway	The proposed interchange and expressway in the floodplain shall have a minimum of 3 ft. of freeboard against the 50-yr storm WSEL, or 2 ft. of freeboard against the 100-yr WSEL, whichever is higher.
	C - FLOODPLAIN	
C-1	Compensatory Storage	For fill in the regulatory floodplain, 17 ILL. ADM. CODE-Part 3708 rules will need to be followed. The Compensatory Storage Volume, for any fill due to roadway widening and structures in the regulatory floodplain, shall be provided incrementally between the normal elevation and the 10-yr flood elevation and between the 10-yr flood elevation and the base flood elevation (BFE) (100-yr flood elevation) as follows: (i) at a 1:1.0 ratio for Cook County (ii) at a 1:1.0 or 1:1.5 ratio for DuPage County. For details, see DuPage County Countywide Stormwater and Flood Plain Ordinance, April 2013, section 15-81.D
	D - DETENTION	
D-1	General Considerations	Detention volume shall be provided to compensate for the effect of increased peak discharges resulting from the additional impervious areas. The proposed construction shall not increase the existing peak runoff from Tollway property and shall comply with the maximum allowable release rate criteria (see section D3). Offsite drainage shall be bypassed rather than detained. Detention in ditches can be provided if it does not cause a hazard to traffic. Detention in pipes is acceptable only if no other alternate is feasible. A 2-fps cleansing velocity must be provided for upsized pipes used for conveyance and storage purpose. Detention facilities and floodplain compensatory storage site shall be provided separately.
D-2	Design Storm	100-yr storm event for the critical storm duration (Cook County facilities) and for the 24-hr storm duration (DuPage County facilities), using the ISWS Bulletin 70 rainfall depth.
D-3	Maximum Allowable Release Rates	The maximum allowable release rates shall be calculated by multiplying the total added impervious area by the below factors (cfs/acre) and added to the non-impacted existing release rate: (i) 0.04-cfs/acre, for the 2-yr storm and for the critical storm duration (Cook County facilities) and for the 24-hr storm duration (DuPage County facilities). (ii) 0.10-cfs/acre, for the 100-yr storm and 24-hr storm duration (DuPage County facilities). (iii) 0.15-cfs/acre, for the 100-yr storm and for the critical storm duration (Cook County facilities). The offsite post-development release rates shall not exceed the maximum allowable release rates. At the sensitive outlets, the offsite post-development release rates shall also not exceed the pre-developed condition release rates, for the 2-yr and 100-yr storm events, for the critical storm duration (Cook County facilities) and for the 24-hr storm duration (DuPage County facilities). The offsite post-development release rates should be estimated as described in section D-6.
D-4	Required Volume	The volume of required detention storage (acre-feet) can be initially estimated using the maximum allowable release rates (see section D-3) and as shown in

	Task	Description
		Appendix G1 (for Cook County facilities) and Appendix G2 (for DuPage County facilities). The final detention volumes and the outlet control structure (restrictor) will be designed according to section D-5 and section D-6.
D-5	Water Quality Volume	The required volume control shall include the capture of the first flush, a runoff volume equal to 1.00" (Cook County), or 1.25" (DuPage County) of rainfall times the added impervious area. The runoff from the first flush rainfall shall be stored below the elevation of the primary gravity outlet of detention facility, or within roadside ditches located upstream of the proposed detention facility. A control structure or underdrain may be used, provided that the draw down time is between 48 and 96 hours. According to USACOE (Oct 2016), the applicants for Regional Permit 3 shall be required to make a reasonable attempt to retain the runoff from the 1.00" rainfall event. Where project constraints make it impracticable to fully met the stormwater performance standard, applicants shall be allowed to implement practices according with the following hierarchy: (i) retention facilities, (ii) use of bioswales, (iii) detention facilities, (iv) use of catch basins with sumps or other inlet controls, and (v) runoff design practices for bridge deck runoff crossing waters to minimize stormwater impacts.
D-6	Methodology	Detention shall be designed using an appropriate hydrograph routing method such as HEC-HMS, xpSWMM, Win TR-20, or Pond-Pack. The offsite post-development release rates shall comply with criteria described in section D-3. Within the same watershed, some shifting of required detention between outfalls (outlets) is allowable (regional detention). However, the offsite post-development release rates shall comply with criteria described in section D-3.
D-7	Detention Basin	Dry detention basins are preferred. Wet basins are allowed for water quality, if they are not a hazard or are shielded by guardrail, and only with the Tollway approval. A minimum of 2 ft. freeboard above the maximum water surface elevation (100-yr) to the top of berm and a minimum of 3 inches above the maximum water surface elevation (100-yr) over emergency spillway to the top of berm shall be provided. The control structure in and out pipes should have the same size. The minimum restrictor plate orifice size is 4" dia.
D-8	Detention in Ditches	Maximum water surface elevation (100-yr) shall be at least 2 ft. below the edge of pavement. A maximum detention depth of 4 ft. is recommended. Minimum ditch check outlet pipe shall be 12" dia. and a minimum 4" dia. restrictor plate orifice. A minimum of 1 ft. freeboard shall be provided between the maximum water surface elevation (100-yr) and the existing right-of-way ground elevation.
D-9	Detention in Infield Areas	Maximum water surface elevation (100-yr) shall be at least 2 ft. below the edge of pavement.

3.1 FLEX LANE DRAINAGE REQUIREMENTS

For flex lane drainage requirements (previously referred to as Lane 0), the criteria for allowable storm water spread within a newly constructed full width flex lane is defined in the Technical memorandum submitted to the Tollway. In all cases, the lane 1 adjacent to the flex lane will follow standard Illinois Tollway criteria limiting travel lane encroachment to 3' away from the travel lane and the gutter water depth to a maximum of 0.35'. Areas where existing shoulder width remains, or a flex lane has a width of less than 16', special consideration will have to be provided on a case by case basis to determine the most viable allowable criteria for storm water spread. For reference, please see Appendix D.

3.2 DESIGN DEVIATION TO CRITERIA

During construction staging, Tollway requires a temporary drainage system to be designed for the 2-year storm event at on grade sections, and for the 5-year event at sag locations and underpasses. The water depth within the traveled way shall not exceed 1.0 inch.

Minimum width shoulders, during construction, often create ponded water situations during heavy storm events that are problematic for travel lanes and therefore, special attention is needed to this design. Initial calculations show that about 5' of shy distance is required to meet the Tollway temporary drainage criteria.

In sections where the criteria cannot be met, a design deviation will be required and will be submitted on a Corridor wide basis.

4 PROPOSED DRAINAGE CONDITIONS

4.1 PROPOSED DRAINAGE DESCRIPTION

The proposed roadway drainage system in sections where the roadway is reconstructed will predominately be a closed drainage system; however, there are isolated areas where an open system will be provided for the outside lanes. All areas with proposed retaining walls, noise walls, cut sections with backslopes, or areas with steep front slopes, will utilize a closed drainage system on the outside. The proposed drainage system would generally consist of drainage structures along the center of the median that would collect runoff from the median shoulder and drainage structures in the outside gutter that collect runoff from the travel lanes and outside shoulder. The proposed system will have trunk sewer at some locations and laterals that outlet directly in other locations. Trunk sewers, when required, would be placed either underneath the median, the underneath the outside shoulder along the gutter section, or outside of the roadway footprint. The Tollway prefers to keep drainage infrastructure outside of the shoulder footprint. The presence of either trunk sewer or laterals, and the location of trunk sewer, is determined by structure spacing required, maintenance of traffic, construction phasing, at the ultimate location of the outlet from the Tollway system. Storm sewer laterals from the median would be aligned in order to promote constructability and maintenance of existing drainage. At proposed gore areas, slotted drains shall be removed and trench drains shall be provided if necessary; however, trench drains shall be avoided as much as possible by either allowing flow to sheet past the gore, or providing catch basins in the gores and providing longitudinal slope to capture flow in the catch basin.

Existing stormwater detention volume will be maintained and proposed detention will be provided in accordance with Tollway policy for new impervious areas. The existing major drainage patterns and existing major outfalls will all be maintained. Some stormwater diversions will occur within larger catchment areas and subwatersheds in order to meet regional goals (see Section 4.6 Regional Stormwater Detention), however, this will not increase flow rates at any given major outfall. All existing corrugated metal pipe will be removed within the limits of pavement and replaced as required. Most RCP storm sewer will also be removed, with the exception of the IDOT Tunnel and associated pipes which outlet to Salt Creek. All proposed pipe within the pavement footprint will be RCP. There are seven drainage issues south of the EOWA omission and one issue impacting areas north of the EOWA omission that are being studied as part of this Master Plan.

In areas where the roadway is rehabilitated and widened, existing RCP drainage infrastructure will be utilized as much as possible. Existing drainage structure locations that are not in conflict with the final footprint and where no flooding problems exist will generally be maintained. Pipe outlets and laterals will be extended within all widening sections. Additional pipes will be placed as required for both conveyance and storage. The existing drainage patterns and existing outlets will all be maintained. All existing corrugated metal pipe will be removed within the limits of pavement and replaced. Most RCP storm sewer, however, will be cleaned and maintained. Major culvert crossings at Silver Creek, Crystal Creek, and a parallel culvert along the Unnamed Tributary to Crystal Creek will be rehabilitated, maintained, and extended as required. Replacement is neither practical nor warranted as these culverts meet Tollway Drainage Criteria and are generally in good condition structurally, requiring only minor structural repairs. Any additional proposed pipe within the pavement footprint that is

required will be RCP. There are four drainage issues north of the EOWA omission that are currently being studied as part of this Master Plan and one issue impacting areas north and south of the EOWA omission.

Due to construction staging, interim drainage will be required and will be created as part of detailed design. This interim design will not be included in Pre-Concept or Concept Design, however, proposed storm sewer laterals and trunk sewers are aligned in order to promote constructability and maintenance of existing drainage in conjunction with the Recommended Alternative for Maintenance of Traffic.

To the south of the EOWA omission, the roadway will be reconstructed and widened as required, with the exception of the Cermak Plaza. Profile adjustments will be made to meet minimum slope requirements, and accommodate existing drainage freeboard issues experienced at St. Charles Road. In addition to proposed drainage work within the existing right-of-way, new right-of-way will be acquired in order to provide additional detention along the east side of I-294. Notable changes to the proposed drainage will occur within the I-290 interchange footprint in order to accommodate the new geometry. Due to regional stormwater management requirements and potential permitting issues, the storage volume of the Elmhurst Reservoir north of St. Charles Avenue between I-290 and I-294 would not be impacted.

South of Roosevelt Road and north of Cermak Plaza, the roadway will be rehabilitated, widened as required, and the inside shoulder and median barrier will be reconstructed. Roadway profile adjustment will be limited to changes due to the nature of the rehabilitation work and final proposed pavement section.

North of the EOWA omission, the median will be replaced through the project limits and both the I-294 NB and I-294 SB lanes will be widened. To accomplish this, the existing drainage system between Wolf Road and the Bensenville Bridge consisting of open ditches with multiple, shallow, cross-road culverts will be replaced by a closed storm sewer system. Detention will be provided for new impervious areas using an underground detention system in the arrangement shown in Figure 10-3 of the Drainage Design Manual. Also, compensatory storage will be provided for fill within the floodplain or floodway. West of Wolf Road, the proposed drainage design will be done by the EOWA project. The design teams of 4224 and EOWA projects will coordinate how the connections to the EOWA system will occur.

North of the Bensenville Bridge to the project limits, the proposed drainage system will be expanded to meet the current Tollway criteria for detention storage. Several of the existing restrictor structure types which are no long accepted by the Tollway will be replaced with less maintenance-intensive restrictors. Although it was noted in the Draft Master Plan that the removal of Plaza 33 could result in some benefits to traffic flow, the provided detention north of the Bensenville Bridge does not assume any changes to the current configuration of Plaza 33, so if the manual toll lanes are eventually removed, the resulting loss of impervious will be an additional benefit to the detention volumes cited in this report. The detention will be provided in underground vaults in the grass infield of Plaza 33. This facility is sized for all detention between the Bensenville Bridge and Plaza 33 because the road grades at the O'Hare Oasis prohibit economical detention options.

Table 9: Proposed Ditch Locations

Start STA	End STA	Length (ft)	Slope (%)	Description
11630+90 LT	1625+40 LT	550	0.61	Behind concrete barrier, east of Ramp C (IDOT)
11634+20 LT	11639+10 LT	470	1.37	West of Ramp C (IDOT)
11651+35 LT	11644+00 LT	740	1.90	Between Ramp F and I-294 SB
11651+30 LT	11647+70 LT	360	0.92	West of Ramp F
11651+30 LT	11656+90 LT	560	0.56	West of Ramp F
11671+85 LT	11674+85 LT	370	2.03	Between Ramp G and Ramp F
11673+40 RT	11675+25 RT	190	0.50	Between NB I-294 and Ramp J
11675+25 RT	11676+60 RT	140	0.50	Between NB I-294 and Ramp J
11681+40 LT	11671+90 LT	950	0.60	West of Ramp F
11678+75 LT	11674+85 LT	490	2.03	Between Ramp H and Ramp F
11680+80 LT	11676+95 LT	520	0.38	Between Ramp G and Ramp H
11677+60 LT	11681+55 LT	400	0.97	Between WB I-290 and SB I-294
11687+05 LT	11681+55 LT	575	0.97	Between WB I-290 and Ramp J
11685+40 LT	11683+85 LT	155	0.82	Between SB I-294 and Ramp J
11684+00 RT	11678+45 RT	510	0.49	Between NB I-294 and Ramp K
11695+00 LT	11708+90 LT	1,400	3.00	Between Ramp F and St. Charles C-D Rd.
11701+45 LT	11707+90 LT	680	0.20	Between Ramp F and St. Charles C-D Rd.
11712+85 LT	11712+25 LT	210	3.84	Between St. Charles Ramp G and Ramp H
11721+00 LT	11722+20 LT	250	1.82	Between St. Charles Ramp F and Ramp E
11717+65 LT	11720+60 LT	290	1.06	Between SB I-294 and Ramp E
11722+55 LT	11720+60 LT	185	1.06	Between SB I-294 and Lower Elmhurst Reservoir
11721+20 LT	11723+60 LT	310	1.15	Between Ramp E and Lower Elmhurst Reservoir
11722+80 LT	11726+00 LT	330	1.06	Between SB I-294 and Lower Elmhurst Reservoir
11729+80 LT	11729+30 LT	350	1.06	Between SB I-294 and Lower Elmhurst Reservoir
11754+50 RT	11746+90 RT	740	1.27	Between NB I-294 and UP RR, east of retaining wall

Start STA	End STA	Length (ft)	Slope (%)	Description
11762+00 RT	11757+30 RT	425	2.35	East of retaining wall
11762+00 RT	11757+35 RT	550	2.75	East of retaining wall
1941+00 RT	1948+00 RT	700	0.21	60” detention pipe to Silver Creek

All existing storm sewer pipes, within the proposed pavement limits, will be removed and replaced. There are several locations where the existing pipes will be abandoned. The existing drainage system, for the rehabilitation section between north of Cermak Plaza and south of Roosevelt Road, will be maintained. Additionally, the rehabilitation section north of Plaza 33 will also be maintained. There will be no impact on the 84” IDOT tunnel.

Table 10: Storm sewers to be maintained or abandoned

Start STA	End STA	Offset	Description
1582+00	1615+00	LT/CL/RT	Roadway rehabilitation only, limited drainage work
1614+00	1617+00	RT	Maintain 18” CMP and connections into Pond-30D
1615+35	1618+70	LT	Maintain Pond-30C, Pond-30E, and Pond-30F outlets
1621+10	1621+10	LT/CL/RT	Abandon 30” RCP crossing, underneath I-294
1625+90	11628+80	RT	Maintain Ramp A (IDOT) 12”/18” RCP
11632+10	11639+10	LT	Maintain 24” RCP connection to IDOT Tunnel
11634+50	11634+50	RT	Maintain 30”/60” RCP at cemetery (outlet pond PR-30K)
11634+80	11634+80	LT/CL/RT	Abandon 42” CMP (HDPE Liner)
11639+80	11644+00	LT/CL/RT	Maintain 15” RCP, in Ramp D
11640+85	11641+50	RT	Maintain 24” RCP from Pond-31A
11642+50	11647+75	LT	Maintain local outlets, outside proposed Ramp F
11642+95	11641+15	RT	Abandon 24” CMP to 84” IDOT Tunnel at Ramp A
11656+90	11664+15	LT/CL/RT	Abandon 24”, 30”, and 36” RCP, outside I-294SB and crossing underneath I-294.
11664+45	11666+45	LT/CL/RT	Abandon 30” culvert underneath I-294
11666+50	11666+50	LT	Maintain 18” RCP connection from Berkeley
11666+85	11669+05	RT	Abandon 18” RCP connection from Pond-31C to I-290
11669+35	11669+00	RT	Maintain 30” VCP from I-290 to Berkeley

Start STA	End STA	Offset	Description
11682+00	11679+50	LT/CL/RT	Abandon 42" BCCMP crossing underneath I-294
11689+25	11689+25	LT	Maintain 18" pipe from I-290
11706+75	11705+45	LT	Maintain 15" RCP to 66" IDOT RCP
11735+15	11665+35	LT/CL/RT	Maintain IDOT 66"/72" RCP
11756+85	11755+25	RT	Maintain 12"/18" CMP crossing UP tracks to outfall
11767+90	11768+65	RT	Maintain 24" RCP crossing underneath Ramp J
1925+11	1927+61	CT	Maintain 15" RCP at median
1927+61	1928+66	CT	Maintain 12" RCP at median
1928+66	1928+97	CT	Maintain 12" RCP at median
1928+97	1929+65	CT	Maintain 12" RCP at median
1931+61	1931+61	CT/RT	Maintain 15" RCP crossing to new 60" proposed detention pipe
1933+60	1933+60	CT/LT	Abandon 18" RCP crossing to ditch
1937+60	1939+61	CT	Maintain 15" RCP at median
1949+60	1949+60	CT/RT	Maintain 15" RCP crossing to ditch
1992+55	1992+55	CT/RT	Abandon 15" RCP crossing to ditch
2000+73	2000+73	LT/CT/RT	Abandon 18" RCP crossing from old Oasis ditch to median
2000+73	2002+52	CT	Maintain 30" RCP at median
2002+52	2003+29	CT	Maintain 18"/30" RCPs at median
2003+29	2003+29	LT/CT/RT	Abandon 18" RCP crossing from old Oasis ditch to median
2003+29	2005+24	CT	Maintain 36" RCP at median
2005+24	2007+79	CT	Maintain 36" RCP at median
2007+79	2009+99	CT	Maintain 15" RCP at median
2010+87	2012+25	CT	Maintain 24" RCP at median, discharges into 60" RCP culvert
2012+25	2014+78	CT	Maintain 15" RCP at median
2031+76	2033+80	LT	Maintain 18" RCP on outside Irving Park Ramp shoulder
2033+80	2033+80	LT	Maintain 24" RCP discharge into Outlet 38H
2035+01	2037+46	LT	Maintain 48" RCP outside Irving Park Ramp shoulder

Start STA	End STA	Offset	Description
2037+46	2039+80	LT	Maintain 48" RCP on outside Irving Park Ramp shoulder
2038+80	2040+78	CT	Maintain 15" RCP at median
2039+80	2040+71	LT	Maintain 48" RCP on outside Irving Park Ramp shoulder
2040+71	2041+77	LT	Maintain 48" RCP on plaza outside shoulder
2040+78	2041+57	CT	Maintain 18" RCP at median
2041+77	2043+12	LT	Maintain 48" RCP on plaza outside shoulder
2041+57	2043+79	CT	Maintain 18" RCP at median
2046+78	2046+78	CT/RT	Abandon 15" RCP crossing to outside shoulder detention pipe
2050+18	2050+47	LT	Maintain 12" RCP at ORT outside shoulder
2050+47	2051+33	LT	Maintain 15" RCP at ORT outside shoulder
2050+57	2051+42	CT	Maintain 18" RCP at median
2051+33	2053+02	LT	Maintain 15" RCP at ORT outside shoulder
2052+90	2054+03	CT	Maintain 18" RCP at median
2053+02	2055+79	LT	Maintain 18" RCP at ORT outside shoulder
2053+48	2055+77	RT	Maintain 36" RCP on outside shoulder, discharges into 38"x24" culvert

4.2 PROPOSED DRAINAGE PLAN

The Proposed Drainage Plans are included in Appendix A, Section 5.5.

4.3 OUTFALL SUMMARY

Following the same procedure utilized for the existing drainage system, as previously described in Section 2.2, the proposed delineated sub-divide areas have been combined in outlets and the outlets further joined in major outfalls which eventually discharge the tollway runoff to an outside drainage system.

For all the major outfalls located south of the EOWA omission and for the sensitive outfalls located north of the EOWA omission, the 2-year and 100-year proposed release rates do not exceed the release rates for the existing conditions. Moreover, at several sensitive locations, the proposed release rates have been significantly reduced, and consequently the proposed drainage system addressed the identified drainage concerns (e.g. I-290 sag location at St. Charles) and provided a significant relief to the neighboring local drainage systems (e.g. Village of Hillside, Village of Berkeley, Union Pacific Yard).

The existing and proposed conditions drainage systems, south of the EOWA omission, have been modeled in xpSWMM and all the related data and key results mentioned in this report (release rates, water surface elevations, detention volumes and hydraulic grade lines) reflect the model outputs (see Appendix E - DVD, Section 10.1.2 xpSWMM). North of the EOWA omission, the existing and proposed drainage systems have been modeled in HEC-HMS, with all model outputs provided in Appendix E - DVD, Section 10.2.3 Subsurface Utility Engineering (SUE) Files.

The 15-min, 30-min, 1-hr, 2-hr, 3-hr, and 24-hr storm durations were analyzed for the 2-yr, 50-yr and 100-yr storm event to determine the critical duration storm, calculate the peak flow rates and analyze the detention ponds performance (see Appendix B - Calculations, Sections 6.1.1.1 to 6.1.1.5). Huff rainfall distributions were used with Bulletin 71 rainfall data (Point Frequency Distributions, All Seasons Combined, Urbana, IL) and, south of the EOWA omission, the soil has been predominantly assigned to the hydrologic soil group C (see Appendix B - Calculations, Section 6.1.1.6 Rainfall Data, Hydrologic Soil, and Typical XS). A hydrologic shape factor (peaking factor) of 484 was used.

Existing storm sewer and roadway ditch information, as well as storage volumes and outlet characteristics of the existing detention ponds were defined by information collected from survey data, available record drawings and existing contours (see Section 6.1.1.7).

An outfall summary is presented in Table 11, while outlet detailed calculations and hydrographs at major outfalls are included in Appendix B - Calculations, Sections 6.1.1.1 to 6.1.1.4.

Table 11: Outfall Summary

Outfall	Outlets	Watershed Subwatershed	EX/PR Q_2 (cfs)	EX/PR Q_{100}(cfs)
Hillside, Sewer System (S)	30A 30B 30C	Addison Creek	23/23	57/57
Oak Brook, Sewer System	30D	Lower Salt Creek	6/6	24/24
IDOT Tunnel (Roosevelt)	30E 30F 30G 30H $30K_{PR}$ $30L_{PR}$ $31A_{PR}$	Lower Salt Creek	17/12	25/21
IDOT Tunnel (I-294)	30J	Lower Salt Creek	12/5	32/30
IDOT Tunnel (Buck Rd.)	$31A_{EX}$	Lower Salt Creek	13/0	30/0
Hillside, Sewer System (N)	30K 30L $31A_{PR}$	Addison Creek	15/0	39/14
Berkeley, Sewer System (I-290)	31B 31C	Addison Creek	24/2	38/12
Berkeley, Sewer System (S)	32A 32B 32C 32E 32G	Addison Creek	4/1	10/7
IDOT 66” RCP, St. Charles	32D 32F	Lower Salt Creek	3/3	5/5
Berkeley, Sewer System (N)	32H 32J	Addison Creek	1/1	7/3
Lower Elmhurst Reservoir	32K 32L	Addison Creek	1/0	20/1

Outfall	Outlets	Watershed Subwatershed	EX/PR Q_2 (cfs)	EX/PR Q_{100}(cfs)
Union Pacific Yard	32M 33A 33B	Addison Creek	22/7	58/23
Doyle Reservoir	33C, 33D, 33E, 33F	Addison Creek	n/a	n/a
Silver Creek	36A 36B	Silver Creek	39/44	98/110
Unnamed Crystal Creek Trib	37A 37B	Crystal Creek	9/4	23/9
Motel Ditch	37C	Crystal Creek	8/11	19/27
Sister Stream (S)	38A	Crystal Creek	35/48	87/121
Sister Stream (N)	38B 38C 38D	Crystal Creek	38/32	96/80
Crystal Creek	38E 38F 38G 38H 38I	Crystal Creek	52/59	130/146
Schiller Park, Storm System (S)	38J	Crystal Creek	36/35	91/87
Schiller Park, Storm System (N)	39A	Crystal Creek	21/22	54/54
Rosemont, Storm System	39B	Des Plaines River	66/65	164/163

Notes: • EX/PR – EX = maximum allowable release rate, PR = proposed release rate;
• $31A_{EX}$ – the outlet is part of the outfall, only for the existing conditions;
• $30K_{PR}$ – the outlet is part of the outfall, only for the proposed conditions;
• Doyle Reservoir outfall has been analyzed and designed as part of Contract I-15-4656;
• For the Crystal Creek subwatershed and Silver Creek subwatershed, only tributaries within the project area are considered for Q_{100};

4.3.1 Hillside, Sewer System (S)

There is no proposed roadway widening in this system and therefore all structures and pipes in Hillside Sewer System (S) are existing to remain (see Section 2.6.1 Hillside, Sewer System (S) and Figure 6: Hillside, Sewer System (S) Drainage Area). This flow is assumed to enter the Hillside sewer system in the Addison Creek subwatershed.

4.3.2 Oak Brook, Sewer System

All structures and pipes in this drainage system are existing to remain (see Section 2.6.2 Oak Brook, Sewer System, Figure 7: Oak Brook Sewer System Drainage Area, and Figure 6: Hillside, Sewer System (S) Drainage Area) as there is no proposed roadway widening in this section. This flow is assumed to outlet at the Oak Brook sewer system in the Lower Salt Creek subwatershed.

4.3.3 IDOT Tunnel (Roosevelt)

The IDOT Tunnel (Roosevelt) system consists of areas 30E, 30F, 30G, 30H, 30K, 30L, and 31A. Area 30F collects flow from I-294 NB, Ramp B, Roosevelt Road, and Ramp B into the existing Pond-30D. Pond-30D outlets to the north into the new pond PR-30G through an 18" RCP.

The new pond PR-30G collects area 30G and the excess from the new pond PR-30K (see Section 4.3.6 Hillside, Sewer System (N)) and outlets into Pond-30E via a 36" RCP along Ramp A (IDOT). The 36" RCP outlets into Pond-30E, which also collects flow from the infield between Ramp C and Ramp A (IDOT). Pond-30E outlets to the southwest through a 24" RCP. Pond-30C outlets flow from Ramp C (IDOT) and Roosevelt Road WB to the northwest through a 15" RCP pipe. The 24" RCP and 15" RCP combine and cross Ramp A (IDOT) and Ramp C (IDOT). Area 30H collects flow from portions of Ramp C (IDOT) in Pond-30F.

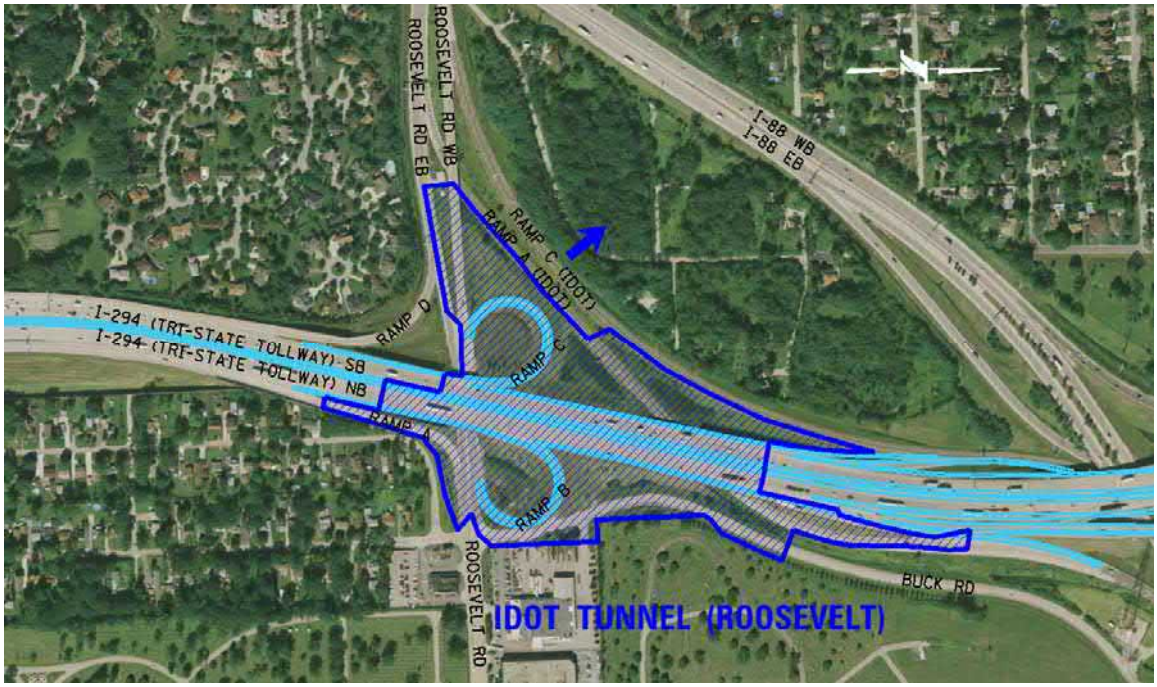

Figure 28: IDOT Tunnel (Roosevelt) Drainage Area

Pond-30F outlets to the southwest through a 15" RCP. The Pond-30F outlet combines with the flow from Pond-30C and Pond-30E approximately 260' southwest of Pond-30F. A 36" CMP carries the pond outlet flow approximately 405' west-northwest to the IDOT Tunnel. Outfall IDOT Tunnel (Roosevelt) joins with the combined flow of outfall IDOT Tunnel (I-294) and eventually discharges to Salt Creek, approximately one mile to the southwest.

4.3.4 IDOT Tunnel (I-294)

The IDOT Tunnel (I-294) system consists of area 30J. Area 30J collects flow from Ramp C (IDOT), Ramp D, Ramp E, and portions of I-88 EB into the infield of Ramp D and Ramp E.

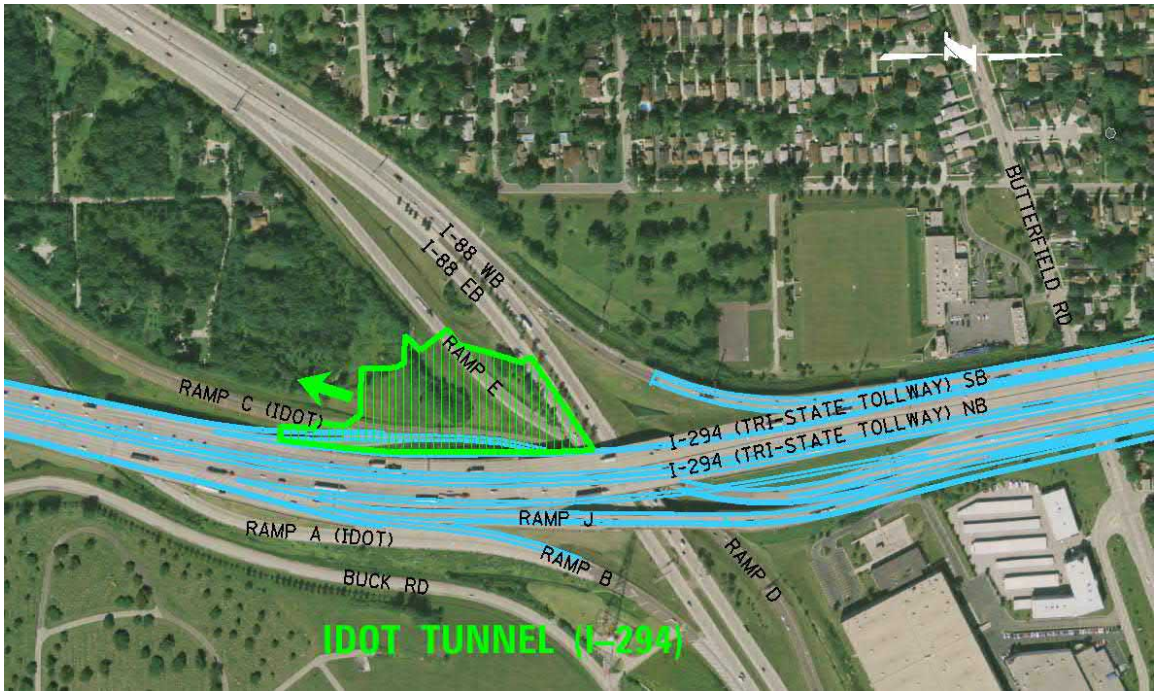

Figure 29: IDOT Tunnel (I-294) Drainage Area

An inlet between Ramp D and Ramp E distributes flow through a 24" RCP south. The 24" RCP connects with the IDOT Tunnel flowing southwest. Approximately 1,480 feet downstream, the flow of outfall IDOT Tunnel (I-294) joins with outfall IDOT Tunnel (Roosevelt) and flows to Salt Creek (Lower Salt Creek subwatershed), approximately one mile to the southwest.

4.3.5 IDOT Tunnel (Buck Rd.)

Area 31A, that originally discharged at IDOT Tunnel (Buck Rd.) outfall (see Section 2.6.6 Hillside, Sewer System (N) and Figure 30: Hillside, Sewer System (N) Drainage Area), has been designed to discharge into the new pond PR-30K at Hillside Sewer System (N). Therefore, there is no tollway discharge at this outfall.

4.3.6 Hillside, Sewer System (N)

The Hillside sewer system (N) consists of areas 30K, 30L, and 31A. Area 30JL falls within a contract by others (see Contract RR-13-4116). Area 30K collects flow from I-294 NB, I-294 SB, Ramp B, portions of Ramp J, and Buck Road. Laterals transfer the flow from area 30K along I-294 NB, I-294 SB, Ramp J, and Ramp B directly into the new pond PR-30K along the former Buck Road. Additionally, area 30L collects flow from I-294 SB, Ramp F, and portions of I-88 EB, I-88 WB and Ramp E. The infield between Ramp F and I-88 WB holds Pond-31B which collects flow from Ramp F and I-294. Between Ramp F and the existing right-of-way, a series of ditches collect the outlet of Pond-31B along with residential runoff from Elmhurst. Area 30L outlets through a 60" RCP, control structure, and new pond PR30JL provided by others (see Contract RR-13-4116) before crossing I-294 in a 60" RCP directly into pond PR-30K. Area 31A

collects flow along I-294 NB, Ramp E, Ramp E1, and Ramp J. This flow crosses I-88 in a 60" RCP provided by others (see Contract RR-13-4116). Pond-31A collects the flow from the infield of Ramp B, Ramp J, and I-290 NB, with an outlet into a ditch through a 24" RCP culvert under Ramp B. The ditch releases into pond PR-30K.

Pond PR-30K is connected to pond PR-30G with a 30" RCP, restrictor manhole, and an overflow weir. The connection between the two ponds allows for flow from areas 30K, 30L, and 31A to enter pond PR-30G during all events, relieving downstream stress on the Hillside Sewer System (N) outfall. Within a 5-year event, pond PR-30K exclusively flows into pond PR-30G. Beyond a 5-year event, at elevation 678.35, restricted flow through a 30" RCP approximately outlets into the Hillside Sewer System. Once pond PR-30K reaches a water level of 678.00, overflow transfers into pond PR-30G across an overflow weir. From pond PR-30G, flow joins the IDOT Tunnel (Roosevelt) system. As a result of the connected two ponds, flow from the Hillside Sewer System (N) outfalls into both the Addison Creek subwatershed and the Lower Salt Creek subwatershed (see Section 4.5 Stormwater Detention Analysis).

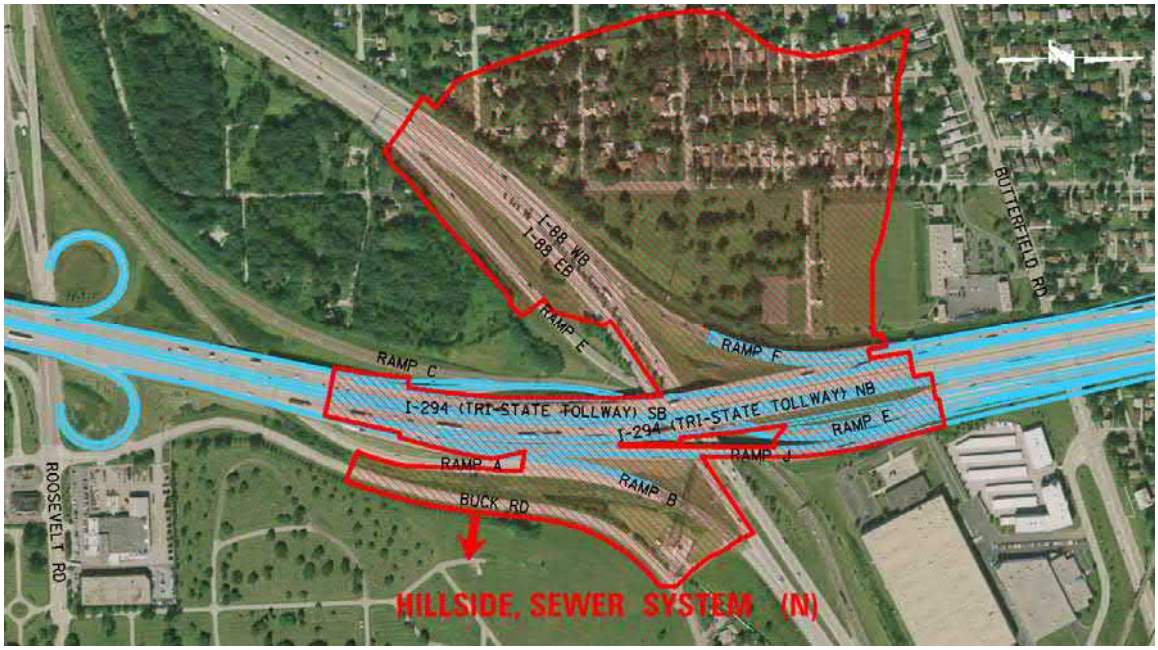

Figure 30: Hillside, Sewer System (N) Drainage Area

4.3.7 Berkeley, Sewer System (I-290)

The Berkeley Sewer System (I-290) consists of areas 31B and 31C with significant detention provided by the new pond PR-31D. Area 31B collects flow from the I-290 interchange south of the mainline and ramp high points, including I-294 NB, I-294 SB, Ramp J, Ramp G, Ramp G1, and Ramp F. Outside of proposed construction, local runoff from the Village of Berkeley and Calvin Avenue is collected at two points along the Ramp F right-of-way. The local flow is crosses I-294 at two points, Butterfield Avenue and CN railroad, to combine with the 54" RCP into pond-31C. A series of laterals direct the flow from I-294 NB, I-294 SB, Ramp F, Ramp G1, Ramp G, and Ramp J to drop structures along Ramp J. South of the CN railroad crossing, the drop structures outlet to a 48" RCP running parallel to Ramp J. The 48" RCP is bored

underneath CN railroad into Pond-31C. Additionally, flow between the CN railroad crossing and the I-290 crossing is collected and distributed along laterals to a drop structure along Ramp J, discharging directly into Pond-31C. Flow from area 31B is released from Pond-31C through a restrictor manhole and a 36" RCP, crossing I-290 and Ramp K directly into pond PR-31D.

Area 31C collects flow from the I-290 crossing north to Electric Avenue Ramp F and the infield between Ramp F, Ramp G1, and Ramp H, drain into a 18" culvert running parallel to Ramp H and I-290. This flow crosses I-290 as a 30" RCP, Ramp K, and Ramp K1 as a 36" RCP before releasing directly into pond PR-31D. The infield between Ramp J, I-290 WB, and I-294 SB collect and joins the flow from Ramp J in a 42" RCP. The flow increases and releases directly into pond PR-31D through a 48" RCP under Ramp K. Between the I-290 crossing and the Ramp J tunnel, flow from I-294 NB and I-294 SB laterals east and passes underneath Ramp J, Ramp K, and Ramp K1 into pond PR-31D in a 24" RCP. Lastly, flow from I-294 NB and I-294 SB (north of the Ramp J tunnel) laterals to Ramp K and enters pond PR-31D through a 36" RCP.

Pond PR-31D provides significant detention (see Table 17: Proposed Detention - Addison Creek subwatershed), collecting all flow from the I-290 interchange and releasing it via an 30" RCP and restrictor manhole into the local Berkeley sewer system and Addison Creek subwatershed.

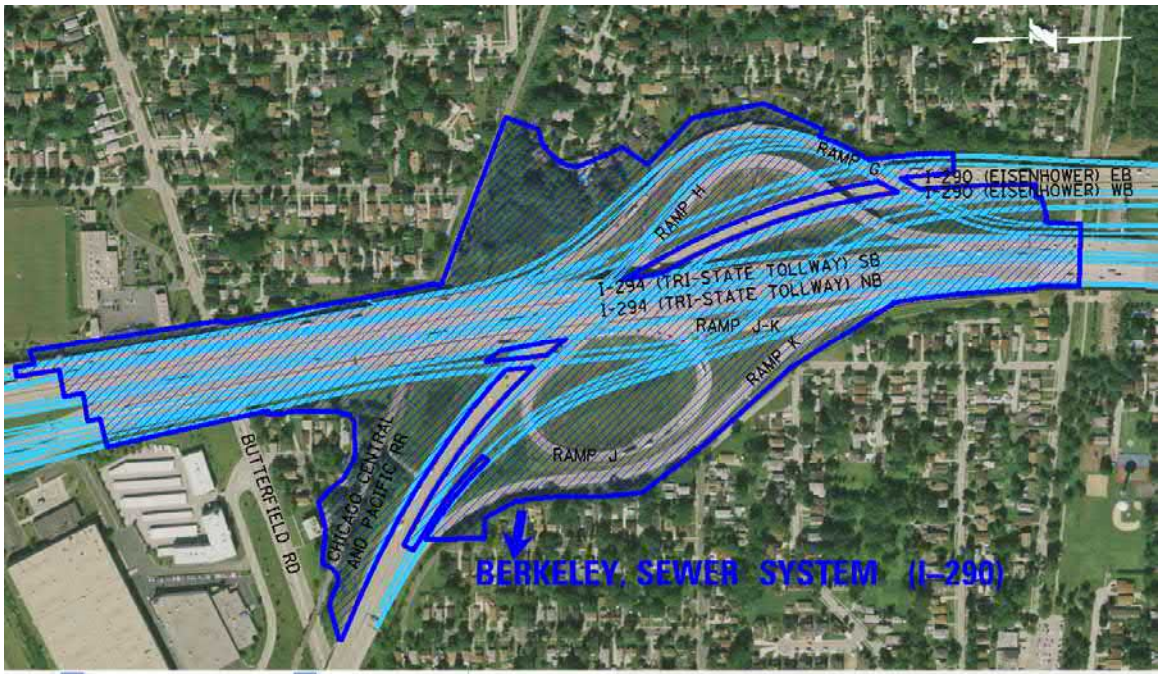

Figure 31: Berkeley, Sewer System (I-290) Drainage Area

4.3.8 Berkeley, Sewer System (S)

The Berkeley sewer system (S) consists of areas 32A, 32B, 32C, and 32E.

Area 32A collects flow from the infield between Ramp F and the St. Charles C-D Road, as well as a small portion of area outside of the northbound I-294 shoulder. Area 32A

releases into the local sewer system flowing east through a surveyed 12" plastic pipe north of Electric Avenue.

Areas 32B, 32C, and 32E consist of the area located east of the I-294 NB retaining wall. Each area drains into the local sewer system. Area 32B enters the local system through inlets along Burr Oak Avenue, area 32C enters Coolidge Avenue and area 32E enters along Bohlander Avenue. The local sewer system collects this flow and eventually distributes it to the Addison Creek subwatershed.

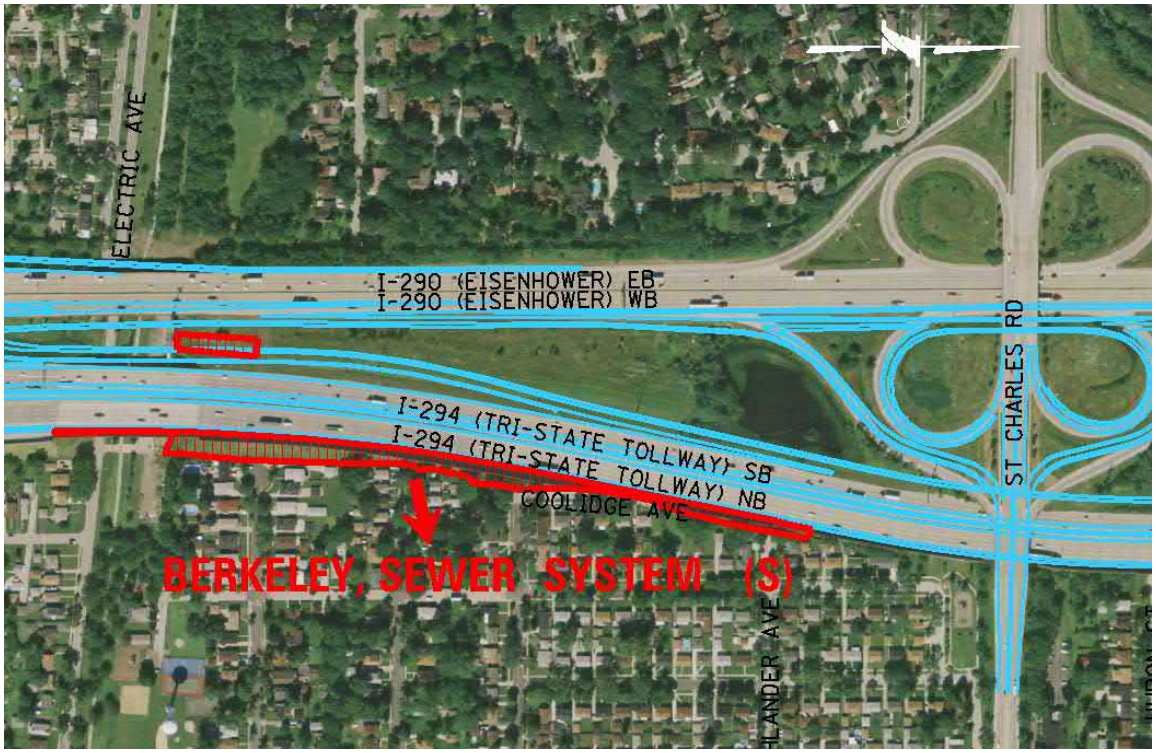

Figure 32: Berkeley, Sewer System (S) Drainage Area

4.3.9 Berkeley, Sewer System (N)

The Berkeley Sewer System (N) outfall consists of areas 32H, and 32J.

Area 32H consists of portions of I-294 NB from Electric Avenue to south of Chicago Avenue and I-294 SB from Bohlander Avenue to south of Chicago Avenue (south of St. Charles Road). Area 32H flow is transferred to a lateral shoulder main (I-294 NB) and flows north into the new pond PR-32HH. Pond-PR-32HH also collects the flow from within the right-of-way along the retaining wall within area 32H north of Bohlander Avenue. Pond PR-32HH restricts the flow and distributes it through an 18" RCP under St. Charles Road into the new pond PR-32H. North of St. Charles Road, three laterals distribute the flow across I-294 directly into pond PR-32H.

Pond PR-32H discharges into the local sewer system, along Huron Street, distributing the flow from Berkeley Sewer System (N) into the Addison Creek subwatershed.

Figure 33: Berkeley, Sewer System (N) Drainage Area

4.3.10 IDOT 66" RCP, St. Charles

IDOT 66" RCP St. Charles system consists of areas 32D and 32F.

Area 32D consists of I-294 SB from Bohlander Avenue to Electric Ave, Ramp F to Electric Avenue, portions of the infield between Ramp F and St. Charles C-D Road, and a portion of I-294 NB at Bohlander Avenue. Flow from Ramp F, the infield between Ramp F and I-294 SB, and the infield between Ramp F and St. Charles C-D Road flows into a ditch along Ramp F through a series of laterals. The ditch releases directly into the southeast corner of the new pond PR-32F-99. Additionally, a median storm sewer main collects flow from I-294 NB and I-294 SB, releasing into pond PR-32F-99 through a 36" RCP lateral.

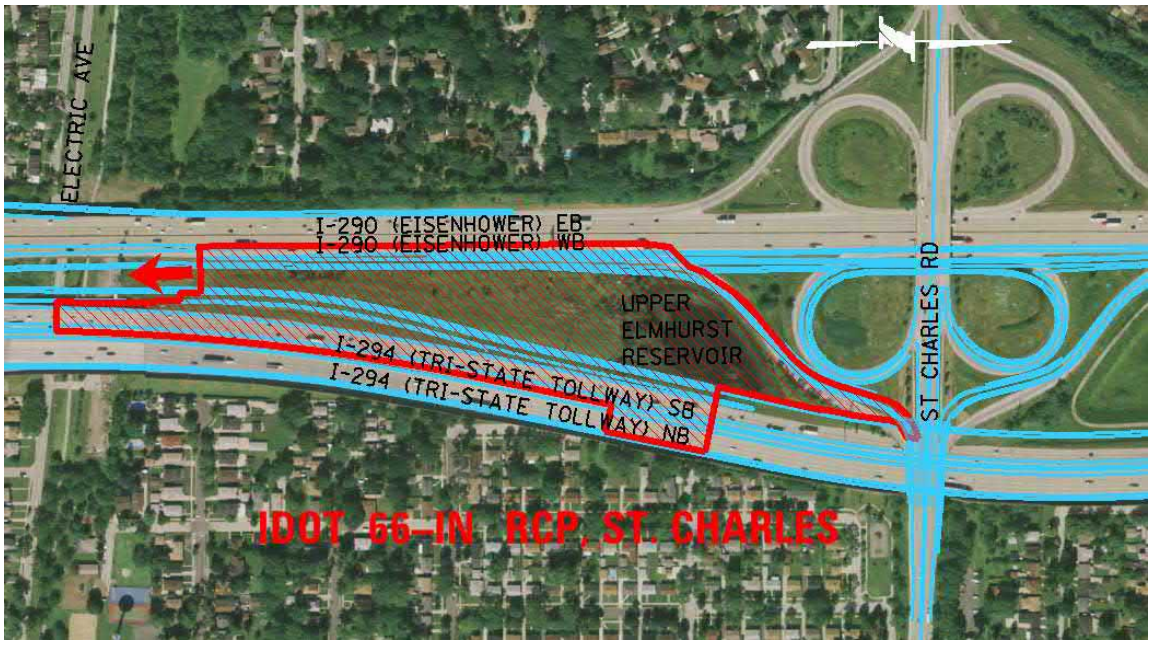

Figure 34: IDOT 66" RCP, St. Charles Drainage Area

Area 32F encompasses approximately two-thirds of the infield between Ramp F and St. Charles C-D Road, St. Charles C-D Road, and the outer lanes of I-290 WB. A ditch running parallel to St. Charles C-D Road collects the area 32F flow and distributes it directly into the southwest corner of pond PR-32F-99. St. Charles Ramp G flows directly into pond PR-32F-99.

Pond-PR-32F-99 is regraded from existing conditions (Pond-32F) and a 15" outlet RCP is reconstructed and relocated, intersecting the existing 15" RCP outlet. Flow from the 15" RCP combines with the IDOT 66" RCP running parallel to I-290, through the I-294 interchange expanding to a 72" RCP. The IDOT 66" RCP eventually is pumped to the Lower Salt Creek subwatershed through the IDOT Tunnel.

4.3.11 Lower Elmhurst Reservoir

The Lower Elmhurst Reservoir system consists of areas 32K and 32L. Both areas collect flow along the outside of the lower basin of the Lower Elmhurst Reservoir, between the east edge of the reservoir and I-294 SB. Flow from this area follows embankment grading directly into the lower basin of the Lower Elmhurst Reservoir. The Lower Elmhurst Reservoir discharges at the north end through a 48" RCP and a 54" RCP into the Union Pacific Yard sewer system, part of the Addison Creek subwatershed.

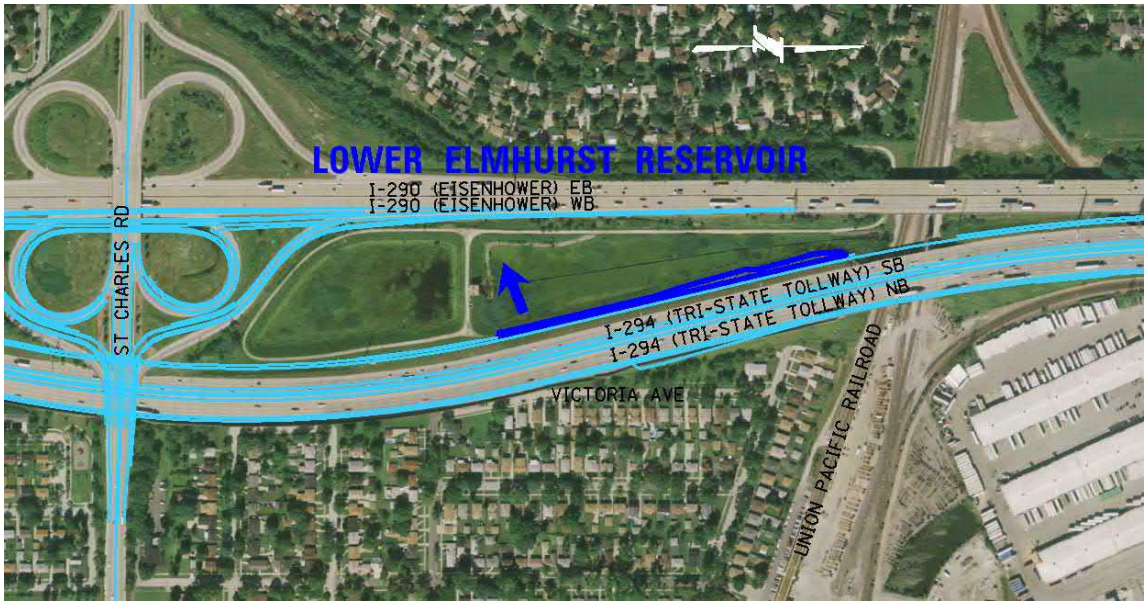

Figure 35: Lower Elmhurst Reservoir Drainage Area

4.3.12 Union Pacific Yard

The Union Pacific Yard outlet is divided into two systems, Union Pacific Yard (S) and Union Pacific Yard (N). The two systems discharge onto Union Pacific property; however, they discharge at different points and combine downstream as one outfall through a combination storage facilities.

Union Pacific Yard (S)

The Union Pacific Yard (S) system consists of areas 32M and 33A. Area 32M collects flow from I-294 NB and I-294 SB, from south of Chicago Avenue to north of the Union

Pacific Railroad crossing. A 36" RCP, located outside of the retaining wall, runs parallel to Victoria Avenue, carrying flow from approximately 345' of mainline length directly into the new pond PR-32M. Laterals then direct flow to a second main sewer run in the I-294 SB shoulder and a jack-and-bored 36" RCP lateral discharges mainline flow into pond PR-32M via a drop structure in the IPDC location with a 48" RCP outlet. A third headwall discharges flow into pond PR-32M from a portion of the I-294 NB shoulder approaching the Union Pacific Railroad crossing. Pond PR-32M outlets through an 18" RCP and restrictor manhole into the drainage system along the south side of the Union Pacific Railroad property. Pervious areas south of the Union Pacific Railroad crossing, including portions of the I-294 bridge embankments, combine with the outflow of pond PR-32M before entering the Union Pacific Yard sewer system.

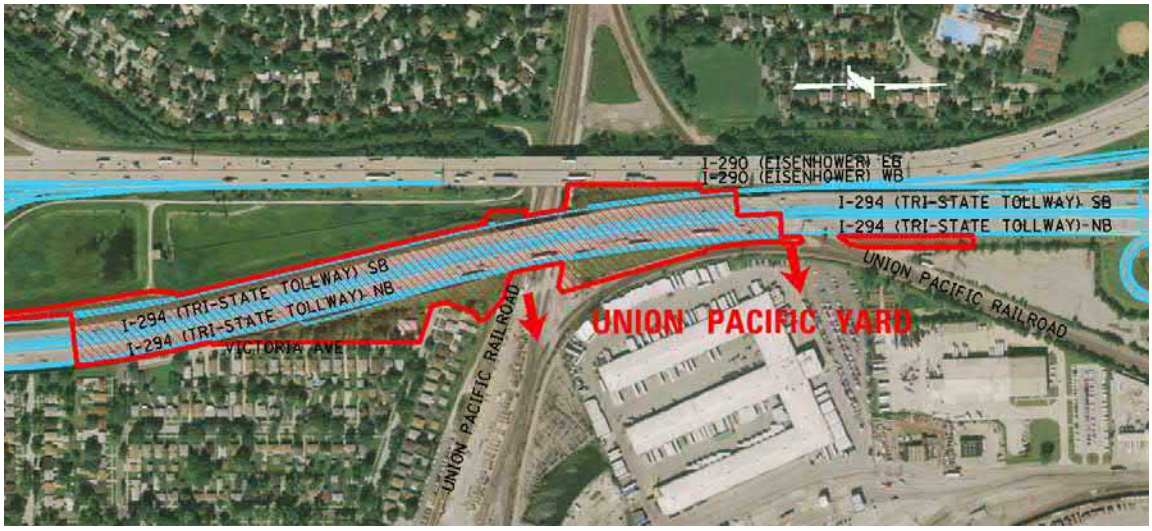

Figure 36: Union Pacific Yard Drainage Area

Area 33A includes approximately 280' of I-294 as well as the northbound embankment of I-294 north of the Union Pacific Railroad crossing, and the infield between I-294 SB, I-290 WB, and the Union Pacific Railroad crossing. Mainline and northbound embankment flow collects in a 24" RCP. The southbound infield discharges through a 48" RCP, crossing underneath I-294. The 48" RCP combines with the 24" RCP and discharges into the Union Pacific Yard (S) outfall, combining with the flow from pond PR-32M south of the tracks, ultimately releasing into the Addison Creek subwatershed.

Union Pacific Yard (N)

The Union Pacific Yard (N) system consists of area 33B. Area 33B collects flow from I-294 south of Union Pacific spur track crossing, as well as a portion of the northbound outside retaining wall embankment north of the spur track. I-294 laterals flow to the northbound shoulder in a 60" RCP oversized for detention. A drop structure with a restrictor and an 18" RCP connects to an existing outlet pipe flowing east into the Union Pacific Yard storm sewer system. The retaining wall portion north of the spur track collects in a ditch outside the retaining wall and crosses under the spur track and combines with the existing outlet pipe. The area outfalls into the Union Pacific Yard near the spur track, combining with the flow from Union Pacific Yard (S) as one system in the Addison Creek subwatershed.

4.3.13 Doyle Reservoir

The Doyle Reservoir system consists of area 33F. Areas 33C, 33D, and 33E are outside of the proposed limits and are accounted for in contract I-15-4656 by others. Area 33F consists of I-294 NB and I-294 SB, from the Union Pacific spur track north to the project limits, as well as a portion of pervious area outside the northbound retaining wall. The embankment collects in a ditch at the base of the retaining wall and enters a 24" RCP. I-294 SB flow collects in the median and laterals to the southbound shoulder, flowing north to 36" RCP crossing. I-294 NB flow collects along the northbound shoulder in a 24" RCP, combining with the 36" RCP crossing.

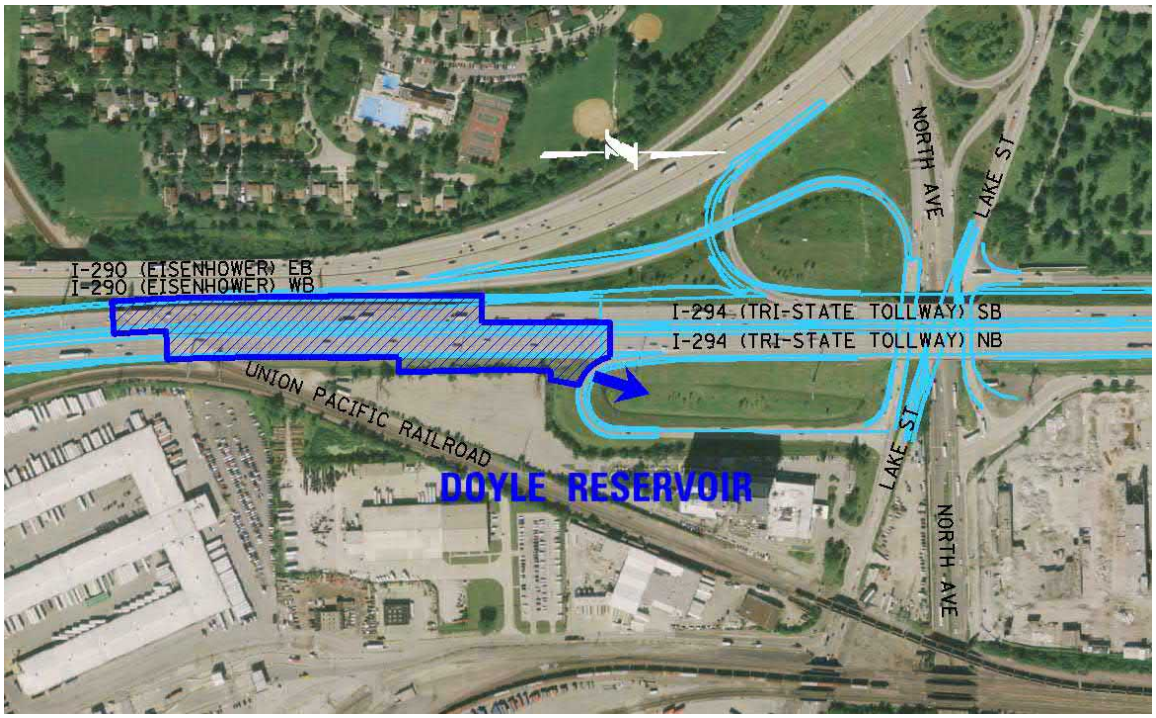

Figure 37: Doyle Reservoir Drainage Area

The mainline flow combines with the 24" RCP outside flow at a structure provided by others (see contract I-15-4656), discharging into the infield of I-294 NB and Ramp J. Contract I-15-4656 outlets the flow from the infield into the local system, releasing into the Doyle Reservoir approximately 1,300 feet east of I-294 along North Avenue. The Doyle Reservoir discharges into the Addison Creek subwatershed.

4.3.14 Silver Creek

The Silver Creek system consists of areas 36A and 36B. Both areas consist of the I-294 right-of-way between Wolf Road and the Bensenville Bridge. Runoff from the I-294 SB lanes are collected in shallow swales off the shoulder which are drained by a 36" storm sewer which discharges at the north face of the Silver Creek twin 12'×8' box culvert. Runoff from the median is collected in storm sewers connecting to an oversized storm sewer along the I-294 NB lanes. Runoff from the I-294 NB lanes is collected in similar swales to the I-294 SB lanes, where it is collected in sewers which drain to the oversized

60" detention pipes. The system discharges to an excavated area for compensatory storage which joins Silver Creek at the south face of the twin 12'×8' box culvert.

4.3.15 Unnamed Crystal Creek Tributary

The Unnamed Tributary to Crystal Creek system consists of areas 37A and 37B. The areas consist of the I-294 NB lanes outside shoulder and the I-294 NB exit ramp to the O'Hare Oasis. Runoff is collected in storm sewers for both systems which discharge to the Unnamed Tributary at the same location as existing outfalls. Both areas lie within the Crystal Creek subwatershed. Due to limitations of clearance between the roadway and the floodplain, detention for this system is provided north of Irving Park Road.

4.3.16 Motel Ditch

The Motel Ditch Doyle Reservoir system consists of area 37C. It consists of the I-294 SB shoulders and I-294 SB entrance ramp from the O'Hare Oasis. Runoff is collected in a storm sewer system which discharges to the Motel Ditch at approximately the same location as the existing outlet point. Due to the widening, the Motel Ditch itself will be relocated further from the roadway to allow for the maintenance of the channel without a reduction in floodway. The Motel Ditch lies within the Crystal Creek subwatershed. Due to limitations of clearance between the roadway and the floodplain, detention for this location is provided north of Irving Park Road.

4.3.17 Sister Stream (South)

The Sister Stream (South) system consists of area 38A. It consists of the median shoulders and inside lane between the Bensenville Bridge and the north side of the O'Hare Oasis as well as the outside shoulder and lanes between the Oasis ramps. Runoff is collected to storm sewer system, which combines the existing median sewer with a proposed extension to the south as well as new sewers along the outside shoulders. The existing 42" RCP pipe which drains directly to the Sister Stream remains the outlet of the storm sewer system. Sister Stream (South) lies within the Crystal Creek subwatershed. Due to limitations of clearance between the roadway and the floodplain, detention for this location is provided north of Irving Park Road.

4.3.18 Sister Stream (North)

The Sister Stream (North) system consists of areas 38B, 38C and 38D. Areas 38B and 38C consist of new median and outside shoulder storm sewers as well as a new 6.5'×5.5', triple-barreled culvert parallel with the I-294 mainline. Area 38D is the outfall of the Irving Park Ramp infield detention system built in the CIP-666 project and modified by the I-05-5334 project. Other than a transition from the new mainline pavement to the ramps and a replacement in-kind of the outlet structures installed by 5334, Ramp 38D is not being modified by this project. Sister Stream (North) lies within the Crystal Creek subwatershed. Due to limitations of clearance between the roadway and the floodplain, detention for this location is provided north of Irving Park Road.

4.3.19 Crystal Creek

The Crystal Creek system consists of areas 38E, 38F, 38G, 38H, and 38I. Areas 38E and 38F are largely unchanged, similar to area 38D in the previous section. In area 38G,

the storm sewer along the outside shoulder will be entirely replaced to accommodate the widening. The median sewers will be directed towards areas 38H and 38I, so that they connect to existing and proposed detention facilities. In area 38H, the existing detention facility constructed in the 5334 project will be maintained with the restrictor structure replaced in-kind with one which will be more easily maintained by Tollway staff. Area 38I will contain a new underground storage vault in the infield of the Plaza 33 area. This vault will drain to the existing 48" storm sewer along the SB outside shoulder, which will be maintained. A restrictor installed near the outlet point on the 48" sewer will allow flow to back into the proposed vault. This vault is sized for detention for all new impervious surfaces between the Bensenville Bridge and Plaza 33, as well as the loss of detention volume from the removal of the area 38G inline pipe detention which was installed in the CIP-666 project.

4.3.20 Schiller Park, Sewer System (S)

The Schiller Park, Sewer System (S) consists of area 38J. Within this area, the proposed work finishes the transition from full reconstruction to resurfacing. Because the changes to the roadway are minimal, the existing storm sewers, which were all inline detention systems installed in the CIP-666 project, will remain in place. A portion of the existing tributary to area 38J will be redirected to the detention facility in area 38I, so the discharge in the proposed conditions is reduced from the existing conditions. The outfall is still to an existing Village of Schiller Park storm sewer. Area 38J lies within the Crystal Creek subwatershed.

4.3.21 Schiller Park, Sewer System (N)

The Schiller Park, Sewer System (N) consists of area 39A. The entire tributary area is being resurfaced and will remain hydrologically unchanged in the proposed conditions. No new drainage improvements are proposed and the existing inline detention will be maintained. The proposed discharge will remain the same as existing after the project. The outfall is still to an existing Village of Schiller Park storm sewer system. Area 39A lies within the Crystal Creek subwatershed.

4.3.22 Rosemont, Sewer System

The Rosemont Sewer System consists of area 39B. The entire tributary area is being resurfaced and will remain hydrologically unchanged in the proposed conditions. A few new inlets will be installed along the I-294 SB Entrance Ramp at Balmoral Road to correct the previously noted concerns in SI 1041. The existing inline detention will be maintained. The proposed discharge will remain the same as existing after the project. The outfall is still to an existing Village of Rosemont storm sewer system. Area 39B lies within the Des Plaines River watershed.

4.4 PROPOSED DRAINAGE ALTERNATIVE FOR IDENTIFIED DRAINAGE CONCERNS

Additional information and calculations regarding proposed alternative detention basins can be found in Appendix A, Section 5.9 Alternative Detention Basin Layouts and Appendix B, Section 6.1.1.10 Alternative Detention Basins.

4.4.1 Flooding in Hillside MP 29 to MP 32 (SI 902)

As described in Section 2.6.6 Hillside, Sewer System (N), some of the tollway runoff from the I-88/I-294 interchange discharges, through a 42" CMP (HDPE liner) culvert crossing I-88 and I-294, into the Mount Carmel Cemetery sewer system, which feeds directly into the Village's system. The existing right-of-way, between east of Ramp A (IDOT) and west of Buck Road, will not allow for adequate detention In order to alleviate the flooding concern at this location, it has been studied the option to restrict some of the tollway runoff into the cemetery system and to convey most of the runoff to the south into existing Pond-30G, cross I-294 into existing Pond-30E, discharge into a proposed detention facility (**Pond PR-30EE**) and eventually outlet at the IDOT tunnel. Due to the additional runoff, most of the existing closed drainage system will need to be replaced with bigger pipes and the roadway ditches to be regraded accordingly.

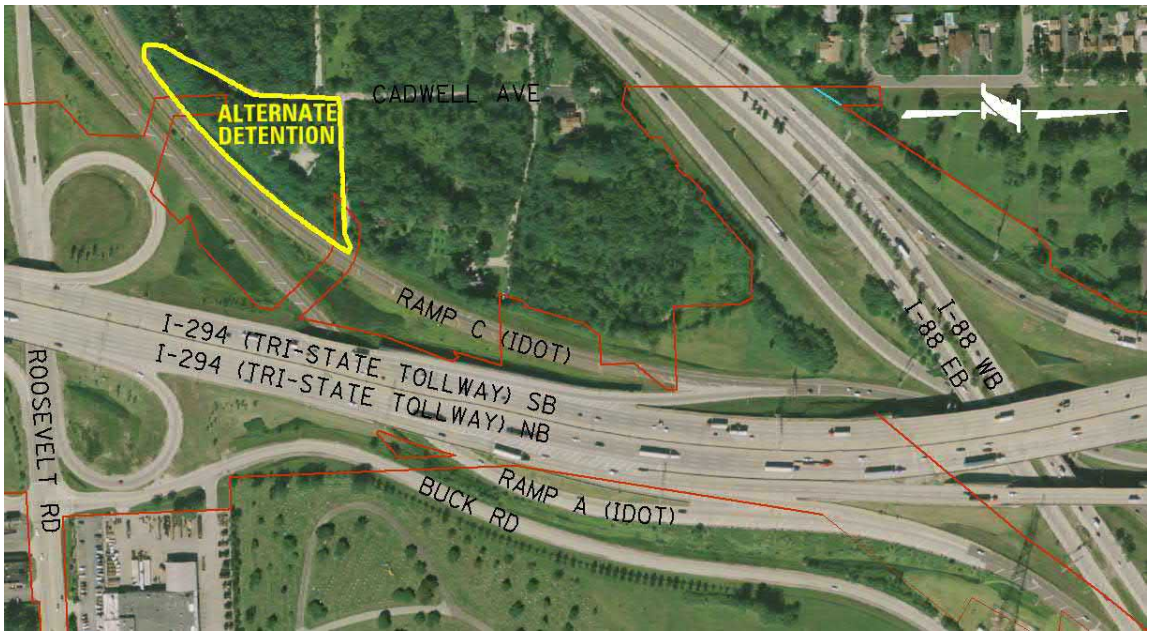

Figure 38: Alternate Detention – Elmhurst Unincorporated

Additional right-of-way will be required, as an incorporated area in City of Elmhurst located west of Ramp C (IDOT) and east of Cadwell Avenue has been considered for this proposed detention facility. The new pond will provide approximately 15 acre-feet of detention volume for the I-294 tributary section between Roosevelt Road and I-88 and will allow alleviating some of the flooding concern at the Hillside sewer system. With the NWL set at elevation 658.00 and the ground elevation at the location in the range of 680.00 to 685.00, the new pond will require approximately 60,000 cubic yards of excavation and will impact an area of approximately 3 acres.

Given the necessary new right-of-way acquisition, the large volume of additional excavation required constructing this detention facility, and the fact that Buck Road alternative (see Section 4.5, Ponds PR-30G and PR-30K in Lower Salt Creek subwatershed) was promoted by Hillside, this alternative was not brought forward to the public. It is considered a less ideal alternative than the Buck Road Alternative.

4.4.2 St. Charles Road (SI 1107)

Two alternate options have been studied in order to reduce the likelihood of recurring drainage issues at the I-294 sag location (proposed roadway profile low point at elevation 670.36). As both options will share Tollway and IDOT drainage facilities and right-of-way, they will require an Intergovernmental Agreement.

One option was to provide a new detention facility in the empty southeast quadrant of the proposed I-290/St. Charles Road interchange (reconfigured from a full cloverleaf to a partial cloverleaf, according to one of the roadway fully developed design alternatives analyzed at this location). The new pond (**Pond PR-32F**) will maximize the available infield area and provide approximately 7 acre-feet of detention volume. With the pond HWL/NWL set at 667.00/662.00, the construction of this detention facility will impact an area of approximately 3.3 acres and require approximately 60,000 cubic yards of excavation. The pond will discharge into the existing 66" IDOT pipe (running parallel to I-290 WB) at one of the existing outlet structures located in the southeast infield area.

Figure 39: Alternate Detention – I-290 / St. Charles Interchange

The other option (**Pond-PR-32F-99-Opt2**), that could be compatible with any of the I-290/St. Charles Road interchange roadway alternatives, was to extend to the south the existing wetland (Pond-32F) and provide approximately 6.5 acre-feet of additional detention volume. This extension will impact an area of approximately 1.4 acres.

The new volume will account for the lost detention volume due to the impact of the proposed I-290 SB on the existing Pond-32F. The existing pond outlet, at the existing 66" IDOT pipe, will be maintained. With respect to the two non-preferred alternative drainage options at the St. Charles interchange, only **Pond-PR-32F-99-Opt2** is a viable alternative given the preferred interchange geometry.

This option could maintain use of the southeast ramp and would provide a similar detention volume while also impacting less area and excavation volumes than **Pond PR-**

32F option. The **Pond PR-32F** option was abandoned, as the preferred roadway geometry would not allow the construction of this detention facility.

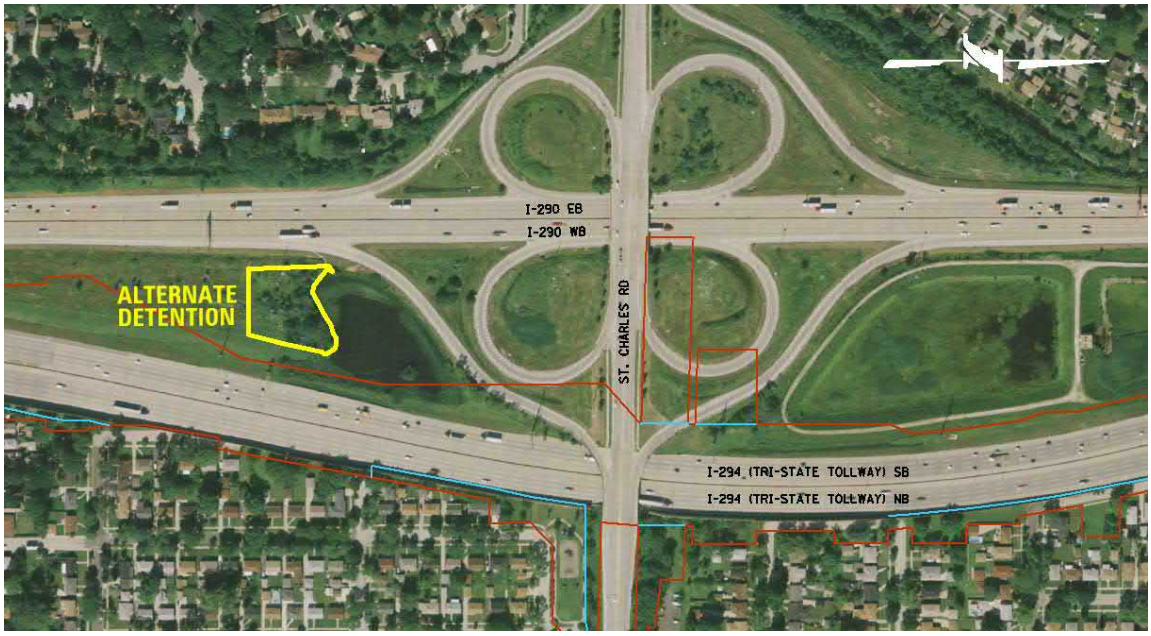

Figure 40: Alternate Detention – Wetland Extension

4.4.3 Flooding at Frontage Roads in Franklin Park

The reported discharge from the I-294 right-of-way to the Village of Franklin Park was evaluated in the field, as described in Section 2.3.9. Additionally, other design constraints, which will be described later in Section 4.8, created a need for a closed drainage system along mainline I-294 to replace the existing open ditches west of Silver Creek. In order to correct the ponding at the 30"×48" elliptical culvert, a few different options were analyzed, including the re-routing of the flow from this culvert through the Tollway's sewers to Silver Creek. After this analysis was completed, the Village provided design plans to the Tollway which show revised ditch grading to the south of I-294 and a new storm sewer connection between the culvert and the new detention facilities being constructed in conjunction with the EOWA project. As such, this issue is now considered resolved with no further action necessary from the 4224 design team.

4.5 STORMWATER DETENTION ANALYSIS

All the existing detention to remain will be maintained within the corridor, with some of the infield detention facilities being relocated and restored (e.g. Ramp-K and Ramp-J) as is required by the proposed roadway geometry. Additional right-of-way acquisition will be required to accommodate several new detention facilities (e.g. South of Park Avenue in Berkeley), or to extend/replace some of the existing facilities (e.g. west of Buck Road in Hillside).

Some of the existing detention to remain (e.g. Roosevelt Road infield ponds, I-290 infield pond at CCPRR) may require sediment accumulation removal, debris cleaning and/or minor regrading in order to reestablish the original design and to avoid any negative impact on the proposed drainage design.

Table 12: Existing Detention to Remain and to be Restored - Summary

Watershed Subwatershed	Existing Detention (acre-ft)	Existing to Remain (acre-ft)	Existing to be Restored (acre-ft)
Addison Creek	25.29	12.02	13.27
Lower Salt Creek	21.57	15.87	5.71
Silver Creek	0.00	0.00	0.00
Crystal Creek	6.22	5.87	0.35
Des Plaines River	0.24	0.24	0.00

Note: The total detention volume for Addison Creek subwatershed does not include Pond-32KL (Lower Elmhurst Reservoir) volume of 32.36 acre-ft. See Section2.2.2 Lower Elmhurst Reservoir.

Table 13: Existing Volumes to Remain

Detention ID	Volume (acre-ft)	Outlet STA	Location	Watershed Subwatershed
Pond-30A	2.11	1589+40 RT	Hawthorne St., at Plaza 35 (Cermak)	Addison Creek
Pond-30FGP	4.35	1595+50 LT	Forest Glen Park, west of Plaza 35 (Cermak)	Addison Creek
Pond-30B	0.16	1613+50 LT	Ramp-D infield, at Roosevelt Rd.	Lower Salt Creek
Pond-30C	1.43	1617+40 LT	Ramp-C infield, at Roosevelt Rd.	Lower Salt Creek
Pond-30D	5.08	1618+70 RT	Ramp-B infield, at Roosevelt Rd.	Lower Salt Creek
Pond-30E	3.10	1620+00 LT	Ramp-C and -A(IDOT) infield, at Roosevelt Rd.	Lower Salt Creek
Pond-30F	2.01	1621+20 LT	IDOT Ramp-C and Ramp-A infield, north of Roosevelt Rd.	Lower Salt Creek
Pond-31A	1.30	1641+25 RT	Ramp-B and -J infield, at I-88 EB	Lower Salt Creek
Pond-31B	2.77	1642+60 LT	Ramp-F infield, at I-88 WB	Lower Salt Creek
Pond-31C	5.56	1666+70 RT	I-290 infield, at CCPRR	Addison Creek
Pond-32KL	*32.36*	*1744+50 LT*	*Lower Elmhurst Reservoir*	*Addison Creek*
Outlet 38D-03	2.74	2024+00 LT	Infield of EB Irving Park Rd/I-294 SB Off-Ramp	Crystal Creek
Outlet 38D-01	0.79	2024+45 RT	Infield of EB Irving Park Rd/I-294 NB On-Ramp	Crystal Creek
Outlet 38E-02	0.50	2027+70 RT	Infield of WB Irving Park Rd/I-294 NB On-Ramp	Crystal Creek
Outlet 38H	1.03	2032+40 LT	Behind the ret. wall, between Crystal Creek and Plaza 33	Crystal Creek
Pipe (36" & 42" RCP)	0.24	2055+80 RT	I-294 NB between Plaza 33 and Lawrence Avenue	Crystal Creek

Detention ID	Volume (acre-ft)	Outlet STA	Location	Watershed Subwatershed
Pipe (48" RCP)	0.27	2055+80 LT	I-294 SB between Plaza 33 and Lawrence Avenue	Crystal Creek
Pipe (36"& 30" RCP)	0.15	2066+80 RT	I-294 NB between Lawrence Avenue & Railroad Bridge	Crystal Creek
Pipe (36"& 30" RCP)	0.15	2066+80 LT	I-294 SB between Lawrence Avenue & Railroad Bridge	Crystal Creek
Pipe (18"& 30" RCP)	0.19	2105+75 RT	I-294 NB at Balmoral Avenue	Des Plaines River
Pipe (36" RCP)	0.05	2105+75 LT	I-294 SB at Balmoral Avenue	Des Plaines River

At several locations, within the right-of-way limits in the vicinity of the new detention facilities, a groundwater investigation has been completed by GSC Consultants in March 2017. The investigation included Geoprobe rig borings with temporary piezometers in order to obtain the 48 hours delayed groundwater readings. For reference, please see Appendix D.

The proposed detention locations with the groundwater elevation less than 3 feet below the bottom of the pond (NWL) will require: (i) a compacted clay liner with a minimum thickness of 18 inches, and (ii) a minimum 6 inches of top soil cover before the seeding.

Wet detention facilities have been provided at the locations where the groundwater elevation is at least 6 feet below the proposed NWL, assuming a 3 feet depth water quality permanent pool.

Table 14: Groundwater Investigation - Summary

Boring ID	Boring STA	Boring OFFSET	Detention ID	Proposed NWL	Groundwater ELEV	Clay Liner Required
RP-1	1621+50	200 RT	PR-30G PR-30K	671.00 675.00	672.92	YES YES
RP-2	1673+00	640 RT	PR-31D	668.00	659.45	NO
RP-3	1716+00	350 RT	PR-32HH	670.00	< 664.00	NO
RP-4	1720+50	130 RT	PR-32H	661.50	655.17	NO
RP-5	1738+40	180 RT	PR-32M	660.00	664.27	YES
RP-6	2045+30	132 RT	---	---	628.76	---
RP-8	2046+10	115 LT	PLAZA33 VAULT	634.43	< 629.50	NO
RP-9	2041+20	180 LT	---	---	624.66	---

The required 100-yr stormwater detention volume, based on the additional bridge and pavement area for the roadway recommended alternative, was estimated using the graphic method shown in the Tollway Drainage Design Manual Appendix G1. Additionally, runoff hydrographs have

been appropriately routed through the proposed conditions to ensure that, at the major outfalls, the 2-year and 100-year release rates do not exceed the release rates for the existing conditions.

The existing and proposed conditions drainage systems, south of the EOWA omission, have been modeled in xpSWMM and all the related data and key results mentioned below (release rates, water surface elevations, and detention volumes) reflect the model outputs (see Appendix E - DVD, Section 10.1.2 xpSWMM). Some of the detention ponds are interconnected and the xpSWMM models were able to predict the flow dynamics of the entire stormwater storage and conveyance system. The proposed ponds have been designed to contain flows for the 100-year storm event without overtopping and providing the required 2 feet freeboard to the pond berm.

The overall proposed additional impervious area of 19.64 acres will require an approximate detention volume of 42.83 acre-feet (see Table 15). For detailed calculations see Appendix B - Calculations, Section 6.1.1.8 Detention Volumes Summary.

The overall required detention volume (V_{TREQ}) of 42.66 acre-feet, which include (i) the required detention volume (estimated as 0.53 acre-feet per acre of additional impervious area at each major outfall), (ii) the WQV (estimated at each major outfall as 1-in per acre of additional impervious area), and (iii) the detention volume to be restored (see Table 12), has been provided in wet and dry ponds (using existing and new right-of-way), bioswales (ditch detention), oversized storm sewers and vaults. The WQV has been primarily provided in wet detention ponds and bioswales, or otherwise incorporated (as additional volume) in dry detention ponds, oversized storm sewers, or vaults. Bioswales design is not part of this study.

Table 15: Proposed Detention Volumes – 100 Year Storm Event

Watershed Subwatershed	New IMP (ac)	Req. Det. (ac-ft)	Req. to be Restored (ac-ft)	Req. WQV (ac-ft)	Required(*) Total V_{TREQ} (ac-ft)	Provided(**) Total V_{TPR} (ac-ft)
Addison Creek	21.24	16.05	13.27	2.54	31.85	45.02
Lower Salt Creek	-6.60	1.20	5.71	0.19	7.09	14.28
South of EOWA	**14.64**	**17.25**	**18.98**	**2.74**	**38.94**	**59.30**
Silver Creek	1.62	0.86	0.00	0.13	0.86(***)	1.14
Crystal Creek	3.49	2.22	0.35	0.29	2.86	2.87
Des Plaines River	0.00	0.00	0.00	0.00	0.00	0.00
North of EOWA	**5.11**	**3.08**	**0.35**	**0.42**	**3.72**	**4.01**
Total Study	**19.64**	**20.33**	**19.33**	**3.16**	**42.66**	**63.31**

Notes: (*) $V_{TREQ} = V_{REQ}$ (required detention and detention to be restored) + WQV_{REQ}
(**)$V_{TPR} = V_{PR}$ (provided detention) + WQV_{PR}
(***)WQV for Silver Creek is recommended to be provided through a partnership with the Silver Creek Planning Council. If this is not feasible, the WQV should be provided in permanent sedimentation basins downstream of the 60" pipe outlet prior to Silver Creek. The proposed detention vault at Plaza 33 will have 1' of depth below the restrictor and a pervious bottom in order to provide the WQV sub-surface.

Some of the proposed detention facilities have been designed to provide regional stormwater detention, if required to mitigate detention deficiencies at other locations within the corridor, contained by the same watershed or subwatershed (see Section 4.6).

There are two locations, south of the EOWA omission, where the proposed drainage design required diversions of stormwater from one subwatershed to another (see Section 4.6), but overall, within the project limits, the existing tributary area ratio of 76% - 24% between the two subwatersheds (Addison Creek - Lower Salt Creek) has been maintained in the same range.

Lower Salt Creek subwatershed

One location where right-of-way will be required, in order to accommodate proposed detention, is at the south section of Buck Road, east of I-294 and west of Mt. Carmel Cemetery, in Hillside, Cook County (see Section 2.3.2 Flooding in Hillside MP 29 to MP 32 (SI 902)). The new dry pond **PR-30G**, replacing the existing dry pond POND-30G located at Ramp-C and Buck Road infield area, will maximize the new available right-of-way, reduce the tollway peak discharges at the IDOT tunnel (Lower Salt Creek subwatershed) and provide approximately 7.35 acre-feet of regional detention storage (see also see Section 4.6 and Table 22).

Adjacent to this location, approximately 1,300 feet north, a new dry pond **PR-30K** (see below Table 17: Proposed Detention - Addison Creek subwatershed) will be located at the northern portion west of Buck Road, replacing the existing small dry pond POND-30K. The narrow right-of-way area between Ramp-A (IDOT) and Mt. Carmel Cemetery will not allow the footprint of a wet pond design. These two new ponds will be connected at the south end of pond PR-30K. Most of the proposed tollway runoff will be initially detained into pond PR-30K, then released and detained into pond PR-30G, and eventually discharged at the IDOT tunnel outfall (Lower Salt Creek subwatershed). The excess detained runoff from pond PR-30K, that occurs only for storms larger than the 5-year event, will be discharged into the local sewer system (Addison Creek subwatershed) at Mt. Carmel Cemetery outfall (Hillside sewer system N). The proposed detention design will maximize the new available right-of-way, address the identified drainage concerns by significantly reducing the tollway discharge at the Hillside sewer system and provide around 5.34 acre-feet of regional detention storage (see Section 4.6 and Table 22).

The existing wetland POND-32F, located south of the Ramp G at the St. Charles Road interchange between I-290 and I-294, will be regraded due to the roadway expansion of I-294 and reconfiguration of Ramp G and continue to be accessible for detention (**PR-32F-99**). The proposed tollway runoff into the wetland will be reduced due to the smaller proposed tributary area and consequently, the regraded wetland **PR-32F-99** will be able to maintain the proposed conditions release rates into the 66 inch diameter IDOT pipe at the same level with the existing conditions release rates.

Table 16: Proposed Detention – Lower Salt Creek subwatershed

Detention Type	Detention ID	Outlet at STA	Required V_{TREQ} (acre-ft)	Provided V_{TPR} (acre-ft)	Detention Location
Dry Pond	PR-30G	1625+70 RT	2.05	9.21	South Cemetery, along old Buck Road
Wetland	PR-32F-99	11708+50 LT	5.05	5.07	St. Charles Exit, east of Ramp G

Addison Creek subwatershed

The new dry pond **PR-30K** has been described in the above section (Lower Salt Creek subwatershed), in conjunction with pond **PR-30G** (see also Section 4.6 and Table 22: Regional Detention Volumes – Ponds PR-30G, PR-30K).

According to the recommended alternative, the I-290 interchange will be reconfigured, with the new Ramp-K alignment requiring the removal of the existing detention POND-31D and POND-31E. The new wet pond **PR-31D** will provide the required WQV, exceed the required detention volume, and consequently reduce significantly the release rate into the Berkeley storm sewer system. The proposed detention facility, with an approximately 4.40 acre footprint, will maximize the new created infield area east of Ramp-K, address the identified drainage concerns without requiring new right-of-way, and provide approximately 2.98 acre-feet of regional detention storage (see Section 4.6 and Table 23: Regional Detention Volumes – Pond PR-31D).

An additional location where right-of-way will be required in order to accommodate proposed detention is north of St. Charles Road just south of Victoria Avenue in Berkeley, Cook County. The proposed wet pond **PR-32H** will provide the necessary detention to offset any volume lost by the removal of the existing POND-32A and the regrading of POND-32F, as well as significantly reduce the runoff to the Lower Elmhurst Reservoir. A proposed dry detention pond **PR-32HH** located at the park area south of St. Charles Road will be used in conjunction to the proposed wet pond PR-32H to provide additional detention. The narrow right-of-way area at the park south of St. Charles Road will not allow the footprint of a wet pond design for PR-32HH. This proposed two-pond detention design will reduce the release rate at the Berkeley storm sewer system, address the drainage concerns at the I-294 profile sag at the St. Charles Road underpass (see Section 2.3.5 St. Charles Road (SI 1107)) and provide approximately 1.17 acre-feet of regional detention storage (see Section 4.6 and Table 24: Regional Detention Volumes – Ponds PR-32HH, PR-32H).

New right-of-way will be required in order to accommodate the proposed detention, located between I-294 and Victoria Avenue, south of Park Avenue in Berkeley, Cook County. The new wet pond **PR-32M** will provide the required WQV, significantly reduce the release rate into the existing Union Pacific Yard drainage system, exceed the required detention volume, and provide approximately 1.45 acre-feet of regional detention storage (see also Section 0 and Table 25: Regional Detention Volumes – Pond PR-32M). The proposed design will reduce significantly the tollway runoff discharged into the Lower Elmhurst Reservoir and address some of the identified drainage concerns at the Metra station (see Section 2.3.6 Flooding in Berkeley).

At the other two outfalls at the Union Pacific Yard there is no available existing or proposed right-of-way to accommodate the required detention volume in detention ponds. Therefore, the proposed detention will be provided in the underground detention pipe **PRPIPE33B**. Below Table 17 summarized the proposed detention within the Addison Creek subwatershed.

Table 17: Proposed Detention - Addison Creek subwatershed

Detention Type	Detention ID	Outlet at STA	Required V_{TREQ} (acre-ft)	Provided V_{TPR} (acre-ft)	Detention Location
Dry Pond	PR-30K(*)	11634+50 RT	3.50	8.39	North Cemetery, along old Buck Road

Detention Type	Detention ID	Outlet at STA	Required V_{TREQ} (acre-ft)	Provided V_{TPR} (acre-ft)	Detention Location
Wet Pond	PR-31D	11668+32 RT	18.37	23.94	I-290 interchange, east of Ramp K
Dry Pond	PR-32HH	11716+00 RT	1.07	1.07	Park area, south of St. Charles Road
Wet Pond	PR-32H	11720+73 RT	5.56	7.19	North of St. Charles, south of Victoria Ave.
Dry Pond	PR-32M	11742+55 RT	3.21	4.28	South of Park Ave., along Victoria Ave.
Pipe 60"	PRPIPE33B	11755+35 RT	0.13	0.15	Outlet at UPRR Yard

(*) Note: Pond PR-30K has been described in the Lower Salt Creek subwatershed section.

Silver Creek subwatershed

In the Silver Creek subwatershed, all detention will be provided in oversized storm sewer **PRPIPE36A**, configured as recommended in Figure 11-3 of the Tollways Drainage Design Manual - 2017. Oversized pipes will run beneath a shallow swale along I-294 NB and discharge into a large channel which provides compensatory storage volume prior to merging with Silver Creek. WQV will be provided through coordination with the Silver Creek Planning Council, or if this is not possible, in permanent sediment basins downstream of the oversized pipe outfall. Based on the tributary area ratio between the roadway runoff and the main stream channel, a 10-year tailwater elevation was assumed for Silver Creek (see Table 9.2 in the Tollway Drainage Design Manual - 2017).

Table 18: Proposed Detention - Silver Creek subwatershed

Detention Type	Detention ID	Outlet at STA	Required V_{TREQ} (acre-ft)	Provided V_{TPR} (acre-ft)	Detention Location
Pipe 60-in	PRPIPE36A	1940+25 RT	0.86(*)	1.14	Outlet at Silver Creek

(*) Note: North of EOWA omission, WQV for Silver Creek is recommended to be provided through a partnership with the Silver Creek Planning Council. If this is not feasible, the WQV should be provided in permanent sedimentation basins downstream of the 60" pipe outlet prior to Silver Creek. The proposed detention vault at Plaza 33 will have 1' of depth below the restrictor and a pervious bottom in order to provide the WQV sub-surface.

Crystal Creek subwatershed

North of the Bensenville Bridge, all proposed detention will also be proposed in an underground vault in the grass infield of Plaza 33. For the purpose of this Concept design, the underground vault capacity was estimated using a StormTrap system, although the specifications of this vault will be deferred to the Final design, when a more thorough cost comparison of different underground detention systems can be performed. WQV will be provided in an infiltration depth at the bottom of the underground vault. As the provided WQV is located underground, there are no anticipated issues with the Federal Aviation Administration (FAA) requirements, due to the proximity of the Chicago O'Hare International Airport. Based on the tributary area

ratio between the roadway runoff and the main stream channel, a 25-year tailwater elevation was assumed for Crystal Creek (see Table 9.2 in the Tollway Drainage Design Manual - 2017).

Table 19: Proposed Detention - Crystal Creek subwatershed

Detention Type	Detention ID	Outlet at STA	Required V_{TREQ} (acre-ft)	Provided V_{TPR} (acre-ft)	Detention Location
Underground Vault	PLAZA33VAULT	2035+00 LT	2.86	2.87	Outlet to existing pond constructed in I-05-5334

Des Plaines River watershed

Table 20: Proposed Detention – Des Plaines River watershed

Detention Type	Detention ID	Outlet at STA	Required V_{TREQ} (acre-ft)	Provided V_{TPR} (acre-ft)	Detention Location
n/a	n/a	n/a	0.00	0.00	n/a

Survey It is noted that areas outside of the existing Tollway ROW that are utilized for detention were not surveyed as access for was not feasible during the preparation of the report. Aerial mapping and county contours were relied upon in these areas for conceptual design. It is the responsibility of the DSE preparing the Phase II design to collect required survey at these locations.

4.6 REGIONAL STORMWATER DETENTION

This project is located within the Des Planes River cataloguing unit (HUC-8: 07120004).

The project section located north of the EOWA omission is tributary to the Lower Des Plaines watershed (HUC-10: 07120004 05), which includes the Bensenville Ditch – Des Plaines River subwatershed (HUC-12: 07120004 05 06). Crystal Creek and Silver Creek catchments are both tributary to the Bensenville Ditch – Des Plaines River subwatershed. Within this section, there are no diversions of stormwater from one watershed to another, and the provided detention volumes (see Table 18, Table 19, and Table 20) do not include regional detention volumes. For detention purposes, no additional right-of-way is required in this section of the project.

The section of the project located south of the EOWA omission is eventually tributary to the Salt Creek watershed (HUC-10: 07120004 04), and includes the Addison Creek subwatershed (HUC-12: 07120004 04 03) and the Lower Salt Creek subwatershed (HUC-12: 07120004 04 04). This section of the project includes some diversions of stormwater from one subwatershed to another and provides available volumes for regional detention.

There are two locations, south of the EOWA omission and contained by the same watershed (Lower Des Plaines), where the proposed drainage design required some diversions of stormwater runoff from one subwatershed to another. Within the project limits, under the

proposed conditions, the tributary area ratio between the two subwatersheds (Addison Creek - Lower Salt Creek) has been maintained approximately within the range of the ratio under the existing conditions (76% - 24%).

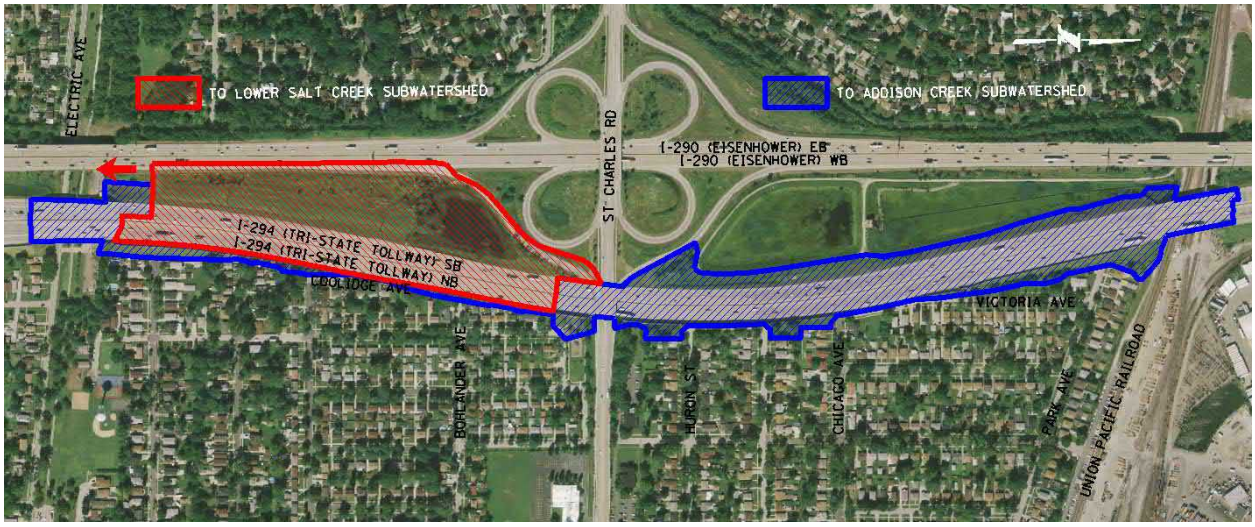

Figure 41: Existing Conditions – Electric Avenue to Union Pacific Railroad Underpass

The first location (see above Figure 41), including stormwater runoff diversion, covers the tributary areas between Electric Avenue (Sta. 11691+00) and the underpass of the Union Pacific Railroad beneath I-294 (Sta. 11745+00).

In order to accommodate the reconfigured St. Charles Road interchange and to address the flooding issue at the I-294 sag location at St. Charles Road underpass (see Section 2.3.5) and at the Metra station (see Section 2.3.6), the proposed drainage design will require to divert some of the stormwater runoff, presently discharging into the Lower Salt Creek subwatershed, into the Addison Creek subwatershed (see Figure 42).

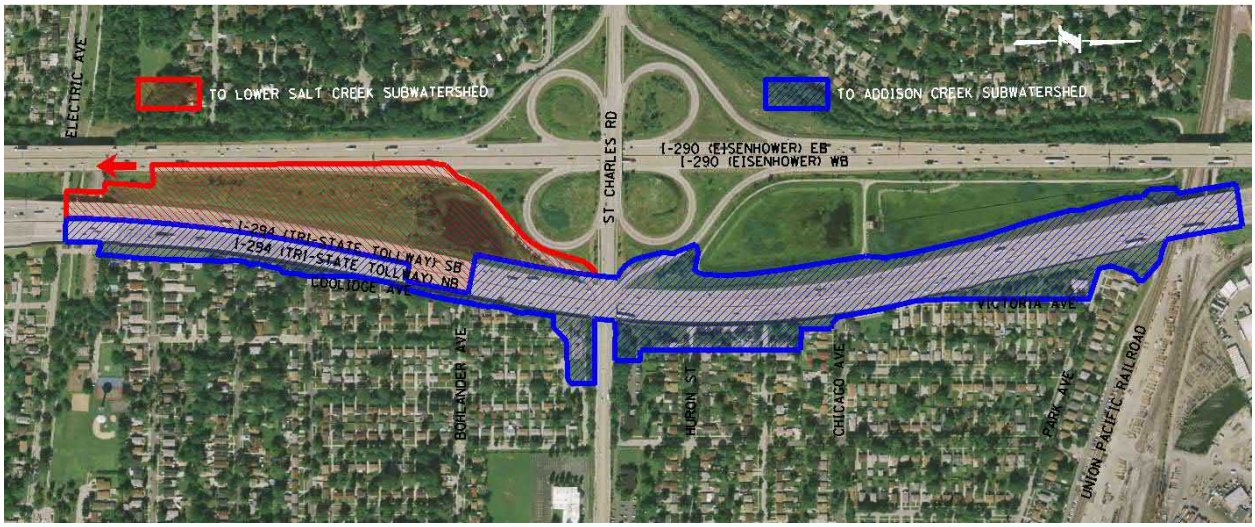

Figure 42: Proposed Conditions – Electric Avenue to Union Pacific Railroad underpass

The second location (see below Figure 43) covers the section between Roosevelt Road (Sta. 1616+00) and north of the I-88 interchange (Sta. 11630+00).

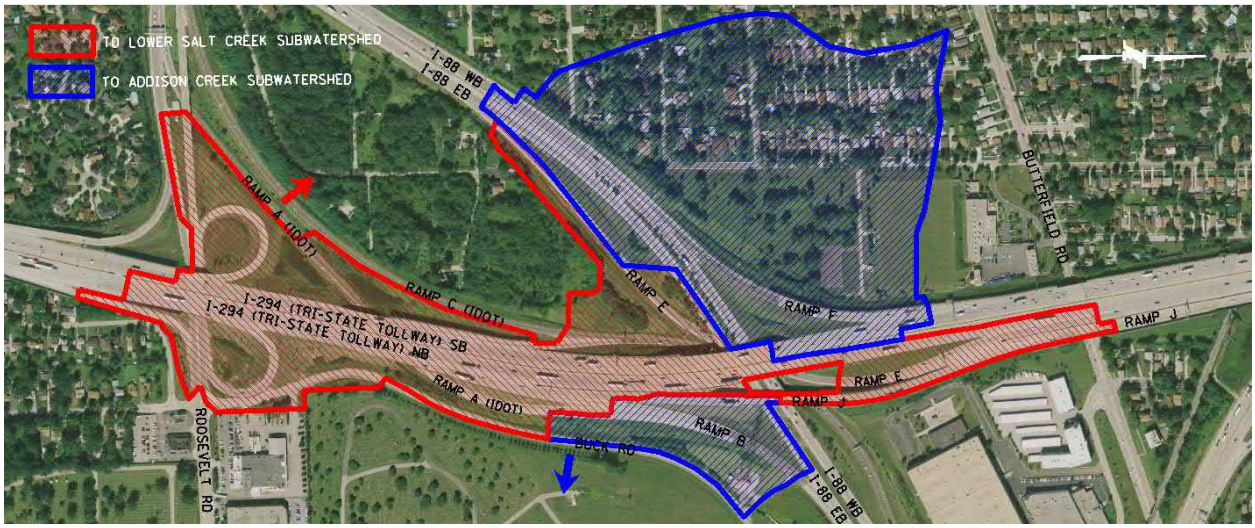

Figure 43: Existing Conditions – Roosevelt Road to north of the I-88 interchange

The proposed drainage design (see Figure 44), in order to address the Village of Hillside flooding issues (see Section 2.3.2), will allow to divert some of the stormwater runoff, currently discharging into the Addison Creek subwatershed, into the Lower Salt Creek subwatershed. Overall, in terms of runoff volumes, the stormwater diversion at this location will balance the stormwater diversion at St. Charles Road interchange.

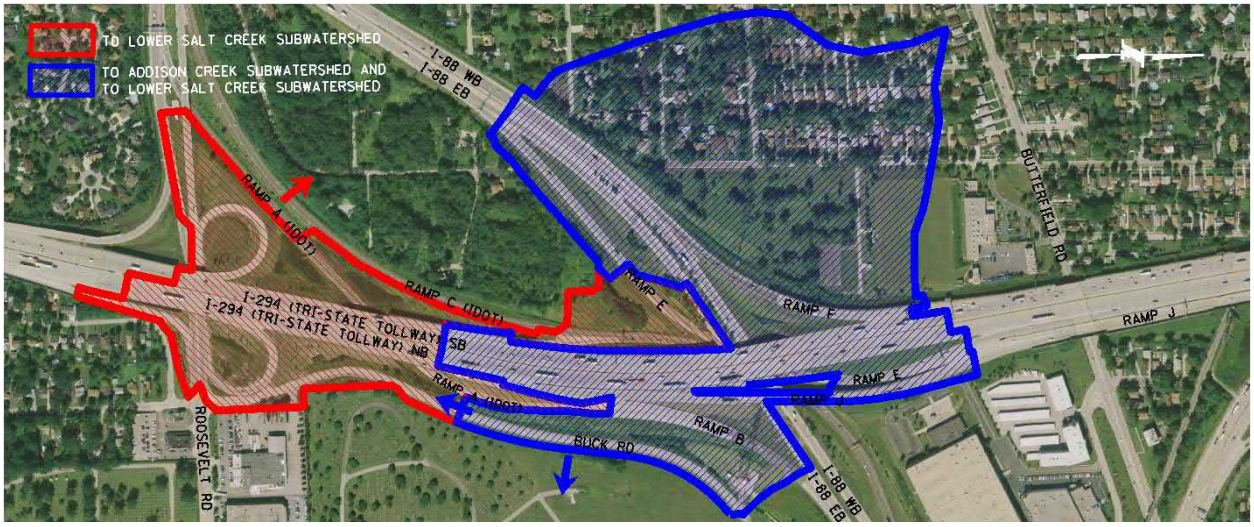

Figure 44: Proposed Conditions – Roosevelt Road to north of I-88 interchange

Some of the proposed detention sites, located south of the EOWA omission, have been designed to include available detention volumes for regional detention storage (V_{REG}), if required to mitigate detention shortages at other locations within the corridor. Overall, a total volume of approximately 18.31 acre-feet of regional detention is available for Lower Salt Creek watershed, with 10.96 acre-feet available for Addison Creek subwatershed and 7.35 acre-feet available for Lower Salt Creek subwatershed.

Table 21: Regional Detention Volumes - Summary

Detention ID	V_{REG} (acre-ft)	Outlet STA	Detention Location	Subwatershed
PR-30G	7.35	1625+70 RT	South Mt. Carmel Cemetery, along old Buck Road, Hillside	Lower Salt Creek
PR-30K	5.34	11634+50 RT	North Mt. Carmel Cemetery, along old Buck Road, Hillside	Addison Creek
PR-31D	2.98	11668+32 RT	I-290 interchange, east of Ramp K, Berkeley	Addison Creek
PR-32HH PR-32H	1.17	11720+73 RT	Park area south of St. Charles and north of St. Charles Rd.	Addison Creek
PR-32M	1.45	11742+55 RT	South of Park Avenue, along Victoria Avenue, Berkeley	Addison Creek

The proposed conditions release rates (Q_{PR}), estimated for the 100-year event at each of these sites correspondent outfall, are significantly lower than the existing conditions release rates (Q_{EX}). The available detention volume for regional detention storage (V_{REG}) has been estimated for the 100-year event and the critical duration, at each of these detention sites, as the difference between the provided volume (V_{PR}) and the required volume (V_{REQ}), $V_{REG} = V_{PR} - V_{REQ}$.

The required volume (V_{REQ}) represents the volumes to be restored and the volume estimated using the graphic method shown in the Tollway Drainage Design Manual Appendix G1, based on the additional bridge and pavement area for the proposed roadway design. The required volume (V_{REQ}) does not include the required WQV (WQV_{REQ}), $V_{TREQ} = V_{REQ} + WQV_{REQ}$.

The provided volume (V_{PR}) does not include the provided WQV (WQV_{REQ}), $V_{TPR} = V_{PR} + WQV_{PR}$. For detailed calculations see Appendix B, Section 6.1.1.1 and Section 6.1.1.8.

Located east of I-294 NB and west of Mount Carmel Cemetery, in Hillside, the two new interconnected dry ponds **PR-30G** (south side) and **PR-30K** (north side) have been designed to utilize the entire new available site along old Buck Road, provided by the Village of Hillside (see Section 2.3.2 Flooding in Hillside MP 29 to MP 32 (SI 902)). Table 22 summarizes the main features of these detention facilities, where Q_{PR} and Q_{EX} represent the release rates at the correspondent major outfall.

Table 22: Regional Detention Volumes – Ponds PR-30G, PR-30K

Detention ID	V_{REG} (acre-ft)	V_{PR} (acre-ft)	V_{REQ} (acre-ft)	Q_{PR} (cfs)	Q_{EX} (cfs)	Subwatershed
PR-30G	7.35	9.21	1.85	21	25	Lower Salt Creek
PR-30K	5.34	8.39	3.05	14	38	Addison Creek

Located at the I-290 interchange, the new wet pond **PR-31D** will conveniently maximize the new available infield area created east of the reconfigured Ramp-K and west of the existing right-of-way limit. Table 23 summarizes the main features of this detention facility.

Table 23: Regional Detention Volumes – Pond PR-31D

Detention ID	V_{REG} (acre-ft)	V_{PR} (acre-ft)	V_{REQ} (acre-ft)	Q_{PR} (cfs)	Q_{EX} (cfs)	Subwatershed
PR-31D	2.98	20.54	17.56	12	36	Addison Creek

Located south and north of St. Charles Road, east of I-294, the interconnected new dry pond PR-32HH and new wet pond PR-32H has been designed to maximize the existing right-of-way (the park area south of St. Charles Road), as well as the new right-of-way area (north of St. Charles Road and south of Victoria Avenue).

Table 24: Regional Detention Volumes – Ponds PR-32HH, PR-32H

Detention ID	V_{REG} (acre-ft)	V_{PR} (acre-ft)	V_{REQ} (acre-ft)	Q_{PR} (cfs)	Q_{EX} (cfs)	Subwatershed
PR-32HH PR-32H	1.17	6.92	5.75	3	5	Addison Creek

Located between I-294 and Victoria Avenue, south of Park Avenue in Berkeley, the new wet pond **PR-32M** has been designed to maximize the new right-of-way area (south of Park Ave., along Victoria Avenue). Table 25 summarizes the main features of this detention facility.

Table 25: Regional Detention Volumes – Pond PR-32M

Detention ID	V_{REG} (acre-ft)	V_{PR} (acre-ft)	V_{REQ} (acre-ft)	Q_{PR} (cfs)	Q_{EX} (cfs)	Subwatershed
PR-32M	1.45	4.28	2.83	4	36	Addison Creek

4.7 RIGHT-OF-WAY ANALYSIS

The additional right-of-way, permanent and temporary easements are shown on the Proposed Drainage Plans, in Appendix A. Table 26 summarizes the properties that are required, in order to meet the Drainage Design Criteria in regards with the proposed detention facilities.

Table 26: Proposed Right-of-Way

Area #1	
Location:	North of Roosevelt Road, east of Ramp-A (IDOT) and Ramp-B, west of Mount Carmel Cemetery and Taft Avenue – Hillside, Cook County
Used for:	Proposed detention facilities PR-30G and PR-30K
PINs:	15-18-301-004, 15-18-301-005, 15-18-303-010, 15-18-303-011, 15-18-303-012,

	15-18-303-013, 15-18-303-014, 15-18-303-015, 15-18-308-013, 15-18-308-025
Area #2	
Location:	North of St. Charles Rd., south of Victoria Avenue, east of I-294 NB – Cook County
Used for:	Proposed detention facility PR-32H
PINs:	15-07-107-004, 15-07-104-016, 15-07-104-004, 15-07-101-016
Area #3	
Location:	East of I-294 NB, south of Park Ave., west of Victoria Avenue – Berkeley, Cook County
Used for:	Proposed detention facility PR-32M
PINs:	15-06-303-024, 15-06-303-030, 15-06-303-031, 15-06-303-032, 15-06-303-038, 15-06-303-046, 15-06-303-048

4.8 DRAINAGE ALTERNATIVES

In general, the urbanized nature of I-294 corridor did not allow for serious consideration of any open ditch alternatives to be considered as part of this improvement. The cost of land and potential impact to local communities would be high, so maintaining the predominant configuration of retaining wall and storm sewer system was quickly determined to be the recommended alternative. Volume 1 of the Master Planning Report Section 5.10, Right-of-way versus Retaining Wall Analysis, provides initial analysis in areas where retaining wall versus an open grading design is studied. Additionally, provided the fact that most of the drainage outfalls are on the east side of I-294 and the plan is to build that side first, it make sense to have most sections of the main drain to the east side of I-294. Then laterals from the median and west side of the facility can connect to this main drain.

There are six locations where drainage alternatives were further evaluated.

The first of these is at the Lower Elmhurst Reservoir. Per coordination with IDNR and City of Elmhurst, the design team was informed about the importance of this facility to regional stormwater storage and in particular for the City of Elmhurst and Village of Berkeley. Based on these findings, our alternatives were refined to fit those that would not have a hydraulic or storage impact on this major facility.

The second area where additional alternatives were considered is to the south of the Lower Elmhurst Reservoir, at the I-290/St. Charles Road interchange. Based on the recommended roadway alternative, green space is being created at this interchange. Alternatives analyzed included the expansion of the existing detention (wetland) that drains via the 66" IDOT storm sewer to Lower Salt Creek subwatershed, and changing of the roadway profile at the sag location. Based on the analysis, it was determined that the lowest impact alternative would be creating a separate wet detention pond adjacent to the wetland (see Section 4.4.2).

The third location involves Culvert 394C, a triple-barrel 6.5'×5.5' box culvert which conveys the Sister Stream along the I-294 NB between the O'Hare Oasis and the Irving Park Road interchange. The proposed ultimate condition would require noise walls to be placed above this culvert, which would necessitate the replacement of this structure. To replace this structure, the replace-in-kind option was compared with an alternative to extend the existing concrete channel

downstream of the culvert to determine if an open channel solution would be feasible. The open channel alternative would directly impact two private residences, as well as the cul-de-sac on Denley Avenue, impacting up to three additional properties. As an additional concern, the banks of the concrete channel would be below the mapped FEMA 100-year BFE, so there could be an increased perception of flooding resulting from this project, even if potential flooding in this area is more likely caused by hydraulic conditions outside the I-294 right-of-way. Due to the cost of the property acquisition and the reduced benefits of a concrete channel, the replace-in-kind alternative was selected.

In the fourth area, several open pond alternatives were considered for the detention north of Irving Park Road in the Crystal Creek watershed. The recommended alternative from the Draft Master Plan was for an open detention facility north of Irving Park Road and west of the I-294 on a parcel owned by the City of Chicago. Property acquisitions in this parcel were determined to be infeasible between the time of the Draft and Final Master Plan, so this option was abandoned. Two different locations were considered for detention in the residential area east of the I-294 between Irving Park Road and Plaza 33. Both of these locations would require a high cost of property acquisition, be in the FEMA flood elevation of Crystal Creek downstream and possibly be viewed negatively by the other Schiller Park residents, in part due to the FAA requirements of a detention facility near to a major airport. Therefore, these locations were also determined to be less desirable than the shown underground detention option in the Proposed Drainage Plans.

Finally, there was some consideration for an open detention or water quality facility at outlet 38J. During field investigations, it was difficult to determine the exact location of the connection to the existing Village storm sewer, until further coordination with the Tollway & GEC cleared up the pipe alignments. The downstream sewers also appeared to be full of water even well after storm events. To provide additional water quality and better control release of runoff from the Tollway to the local sewers, a detention or water quality facility could be placed at the location of one or two current residences. Due to the cost of this acquisition and the fact that no complaints were made regarding this location during the local outreach, it was deemed to not be cost effective. Instead, to relieve runoff at outlet 38J, some of the existing tributaries will be rerouted to the new underground detention facility to decrease the total volume of runoff and peak flow to outlet 38J in the future conditions. As both systems are part of the Crystal Creek catchment, no "inter basin transfer of flow" concerns apply.

4.9 FLOODPLAIN ENCROACHMENT EVALUATION

For the proposed ultimate conditions, there would be minor floodplain impacts at Silver and Crystal Creeks due to the widened cross section. The culverts would be extended with grading performed to replace any loss of storage at a 1:1 ratio per permit requirements.

More significant impacts would occur at the Motel Ditch west of the O'Hare Oasis and the Industrial Tributary to the north. The widened section from the roadway would directly impact the existing channels. Along both channels, a detailed stream bottom survey was not available for the Concept Report, so the Lidar data was used to estimate compensatory storage. Because this Lidar topo would not accurately get elevations below the water surface elevation at the time of the fly-over, an open area of a conservative width was shown to estimate the envelope of space necessary for the channel grading to be contained. More exact channel survey and proposed grading will need to be performed as part of Preliminary design.

Table 27: Proposed Compensatory Storage

Watershed Subwatershed	I-294	Required (cu yd.)	Provided (cu yd.)	Comments
Silver Creek	NB	0	3,697	Excavated channel for pipe outfall provides compensatory storage
Silver Creek	SB	608	(see NB)	Culvert extension and minor retaining wall impacts
Crystal Creek (Oasis to Irving Park Rd)	NB	135	0	Retaining wall locations in widened section impacts existing ditch below the BFE. Compensatory storage provided elsewhere in watershed
Crystal Creek (Oasis to Irving Park Rd)	SB	0	213	Excavated channel for relocated Industrial Tributary provides surplus compensatory storage
Crystal Creek (North of Irving Park Rd)	NB	0	642	Excavated channel for pipe outfall provides compensatory storage
Crystal Creek (North of Irving Park Rd)	SB	217	(see NB)	Retaining wall locations in widened section impacts existing channel
Crystal Creek (Bensenville Bridge to Oasis)	NB	0	0	
Crystal Creek (Bensenville Bridge to Oasis)	SB	0	27	Excavated channel for relocated Motel provides surplus compensatory storage

4.10 CULVERTS

The culvert crossing at Silver Creek will remain twin 12'×8' box culverts. Based on the hydraulic analysis, the culverts do not provide a constriction for flow on Silver Creek. These culverts will be repaired in place and extended as required for roadway widening. The proposed inverts will be set by holding the grade of the existing culvert. Per direction received from the GEC since the time of the Draft Master Plan, the Appendix K analysis from the Tollway's Drainage Design Manual is not appropriate for this location.

The culvert crossing at Crystal Creek will remain twin 10'×7' box culverts. Based on the hydraulic analysis, the culverts do not provide a constriction for flow on Crystal Creek. These culverts will be repaired in place and extended as required for roadway widening. The proposed inverts will be set by holding the grade of the existing culvert. Per direction received from the GEC since the time of the Draft Master Plan, the Appendix K analysis from the Tollway's Drainage Design Manual is not appropriate for this location.

Proposed hydraulic modeling of the culvert beneath I-294 connecting the Industrial Tributary & Motel Ditch with the Sister Stream at Sta. 2011+00 is not yet complete. A preliminary analysis estimates that in the proposed condition, this culvert will be cleaned and supplemented with a

parallel culvert to provide additional capacity. The proposed inverts of the parallel culvert may be lowered, as generally preferred by the Chicago District of the Army Corp of Engineers, pending the results of the Appendix K review.

The culvert, conveying the Sister Stream between the O'Hare Oasis and the Irving Park eastbound on-ramp to I-294 NB, will remain triple 6.5'×5.5' box culverts. Based on the hydraulic analysis, the culverts do not provide a constriction for flow on the Unnamed Tributary to Crystal Creek. In the proposed condition, these culverts will be replaced in kind, and redesigned to support additional loading from the new roadway cross section. Per direction received from the GEC since the time of the Draft Master Plan, the Appendix K analysis from the Tollway's Drainage Design Manual is not appropriate for this location.

4.11 JACK AND BORE PIPES

The below Table 28 summarizes the jack and bore pipes, as required by the proposed drainage design (see also the Proposed Drainage Plans, Appendix A, Section 5.5).

Table 28: Jack and Bore Pipes

Alignment	STA	LT/RT	Pipe Size	Pipe Length
Ramp A(IDOT)	PR-30G	---	15-in dia	75'
Ramp A(IDOT)	PR-30K	---	36-in dia	105'
Ramp A(IDOT)	PR-30K	---	24-in dia	70'
Ramp A(IDOT)	PR-30K	---	24-in dia	55'
Ramp A(IDOT)	PR-30K	---	15-in dia	150'
Ramp A(IDOT)	POND-31A	---	36-in dia	110'
Ramp J	523+45	LT	42-in dia	100'
Ramp J	536+60	RT	48-in dia	85'
Ramp F	159+90	RT	15-in dia	80'
Ramp J	542+95	RT	48-in dia	80'
Ramp H	318+20	RT	36-in dia	335'
Ramp H	315+30	LT	30-in dia	135'
I-294	11635+55	LT/CL/RT	60-in dia	425'
I-294	11667+65	RT	36-in dia	170'
I-294	11670+00	RT	30-in dia	134'
I-294	11719+25	RT	36-in dia	90'
I-294	11720+65	RT	24-in dia	125'
I-294	11724+15	RT	24-in dia	90'
I-294	11726+15	RT	36-in dia	110'
I-294	11737+60	RT	36-in dia	115'

Alignment	STA	LT/RT	Pipe Size	Pipe Length
I-294	11767+75	LT/RT	36-in dia	200'
I-294	1927+65	RT	24-in dia	100’
I-294	1933+60	RT	24-in dia	100’
I-294	1937+60	RT	24-in dia	115’
I-294	1944+60	RT	24-in dia	135’
I-294	2017+80	RT	30-in dia	100’
I-294	2033+80	LT	24-in dia	100’
I-294	2040+80	LT	24-in dia	150’
I-294	2046+80	RT	18-in dia	115’
I-294	2051+40	RT	24-in dia	90’
I-294	2052+90	RT	24-in dia	90’
I-294	2053+50	RT	24-in dia	90’
I-294	2063+35	RT	24-in dia	90’
I-294	2068+80	RT	24-in dia	90’
I-294	2085+70	LT	24-in dia	100’
I-294	2091+75	LT	18-in dia	115’
I-294	2097+20	LT	24-in dia	90’
I-294	2099+85	LT	24-in dia	90’

4.12 PERMITS

The following permits will be required for drainage related items within the corridor.

Table 29: Required Permits

Permit	Responsible Agency	Justification/Comment
Floodway Construction Permit	IDNR-OWR	Required due to construction of widened and new roadway section within a floodway and temporary construction activities within the floodplain. IDNR-OWR has jurisdiction over construction activities in regulatory floodways.
Section 401, Clean Water Act, Water Quality Certification	IEPA	Required in conjunction with Section 404 permit process by Clean Water Act.

Permit	Responsible Agency	Justification/Comment
Section 402, Clean Water Act, NPDES	IEPA	Disturbance and construction impact to an area greater than one acre. Required notification to the IEPA through Illinois Tollway joint agreement with IEPA
Section 404 Permit, Clean Water Act	USACE, Chicago District	Discharge of dredged or fill material into Waters of the U.S., including jurisdictional wetlands and streams. It appears that the USACE is going to require an individual permit, however this is under review. Wetland impact requires mitigation.
National Pollution Discharge Elimination System Permit	IEPA	Disturbance area is greater than 1 acre.
Erosion Control Review	North Cook County Soil and Water Conservation District	SWCD review of erosion control plan required under standing agreement with Chicago District USACE Section 404 permit process.
Watershed Management Ordinance Permit	MWRD	*(Not Anticipated)* As coordinated with MWRD, the improvements will be exempt from the stormwater management requirements and related permits from the MWRD Watershed Management Ordinance (WMO) as stated in Article 200.4.G of the WMO.

Permitting with IDNR OWR will also be required, but is being facilitated by Phase II DSEs. For previous meetings and minutes, please refer to Appendix 8, Section 8.1 Letters, Memos, Transmittals and Meeting Minutes.

4.13 INTERGOVERNMENTAL AGREEMENTS (IGA'S)

In conjunction with the completion of the drainage infrastructure for this project, a series of intergovernmental agreements may be required with state and local agencies. The following is a list of potential IGA's in conjunction with drainage infrastructure. These IGA's will be developed based on continuing coordination with state and local agencies during detailed design. This list may further evolve during detailed design:

- IDOT regarding land use, access, maintenance, and continued use of outelts and infastructure
- Municipalities regarding access, maintenance, and continued use of existing outlets and infastructure
- MWRD regarding regional drainage facilities and outlets to their facilities
- Village of Hillside regarding Buck Road Regional Detention Facility

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5 APPENDIX A – EXHIBITS

5.1 GENERAL LOCATION DRAINAGE MAP

5.2 EXISTING DRAINAGE PLAN

5.3 IDENTIFIED BASE FLOODPLAIN MAPS

5.4 WATERWAY INFORMATION TABLES

5.5 PROPOSED DRAINAGE PLAN AND PROFILE

5.6 TYPICAL EXISTING CROSS SECTION

5.7 TYPICAL PROPOSED CROSS SECTION

5.8 DETENTION BASIN LAYOUTS

5.9 ALTERNATIVE DETENTION BASIN LAYOUTS

5.10 EROSION AND SEDIMENT CONTROL PLANS

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5.1 GENERAL LOCATION DRAINAGE MAP

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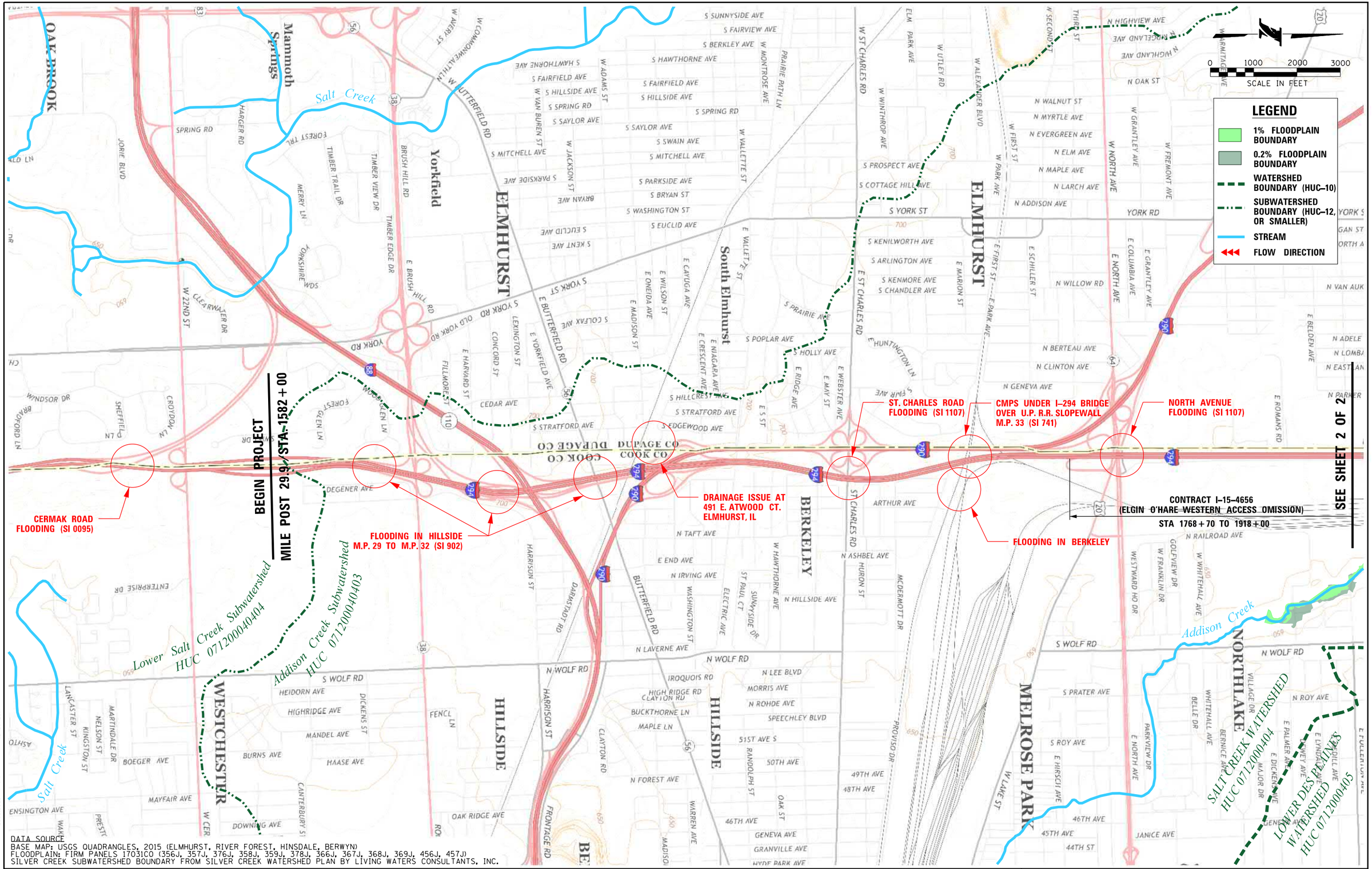

DATA SOURCE
BASE MAP: USGS QUADRANGLES, 2015 (ELMHURST, RIVER FOREST, HINSDALE, BERWYN)
FLOODPLAIN: FIRM PANELS 17031C0 (356J, 357J, 376J, 358J, 359J, 378J, 366J, 367J, 368J, 369J, 456J, 457J)
SILVER CREEK SUBWATERSHED BOUNDARY FROM SILVER CREEK WATERSHED PLAN BY LIVING WATERS CONSULTANTS, INC.

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EXHIBIT A5.1
GENERAL LOCATION DRAINAGE MAP

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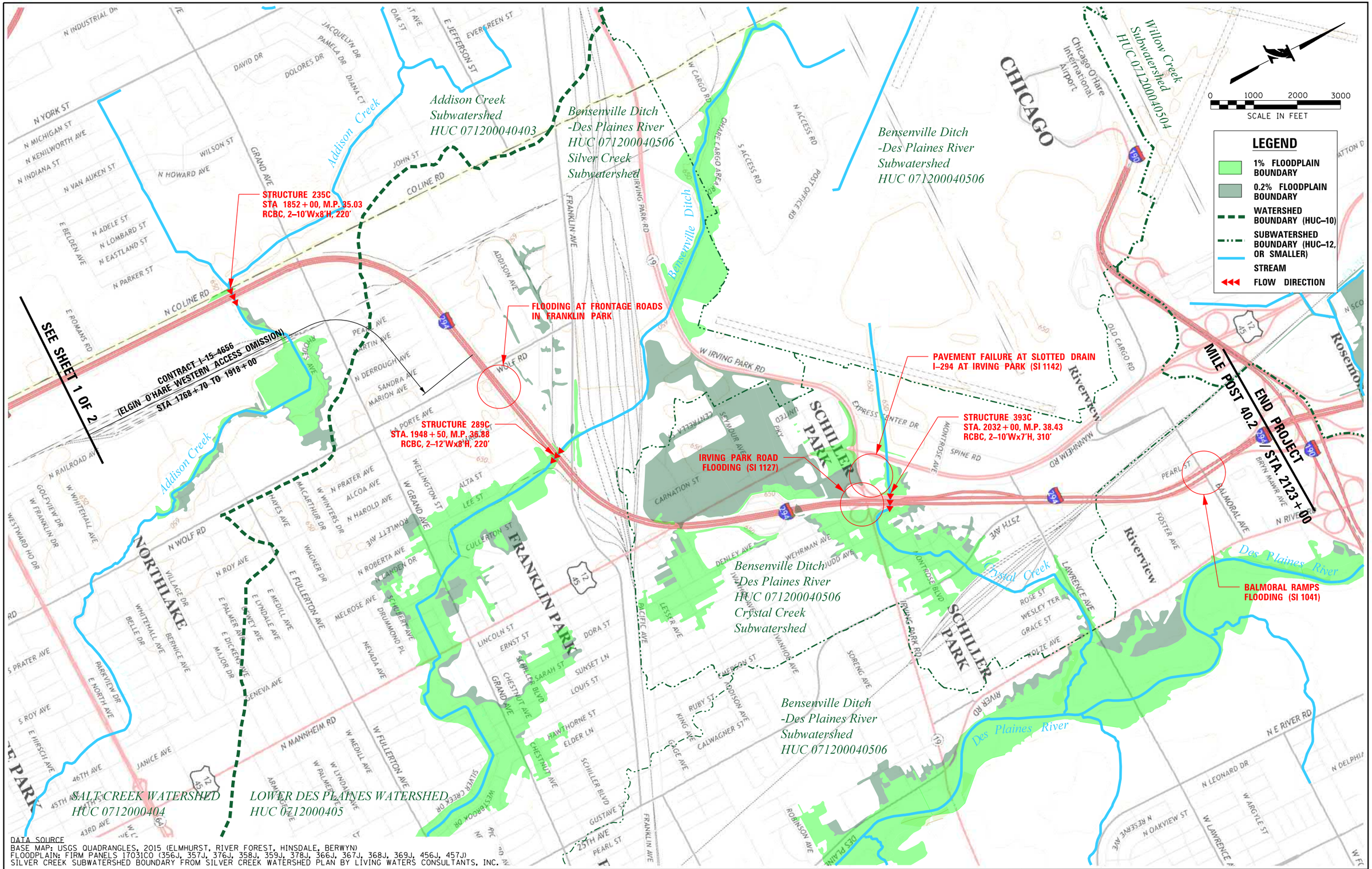

DATA SOURCE
BASE MAP: USGS QUADRANGLES, 2015 (ELMHURST, RIVER FOREST, HINSDALE, BERWYN)
FLOODPLAIN: FIRM PANELS 17031CO (356J, 357J, 376J, 358J, 359J, 378J, 366J, 367J, 368J, 369J, 456J, 457J)
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EXHIBIT A5.1
GENERAL LOCATION DRAINAGE MAP

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DRAWING NO. 2 OF 196

5.2 EXISTING DRAINAGE PLAN

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LEGEND

BOUNDARY LINES/SYMBOLS

EXISTING REFERENCE LINE/ CENTERLINE AND STATIONING	1585+00	OVERFLOW		INLET	
EXISTING RIGHT OF WAY LINE		OUTLET, OUTFALL		CATCH BASIN	
WATERSHED BOUNDARY (HUC-10)		OUTLET ID	OUTLET 30A	MANHOLE	
INTERPRETED DRAINAGE AREA TO OUTLET/SUB-DIVIDE		SUB-DIVIDE OUTLET		HEADWALL/ENDWALL	
FLOODPLAIN BOUNDARY		SUB-DIVIDE OUTLET ID	30A–01	FLARED END SECTION	
FLOODWAY BOUNDARY		WETLAND, WOUS, STORMWATER CONVEYANCE		CULVERT SIZE - TYPE	30" RCP
STREAM		DETENTION POND	POND–30A	STORM SEWER	24" CMP
				DITCH	

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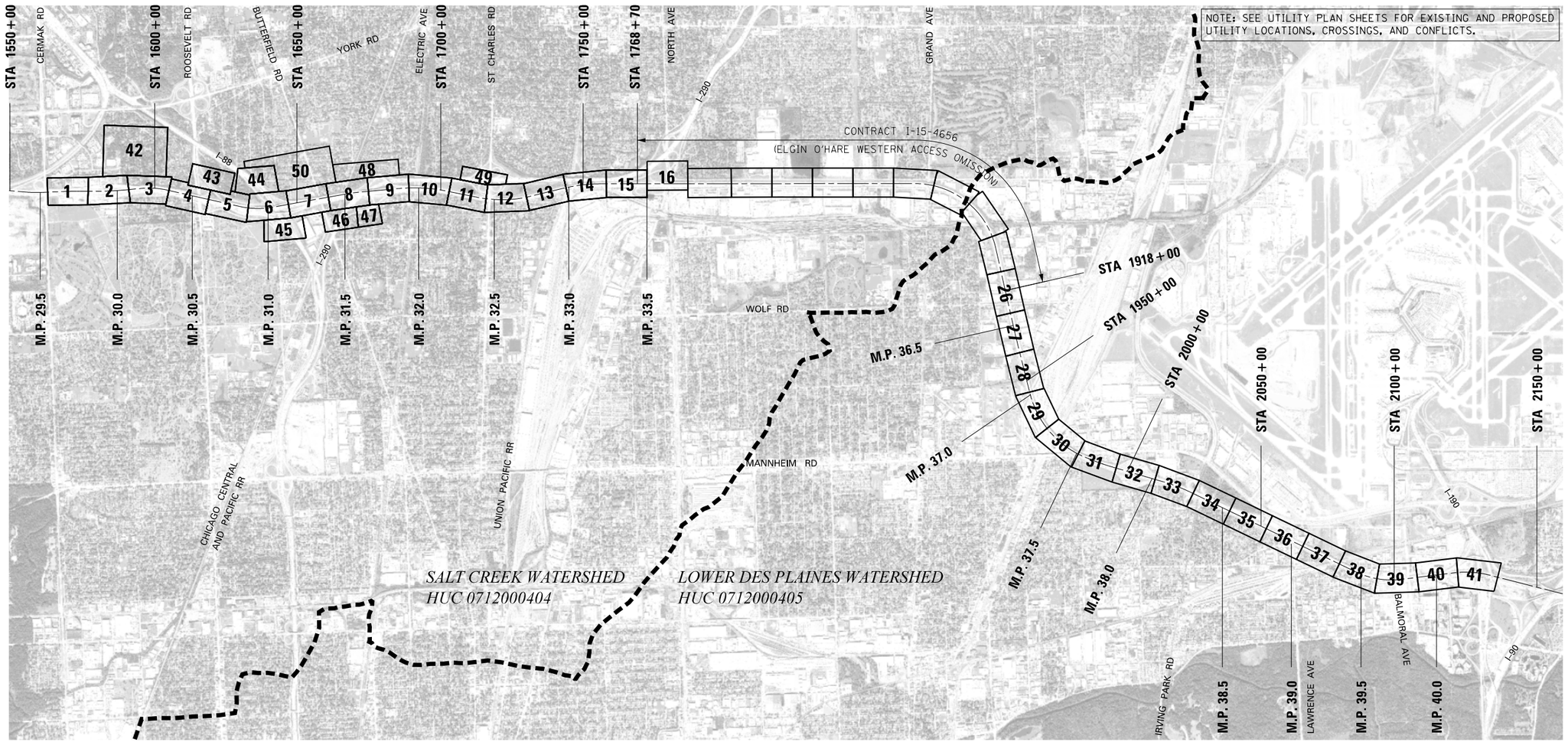

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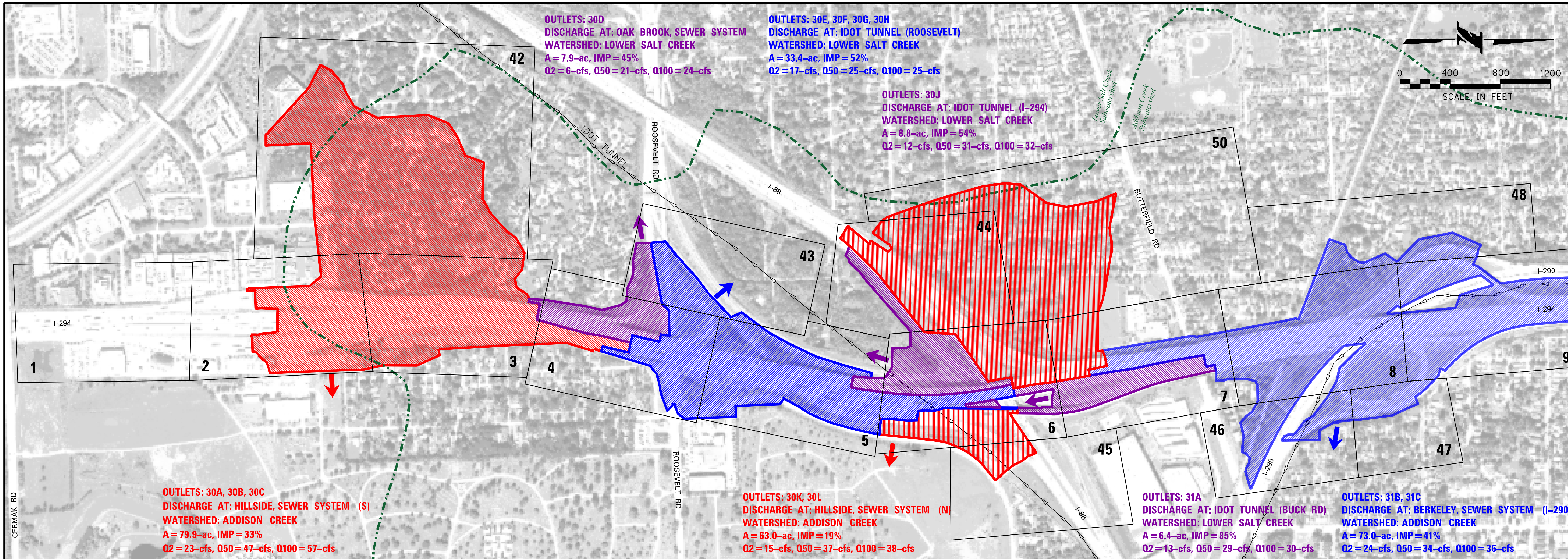

MAJOR OUTFALLS

OUTLETS	OUTFALL LOCATION	WATERSHED	AREA (AC)	EXISTING RUNOFF (CFS) 2-YR	50-YR	100-YR
30A 30B 30C	HILLSIDE, SEWER SYSTEM (S)	ADDISON CREEK	79.92	23	47	57
30D	OAK BROOK, SEWER SYSTEM	LOWER SALT CREEK	7.87	6	21	24
30E 30F 30G 30H	IDOT TUNNEL (ROOSEVELT)	LOWER SALT CREEK	33.35	17	25	25
30J	IDOT TUNNEL (I-294)	LOWER SALT CREEK	8.75	12	31	32
31A	IDOT TUNNEL (BUCK RD)	LOWER SALT CREEK	6.43	13	29	30
30K 30L	HILLSIDE, SEWER SYSTEM (N)	ADDISON CREEK	62.95	15	37	38
31B 31C	BERKELEY, SEWER SYSTEM (I-290)	ADDISON CREEK	72.98	24	34	36

NO MAJOR WATERWAY CROSSINGS

OUTLET SUMMARY

ID	M.P.	STA.	OFF.	DISCHARGE LOCATION	MAJOR OUTFALL	AREA (AC)	IMPERV. (%)	EXISTING RUNOFF (CFS) 2-YR	50-YR	100-YR
30A	30.04	1589+24	RT	POND-30A, STORM SEWER 36-IN	HILLSIDE, SEWER SYSTEM (S)	27.86	60%	48	126	144
30B	30.04	1589+17	LT	POND-30FGP, STORM SEWER 18-IN	HILLSIDE, SEWER SYSTEM (S)	49.96	19%	6	23	29
30C	30.32	1604+00	RT	STORM SEWER	HILLSIDE, SEWER SYSTEM (S)	2.09	0%	6	8	9
30D	30.47	1611+80	LT	ROADWAY DITCH, ROOSEVELT RD.	OAK BROOK, SEWER SYSTEM	7.87	45%	6	21	24
30E	30.59	1618+13	LT	POND-30C, STORM SEWER 24-IN	IDOT TUNNEL (ROOSEVELT)	12.60	45%	11	18	20
30F	30.63	1620+00	RT	POND-30D, STORM SEWER 15-IN	IDOT TUNNEL (ROOSEVELT)	6.07	62%	4	5	6
30G	30.64	1621+00	RT	POND-30G, STORM SEWER 30-IN	IDOT TUNNEL (ROOSEVELT)	6.02	36%	3	14	18
30H	30.64	1621+00	LT	POND-30F, STORM SEWER	IDOT TUNNEL (ROOSEVELT)	8.66	68%	6	7	7
30J	30.88	1633+44	LT	STORM SEWER 24-IN	IDOT TUNNEL (I-294)	8.75	54%	12	31	32
30K	30.90	1634+55	RT	STORM SEWER (RAMP-A IDOT) 60-IN	HILLSIDE, SEWER SYSTEM (N)	8.12	31%	5	16	20
30L	30.99	1639+32	LT	STORM SEWER (I-88) 42-IN	HILLSIDE, SEWER SYSTEM (N)	54.83	18%	11	39	47
31A	31.11	1645+82	RT	STORM SEWER 24-IN	IDOT TUNNEL (BUCK RD)	6.43	85%	13	29	30
31B	31.54	1668+50	RT	POND-31C, STORM SEWER 18-IN	BERKELEY, SEWER SYSTEM (I-290)	41.67	38%	13	17	18
31C	31.54	1668+44	RT	POND-31D, STORM SEWER 30-IN	BERKELEY, SEWER SYSTEM (I-290)	31.30	45%	20	57	73

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EXISTING DRAINAGE - OUTLET SUMMARY

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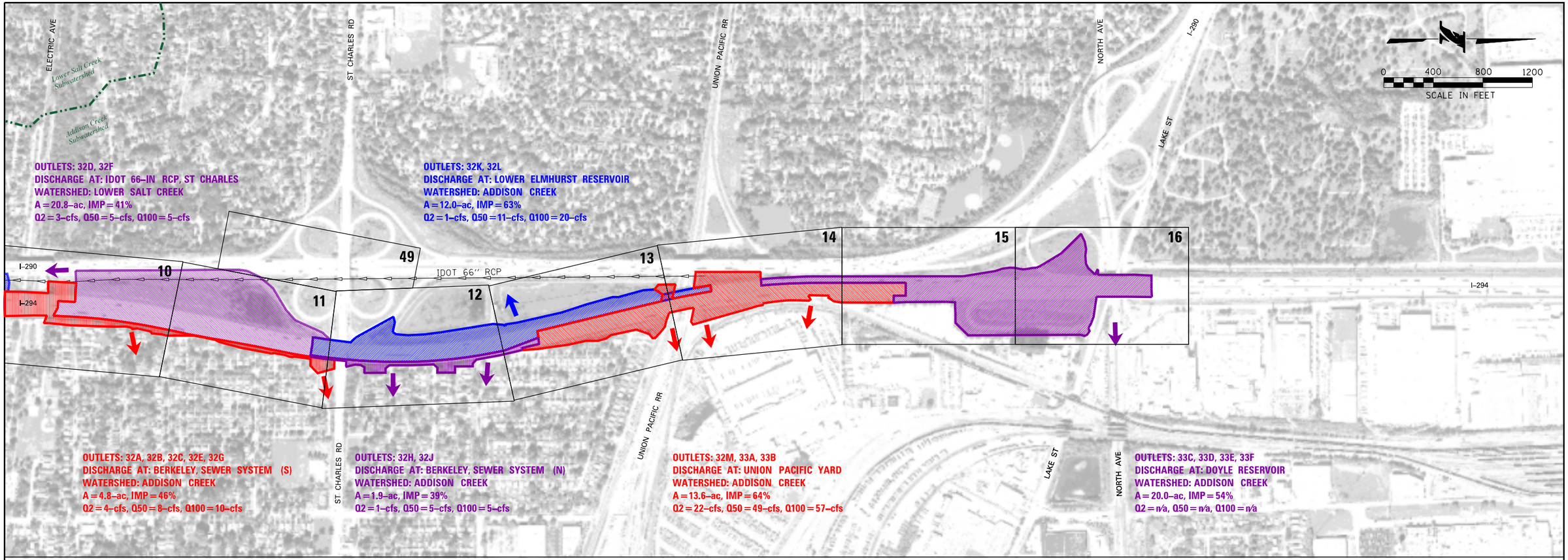

MAJOR OUTFALLS

OUTLETS	OUTFALL LOCATION	WATERSHED	AREA (AC)	EXISTING RUNOFF (CFS)		
				2-YR	50-YR	100-YR
32A 32B 32C 32E 32G	BERKELEY, SEWER SYSTEM (S)	ADDISON CREEK	4.79	4	8	10
32D 32F	IDOT 66-IN RCP, ST CHARLES	LOWER SALT CREEK	20.77	3	5	5
32H 32J	BERKELEY, SEWER SYSTEM (N)	ADDISON CREEK	1.91	1	5	5
32K 32L	LOWER ELMHURST RESERVOIR	ADDISON CREEK	12.00	1	11	20
32M 33A 33B	UNION PACIFIC YARD	ADDISON CREEK	13.57	22	49	57
33C 33D 33E 33F	DOYLE RESERVOIR	ADDISON CREEK	20.02	-----	-----	-----

NOTE:
THE DOYLE RESERVOIR OUTFALL AND OUTLETS WILL BE ANALYZED AS PART OF THE CONTRACT I-15-4656 (ELGIN O-HARE WESTERN ACCESS PROJECT).

NO MAJOR WATERWAY CROSSINGS

OUTLET SUMMARY

ID	M.P.	STA.	OFF.	DISCHARGE LOCATION	MAJOR OUTFALL	AREA (AC)	IMPERV. (%)	EXISTING RUNOFF (CFS)		
								2-YR	50-YR	100-YR
32A	32.01	1693+00	RT	STORM SEWER	BERKELEY, SEWER SYSTEM (S)	2.58	79%	4	5	5
32B	32.14	1700+00	RT	STORM SEWER	BERKELEY, SEWER SYSTEM (S)	0.93	9%	0	1	2
32C	32.20	1703+00	RT	STORM SEWER	BERKELEY, SEWER SYSTEM (S)	0.38	7%	0	1	1
32D	32.29	1708+00	LT	STORM SEWER 2-30-IN	IDOT 66-IN RCP, ST CHARLES	7.43	49%	6	27	36
32F	32.29	1708+00	LT	POND-32F	IDOT 66-IN RCP, ST CHARLES	13.34	37%	5	14	18
32E	32.33	1710+00	RT	STORM SEWER	BERKELEY, SEWER SYSTEM (S)	0.30	8%	0	0	1
32G	32.44	1716+00	RT	ROADWAY DITCH, ST.CHARLES RD.	BERKELEY, SEWER SYSTEM (S)	0.60	5%	0	1	1
32H	32.53	1720+50	RT	STORM SEWER	BERKELEY, SEWER SYSTEM (N)	1.42	50%	1	4	4
32J	32.68	1728+50	RT	STORM SEWER	BERKELEY, SEWER SYSTEM (N)	0.49	7%	0	1	1
32K	32.72	1730+50	LT	STORM SEWER 18-IN	LOWER ELMHURST RESERVOIR	11.53	66%	8	16	18
32L	32.90	1740+00	LT	STORM SEWER	LOWER ELMHURST RESERVOIR	0.47	0%	0	1	1
32M	32.94	1742+40	RT	STORM SEWER 3-24-IN	UNION PACIFIC YARD	5.94	60%	12	30	36
33A	33.01	1746+00	RT	STORM SEWER 48-IN	UNION PACIFIC YARD	3.91	51%	5	11	13
33B	33.18	1755+00	RT	STORM SEWER 18-IN	UNION PACIFIC YARD	3.72	86%	5	9	9
33C	33.47	1770+00	LT	ROADWAY DITCH	DOYLE RESERVOIR	3.59	82%	-----	-----	-----
33D	33.60	1777+00	LT	STORM SEWER (W NORTH AVE)	DOYLE RESERVOIR	2.71	42%	-----	-----	-----
33E	33.61	1777+50	RT	STORM SEWER (E NORTH AVE)	DOYLE RESERVOIR	1.60	14%	-----	-----	-----
33F	33.61	1777+40	RT	STORM SEWER (E NORTH AVE)	DOYLE RESERVOIR	12.11	54%	-----	-----	-----

NOTE: THE DOYLE RESERVOIR OUTFALL AND OUTLETS WILL BE ANALYZED AS PART OF THE CONTRACT I-15-4656 (ELGIN O-HARE WESTERN ACCESS PROJECT).

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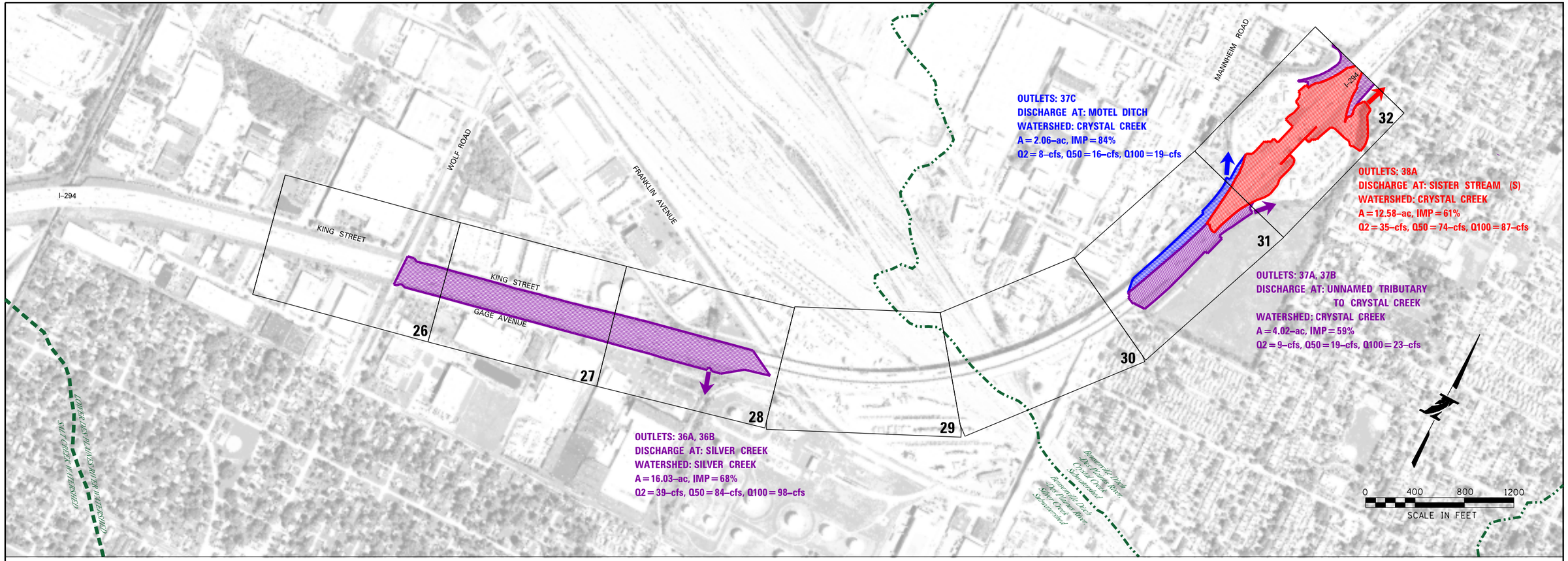
SHEET NO. EDS-02
DRAWING NO. 5 OF 196



MAJOR OUTFALLS

OUTLETS	OUTFALL LOCATION	WATERSHED	AREA (AC)	EXISTING RUNOFF (CFS)		
				2-YR	50-YR	100-YR
36A 36B	SILVER CREEK	SILVER CREEK	16.03	39	84	98
37A 37B	CRYSTAL CREEK	CRYSTAL CREEK	4.02	9	19	23
37C	CRYSTAL CREEK	CRYSTAL CREEK	2.06	8	16	19
38A	CRYSTAL CREEK	CRYSTAL CREEK	12.58	35	74	87

MAJOR WATERWAY CROSSINGS

M.P.	STA.	WOUS	TYPE	LENGTH	TRIB. AREA (SQ MI)	RUNOFF (CFS)		WSEL	
						50-YR	100-YR	50-YR	100-YR
36.83	1948+25	YES	2 - 12'x8' BOX CULVERTS	218'	4.87	399	659	646	647

OUTLET SUMMARY

ID	M.P.	STA.	OFF.	DISCHARGE LOCATION	MAJOR OUTFALL	AREA (AC)	IMPERV. (%)	EXISTING RUNOFF (CFS)		
								2-YR	50-YR	100-YR
36A	36.84	1948+31	RT	STORM SEWER, 54-IN	SILVER CREEK	13.83	68%	34	72	84
36B	36.84	1948+45	RT	12'x8' TWIN BOX CULVERT	SILVER CREEK	2.21	69%	7	15	18
37A	37.68	1992+52	RT	STORM SEWER, 15-IN	CRYSTAL CREEK	3.47	61%	8	17	20
37B	37.74	1995+62	RT	STORM SEWER, 15-IN	CRYSTAL CREEK	0.55	48%	1	3	4
37C	37.76	1996+25	LT	STORM SEWER, 12-IN	CRYSTAL CREEK	2.06	84%	8	16	19
38A	37.98	2008+33	RT	STORM SEWER, 42-IN	CRYSTAL CREEK	12.58	61%	35	74	87

LAYOUT	KRH		04/14/17
DRAWN	KRH		04/14/17
REVIEWED	JJW		07/21/17

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DRAWN BY KRH SCALE 1" = 400'
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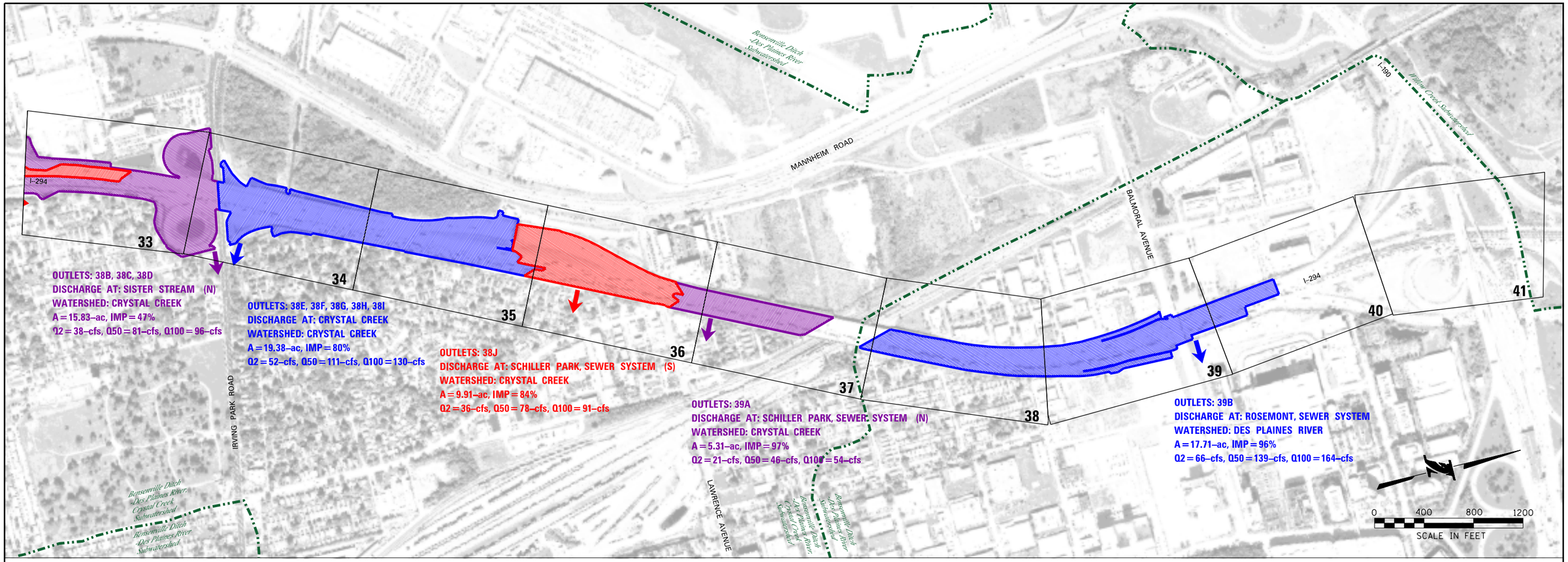
REVISIONS

NO.	DATE	DESCRIPTION

RR-14-4224
EXHIBIT A5.2-2
EXISTING DRAINAGE - OUTLET SUMMARY

SHEET NO. EDS-03
DRAWING NO. 6 OF 196



MAJOR OUTFALLS

OUTLETS	OUTFALL LOCATION	WATERSHED	AREA (AC)	EXISTING RUNOFF (CFS)		
				2-YR	50-YR	100-YR
38B 38C 38D	CRYSTAL CREEK	CRYSTAL CREEK	15.83	38	81	96
38E 38F 38G 38H 38I	CRYSTAL CREEK	CRYSTAL CREEK	19.38	52	111	130
38J	SCHILLER PARK, SEWER SYSTEM (S)	CRYSTAL CREEK	9.91	36	78	91
39A	SCHILLER PARK, SEWER SYSTEM (N)	CRYSTAL CREEK	5.31	21	46	54
39B	ROSEMONT, SEWER SYSTEM	DES PLAINES RIVER	71.71	66	139	164

MAJOR WATERWAY CROSSINGS

M.P.	STA.	WOUS	TYPE	LENGTH	TRIB. AREA (SQ MI)	RUNOFF (CFS)		WSEL	
						50-YR	100-YR	50-YR	100-YR
38.03	2010+87	YES	60" RCP	256'	0.27	96	113	639	640
38.41	2030+89	YES	2 - 10'x7' BOX CULVERTS	315'	0.75	194	242	637	638

OUTLET SUMMARY

ID	M.P.	STA.	OFF.	DISCHARGE LOCATION	MAJOR OUTFALL	AREA (AC)	IMPERV. (%)	EXISTING RUNOFF (CFS)		
								2-YR	50-YR	100-YR
38B	38.04	2011+28	RT	60" CULVERT	CRYSTAL CREEK	3.50	51%	9	21	24
38C	38.23	2021+28	RT	6.5'x5.5' TRIPLE BOX CULVERT	CRYSTAL CREEK	4.58	71%	15	33	38
38D	38.33	2026+59	RT	10'x4'/7'x4' TWIN BOX CULVERT	CRYSTAL CREEK	7.76	30%	16	33	39
38E	38.35	2028+03	RT	24" CULVERT	CRYSTAL CREEK	2.14	45%	5	12	14
38F	38.36	2028+10	LT	STORM SEWER, 15-IN	CRYSTAL CREEK	0.66	58%	2	4	5
38G	38.40	2030+55	RT	10'x7' TWIN BOX CULVERT	CRYSTAL CREEK	5.04	88%	18	37	44
38H	38.46	2033+80	LT	STORM SEWER, 30-IN	CRYSTAL CREEK	3.67	94%	14	31	37
38I	38.49	2034+99	LT	STORM SEWER, 48-IN	CRYSTAL CREEK	7.86	79%	21	45	52
38J	38.88	2055+77	RT	38"x24" ELLIPTICAL CULVERT	SCHILLER PARK, SEWER SYSTEM (S)	9.91	84%	36	78	91
39A	39.08	2066+77	RT	36" CULVERT	SCHILLER PARK, SEWER SYSTEM (N)	5.31	97%	21	46	54
39B	39.83	2105+99	RT	STORM SEWER, 48-IN	ROSEMONT, SEWER SYSTEM	17.71	96%	66	139	164

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LAYOUT	KRH	04/14/17
DRAWN	KRH	04/14/17
REVIEWED	JJW	07/21/17

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CHECKED BY JJW DATE 12/22/2017

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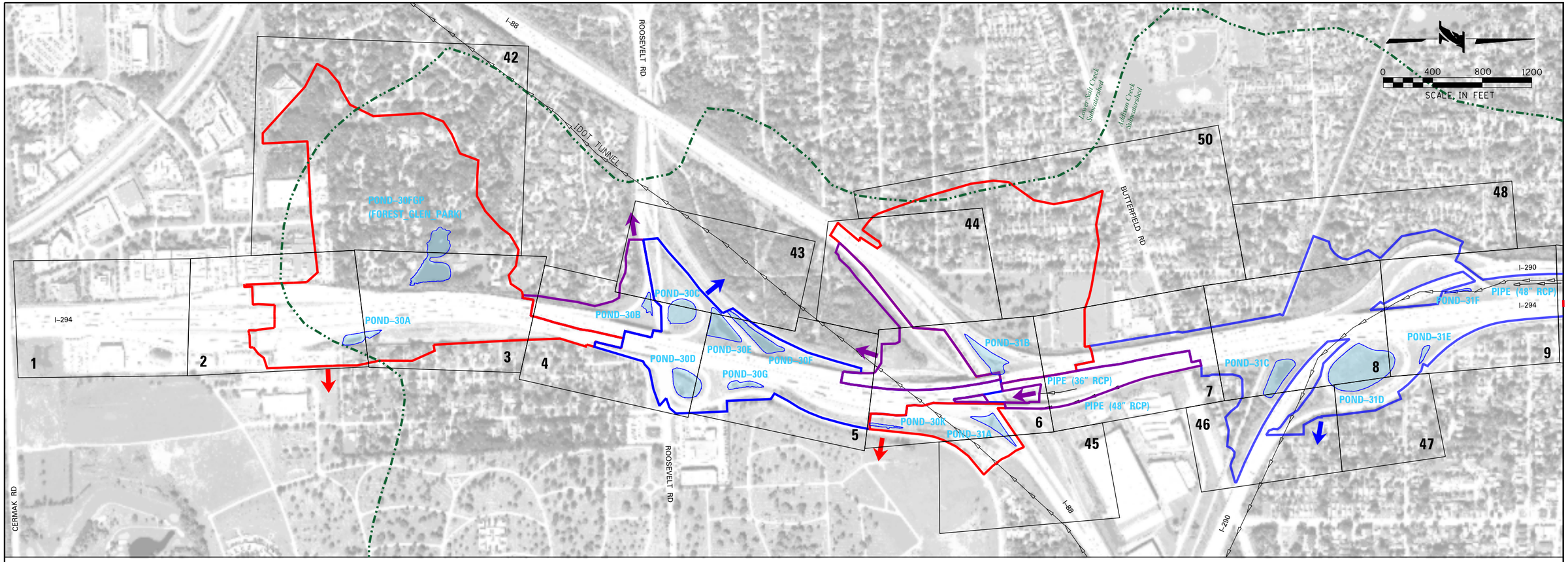
REVISIONS
NO. | DATE | DESCRIPTION

RR-14-4224
EXHIBIT A5.2-2
EXISTING DRAINAGE - OUTLET SUMMARY

SHEET NO. EDS-04
DRAWING NO. 7 OF 196



EXISTING DETENTION

DETENTION ID	OUTLET AT STA	BOTTOM ELEV. (FT)	TOP WSEL (FT)	MAXIMUM DEPTH (FT)	VOLUME (CU FT)	VOLUME (AC-FT)	DETENTION LOCATION
POND-30A	1589+40 RT	675.70	685.00	9.30	91,995	2.11	OUTLET AT HAWTHORNE ST., AT PLAZA 35 (CERMAK)
POND-30FGP	1595+50 LT	682.40	684.60	2.20	189,314	4.35	FOREST GLEN PARK, WEST OF PLAZA 35 (CERMAK)
POND-30B	1613+50 LT	674.80	678.00	3.20	7,079	0.16	RAMP-D INFIELD AREA, AT ROOSEVELT RD.
POND-30C	1617+40 LT	675.00	679.00	4.00	62,372	1.43	RAMP-C INFIELD AREA, AT ROOSEVELT RD.
POND-30D	1618+70 RT	672.00	680.00	8.00	221,358	5.08	RAMP-B INFIELD AREA, AT ROOSEVELT RD.
POND-30E	1620+00 LT	668.50	674.00	5.50	135,121	3.10	RAMP-C AND -A(IDOT) INFIELD AREA, AT ROOSEVELT RD.
POND-30F	1621+20 LT	668.00	675.00	7.00	87,670	2.01	IDOT RAMP-C AND -A INFIELD AREA, N OF ROOSEVELT RD.
POND-30G	1622+00 RT	672.00	678.00	6.00	14,569	0.33	RAMP-B AND BUCK RD. INFIELD AREA
POND-30K	1634+60 RT	678.50	685.00	6.50	10,741	0.25	BUCK RD, AT THE MT. CARMEL CEMETERY
POND-31A	1641+25 RT	693.50	700.00	6.50	56,769	1.30	RAMP-B AND -J INFIELD AREA, AT EB I-88
POND-31B	1642+60 LT	689.00	699.00	10.00	120,819	2.77	OUTLET AT RAMP-F INFIELD AREA, AT WB I-88
POND-31C	1666+70 RT	674.00	683.00	9.00	242,353	5.56	OUTLET AT I-290 INFIELD AREA, AT C.C.P.R.R.
POND-31D	1670+40 RT	670.50	678.00	7.50	525,528	12.06	OUTLET AT RAMP-J INFIELD AREA, NORTH OF C.C.P.R.R.
POND-31E	1678+65 RT	703.00	706.00	3.00	7,616	0.17	OUTLET AT RAMP-K AND -J INFIELD AREA, NORTH OF C.C.P.R.R.
POND-31F	1682+00 LT	689.50	692.00	2.50	2,044	0.05	OUTLET AT RAMP-H INFIELD AREA, SOUTH OF ELECTRIC AVE.

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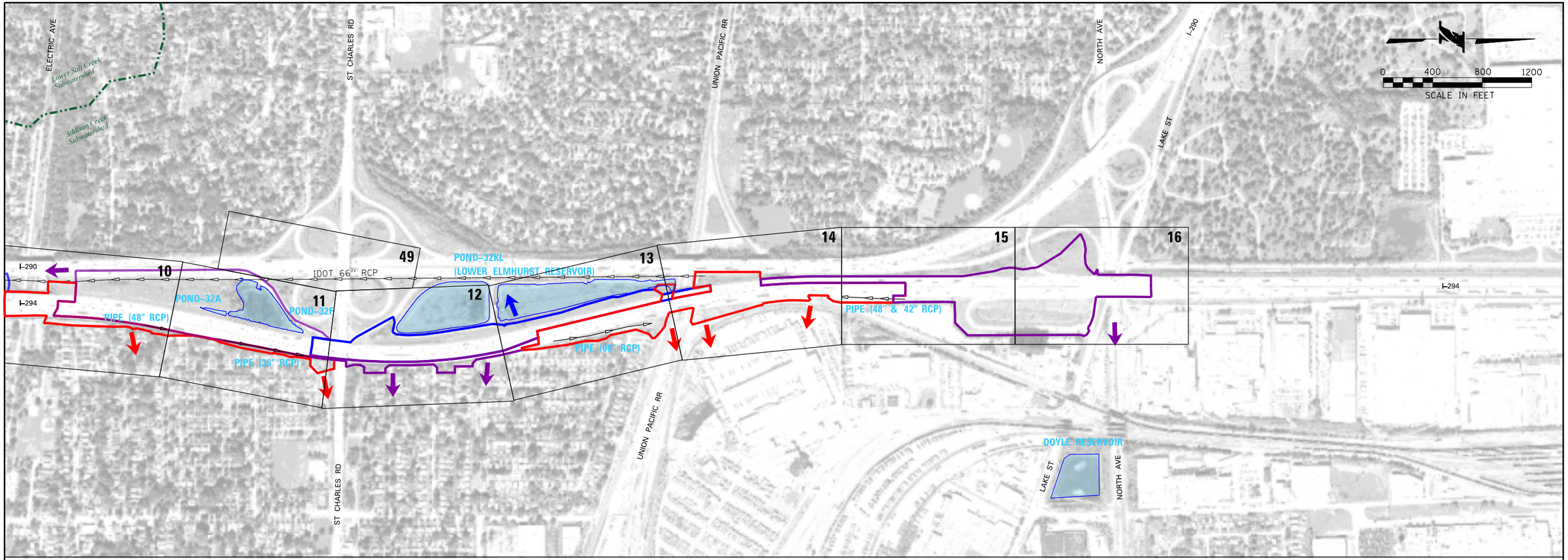
REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224
EXHIBIT A5.2-3
EXISTING DRAINAGE - DETENTION SUMMARY

SHEET NO. EDD-01
DRAWING NO. 8 OF 196



EXISTING DETENTION

DETENTION ID	OUTLET AT STA	BOTTOM ELEV. (FT)	TOP WSEL (FT)	MAXIMUM DEPTH (FT)	VOLUME (CU FT)	VOLUME (AC-FT)	DETENTION LOCATION
POND-32A	1707+20 LT	682.50	687.00	4.50	6,229	0.14	OUTLET AT I-290 SE INFIELD AREA, WETLAND S OF ST. CHARLES RD.
POND-32F	1708+00 LT	668.00	675.00	7.00	213,869	4.91	WETLAND SOUTH OF ST. CHARLES RD.
POND-32KL	1744+50 LT	658.75	665.00	6.25	1,409,664	32.36	LOWER ELMHURST RESERVOIR
PIPE (36" RCP)	1646+00 RT	-----	-----	-----	2,121	0.05	WEST SIDE OF RAMP-E
PIPE (48" RCP)	1646+00 RT	-----	-----	-----	11,825	0.27	EAST SIDE OF RAMP-J
PIPE (48" RCP)	1685+00 LT	-----	-----	-----	4,851	0.11	WEST SIDE OF RAMP-H
PIPE (48" RCP)	1702+00 RT	-----	-----	-----	2,513	0.06	BEHIND THE RETAINING WALL, SOUTH OF ELECTRIC AVE.
PIPE (36" RCP)	1714+50 RT	-----	-----	-----	3,039	0.07	BEHIND THE NOISE WALL, SOUTH OF ST. CHARLES RD.
PIPE (60" RCP)	1742+20 RT	-----	-----	-----	16,002	0.37	BEHIND THE RETAINING WALL, SOUTH OF THE UP YARD
PIPE (48"&42" RCP)	1758+00 RT	-----	-----	-----	5,784	0.13	BEHIND THE RETAINING WALL, NORTH OF THE UP YARD

NOTE:
THE DOYLE RESERVOIR OUTFALL AND OUTLETS WILL BE ANALYZED AS PART OF THE CONTRACT I-15-4656 (ELGIN O-HARE WESTERN ACCESS PROJECT).

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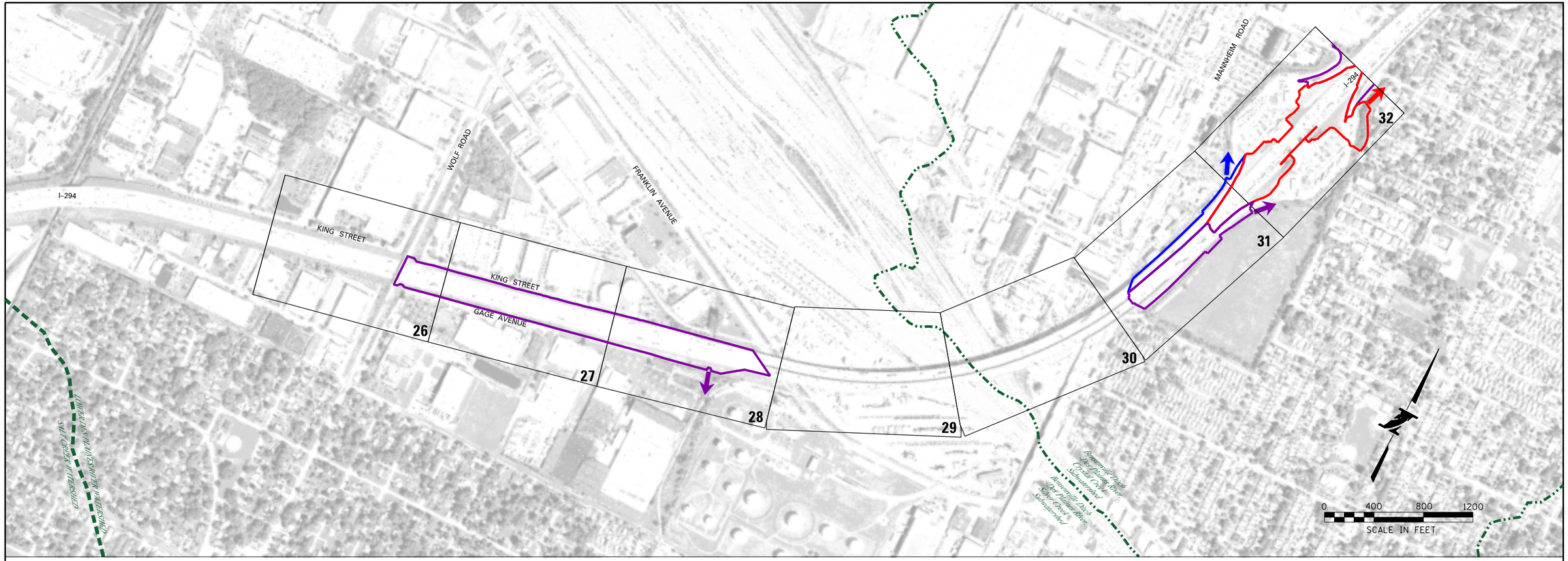
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-3
EXISTING DRAINAGE - DETENTION SUMMARY

SHEET NO. EDD-02
DRAWING NO. 9 OF 196



NO EXISTING DETENTION IDENTIFIED ON THIS SHEET

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NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-3
EXISTING DRAINAGE - DETENTION SUMMARY

SHEET NO. EDD-03
DRAWING NO. 10 OF 196

LAYOUT	KRH	04/14/17
DRAWN	KRH	04/14/17
REVIEWED	JJW	07/21/17

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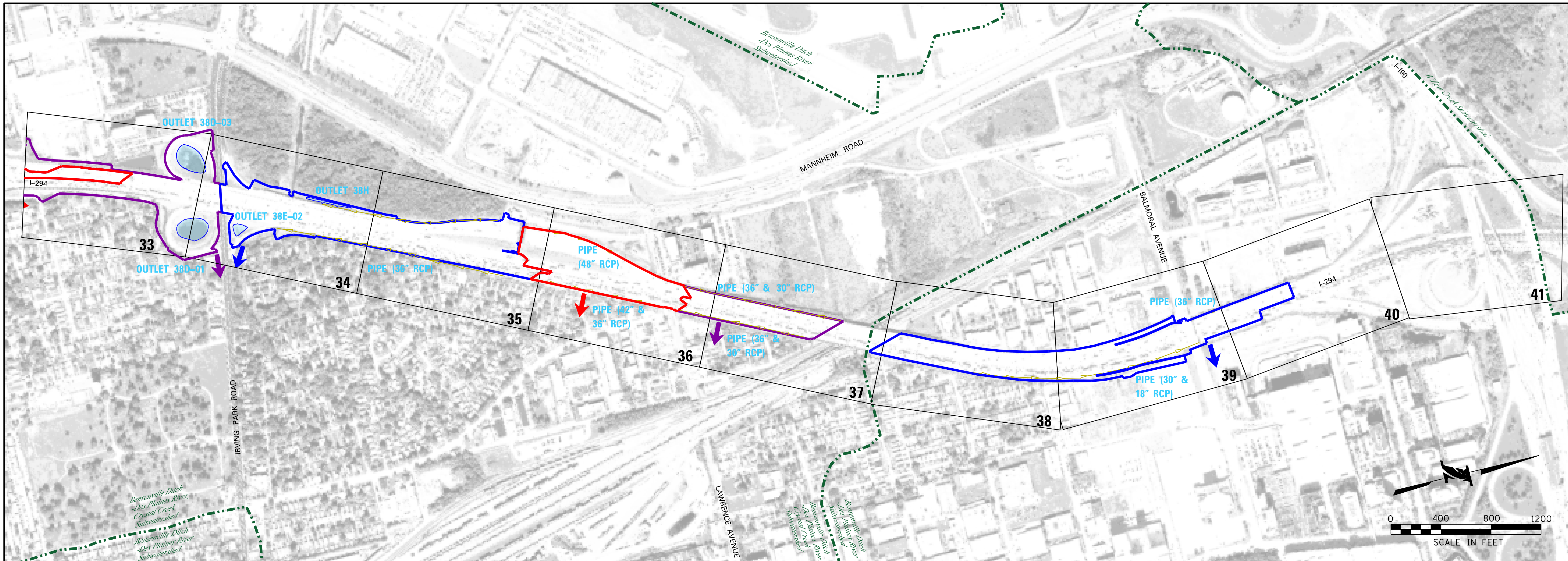

EXISTING DETENTION

DETENTION ID	OUTLET AT STA	BOTTOM ELEV. (FT)	TOP WSEL (FT)	MAXIMUM DEPTH (FT)	VOLUME (CU FT)	VOLUME (AC-FT)	DETENTION LOCATION
OUTLET 38D-03	2024+00 LT	636.44	639.60	3.16	119,152	2.74	INFIELD OF EB IRVING PARK RD / SB I-294 OFF-RAMP
OUTLET 38D-01	2024+45 RT	632.60	634.50	1.90	34,200	0.79	INFIELD OF EB IRVING PARK RD / NB I-294 ON-RAMP
OUTLET 38E-02	2027+70 RT	636.00	640.00	4.00	21,780	0.50	INFIELD OF WB IRVING PARK RD / NB I-294 ON-RAMP
OUTLET 38H	2032+40 LT	632.77	636.90	4.13	45,000	1.03	BEHIND THE RET. WALL, BETWEEN CRYSTAL CREEK AND PLAZA 33
PIPE (36" RCP)	2030+70 RT	-----	-----	-----	15,442	0.35	NB I-294 BETWEEN CRYSTAL CREEK AND PLAZA 33
PIPE (42" & 36" RCP)	2055+80 RT	-----	-----	-----	10,374	0.24	NB I-294 BETWEEN PLAZA 33 AND LAWRENCE AVENUE
PIPE (48" RCP)	2055+80 LT	-----	-----	-----	11,938	0.27	SB I-294 BETWEEN PLAZA 33 AND LAWRENCE AVENUE
PIPE (36" & 30" RCP)	2066+80 RT	-----	-----	-----	6,634	0.15	NB I-294 BETWEEN LAWRENCE AVENUE & RAILROAD BRIDGE
PIPE (36" & 30" RCP)	2066+80 LT	-----	-----	-----	6,634	0.15	SB I-294 BETWEEN LAWRENCE AVENUE & RAILROAD BRIDGE
PIPE (30" & 18" RCP)	2105+75 RT	-----	-----	-----	8,633	0.19	NB I-294 AT BALMORAL AVENUE
PIPE (36" RCP)	2105+75 LT	-----	-----	-----	2,036	0.05	SB I-294 AT BALMORAL AVENUE

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12/21/2017

LAYOUT	KRH	04/14/17
DRAWN	KRH	04/14/17
REVIEWED	JJW	07/21/17

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RR-14-4224
EXHIBIT A5.2-3
EXISTING DRAINAGE - DETENTION SUMMARY

SHEET NO. EDD-04
DRAWING NO. 11 OF 196

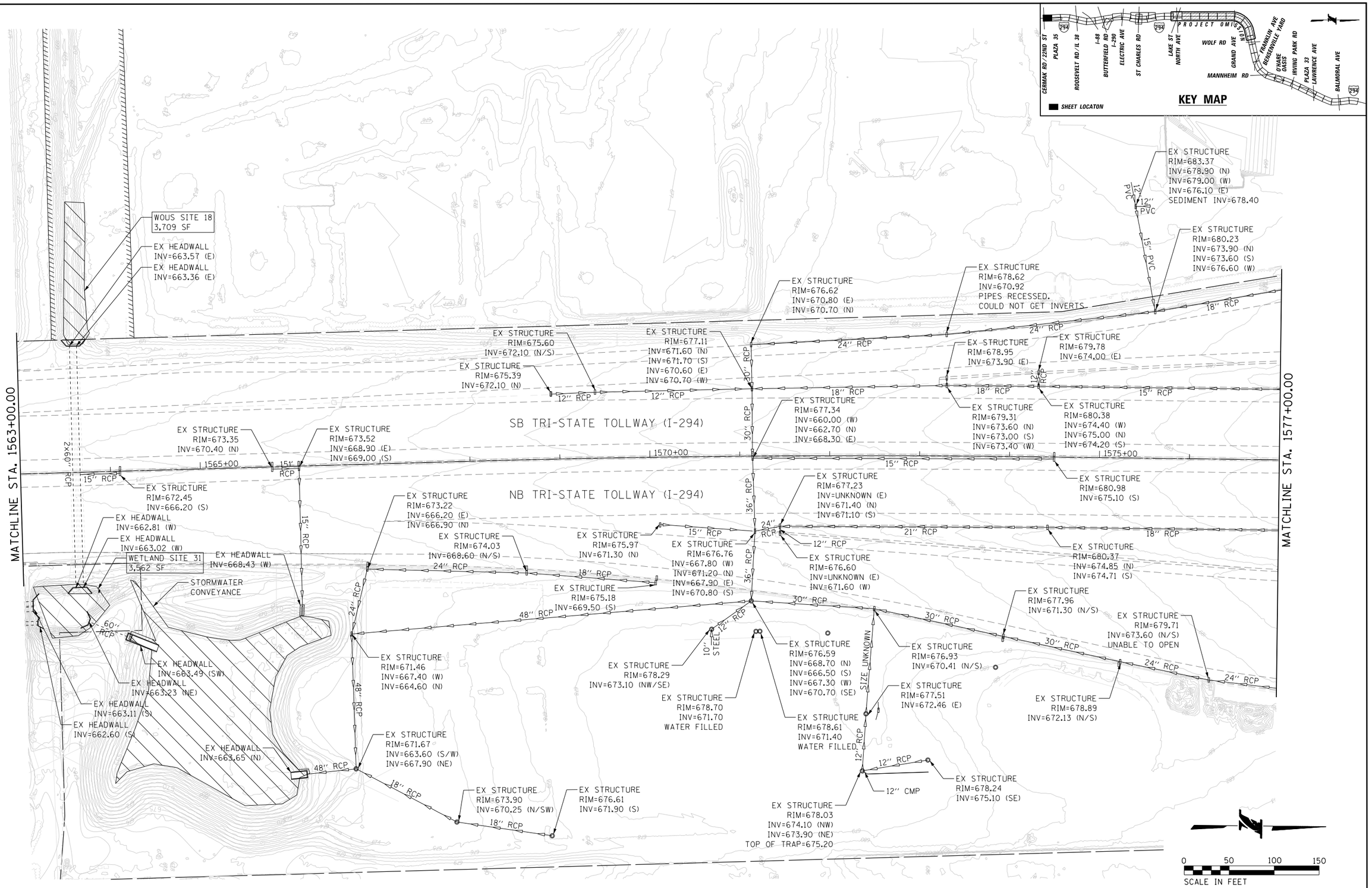

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EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO.
EDP-01
DRAWING NO.
12 OF 196

MATCHLINE (SEE SHEET EDP-42)

CONTRACT RR-14-4223
BEGIN PROJECT
PLAZA STA. 1582+00

MATCHLINE STA. 1577+00.00

MATCHLINE STA. 1591+00.00

SB TRI-STATE TOLLWAY (I-294)

NB TRI-STATE TOLLWAY (I-294)

MAINLINE STA. 1584+00

CONTRACT RR-14-4223
BEGIN PROJECT
PLAZA STA. 1582+00

1580+00
1585+00
1590+00

ADDISON CREEK SUBWATERSHED
OWER SALT CREEK SUBWATERSHED

EX STRUCTURE
RIM=683.39
INV=677.90 (N)
INV=677.90 (S) 15"
INV=679.50 (S) 12"

12" RCP
EX STRUCTURE
RIM=685.45
INV=679.60 (N)

15" RCP
EX STRUCTURE
RIM=681.69
INV=676.10 (N)
INV=675.80 (S)

EX STRUCTURE
RIM=685.66
INV=680.20 (S)

EX STRUCTURE
RIM=685.64
INV=680.40 (S)

EX STRUCTURE
RIM=684.30
INV=676.60 (N/E/S)

EX STRUCTURE
RIM=684.61
INV=678.86 (N/S)

EX STRUCTURE
RIM=681.71
INV=676.20 (N)
INV=675.20 (S)
INV=678.30 (W)

EX STRUCTURE
RIM=684.40
INV=679.30 (W)

EX STRUCTURE
RIM=684.10
INV=678.85 (W/E)

EX STRUCTURE
RIM=688.28
INV=683.63 (N)
INV=683.78 (S)

EX STRUCTURE
RIM=687.09
INV=682.80 (N)
INV=683.10 (S)

EX STRUCTURE
RIM=690.33
UNABLE TO OPEN

EX STRUCTURE
RIM=686.92
INV=682.22 (N)
INV=682.32 (S)

EX STRUCTURE
RIM=686.84
INV=681.44 (N)
INV=691.94 (S)

EX STRUCTURE
RIM=686.95
INV=681.25 (N/S)

EX STRUCTURE
RIM=688.54
INV=683.34 (N)
INV=683.54 (S)

EX STRUCTURE
RIM=688.60
INV=684.20 (N)

EX STRUCTURE
RIM=690.81
INV=681.81 (E)

EX STRUCTURE
RIM=688.47
INV=683.00 (S)
INV=682.70 (N)

EX STRUCTURE
RIM=688.72
INV=683.20 (N)

EX STRUCTURE
RIM=687.67
INV=681.90 (N)
INV=681.40 (S)

EX STRUCTURE
RIM=690.55
COULD NOT OPEN

EX STRUCTURE
RIM=687.31
INV=681.54 (S)
INV=681.41 (N)

EX STRUCTURE
RIM=687.25
INV=680.30 (N)
INV=680.80 (E)
INV=680.70 (S)

EX STRUCTURE
RIM=688.31
INV=683.00 (N)
INV=682.50 (S)

EX STRUCTURE
RIM=687.11
INV=683.87 (W)
INV=681.26 (N)
INV=681.60 (S)

EX STRUCTURE
RIM=681.02 (N)
INV=681.30 (E)
INV=681.20 (S)

EX STRUCTURE
RIM=687.21
INV=682.46 (W)

EX STRUCTURE
RIM=687.39
INV=681.30 (W)

EX STRUCTURE
RIM=688.99
INV=682.30
WATER FILLED

EX STRUCTURE
RIM=689.16
INV=684.20
WATER FILLED

EX STRUCTURE
RIM=687.37
INV=683.37 (N)

EX STRUCTURE
RIM=687.33
INV=680.10 (N)
INV=680.20 (S)

EX STRUCTURE
RIM=687.34
INV=679.00 (W)
INV=678.10 (N)
INV=681.00 (E)
INV=679.00 (S)

EX STRUCTURE
RIM=687.48
INV=683.18 (N)

EX STRUCTURE
RIM=687.55
INV=680.85 (N/E/S)
INV=682.95 (W)

EX STRUCTURE
RIM=684.01
OVERLAID/FILLED
STRUCTURE

EX STRUCTURE
RIM=687.15
INV=681.35 (N/S)

EX STRUCTURE
RIM=688.96
INV=680.06 (E)
INV=679.86 (W)
INV=682.06 (S)

EX STRUCTURE
RIM=688.27
INV=682.57 (S)
INV=673.07 (N/SE)

EX STRUCTURE
RIM=687.48
INV=674.37 (SW)
INV=672.48 (NW)
INV=671.60 (E)

EX STRUCTURE
RIM=688.69
INV=681.90 (NW)

EX STRUCTURE
RIM=688.40
INV=683.80 (NW)

EX STRUCTURE
RIM=687.51
INV=683.40 (SE)
INV=683.50 (E)

EX STRUCTURE
RIM=687.59
INV=675.40 (N)
INV=676.60 (S)
INV=679.60 (NW)

EX STRUCTURE
RIM=686.91
INV=674.46 (W/S)

EX STRUCTURE
RIM=688.83
INV=680.83 (N/E)

EX STRUCTURE
RIM=688.45
INV=682.15 (N)
INV=680.35 (S/W)

EX STRUCTURE
RIM=686.05
INV=681.00 (N)
INV=681.10 (E)

EX STRUCTURE
RIM=687.53
INV=679.83
UNABLE TO OPEN

EX STRUCTURE
RIM=688.06
INV=680.76 (N)
INV=680.26 (S)
INV=681.16 (W)

EX STRUCTURE
RIM=688.31
INV=681.91 (N/S)

EX STRUCTURE
RIM=689.64
INV=684.44 (S)

EX STRUCTURE
RIM=689.92
INV=679.32 (E)
INV=679.32 (W)
INV=683.60 (N)

EX STRUCTURE
RIM=690.33
INV=679.08 (W)
INV=UNKNOWN (E)

EX STRUCTURE
RIM=689.64
INV=682.64 (N)
INV=682.84 (SE)

EX STRUCTURE
RIM=688.22
INV=680.20 (W)
INV=681.20 (S)
INV=679.20 (E)

EX STRUCTURE
RIM=688.02
INV=683.52 (NW)

EX STRUCTURE
RIM=689.44
INV=683.11 (N)
INV=681.94 (E)
INV=682.04 (S)

EX HEADWALL
INV=674.88 (SE)

EX STRUCTURE
RIM=687.97
INV=680.50 (W)
INV=676.50 (N)
INV=675.00 (E)
INV=680.50 (S)

EX STRUCTURE
RIM=685.29
INV=676.29 (N)
INV=675.80 (S)
INV=675.30 (E)

EX HEADWALL
INV=675.37

EX STRUCTURE
RIM=685.12
INV=674.00 (NW)
INV=674.00 (E)

30B–01
30A–07
30A–17
30A–10
30A–06
30A–05
30A–09
30A–04
30A–12
30A–11
30A–03
30A–08
30A–02
30A–01

18" RCP
24" RCP
36" RCP
48" RCP
60" RCP
12" RCP
15" RCP

OUTLET
30B

OUTLET
30A

WETLAND SITE 32
5.743 SF

POND–30A

HAWTHORNE CT

0 50 100 150
SCALE IN FEET

KEY MAP

SHEET LOCATON

CERMAK RD /22ND ST
PLAZA 35
ROOSEVELT RD / IL 38
BUTTERFIELD RD
I-88
I-290
ELECTRIC AVE
ST CHARLES RD
LAKE ST
NORTH AVE
PROJECT OMITTED
WOLF RD
GRAND AVE
MANNHEIM RD
FRANKLIN AVE
BENSENVILLE YARD
O'HARE OASIS
IRVING PARK RD
PLAZA 32
LAWRENCE AVE
BALMORAL AVE

DRAWN BY	KLG	SCALE	1" = 50'
CHECKED BY	SN	DATE	12/22/2017

JACOBS
525 W. Monroe Suite 1600
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Telephone: 312.251.3000
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THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS

NO.	DATE	DESCRIPTION

RR-14-4224
EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-02
DRAWING NO. 13 OF 196

Default
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gomezxi 12/28/2017
100.00000 / in.

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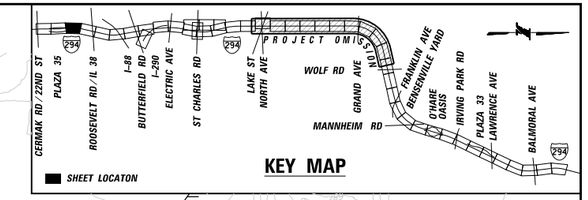

WETLAND SITE 33
40,023 SF

POND-30FGP

30B-01

EX STRUCTURE
RIM=688.71
INV=683.31 (N)
INV=685.61 (E)
INV=683.21 (S)

EX STRUCTURE
RIM=688.71
INV=683.61 (N)
INV=683.51 (S)

EX STRUCTURE
RIM=686.13
INV=681.63 (N/S)

EX STRUCTURE
RIM=688.03
INV=683.18 (N/S)
INV=684.53 (E)

EX STRUCTURE
RIM=688.86
INV=681.96 (N/S)

EX STRUCTURE
RIM=685.01
INV=682.06 (NW/S)

EX STRUCTURE
RIM=684.24
INV=682.24 (NW/SE)

EX HEADWALL
INV=682.62 (SE)

30A-18

30A-17

30A-10

30A-05

30A-09

30A-01

30A-13

30A-15

30A-14

30A-12

30A-11

30A-16

30D-03

30D-01

30D-02

30C-01

OUTLET
30C

EX HEADWALL
INV=693.34 (E)

EX STRUCTURE
RIM=697.63
INV=690.63 (W)

EX STRUCTURE
RIM=697.32
INV=693.02 (N)
INV=693.12 (E)
INV=692.82 (W)

EX STRUCTURE
RIM=694.38
INV=689.38 (S)

EX STRUCTURE
RIM=692.89
INV=687.89 (N)
INV=687.69 (S)

EX STRUCTURE
RIM=691.56
INV=686.26 (N)
INV=686.06 (S)

EX STRUCTURE
RIM=690.35
INV=684.65 (N/S)

EX STRUCTURE
RIM=689.23
INV=683.53 (N)
INV=683.13 (S)

EX STRUCTURE
RIM=688.82
INV=681.62 (S)
INV=682.32 (N)

EX STRUCTURE
RIM=688.54
INV=683.50 (S)
INV=680.74 (E)
INV=681.54 (N)

EX STRUCTURE
RIM=693.35
DEBRIS FILLED

EX STRUCTURE
RIM=689.66
INV=685.01 (S)

EX STRUCTURE
RIM=688.72
INV=684.92 (N)
INV=684.62 (S)

EX STRUCTURE
RIM=688.33
INV=683.93 (N/S)

EX STRUCTURE
RIM=689.11
INV=685.31 (S)
INV=685.11 (N)

EX STRUCTURE
RIM=689.41
INV=686.21 (N)

EX STRUCTURE
RIM=688.90
INV=683.90 (N)

EX STRUCTURE
RIM=688.67
INV=683.27 (N)
INV=683.57 (S)

EX STRUCTURE
RIM=688.83
INV=683.93 (S)

EX STRUCTURE
RIM=688.58
SILTED IN
TOP OF SILT=684.30

EX STRUCTURE
RIM=686.47
INV=677.67 (N)
INV=677.47 (S)

EX STRUCTURE
RIM=686.72
INV=681.72 (N)
INV=679.97 (E)
INV=681.72 (S)
INV=680.47 (W)

EX STRUCTURE
RIM=685.41
INV=679.41 (W)
INV=678.31 (S)
INV=679.31 (N)

EX STRUCTURE
RIM=685.35
INV=679.35 (N)
INV=679.15 (S)

EX STRUCTURE
RIM=686.51
INV=682.01 (N)
INV=681.51 (S)

EX STRUCTURE
RIM=687.06
INV=682.86 (S)

EX STRUCTURE
RIM=685.70
INV=680.70 (N)
INV=679.70 (S)

EX STRUCTURE
RIM=687.11
INV=682.71 (N)
INV=682.51 (S)

EX STRUCTURE
RIM=690.12
INV=685.87 (N)
INV=685.13 (E)

EX STRUCTURE
RIM=692.17
INV=687.07 (S)

EX STRUCTURE
RIM=691.21
INV=687.51 (S)
INV=687.61 (N)

EX STRUCTURE
RIM=689.28
INV=684.28 (S)
INV=684.48 (W)
INV=686.28 (N)

EX STRUCTURE
RIM=696.46
SILTED IN
TOP OF SILT=693.46

POND-30A

EX STRUCTURE
RIM=688.33
INV=677.13 (N/S)
STORMWATER
CONVEYANCE

ISOLATED WETLAND SITE 34
2,591 SF

SB TRI-STATE TOLLWAY (I-294)

NB TRI-STATE TOLLWAY (I-294)

MATCHLINE STA. 1591+00.00

MATCHLINE STA. 1605+00.00

STA. 1595+00

STA. 1600+00

ADDISON CREEK SUBWATERSHED
LOWER SALT CREEK SUBWATERSHED

DEGENER AVE

0 50 100 150
SCALE IN FEET

Default
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gomezkl
12/20/2017
100.0000 / in.

DRAWN BY	KLG	SCALE	1" = 50'
CHECKED BY	SN	DATE	12/22/2017

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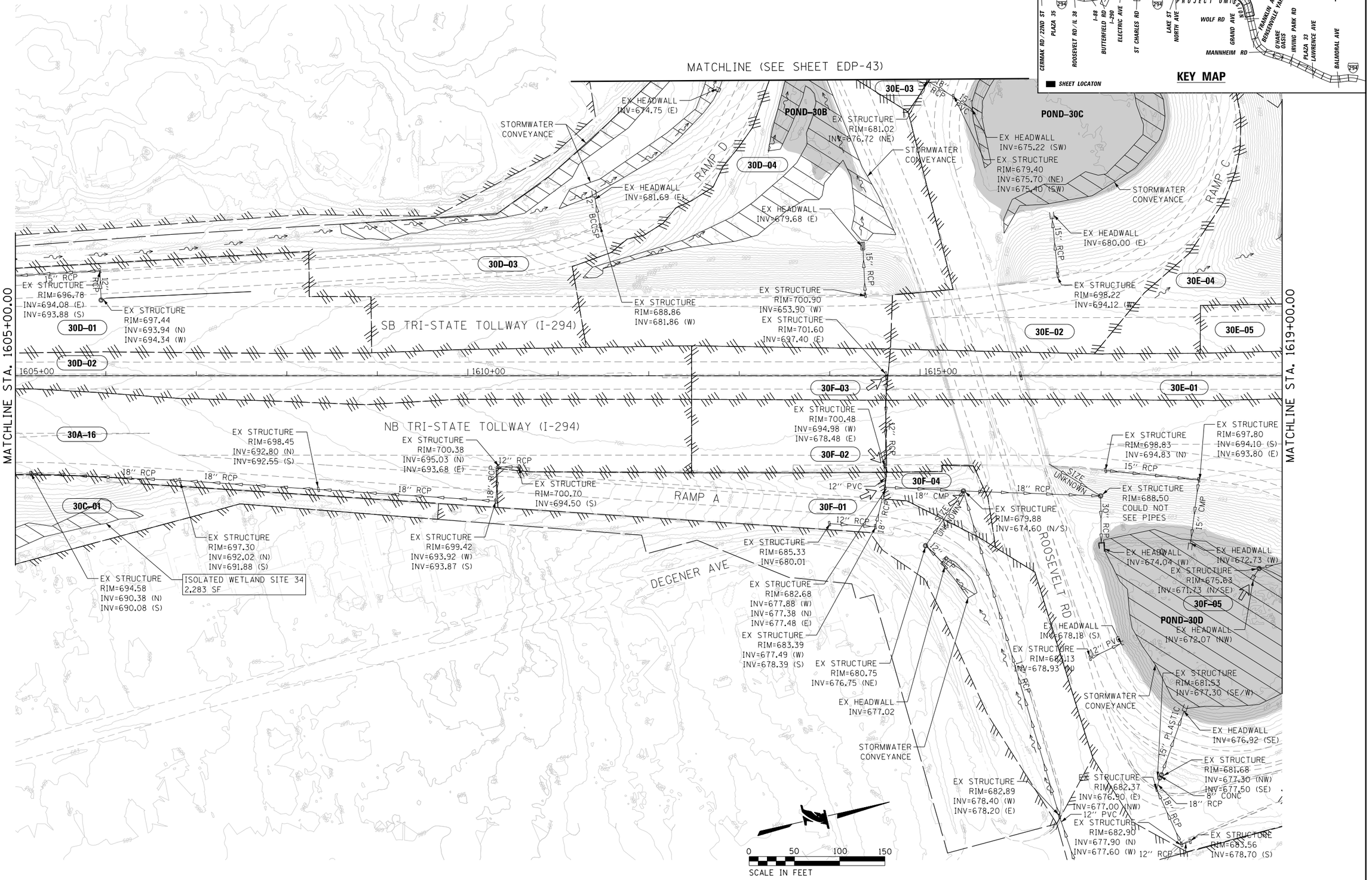
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-03
DRAWING NO. 14 OF 196



DRAWN BY	KLG	SCALE	1" = 50'
CHECKED BY	SN	DATE	12/22/2017

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THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-04
DRAWING NO. 15 OF 196

Default
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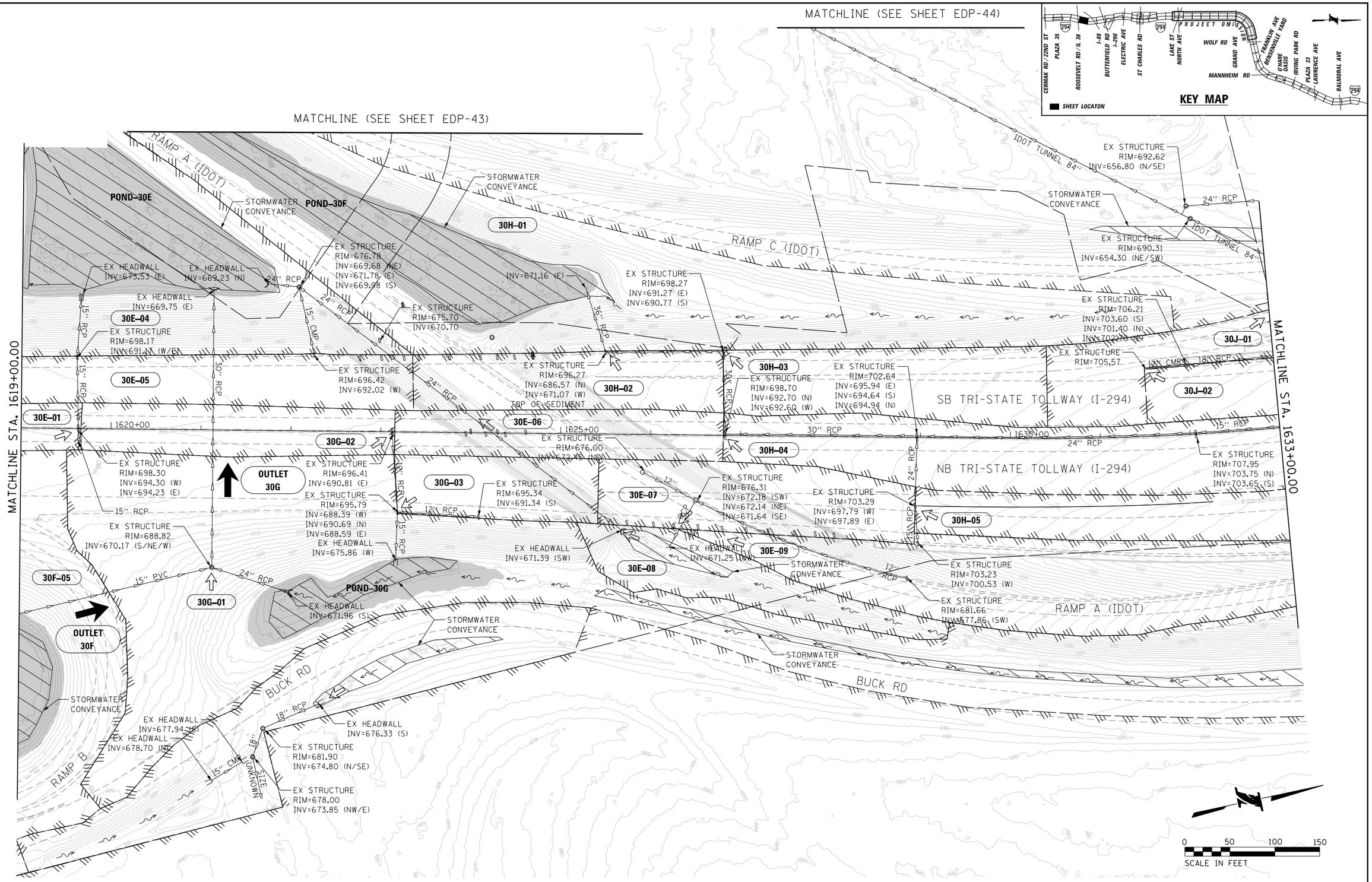
12/20/2017
100.0031 = in.



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CHECKED BY	SN	DATE	12/22/2017			REVISIONS: NO. / DATE / DESCRIPTION	SHEET NO. EDP-05 DRAWING NO. 16 OF 196

MATCHLINE (SEE SHEET EDP-44)

MATCHLINE (SEE SHEET EDP-45)

MATCHLINE STA. 1633+00.00

MATCHLINE STA. 1647+00.00

BEGIN RR-13-4116

KEY MAP

SHEET LOCATON

PROJECT OMISSION

CERMAK RD /22ND ST · PLAZA 35 · ROOSEVELT RD / IL 38 · I-88 · BUTTERFIELD RD · I-290 · ELECTRIC AVE · ST CHARLES RD · LAKE ST · NORTH AVE · WOLF RD · GRAND AVE · MANNHEIM RD · FRANKLIN AVE · BENSENVILLE YARD · O'HARE OASIS · IRVING PARK RD · PLAZA 32 · LAWRENCE AVE · BALMORAL AVE

SCALE IN FEET: 0 50 100 150

DRAWN BY	KLG	SCALE	1" = 50'
CHECKED BY	SN	DATE	12/22/2017

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Chicago, Illinois 60661
Telephone: 312.251.3000
Fax: 312.251.3015

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-06
DRAWING NO. 17 OF 196

Default
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gomezk1
12/20/2017
100.0000 / in.

MATCHLINE (SEE SHEET EDP-50)

0 50 100 150
SCALE IN FEET

KEY MAP
SHEET LOCATON
CERMAK RD /22ND ST
PLAZA 35
ROOSEVELT RD / IL 38
I-88
BUTTERFIELD RD
I-290
ELECTRIC AVE
ST CHARLES RD
LAKE ST
NORTH AVE
PROJECT OMITTED
WOLF RD
GRAND AVE
MANNHEIM RD
FRANKLIN AVE
BERKELEY YARD
O'HARE OASIS
IRVING PARK RD
PLAZA 32
LAWRENCE AVE
BALMORAL AVE

BEGIN RR-13-4116
BUTTERFIELD RD
RAMP F
RAMP E
RAMP J
SB TRI-STATE TOLLWAY (I-294)
NB TRI-STATE TOLLWAY (I-294)
AIWOOD AVE
MATCHLINE STA. 1647+00.00
MATCHLINE STA. 1661+00.00
1650+00
1655+00
1660+00

30L–09
30L–04
30L–06
30L–08
30L–02
30L–07
31B–11
31B–03
31B–12
31B–02
31B–04
31B–07
31B–10
31B–01
31B–05
31A–07
31B–09
31A–05
31A–01
31A–03
31A–04
31A–06
31A–02
31B–08
31B–18
31B–14

EX STRUCTURE RIM=UNKNOWN INV=UNKNOWN
EX STRUCTURE RIM=716.22 INV=708.12 (N/S)
21" RCP
EX STRUCTURE RIM=716.66 INV=710.06 (N/E/S)
EX STRUCTURE RIM=718.24 SEDIMENT FILLED
12" RCP
EX STRUCTURE RIM=715.55 INV=710.75 (S)
EX STRUCTURE RIM=713.79 INV=709.69 (N)
EX STRUCTURE RIM=698.11 INV=694.10 (E) INV=685.01 (N)
EX STRUCTURE RIM=692.88 COULD NOT INVENTORY
EX STRUCTURE RIM=711.70 INV=706.10 (N/S)
24" RCP
EX STRUCTURE RIM=706.07 INV=683.12 (N/S) INV=687.62 (W)
EX STRUCTURE RIM=692.88 INV=683.18 (N) INV=683.98 (S) INV=686.48 (E)
EX STRUCTURE RIM=688.37 INV=686.8 (E)
12" PVC
30" RCP
EX STRUCTURE RIM=712.92 INV=708.22 (N) INV=708.62 (S)
EX STRUCTURE RIM=713.12 INV=708.82 (N)
15" RCP
18" RCP
EX STRUCTURE RIM=711.29 INV=705.59 (E) INV=704.79 (S) INV=694.29 (SW)
EX STRUCTURE RIM=712.71 INV=707.91 (N) INV=708.01 (E)
EX STRUCTURE RIM=712.96 INV=707.46 (W)
EX STRUCTURE RIM=712.15 INV=708.15 (N) INV=708.35 (S)
EX STRUCTURE RIM=711.62 INV=706.42 (W) INV=707.32 (S)
EX STRUCTURE RIM=711.80 INV=708.60 (N)
EX STRUCTURE RIM=713.29 INV=705.29 (E) INV=705.49 (S)
EX STRUCTURE RIM=712.04 SILTED IN
EX STRUCTURE RIM=713.91 INV=706.01 (N/W) INV=706.41 (S)
EX STRUCTURE RIM=720.27 INV=715.70 (E)
EX STRUCTURE RIM=699.70 INV=684.30 (S)
EX STRUCTURE RIM=694.03 INV=690.13 (W) INV=682.83 (N) INV=682.63 (S)
15" RCCSP
(OVERSIZED FOR DETENTION)
36" RCP
EX STRUCTURE RIM=708.33 INV=703.33 (E)
EX STRUCTURE RIM=712.81 INV=710.71 (E)
EX STRUCTURE RIM=711.16 INV=703.46 (E)
EX STRUCTURE RIM=710.92 INV=703.12 (E)
EX STRUCTURE RIM=709.57 INV=701.97 (S) INV=702.07 (W)
EX STRUCTURE RIM=709.09 INV=701.29 (N/S)
EX STRUCTURE RIM=717.08 INV=698.48 (N/S)
48" RCP
EX STRUCTURE RIM=709.32 INV=700.72 (N/S)
EX STRUCTURE RIM=708.94 INV=700.94 (N/S) INV=701.74 (W)
EX STRUCTURE RIM=688.47
EX STRUCTURE RIM=688.32
EX STRUCTURE RIM=713.85 INV=699.05 (N/S/W)
EX STRUCTURE RIM=687.91
EX STRUCTURE RIM=689.09
EX STRUCTURE RIM=710.27 INV=700.07 (N) INV=699.77 (S) INV=702.97 (W)
EX STRUCTURE RIM=688.11

MATCHLINE (SEE SHEET EDP-45)
MATCHLINE (SEE SHEET EDP-46)

DRAWN BY	KLG	SCALE	1" = 50'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015
CHECKED BY	SN	DATE	12/22/2017		

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224
EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-07
DRAWING NO. 18 OF 196

Default
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12/28/2017
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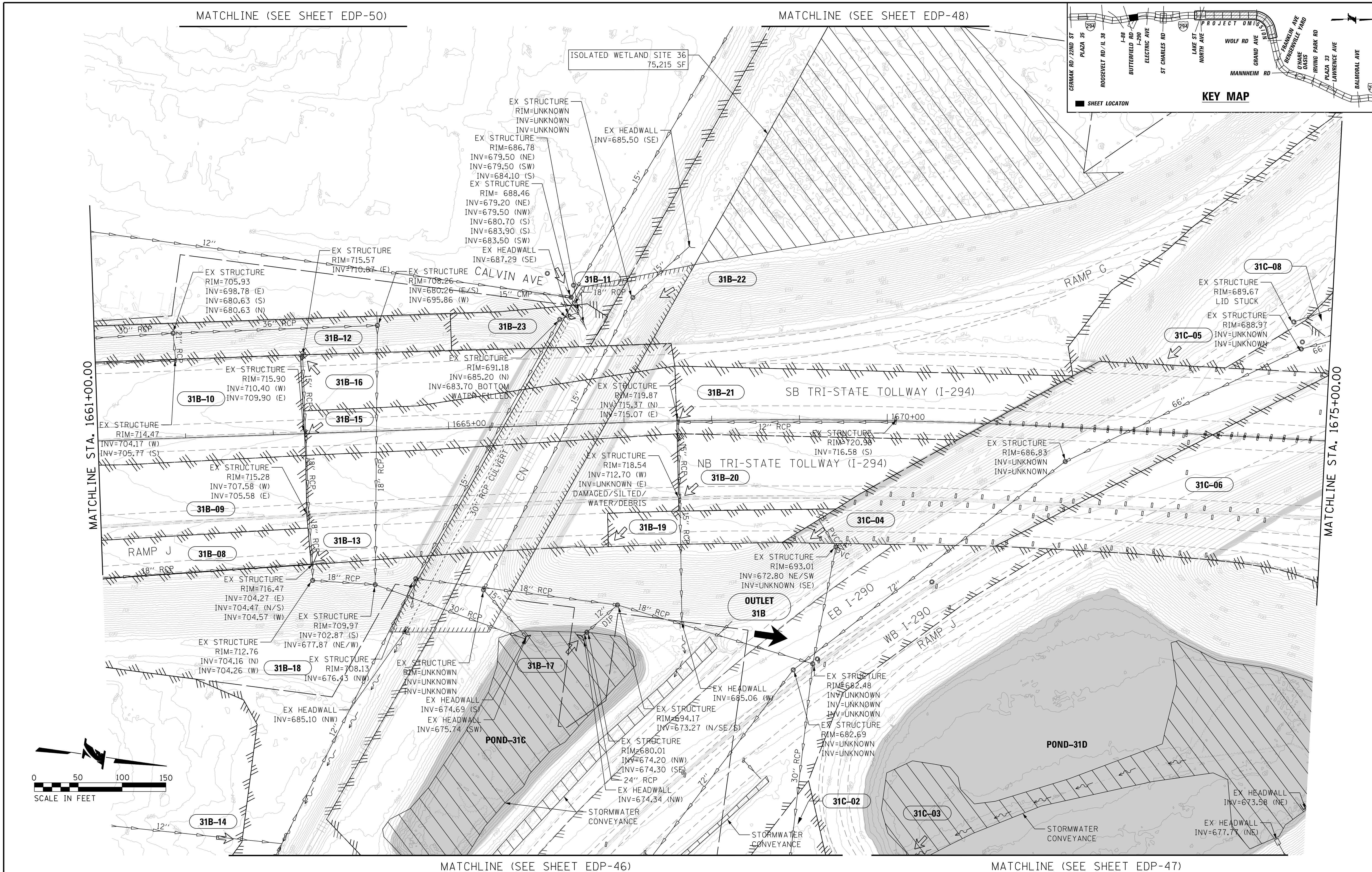


MATCHLINE (SEE SHEET EDP-50)
MATCHLINE (SEE SHEET EDP-48)
MATCHLINE (SEE SHEET EDP-46)
MATCHLINE (SEE SHEET EDP-47)
MATCHLINE STA. 1661+00.00
MATCHLINE STA. 1675+00.00
KEY MAP
SHEET LOCATON
CERMAK RD/22ND ST
PLAZA 35
ROOSEVELT RD/IL 38
I-88
BUTTERFIELD RD/I-290
ELECTRIC AVE
ST CHARLES RD
LAKE ST
NORTH AVE
GRAND AVE
WOLF RD
MANNHEIM RD
FRANKLIN AVE
BENSENVILLE YARD
O'HARE OASIS
IRVING PARK RD
PLAZA 33
LAWRENCE AVE
BALMORAL AVE
PROJECT OMISSION
ISOLATED WETLAND SITE 36
75,215 SF
EX STRUCTURE
RIM=UNKNOWN
INV=UNKNOWN
INV=UNKNOWN
EX HEADWALL
INV=685.50 (SE)
EX STRUCTURE
RIM=686.78
INV=679.50 (NE)
INV=679.50 (SW)
INV=684.10 (S)
EX STRUCTURE
RIM= 688.46
INV=679.20 (NE)
INV=679.50 (NW)
INV=680.70 (S)
INV=683.90 (S)
INV=683.50 (SW)
EX HEADWALL
INV=687.29 (SE)
EX STRUCTURE
RIM=715.57
INV=710.87 (E)
EX STRUCTURE
RIM=708.26
INV=680.26 (E/S)
INV=695.86 (W)
CALVIN AVE
EX STRUCTURE
RIM=705.93
INV=698.78 (E)
INV=680.63 (S)
INV=680.63 (N)
30" RCP
36" RCP
21" RCP
15" CMP
18" RCP
31B-11
31B-22
31B-23
31B-12
31B-16
31B-10
31B-15
31B-21
31B-20
31B-09
31B-19
31B-13
31B-08
31B-18
31B-17
31B-14
31C-08
31C-05
31C-06
31C-04
31C-02
31C-03
RAMP G
RAMP J
EX STRUCTURE
RIM=689.67
LID STUCK
EX STRUCTURE
RIM=688.97
INV=UNKNOWN
INV=UNKNOWN
66"
EX STRUCTURE
RIM=715.90
INV=710.40 (W)
INV=709.90 (E)
EX STRUCTURE
RIM=691.18
INV=685.20 (N)
INV=683.70 BOTTOM
WATER FILLED
EX STRUCTURE
RIM=719.87
INV=715.37 (N)
INV=715.07 (E)
SB TRI-STATE TOLLWAY (I-294)
1670+00
1665+00
12" RCP
EX STRUCTURE
RIM=720.98
INV=716.58 (S)
EX STRUCTURE
RIM=686.83
INV=UNKNOWN
INV=UNKNOWN
EX STRUCTURE
RIM=714.47
INV=704.17 (W)
INV=705.77 (S)
EX STRUCTURE
RIM=718.54
INV=712.70 (W)
INV=UNKNOWN (E)
DAMAGED/SILTED/
WATER/DEBRIS
NB TRI-STATE TOLLWAY (I-294)
EX STRUCTURE
RIM=715.28
INV=707.58 (W)
INV=705.58 (E)
30" RCP CULVERT
CN
EX STRUCTURE
RIM=693.01
INV=672.80 NE/SW
INV=UNKNOWN (SE)
EX STRUCTURE
RIM=716.47
INV=704.27 (E)
INV=704.47 (N/S)
INV=704.57 (W)
OUTLET
31B
EB I-290
WB I-290
72"
EX STRUCTURE
RIM=709.97
INV=702.87 (S)
INV=677.87 (NE/W)
EX STRUCTURE
RIM=712.76
INV=704.16 (N)
INV=704.26 (W)
EX STRUCTURE
RIM=708.13
INV=676.43 (NW)
EX STRUCTURE
RIM=UNKNOWN
INV=UNKNOWN
INV=UNKNOWN
EX HEADWALL
INV=674.69 (S)
EX HEADWALL
INV=675.74 (SW)
12" DIP
EX HEADWALL
INV=685.06 (W)
EX STRUCTURE
RIM=682.48
INV=UNKNOWN
INV=UNKNOWN
INV=UNKNOWN
EX HEADWALL
INV=685.10 (NW)
EX STRUCTURE
RIM=694.17
INV=673.27 (N/SE/S)
EX STRUCTURE
RIM=682.69
INV=UNKNOWN
INV=UNKNOWN
POND-31C
POND-31D
EX STRUCTURE
RIM=680.01
INV=674.20 (NW)
INV=674.30 (SE)
24" RCP
EX HEADWALL
INV=674.34 (NW)
30" RCP
STORMWATER
CONVEYANCE
EX HEADWALL
INV=673.58 (NE)
EX HEADWALL
INV=677.77 (NE)
0 50 100 150
SCALE IN FEET

DRAWN BY	KLG	SCALE	1" = 50'
CHECKED BY	SN	DATE	12/22/2017

JACOBS

525 W. Monroe Suite 1600
Chicago, Illinois 60661
Telephone: 312.251.3000
Fax: 312.251.3015

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS

NO.	DATE	DESCRIPTION

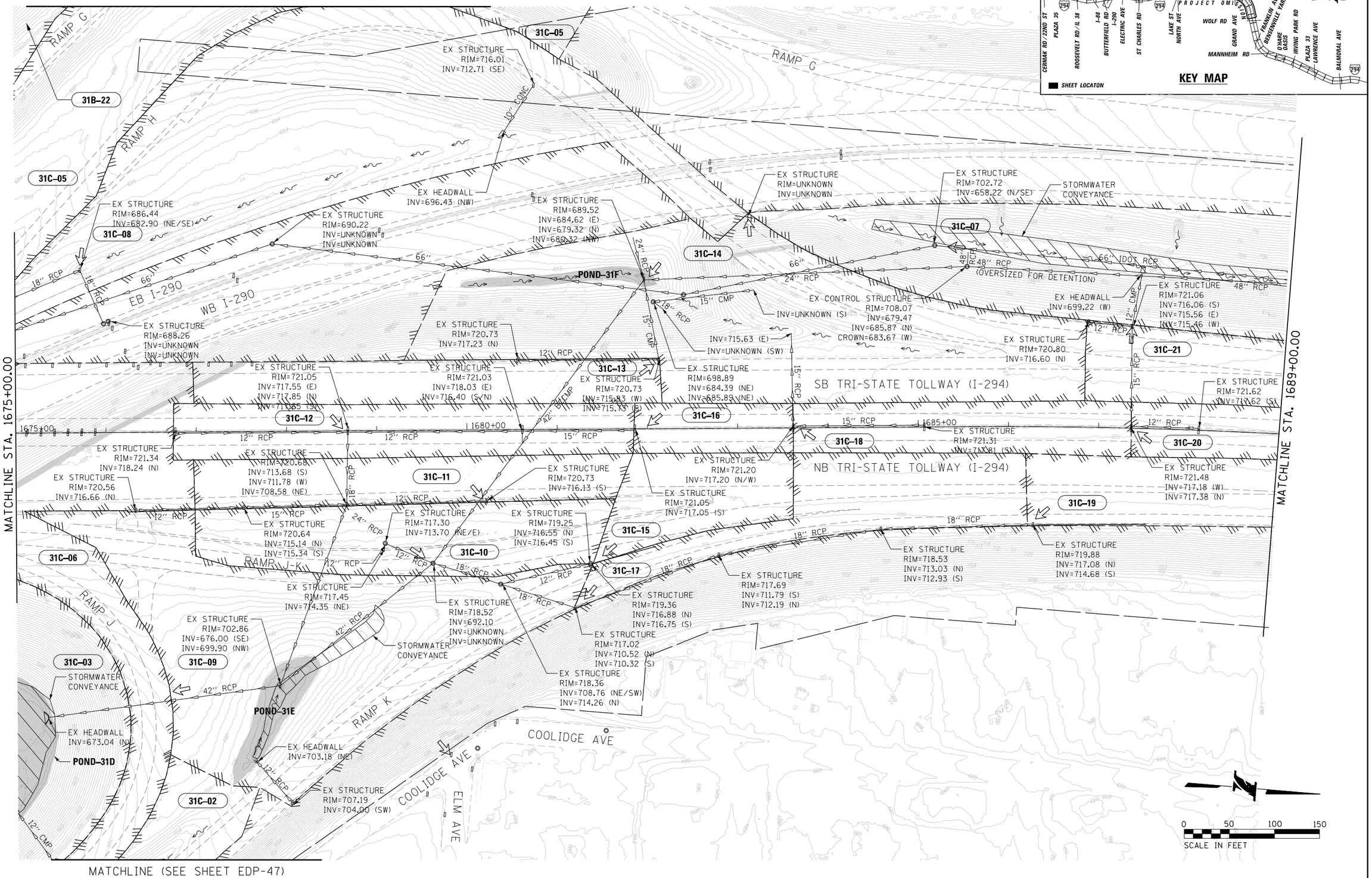
RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-08
DRAWING NO. 19 OF 196

Default
pw:\\OCICLUS01.jacobs.com:NA\Documents\C9X24600.Central.Tri-State.Tollway\C9X24600\700CADD\Jacobs\705DRAIN\Plan & Profile\4224J-sht-ex-drain-008.dgn
100.0000 ' / in. 12/20/2017
gomezkl

MATCHLINE (SEE SHEET EDP-48)



DRAWN BY	KLG	SCALE	1" = 50'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015
CHECKED BY	SN	DATE	12/22/2017		

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-09
DRAWING NO. 20 OF 196

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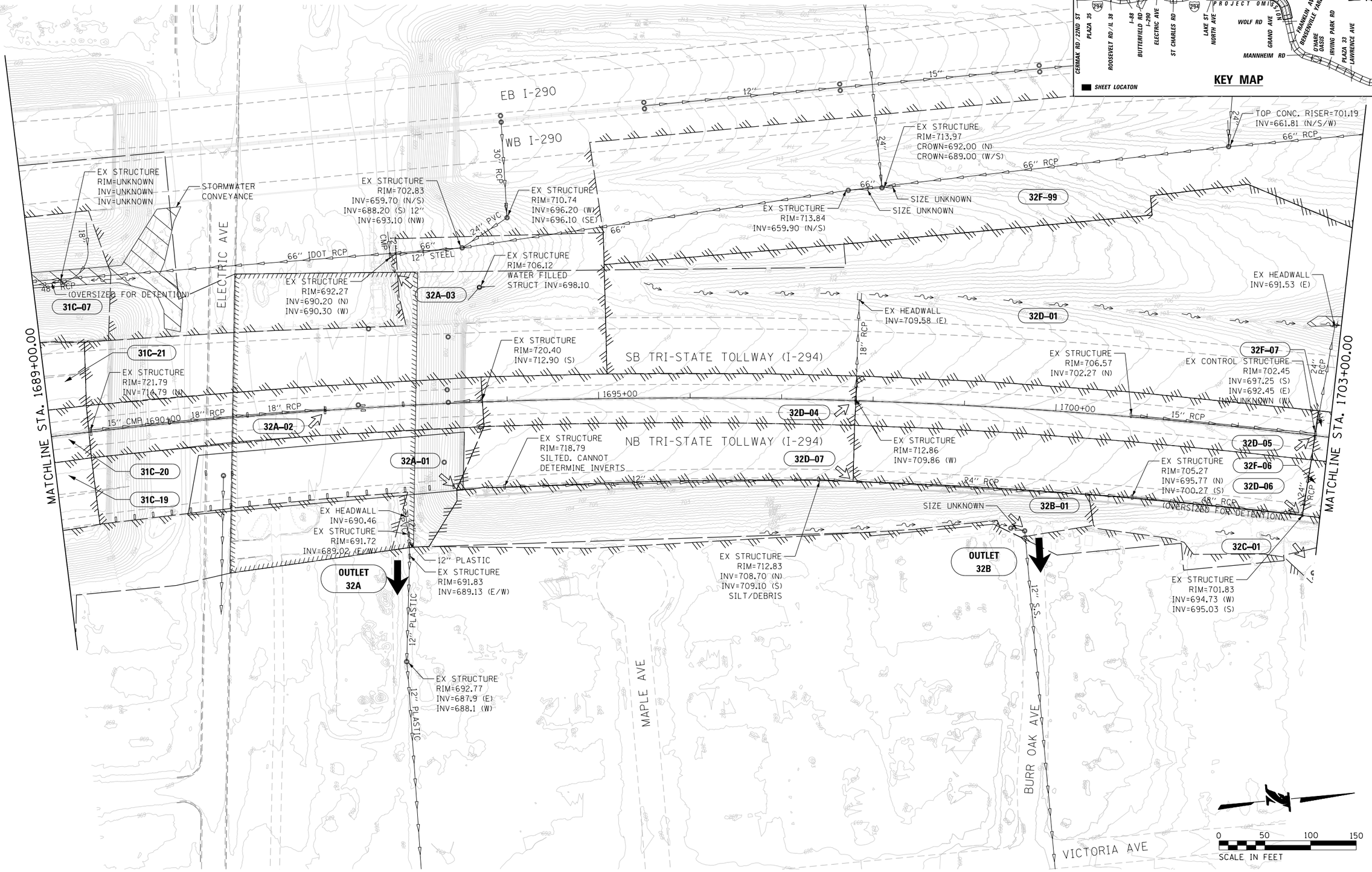
gomezkl
12/20/2017
100.00000 = 1 in.



DRAWN BY	KLG	SCALE	1" = 50'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY 2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515	RR-14-4224
CHECKED BY	SN	DATE	12/22/2017			REVISIONS: NO. / DATE / DESCRIPTION	EXHIBIT A5.2-4 EXISTING DRAINAGE PLAN
							SHEET NO. EDP-10 DRAWING NO. 21 OF 196

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gomezx1
12/20/2017
100.0000 / in.

MATCHLINE (SEE SHEET EDP-49)

WB I-290

SB TRI-STATE TOLLWAY (I-294)

NB TRI-STATE TOLLWAY (I-294)

MATCHLINE STA. 1703+00.00

MATCHLINE STA. 1716+00.00

36"

24"

66" RCP

EX STRUCTURE
RIM=687.53
INV=661.83 (N/S/E)

NO STRUCTURE FOUND
RIM=687.53
INV=661.83 (W/E)

15" RCP

EX STRUCTURE
RIM=679.50
INV=661.85 (N/S)

STORMWATER CONVEYANCE

NO STRUCTURE FOUND

POND-32F

RAMP G

RAMP H

STORMWATER CONVEYANCE

EX HEADWALL
INV=673.46 (NE)

EX HEADWALL
INV=UNKNOWN

NO STRUCTURE FOUND
RIM=669.65
INV=667.78 (SW)

INV=679.44 (S)

INV=682.51 (N)

STORMWATER CONVEYANCE

POND-32A

2x30" RCP

OUTLET 32D

OUTLET 32F

32F-99

32D-01

32F-01

32F-02

15" RCP

30" RCP

EX CONTROL STRUCTURE
RIM=676.25
INV=670.00 (N)
INV=669.55 (S)
WATER/DEBRIS

EX STRUCTURE
RIM=676.22
STRUCT INV=671.72
DEBRIS/SEDIMENT

32K-08

32F-03

EX STRUCTURE
RIM=677.14
WATER & DEBRIS FILLED

32K-09

1705+00

1710+00

1715+00

EX STRUCTURE
RIM=692.66
INV=688.26 (E)

32F-07

32F-04

32F-06

EX STRUCTURE
RIM=692.17
INV=687.17 (N)
INV=687.07 (W)
INV=687.47 (S)

54" RCP

EX STRUCTURE
RIM=686.03
INV=672.93 (N)
INV=681.33 (S)

EX STRUCTURE
RIM=681.49
INV=671.99 (N)
INV=672.49 (S)

32F-05

12" RCP

18" RCP

36" RCP
(OVERSIZED FOR DETENTION)

36" RCP
(OVERSIZED FOR DETENTION)

32H-02

32E-01

EX STRUCTURE
RIM=678.37
STRUCT INV=671.10
INV=672.10 (W)
FILLED WITH WATER

32G-01

COOLIDGE AVE

EX STRUCTURE
RIM=699.94
INV=695.49 (N)

32C-01

OUTLET 32C

12" S.S.

OUTLET 32E

12" S.S.

BOHLANDER AVE

ALBIN TERRACE

VICTORIA AVE

ATWOOD AVE

0 50 100 150
SCALE IN FEET

KEY MAP

SHEET LOCATON

CERMAK RD /22ND ST
PLAZA 35
ROOSEVELT RD / IL 38
I-88
BUTTERFIELD RD
I-290
ELECTRIC AVE
ST CHARLES RD
LAKE ST
NORTH AVE
PROJECT OMISSION
WOLF RD
GRAND AVE
MANNHEIM RD
FRANKLIN AVE
BENSENVILLE YARD
O'HARE OASIS
IRVING PARK RD
PLAZA 32
LAWRENCE AVE
BALMORAL AVE

Default
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gomezkl
12/20/2017
100.0000 / in.

DRAWN BY	KLG	SCALE	1" = 50'		
CHECKED BY	SN	DATE	12/22/2017		

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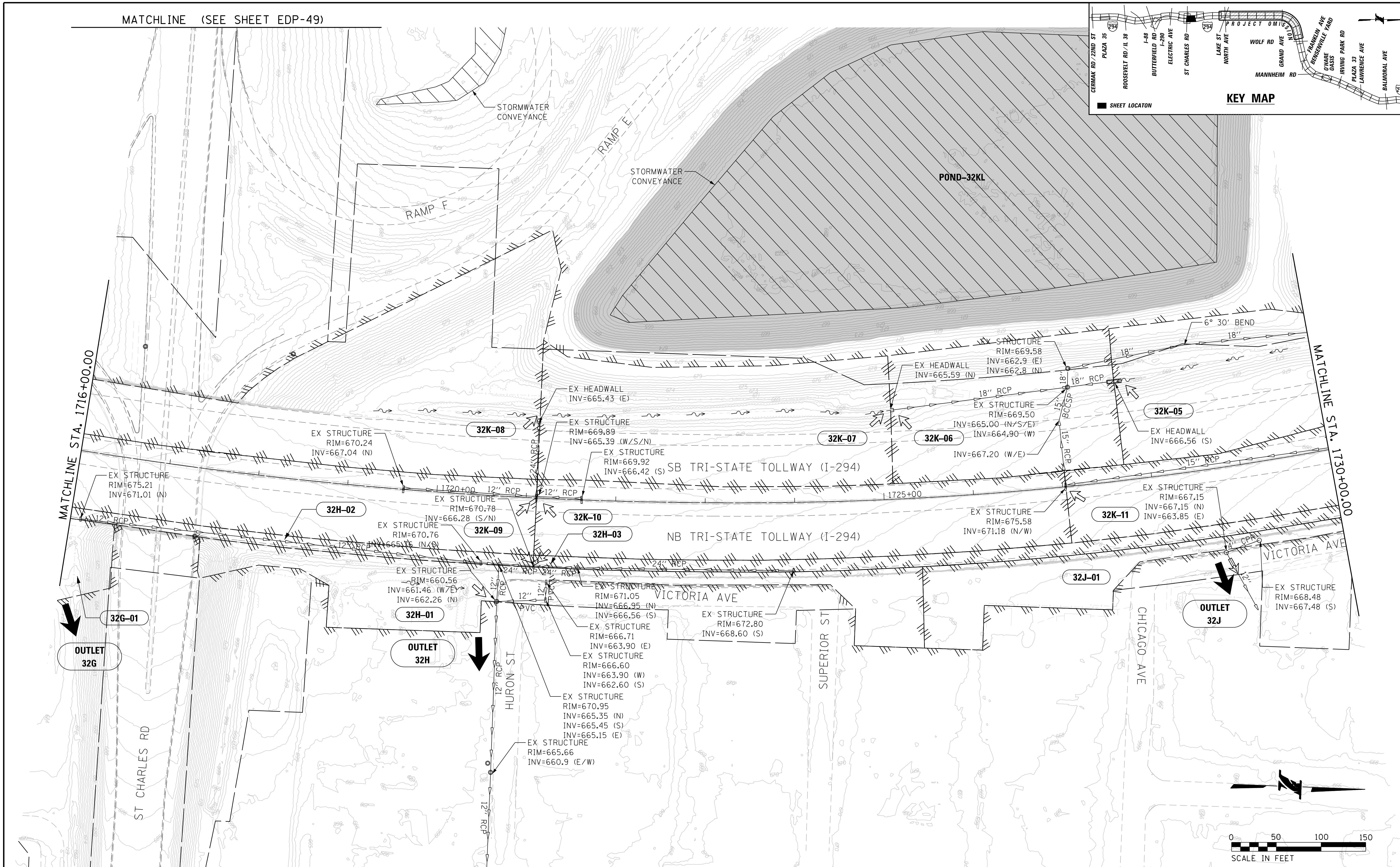
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

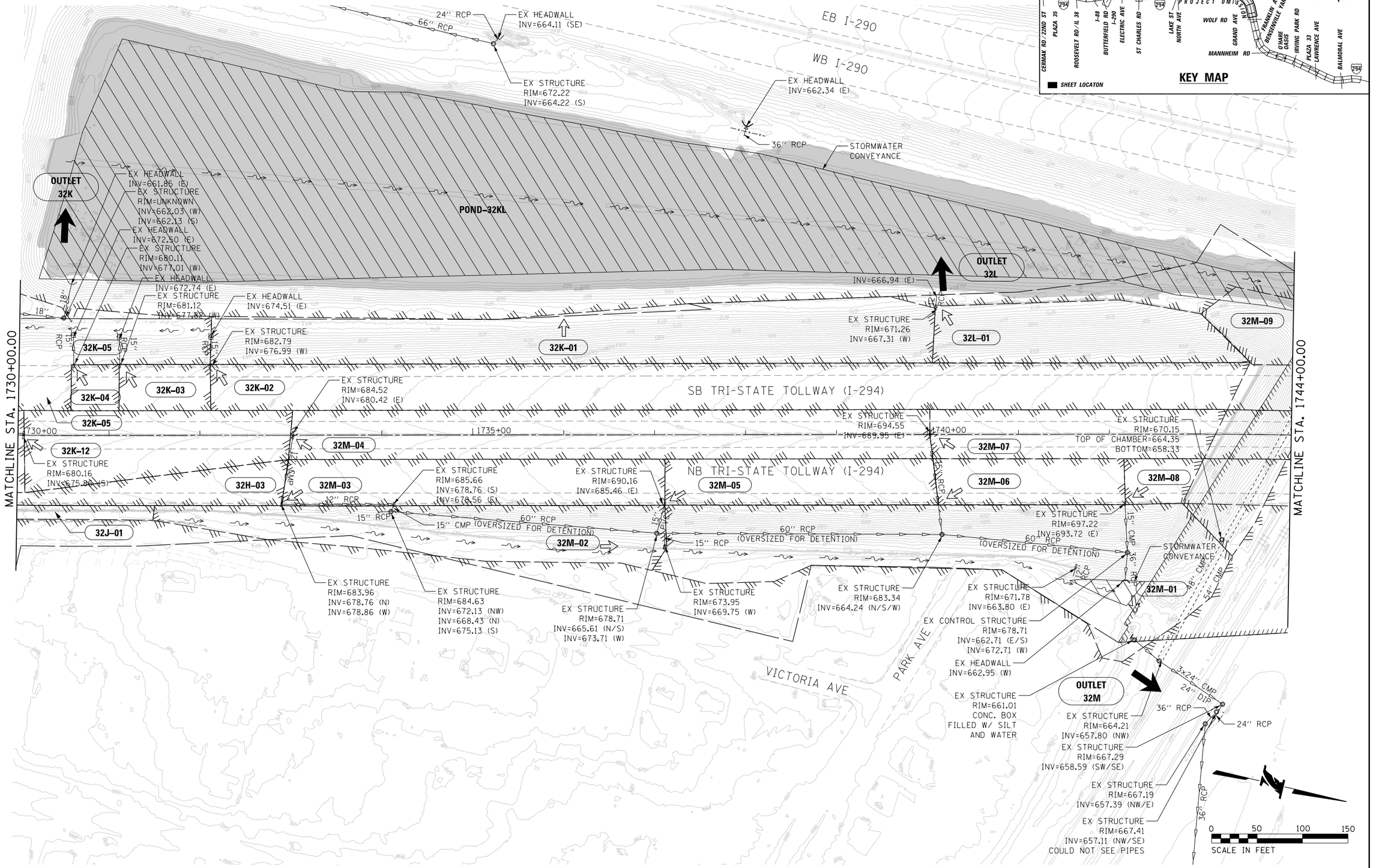
EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO.
EDP-11
DRAWING NO.
22 OF 196


MATCHLINE (SEE SHEET EDP-49)
KEY MAP
SHEET LOCATON
CERMAK RD/22ND ST
PLAZA 35
ROOSEVELT RD/IL 38
I-88
BUTTERFIELD RD
I-290
ELECTRIC AVE
ST CHARLES RD
LAKE ST
NORTH AVE
PROJECT OMISSION
WOLF RD
GRAND AVE
FRANKLIN AVE
BENSENVILLE YARD
O'HARE OASIS
IRVING PARK RD
PLAZA 33
LAWRENCE AVE
MANNHEIM RD
BALMORAL AVE
STORMWATER CONVEYANCE
RAMP E
RAMP F
POND-32KL
MATCHLINE STA. 1716+00.00
MATCHLINE STA. 1730+00.00
SB TRI-STATE TOLLWAY (I-294)
NB TRI-STATE TOLLWAY (I-294)
VICTORIA AVE
ST CHARLES RD
HURON ST
SUPERIOR ST
CHICAGO AVE
6° 30' BEND
EX STRUCTURE RIM=669.58 INV=662.9 (E) INV=662.8 (N)
EX HEADWALL INV=665.59 (N)
EX STRUCTURE RIM=669.50 INV=665.00 (N/S/E) INV=664.90 (W)
INV=667.20 (W/E)
EX HEADWALL INV=666.56 (S)
EX HEADWALL INV=665.43 (E)
EX STRUCTURE RIM=669.89 INV=665.39 (W/S/N)
EX STRUCTURE RIM=669.92 INV=666.42 (S)
EX STRUCTURE RIM=670.24 INV=667.04 (N)
EX STRUCTURE RIM=675.21 INV=671.01 (N)
EX STRUCTURE RIM=670.78 INV=666.28 (S/N)
EX STRUCTURE RIM=670.76 INV=665.76 (N/S)
EX STRUCTURE RIM=660.56 INV=661.46 (W/E) INV=662.26 (N)
EX STRUCTURE RIM=671.05 INV=666.95 (N) INV=666.56 (S)
EX STRUCTURE RIM=666.71 INV=663.90 (E)
EX STRUCTURE RIM=666.60 INV=663.90 (W) INV=662.60 (S)
EX STRUCTURE RIM=670.95 INV=665.35 (N) INV=665.45 (S) INV=665.15 (E)
EX STRUCTURE RIM=665.66 INV=660.9 (E/W)
EX STRUCTURE RIM=672.80 INV=668.60 (S)
EX STRUCTURE RIM=675.58 INV=671.18 (N/W)
EX STRUCTURE RIM=667.15 INV=667.15 (N) INV=663.85 (E)
EX STRUCTURE RIM=668.48 INV=667.48 (S)
32K-05
32K-06
32K-07
32K-08
32K-09
32K-10
32K-11
32H-01
32H-02
32H-03
32G-01
32J-01
OUTLET 32G
OUTLET 32H
OUTLET 32J
1720+00
1725+00
18" RCP
15" RCP
15" BCCSP
12" RCP
24" RCP
12" PVC
0 50 100 150
SCALE IN FEET

DRAWN BY KLG	SCALE 1" = 50'	JACOBS 525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY 2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515	RR-14-4224
CHECKED BY SN	DATE 12/22/2017		REVISIONS: NO. / DATE / DESCRIPTION	EXHIBIT A5.2-4 EXISTING DRAINAGE PLAN

SHEET NO. EDP-12
DRAWING NO. 23 OF 196



DRAWN BY	KLG	SCALE	1" = 50'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY 2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515	RR-14-4224
CHECKED BY	SN	DATE	12/22/2017			REVISIONS: NO. / DATE / DESCRIPTION	EXHIBIT A5.2-4 EXISTING DRAINAGE PLAN

SHEET NO. EDP-13
DRAWING NO. 24 OF 196

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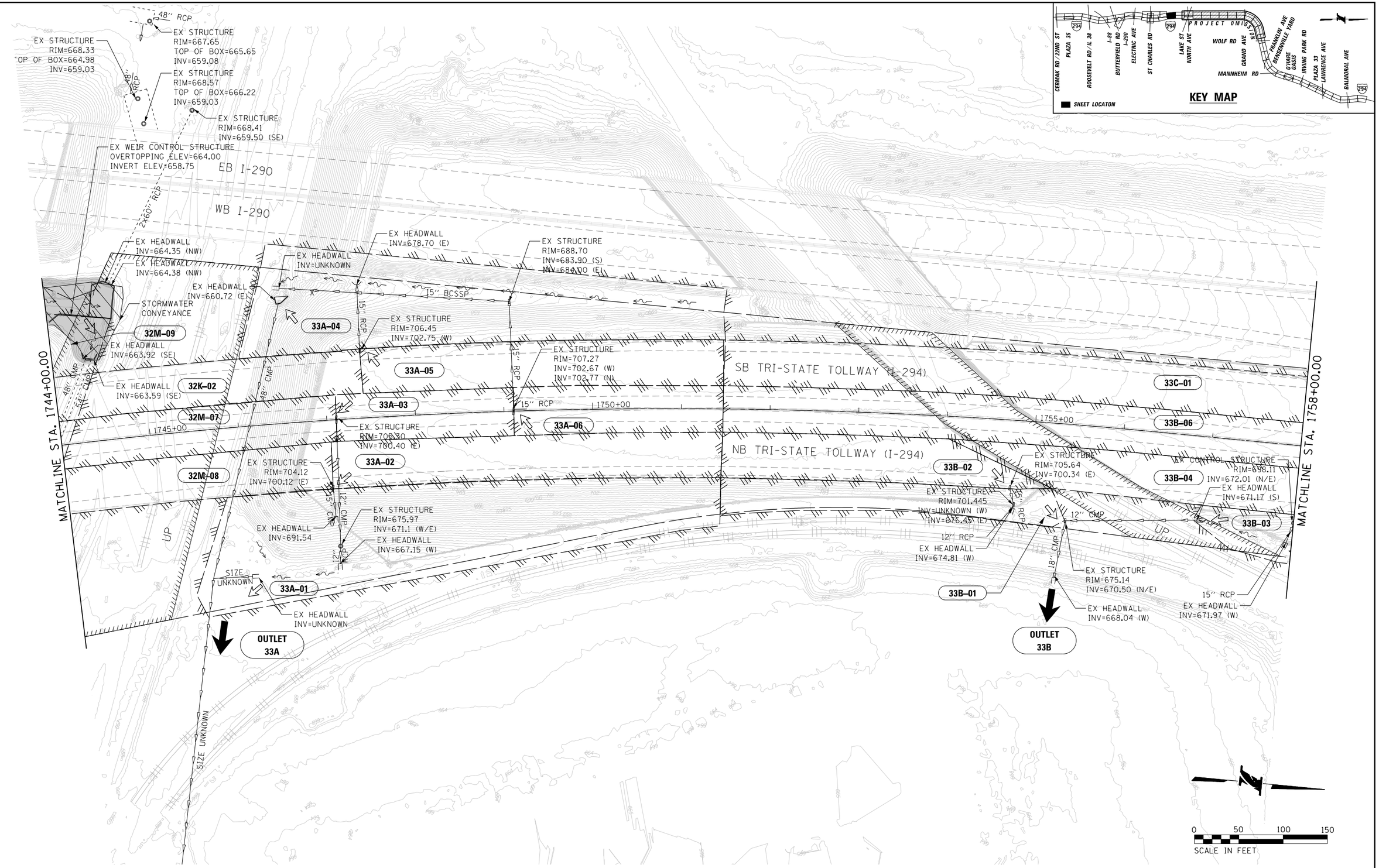
gomezkl
12/20/2017
100.00000 / in.



DRAWN BY	KLG	SCALE	1" = 50'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY 2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515	RR-14-4224
CHECKED BY	SN	DATE	12/22/2017			REVISIONS: NO. / DATE / DESCRIPTION	EXHIBIT A5.2-4 EXISTING DRAINAGE PLAN
							SHEET NO. EDP-14 DRAWING NO. 25 OF 196

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12/20/2017
100.0000 / in.
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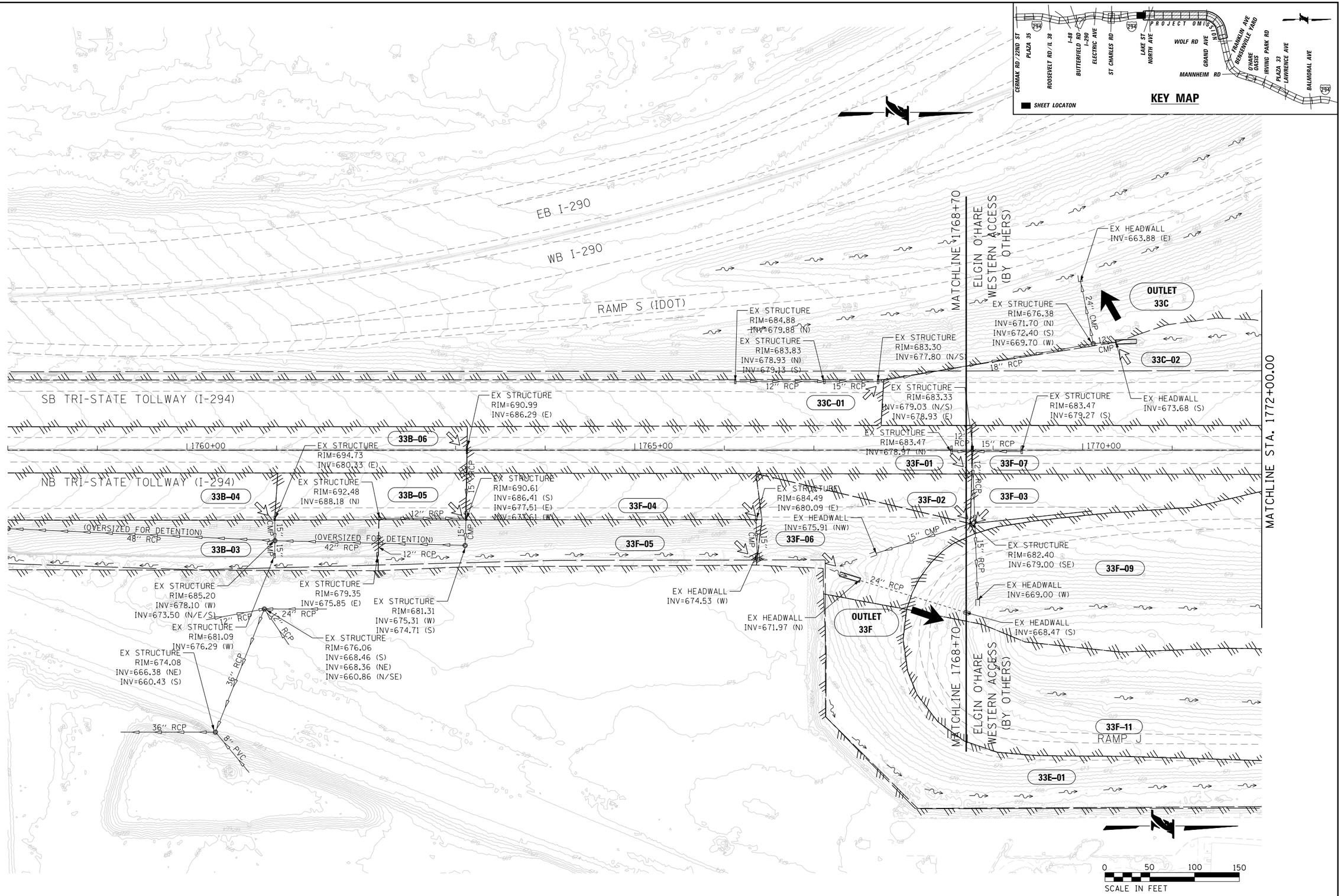

DRAWN BY	KLG	SCALE	1" = 50'
CHECKED BY	SN	DATE	12/22/2017

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Telephone: 312.251.3000
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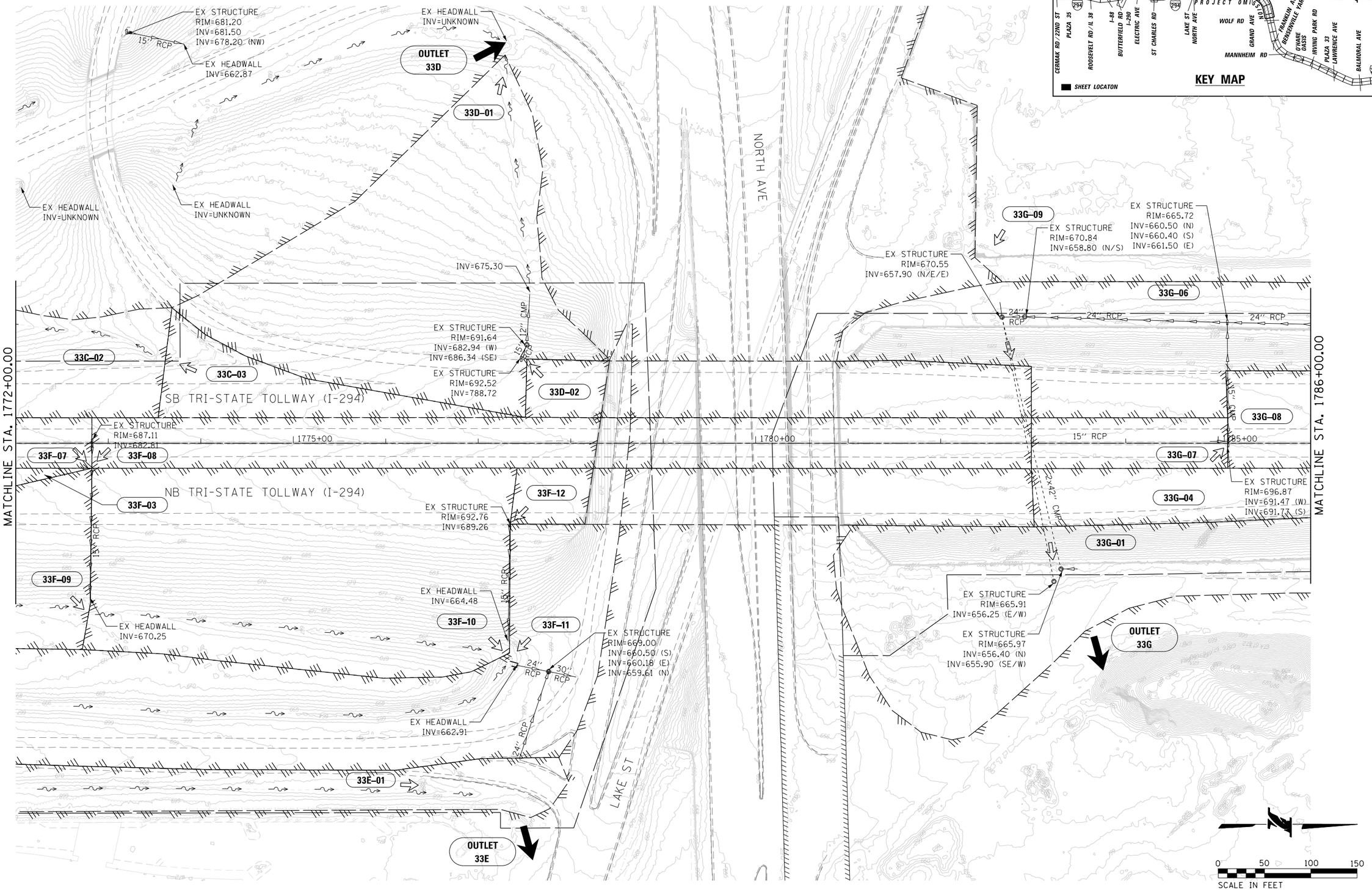
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-15
DRAWING NO. 26 OF 196



DRAWN BY	KLG	SCALE	1" = 50'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY 2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515	RR-14-4224
CHECKED BY	SN	DATE	12/22/2017			REVISIONS: NO. / DATE / DESCRIPTION	EXHIBIT A5.2-4 EXISTING DRAINAGE PLAN

SHEET NO. EDP-16
DRAWING NO. 27 OF 196

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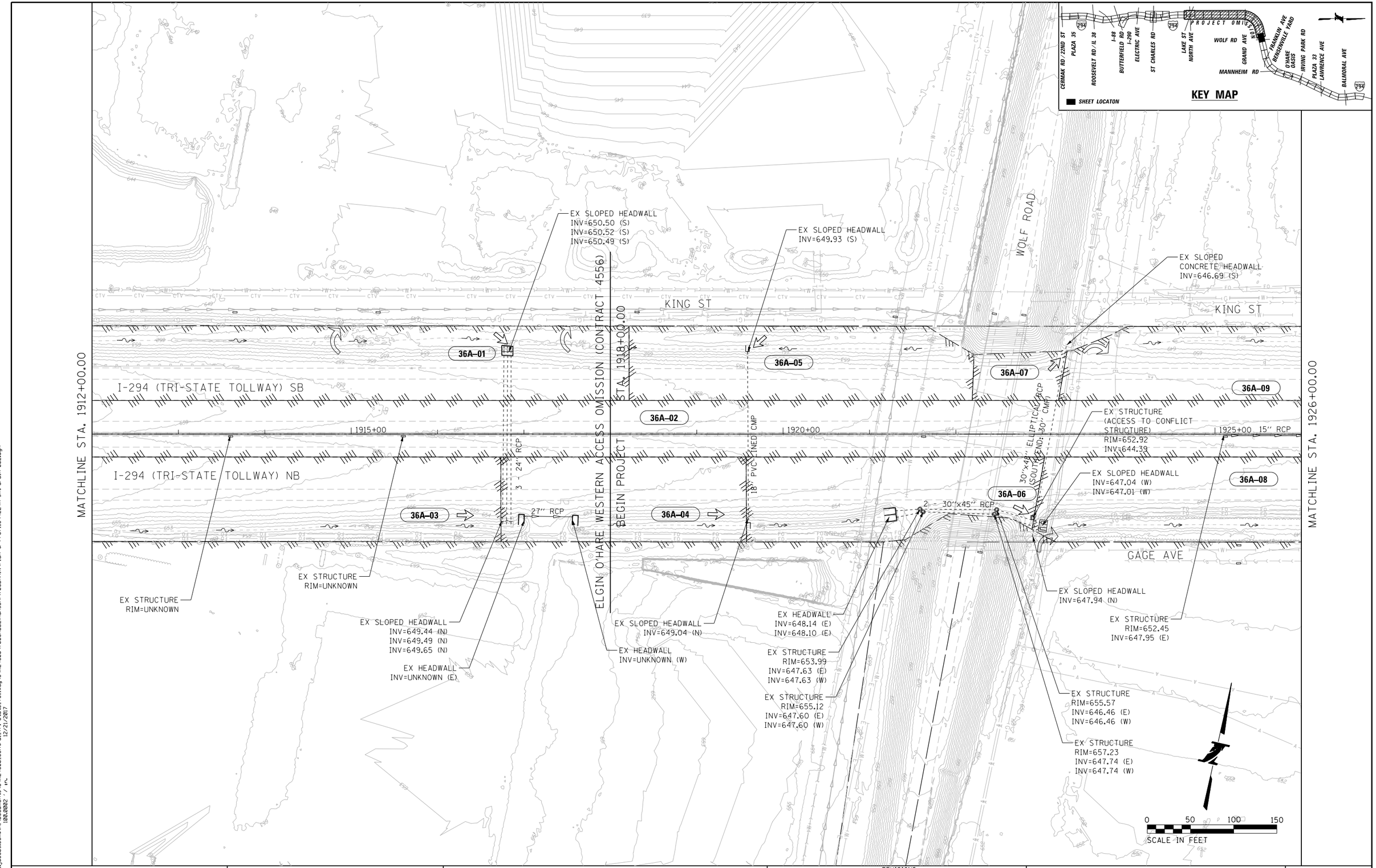
gomezkl
12/20/2017
100.0000 / in.



LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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12/21/2017
100.0002 / in.
hanv01663

DRAWN BY KRH SCALE 1" = 50'
CHECKED BY JJW DATE 12/22/2017

HANSON
750 Warrenville Rd, Suite 200
Lisle, Illinois 60532
Telephone: 630.990.3800
Fax: 630.990.3801

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

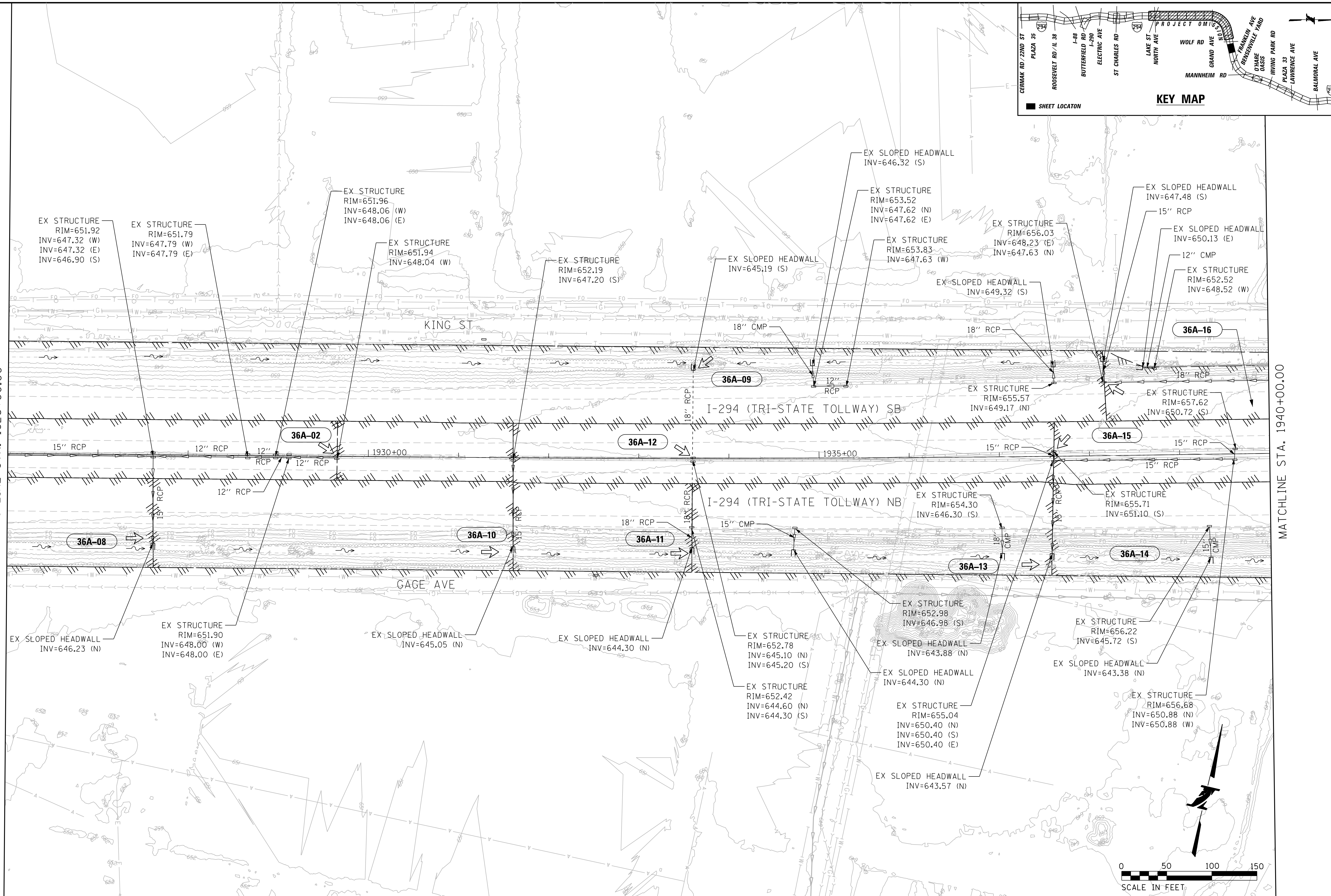
REVISIONS

NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-26
DRAWING NO. 28 OF 196



DRAWN BY	KRH	SCALE	1" = 50'
CHECKED BY	JJW	DATE	12/22/2017

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750 Warrenville Rd, Suite 200
Lisle, Illinois 60532
Telephone: 630.990.3800
Fax: 630.990.3801

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS

NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-27
DRAWING NO. 29 OF 196

LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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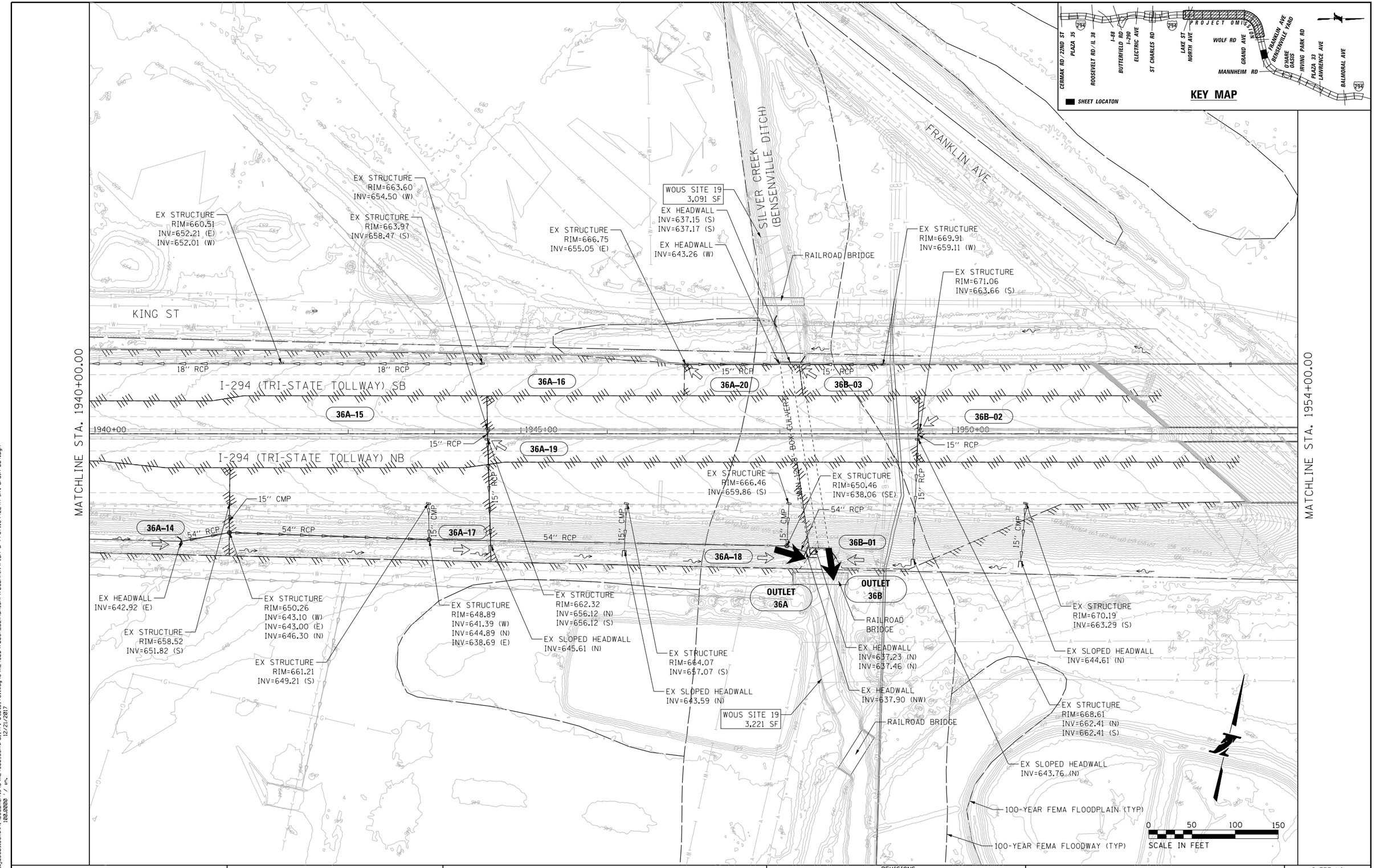

LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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12/21/2017
100.0000 / in.
hehn01653

DRAWN BY	KRH	SCALE	1" = 50'
CHECKED BY	JJW	DATE	12/22/2017

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Lisle, Illinois 60532
Telephone: 630.990.3800
Fax: 630.990.3801

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-28
DRAWING NO. 30 OF 196

LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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100.0000 = in. 12/21/2017
hehrdl6563

DRAWN BY	KRH	SCALE	1'' = 50'
CHECKED BY	JJW	DATE	12/22/2017

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Lisle, Illinois 60532
Telephone: 630.990.3800
Fax: 630.990.3801

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

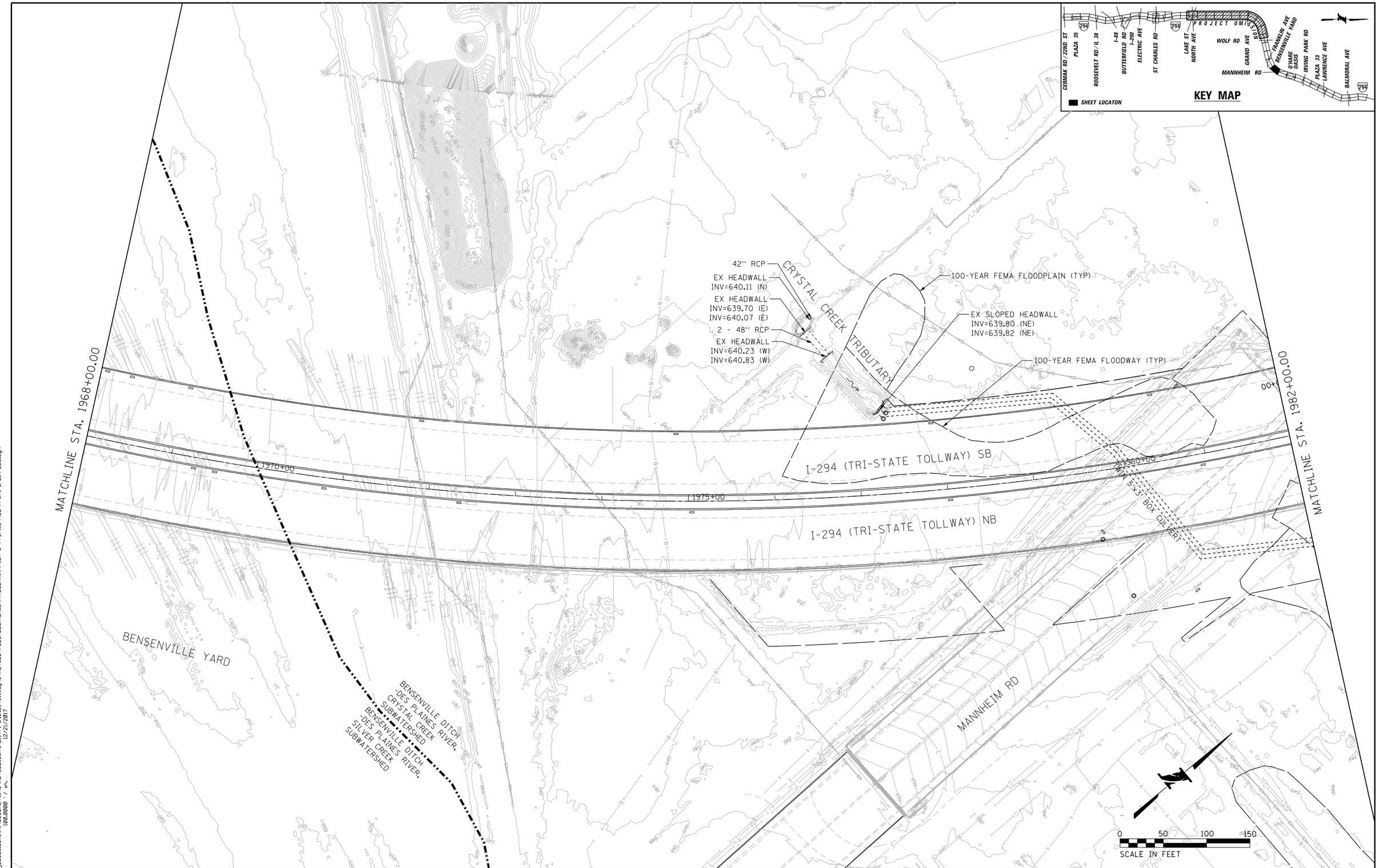
REVISIONS

NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO.
EDP-29
DRAWING NO.
31 OF 196



LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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12/21/2017
100.0000 / in.
hennDI663

DRAWN BY	KRH	SCALE	1" = 50'
CHECKED BY	JJW	DATE	12/22/2017

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Fax: 630.990.3801

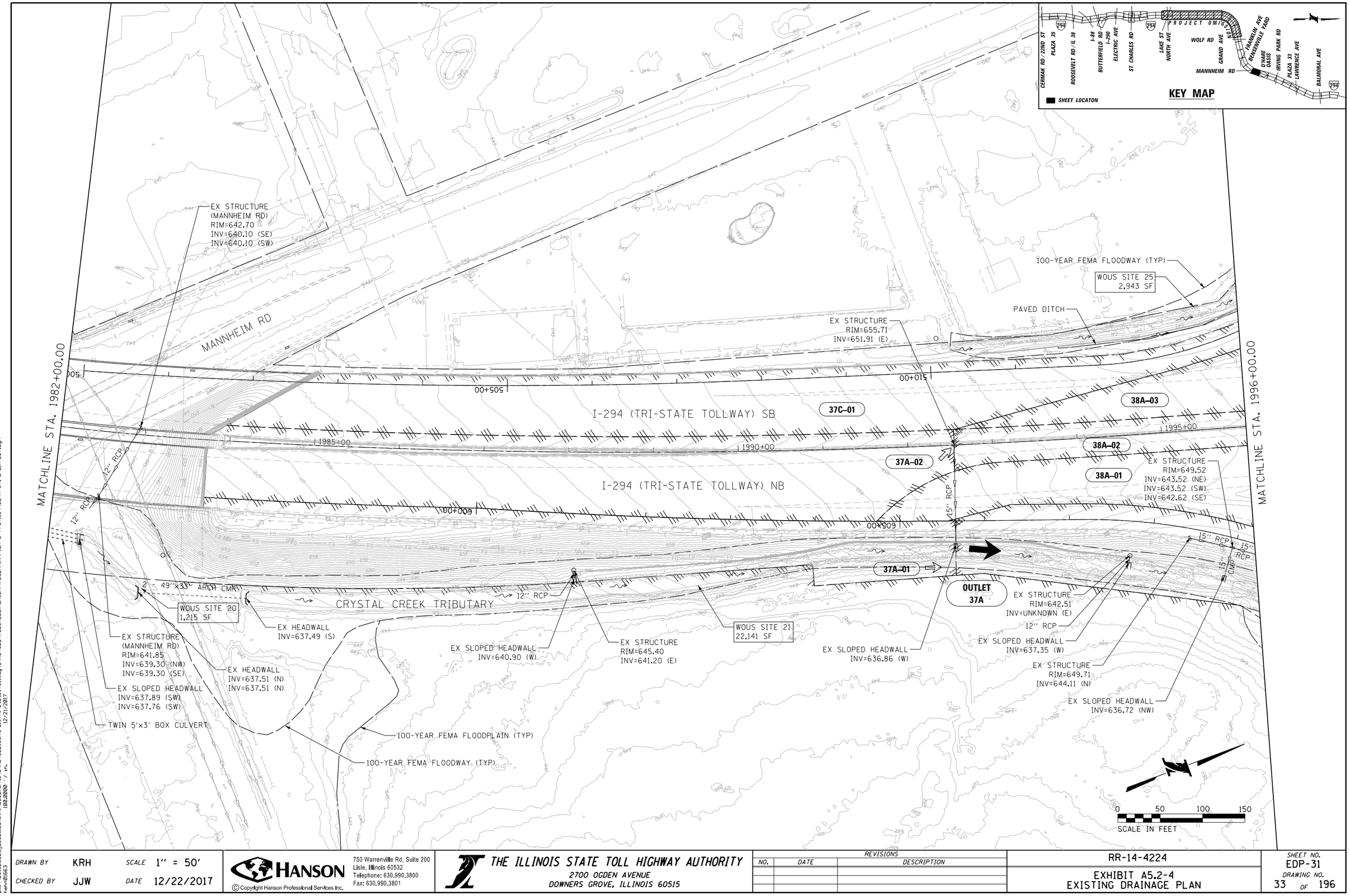
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-30
DRAWING NO. 32 OF 196



LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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12/21/2017
100.00000 / in.
hennr81663

DRAWN BY	KRH	SCALE	1" = 50'
CHECKED BY	JJW	DATE	12/22/2017

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Lisle, Illinois 60532
Telephone: 630.990.3800
Fax: 630.990.3801

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

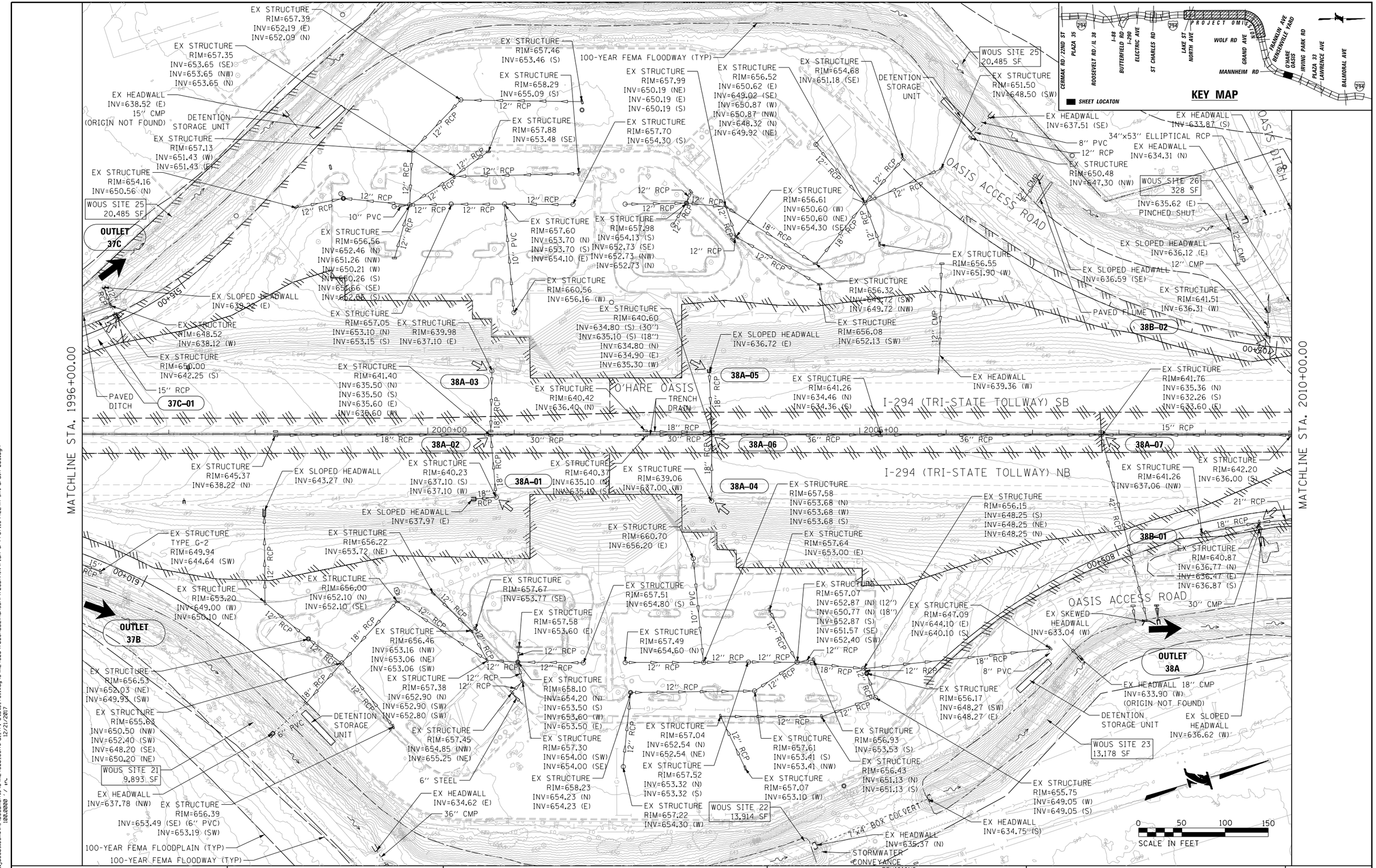
REVISIONS

NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO.
EDP-31
DRAWING NO.
33 OF 196



LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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12/21/2017
100.0000 / in.
hen\01663

DRAWN BY KRH SCALE 1" = 50'
CHECKED BY JJW DATE 12/22/2017

HANSON
750 Warrenville Rd, Suite 200
Lisle, Illinois 60532
Telephone: 630.990.3800
Fax: 630.990.3801

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

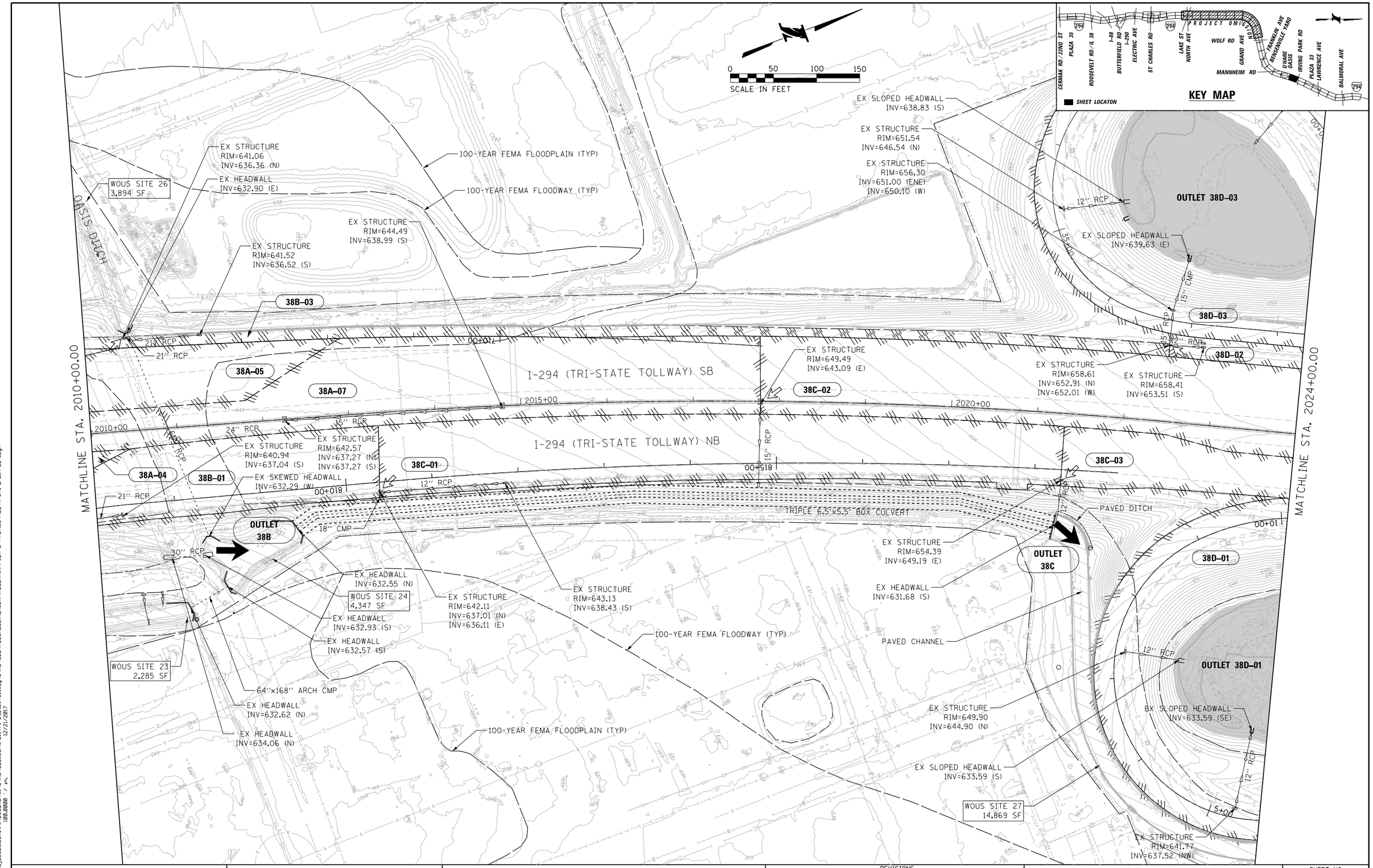
REVISIONS

NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-32
DRAWING NO. 34 OF 196



LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	01/14/17

DeFault
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12/21/2017
100.0000 / in.
hwm01663

DRAWN BY	KRH	SCALE	1" = 50'
CHECKED BY	JJW	DATE	12/22/2017

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750 Warrenville Rd, Suite 200
Lisle, Illinois 60532
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THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

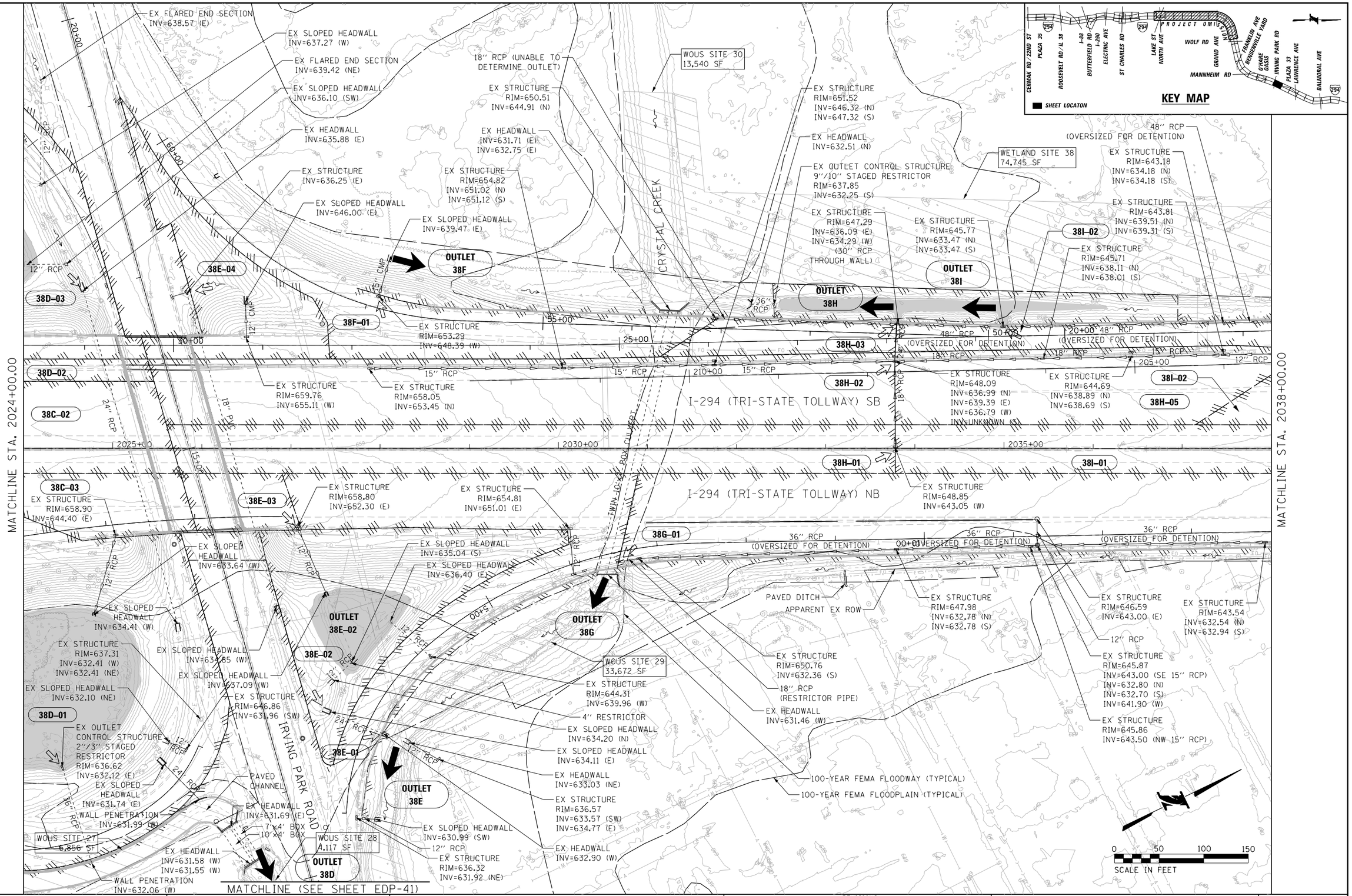
REVISIONS

NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO.
EDP-33
DRAWING NO.
35 OF 196



LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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12/21/2017
100.0000 / in.
hanh01663

DRAWN BY	KRH	SCALE	1" = 50'
CHECKED BY	JJW	DATE	12/22/2017

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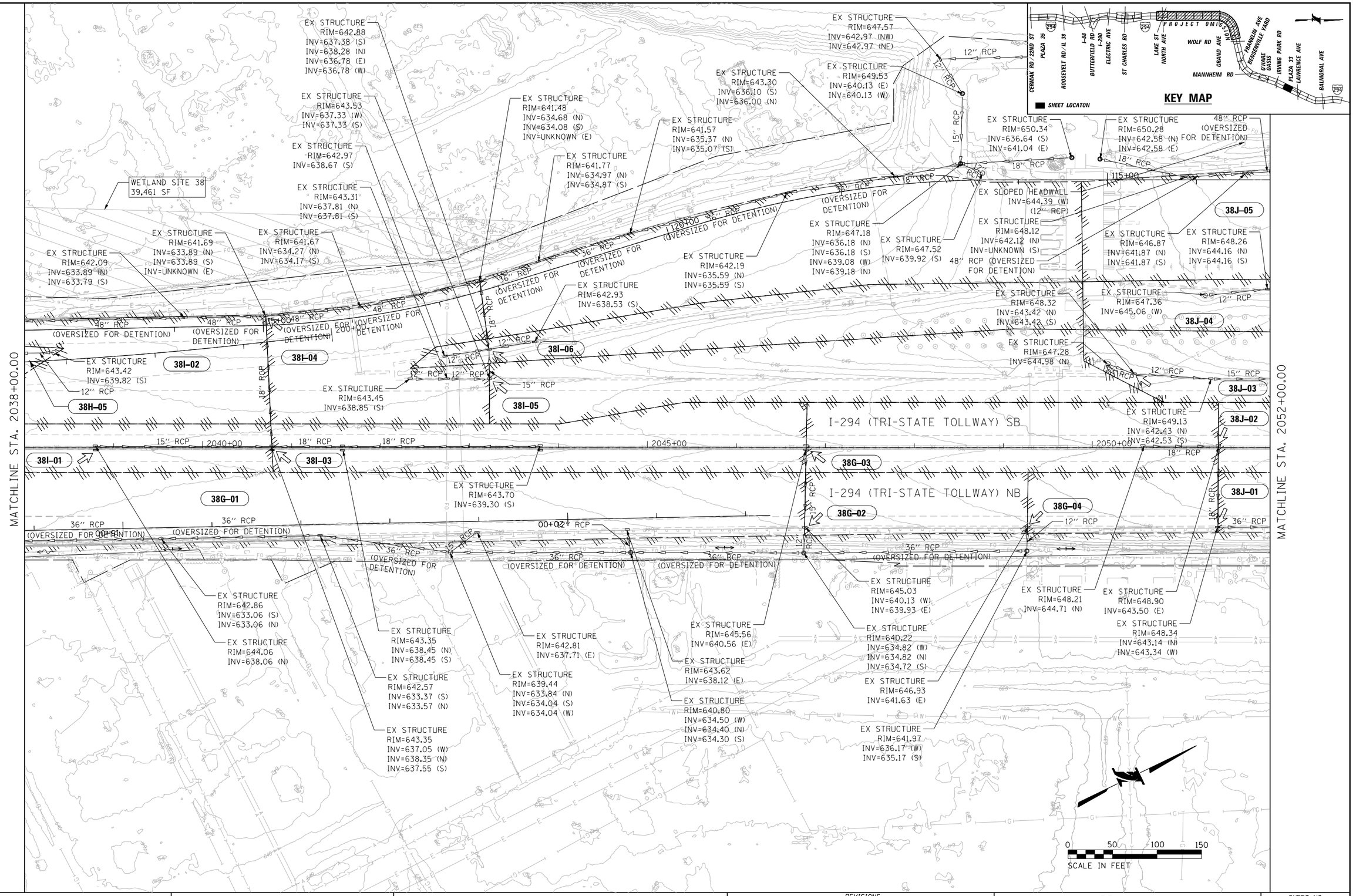
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO.
EDP-34
DRAWING NO.
36 OF 196



LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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12/21/2017
100.0000 / in.
hanm01663

DRAWN BY	KRH	SCALE	1" = 50'
CHECKED BY	JJW	DATE	12/22/2017

HANSON
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THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224
EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-35
DRAWING NO. 37 OF 196

EX PRE-CAST CONCRETE PIPE END SECTION INV=639.18 (E)

53"x34" ELLIPTICAL RCP
EX STRUCTURE RIM=643.57
INV=639.57 (N)
INV=639.57 (S)
INV=639.57 (E)
INV=639.57 (W)

48" RCP (OVERSIZED FOR DETENTION)

EX STRUCTURE RIM=647.63
INV=640.43 (N)
INV=640.23 (S)

53"x34" ELLIPTICAL RCP
EX STRUCTURE RIM=649.77
INV=639.77 (N)
INV=639.57 (E)
INV=639.57 (W)
INV=UNKNOWN (S)

12" RCP

EX SLOPED HEADWALL INV=640.57 (W)

EX SLOPED HEADWALL INV=640.39 (S)

EX SLOPED HEADWALL INV=640.03 (N)

EX STRUCTURE RIM=646.62
INV=641.22 (N)
INV=641.02 (S)

EX STRUCTURE RIM=647.45
INV=640.45 (N)
INV=640.35 (S)

PLAZA ACCESS ROAD

LAWRENCE AVENUE

12" RCP

18" RCP

48" RCP (OVERSIZED FOR DETENTION)

48" RCP (OVERSIZED FOR DETENTION)

PAVED FLUME

110+00

38J–05

12" RESTRICTOR

12" RESTRICTOR

38J–12

EX STRUCTURE RIM=652.31
INV=640.91 (N)
INV=640.81 (S)

EX STRUCTURE RIM=654.53
INV=641.73 (N)
INV=641.43 (S)

48" RCP (OVERSIZED FOR DETENTION)

42" RCP (OVERSIZED FOR DETENTION)

1065+00

EX STRUCTURE RIM=657.06
INV=642.16 (S)

EX STRUCTURE RIM=650.55
INV=642.65 (N)
INV=642.75 (S)
INV=642.95 (W)

EX STRUCTURE RIM=648.98
INV=643.28 (S)
INV=643.28 (E)

EX STRUCTURE RIM=653.47
INV=639.07 (E)
INV=639.07 (W)
INV=639.07 (S)

38"x24" ELLIPTICAL

12" RCP

38J–04

15" RCP

15" RCP

18" RCP

38J–03

38J–11

I-294 (TRI-STATE TOLLWAY) SB

38J–02

38J–07

38J–09

EX STRUCTURE RIM=650.18
INV=644.88 (N)
INV=644.88 (E)

15" RCP

18" RCP

2055+00

2060+00

2065+00

15" RCP

15" RCP

38J–01

36" RCP (OVERSIZED FOR DETENTION)

38J–08

38J–10

10" RESTRICTOR

36" RCP (OVERSIZED FOR DETENTION)

10" RESTRICTOR

42" RCP (OVERSIZED FOR DETENTION)

I-294 (TRI-STATE TOLLWAY) NB

42" RCP (OVERSIZED FOR DETENTION)

42" RCP (OVERSIZED FOR DETENTION)

18" RCP

EX STRUCTURE RIM=649.48
INV=642.98 (W)
INV=642.38 (N)
INV=642.58 (S)

EX STRUCTURE RIM=652.60
INV=638.80 (E)
INV=638.90 (W)
INV=640.30 (N)
INV=640.60 (S)

OUTLET 38J

638.5=CROWN ELEV OF 12" PVC CONNECTED TO 18" RCP OUTSIDE NOISE WALL
12" PVC OUTLET
NOT FOUND IN SURVEY

EX STRUCTURE RIM=654.99
INV=641.39 (N)
INV=641.19 (S)

EX STRUCTURE RIM=657.33
INV=642.33 (N)
INV=642.03 (S)

EX STRUCTURE RIM=659.60
INV=643.00 (S)

38J–06

36" RCP (OVERSIZED FOR DETENTION)

EX STRUCTURE RIM=651.36
INV=646.76 (S)

EX STRUCTURE RIM=650.77
INV=645.97 (N)
INV=645.97 (S)
INV=645.97 (E)

EX STRUCTURE RIM=650.05
INV=644.05 (W)
INV=642.05 (N)
INV=642.15 (S)

25TH AVE

EX STRUCTURE RIM=660.47
INV=651.77 (N)

30" RCP (OVERSIZED FOR DETENTION)

EX STRUCTURE RIM=661.49
INV=655.79 (E)
INV=657.49 (N)

EX STRUCTURE RIM=661.70
INV=650.90 (N)
INV=651.10 (S)

30" RCP 100+00
(OVERSIZED FOR DETENTION)

39A–03

39A–02

39A–01

30" RCP (OVERSIZED FOR DETENTION)

EX STRUCTURE RIM=660.71
INV=651.91 (N)

EX STRUCTURE RIM=662.03
INV=651.13 (N)
INV=651.43 (S)

30" RCP (OVERSIZED FOR DETENTION)

MATCHLINE STA. 2052+00.00

MATCHLINE STA. 2066+00.00

0 50 100 150
SCALE IN FEET

KEY MAP

CERMAK RD /22ND ST · PLAZA 35 · ROOSEVELT RD / IL 38 · I-88 · BUTTERFIELD RD · I-290 · ELECTRIC AVE · ST CHARLES RD · LAKE ST · NORTH AVE · PROJECT OMITTED · WOLF RD · GRAND AVE · NORTH AVE · MANNHEIM RD · FRANKLIN AVE · BENSENVILLE YARD · O'HARE OASIS · IRVING PARK RD · PLAZA 32 · LAWRENCE AVE · BALMORAL AVE · 294

SHEET LOCATON

LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

Default
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12/21/2017
100.0000 / in.

DRAWN BY KRH SCALE 1" = 50'
CHECKED BY JJW DATE 12/22/2017

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THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

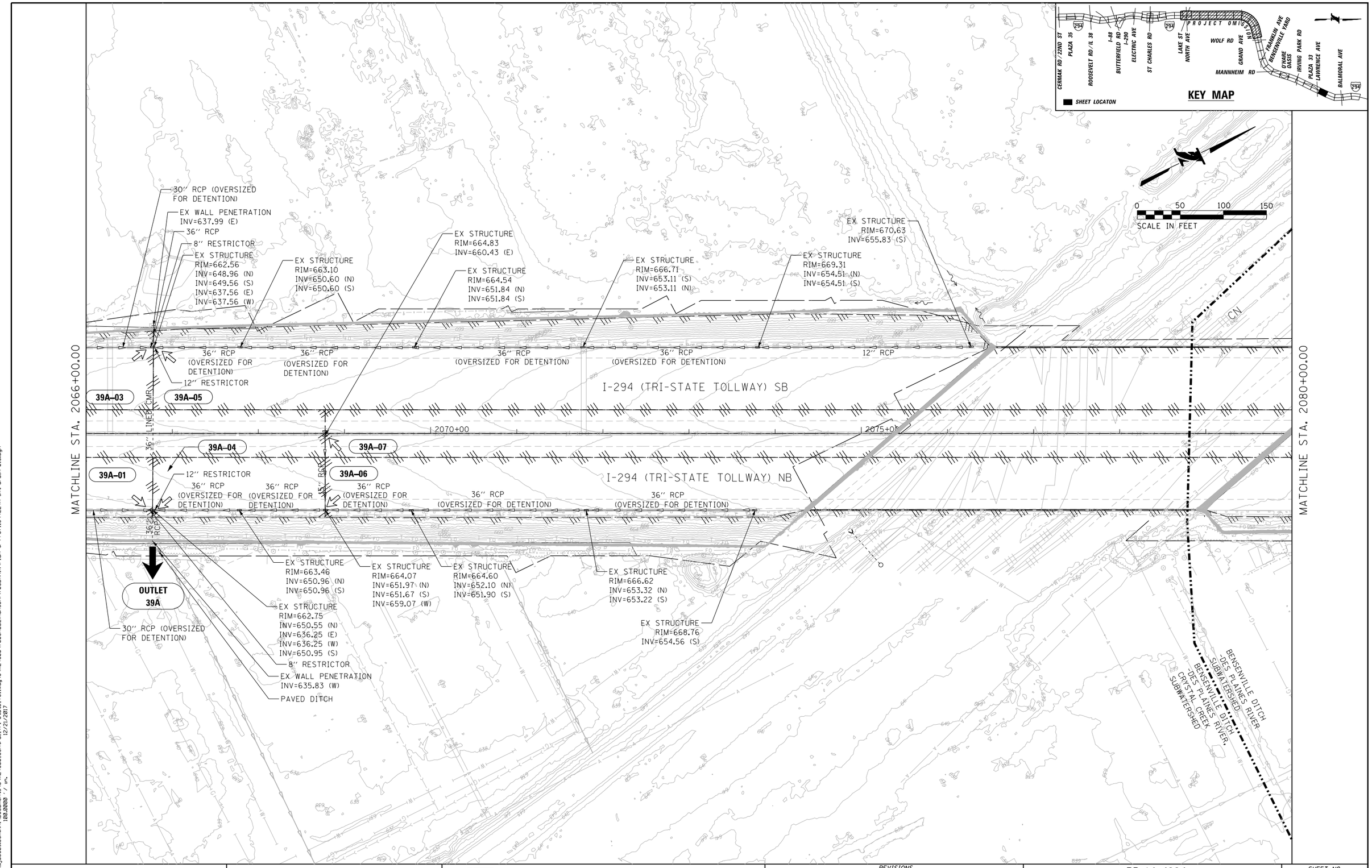
REVISIONS

NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-36
DRAWING NO. 38 OF 196



LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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hehn01663
12/21/2017
100.0000 / in.

DRAWN BY KRH
CHECKED BY JJW
SCALE 1" = 50'
DATE 12/22/2017

HANSON
750 Warrenville Rd. Suite 200
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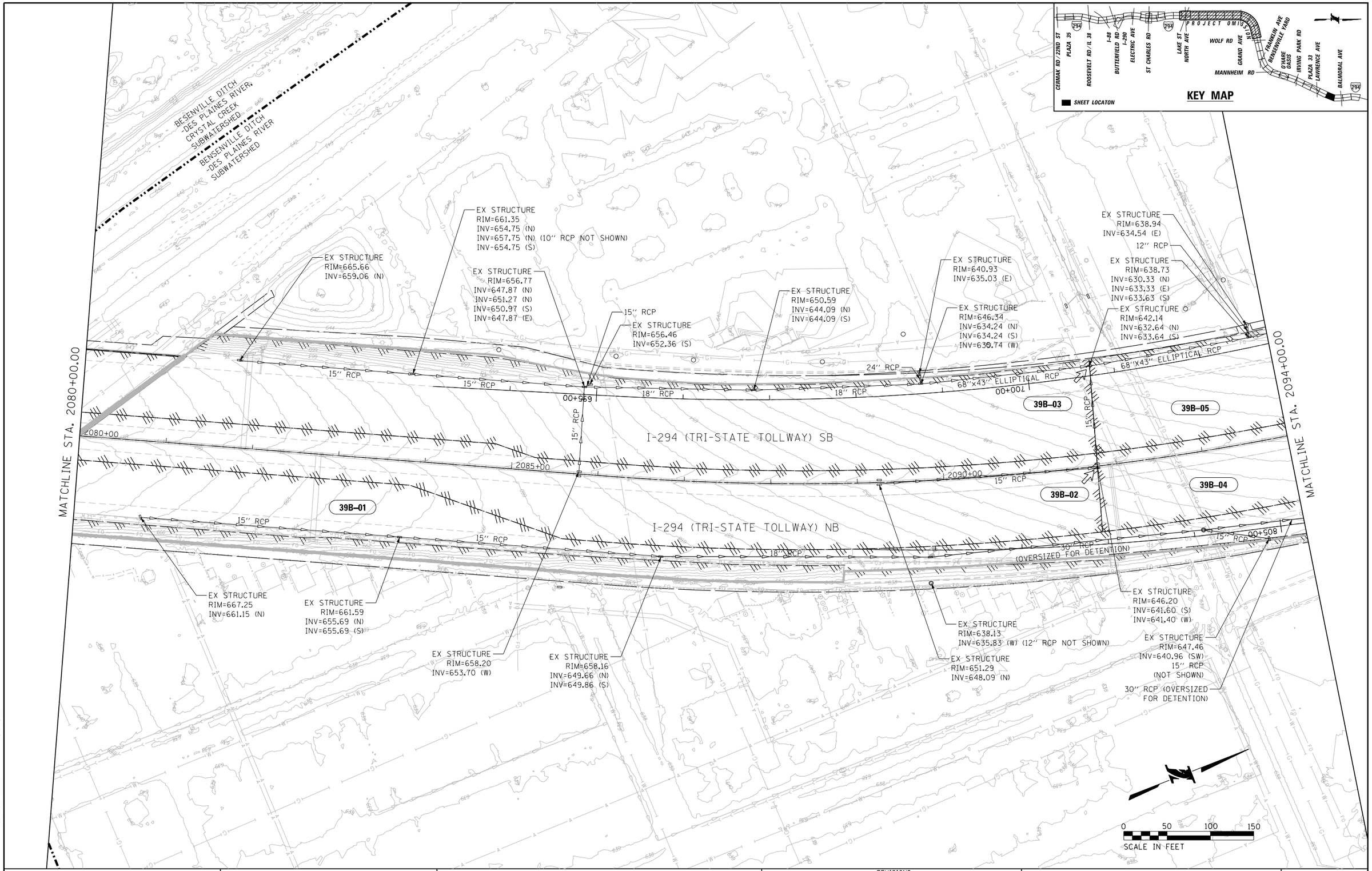
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224
EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-37
DRAWING NO. 39 OF 196



LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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12/21/2017
100.0000 = 1 in.
hehn01663

DRAWN BY	KRH	SCALE	1'' = 50'
CHECKED BY	JJW	DATE	12/22/2017

HANSON
750 Warrenville Rd. Suite 200
Lisle, Illinois 60532
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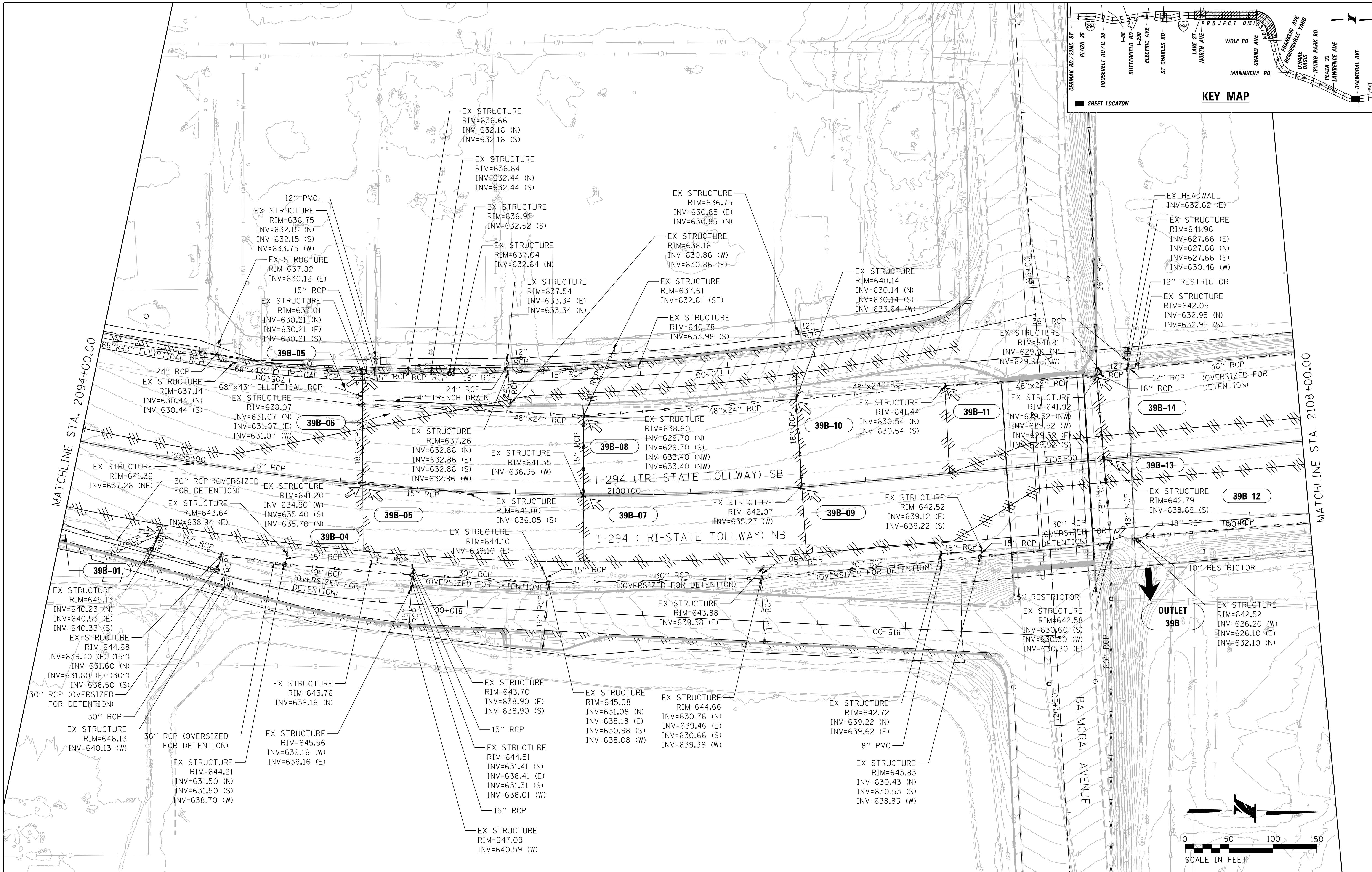
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-38
DRAWING NO. 40 OF 196



DRAWN BY	KRH
CHECKED BY	JJW
SCALE	1" = 50'
DATE	12/22/2017

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THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

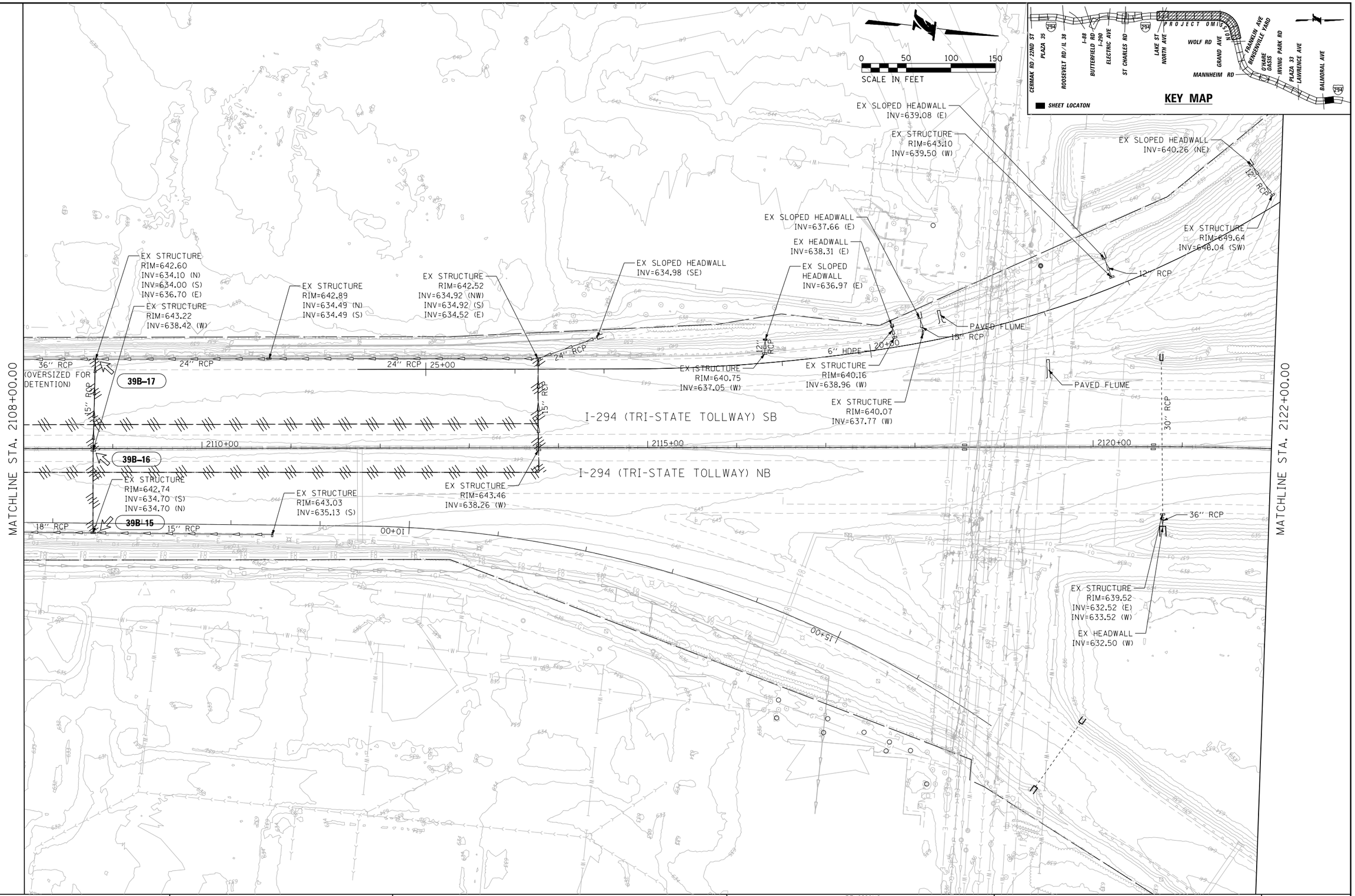
REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-39
DRAWING NO. 41 OF 196

LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17



LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	07/14/17

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12/21/2017
100.0000 / in.
hehn81653

DRAWN BY	KRH	SCALE	1" = 50'
CHECKED BY	JJW	DATE	12/22/2017

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Lisle, Illinois 60532
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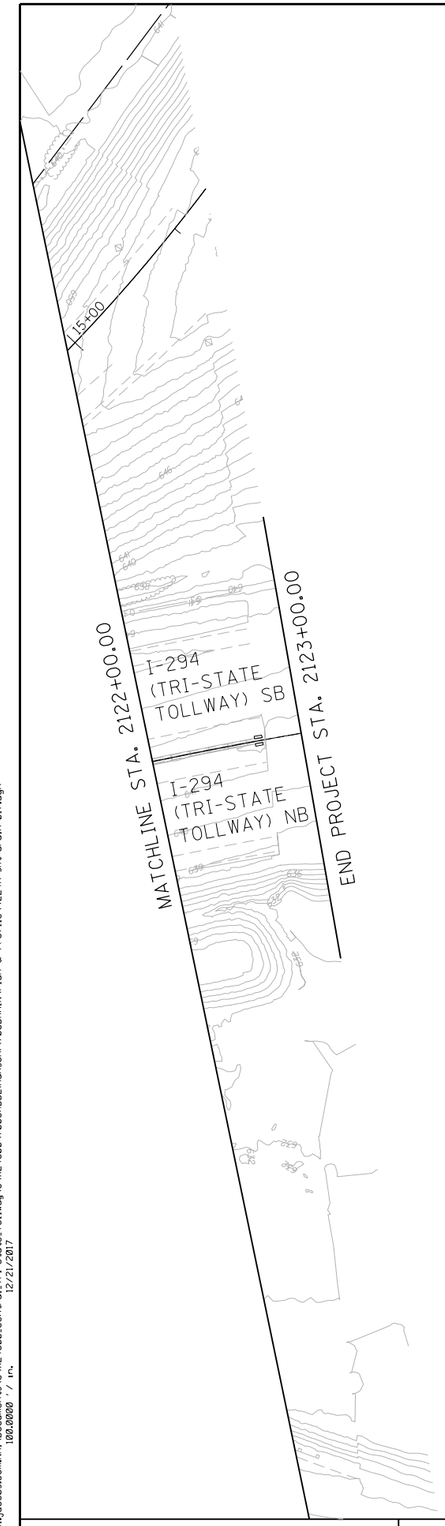
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

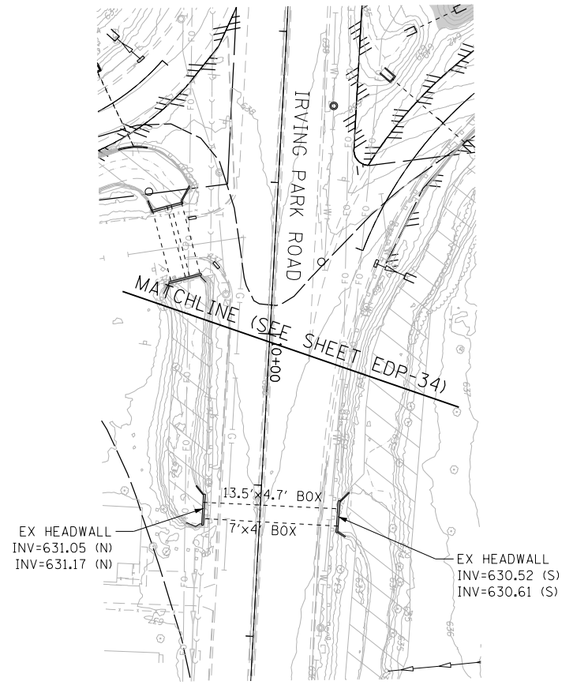
REVISIONS		
NO.	DATE	DESCRIPTION

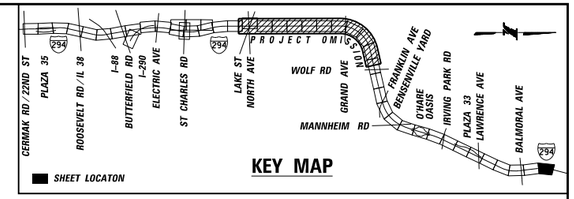
RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-40
DRAWING NO. 42 OF 196







0 50 100 150
SCALE IN FEET

DRAWN BY	KRH	SCALE	1'' = 50'
CHECKED BY	JJW	DATE	12/22/2017

HANSON
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Lisle, Illinois 60532
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THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS

NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-41
DRAWING NO. 43 OF 196

LAYOUT	KRH	08/11/16
DRAWN	KRH	08/11/16
REVIEWED	JJW	01/14/17

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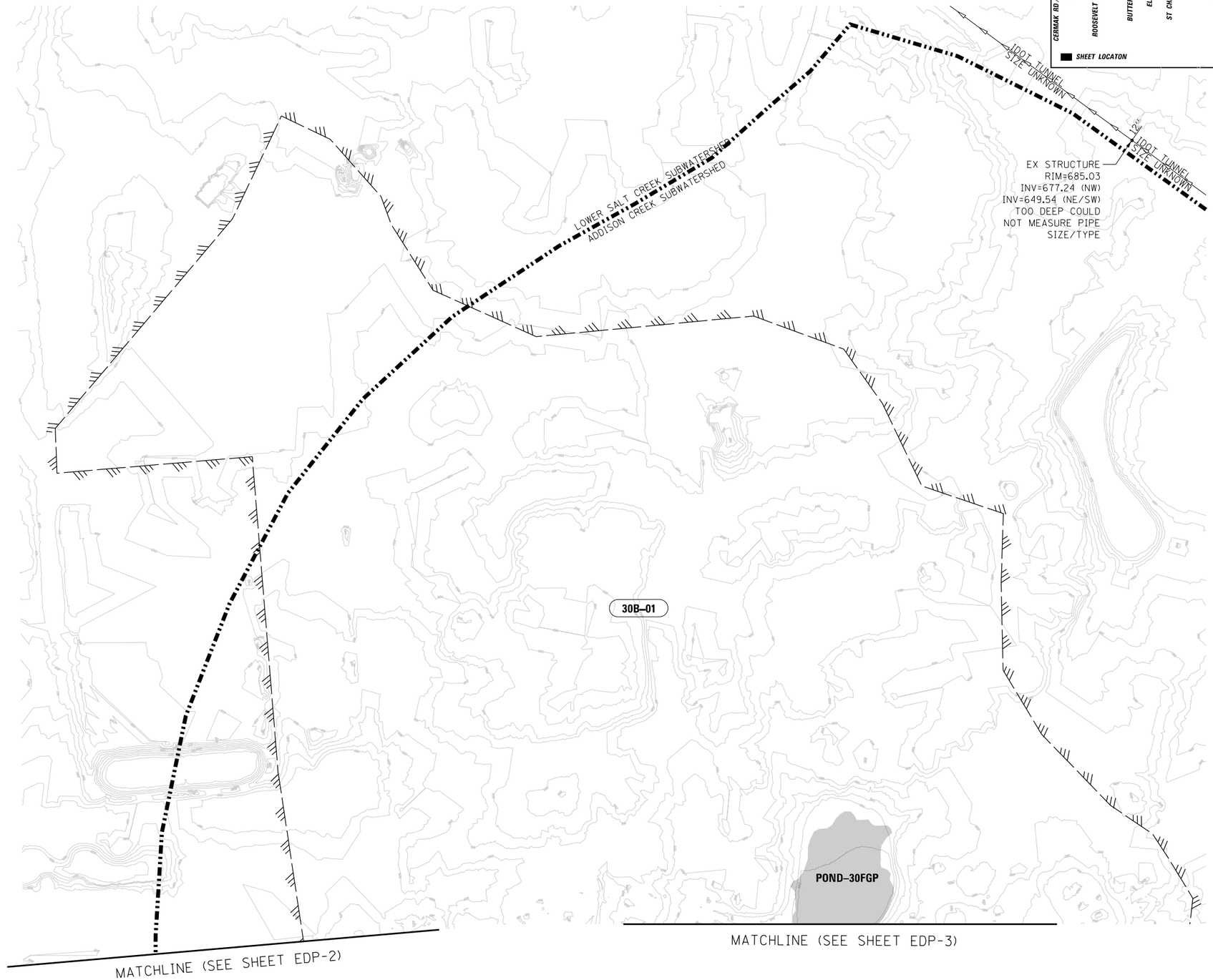
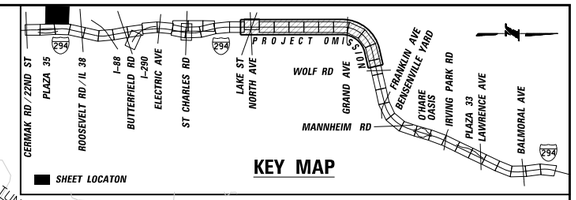
12/21/2017
100.0000 / in.
hwm01663





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gomezkl
12/20/2017
200.0000 / in.

DRAWN BY	KLG	SCALE	1'' = 100'		
CHECKED BY	SN	DATE	12/22/2017		

JACOBS
525 W. Monroe Suite 1600
Chicago, Illinois 60661
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THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
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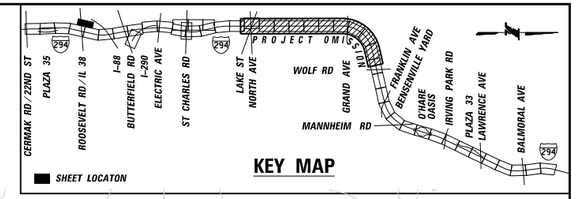
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-42
DRAWING NO. 44 OF 196



EX STRUCTURE
RIM=680.33
INV=655.43

EX STRUCTURE
RIM=681.93
INV=651.83 (NE)

IDOT TUNNEL SIZE UNKNOWN

FOREST LN

EX STRUCTURE
RIM=677.00
INV=653.25 (SW/NE)

EX STRUCTURE
RIM=668.09
INV=662.59 (NE/NW/W)

15" CMP

EX STRUCTURE
RIM=665.85
INV=661.95 (NW/SW/SE)

15" CMP

EX STRUCTURE
RIM=667.57
INV=663.97 (NW/E/S)

15" CMP

EX STRUCTURE
RIM=676.17
F.L. DROP=660.77 (E)
BOTTOM=654.27

DUNCAN ST

CADWELL AVE

OUTLET
30D

30D–03

30E–03

12" CMP

12" CMP

RAMP A (IDOT)

RAMP C (IDOT)

SIZE UNKNOWN - CMP

IDOT TUNNEL 84"

ROOSEVELT RD WB

ROOSEVELT RD EB

EX STRUCTURE
RIM=672.04
INV=664.64 (W/SE)

EX STRUCTURE
RIM=670.78
INV=666.50 (NE/SE)
INV=664.70 (NW)

36" CMP

12" PVC

24" CMP

STORMWATER
CONVEYANCE

EX STRUCTURE
RIM=676.69
INV=667.24 (NW/NE/SE)

OUTLET
30E

OUTLET
30H

EX STRUCTURE
RIM=672.76
INV=668.10 (SW)
INV=668.20 (NE)

EX HEADWALL
INV=671.80 (NE)

STORMWATER
CONVEYANCE

12" RCP

18" RCP

18" RCP

EX STRUCTURE
RIM=677.99
INV=674.20 (S)

EX HEADWALL
INV=674.81 (SW)

EX HEADWALL
INV=677.87
COLLAPSED END

30D–04

15" RCP

24" RCP

30E–04

EX STRUCTURE
RIM=672.88
INV=667.48 (NE/SW)

24" RCP

EX HEADWALL
INV=667.51 (SW)

EX HEADWALL
INV=668.81 (SW)

STORMWATER
CONVEYANCE

EX STRUCTURE
RIM=678.09
INV=674.49 (SE)
INV=668.09 (NW)

EX HEADWALL
INV=676.00 (NW)

15" RCP

24" RCP

15" RCP

30H–01

30E–02

POND–30C

STORMWATER
CONVEYANCE

MATCHLINE (SEE SHEET EDP-4)

MATCHLINE (SEE SHEET EDP-5)

0 50 100 150
SCALE IN FEET

Default
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gomezkl
100.0000 / in.
12/28/2017

DRAWN BY	KLG	SCALE	1" = 50'		
CHECKED BY	SN	DATE	12/22/2017		

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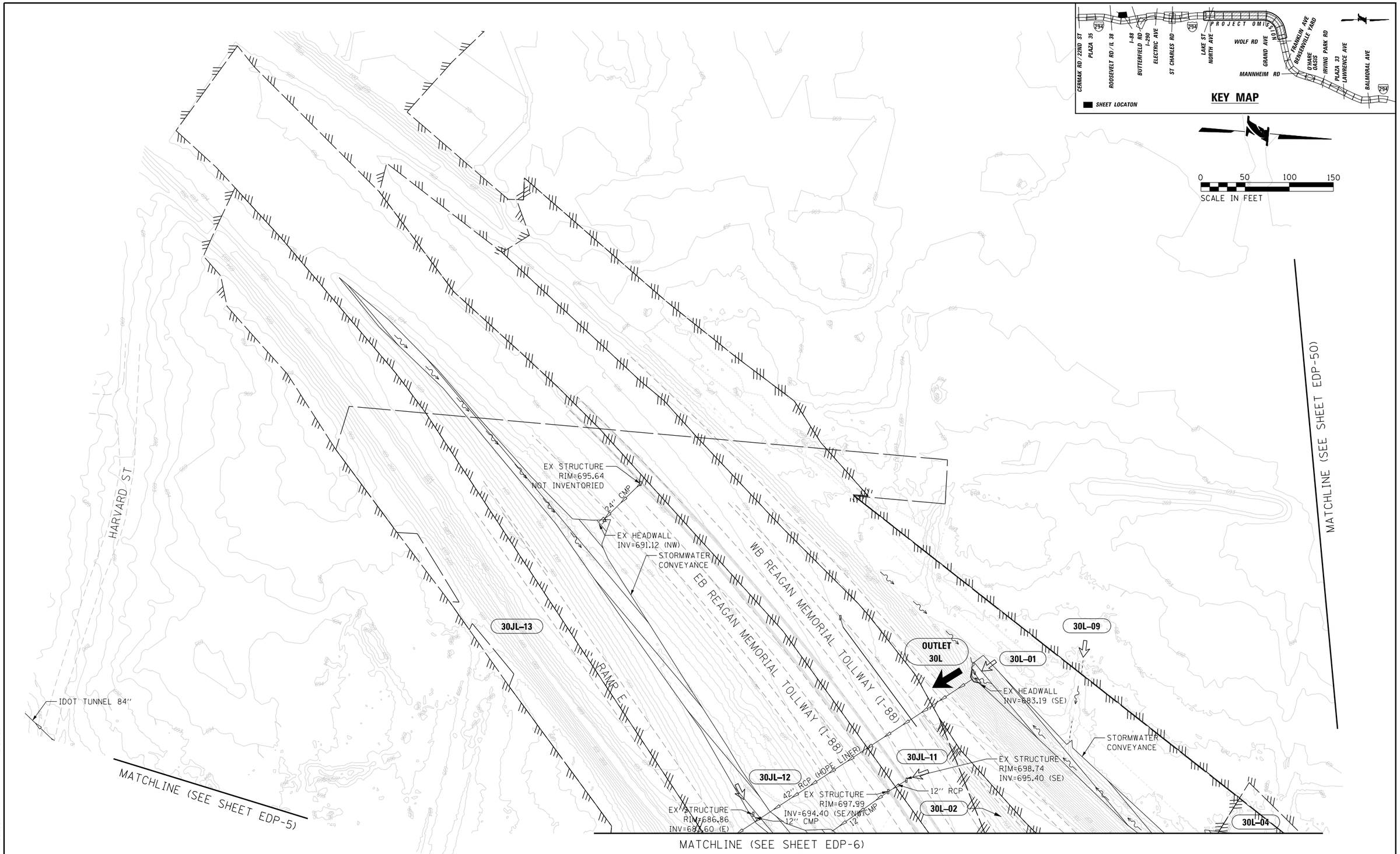
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO.
EDP-43
DRAWING NO.
45 OF 196



DRAWN BY KLG | SCALE 1" = 50'
CHECKED BY SN | DATE 12/22/2017

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Fax: 312.251.3015

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-44
DRAWING NO. 46 OF 196

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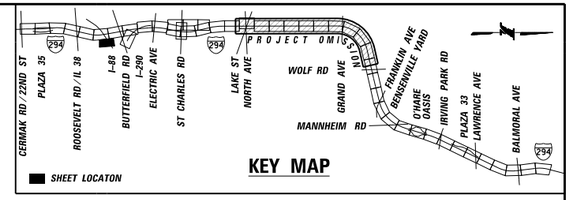
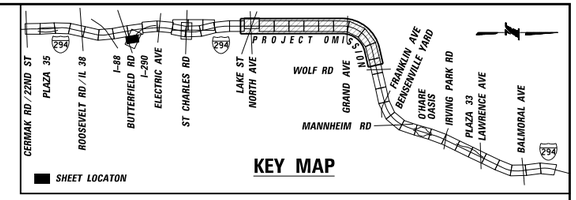


DRAWN BY	KLG	SCALE	1" = 50'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY 2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515	RR-14-4224
CHECKED BY	SN	DATE	12/22/2017			REVISIONS: NO. / DATE / DESCRIPTION	EXHIBIT A5.2-4 EXISTING DRAINAGE PLAN
							SHEET NO. EDP-45 DRAWING NO. 47 OF 196



MATCHLINE (SEE SHEET EDP-7)

MATCHLINE (SEE SHEET EDP-8)

MATCHLINE (SEE SHEET EDP-45)

MATCHLINE (SEE SHEET EDP-47)

POND-31C

31B–17

31B–05

31B–18

31C–03

31C–02

31C–01

OUTLET 31C

STORMWATER CONVEYANCE

EX STRUCTURE
RIM=680.18
INV=656.88 (NW/E/S)
UNABLE TO DETERMINE PIPE SIZES/TYPE

EX STRUCTURE
RIM=681.81
INV=668.10 (E)
INV=668.30 (W)
INV=668.60 (NW)
INV=668.40 (SW)

STORMWATER CONVEYANCE
EX HEADWALL
INV=672.57 (E)

EX HEADWALL
INV=672.20 (W)
EX HEADWALL
INV=670.68 (N)

EX STRUCTURE
RIM=679.39
INV=674.40 (E)
INV=667.60 (E)
INV=667.90 (S)
INV=667.70 (W)

EX STRUCTURE
RIM=679.86
INV=675.60 (S)

EX STRUCTURE
RIM=680.29
INV=675.00 (N/W)

EX STRUCTURE
RIM=681.17
INV=667.15 (N)
INV=675.62 (NE)
INV=667.15 (E)
INV=677.75 (SE)
INV=673.77 (S)
INV=673.47 (SW)
INV=667.15 (W)

RUTHERFORD RD
EB I-290
WB I-290
RAMP K
RAMP C
ARTHUR AVE
MADISON ST
72"
24" RCP
30" RCP
12" HDPE
18" CMP
12" RCP
24" RCP
30" VCP
8" VCP
12" PVC
12" VCP
8" VCP
5" BRICK
8" VCP
10"
8"
12"

0 50 100 150
SCALE IN FEET

DRAWN BY	KLG	SCALE	1" = 50'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY 2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515	RR-14-4224
CHECKED BY	SN	DATE	12/22/2017			REVISIONS: NO. / DATE / DESCRIPTION	EXHIBIT A5.2-4 EXISTING DRAINAGE PLAN
							SHEET NO. EDP-46 DRAWING NO. 48 OF 196

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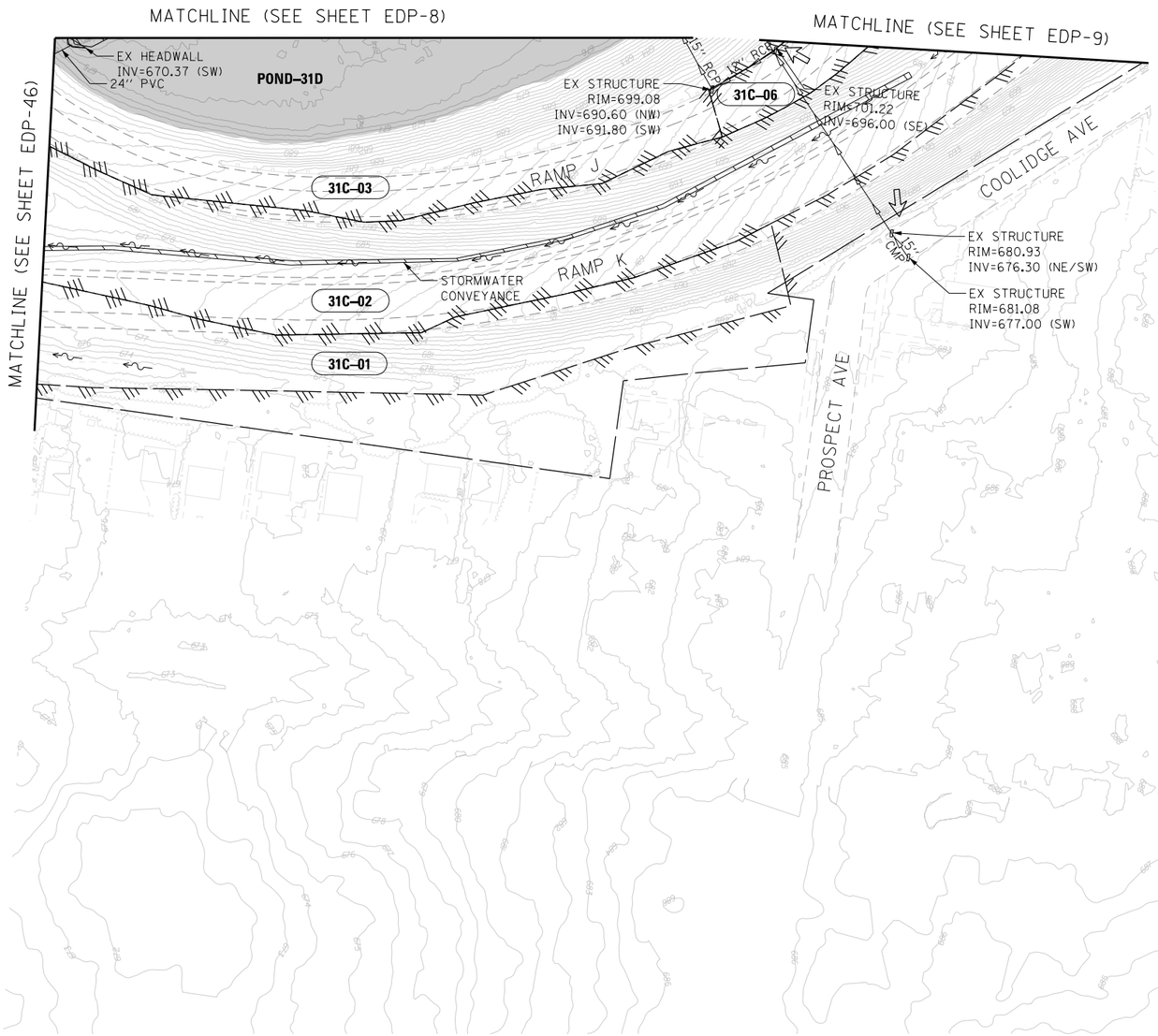
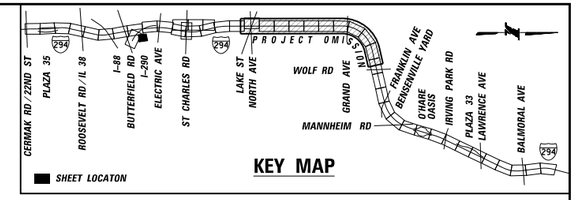
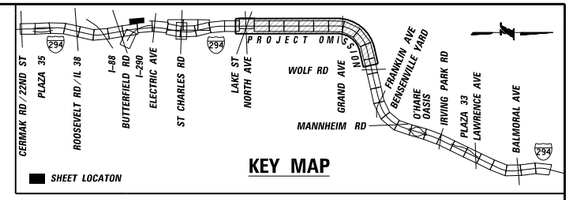
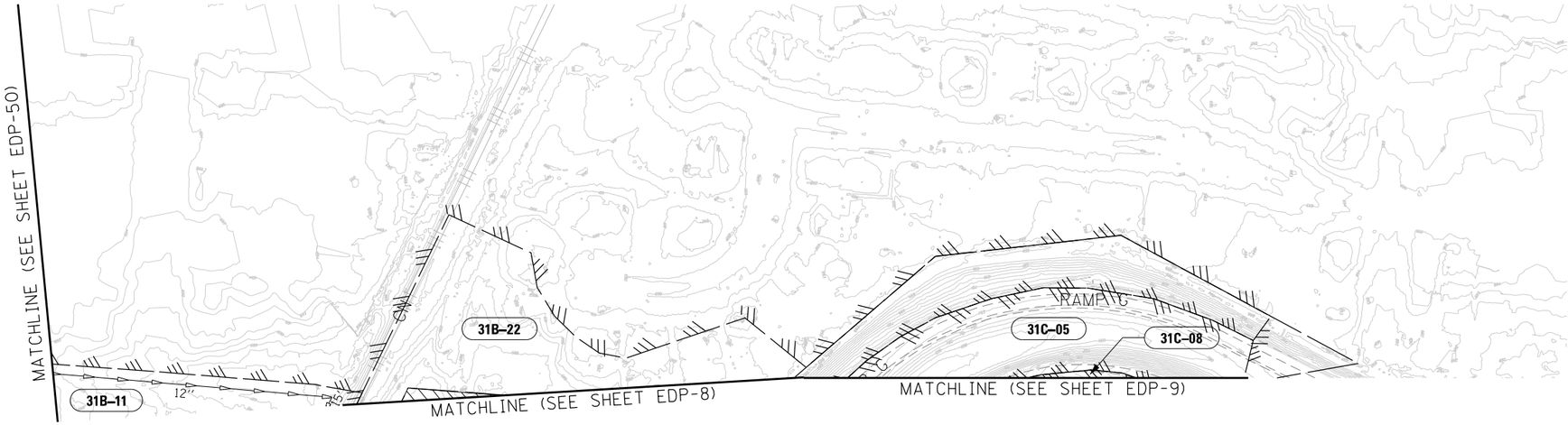




0 50 100 150
SCALE IN FEET

DRAWN BY	KLG	SCALE	1" = 50'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY 2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515	RR-14-4224
CHECKED BY	SN	DATE	12/22/2017			REVISIONS: NO. / DATE / DESCRIPTION	EXHIBIT A5.2-4 EXISTING DRAINAGE PLAN
							SHEET NO. EDP-47 DRAWING NO. 49 OF 196





0 100 200 300
SCALE IN FEET

DRAWN BY KLG	SCALE 1'' = 100'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015
CHECKED BY SN	DATE 12/22/2017		

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

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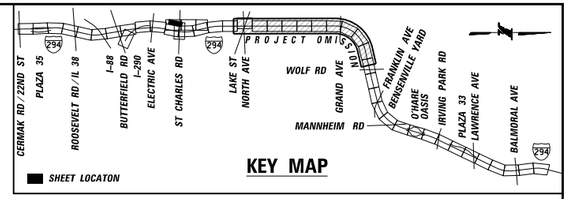
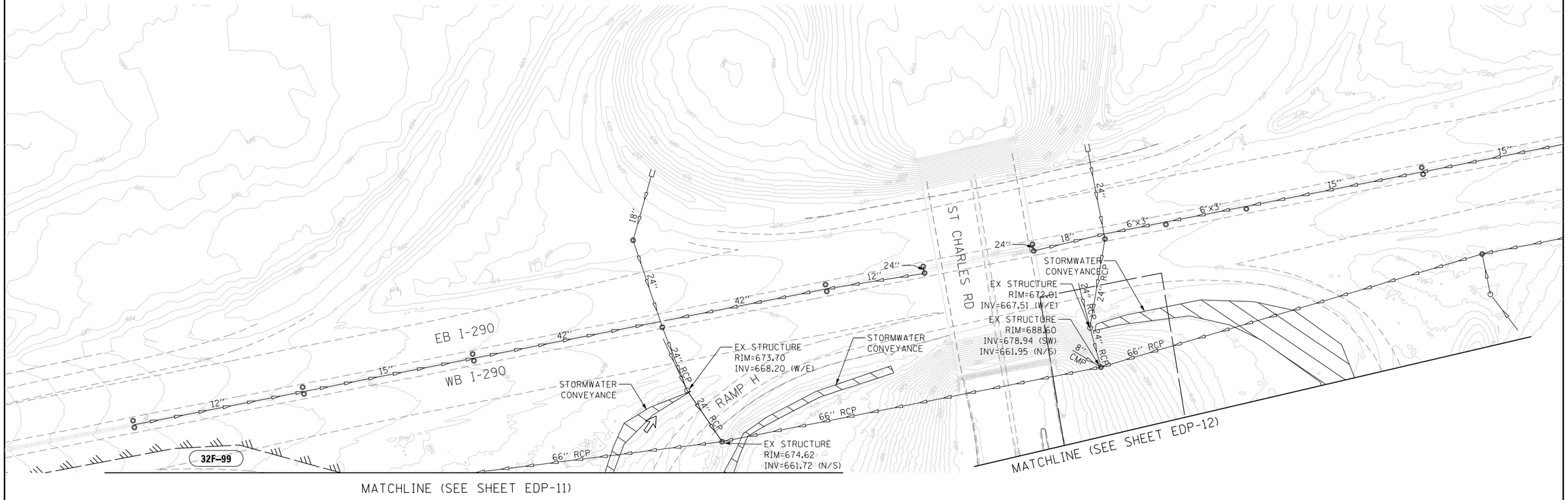
RR-14-4224

EXHIBIT A5.2-4
EXISTING DRAINAGE PLAN

SHEET NO. EDP-48
DRAWING NO. 50 OF 196





0 50 100 150
SCALE IN FEET

DRAWN BY	KLG	SCALE	1" = 50'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY 2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515	RR-14-4224
CHECKED BY	SN	DATE	12/22/2017			REVISIONS: NO. / DATE / DESCRIPTION	EXHIBIT A5.2-4 EXISTING DRAINAGE PLAN
							SHEET NO. EDP-49 DRAWING NO. 51 OF 196

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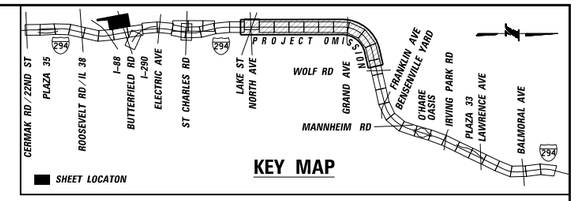

LOWER SALT CREEK SUBWATERSHED
ADDISON CREEK SUBWATERSHED

MATCHLINE (SEE SHEET EDP-44)

MATCHLINE (SEE SHEET EDP-44)

30L–09

BUTTERFIELD RD

12"

31B–11

MATCHLINE (SEE SHEET EDP-48)

MATCHLINE (SEE SHEET EDP-6)

MATCHLINE (SEE SHEET EDP-7)

MATCHLINE (SEE SHEET EDP-8)

0 100 200 300
SCALE IN FEET

DRAWN BY	KLG	SCALE	1'' = 100'	JACOBS	525 W. Monroe Suite 1600 Chicago, Illinois 60661 Telephone: 312.251.3000 Fax: 312.251.3015	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY 2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515	RR-14-4224
CHECKED BY	SN	DATE	12/22/2017				EXHIBIT A5.2-4 EXISTING DRAINAGE PLAN

REVISIONS

NO.	DATE	DESCRIPTION

SHEET NO. EDP-50
DRAWING NO. 52 OF 196

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12/20/2017
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5.3 IDENTIFIED BASE FLOODPLAIN MAPS