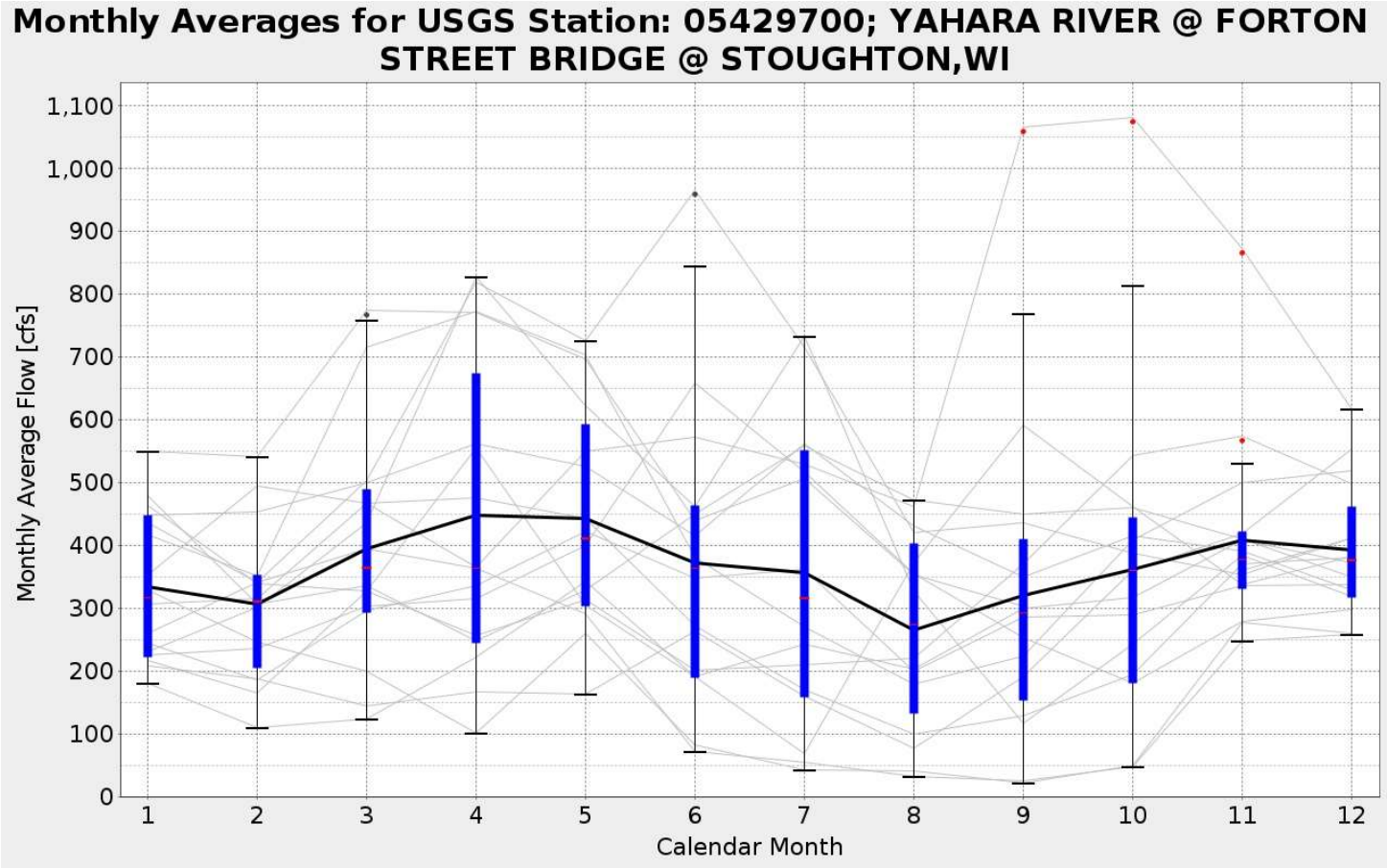
Preliminary Hydraulic Analysis Results

Yahara River

Stoughton, WI

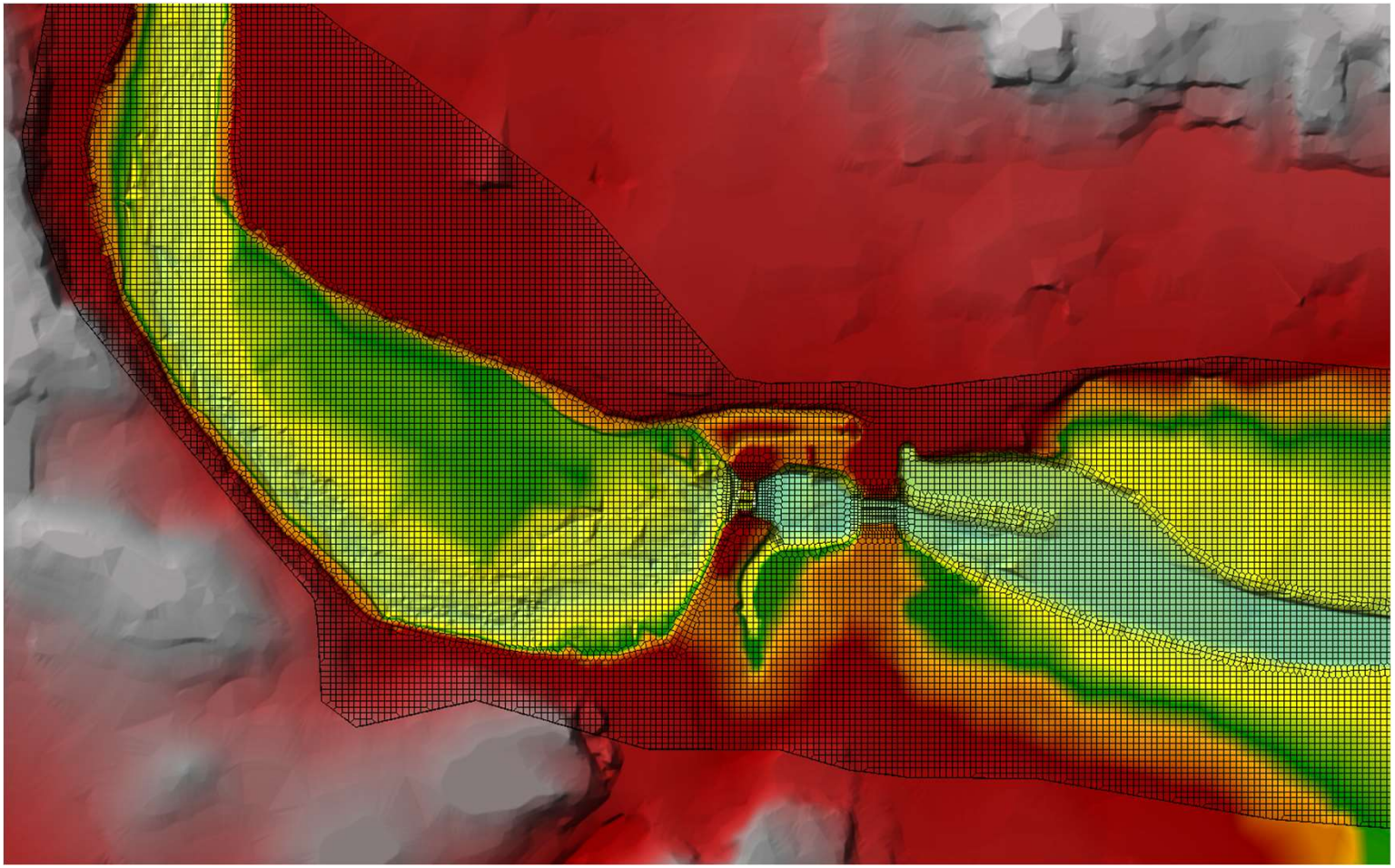
Developed for discussion at Sept 16, 2019 steering committee meeting

Hydrology



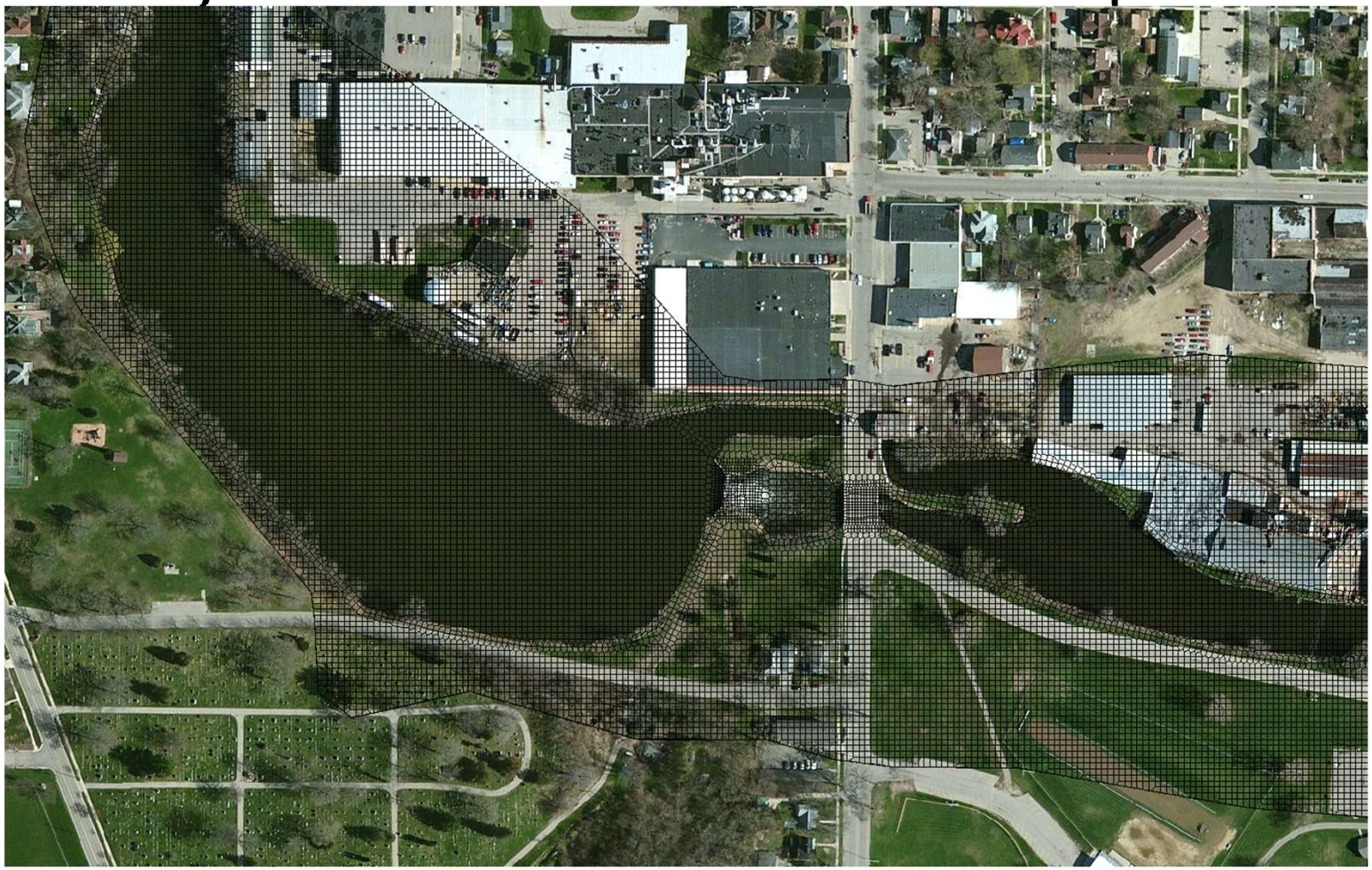
- Mean annual flow: 380cfs
- 1% annual exceedance probability flow (100-yr): 1,304cfs

2D hydraulic model development



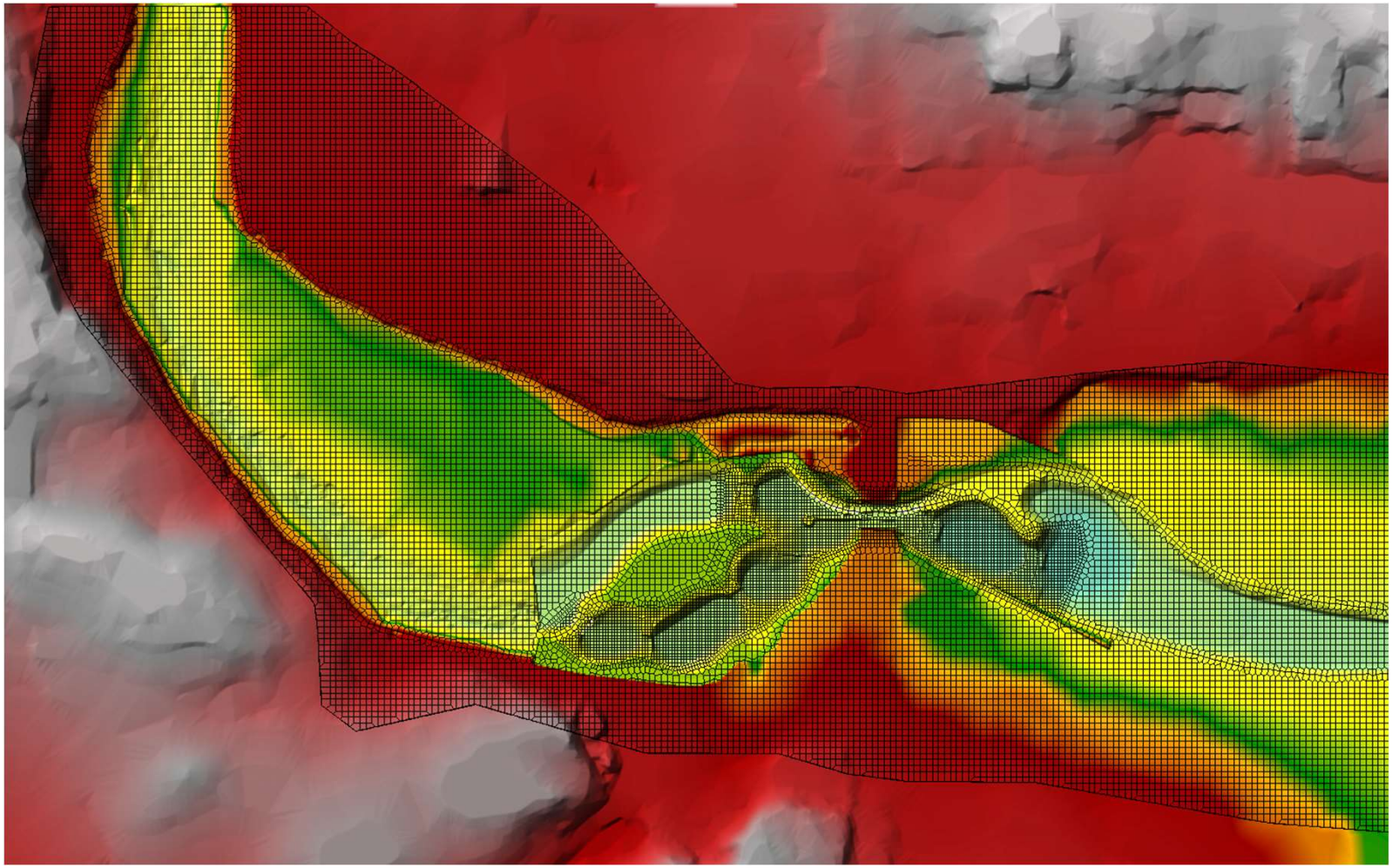
- Addition of 2D flow area to existing DNR hydraulic model

2D hydraulic model development

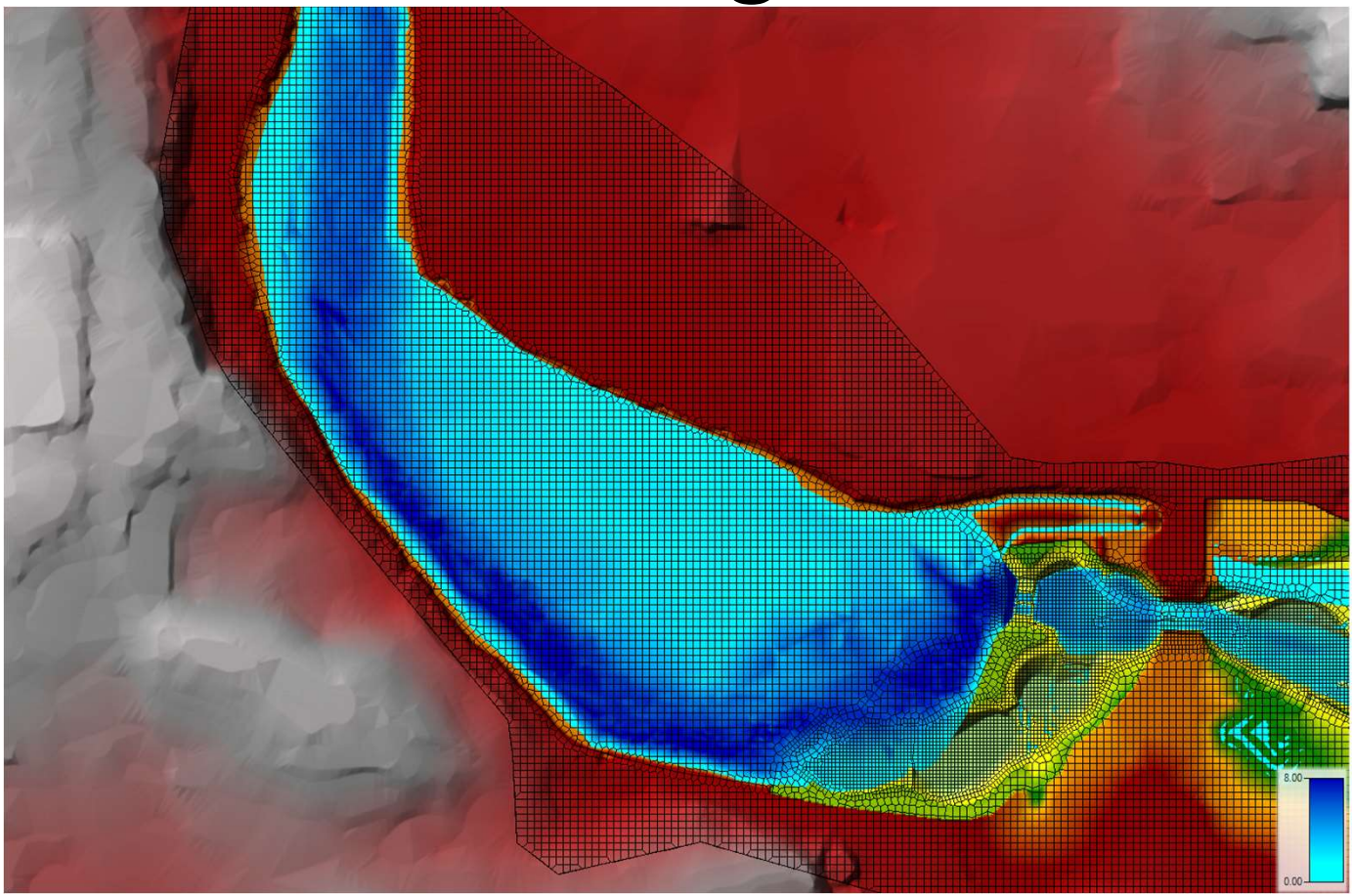


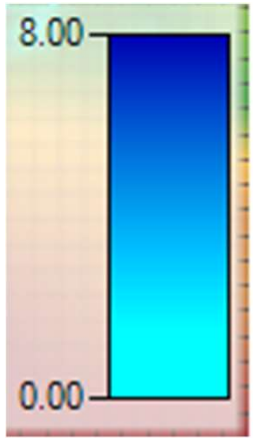
- Addition of 2D flow area to existing DNR hydraulic model

Proposed geometry



Results – Existing 380cfs

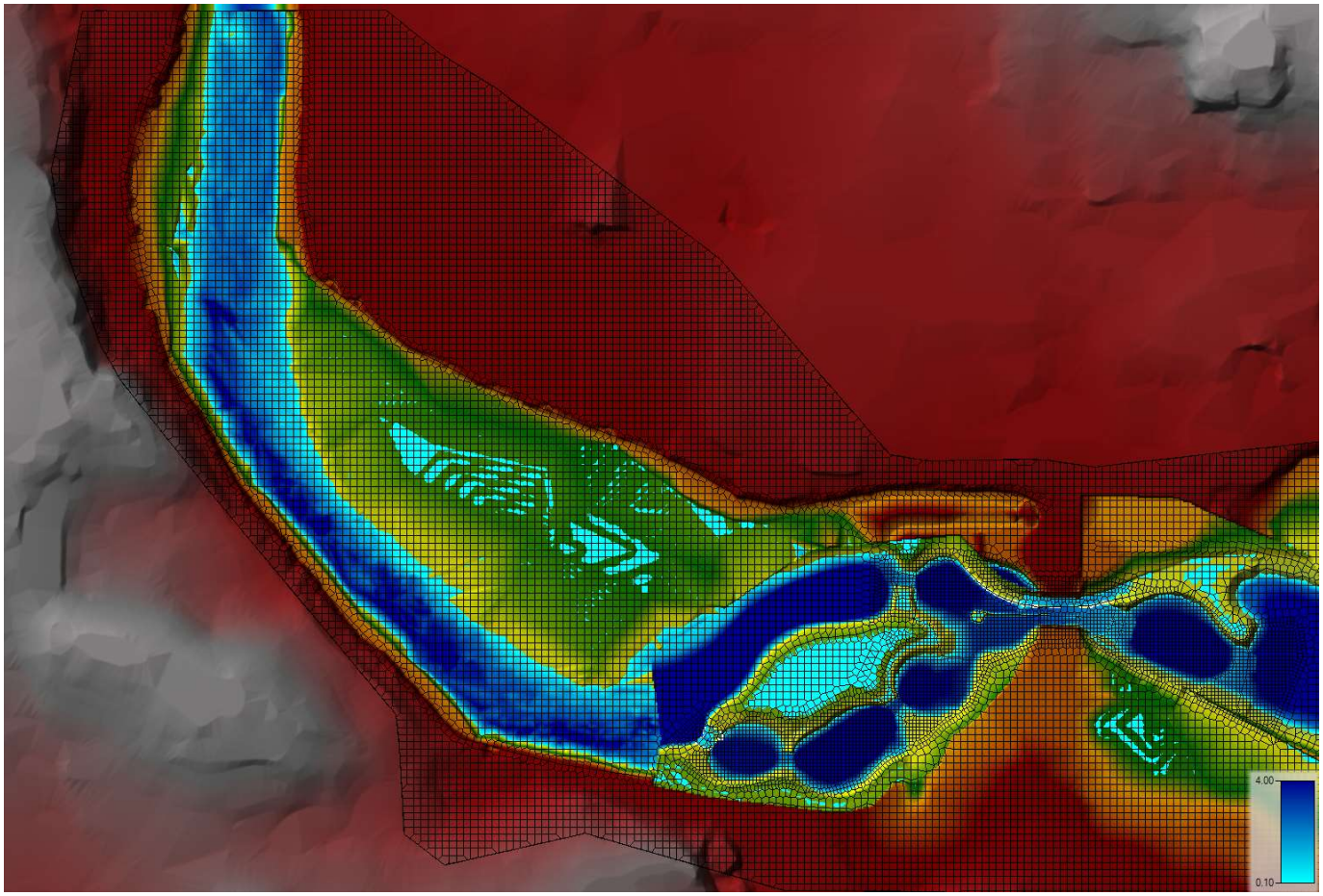


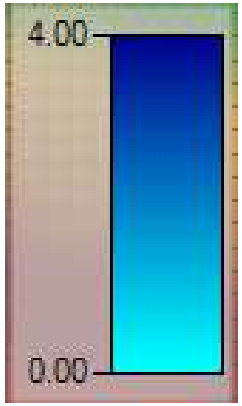


- Shaded by depth (ft). WSE upstream of dam: 841.4

PRELIMINARY RESULTS – FOR DISCUSSION ONLY

Results – Proposed 380cfs

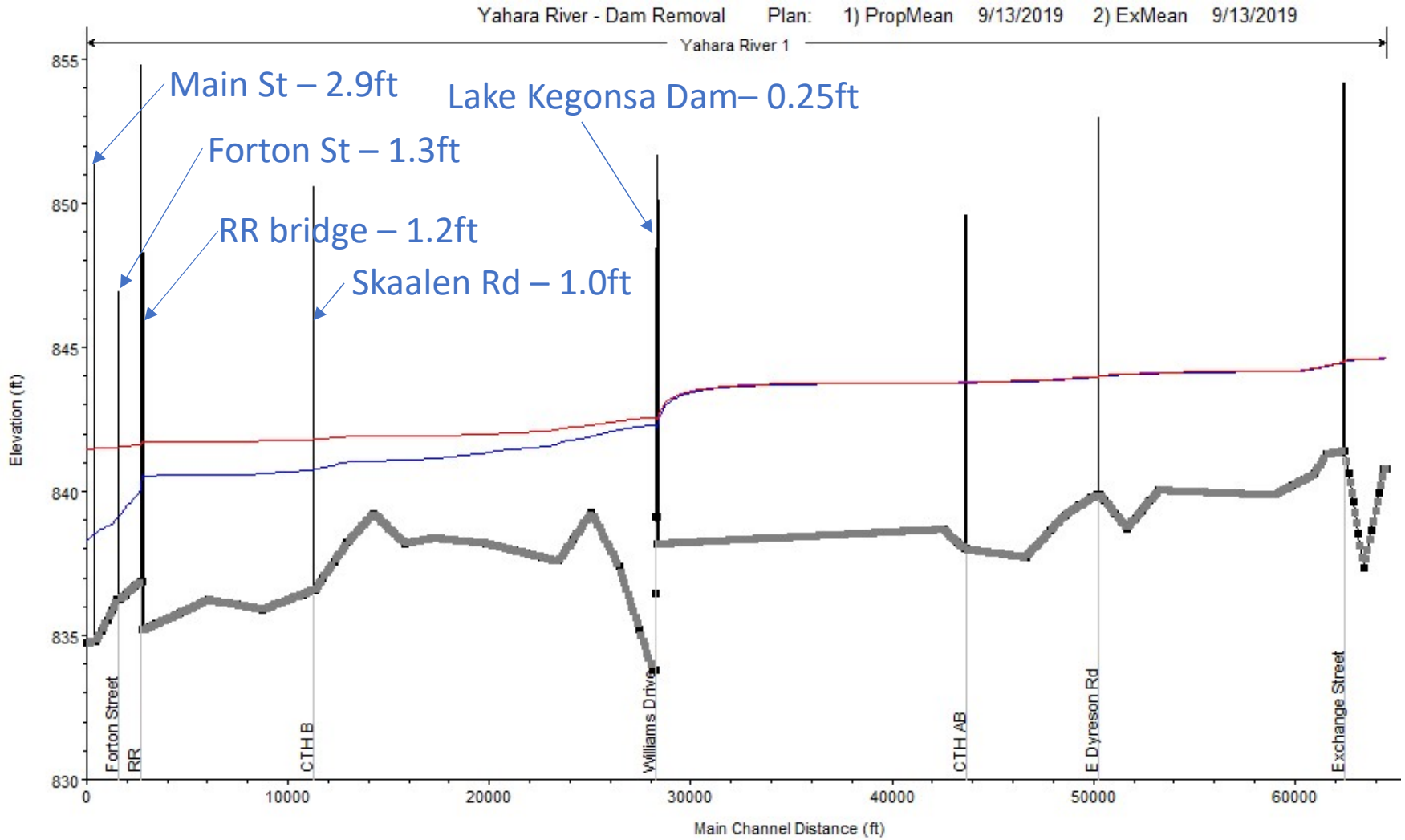




- Shaded by depth (ft). WSE upstream of dam: 837.2

PRELIMINARY RESULTS – FOR DISCUSSION ONLY

Upstream Water Surface – 380cfs



- Red is existing water surface, Blue is proposed
- Blue text is approximate lowering from exist to proposed

PRELIMINARY RESULTS – FOR DISCUSSION ONLY

CITY OF STOUGHTON

Stoughton Whitewater Park

PRELIMINARY DESIGN REVIEW

PROJECT NO. XXXX

AUGUST, 2019

Stoughton Wisconsin

NON-EMERGENCY UTILITY OWNER CONTACTS
CALL WISCONSIN 811 SYSTEM AT LEAST TWO FULL BUSINESS DAYS BEFORE DIGGING FOR UNDERGROUND UTILITY LOCATES

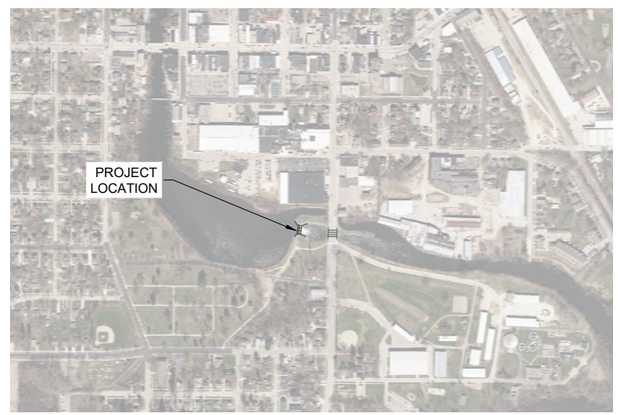
DIGGERS HOTLINE, INC.
811 OR
1-800-242-8511

ADDRESS:
14100 WEST NATIONAL AVENUE
NEW BERLIN WI 53151

PROJECT LOCATION:

LATITUDE: 42° 54' 48.6" N
LONGITUTE: 89° 13' 07.7" W

DANE COUNTY



VICINITY MAP

SCALE: 1"=500' (FOR 22X34" SHEETS)

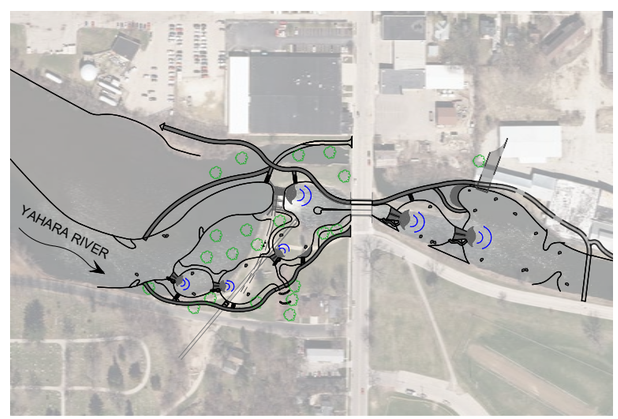
SHEET INDEX:

SHEET NUMBER	SHEET TITLE
1	COVER & TOC
2	SITE PLAN OVERALL - DAM OUT
3	SITE PLAN - DAM OUT
4	STOUGHTON DAM PLAN & PROFILE
5	UNDERPASS PLAN & PROFILE
6	BYPASS PLAN & PROFILE
7	YAHARA STRUCTURES PLAN & PROFILE
8	SITE PLAN - UPSTREAM MILLPOND
9	SITE PLAN - EXTRA UPSTREAM MILLPOND
10	DAM REMOVAL DETAIL
11	GATE BAY DETAIL
12	FOURTH STREET BOXES DETAIL
13	CREST DETAILS
14	CREST DETAILS
15	TRAIL DETAILS
16	MISCELLANEOUS DETAILS
17	PROJECT SPECIFICATIONS

HEC RAS SECTIONS EXHIBIT

SURVEY NOTES:

1. UPLAND EXISTING GRADE CONTOURS BASED ON LIDAR DATA FROM DANE COUNTY GIS.
2. LIMITED BATHYMETRIC DATA COLLECTED BY JSD PROFESSIONAL SERVICES INC ON JUNE 24, 2019.
3. ADDITIONAL UPSTREAM BATHYMETRIC DATA COLLECTED BY INTERFLUVE.
4. ELEVATIONS REFERENCE VERTICAL DATUM NVGD29.
5. CONCEPTUAL HYDRAULIC STUDY RESULTS ARE SHOWN TO QUANTIFY DAM REMOVAL EFFECTS ON UPSTREAM WATER LEVELS.



SITE PLAN

SCALE: 1"=200' (FOR 22X34" SHEETS)

LEGEND:

ABBREVIATIONS:

AVG	AVERAGE
DTL	DETAIL
E	EAST
ELEV	ELEVATION
FT	FEET
IN	INCHES
MAX	MAXIMUM
MIN	MINIMUM
N	NORTH
NTS	NOT TO SCALE
OC	ON CENTER
OHWM	ORDINARY HIGH WATER MARK
SHT	SHEET
STA	STATION
STD	STANDARD
TYP	TYPICAL

PROJECT OWNER:

CITY OF STOUGHTON
CITY OF STOUGHTON
381 E. MAIN ST
STOUGHTON, WI 53589

Recreation Engineering & Planning

RECREATION ENGINEERING AND PLANNING
485 ARAPAHOE AVE.
BOULDER | CO | 80302
WWW.BOATERPARKS.COM

DRAFT

PROJECT OWNER:
CITY OF STOUGHTON
---
381 E. MAIN ST
STOUGHTON, WI 53589

STOUGHTON WHITEWATER PARK
YAHARA RIVER
STOUGHTON, WISCONSIN

PRELIMINARY - NOT FOR CONSTRUCTION

COVER & TOC

REVISIONS:

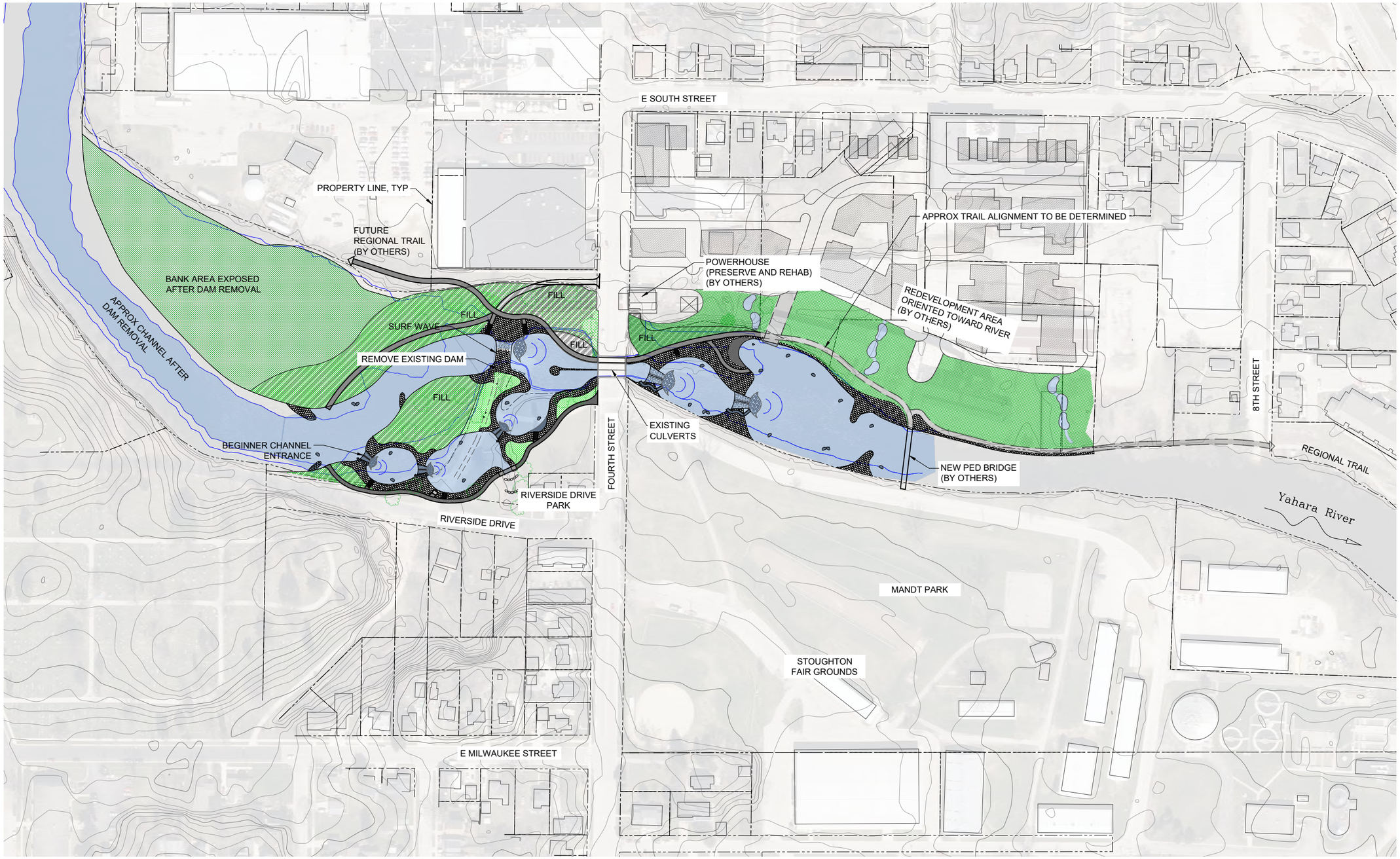
NO.	DATE

DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.

1

SHEET 1 OF 17



SITE PLAN OVERALL - DAM OUT

N

SCALE BAR 1"=100'

100 0 100

CONTOUR INTERVAL 2FT

NOTES:
1. ALL REDEVELOPMENT AREA IMPROVEMENTS SHOWN ARE CONCEPTUAL.

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STOUGHTON WHITEWATER PARK
YAHARA RIVER STOUGHTON, WISCONSIN
PRELIMINARY - NOT FOR CONSTRUCTION
SITE PLAN OVERALL - DAM OUT

REVISIONS:

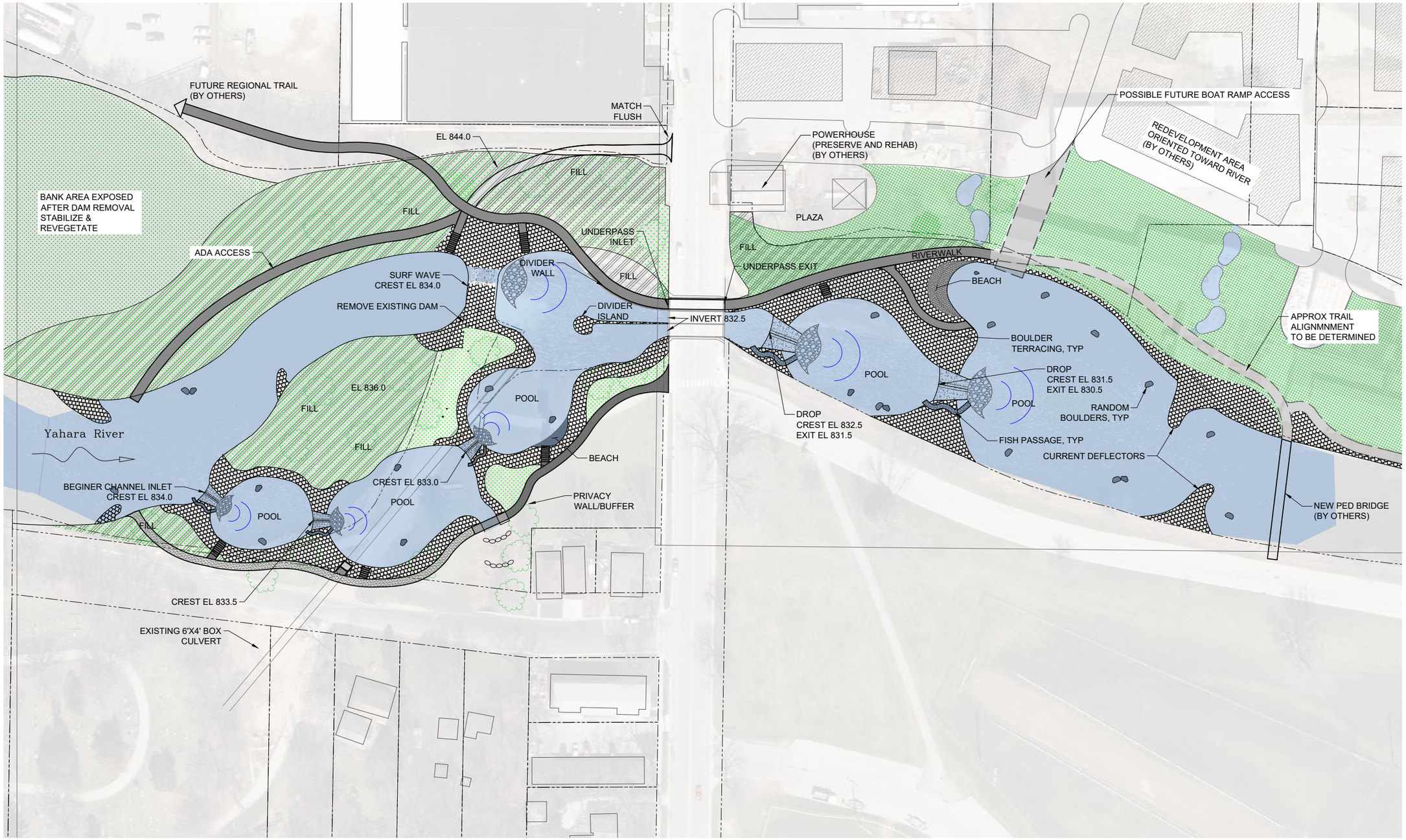
NO.	DATE

DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.

2

SHEET 2 OF 17



SITE PLAN - DAM OUT

N

SCALE BAR 1"=50'

50 0 50

CONTOUR INTERVAL 2FT

NOTES:

1. ALL REDEVELOPMENT AREA IMPROVEMENTS SHOWN ARE CONCEPTUAL.

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YAHARA RIVER
STOUGHTON, WISCONSIN

PRELIMINARY - NOT FOR CONSTRUCTION

SITE PLAN-DAM OUT

REVISIONS:

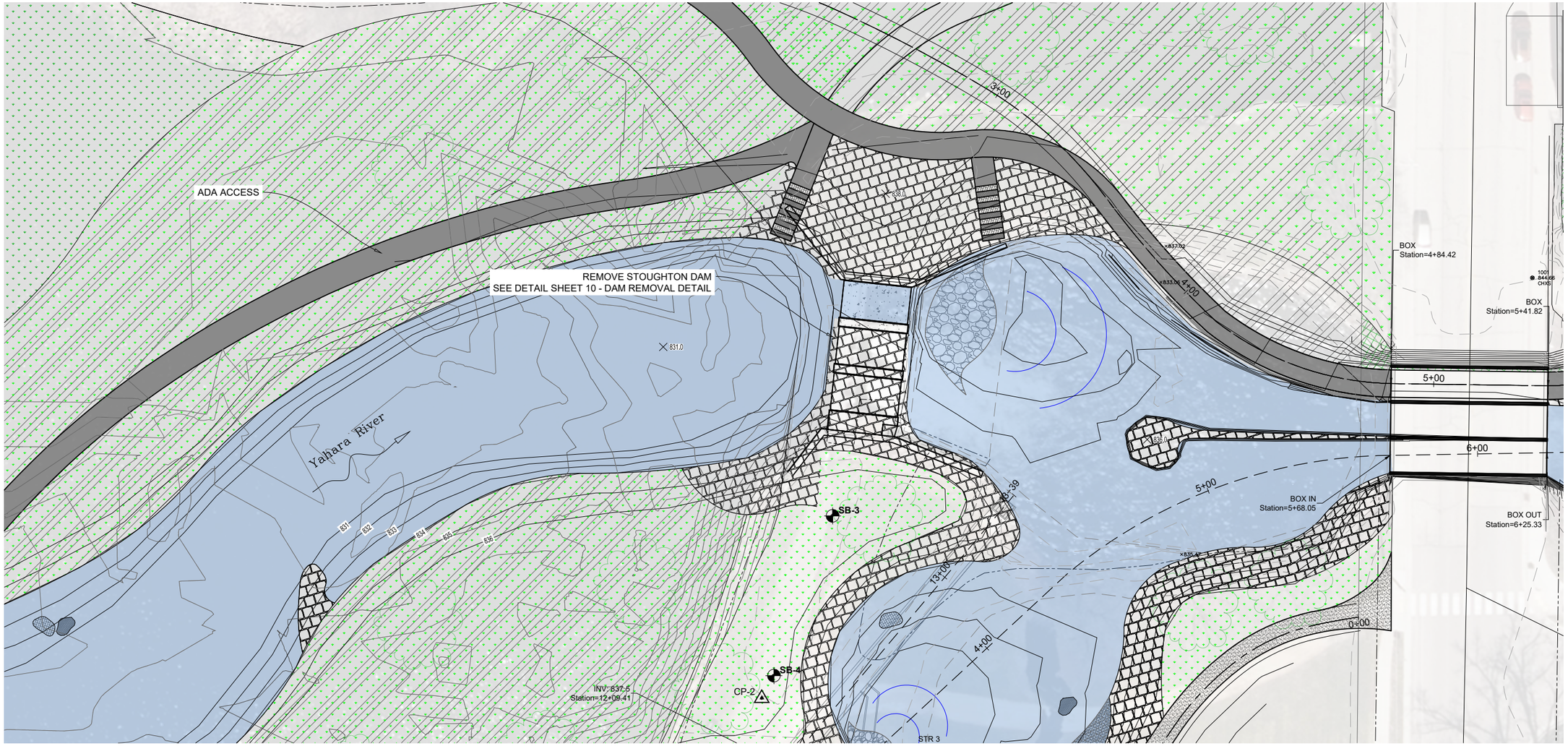
NO.	DATE

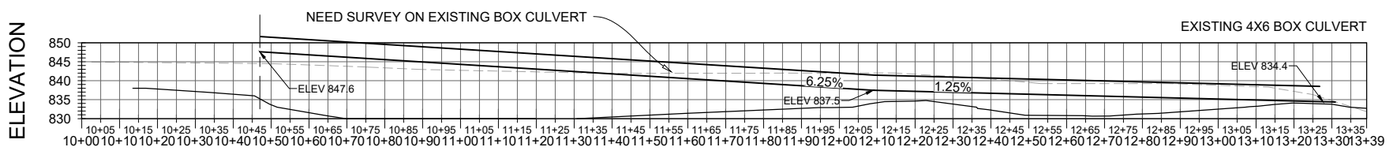
DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.

3

SHEET 3 OF 17





SITE PLAN & PROFILE

N

SCALE BAR 1"=20'

20 0 20

CONTOUR INTERVAL 2FT

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YAHARA RIVER
STOUGHTON, WISCONSIN

PRELIMINARY - NOT FOR CONSTRUCTION

STOUGHTON DAM PLAN & PROFILE

REVISIONS:

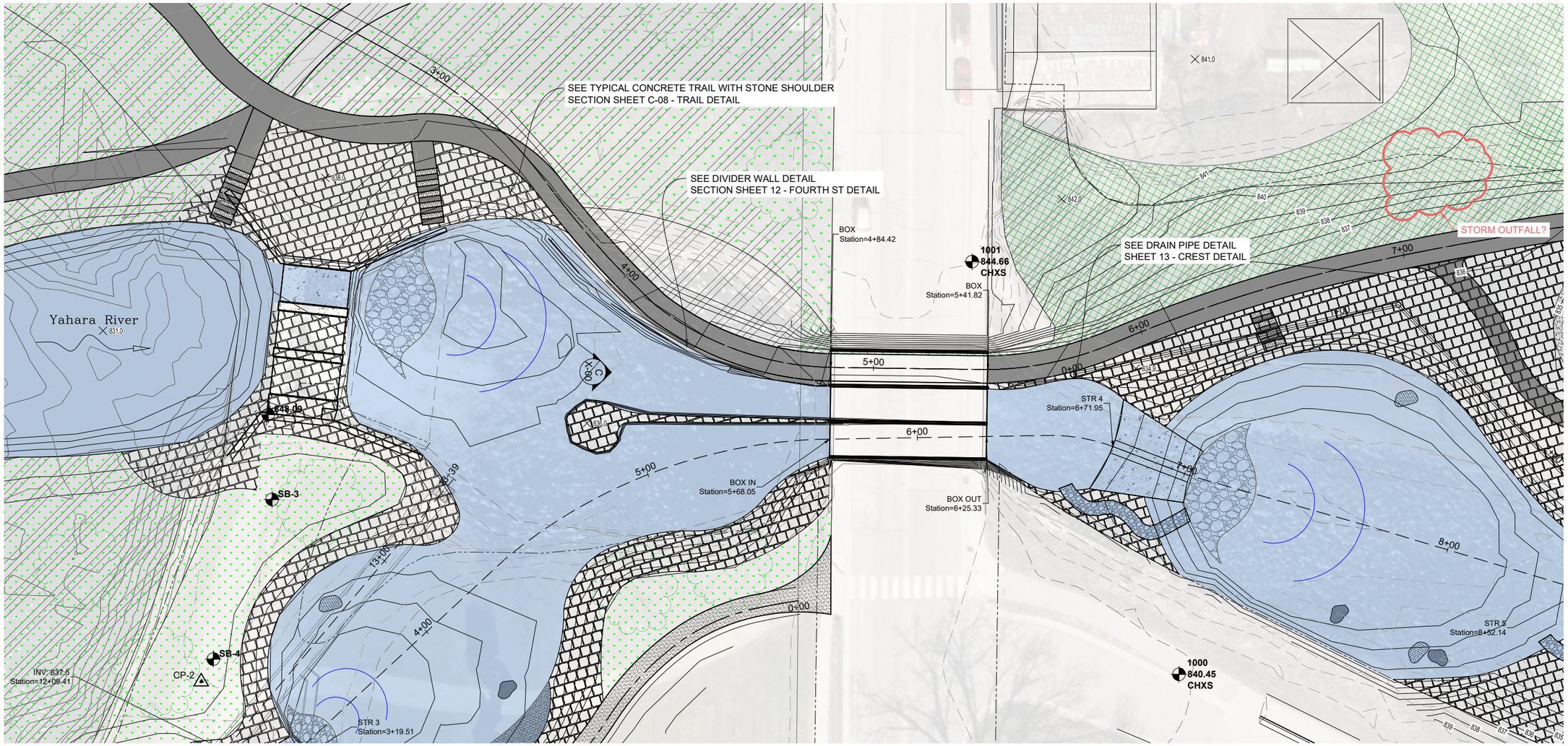
NO.	DATE

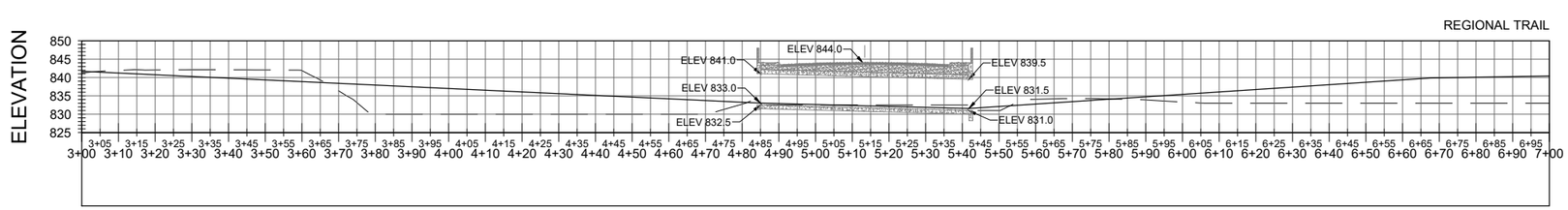
DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.

4

SHEET 4 OF 17





SITE PLAN & PROFILE

N

SCALE BAR 1"=20'

20 0 20

CONTOUR INTERVAL 2FT

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STOUGHTON WHITEWATER PARK
YAHARA RIVER
STOUGHTON, WISCONSIN

PRELIMINARY - NOT FOR CONSTRUCTION

UNDERPASS PLAN & PROFILE

REVISIONS:

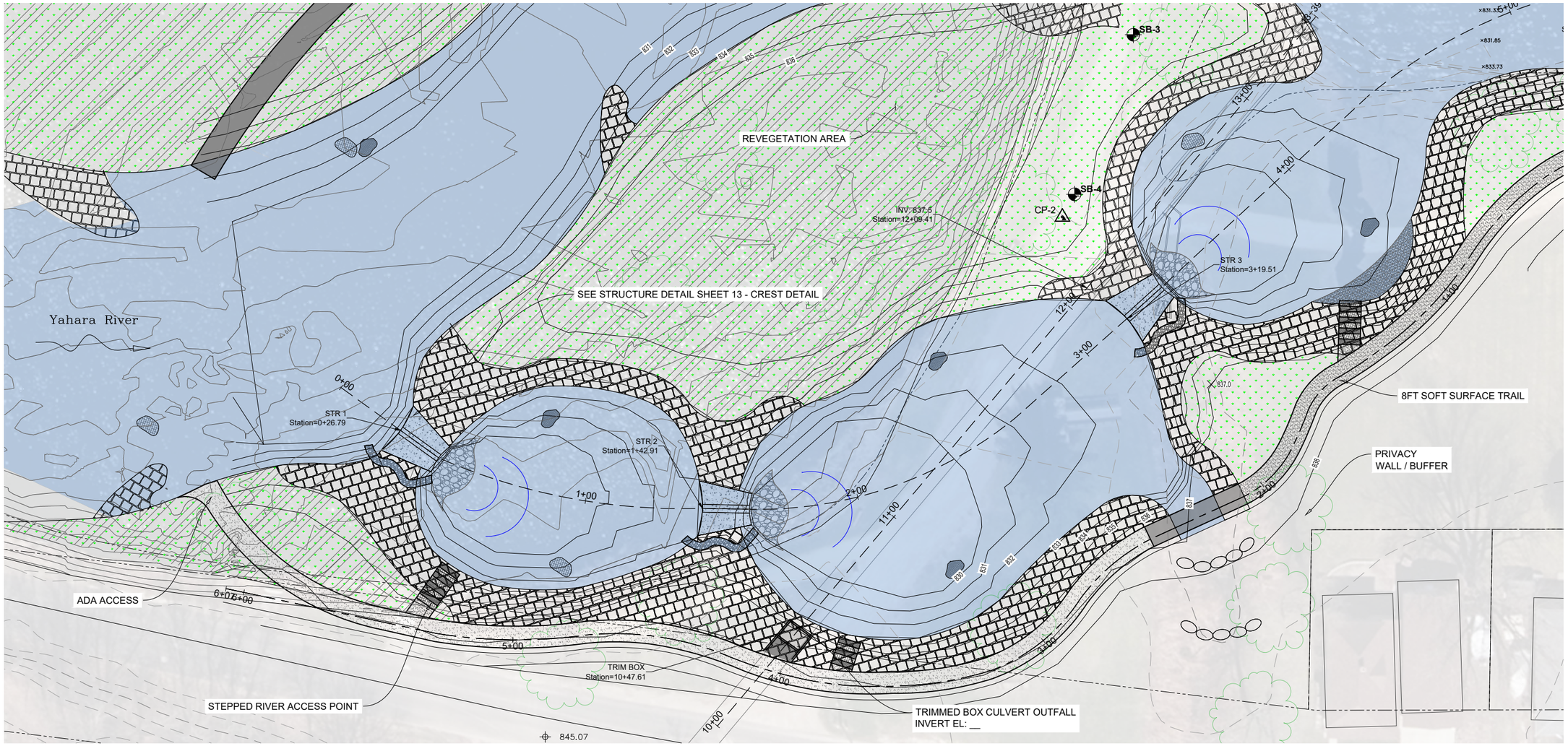
NO.	DATE

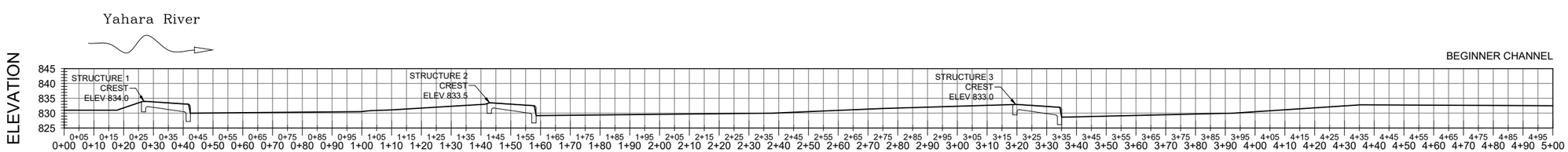
DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.

5

SHEET 5 OF 17





SITE PLAN & PROFILE

N

SCALE BAR 1"=20'

20 0 20

CONTOUR INTERVAL 2FT

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YAHARA RIVER
STOUGHTON, WISCONSIN

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BYPASS PLAN & PROFILE

REVISIONS:

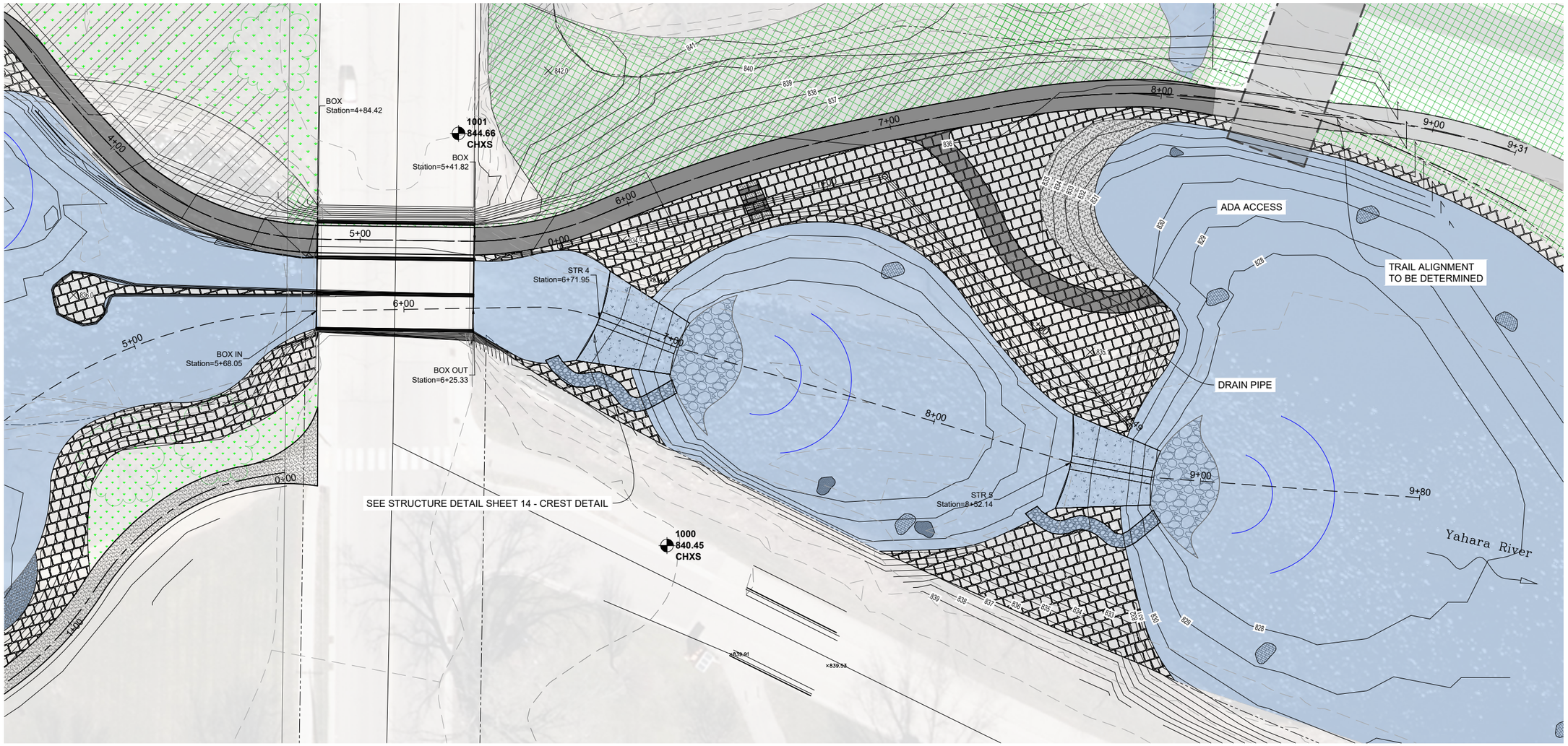
NO.	DATE

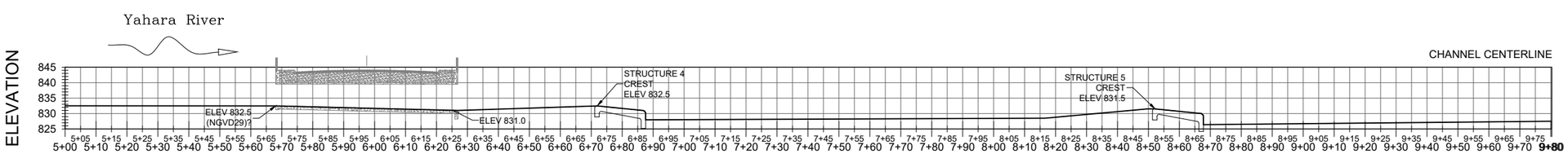
DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.

6

SHEET 6 OF 17





SITE PLAN & PROFILE

N

SCALE BAR 1"=20'

20 0 20

CONTOUR INTERVAL 2FT

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STOUGHTON WHITEWATER PARK
YAHARA RIVER STOUGHTON, WISCONSIN
PRELIMINARY - NOT FOR CONSTRUCTION
YAHARA STRUCTURES PLAN & PROFILE

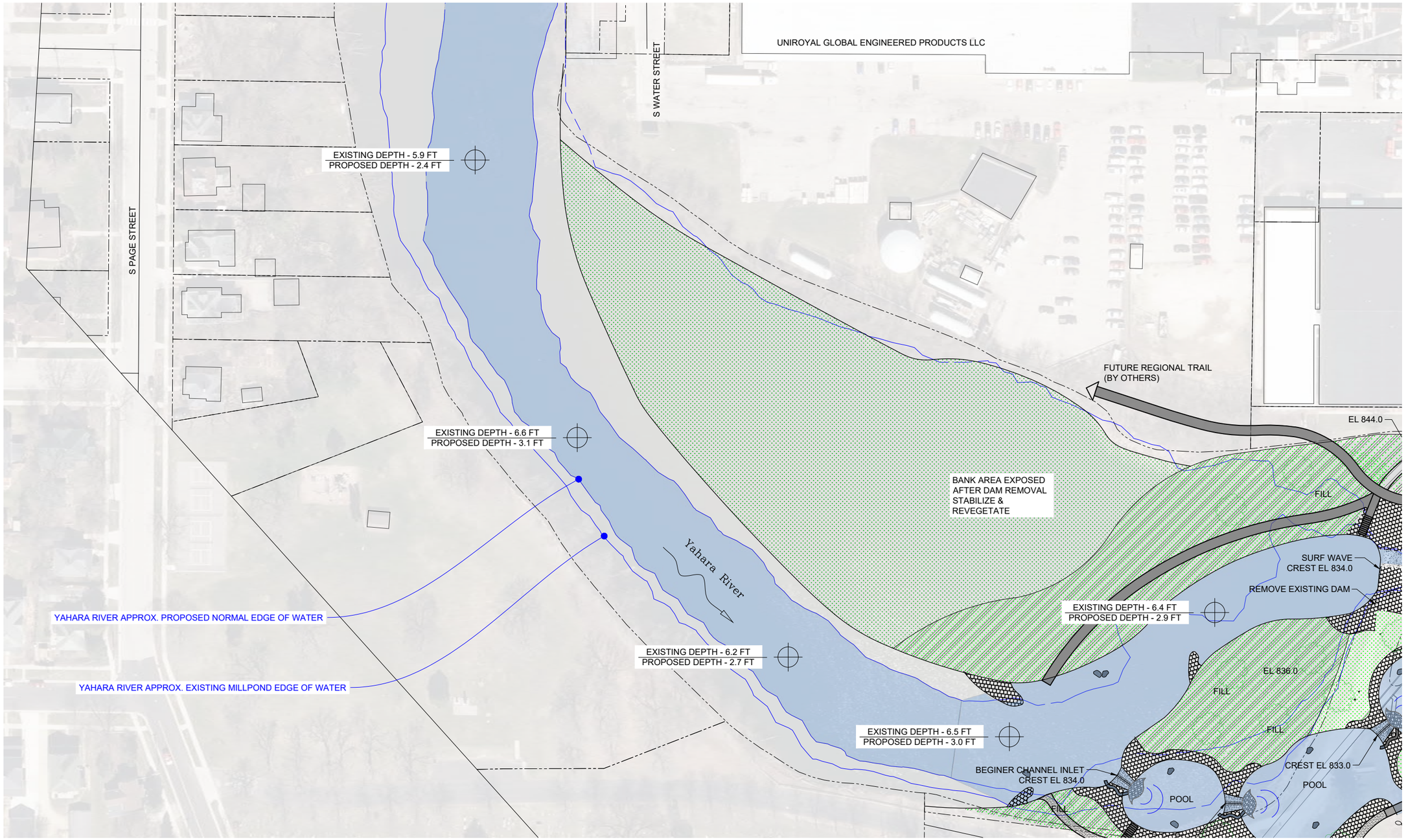
REVISIONS:

NO.	DATE

DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.
7

SHEET 7 OF 17



SITE PLAN - DAM OUT

N

SCALE BAR 1"=50'

50 0 50

CONTOUR INTERVAL 2FT

NOTES:

1. DEPTHS AND EXTENTS BASED ON PRELIMINARY HYDRAULIC ANALYSIS. ALL CHANGES SHOWN ARE CONCEPTUAL.

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STOUGHTON WHITEWATER PARK
YAHARA RIVER
STOUGHTON, WISCONSIN
PRELIMINARY - NOT FOR CONSTRUCTION
SITE PLAN-UPSTREAM MILLPOND

REVISIONS:

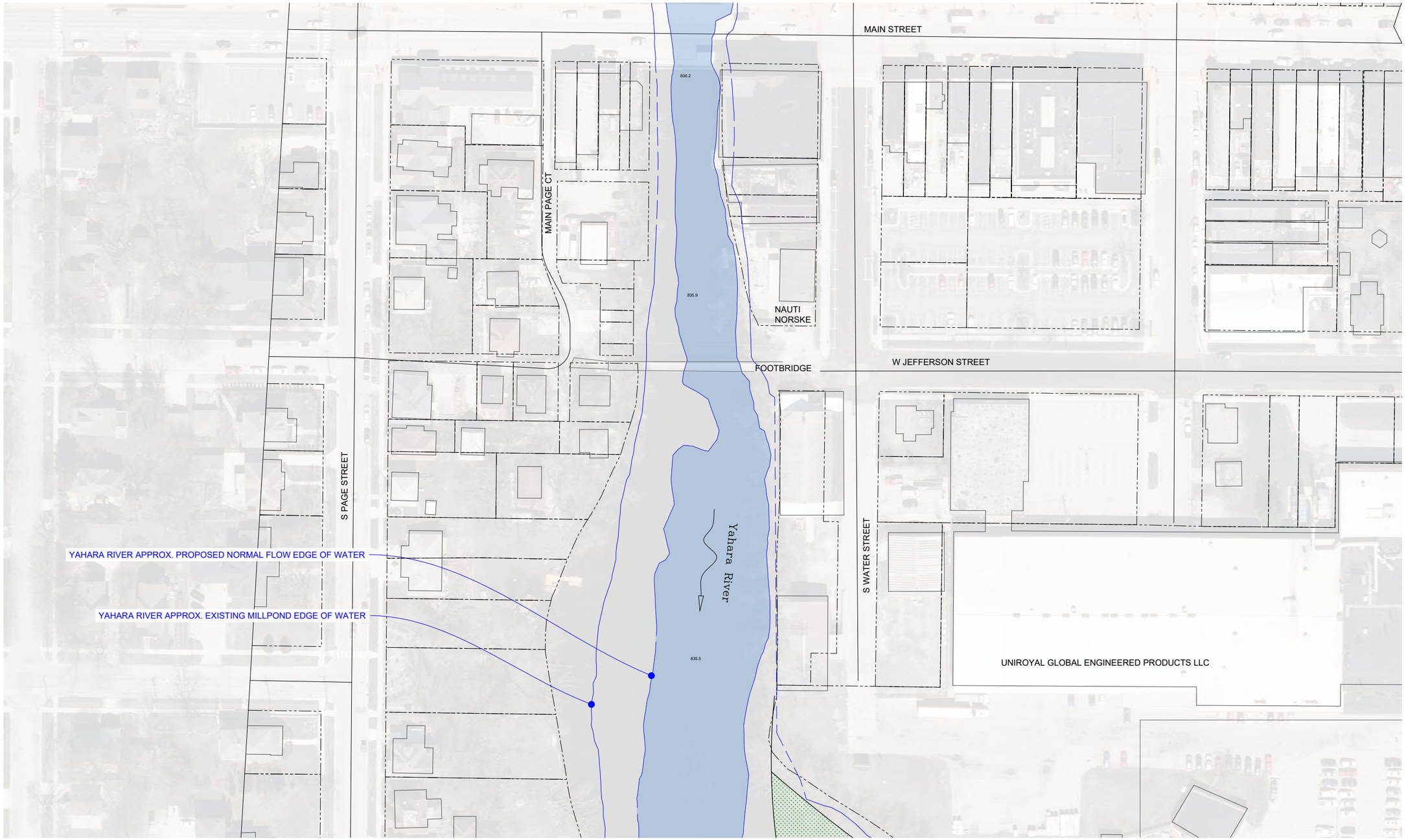
NO.	DATE

DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.

8

SHEET 8 OF 17



SITE PLAN - DAM OUT

N

SCALE BAR 1"=50'

50 0 50

CONTOUR INTERVAL 2FT

NOTES:

1. DEPTHS AND EXTENTS BASED ON PRELIMINARY HYDRAULIC ANALYSIS. ALL CHANGES SHOWN ARE CONCEPTUAL.

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STOUGHTON WHITEWATER PARK
YAHARA RIVER STOUGHTON, WISCONSIN
PRELIMINARY - NOT FOR CONSTRUCTION
SITE PLAN-EXTRA UPSTREAM MILLPOND

REVISIONS:

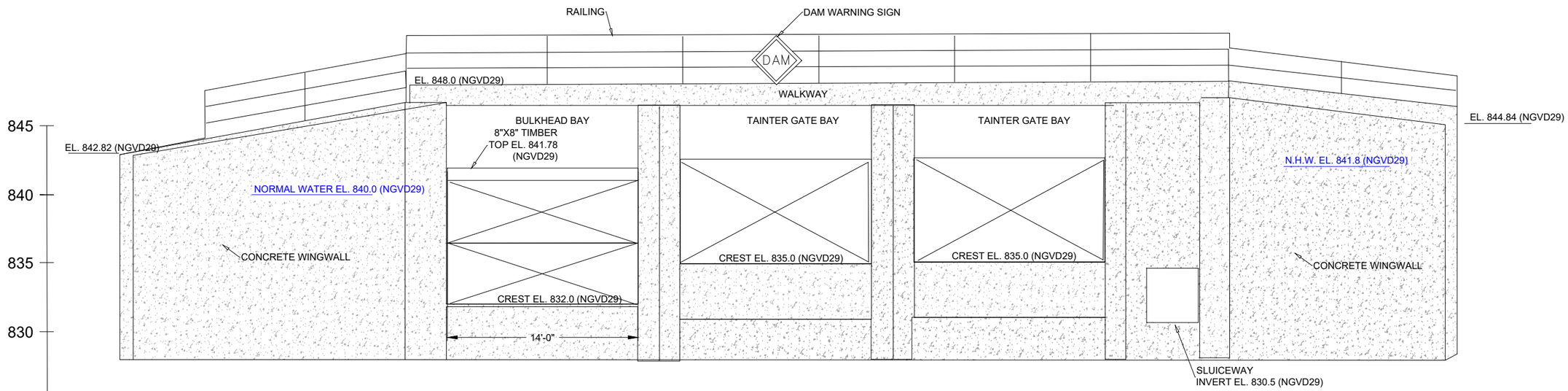
NO.	DATE

DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

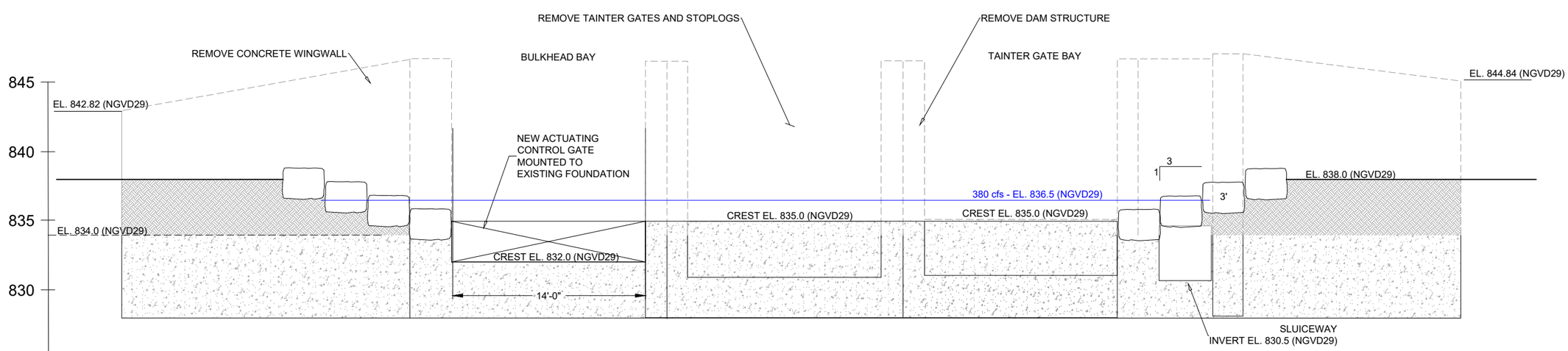
DRAWING NO.

9

SHEET 9 OF 17



X-00 EXISTING FOURTH STREET DAM SPILLWAY CREST
SECTION LOOKING DOWNSTREAM



X-00 DAM REMOVAL & RECREATIONAL STRUCTURE CREST
SECTION LOOKING DOWNSTREAM

Recreation Engineering & Planning

RECREATION ENGINEERING
AND PLANNING
485 ARAPAHOE AVE.
BOULDER | CO | 80302
WWW.BOATERPARKS.COM

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PROJECT OWNER:
CITY OF STOUGHTON
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381 E. MAIN ST
STOUGHTON, WI 53589

STOUGHTON WHITEWATER PARK
YAHARA RIVER STOUGHTON, WISCONSIN
PRELIMINARY - NOT FOR CONSTRUCTION
DAM REMOVAL DETAIL

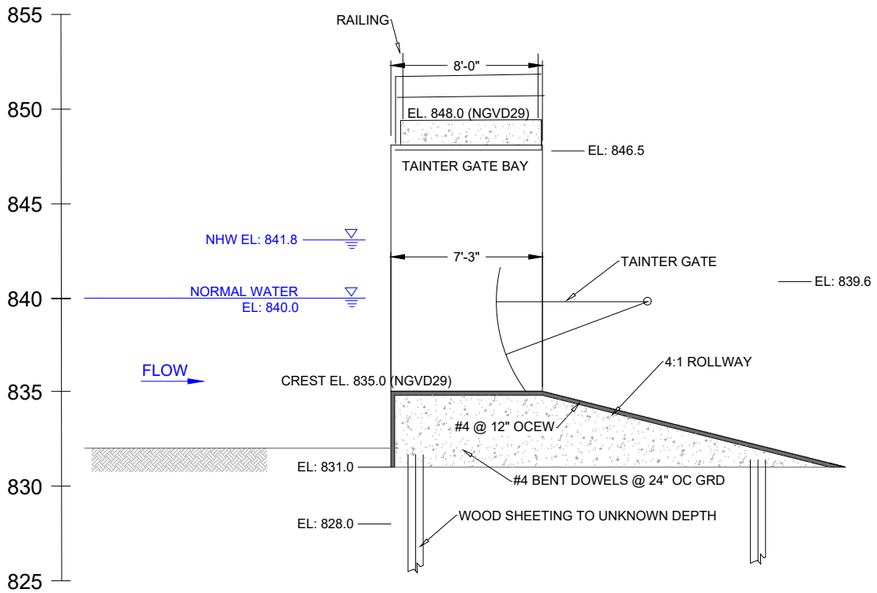
REVISIONS:

NO.	DATE

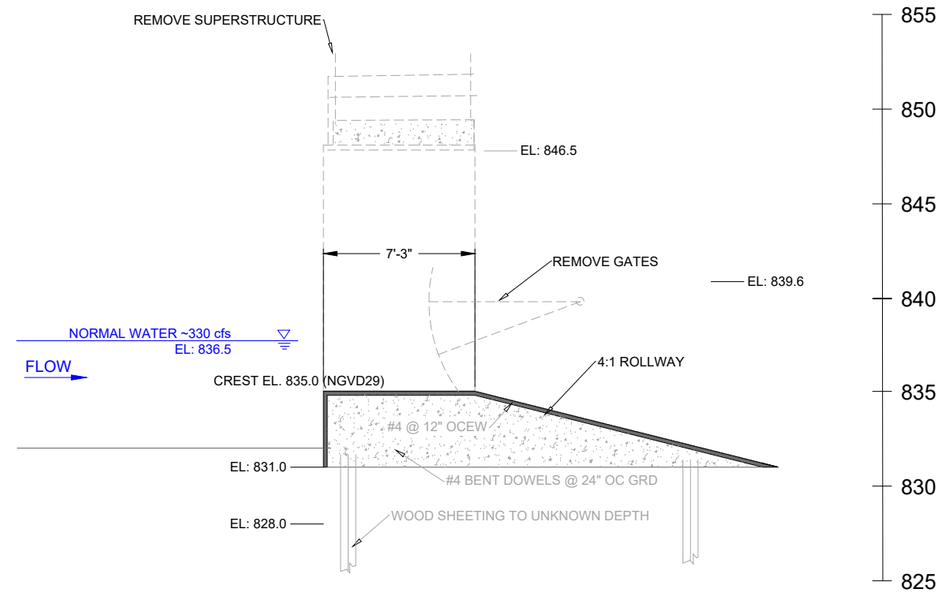
DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.
10

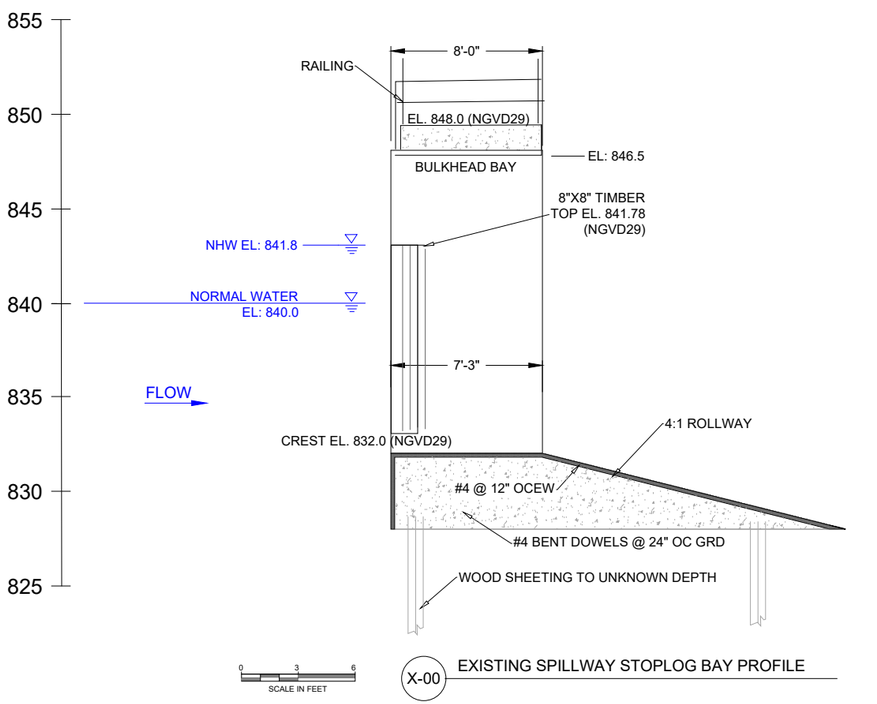
SHEET 10 OF 17



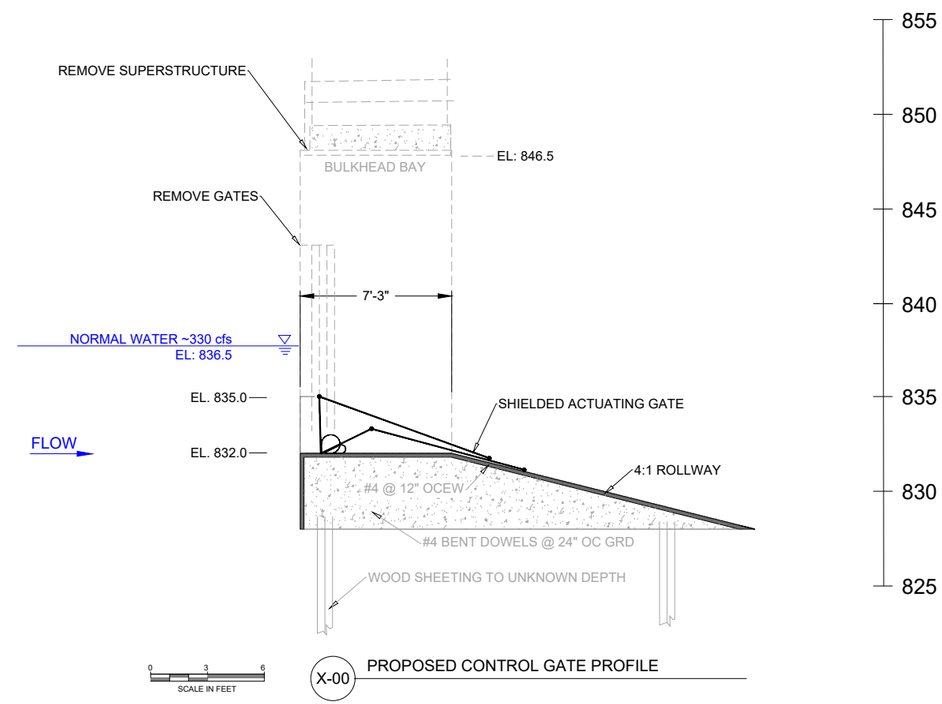
X-00 EXISTING SPILLWAY TAINTER GATE PROFILE



X-00 PROPOSED SPILLWAY TAINTER GATE PROFILE



X-00 EXISTING SPILLWAY STOPLOG BAY PROFILE



X-00 PROPOSED CONTROL GATE PROFILE

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STOUGHTON, WISCONSIN

PRELIMINARY - NOT FOR CONSTRUCTION

GATE BAY DETAIL

REVISIONS:

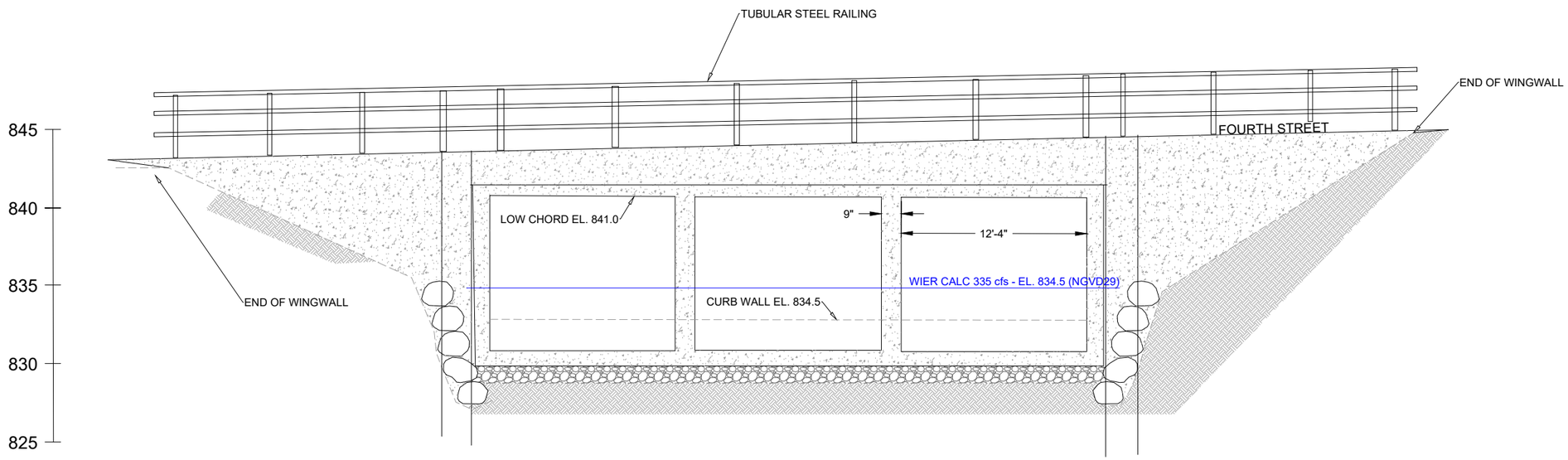
NO.	DATE

DESIGNED: GL
DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.

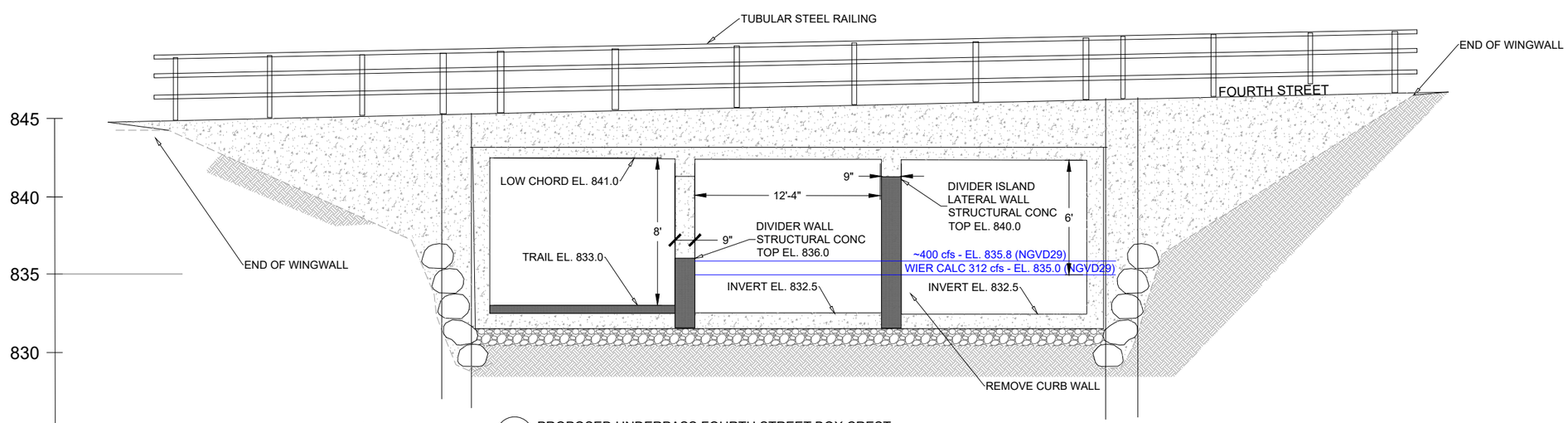
11

SHEET 11 OF 17



0 3 6
SCALE IN FEET

X-00 EXISTING FOURTH STREET 3 BOX CREST
SECTION LOOKING DOWNSTREAM



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SCALE IN FEET

X-00 PROPOSED UNDERPASS FOURTH STREET BOX CREST
SECTION LOOKING DOWNSTREAM

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PROJECT OWNER:
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381 E. MAIN ST
STOUGHTON, WI 53589

STOUGHTON WHITEWATER PARK
YAHARA RIVER
STOUGHTON, WISCONSIN

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FOURTH ST DETAIL

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PLOT DATE: 8/7/2019

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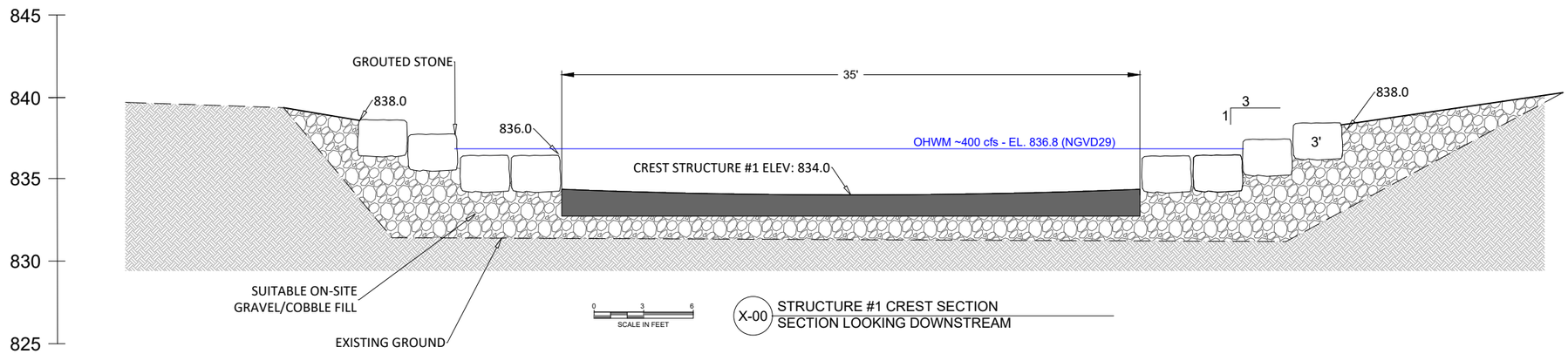
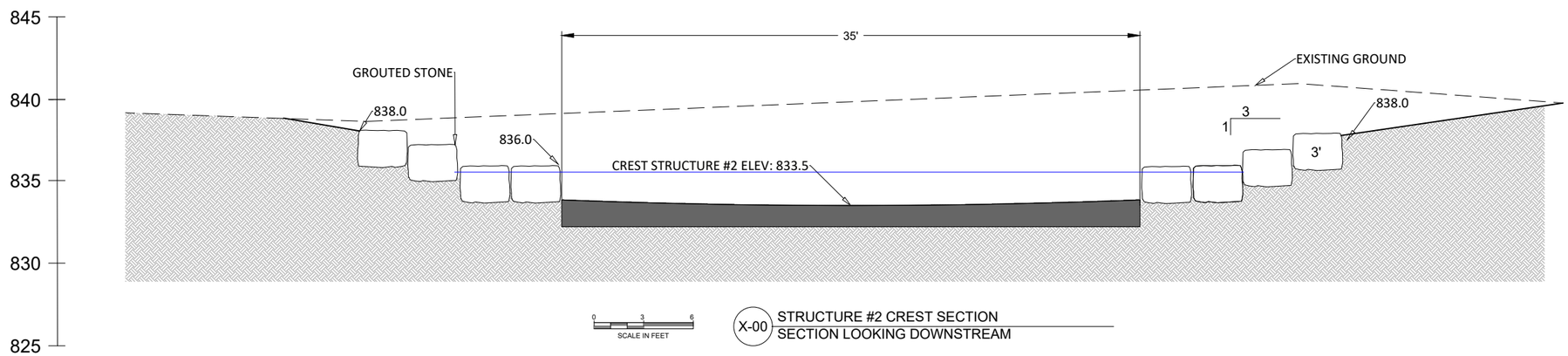
12

SHEET 12 OF 17



X-00 STRUCTURE #1 CREST SECTION
SECTION LOOKING DOWNSTREAM



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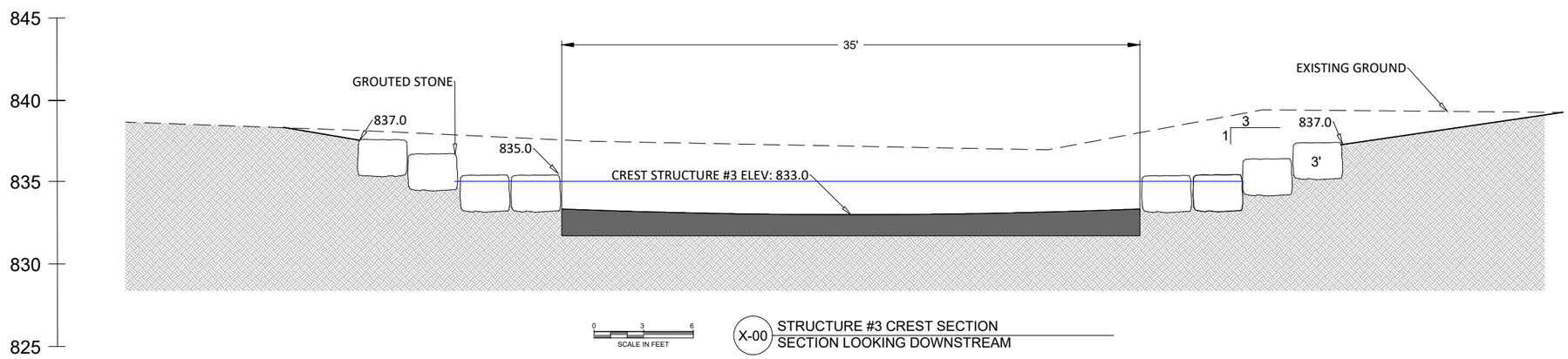
SECTION LOOKING DOWNSTREAM



X-00 STRUCTURE #3 CREST SECTION
SECTION LOOKING DOWNSTREAM

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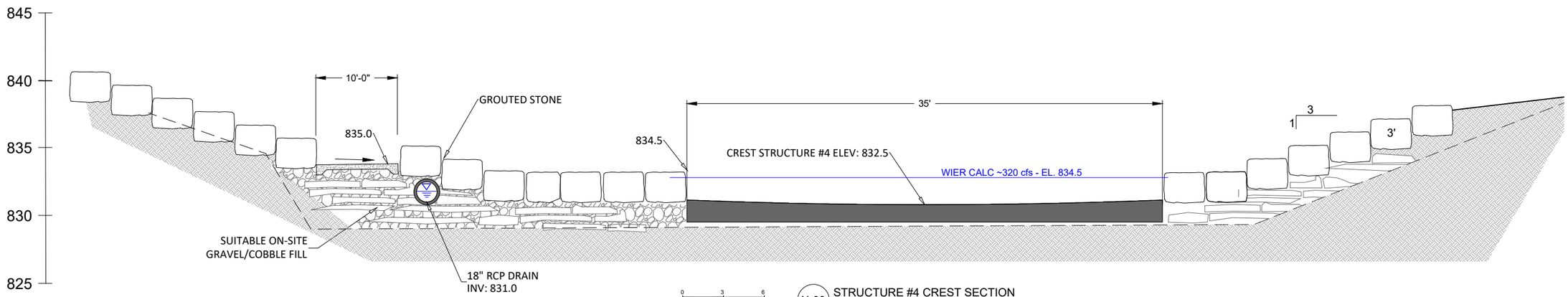
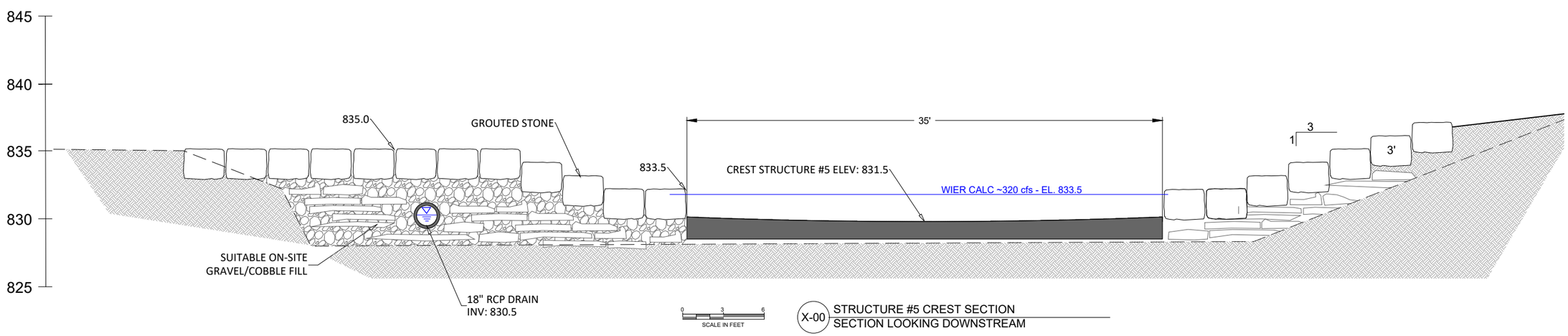
13

SHEET 13 OF 17



X-00 STRUCTURE #4 CREST SECTION
SECTION LOOKING DOWNSTREAM



X-00 STRUCTURE #5 CREST SECTION
SECTION LOOKING DOWNSTREAM

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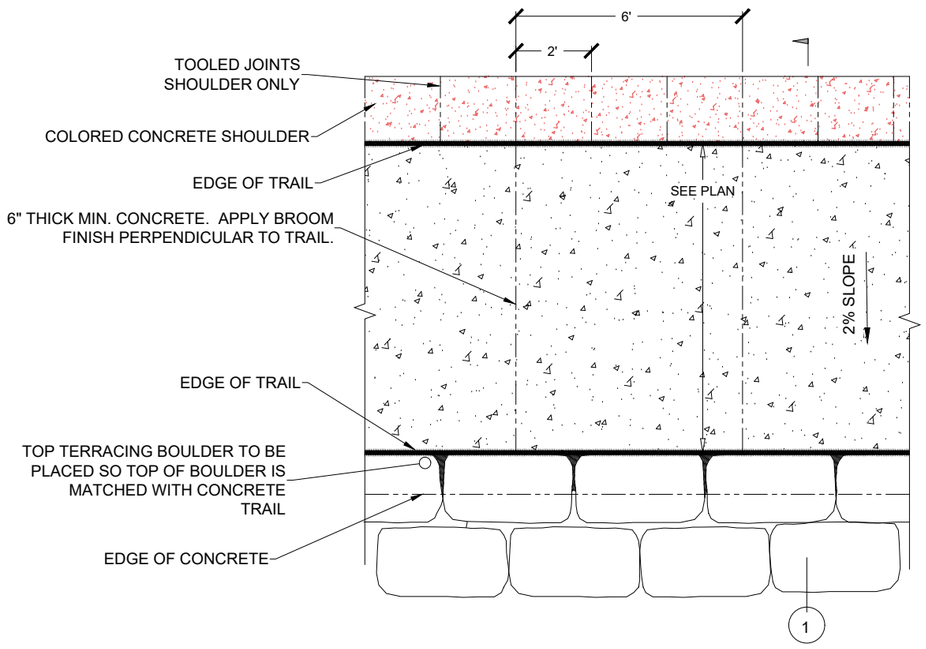
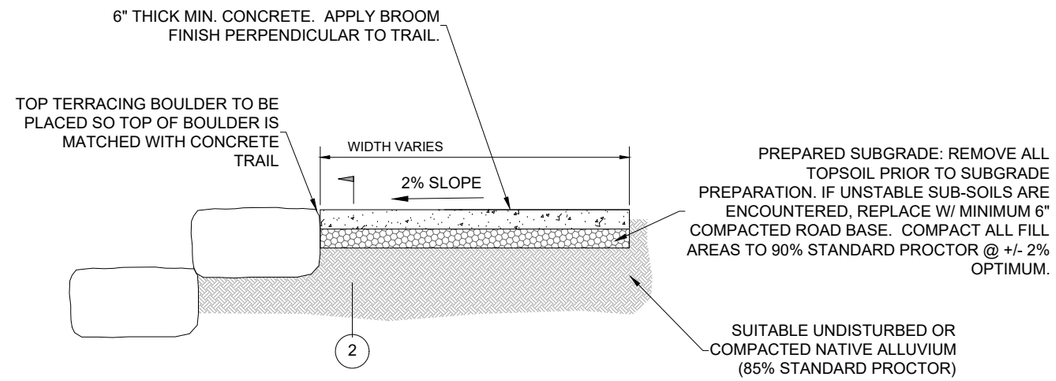
14

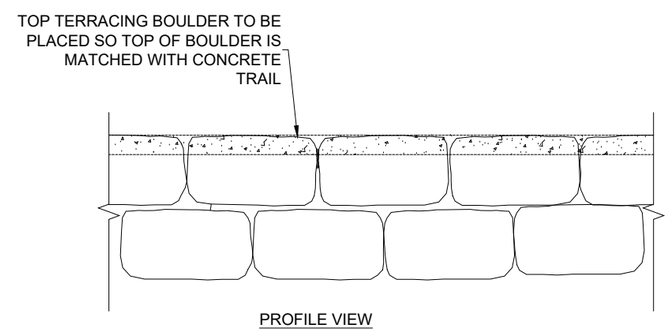


TYPICAL CONCRETE TRAIL WITH STONE SHOULDER



SECTION VIEW

TYPICAL SECTION 1 (1)



PROFILE VIEW

TYPICAL PROFILE 2 (2)

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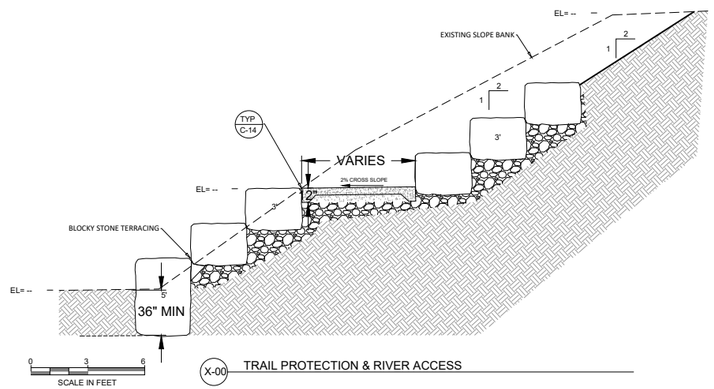
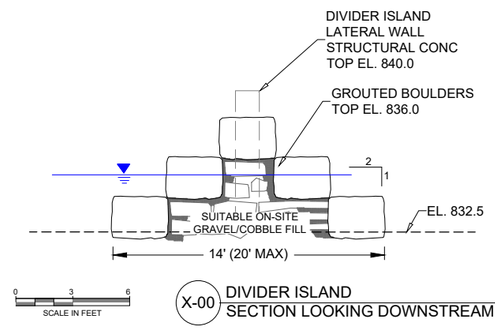
15

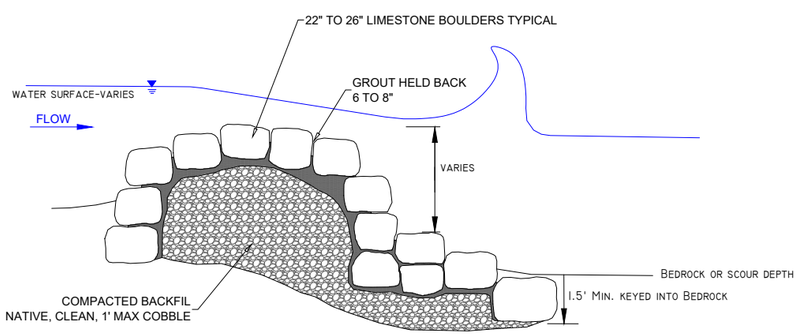
SHEET 15 OF 17



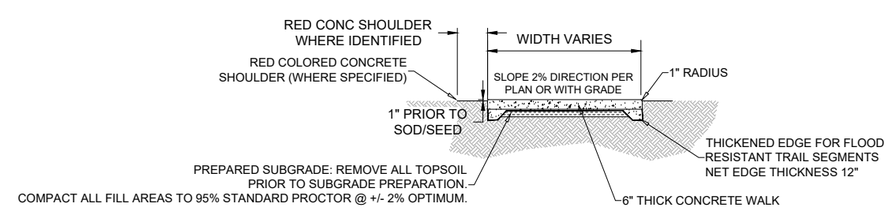
X-00 TRAIL PROTECTION & RIVER ACCESS



X-00 DIVIDER ISLAND
SECTION LOOKING DOWNSTREAM



X-00 TYPICAL PROFILE OF ROCK IN "WING"
NTS



X-00 TYPICAL CONCRETE TRAIL SECTION

NOTES:
1. SAW CUT JOINTS (WITHIN 96 HOURS)
2. EXPANSION JOINTS WHERE SIDEWALK RUN EXCEEDS 120'
3. TOOLED JOINTS ONLY ON RED COLORED CONCRETE SHOULDERS (WHERE SPECIFIED)

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PLOT DATE: 8/7/2019

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16

SHEET 16 OF 17

PROJECT SPECIFICATIONS:

GENERAL NOTES

ENGINEERS OVERSIGHT

1. THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY, AND IS NOT LIABLE FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY OR FOR PROBLEMS WHICH ARISE FROM OTHERS OR OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES, AMBIGUITIES OR CONFLICTS.
2. REP STAFF SHALL BE PRESENT FOR THE CONSTRUCTION OF KEY ASPECTS OF THIS PROJECT AND HOLDS NO RESPONSIBILITY FOR CONSTRUCTION DONE WITHOUT OVERSIGHT
3. ALL ELEVATIONS, DIMENSIONS, ALIGNMENTS AND ORIENTATION OF ALL ELEMENTS SHOWN IN THE PLANS MUST BE APPROVED BY THE REP ENGINEER OR REP ENGINEER'S REPRESENTATIVE (ENGINEER).
4. WORK SHALL NOT COMMENCE UNTIL AFTER THE DATE OF THE ON-SITE PRE-CONSTRUCTION MEETING WHICH WILL BE ATTENDED BY REPRESENTATIVES OF THE PROJECT OWNER, ENGINEER, CONTRACTOR AND ANY SUB-CONTRACTORS. IN THE EVENT THAT WORK DOES NOT BEGIN IMMEDIATELY FOLLOWING THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL PROVIDE REPRESENTATIVES OF THE PROJECT OWNER, ENGINEER, ANY SUB-CONTRACTORS, AND RELEVANT AGENCIES NOTED IN THE PERMITS, TWO WEEKS NOTICE BEFORE CONSTRUCTION COMMENCES.
5. STANDARD SPECIFICATIONS OF MATERIALS FOR AGGREGATES AND SOIL AGGREGATE SUB-BASE, BASE AND SURFACE COURSES SHALL BE GOVERNED BY AASHTO DESIGNATION M147-65 (1993) OR LATEST REVISION. ALL CONSTRUCTION SHALL CONFORM TO CITY AND COUNTY STANDARDS AND SPECIFICATIONS AS APPLICABLE.
6. WHENEVER THE INCLUDED DRAWINGS ARE FOUND TO BE INCONSISTENT WITH ANY OTHER RESOLUTION, ORDINANCE, CODE, REGULATION, OR OTHER STANDARDS REFERENCED, THE ENACTMENT IMPOSING THE MORE RESTRICTIVE STANDARDS OR REQUIREMENTS SHALL CONTROL.
7. THE CONTRACTOR SHALL NOT COMMENCE CONSTRUCTION WITHOUT CONSTRUCTION PLAN APPROVAL BY ALL RELEVANT AGENCIES. A COPY OF THE APPROVED PLANS SHALL BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES DURING WORKING HOURS.
8. THE ENGINEER IS TO BE NOTIFIED PRIOR TO ANY PLAN CHANGES OR ON-SITE DESIGN MODIFICATIONS. ALL PLAN CHANGES MUST BE APPROVED BY THE ENGINEER.
9. ALL EXISTING TOPOGRAPHIC SURVEY DATA SHOWN ON THESE PLANS HAS BEEN OBTAINED AND CERTIFIED BY OTHERS. THE ENGINEER HAS UNDERTAKEN NO FIELD VERIFICATION OF THIS TOPOGRAPHIC INFORMATION, AND MAKES NO REPRESENTATION PERTAINING THERETO AND THEREFORE ASSUMES NO RESPONSIBILITY OR LIABILITY.
10. THE CONTRACTOR SHALL CONFINE HIS OPERATIONS TO THE CONSTRUCTION LIMITS OF THE PROJECT AND IN NO WAY SHALL ENCROACHMENT OCCUR ONTO ADJACENT PROPERTIES UNLESS LEGAL EASEMENTS ARE OBTAINED. ALL FILL AND CUT SLOPES SHALL BE SETBACK FROM THE PROPERTY LINE IN ACCORDANCE WITH CHAPTER 70 OF THE UNIFORM BUILDING CODE. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY AGREEMENTS NECESSARY OR DAMAGE CAUSED BY CONSTRUCTION ACTIVITIES TO PUBLIC OR PRIVATE PROPERTY, INCLUDING UTILITIES.

SURVEY

1. THE CONSTRUCTION SURVEYOR SHALL VERIFY PROPOSED GRADES AND INVERT ELEVATIONS, FLOW LINES, ALIGNMENTS, SETBACKS AND TOPOGRAPHY PRIOR TO CONSTRUCTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SURVEY EQUIPMENT, STAKING, CONTROL POINT LOCATIONS, AND TOOLS FOR ELEVATION DETERMINATION.
3. THE CONTRACTOR IS RESPONSIBLE TO SET UP CONTROL POINTS NEAR EACH FEATURE. THESE CONTROL POINTS MUST OVERLAP SO GRADES MAY BE CHECKED FROM MULTIPLE CONTROL POINTS.
4. THE CONTRACTOR IS RESPONSIBLE FOR COMPLETING AN AS-BUILT SURVEY, IF REQUESTED, FOLLOWING COMPLETION OF THE FINAL GRADES.

UTILITIES

1. A MINIMUM OF 12 INCHES OF SEPARATION MUST BE MAINTAINED BETWEEN UTILITY LINES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF ALL EXISTING UTILITIES AND SHOULD NOT RELY SOLELY ON THESE CONSTRUCTION PLANS FOR UTILITY LOCATIONS. CONTRACTOR MUST COMPLETE ALL UTILITY LOCATES PRIOR TO CONSTRUCTION. LOCATES CAN BE COORDINATED WITH THE WISCONSIN 811 ONE-CALL BY CALLING 811. DAMAGE TO ANY EXISTING UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.

GENERAL ENVIRONMENTAL

1. WORK SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL AGENCIES' LAWS, RULES, REGULATIONS, AND PERMITS. ALL WORK SHALL BE SUBJECT TO INSPECTIONS AND SITE INVESTIGATION BY REGULATORY AGENCIES. FAILURE TO COMPLY WITH THESE REGULATIONS IS SUBJECT TO LEGAL ENFORCEMENT ACTION.
2. COPIES OF PERMITS OBTAINED BY THE OWNER WILL BE PROVIDED TO THE CONTRACTOR. CONTRACTOR SHALL MAINTAIN COPIES OF ALL PERMITS ON THE SITE AT ALL TIMES. THESE MAY INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING: CLEAN WATER ACT SECTION 404 PERMIT FROM THE U.S, ARMY CORPS OF ENGINEERS, SECTION 401 WATER QUALITY CERTIFICATION, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT, FLOODPLAIN DEVELOPMENT PERMIT, ANY APPROPRIATE LAND USE PERMITS, AND ANY RELEVANT CONSTRUCTION STORM WATER PERMITS.
3. A PRE-CONSTRUCTION MEETING WITH EQUIPMENT OPERATORS SHALL BE HELD TO DISCUSS THE PROJECT REQUIREMENTS AS THEY RELATE TO ENVIRONMENTAL PERMIT COMPLIANCE.
4. ON-SITE CONSTRUCTION REVIEWS SHALL BE CONDUCTED TO IDENTIFY MAINTENANCE NEEDS AND CHRONIC PROBLEMS THAT MAY BE OCCURRING. APPROPRIATE REMEDIAL ACTIONS SHALL BE IMPLEMENTED IN A TIMELY MANNER.
5. IF PREVIOUSLY UNKNOWN ARCHEOLOGICAL MATERIALS ARE DISCOVERED DURING CONSTRUCTION ACTIVITIES, WORK SHALL STOP IMMEDIATELY AND THE ENGINEER AND OWNER SHALL BE CONTACTED. THE STATE HISTORIC PRESERVATION OFFICE WILL THEN BE CONTACTED BY THE ENGINEER OR OWNER FOR CONSULTATION.

SEDIMENT AND POLLUTION CONTROL

1. ALL APPROPRIATE SEDIMENT AND POLLUTION CONTROL MEASURES, AND BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE IN PLACE TO MINIMIZE SEDIMENTATION AND RIVERBED IMPACTS PRIOR TO INITIATING IN-RIVER / RIVERBANK WORK. SEDIMENT AND EROSION CONTROLS SHALL BE INSTALLED IN ACCORDANCE WITH THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT GUIDELINES AND ANY STORM WATER POLLUTION PREVENTION PLAN PROVIDED BY THE ENGINEER.
2. CONTRACTOR SHALL BE WHOLLY RESPONSIBLE FOR THE DESIGN, IMPLEMENTATION, AND MAINTENANCE OF SEDIMENT AND EROSION CONTROLS IN CONFORMANCE WITH CONSTRUCTION STANDARDS AND THE REQUIREMENTS OF REGULATORY AGENCIES THROUGHOUT THE CONSTRUCTION PERIOD. THE ENGINEER WILL NOT BE ON-SITE TO APPROVE, REVIEW, OR MAINTAIN THE CONTROLS. STORMWATER MEASURES MAY BE REQUIRED TO BE INSTALLED AT ANY TIME DURING CONSTRUCTION AT THE DIRECTION OF THE ENGINEER OR OWNER.
3. IN ADDITION TO CONSTRUCTION BMP'S, TEMPORARY SEDIMENT AND EROSION CONTROLS (E.G., TEMPORARY SEEDING, MULCHING, SILT FENCE, STRAW WADDLE) SHALL BE IMPLEMENTED ON ALL DISTURBED AREAS WITHIN 2-DAYS IF DISTURBED AREAS ARE TO REMAIN DORMANT FOR MORE THAN 21-DAYS. PERMANENT SOIL STABILIZATION (E.G., PERMANENT SEEDING, EROSION CONTROL FABRIC) SHALL BE IMPLEMENTED ON DISTURBED AREAS WITHIN 2-DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE PROJECT AREA.
4. SPOIL PILES SHALL BE COVERED OR OTHERWISE MANAGED TO REDUCE SEDIMENTATION. ALL MATERIAL WHICH IS TO BE PLACED AT UPLAND SITE SHALL BE DISPOSED OF IN SUCH A WAY THAT SEDIMENT RUNOFF IS CONTROLLED AND MINIMIZED.
5. CONTRACTOR SHALL NOT STORE EQUIPMENT BELOW THE ORDINARY HIGH WATER LINE, AND TAKES FULL RESPONSIBILITY FOR ANY MATERIALS VANDALIZED, DAMAGED, BROKEN, OR LOST AS A RESULT OF RIVER EVENTS.
6. ALL FUELING OPERATIONS, LUBRICATING, HYDRAULIC TOPPING OFF, FUEL TANK PURGING, AND EQUIPMENT MAINTENANCE/REPAIRS SHALL BE PERFORMED AT AN UPLAND SITE OUTSIDE OF THE BANKS OF ANY SITE WATERWAYS AT A LOCATION TO BE DETERMINED BY THE ENGINEER OR OWNER. THESE ACTIVITIES SHALL TAKE PLACE ON AN APPROVED PAD WITH SPILL CONTROL/ COLLECTION DEVICES IN PLACE.
7. ALL CONSTRUCTION EQUIPMENT SHALL BE INSPECTED DAILY FOR HYDRAULIC AND FUEL LEAKS. LEAKS SHALL BE REPAIRED PRIOR TO OPERATION WITHIN THE 100-YEAR FLOODPLAIN. WHEN NOT IN USE, FUEL AND HYDRAULIC FLUIDS SHALL BE STORED AT AN UPLAND SITE OUTSIDE OF THE 100-YEAR FLOODPLAIN. EMERGENCY SPILL RESPONSE DEVICES SHALL BE ON-SITE AT ALL TIMES DURING CONSTRUCTION IN WATERWAYS AND FLOODPLAINS AND SHALL BE READY TO DEPLOY IN THE EVENT OF A SPILL.
8. NO CHEMICALS, FUELS, LUBRICANTS, BRUSH, ETC. SHALL BE DISCHARGED OR DISPOSED OF INTO OR ALONGSIDE ANY STREAM, WATERCOURSE, OR FLOODPLAIN UNDER ANY CIRCUMSTANCES.
9. LITTER AND CONSTRUCTION DEBRIS SHALL BE CONTAINED DAILY. ALL CONSTRUCTION DEBRIS AND LITTER SHALL BE COMPLETELY REMOVED OFFSITE AND DISPOSED OF PROPERLY UPON PROJECT COMPLETION.
10. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AS NECESSARY TO PROVIDE ACCESS TO CONSTRUCTION AREAS FROM ALL EXISTING ROADWAYS AND PATHS TO MINIMIZE GROUND DISTURBANCE AND SEDIMENT TRACKING FROM VEHICLE TIRES. ADJACENT ROADWAYS AND PATHS SHALL BE VISUALLY INSPECTED DAILY TO ENSURE THAT SEDIMENT IS NOT BEING CARRIED OFF-SITE. IF SEDIMENT IS BEING CARRIED OFF-SITE, THE ADJACENT ROADWAYS AND PATHS SHALL BE SWEPT CLEAN DAILY.
11. BMP'S PLUS TEMPORARY SEDIMENT AND EROSION CONTROLS SHALL BE MAINTAINED TO BE FUNCTIONAL UNTIL THE SITE HAS REACHED FINAL STABILIZATION. THE PROJECT AREA SHALL BE CONSIDERED TO HAVE REACHED FINAL STABILIZATION WHEN:
    - A. A PERENNIAL, VEGETATIVE COVER HAS GROWN TO A 80-PERCENT DENSITY THROUGHOUT THE ENTIRE DISTURBED AREA.
    - B. ALL TEMPORARY SEDIMENT AND EROSION CONTROLS HAVE BEEN REMOVED AND DISPOSED OF PROPERLY.
    - C. ALL TRAPPED SEDIMENT HAS BEEN REMOVED AND PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION.
    - D. ALL CONSTRUCTION ACTIVITIES HAVE CEASED.

BEST MANAGEMENT PRACTICES (BMP'S)

1. BMP'S SUCH AS DRAINAGE CHANNELS, PERIMETER FENCING, DETENTION BASINS, AND VEHICLE TRACKING CONTROLS MUST BE INSTALLED PRIOR TO CONSTRUCTION ACTIVITIES. EFFECTIVE EROSION CONTROL REQUIRES ADAPTATION AND CHANGES DURING CONSTRUCTION THAT CANNOT BE DESIGNED OR ANTICIPATED PRIOR TO CONSTRUCTION. A QUALIFIED SUPERVISOR SHOULD CHECK ALL BMP'S REGULARLY AND NOTIFY THE ENGINEER IF THERE ARE QUESTIONS OR CONCERNS. THE ENGINEER ACCEPTS NO LIABILITY FOR THE PLACEMENT, EFFECTIVENESS, MAINTENANCE, OR CHOICE OF BMP ON THE SITE IF THE ENGINEER AND/OR ENGINEER'S REPRESENTATIVE ARE NOT PRESENT.
2. THE CONTRACTOR SHALL IMPLEMENT THE NECESSARY SITE EROSION CONTROL MEASURES FOR INHIBITING DUST, WIND, AND AIR SEDIMENT MOVEMENT OFFSITE DURING ALL PHASES OR STAGES OF CONSTRUCTION.
3. THE CONTRACTOR SHALL PROVIDE AN AREA TO STORE CONSTRUCTION DEBRIS WHERE IT WILL NOT BE A NUISANCE TO THE SURROUNDING NEIGHBORHOOD. ALL DEBRIS SHALL BE CONTAINED IN SUCH A MANNER THAT WILL PREVENT SCATTERING. ALL DEBRIS, INCLUDING TREES AND UNDERGROWTH SHALL BE DISPOSED OF PROPERLY. ALL DEBRIS SHALL BE REMOVED FROM THE SITE PRIOR TO FINAL SITE INSPECTION.
4. CONTRACTOR SHALL LIMIT THE AREAS OF DISTURBANCE AND COMPLETE CONSTRUCTION WITH PHASES IN MIND.
5. CONTRACTOR SHALL LIMIT DIRECTLY CONNECTED IMPERVIOUS AREAS (DCIA).
6. BUFFER STRIPS SHOULD BE USED DURING CONSTRUCTION TO LIMIT THE DCIA'S. WHEN POSSIBLE, TRANSITIONING CHANGES IN SLOPE, TERRACING LONGER SLOPES, SURFACE ROUGHENING, AND CONTOUR FURROWS SHOULD BE USED TO MINIMIZE CONSOLIDATED FLOW.
7. ANY STAGED GRADING MUST BE DONE TO DIRECT STORMWATER TOWARDS THE APPROPRIATE BMP'S.
8. DURING CONSTRUCTION, STRAW WADDLES, COMPACTED SOIL BERMS, AGGREGATE BAGS, OR SIMILAR MUST BE USED ON ALL DISTURBED SLOPES OF 3:1 AND GREATER THAN 20 FEET IN LENGTH.
9. SILT FENCING LOCATED ON THE PERIMETER OF DISTURBED AREAS SHOULD BE CHECK ONA DAILY BASIS, OR FOLLOWING SIGNIFICANT STORM EVENTS TO ENSURE IT IS WORKING PROPERLY.
10. INLET PROTECTION MUST BE INCLUDED AT ALL STORM, SEWER, AND CULVERT LINKS. APPROPRIATE BMP'S INCLUDE ROCK SOCKS, SEDIMENT CONTROL LOGS, OR SIMILAR.
11. SEDIMENT ENTRAINMENT FACILITIES HAVE BEEN DESIGNED TO STORE THE APPROPRIATE VOLUME OF STORMWATER DISCHARGE, BUT CONTAIN MINIMAL ADDITIONAL CAPACITY. THEY MUST BE MAINTAINED TO THE CALCULATED VOLUME AND DREDGED AS NECESSARY.

MATERIAL HANDLING

1. A LIST OF ALL POTENTIALLY TOXIC OR HAZARDOUS CHEMICALS THAT WILL BE USED OR STORED ON-SITE SHALL BE MAINTAINED WITH THE EROSION CONTROL SUPERVISOR. WARNING LABELS MUST BE ATTACHED. MATERIAL SAFETY DATA SHEETS (MSDS) AND OTHER SAFETY INFORMATION FOR A POTENTIALLY TOXIC OR HAZARDOUS SUBSTANCE MUST BE ON THE SITE WHILE THE SUBSTANCE IS USED OR STORED.

SPILL REMEDIATION PRACTICES

1. ALL CONSTRUCTION SITE PERSONNEL MUST FOLLOW SPILL PREVENTION AND CONTROL PRACTICES AS FOLLOWS:
    - a. THE SENIOR SAFETY MANAGER, DESIGNATED COORDINATORS, AND THE WATER QUALITY OFFICER WILL BE CONTACTED IMMEDIATELY FOLLOWING ANY SPILL. THE SENIOR SAFETY MANAGER (OR DESIGNEE) MUST IN TURN REPORT THE SPILL TO THE APPROPRIATE FEDERAL, STATE, OR LOCAL AGENCIES IN ACCORDANCE WITH APPLICABLE REGULATIONS.
    - b. PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE EQUIPMENT.
    - c. THERE MUST BE A DESIGNATED INDIVIDUAL ON THE SITE TRAINED IN THE APPROPRIATE CLEANUP PROCEDURES FOR VARIOUS TYPES OF CHEMICALS AND THE LOCATION OF INFORMATION AND CLEANUP SUPPLIES.
    - d. THE MSDS OF ANY MATERIAL SHOULD BE CONSULTED ON THE EVENT OF A SPILL. THE MSDS FOR ALL CHEMICALS USED ON THE SITE WILL BE KEPT ON THE SITE, AND WORKERS WILL BE REQUIRED TO REVIEW MSDS'S.
    - e. SPILL KITS MUST BE LOCATED ON-SITE. SUBCONTRACTORS MUST BE NOTIFIED OF THEIR LOCATION AND INSTRUCTED HOW TO USE THEM WHEN NECESSARY.
    - f. SPILLS MUST BE CLEANED UP PROMPTLY AFTER DISCOVERY, AND MATERIALS USED FOR CLEANUP MUST BE DISPOSED OF OFF-SITE AT AN APPROVED FACILITY.

WORK LIMITS AND LAYDOWN

1. WORK LIMITS, ACCESS, STAGING, LAYDOWN, AND STOCKPILE AREAS SHALL BE LOCATED WHERE SHOWN ON THE CONSTRUCTION DRAWINGS OR OTHERWISE AS APPROVED BY THE ENGINEER OR OWNER.
2. ALL CONSTRUCTION ACTIVITIES SHALL OCCUR WITHIN CURRENTLY DISTURBED AREAS TO THE EXTENT POSSIBLE.
3. DISTURBED/ EXPOSED RIVERBANKS AND STAGING AND PROJECT ACCESS AREAS SHALL BE PROPERLY STABILIZED (SEEDED, MULCHED, OR OTHERWISE) WITH NATIVE VEGETATION IMMEDIATELY AFTER GRADING TO PREVENT EROSION AND ESTABLISHMENT OF INVASIVE PLANT SPECIES.
4. CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE TO VEGETATION OR PROPERTY OUTSIDE THE WORK LIMITS RESULTING FROM CONSTRUCTION OPERATIONS.
5. ALL AREAS TEMPORARILY DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION, SLOPES, AND ELEVATIONS, UNLESS OTHERWISE NOTED IN THE CONSTRUCTION DRAWINGS.

ROCK QUALITY

1. ALL ROCK USED FOR INSTREAM STRUCTURES SHALL MEET SECTION 31 37 00 OF THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT SPECIFICATIONS.
2. INDIVIDUAL STONE BOULDERS SHALL BE DENSE, SOUND AND FREE FROM CRACKS, SEAMS AND OTHER DEFECTS CONDUCIVE TO ACCELERATED WEATHERING.
3. AT A MINIMUM EXPOSED ROCK SHOULD HAVE ONE FLAT SURFACE AND THIS SHOULD BE THE ONLY EXPOSED SURFACE.
4. THE ROCK SHALL HAVE THE FOLLOWING PROPERTIES:
    - a. BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) NOT LESS THAN 2.5.
    - b. ABSORPTION NOT MORE THAN 2% BY WEIGHT.
    - c. THE BULK SPECIFIC GRAVITY AND ABSORPTION SHALL BE DETERMINED BY ASTM METHOD C-127.
5. ROCK THAT FAILS TO MEET THESE REQUIREMENTS MAY BE ACCEPTED ONLY IF SIMILAR ROCK FROM THE SAME SOURCE HAS BEEN DEMONSTRATED TO BE SOUND AFTER FIVE YEARS OR MORE OF SERVICE UNDER CONDITIONS OF WEATHER, WETTING AND DRYING, AND EROSIVE FORCES SIMILAR TO THOSE ANTICIPATED. ALTERNATIVELY NATIVE OR IMPORTED STONE, ALREADY AT THE SITE AND MEETING THE STANDARDS OUTLINED ABOVE, MAY BE USED.
6. THE ENGINEER RETAINS RIGHT OF REFUSAL FOR ANY ROCK BROUGHT TO THE SITE WHICH IS NOT SUITABLE AND DOES NOT MEET THE ABOVE CRITERIA AND/OR SHOWS EXCESSIVE WEATHERING, CRACKING OR DEFORMATION.
7. MINIMUM ROCK DIMENSIONS FOR "QUARRIED STONE" SHALL BE 2'X2'X2'.
8. ALL RIP RAP TO MEET ASTM C-535-69, AASHTO TEST 103 AND HAVE A SPECIFIC GRAVITY OF 2.65 AS WELL AS MEETING THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT (UDFCD) SPECIFICATIONS. THE ENGINEER TAKES NO RESPONSIBILITY FOR MATERIAL USED NOT MEETING THESE SPECIFICATIONS OR NOT APPROVED ON-SITE BY THE ENGINEER OR OWNER.

SITE PREPARATION-ROCK EXCAVATION

1. CONTRACTOR SHALL USE SUITABLE EXCAVATION TECHNIQUES THAT INCLUDE RIPPERS, STANDARD BUCKET EXCAVATION, AND HYDRAULIC BREAKERS. NO BLASTING OR EXPLOSIVES MAY BE USED WITHOUT PRIOR APPROVAL.

SITE PREPARATION- STONES PLACED IN CHANNEL

1. QUARRIED STONE SHALL BE PLACED AS SHOWN ON THE DRAWINGS WITHOUT ANY GAPS, SO THAT EACH BOULDER TOUCHES THE NEXT ONE.
2. EACH STONE SHALL BE PLACED TO THE FINAL POSITION BY SUITABLE EQUIPMENT FOR HANDLING MATERIAL AND, IF NECESSARY; THE STONE SHALL BE PICKED UP AND REPOSITIONED.
3. IT SHOULD BE ANTICIPATED THAT RE-HANDLING OF INDIVIDUAL STONES, AFTER INITIAL PLACEMENT WILL BE REQUIRED TO ACHIEVE REQUIRED SLOPES, GRADES, ELEVATIONS AND POSITION.
4. THE ENGINEER SHALL OBSERVE AND APPROVE CONTRACTOR'S METHOD FOR STONE PLACEMENT IN A REPRESENTATIVE AREA FOR EACH PROJECT COMPONENT.

REVEGETATION NOTES

1. ANY REVEGETATION OR PLANTING SHALL OCCUR WITHIN THE APPROPRIATE PLANTING WINDOWS AND IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. THIS TIMEFRAME SHOULD NOT EXCEED 14 DAYS AFTER COMPLETION OF FINAL GRADES.
2. THE CONTRACTOR SHALL PLANT THE TYPE OF PLANT MATERIAL AND MIX OF SPECIES INDICATED FOR THE RIPARIAN BUFFER TO CREATE WETLAND AND RESTORE DISTURBED UPLAND AREAS. LOCATIONS OF TREE AND SHRUB PLANTINGS WILL BE MARKED IN THE FIELD UPON COMPLETION OF EARTHWORK BY THE ENGINEER AND MAY VARY FROM THOSE SHOWN ON THE DRAWING DUE TO ACTUAL SITE CONDITIONS.
3. ALL SUITABLE TOPSOIL SHALL BE STOCKPILED DURING CONSTRUCTION AND PLACED WITHIN THE SEEDED AREAS IN MINIMUM 3-INCH DEPTHS.
4. CONTRACTOR SHALL MAINTAIN ALL PLANT MATERIAL IN A VIABLE CONDITION UP TO THE TIME OF PLANTING AND SHALL NOT PLANT DEAD, DISEASED, OR DAMAGED PLANTS OR SEEDS.
5. NO PLANTING OR SEEDING SHALL OCCUR UNTIL THE AREA HAS BEEN PROPERLY PREPARED AND APPROVED BY THE ENGINEER (INCLUDING SOILS BEING SATURATED AND/OR FLOODED TO APPROPRIATE WATER DEPTHS).
6. PLANT MATERIALS SHALL BE INSTALLED USING STANDARD PRACTICES FOR THE TYPE OF MATERIAL. THE FOLLOWING DESCRIBES THE SPECIFIC METHODS TO BE USED FOR EACH TYPE OF PLANTING:
    - a. TREES AND SHRUBS: TREES AND SHRUBS SHALL BE PLANTED ACCORDING TO TABLE 1 ON SHEET C-10.
    - b. SEEDING: THE UPPER THREE (3) INCHES (MINIMUM) OF THE AREA TO BE SEEDED SHALL BE IN A LOOSE AND FRIABLE CONDITION SUITABLE FOR SEEDING. IF NECESSARY, AREAS TO BE SEEDED WILL BE TILLED TO RELIEVE COMPACTION PRIOR TO SEEDING. ONCE SEEDING IS COMPLETE, NO MORE THAN 0.5-INCHES OF SOIL MAY BE PLACED OVER THE SEED.
7. CONTROL ANY SURFACE FLOW TO ENABLE SEEDING.
8. 2 TONS PER ACRE OF STRAW MULCH SHALL BE APPLIED TO SEEDED AREAS IMMEDIATELY AFTER SEEDING,
9. ALL PLANTED AND SEEDED AREAS SHALL BE ADEQUATELY WATERED WITHIN 4 HOURS AFTER SEEDING/PLANTING. THE FOLLOWING DESCRIBES THE REVEGETATION TO BE COMPLETED BY AREA:
    - 9.1. RIPARIAN BUFFER WITH CREATED WETLAND: PLANT AS SHOWN IN DETAILS AND TABLE 1 ON SHEET C-10
    - 9.2. EXCESS SOIL DISPOSAL AREA AND OTHER UPLAND AREAS: A) BROADCAST UPLAND SEED MIX SPECIFIED, B) APPLY 2 TONS PER ACRE STRAW MULCH, C) CRIMP MULCH TO SECURE.

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STOUGHTON WHITEWATER PARK
YAHARA RIVER
STOUGHTON, WISCONSIN

PRELIMINARY - NOT FOR CONSTRUCTION

PROJECT SPECIFICATIONS

REVISIONS:

NO.	DATE

DESIGNED: GL DRAFTED: RG
CHECKED: GL
PLOT DATE: 8/7/2019

DRAWING NO.

17

SHEET 17 OF 17