

MEETING: REGULAR MEETING OF THE PLAN COMMISSION
DATE & TIME: Monday, August 26, 2024 at 6:30 PM
LOCATION: Germantown Village Hall Board Room
N112 W17001 Mequon Road

Any member of the body and/or citizen also attend the meeting virtually through the WebEx platform, Meeting #: **2557 993 0299** Password: **vbBsJn478R3** which can be accessed by phone at **408-418-9388** or by logging on at <https://villageofgermantown.my.webex.com/villageofgermantown.my/j.php?MTID=m8ea18283017d7479a65aeb3ae5e8f155>

Citizens not wishing to attend the meeting personally or virtually may submit any public comments by sending an email to comments@germantownwi.gov by 4 p.m. on the day of the meeting so that it can be provided to the members of the body for their consideration.

Previously recorded Village Board Meeting Videos can be viewed at https://www.youtube.com/channel/UCOYp0EgELzTCa9X_iCohyhQ.

AGENDA

- I. **CALL TO ORDER:** *This meeting has been given public notice in accordance with Section 19.83 and 19.84, Wis. Stats, in such form that will apprise the general public and news media of subject matter that is intended for consideration and action.*
- II. **ROLL CALL:**
- III. **APPROVAL OF MINUTES:**
 - A. PC Minutes 8/12/24
- IV. **NEW BUSINESS:**
 - A. Michael Anderson, Agent for GH Industries LLC and Klosett Investments and Mark Mason, Property Owners, N114 W18686 Clinton Drive. Conditional Use Permit (CUP) application to Allow Horticultural Services and Snow Removal Services operations from Property in an M-1: Limited Industrial Zoning District, and, to Allow a "Salt or De-Icing Material Storage" in a Groundwater Protection Overlay District. (PUBLIC HEARING) - STAFF REQUEST TO TABLE HEARING UNTIL SEPTEMBER 9TH AT 6:30PM.
 - B. Michael Anderson, Agent for GH Industries LLC and Klosett Investments and Mark Mason, Property Owners, N114 W18686 Clinton Drive. Proposed Amendment to the list of Prohibited Uses in Section 17.40.10(1)(j) of the Zoning Code. (PUBLIC HEARING) - (CANCELED; APPLICATION WITHDRAWN).
 - C. MSA Professional Services, Inc. Agent for CrossWay Church Property Owner, W156 N10041 Pilgrim Road. Site Plan Review - Parking lot Expansion & Driveway Reconstruction. (ACTION)
 - D. Plunkett Raysich Architects, LLP Agent for CrossWay Church Property Owner, W156 N10041 Pilgrim Road. Site Plan Review - 2,240 sqft Building Addition, Entrance & Interior Remodeling. (ACTION)
 - E. Community Development Department - Ordinance Amending Section 1.29(1) of the Germantown Municipal Code to Amend the Membership of the Plan Commission. (ACTION)

- F. Community Development Department - Holy Hill Gateway District Master Plan Project; Review Revised Request for Proposals (RFP) and Timeline.
(DISCUSSION & ACTION)

V. **CITIZEN INPUT/PUBLIC APPEARANCE:** *(Please be advised per 19.84(2) that information and comment will be received from the public. It is the policy of this municipality that public input be limited to a three (3) minute period per person with a time extension granted at the discretion of the Chairperson. Be advised that there may be limited discussion of the information received but no action will be taken under public comments.)*

VI. **ANNOUNCEMENTS:**

VII. **ADJOURNMENT:**

UPON REASONABLE NOTICE, efforts will be made to accommodate the needs of disabled individuals through appropriate aids and services. For additional information or to request this service, please contact the Village Clerk at (262)250-4745 at least 2 days prior to the meeting. Notice is given that a majority of the Village Board may attend this meeting to gather information about an item over which they have decision-making responsibility. This may constitute a meeting of the Village Board per State ex rel. Badke v Greendale Village Board, even though the Village Board will not take formal action at this meeting.

MEETING:	REGULAR MEETING OF THE PLAN COMMISSION
DATE AND TIME:	Monday, August 12, 2024 6:30 PM
LOCATION:	Germantown Village Hall Board Room N112 W17001 Mequon Road

MINUTES

- I. **CALL TO ORDER:** *This meeting has been given public notice in accordance with Section 19.83 and 19.84, Wis. Stats, in such form that will apprise the general public and news media of subject matter that is intended for consideration and action.*

Chairman Wolter called the meeting to order at 6:30pm.

- II. **ROLL CALL:**

Chairman Wolter and all voting members of the committee were present as well as Community Development Director Retzlaff and Associate Planner Yanke.

- III. **APPROVAL OF MINUTES:**

A. PC Minutes 7/8/24

Motion: Approve as presented

Motioned By: David Baum

Seconded By: William Shadid

Yes: Dean Wolter, David Baum, Josh Tarantino, Robert Williams, William Shadid, Bridget Henk

No: None

Abstain: None

Motion Passed (Yes 6, No 0, Abstained 0)

- IV. **NEW BUSINESS:**

A. Michael Anderson, Agent for GH Industries LLC and Klosett Investments and Mark Mason, Property Owners, N114 W18686 Clinton Drive. Conditional Use Permit (CUP) application to Allow Horticultural Services and Snow Removal Services operations from Property in an M-1: Limited Industrial Zoning District. (PUBLIC HEARING) - STAFF REQUEST TO TABLE HEARING UNTIL AUGUST 26TH.

Director Retzlaff asked the Plan Commission to table this Public Hearing until August 26th. Director Retzlaff indicated that the applications and plans needed for this proposal are not complete and not ready for public hearing or presentation to the Plan Commission.

Motion: Approve tabling topic until Plan Commission Meeting on 8/26/24

Motioned By: David Baum

Seconded By: William Shadid

Yes: Dean Wolter, David Baum, Josh Tarantino, Robert Williams, William Shadid, Bridget Henk

No: None

Abstain: None

Motion Passed (Yes 6, No 0, Abstained 0)

- B. Michael Anderson, Agent for GH Industries LLC and Klosett Investments and Mark Mason, Property Owners, N114 W18686 Clinton Drive. Proposed Amendment to the list of Prohibited Uses in Section 17.40.10(1)(j) of the Zoning Code (Wellhead Protection) to Allow a "Deicing Material Storage Facility" to Operate from Property in a Groundwater Protection Overlay District. (PUBLIC HEARING) - REQUEST TO TABLE HEARING - (APPLICATION HAS BEEN WITHDRAWN).

Director Retzlaff asked the Plan Commission to table this Public Hearing until August 26th. - Application has been withdrawn.

Motion: Approve tabling topic until Plan Commission Meeting on 8/26/24 as presented

Motioned By: David Baum

Seconded By: Robert Williams

Yes: Dean Wolter, David Baum, Josh Tarantino, Robert Williams, William Shadid, Bridget Henk

No: None

Abstain: None

Motion Passed (Yes 6, No 0, Abstained 0)

- C. Village of Germantown Community Development Department - Proposed Text Amendments to Chapter 17.40 (Wellhead Protection) of the Village of Germantown Municipal Code (PUBLIC HEARING & ACTION)

Director Retzlaff went over the history of the Wellhead Protection Ordinance which went into effect in Germantown in 2010, and explained the four (4) amendments to various subsections under 17.40 (Wellhead Protection) in the Village Zoning Code as referenced in the ordinance draft.

Public Hearing was opened at 7:05pm.

Comments were received from:

-Melanie Smythe who lives on Cedar Lane.

-Jan Miller who lives on Windsong Circle.

Public hearing closed at 7:17pm.

Motion: Approve as presented

Motioned By: David Baum

Seconded By: Robert Williams

Discussion followed. Chairman Wolter asked if these amendments affect Items A or B on the agenda? Director Retzlaff replied that the amendments may impact the Anderson proposal with respect to the recommended language concerning land uses that are a relocation or substitution because the Anderson proposal is in a location that previously had storage for salt and deicing materials, which is a prohibited use. This new business would be a preexisting use for the site that is proposed. Committee Member Henk stated that this reflects Well #12 which is already in place, and we are just adopting this for our protection in the future. She has read through the current ordinance and the new changes, and she thinks that this gives the Village a lot more protection than previously. Henk indicated that KwikTrip would need to have stormwater management and protection systems with gas distribution & storage at the proposed new location that they don't have now at their current location. Committee

Member Williams asked whether a new prohibited business would not be able to apply for anything within a groundwater protection area? Director Retzlaff stated that a new business could apply if there is a preexisting prohibited use at the same location, but the new business would have to prove that they pose less of a risk and are using further protection where an existing prohibited business could relocate, expand and remodel within the protection area with these changes.

Yes: Dean Wolter, David Baum, Josh Tarantino, Robert Williams, William Shadid, Bridget Henk

No: None

Abstain: None

Motion Passed (Yes 6, No 0, Abstained 0)

D. JSD Professional Service, Inc., Agent for Heather Lake LLC/Patsy Ellsworth, Property Owner, and the Ellsworth Corporation N109 W13300 Ellsworth Drive. Site Plan Review for a 52-stall Parking Lot Expansion. (ACTION)

Associate Planner Yanke summarized this proposal for JSD Professional Services, agent for Ellsworth Corporation, is seeking approval of a site development plan for a parking lot expansion including fifty-two (52) additional parking spaces to the east of the existing parking lot. This is a 20 acre site with 2 driveways from Ellsworth and Eisenhower which serve the existing facility & parking area. This parking lot expansion was originally shown in 2012 on a previous site plan, but it was required that they bring any future expansion back to the Plan Commission.

Staff recommends approval of this site plan subject to the following conditions:

- Approval is for the site development plan dated June 10, 2024 (unless either is otherwise revised by a subsequent plan set approved by the Village Planner pursuant to revisions required herein or by the Plan Commission).
- Prior to commencing construction, all issues, both minor technical/plan corrections and other storm water management requirements (including erosion control permitting) identified in the June 10, 2024 review memo from the Village Engineer shall be resolved and reflected in additional information and/or revised plans submitted to staff for further review, comment, and approval.
- The landscaping plan, meeting the requirements of Chapter 17.43(5) Site Plan Approval Requirements, shall be subject to final acceptance by the Village Forester and Community Development staff prior to commencement of construction.
- All future phasing/development improvements on the property, such as building expansion or parking lot expansion, shall be subject to Plan Commission review and approval.

Motion: Approve as presented

Motioned By: David Baum

Seconded By: William Shadid

Yes: Dean Wolter, David Baum, Josh Tarantino, Robert Williams, William Shadid, Bridget Henk

No: None

Abstain: None

Motion Passed (Yes 6, No 0, Abstained 0)

E. Lemberg Electric Agent for County Line LLC Property Owner. NEC of County Line Rd and Appleton Avenue - Sign Review for Chase Bank. (ACTION)

Associate Planner Yanke stated that Lemberg Electric, agent for County Line LLC, property owner, and Chase Bank are requesting approval of 4 (37SF) wall signs proposed for all building frontages with standard Chase Bank wall signs, as well as 2 small (2.3SF) directional signs. The new Chase Bank facility was approved by the Village Board and Plan Commission in late 2023 for a CSM, site development plan, and building plans. Staff recommends approval of the proposed wall and directional signs for Chase Bank located at N96 W18250 County Line Road in the Fleet Farm parking lot, subject to the following 2 conditions:

- Applicant/owner shall obtain an electrical permit(s) from building inspection services for the sign installations.
- Prior to issuance of an electrical permit and installation of the Chase Bank signs, the existing nonconforming pylon sign advertising Fleet Farm and its gas prices, which fronts the property at the corner of County Line Road and Appleton Avenue, shall be removed. This was a commitment made by the applicant in 2023.

Motion: Approve as presented

Motioned By: David Baum

Seconded By: William Shadid

Discussion Followed. Tina Lewis, a representative for Lemberg Electric spoke, asking if the Plan Commission would consider allowing Chase Bank to move forward with their sign installation if the replacement of the Fleet Farm pylon sign is not ready? Director Retzlaff stated that this was a commitment made by Chase Bank on behalf of Fleet Farm as their authorized agent as part of the original approval for building Chase Bank on this site and the sign in question now rests on Chase Bank property. He said that there have been several sign proposals for Fleet Farm signage that do not include removal of the pylon sign, so there has been no movement towards removal and, from the standpoint of leverage, we need to keep that commitment made by applicant/owner. Committee members Baum and Shadid want that condition to remain in the proposal. Baum reiterated that this is what was committed to when the site plans were approved. Tina Lewis said that she would speak with their contacts and inform them about the requirement for removal.

Yes: Dean Wolter, David Baum, Josh Tarantino, Robert Williams, William Shadid, Bridget Henk

No: None

Abstain: None

Motion Passed (Yes 6, No 0, Abstained 0)

- V. **CITIZEN INPUT/PUBLIC APPEARANCE:** *(Please be advised per 19.84(2) that information and comment will be received from the public. It is the policy of this municipality that public input be limited to a three (3) minute period per person with a time extension granted at the discretion of the Chairperson. Be advised that there may*

be limited discussion of the information received but no action will be taken under public comments.)

The following residents spoke:

Lynn Bednarz who lives on Pawney Court.

Melanie Smythe who lives on Cedar Lane.

Karl Griffiths who lives on Rockfield Road.

VI. ANNOUNCEMENTS:

Chairman Wolter stated that there are 3 meetings scheduled this week: Public Works & Highways Committee and Economic Development Commission on Wednesday, as well as the Utility Advisory Meeting on Thursday. Also, on Thursday there is Music at the Pavillion which starts at 6pm in Fireman's Park, and on Friday night there is movie night in the park at 7pm.

Director Retzlaff stated that we are having a 2nd Plan Commission meeting on August 26th at 6:30pm.

And there is an election tomorrow 8/13. Polls open at 7am and close at 8pm. District 1 polling location has been changed to the Senior Center.

VII. ADJOURNMENT:

Chairman Wolter adjourned the meeting at 7:34pm.

CONDITIONSAL USE PERMIT

8/26/24 Plan Commission Meeting

Michael Anderson / GH Contracting LLC

Village Staff Report & Recommendation

Germantown, Wisconsin

Summary

Michael Anderson, Agent for GH Contracting LLC and Klosett Investments and Mark Mason, Property Owners, N114 W18686 Clinton Drive. Conditional Use Permit (CUP) application to Allow Horticultural Services and Snow Removal Services operations from Property in an M-1: Limited Industrial Zoning District, and, to Allow a "Salt or De-Icing Material Storage" in a Groundwater Protection Overlay District.

As was the case at the August 12 Plan Commission meeting, the application submitted by Anderson is not complete and not ready for public hearing. As a result of the Wellhead Protection Zoning Code amendment approved by the Village Board on August 19, the conditional use permit application requirements for a "pre-existing prohibited land use" have changed. Consequently, the Anderson application needs to be supplemented with addition information addressing wellhead protection. In addition, the Anderson CUP application is required to be reviewed and a recommendation prepared by the Groundwater Technical Review Committee. Because the application is incomplete, the Committee has not had an opportunity to review or recommend any action on the Anderson application.

Staff is requesting that the public hearing be **TABLED** to the September 9 Plan Commission meeting.

SITE PLAN REVIEW

8/26/24 Plan Commission Meeting

CrossWay Church

Village Staff Report & Recommendation

Germantown, Wisconsin

Summary

Brian Kehrli, MSA Professional Services, and Ben Cartland, agents for CrossWay Church, property owner, are requesting approval of site development & building plans for a 107-stall parking lot expansion, new driveway connection to Santa Fe/Council Bluffs Drive, and reconstructed driveway entrance on Pilgrim Road for the existing church facility located at W156 N10041 Pilgrim Road.

Property Location: W156 N10041 Pilgrim Road

Agent/

Property Owner: Brian Kehrl
MSA
Baraboo, WI

Ben Cartland
CrossWay Church
W156 N10041 Pilgrim Road
Germantown, WI

Current Zoning: I: Institutional

Adjacent Land Uses		Zoning
North	Residential	Rs-6/Rd-2
South	Residential	Rs-4
East	Residential	Rs-4
West	Institutional (Spassland Park)	I



Proposal

Brian Kehrl, MSA Professional Services, and Ben Cartland, agents for CrossWay Church, property owner, are requesting approval of site development & building plans for a 107-stall parking lot expansion, new driveway connection to Santa Fe/Council Bluffs Drive, and reconstructed driveway entrance on Pilgrim Road for the existing church facility located at W156 N10041 Pilgrim Road.

As indicated in the June 10 project narrative, the proposed improvements are needed/proposed to address the demand for additional parking for Sunday & holiday services and to improve traffic circulation within and access to/from the church. The following improvements are proposed (as detailed in the site plans):

- Parking Lot Expansion (west/rear yard)
 - 132 new stalls (25 existing stalls to be removed; 107 net increase)
 - Paved parking w/ curbed landscaped islands
 - 52,800 sqft additional impervious area (3,275 sqft interior landscaped islands)
- Santa Fe/Council Bluffs Drive Entrance (new)
 - Reconstruct intersection abutting Santa Fe Drive w/ extended curb & gutter
 - Paved driveway into church property serving new & existing parking stalls
- Expanded on-site storm basin in northwest of site
- Pilgrim Road Driveway Entrance Expansion (existing)
 - Widen existing north entrance 22' to 40'
 - Replace concrete aprons & sidewalk @ both south & north entrances

Parking, Access & Traffic Circulation

Access will continue to be provided via two (2) driveways on Pilgrim Road serving the existing and expanded parking areas. A new entrance to/from Santa Fe/Council Bluffs Drive is proposed that will provide an alternative point of access to the church. A net increase of 107 additional parking stalls will be provided (for a total of 401 stalls) by adding paved parking stalls onto the west end of the existing parking lot (132 stalls) and on the north side of the existing parking lot near the new driveway entrance to Santa Fe/Council Bluffs Drive (30 stalls). It is anticipated that 75 vehicles per service (25% of the existing 300 stall parking lot) will utilize the new Santa Fe/Council Bluffs driveway. The new driveway entrance will not be gated or closed off to non-church traffic.

Storm Water Management

Total area of disturbance for the project is 3.5 acres of the entire 12.2-acre site with an increase in impervious area of approximately 66,000 sqft (1.4 acres). On-site storm water facilities include two (2) on-site storm water basins, storm sewer, ditching, and swales to convey run-off from the new and existing impervious areas to the existing storm basins and eventually discharging into the Village's storm sewers in Santa Fe/Council Bluffs Drive and Pilgrim Road. The storm basin located in the northwest portion of the site (wet pond) is proposed to be expanded to accommodate addition run-off from the new parking areas and driveway to Santa Fe/Council Bluffs Drive. No changes to the east basin (dry basin) are proposed.

Landscaping & Buffering

Additional landscaping within and around the west perimeter of the new parking areas is

proposed. As shown in the landscape plan (Sheet L201) curbed islands with one (1) deciduous tree per island along with a variety of shrubs and mulch are proposed in the two new parking areas. Overall, one (1) new deciduous tree per 10 parking stalls is proposed (12 trees total). A perimeter buffer is proposed west of and around the new parking area and driveway to Santa Fe/Council Bluffs Drive along the west property line comprised of plantings that include a variety of deciduous and evergreen trees (see Sheet L201).

Lighting. Exterior lighting is limited to the relocation of two (2) existing light poles from the existing parking area over into the new parking areas.

Signage. No new signage is proposed.

Staff Comments

Community Development: Planning & Zoning

Staff is concerned that there is not adequate information or data to predict the amount of traffic that will use the new Santa Fe/Council Bluffs driveway nor how that additional traffic will impact the adjacent neighborhood (if at all). Although a stop sign and stop bar are proposed to be installed, it's not known at this point if any other traffic control or calming devices may be needed for the volume and timing of traffic generated by the Church (e.g. pedestrian crossing, additional signage, right-turn exit lane, etc.). For that reason, Staff is recommending that the Church monitor use of the new driveway intersection at Santa Fe/Council Bluffs Drive and report back to the Village after one year. Monitoring should be conducted consistent with WisDOT recommended practices for Traffic Impact Analyses and include taking traffic & turning movement counts at monthly intervals over the course of the next year (e.g. one weekend of services every three months and on major holiday services). The traffic count data collected should be provided to the Village Department of Public Works along with an overall assessment of the data and recommendations for any new or modified traffic control devices or improvements.

Finally, the new Santa Fe/Council Bluffs driveway will create an opportunity for some drivers to use the new driveway and existing connection to Pilgrim Road as a shortcut; especially during those days and times when there are no Church services. While it is private property and the Church has every right to make whatever internal modifications may be necessary to reduce or prohibit non-Church traffic from cutting through the Church property, the Church should let the Village know before installing any improvements that may be located in or otherwise affect the public right-of-way (e.g. installing a gate, signs, etc.).

Village Forester

The revised plan [dated August 23, 2024] as proposed meets the development landscaping requirements of the Village for internal parking lot trees, the west perimeter border/buffer plantings, and new street trees at the proposed new driveway entrance to Santa Fe/Council Bluffs Drive.

With respect to the proposed evergreen trees, I highly recommend choosing a different tree species than Austrian Pine. Acceptable alternatives include:

- Serbian spruce (*Picea omorika*)
- Douglas fir (*Pseudotsuga menziesii*)
- Korean pine (*Pinus koraiensis*)

Public Works/ Village Engineer/Village Surveyor

The Village Engineer, Public Works Department and Utility staff identified several technical issues and plan revisions in a July 2, 2024 review memo (copy attached). In response, the project engineer for the Church sent revised plans and other supporting documents as late as August 23 to address these items. Unfortunately, the Village Engineer has not had sufficient time to review the response nor conclude all the items have been completed, resolved or adequately addressed. These items will need to be resolved or otherwise addressed by the Developer prior to commencing construction activities for the improvements.

With that said, the Village engineer is recommending conditional approval of the site development and building plans subject to all the outstanding items and issues identified in the July 2, 2024 review memo being resolved prior to commencing any site construction.

VILLAGE STAFF RECOMMENDATIONS

APPROVE the site development & building plans for the proposed parking lot expansion, new driveway connection to Santa Fe/Council Bluffs Drive, and reconstructed driveway entrances on Pilgrim Road for the CrossWay Church facility located at W156 N10041 Pilgrim Road subject to the following conditions:

1. This approval is for the various plan sheets that comprise the site plan set as noted below and is subject to compliance with all the conditions and requirements set forth herein and subsequently adopted and/or revised by the Plan Commission. Approval is granted for the following unless superseded by subsequent plan sheets approved by Village Staff pursuant to revisions required herein and/or by the Plan Commission:
 - a. *Civil Engineering plans dated August 14, 2024;*
 - b. *Landscaping plans dated August 23, 2024;*
 - c. *Lighting plans dated August 14, 2024;*

If revised plan sheets are necessary, each revised sheet shall contain the date of said revision clearly stamped in the lower right corner.

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2. All landscaping, screening, grading, and paving improvements shown on the approved site plans shall be installed as proposed prior to issuance of an occupancy permit unless a cash bond or letter of credit in an amount equal to 120 percent of the estimated installation and material costs reviewed and approved by the Village is submitted to the Village as necessary to ensure that installation of the proposed features and improvements will be completed within one (1) year after issuance of the occupancy permit for the shell building.
 3. All outstanding items and issues identified by Village Staff in the following review memos shall be resolved and reflected in additional information and/or revised plans submitted to Staff for further review, comment, and approval prior to commencing construction (excluding “early start” site clearing approved by the Village and/or WI DSPS):
 - a. July 2, 2024 memo from Kevin Driscoll, PE, Village Engineer
 4. With respect to the proposed evergreen trees shown in the landscape plan dated 8-23-2024, the Church shall select and install a different tree species than Austrian Pine. Acceptable alternatives are listed below. The Church should coordinate any plan revisions with the Village Forester prior to installation:
 - a. Serbian spruce (*Picea omorika*)
 - b. Douglas fir (*Pseudotsuga menziesii*)
 - c. Korean pine (*Pinus koraiensis*)
 5. Right-of-way and erosion control permits are required for any/all storm water basin construction and any/all construction conducted in the public right-of-way for Santa Fe/Council Bluffs Drive and Pilgrim Road. Contact the Public Works Department/Highway Superintendent for permit applications and submittal requirements.
 6. CrossWay Church shall monitor use of the new driveway intersection at the Santa Fe/Council Bluffs Drive intersection and submit a summary report to the Village after one year of use of the new driveway connection. Said monitoring shall be conducted consistent with WisDOT recommended practices for Traffic Impact Analyses and include traffic volume & turning movement counts during the peak period of traffic generation from the Church at three-month intervals over the course of the next year (e.g. one weekend of services every three months and on major holiday services including Easter, Thanksgiving, and Christmas). The traffic count data collected and evaluation of said data shall be provided in a report prepared by a professional traffic engineer and submitted to the Village Department of Public Works. Said report shall include an overall assessment of the data and contain recommendations for any new or modified traffic control devices or improvements that may be required or recommended. The cost of any traffic control devices needed as a result of traffic using the new driveway shall be the responsibility of the Church with installation coordinated with the Village Department of Public Works.



Village of



Fee must accompany application

- ☐ \$700 Minor Addition
- ☐ \$1,240 Construction <10,000 SF
- ☐ \$2,095 Construction 10,000 SF to 50,000
- ☐ \$3,460 Industrial Construction >50,000 SF
- ☐ \$3,460 Commercial Construction >50,000
- ☒ \$200 Plan Commission Consultation
- ☒ \$125 Fire Department Plan Review

PAID _____ DATE _____

SITE PLAN REVIEW APPLICATION

Pursuant to Section 17.43 of the Municipal Code

Please read and complete this application carefully. All applications must be signed and dated.

1

APPLICANT OR AGENT

MSA Professional Services, Inc.

Brian Kehrli

1230 South Blvd

Baraboo, WI 53913

Phone (608) 355-8887

E-Mail bkehrli@msa-ps.com

PROPERTY OWNER

CrossWay Church

Ben Cartland

W156N10041 Pilgrim Road

Germantown, WI 53022

Phone (262) 255-0702

E-Mail benc@crosswayc.org

2

PROPERTY ADDRESS

CrossWay Church Germantown, WI

W156 N10041 Pilgrim Rd

Germantown, WI 53022

3

NEIGHBORING USES – Specify name and type of use, e.g. Enviro Tech – Industrial, Smith – Residential, etc.

North Residential	South Residential	East Residential	West Institutional
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4

READ AND INITIAL THE FOLLOWING:

X I am aware of the Village of Germantown ordinance requiring fire sprinklers in most new construction.

X I understand that all new development is subject to Impact and/or Connection Fees that must be paid before building permits will be issued.

X I understand that an incomplete application will be withdrawn from the Plan Commission agenda and that all resubmissions to the Plan Commission are subject to a new application fee.

5

SIGNATURES – ALL APPLICATION MUST BE SIGNED BY OWNER!

Brian J. Kehrli

06/10/2024

Applicant

Date

6.10.2024

Owner

Date

To: Village of Germantown Reviewers
From: Brian Kehrli, P.E.
Subject: CrossWay Church Improvements
Date: June 10, 2024

Village Officials and Plan Commission Members,

Crossway Church, located at W156N10041 Pilgrim Road in Germantown, WI is planning to complete a parking lot expansion, driveway addition, and driveway reconstruction along with a small remodel to the building itself.

Site Work:

The site work is split into three separate processes. A parking lot expansion on the west and north sides of the existing parking lot, a new driveway and roadway connection to the north to Sante Fe Drive, and a reconstruction of the existing entrances along Pilgrim Drive. These improvements will require changes to the existing storm water system by expanding the north pond so that the improvements meet performance standards.

Parking Lot Expansion:

The parking lot expansion is desired for a few reasons. The weekly services are drawing more people to the church and there have been a few times when all parking stalls are being used. There have been no expansions to the building since 2009. There are simply more people attending worship services. The desire is to expand approximately 100-110 parking stalls on the west and north sides of the existing parking lot.

Driveway Addition and Connection to Sante Fe Drive:

One other issue that concerns staff at CrossWay is the traffic flow and patterns in the existing parking lot. With only one entrance and exit to Pilgrim Drive, the drive aisles within the existing parking lot become quite congested at the end of services. In order to alleviate some of the congestion, a new connection to Sante Fe Drive is requested. This new connection is expected to alleviate some of the congestion at the end of services. There will be some that use this new driveway as an entrance as well. We do realize this will be a change to the neighborhood to the north with a new connection to the municipal roadway network. The new connection will allow more vehicles to exit onto Sante Fe Drive who will mostly likely turn onto Council Bluffs Drive which intersects with Pilgrim Drive again. Council Bluffs Drive and the exit driveway from CrossWay Church are approximately 1,000 feet apart, so the conflicts between the two intersections should be minimal even with the additional traffic after services.

The plan is to connect the proposed driveway to Sante Fe Drive by extending curb and gutter into the CrossWay Church property. Sante Fe Drive, south of Council Bluffs Drive will not drain well after this connection is completed unless a new inlet is added along the east curb line. This is proposed in the plans and will connect to the existing manhole/inlet on the far south and west side of Sante Fe Trail. The proposed intersection improvement will also include pavement markings for a stop bar and a stop sign for all exiting traffic from the proposed driveway from CrossWay Church Property. This should help control traffic exiting from the church property.

Driveway Reconstruction – Pilgrim Drive Entrances:

MEMO

June 10, 2024

Currently, the property has two driveways that connect to Pilgrim Drive. The southern driveway is intended for exit only and is approximately 40 feet wide at the right-of-way. The concrete for the southern driveway is aged with poor joints. The goal of the reconstruction of this driveway is to replace the concrete apron and sidewalk and to lower the sidewalk 3-inches +/- to reduce the slope between the sidewalk and back of curb. This should smooth the transition between the apron and asphalt pavement along Pilgrim Drive and allow for more efficient traffic flow. The northern driveway is intended for entrance only and is approximately 24 feet wide. The northern driveway is planned to be lowered as well, similar to the southern driveway. The northern driveway is also proposed to be widened to 40 feet to allow for traffic from Pilgrim to enter from the north and south simultaneously.

Pond and Storm Water Improvements:

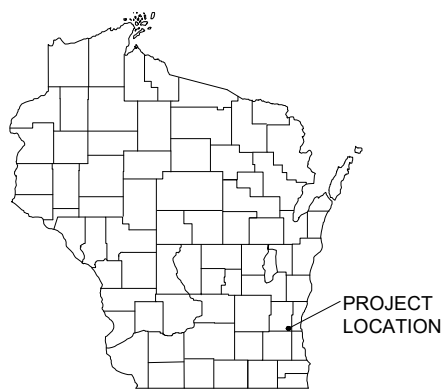
The work at the property will require improvements to the storm water system and storm water pond. The pond on the north side of the property will handle storm water flows from the parking lot and driveway improvements. Two new culverts will be installed under the proposed 30 stall parking lot north of the existing parking lot and under the entrance driveway just south of Sante Fe Drive. These are existing grassed swales that will be partially paved with a driveway or parking lot. The culverts are required to convey storm water to the pond. The pond will be expanded to include additional storage volume to accommodate the added impervious area of the proposed parking lot and driveway. Currently, the north storm water pond is controlled by an orifice in the end of a 10" HDPE pipe. The proposed plan will add an outlet structure to connect to the existing 10" HDPE pipe. The outlet structure will have a 3-inch orifice on the pond side of the structure, an overflow with grate, and will connect to the 10-inch pipe that convey storm water to the municipal storm water system along Sante Fe and Council Bluffs Drive. The expanded pond will be able to meet peak flow and TSS requirements as set by the DNR, Village and Milwaukee Metropolitan Sewerage District. Infiltration will be almost impossible on the site. Soil borings show the material is clay from the surface to a minimum of 14 feet below ground surface. Clay soils have extremely low infiltration rates and any attempt to infiltrate storm water in clay soils will almost certainly fail. According to DNR requirements, any soil listed as clay, clay loam, silty clay loam, or sandy clay loam is exempt from infiltration requirements.

Summary:

The proposed site improvements at CrossWay will expand the parking lot to accommodate more worshippers, especially on Sunday mornings and holidays, improvement traffic flow in the parking lot, allow for more efficient entrance and exit driveways along Pilgrim Drive and expand the storm water facilities to meet regulatory requirements.

CROSSWAY CHURCH IMPROVEMENTS

CROSSWAY CHURCH VILLAGE OF GERMANTOWN, WASHINGTON COUNTY, WI

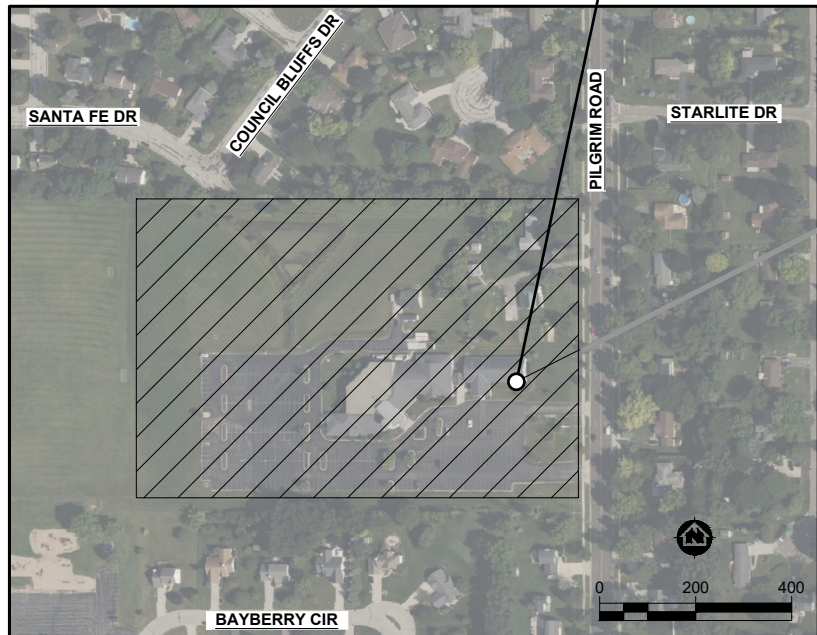


PROJECT
LOCATION

SHEET INDEX

C - CIVIL SHEETS	
C100	TITLE SHEET
C101	EXISTING SITE & BENCHMARKS
C201	DEMOLITION PLAN
C202	EROSION CONTROL PLAN
C203	PROPOSED SITE PLAN
C204	GRADING PLAN
C501	EROSION CONTROL DETAILS
C502	INLET PROTECTION DETAILS
C503	STORM SEWER DETAILS
C504	ROADWAY & PARKING DETAILS
C505	STOP LINE & CROSSWALK DETAILS
C506	WET POND EXPANSION DETAILS
C507	DRIVEWAY DETAIL - PILGRIM RD
C508	DRIVEWAY DETAIL - SANTA FE DR
L201	PROPOSED LANDSCAPING PLAN
L501	LANDSCAPING DETAILS
E201	PROPOSED LIGHTING & ELECTRICAL PLAN
E501	ELECTRICAL DETAILS

PROJECT LOCATION - CROSSWAY
CHURCH



LOCATION MAP



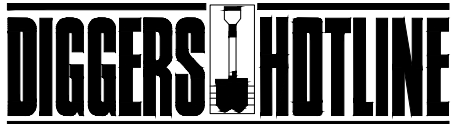
NOTE:
PER THE VILLAGE OF GERMANTOWN
DEVELOPMENT HANDBOOK, NAD83
AND NAVD88 ARE TO BE USED. FOR
THIS SITE, THE DIFFERENCE BETWEEN
NAVD29 AND NAVD88 RANGES FROM
0.04 FT TO 0.05 FT.

LEGEND

W	EXISTING WATER MAIN
W+H	EXISTING WATER MAIN, VALVE & HYDRANT
W+S	EXISTING WATER SERVICE & CURB STOP
W+H+S	PROPOSED WATER MAIN, VALVE, & HYDRANT
W+S	PROPOSED WATER SERVICE & CURB STOP
SAN	EXISTING SANITARY SEWER & MANHOLE
SAN+S	PROPOSED SANITARY SEWER & MANHOLE
FM	EXISTING FORCEMAIN
SS	EXISTING STORM SEWER & INLET
SS+S	PROPOSED STORM SEWER & INLET
SS+S	PROPOSED STORM SEWER & MANHOLE
E	BURIED ELECTRIC
G	BURIED GAS & VALVE
TV	BURIED CABLE TELEVISION
T	BURIED TELEPHONE
FO	BURIED FIBER OPTICS
OH	OVERHEAD UTILITY
RR	RAILROAD TRACKS
CG	EXISTING CURB & GUTTER
CG	PROPOSED CURB & GUTTER
SW	EXISTING SIDEWALK
SW	PROPOSED SIDEWALK
CP	EXISTING CULVERT PIPE
CP	PROPOSED CULVERT PIPE
FL	FENCE LINE
DA	DRAINAGE ARROW
SF	SILT FENCE
ROW	RIGHT-OF-WAY
BL	BASELINE
PL	PROPERTY LINE
TL	TREE LINE
B	BENCHMARK
IP	IRON PIPE
IR	IRON ROD
CP	CONTROL POINT
UPG	UTILITY POLE & GUY
SB	SOIL BORING
LP	LIGHT POLE
P	PEDESTAL
SS	STREET SIGN
M	MAILBOX
F	FLAGPOLE
D	TREE - DECIDUOUS
C	TREE - CONIFEROUS
X	TREE TO BE REMOVED

UTILITIES

ROADS, SEWER & WATER:	VILLAGE OF GERMANTOWN N122 W17177 FOND DU LAC AVE GERMANTOWN, WI 53022
	TIM ZIMMERMAN (WASTEWATER) 262-253-7765
	PAUL HAUGEN (WATER) 262-253-8254 PHAUGEN@GERMANTOWNWI.GOV
GAS & ELECTRIC:	MATTHEW MORTWEDT (DPW) 262-250-4725 MMORTWEDT@GERMANTOWNWI.GOV
	WE ENERGIES 1921 8TH ST SOUTH WISCONSIN RAPIDS, WI 54494
	LARRY KOCH 715-421-7249 LARRY.KOCH@WE-ENERGIES.COM
COMMUNICATIONS:	AT&T 411 7th ST RACINE, WI 53403
	MATTHEW VACHALIK 262-707-6216 MV5616@ATT.COM
	TIME WARNER CABLE E10704 STH 33 BARABOO, WI 53913
	TERRY BLAKE 608-576-9208 TERRY.BLAKE@CHARTER.COM



Dial 811 or (800) 242-8511
www.DiggersHotline.com

NOTE:
UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR
SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO
CONSTRUCTION.

PROJECT DATE: 08-14-2024	DRAWN BY: KEF	NO.	DATE	REVISION	BY
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	CHECKED BY: Init				



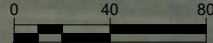
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CROSSWAY CHURCH IMPROVEMENTS
CROSSWAY CHURCH
GERMANTOWN, WASHINGTON COUNTY, WI

TITLE SHEET

PROJECT NO:
20426215
SHEET
C100

BENCHMARK TABLE				
POINT #	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP1	3/4" IRON ROD	102,526.39	383,432.39	895.62
CP2	3/4" IRON ROD	102,492.35	383,159.88	897.81
CP3	3/4" IRON ROD	102,808.51	383,408.95	895.88
CP4	3/4" IRON ROD	102,806.50	383,195.94	897.36
CP5	CUT "X" IN CURB	102,633.21	382,753.67	899.43
BM101	BENCHMARK	102,480.72	383,568.07	896.51
BM102	SECTION MONUMENT	102,464.94	383,554.83	893.89



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	DESIGNED BY:	KEF	-	-	-
	CHECKED BY:	Init	-	-	-
PLOT DATE: 8/15/2024 1:16 PM, G:\20\20426\20426215\05_bim_cadd_discipline\06_Civil\construction documents\20426215 EXISTING SITE PLAN.dwg					

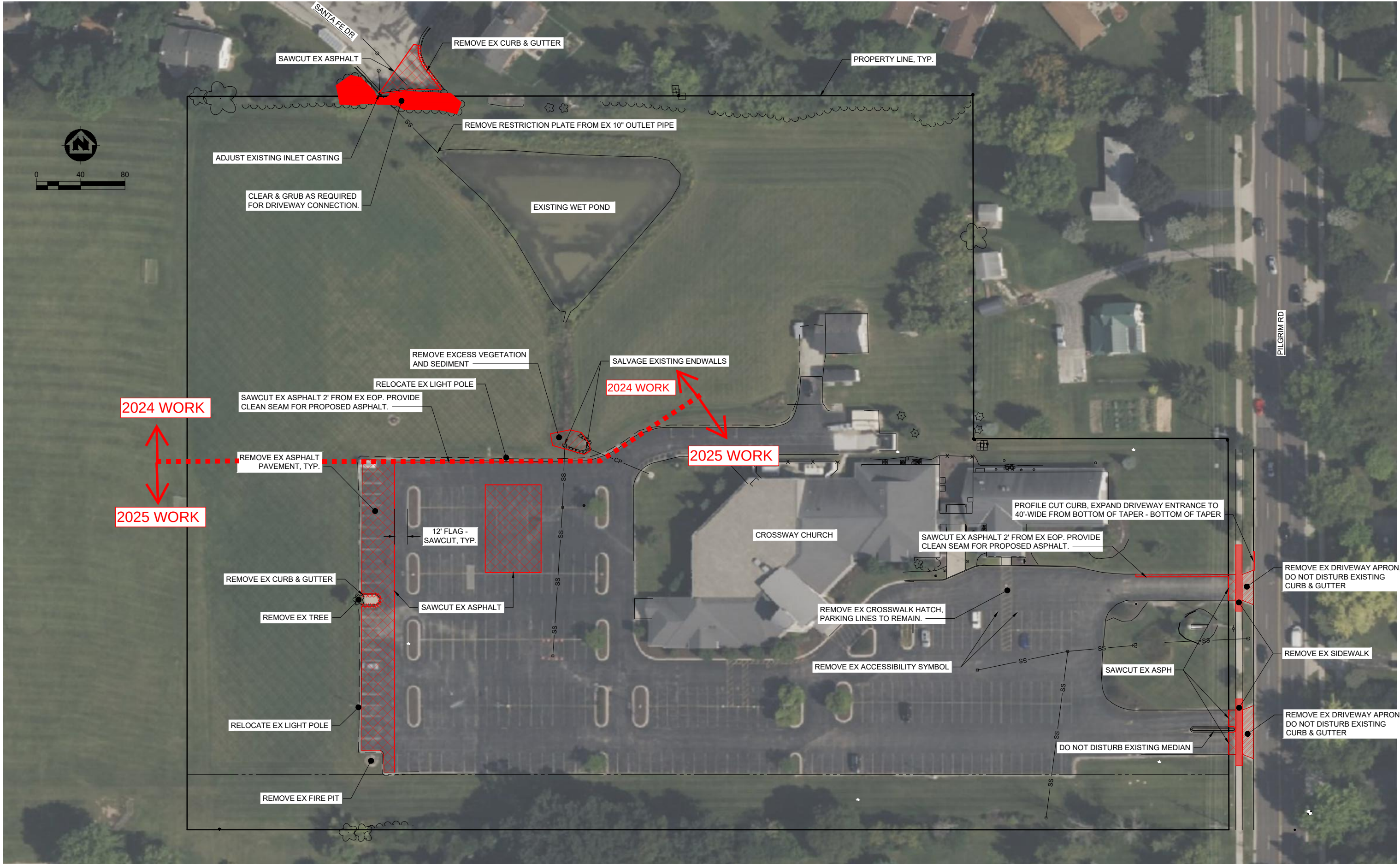


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GERMANTOWN, WASHINGTON COUNTY, WI

EXISTING SITE & BENCHMARKS

PROJECT NO:
20426215
SHEET
C101



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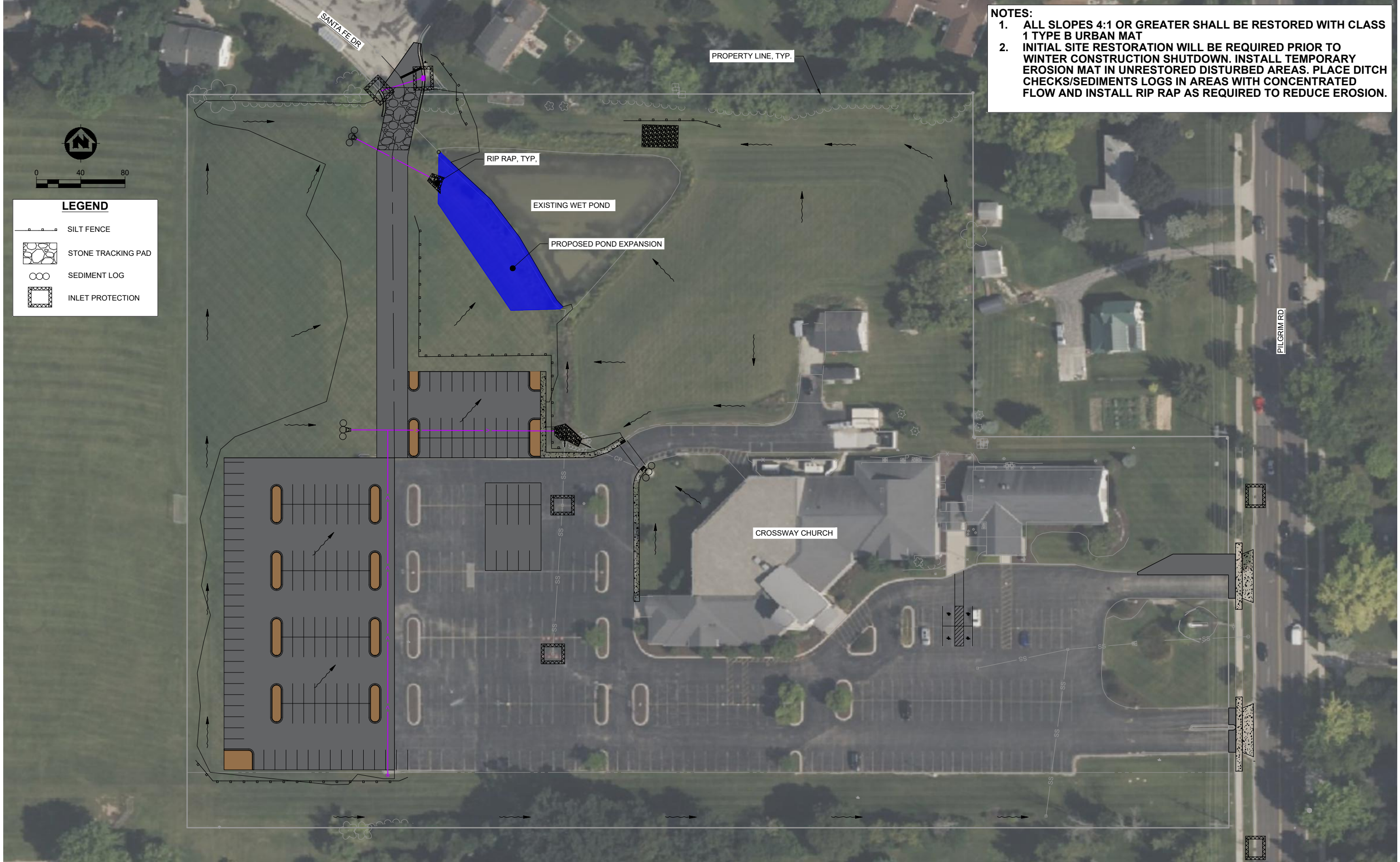


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CROSSWAY CHURCH
GERMANTOWN, WASHINGTON COUNTY, WI

DEMOLITION PLAN

PROJECT NO:
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SHEET
C201



- NOTES:**
1. ALL SLOPES 4:1 OR GREATER SHALL BE RESTORED WITH CLASS 1 TYPE B URBAN MAT
 2. INITIAL SITE RESTORATION WILL BE REQUIRED PRIOR TO WINTER CONSTRUCTION SHUTDOWN. INSTALL TEMPORARY EROSION MAT IN UNRESTORED DISTURBED AREAS. PLACE DITCH CHECKS/SEDIMENTS LOGS IN AREAS WITH CONCENTRATED FLOW AND INSTALL RIP RAP AS REQUIRED TO REDUCE EROSION.

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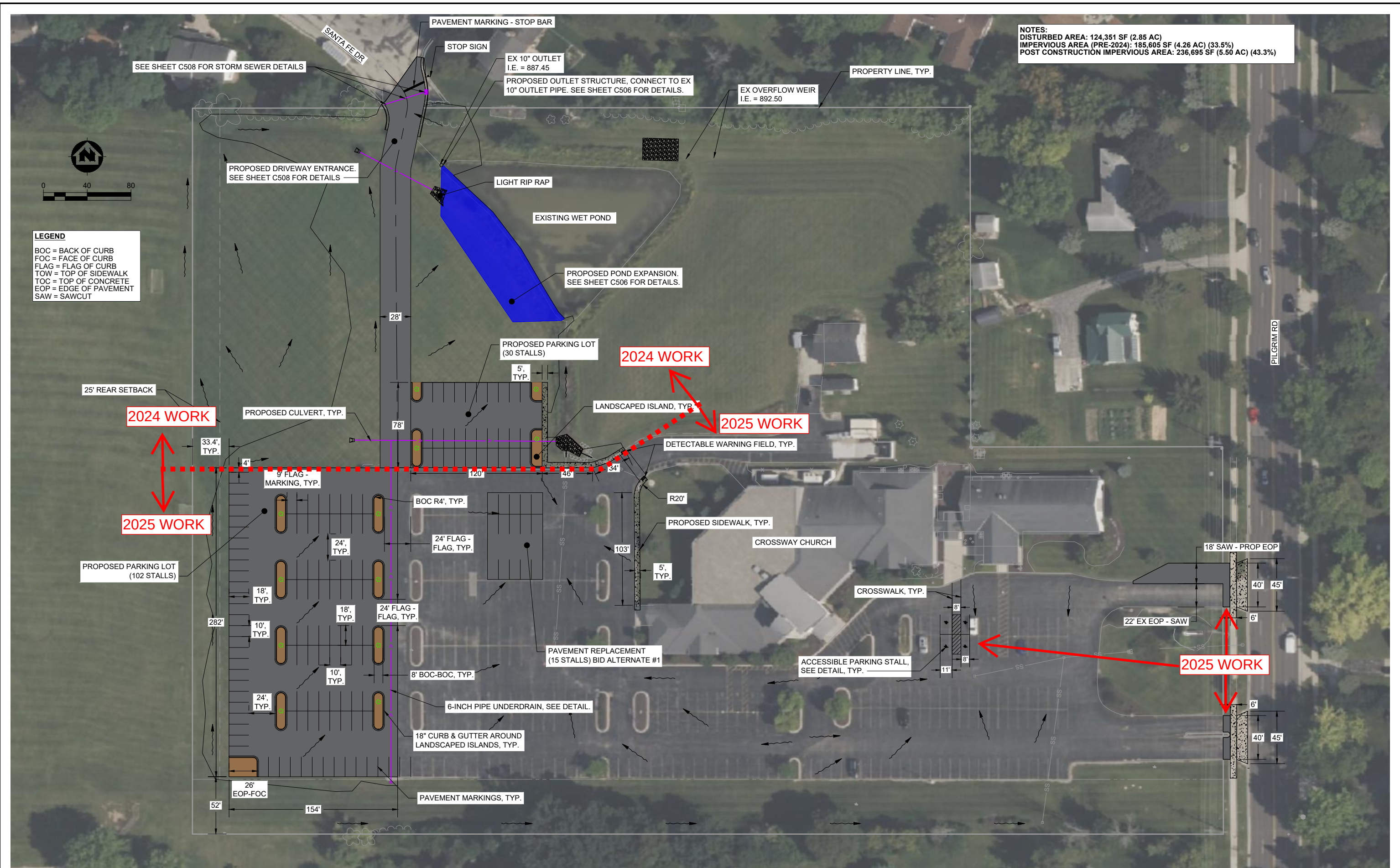


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CROSSWAY CHURCH
GERMANTOWN, WASHINGTON COUNTY, WI

EROSION CONTROL PLAN

PROJECT NO:
20426215
SHEET
C202



NOTES:
DISTURBED AREA: 124,351 SF (2.85 AC)
IMPERVIOUS AREA (PRE-2024): 185,605 SF (4.26 AC) (33.5%)
POST CONSTRUCTION IMPERVIOUS AREA: 236,695 SF (5.50 AC) (43.3%)

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PLOT DATE: 8/15/2024 10:13 AM, G:\20\20426\20426215\05_bim_cadd_discipline\06_Civil\construction documents\20426215 PROPOSED SITE PLAN.dwg					

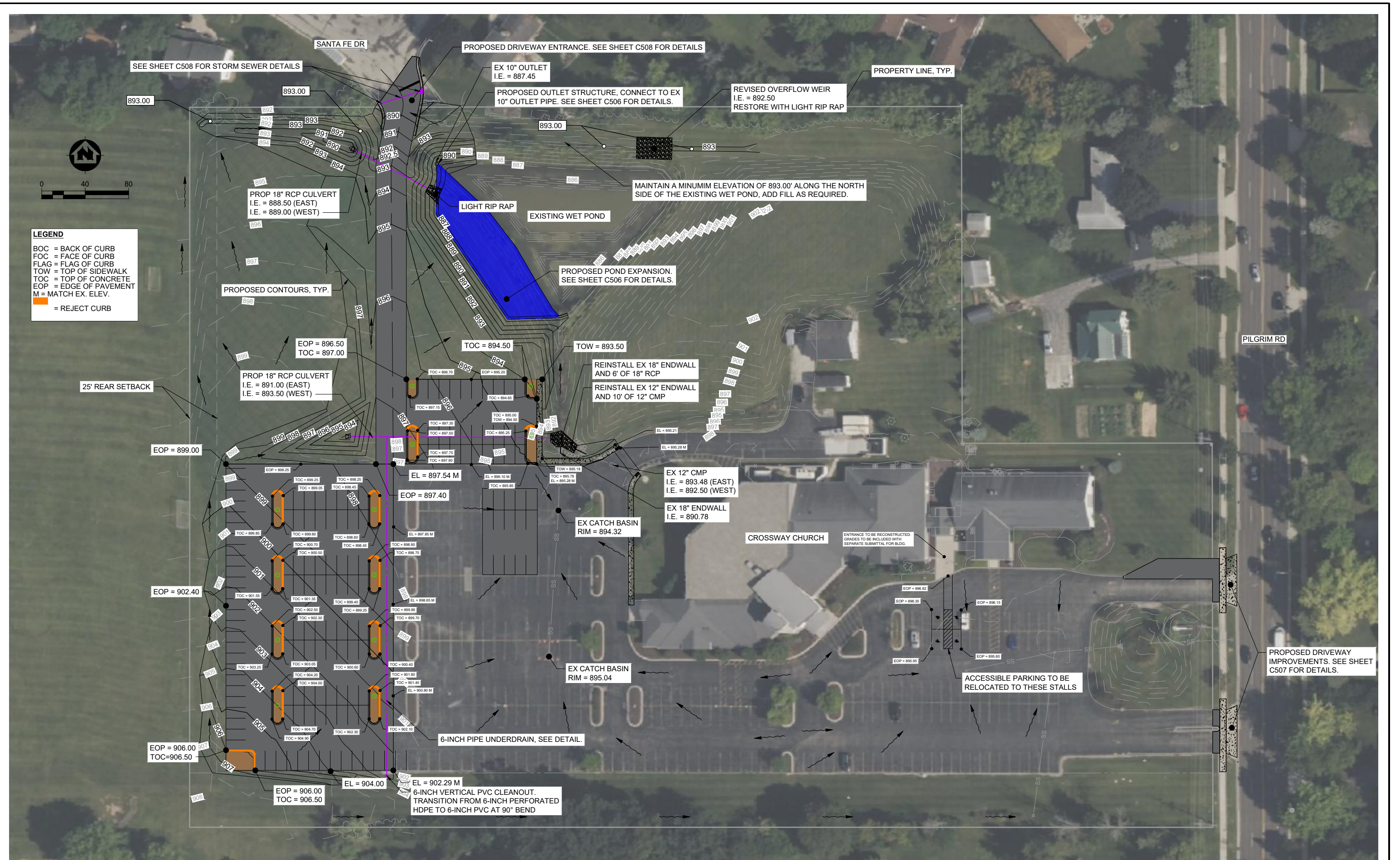


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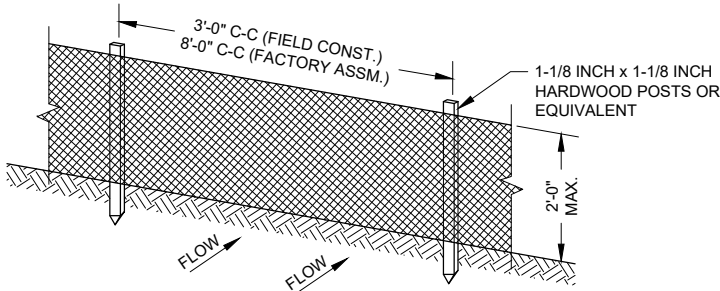
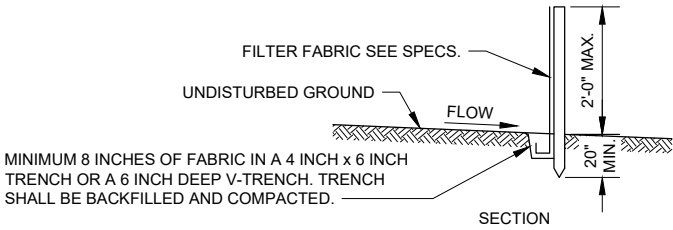
PROPOSED SITE PLAN

PROJECT NO:
20426215
SHEET
C203



CONSTRUCTION SITE
EROSION CONTROL REQUIREMENTS

1. SECTION NR216.46 OF WISCONSIN STATE ADMINISTRATIVE CODE IDENTIFIES REQUIREMENTS FOR CONSTRUCTION SITE AND POST-CONSTRUCTION EROSION CONTROL. IT IS THE INTENT OF THESE PLANS TO SATISFY THESE REQUIREMENTS. THE METHODS AND STRUCTURES USED TO CONTROL EROSION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL IMPLEMENT AN APPROPRIATE MEANS OF CONTROLLING EROSION DURING SITE OPERATION AND UNTIL THE VEGETATION IS RE-ESTABLISHED. ADJUSTMENTS TO THE CONTROL SYSTEM SHALL BE MADE AS REQUIRED.
2. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE WISCONSIN DNR'S CONSERVATION PRACTICE STANDARDS. THESE STANDARDS ARE PERIODICALLY UPDATED AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND REFERENCE THE MOST RECENTLY RELEASED STANDARD.
3. THIS INFORMATION IS ONLY ONE PART OF THE OVERALL EROSION CONTROL REQUIREMENTS. ADDITIONAL REQUIREMENTS MAY ALSO BE SHOWN ON THE CONTRACT DRAWINGS AND IN THE ACCOMPANYING SPECIFICATIONS.
4. ADDITIONAL EROSION CONTROL MEASURES, AS REQUESTED IN WRITING BY THE STATE OR LOCAL INSPECTORS, OR THE OWNER'S ENGINEER, SHALL BE INSTALLED WITHIN 24 HOURS.
5. THE AREA OF EROSION LAND EXPOSED TO THE ELEMENTS BY GRUBBING, EXCAVATION, TRENCHING, BORROW AND FILL OPERATIONS AT ANY ONE TIME SHALL BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE. FOR ANY DISTURBED AREA THAT REMAINS INACTIVE FOR GREATER THAN 7 WORKING DAYS, OR WHERE GRADING WORK EXTENDS BEYOND THE PERMANENT SEEDING DEADLINES, THE SITE MUST BE TREATED WITH TEMPORARY STABILIZATION MEASURES SUCH AS SOIL TREATMENT, TEMPORARY SEEDING AND/OR MULCHING. ALL DISTURBED AREAS SHALL BE TREATED WITH PERMANENT STABILIZATION MEASURES WITHIN 3 WORKING DAYS OF FINAL GRADING.
6. ALL EROSION CONTROL MEASURES AND STRUCTURES SERVING THE SITE MUST BE INSPECTED AT LEAST WEEKLY OR WITHIN 24 HOURS OF THE TIME 0.5 INCHES OF RAIN HAS OCCURRED. ALL NECESSARY REPAIR AND MAINTENANCE WILL BE DONE AT THIS INSPECTION TIME.
7. ALL EROSION CONTROL DEVICES AND/OR STRUCTURES SHALL BE PROPERLY INSTALLED PRIOR TO CLEARING AND GRUBBING OPERATIONS WITHIN THEIR RESPECTIVE DRAINAGE AREAS. THESE SHALL BE PROPERLY MAINTAINED FOR MAXIMUM EFFECTIVENESS UNTIL VEGETATION IS RE-ESTABLISHED.
8. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY INSTALLED PRIOR TO ANY SOIL DISTURBANCE.
9. ANY SLOPES STEEPER THAN 3H:1V SHALL BE STAKED WITH EROSION CONTROL FABRIC UNLESS INDICATED ON THE PLAN.
10. ALL WASTE AND UNUSED BUILDING MATERIALS (INCLUDING GARBAGE, DEBRIS, CLEANING WASTES, WASTEWATER, TOXIC MATERIALS, OR HAZARDOUS MATERIALS) SHALL BE PROPERLY DISPOSED OF AND NOT ALLOWED TO BE CARRIED OFF-SITE BY RUNOFF OR WIND.
11. WIND EROSION SHALL BE KEPT TO A MINIMUM DURING CONSTRUCTION. WATERING, MULCH, OR A TACKING AGENT MAY BE REQUIRED TO PROTECT NEARBY RESIDENCES AND WATER RESOURCES.
12. CHANNELIZED RUNOFF ENTERING THE PROJECT SITE FROM ADJOINING LANDS SHALL BE DIVERTED THROUGH NATURALLY OR ARTIFICIALLY EROSION-RESISTANT CONVEYANCES. IF CHANNELIZED RUNOFF CANNOT BE DIVERTED, SITE BEST MANAGEMENT PRACTICES MUST ACCOUNT FOR THE ADDITIONAL FLOW RATES AND EROSION POTENTIAL THAT SUCH RUNOFF PRESENTS.
13. THE CONTRACTOR SHALL TAKE ALL POSSIBLE PRECAUTIONS TO PREVENT SOILS FROM BEING TRACKED ONTO PUBLIC OR PRIVATE ROADWAYS. PAVED SURFACES ADJACENT TO CONSTRUCTION SITE VEHICLE ACCESS SHALL BE SWEEPED AND/OR SCRAPED (NOT FLUSHED) PERIODICALLY TO REMOVE SOIL, DIRT, AND/OR DUST.
14. EROSION CONTROLS SHALL BE INSTALLED ON THE DOWNSTREAM SIDE OF TEMPORARY STOCKPILES. ANY SOIL STOCKPILE THAT REMAINS FOR MORE THAN 30 DAYS SHALL BE COVERED OR TREATED WITH STABILIZATION PRACTICES SUCH AS TEMPORARY OR PERMANENT SEEDING AND MULCHING. ALL STOCK PILES SHALL BE PLACED AT LEAST 75 FEET FROM STREAMS OR WETLANDS.
15. ADDITIONAL EROSION CONTROL FOR UTILITY CONSTRUCTION (STORM SEWER, SANITARY SEWER, WATER MAIN, ETC.) SHALL INCLUDE THE FOLLOWING:
- a. PLACE EXCAVATED TRENCH MATERIAL ON THE HIGH SIDE OF THE TRENCH.
- b. BACKFILL, COMPACT, AND STABILIZE THE TRENCH IMMEDIATELY AFTER PIPE CONSTRUCTION.
- c. DISCHARGE OF TRENCH WATER OR DEWATERING EFFLUENT MUST BE PROPERLY TREATED TO REMOVE SEDIMENT IN ACCORDANCE WITH THE WDNR CONSERVATION PRACTICE STANDARD 1061 - DEWATERING OR A SUBSEQUENT WDNR DEWATERING STANDARD PRIOR TO DISCHARGE INTO A STORM SEWER, DITCH, DRAINAGEWAY, OR WETLAND OR LAKE.
16. ALL DRAINAGE CULVERTS, STORM DRAIN INLETS, MANHOLES, OR ANY OTHER EXISTING STRUCTURES THAT COULD BE DAMAGED BY SEDIMENTATION SHALL BE PROTECTED ACCORDING TO THE VARIOUS METHODS PROVIDED IN THE PRINTED CONSERVATION PRACTICE STANDARDS.
17. ANY SOIL EROSION THAT OCCURS AFTER FINAL GRADING AND/OR STABILIZATION MUST BE REPAIRED AND THE STABILIZATION WORK REDONE.
18. THE FIRST SIX WEEKS AFTER INITIAL STABILIZATION, ALL NEWLY SEEDED AND MULCHED AREAS SHALL WATERED WHENEVER 7 DAYS ELAPSE WITHOUT A RAIN EVENT.
19. WHEN THE DISTURBED AREA HAS BEEN STABILIZED BY PERMANENT VEGETATION OR OTHER MEANS, TEMPORARY BMP'S SUCH AS SILT FENCES, STRAW BALES, AND SEDIMENT TRAPS SHALL BE REMOVED AND THESE AREAS STABILIZED.
20. ALL TEMPORARY BEST MANAGEMENT PRACTICES SHALL BE MAINTAINED UNTIL THE SITE IS STABILIZED.
21. ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED WITH SEED AND MULCH UNLESS OTHERWISE SPECIFIED. A MINIMUM OF FOUR INCHES OF TOPSOIL SHALL BE APPLIED TO ALL AREAS TO BE SEEDED OR SODDED.
22. FOR AREAS NOT STABILIZED BY OCTOBER 15, ADDITIONAL EROSION CONTROL MEASURES AND OVERSIGHT ARE REQUIRED. TEMPORARY SEEDING MUST BE COMPLETED, GERMINATION AND SURVIVAL MAY BE LIMITED. THIS MEANS SEED GERMINATION IS PLANNED FOR THE FOLLOWING SPRING. TO OFFER MORE PROTECTION FROM SOIL EROSION DURING THIS PERIOD, TOPSOIL, SEED, AND FERTILIZE ALL DISTURBED AREAS BY NOV. 15



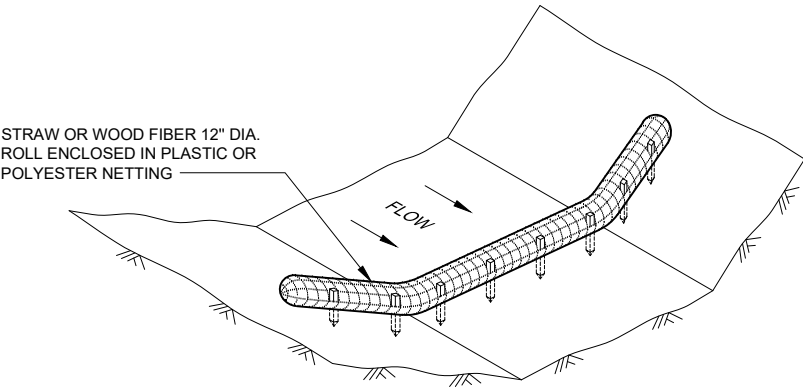
PERSPECTIVE VIEW

GENERAL NOTES:

1. ENDS OF FENCE SHALL BE TURNED UPSLOPE 1 TO 2 FEET IN ELEVATION TO PREVENT FLANKING.
2. STAPLE FABRIC WITH 1/2 INCH (MINIMUM) STAPLES TO THE UPSLOPE SIDE OF THE POSTS.
3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.

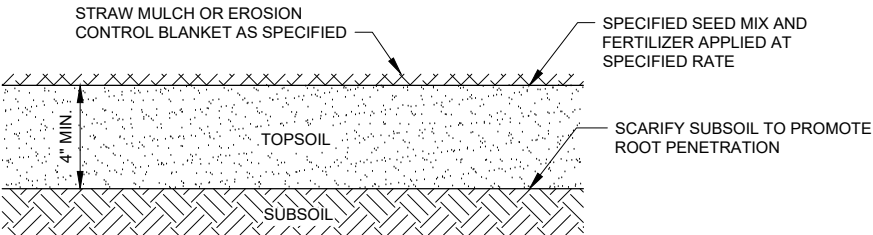
TYPICAL SILT FENCE INSTALLATION AT SITE PERIMETER DETAIL

NO SCALE



SEDIMENT LOG

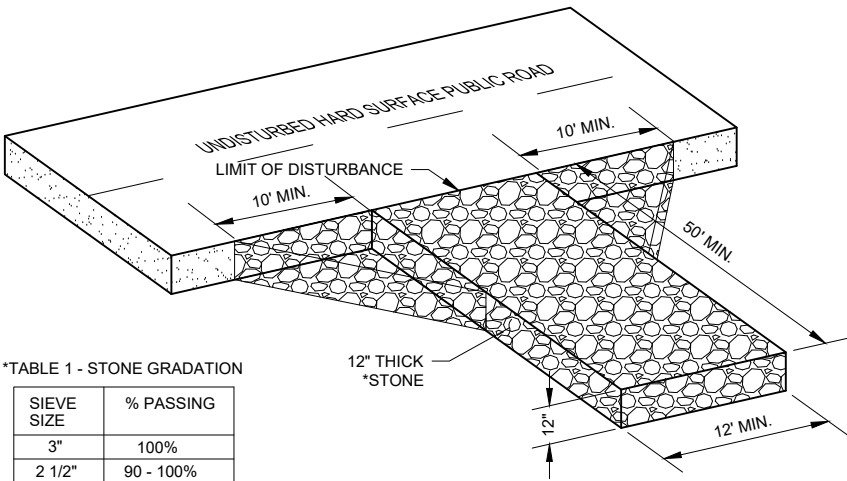
NO SCALE



NOTE: WHERE REQUIRED, PLANT HERBACEOUS PLUGS ACCORDING TO PLAN, OR AS DIRECTED BY ENGINEER.

TOPSOIL AND SEEDING DETAIL

NO SCALE



*TABLE 1 - STONE GRADATION

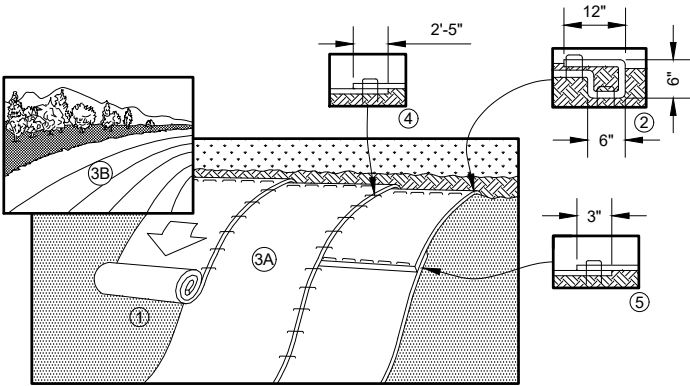
SIEVE SIZE	% PASSING
3"	100%
2 1/2"	90 - 100%
1 1/2"	25 - 60%
3/4"	0 - 20%
3/8"	0 - 5%

NOTES:

1. TRACKING PAD WIDTH SHALL BE AT LEAST THE FULL WIDTH OF HTE EGRESS POINT OR 12' WIDE MINIMUM.
2. TRACKING PAD LENGTH SHALL BE 50' FOR CONSTRUCTION SITES, 30' FOR SINGLE FAMILY RESIDENTIAL, OR AS SPECIFIED IN THE CONTRACT DOCUMENTS. LENGTH OF TRACKING PAD MAY NEED TO BE INCREASE OR ADDITIONAL SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED BY THE CONTRACTOR IS SEDIMENT TRACK-OUT OCCURS.
3. GEOTEXTILE FABRIC TYPE R SHALL BE INSTALLED BETWEEN THE STONE AND SUBGRADE ON SITES WHERE HIGH GROUND WATER IS OBSERVED.
4. CONTRACTOR SHALL CLEAN STREET/ROADWAY ADJACENT TO ALL CONSTRUCTION ACCESS POINTS AT THE END OF EACH WORKDAY OR MORE FREQUENTLY IF REQUESTED.

STONE TRACKING PAD

NO SCALE



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5 CM-12.5 CM) OVERLAP DEPENDING ON BLANKET TYPE.
5. CONSECUTIVE BLANKETS SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE BLANKET WIDTH.

NOTE:

*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

EROSION CONTROL BLANKET DETAIL

NO SCALE

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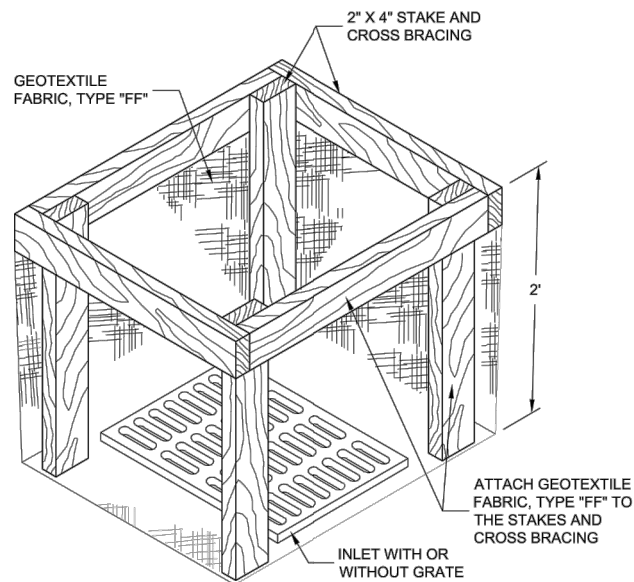
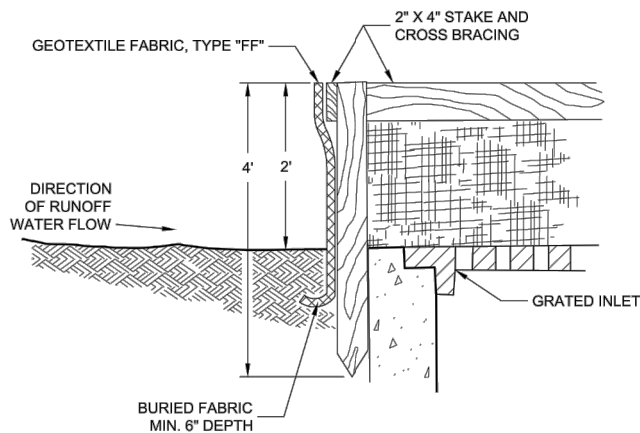
CROSSWAY CHURCH IMPROVEMENTS
CROSSWAY CHURCH
GERMANTOWN, WASHINGTON COUNTY, WI

EROSION CONTROL DETAILS

PROJECT NO: 20426215
SHEET C501



SDD 08E10 Inlet Protection, Types A, B, C and D



INLET PROTECTION, TYPE "A"

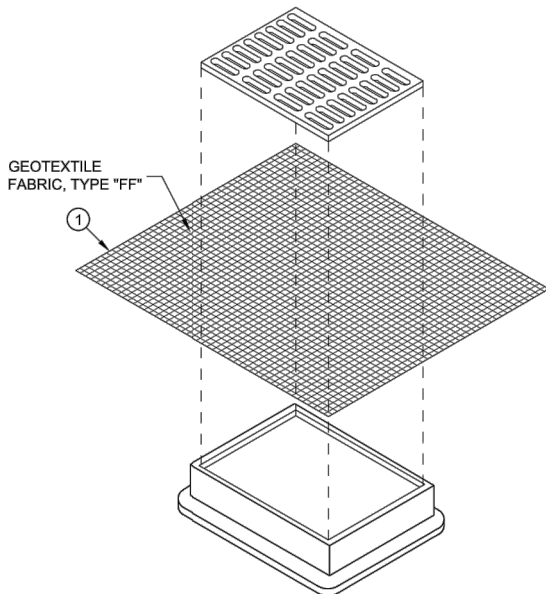
GENERAL NOTES

INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.

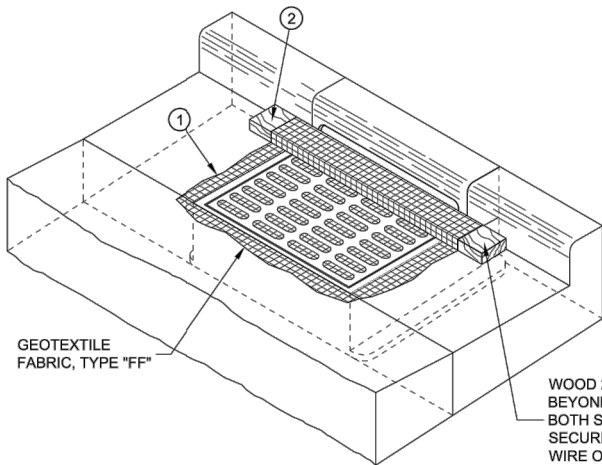
MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

- 1 FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- 2 FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.
- 3 FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.



INLET PROTECTION, TYPE "B"
(WITHOUT CURB BOX)
(CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX)



INLET PROTECTION, TYPE "C"
(WITH CURB BOX)

INSTALLATION NOTES

TYPES B & C

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

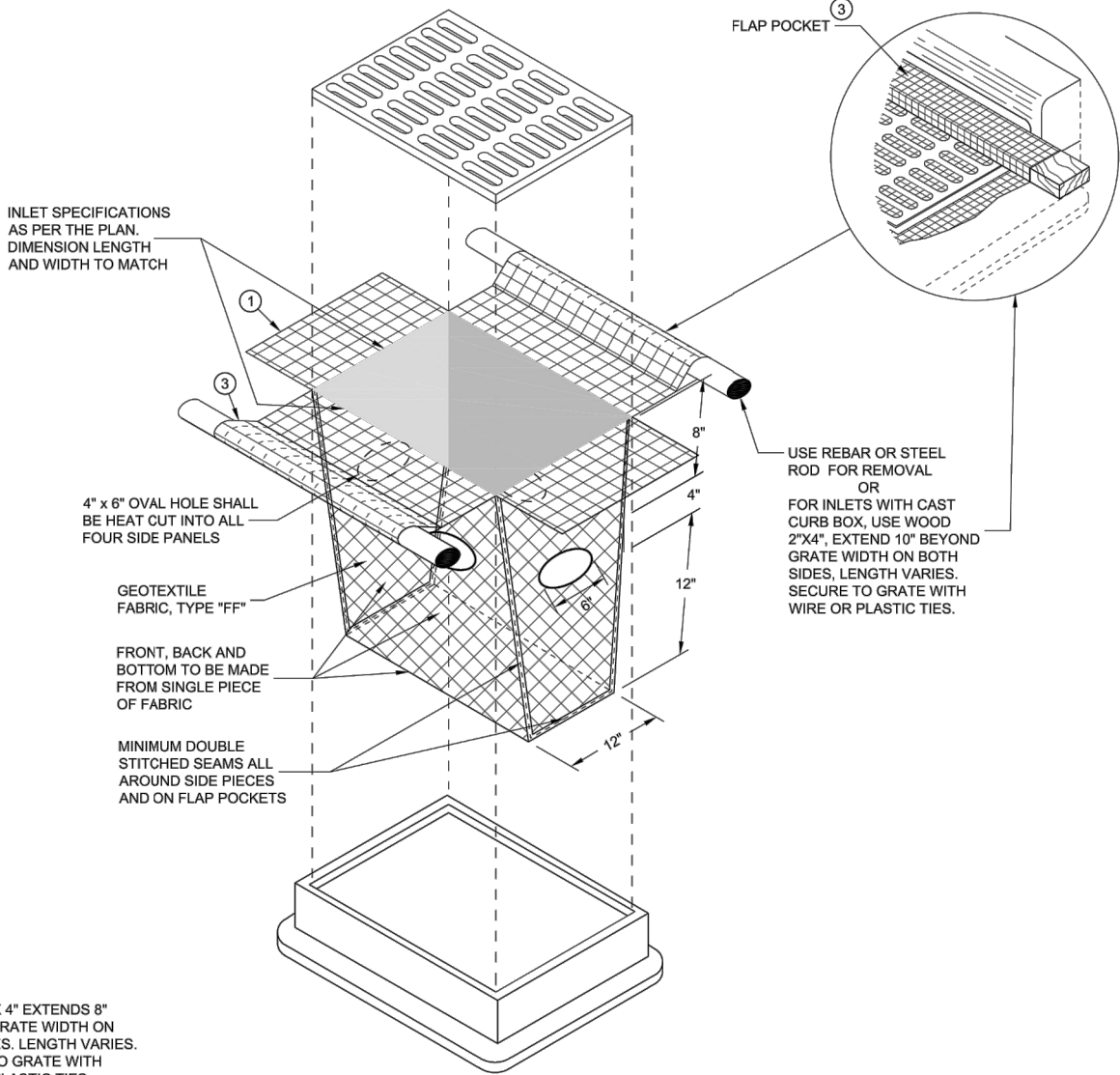
THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

TYPE D

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

DO NOT INSTALL INLET PROTECTION TYPE D IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.

THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.



INLET PROTECTION, TYPE "D"
(CAN BE INSTALLED IN ANY INLET WITH OR WITHOUT A CURB BOX AS PER NOTE 2)

INLET PROTECTION TYPES A, B, C AND D

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
10/16/02 /S/ Beth Cannestra
DATE ROADWAY STANDARDS DEVELOPMENT
ENGINEER

FHWA

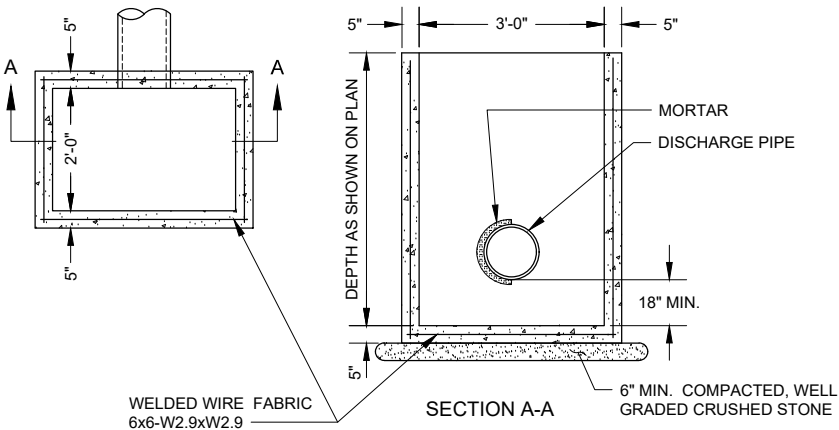


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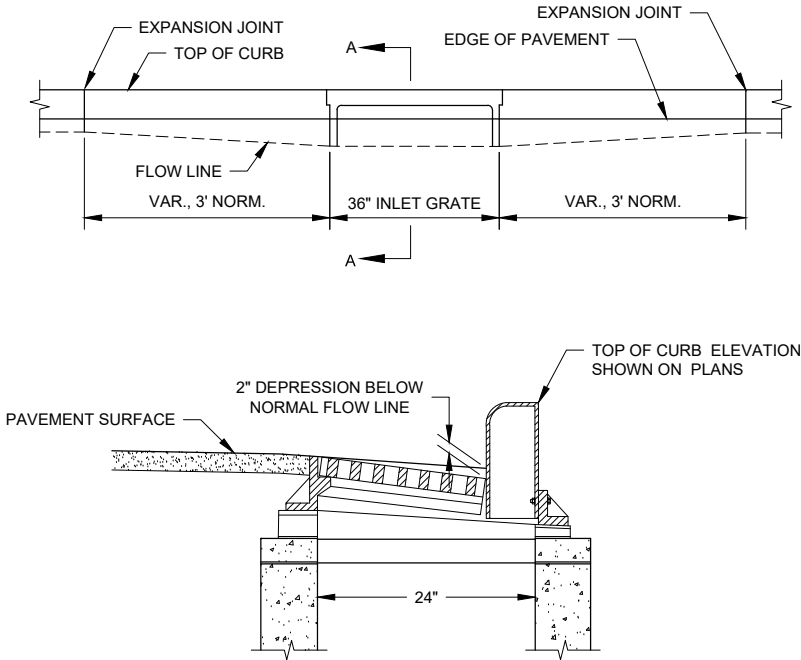
INLET PROTECTION DETAILS

PROJECT NO:
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SHEET
C502

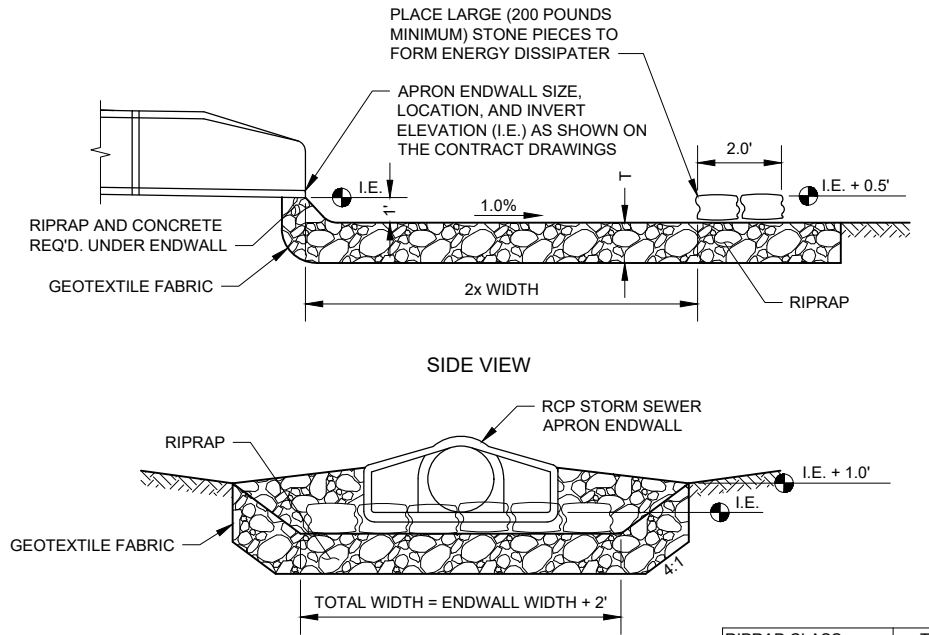


- GENERAL NOTES:
- SEE PLANS FOR SIZE, NUMBER, AND LOCATION OF PIPES.
 - DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE SPECIFICATIONS.
 - DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.
 - ALL PRECAST INLET UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF AASHTO DESIGNATION M 199.
 - PRECAST REINFORCED BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS FOR WELL GRADED CRUSHED STONE. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.
 - PRECAST REINFORCED CONCRETE FLAT SLAB TOPS MAY BE USED ON THE STRUCTURES. THE TOPS SHALL BE INSTALLED ON A BED OF MORTAR.
 - ALL BAR STEEL AND WELDED WIRE FABRIC REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.
 - PRECAST REINFORCED CONCRETE RISERS SHALL BE PLACED WITH TONGUE DOWN.

2' x 3' INLET WITH SUMP DETAIL
NO SCALE

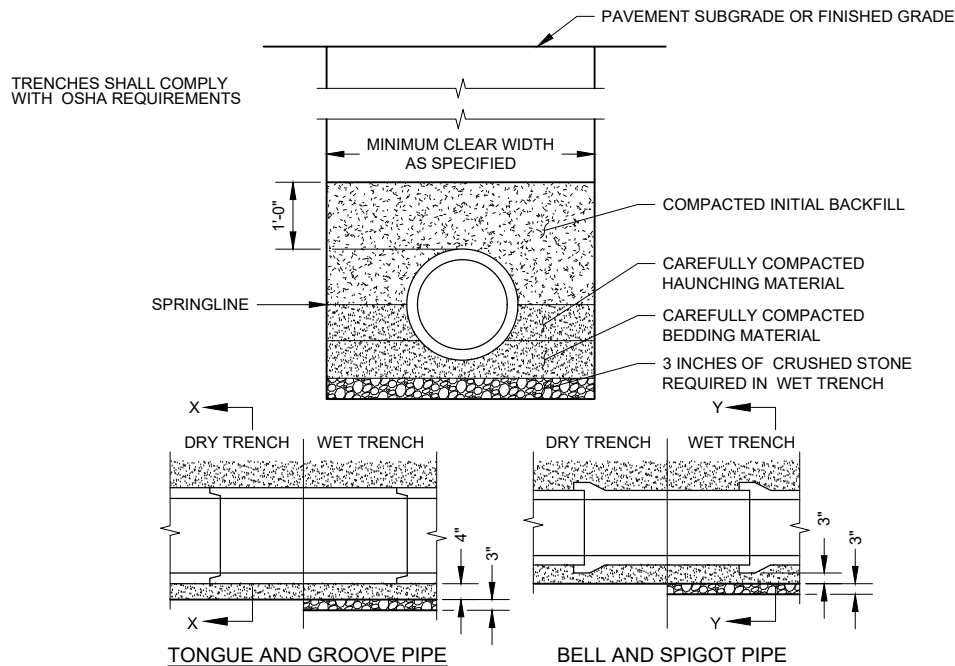


CURB AND GUTTER AT INLETS DETAIL
NO SCALE



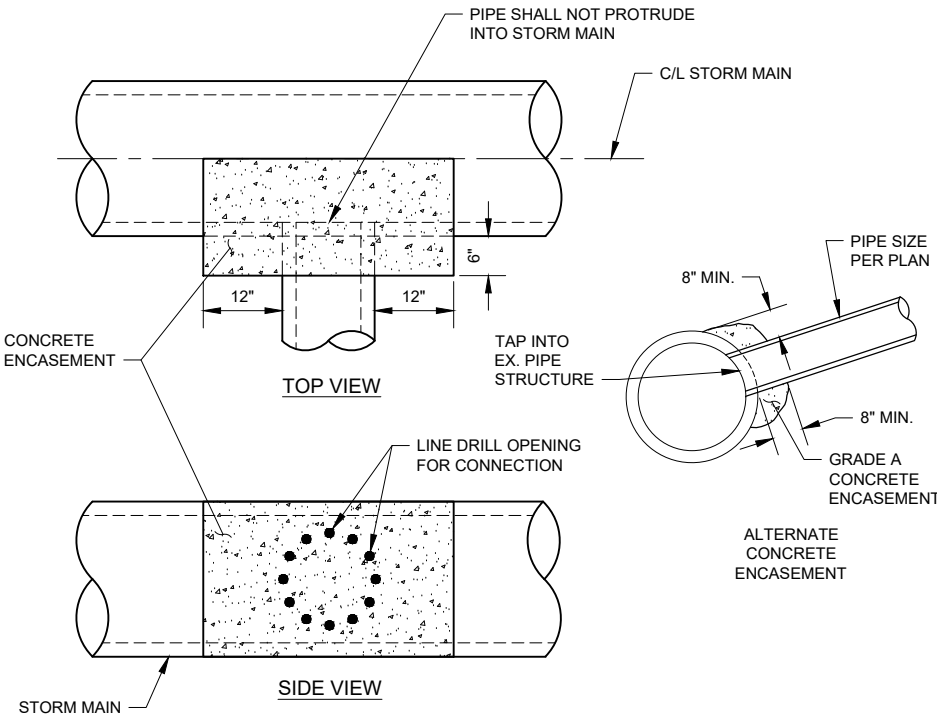
- GENERAL NOTES:
- DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE SPECIFICATIONS.
 - THE RIPRAP CLASS AND GEOTEXTILE FABRIC TYPE SHALL BE AS SHOWN ON THE PLANS AND REQUIRED IN THE SPECIFICATIONS.

STORM SEWER OUTFALL DETAIL
NO SCALE

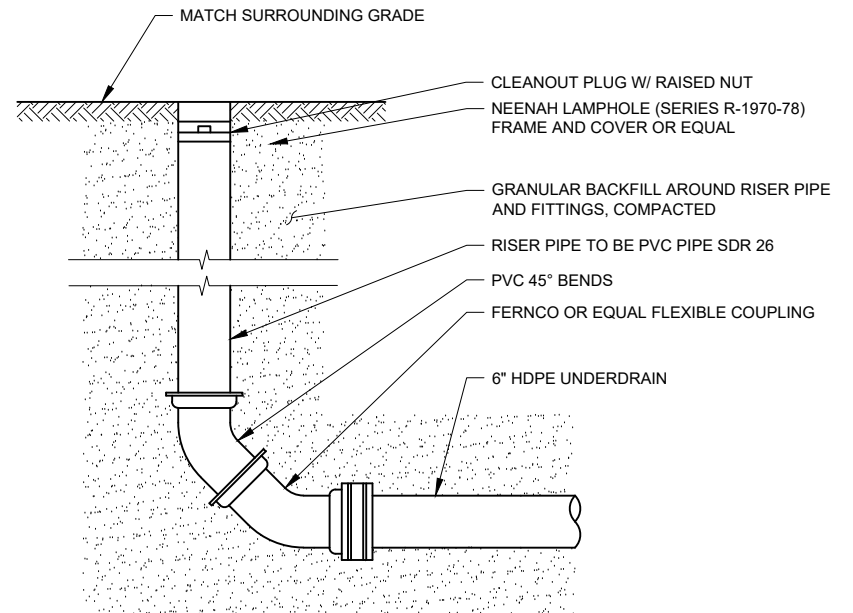


- GENERAL NOTES:
- BEDDING AND HAUNCHING MATERIAL SHALL BE WELL-GRADED 3/4 TO 1/4 INCH CRUSHED STONE OR OTHER NON-COHESIVE MATERIAL NOT SUBJECT TO MIGRATION AND FREE OF DEBRIS, ORGANIC MATERIAL, AND LARGE STONES.
 - BEDDING MATERIAL TO BE PLACED BEFORE SETTING PIPE, 4 INCH MINIMUM UNDER BARREL WITH 3 INCH MINIMUM UNDER BELL.
 - INITIAL BACKFILL SHALL BE DENSELY COMPACTED, NON-COHESIVE FINELY DIVIDED MATERIAL FREE OF DEBRIS, ORGANIC MATERIAL, AND LARGE STONES.
 - IN ROCK OR OTHER UNCOMPRESSIBLE MATERIALS, THE TRENCH SHALL BE OVEREXCAVATED A MINIMUM OF 6-INCHES AND REFILLED WITH GRANULAR MATERIAL.

CLASS "B" EMBEDMENT FOR RIGID PIPE DETAIL
NO SCALE



STORM SEWER TAP DETAIL (BLIND CONNECTION)
NO SCALE



UNDERDRAIN CLEANOUT
NO SCALE

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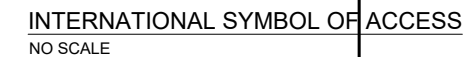
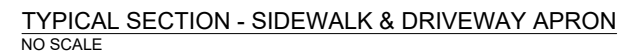
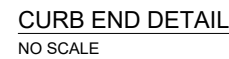


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STORM SEWER DETAILS

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C503



- GENERAL NOTES:
1. DETAILS OF INSTALLATION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE SPECIFICATIONS.
 2. A DETAILED DRAWING OF THE DISABLED PARKING SYMBOL IS ILLUSTRATED IN THE "STANDARD HIGHWAY SIGNS MANUAL" BY THE FEDERAL HIGHWAY ADMINISTRATION.
 3. WDOT SPEC. MEANS THE STATE OF WISCONSIN STANDARD SPECIFICATION FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION, AS AMENDED BY THE MOST CURRENT INTERIM SUPPLEMENTAL SPECIFICATION.
 4. PROVIDE DISABLED PARKING STALLS AT LOCATIONS SHOWN ON THE DRAWINGS. STALL AND ACCESS ISLE DIMENSIONS SHALL BE AS SHOWN ON THE DETAIL UNLESS INDICATED OTHERWISE ON THE DRAWING.
 5. PROVIDE A DISABLED SYMBOL AND BARRIER FREE SIGNAGE FOR EACH STALL SHOWN ON THE DRAWING.
 6. PROVIDE WHEEL STOPS WHEN SHOWN ON THE DRAWINGS.
 7. THE MAXIMUM SURFACE SLOPE, ACROSS STALLS OR ACCESSIBLE ROUTES, IN ANY DIRECTION, SHALL BE 2%.



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ROADWAY & PARKING DETAILS

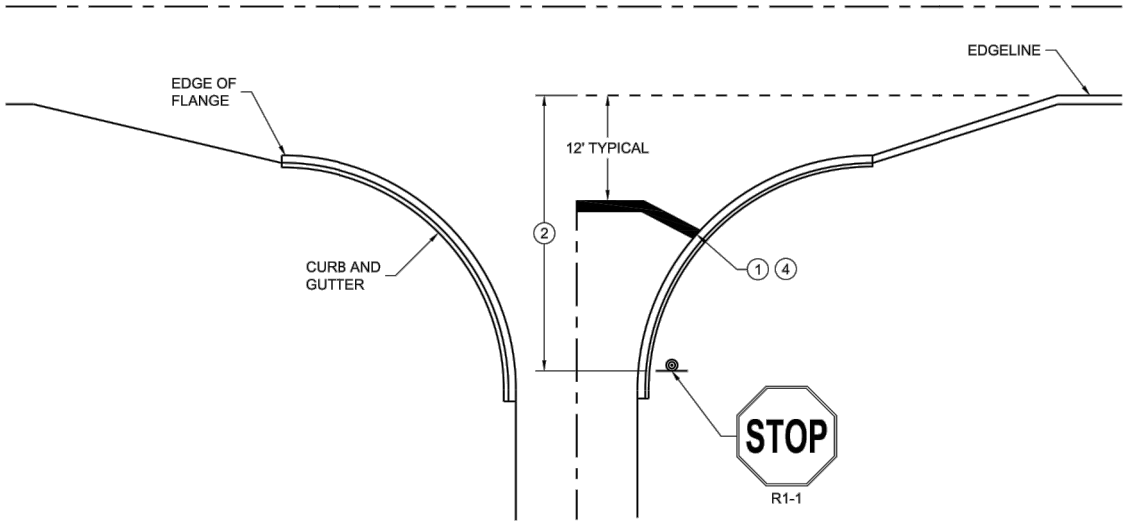
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C504

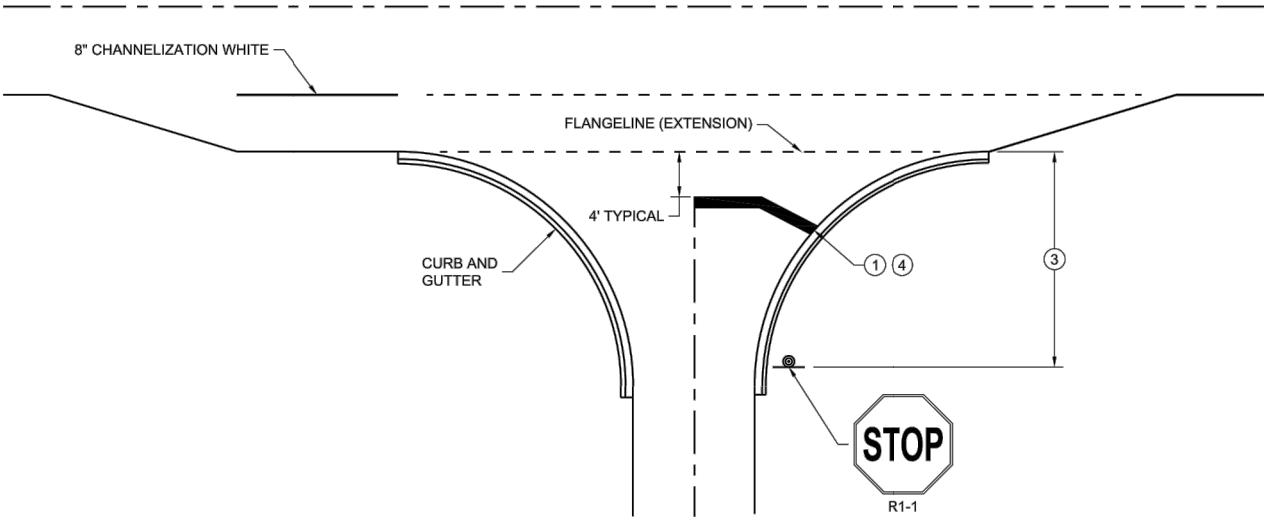
GENERAL NOTES

STOP SIGN SHALL BE PLACED A MINIMUM OF 6 FEET TO A MAXIMUM OF 50 FEET FROM THE EDGE LINE LOCATION.

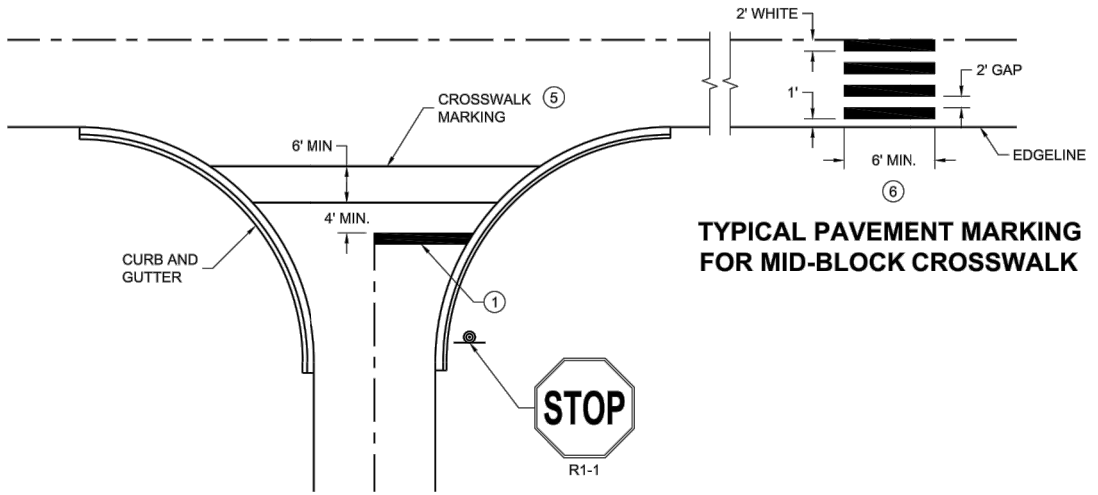
- 1 18-INCH STOP LINES MAY BE DELETED OR ADDED BY THE REGION MARKING ENGINEER BASED ON VISIBILITY AND SIGHT LINES.
- 2 NO STOP LINE IS REQUIRED IF STOP SIGN IS LESS THAN OR EQUAL TO 40 FEET FROM THE EDGE LINE.
- 3 NO STOP LINE IS REQUIRED IF STOP SIGN IS LESS THAN OR EQUAL TO 30 FEET FROM THE FLANGE LINE EXTENSION.
- 4 MOVE CLOSER TO THE EDGE OF TRAVEL LINE AS NEEDED FOR VISIBILITY AND SIGHT LINES (NO CLOSER THAN 4 FEET).
- 5 LADDER BAR CROSSWALKS SHOULD ONLY BE USED FOR MID BLOCK CROSSINGS. USE 2 - 6" TRANSVERSE LINES.
- 6 POSTED SPEED LIMITS OF 40 MPH OR GREATER USE A MINIMUM WIDTH OF 8' FOR MIDBLOCK CROSSWALKS



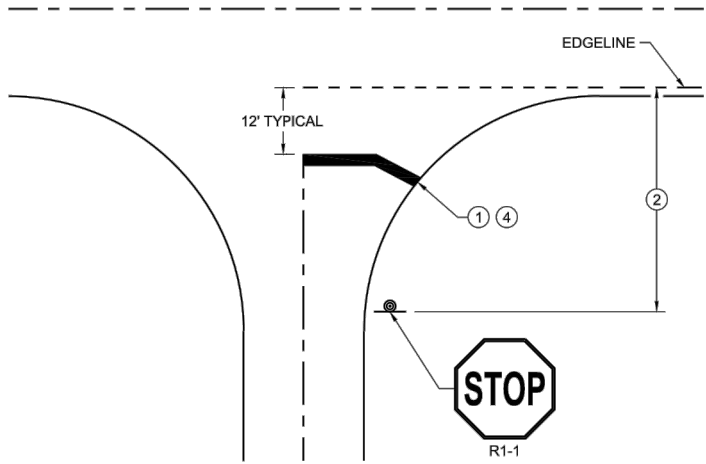
TYPICAL STOP LINE PAVEMENT MARKING WITH CURB AND GUTTER



TYPICAL STOP LINE PAVEMENT MARKING FOR SIDE ROADS WITH RIGHT TURN LANE



TYPICAL STOP LINE PAVEMENT MARKING FOR SIDE ROADS WITH CROSSWALK MARKING



TYPICAL STOP LINE PAVEMENT MARKING WITHOUT CURB AND GUTTER

STOP LINE AND CROSSWALK PAVEMENT MARKING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
March 2024
DATE

/S/ Matthew Rauch
STATE SIGNING AND MARKING
ENGINEER

FHWA

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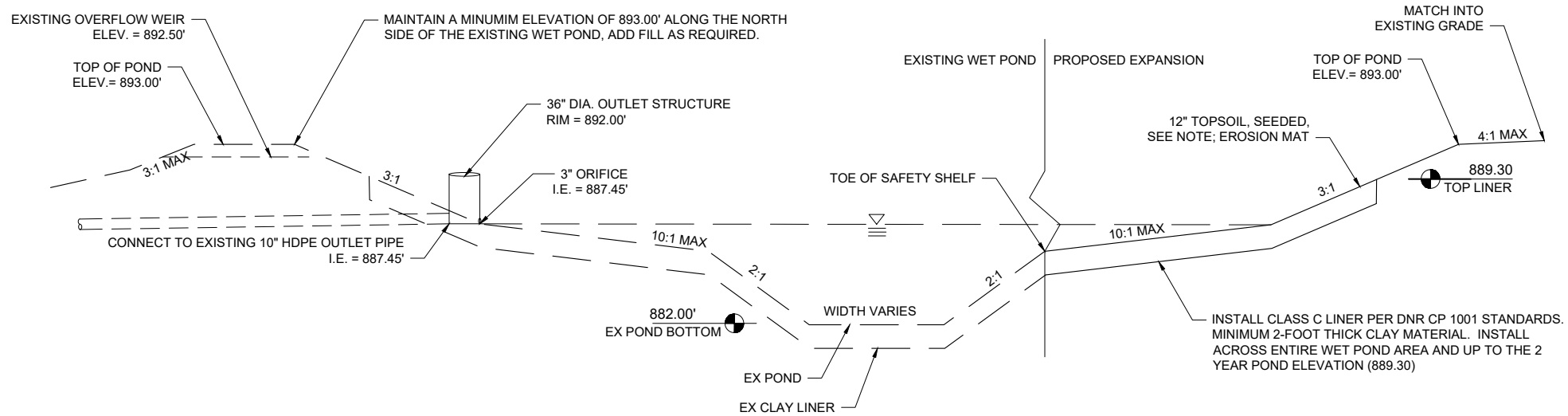


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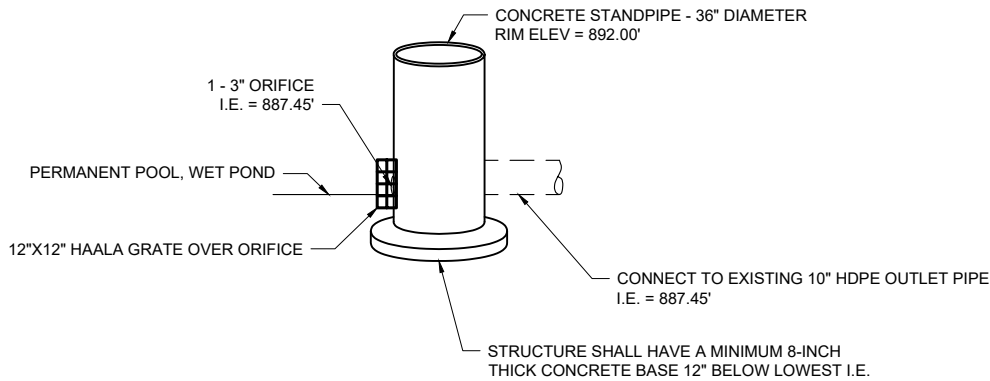
STOP LINE & CROSSWALK DETAIL

PROJECT NO:
20426215
SHEET
C505



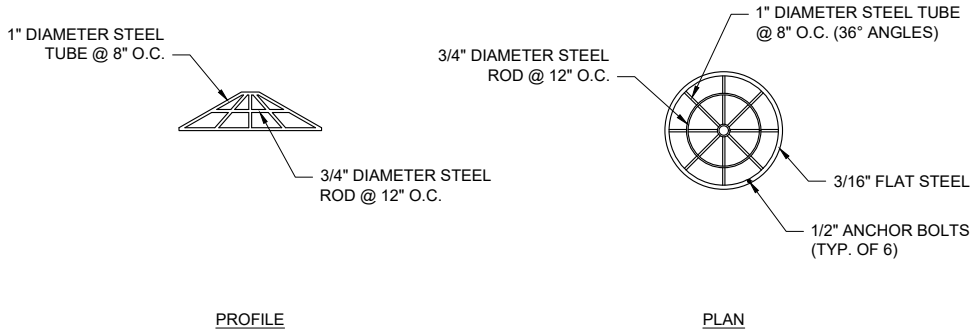
- NOTES:
- TOP OF POND TO BE A MINIMUM OF 4-FEET WIDE
 - WET POND EXPANSION TO OCCUR ABOVE THE TOE OF THE EXISTING SAFETY SHELF

WET POND WITH OUTLET STRUCTURE DETAIL
NO SCALE



NOTE:
THE GRATE FOR THIS OUTLET STRUCTURE SHALL BE EITHER A
NEENAH HIGH CAPACITY GRATE, BEEHIVE GRATE, OR CONE GRATE
AS DETAILED ABOVE. SEE PLAN FOR EXACT ELEVATIONS AND I.E.

WET POND OUTLET STRUCTURE DETAIL
NO SCALE



CONE GRATE DETAIL
NO SCALE

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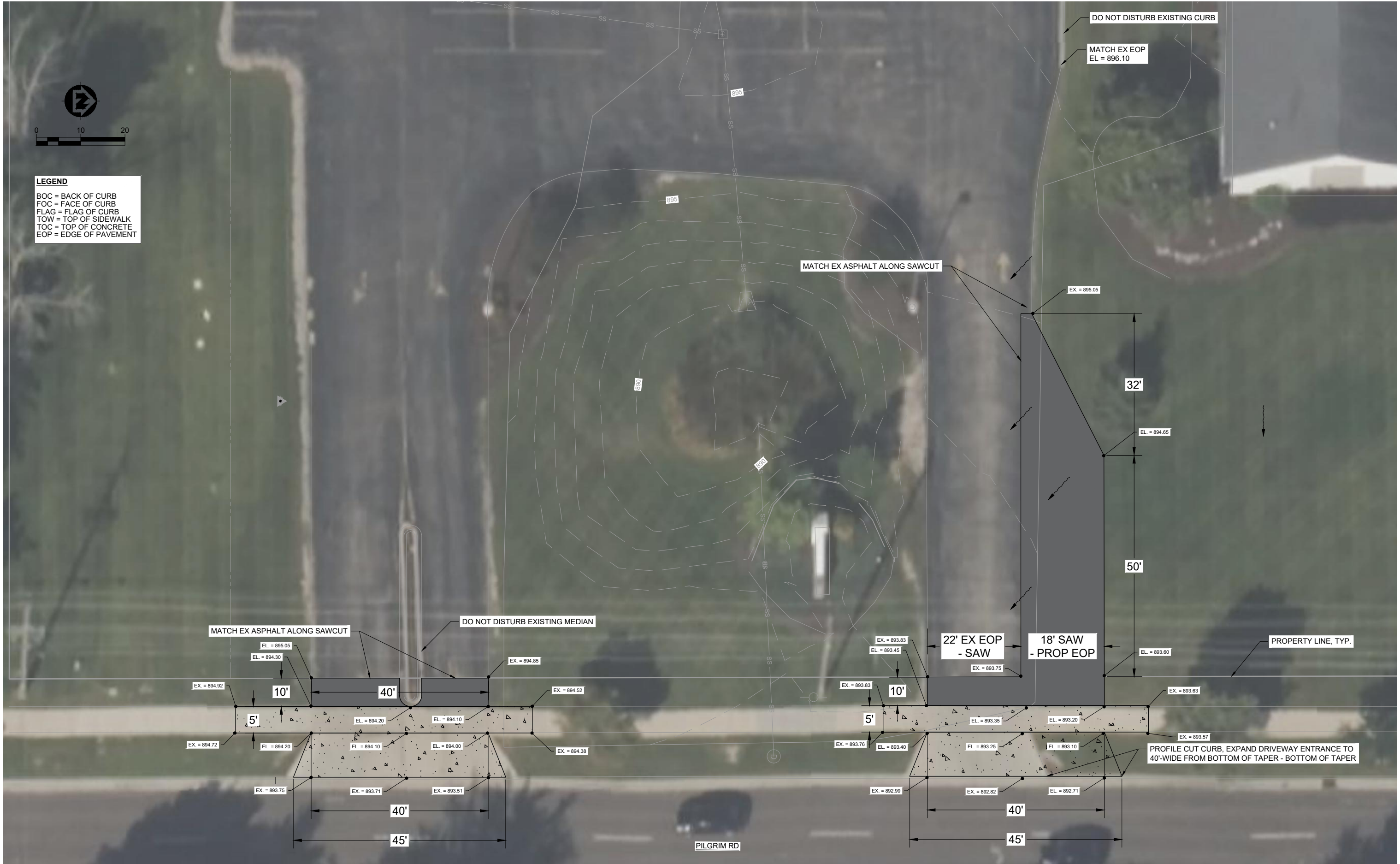


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WET POND EXPANSION DETAILS

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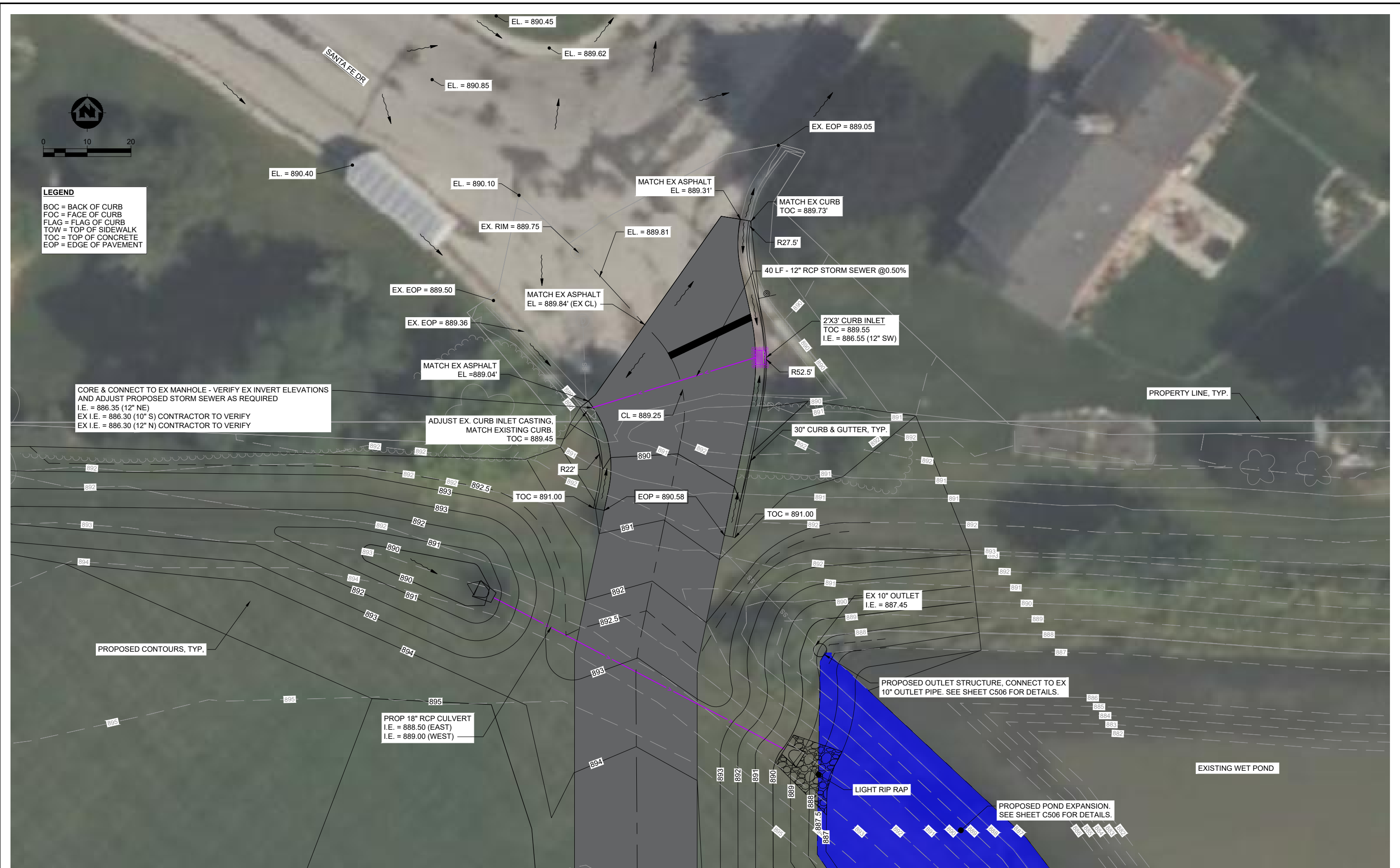


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DRIVEWAY DETAIL - PILGRIM RD

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C507



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DRIVEWAY DETAIL - SANTA FE DR

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- *NOTES**
- ALL YARDS MUST BE SODDED OR SEEDED ON AT LEAST 4-INCHES OF TOPSOIL
 - ONE TREE OF A MINIMUM OF 2-INCH CALIPER TO BE PLANTED FOR EACH 10 PROPOSED PARKING SPACES (107 NET)
 - LANDSCAPING MUST CONFORM TO VILLAGE OF GERMANTOWN CHAPTER 17 ZONING REQUIREMENTS
 - PROPOSED TREE SPECIES MUST BE INCLUDED IN THE VILLAGE OF GERMANTOWN APPROVED LIST OF TREES AND BE APPROVED BY THE VILLAGE FORESTER

PROPOSED PARKING LOT (102 STALLS)
PARKING LOT AREA = 43,428 SF
INTERIOR LANDSCAPED AREA = 2,440 SF (5.6%)

PROPOSED TREE, TYP.
BOC R4', TYP.
SEE DEMOLITION PLAN FOR TREE REMOVAL
EXISTING PARKING LOT
PARKING SPACES REMOVED = 25 TOTAL
TREES REMOVED = 1 TOTAL
8' BOC-BOC, TYP.
18" CURB & GUTTER AROUND
LANDSCAPED ISLANDS, TYP.

26' EOP-FOC

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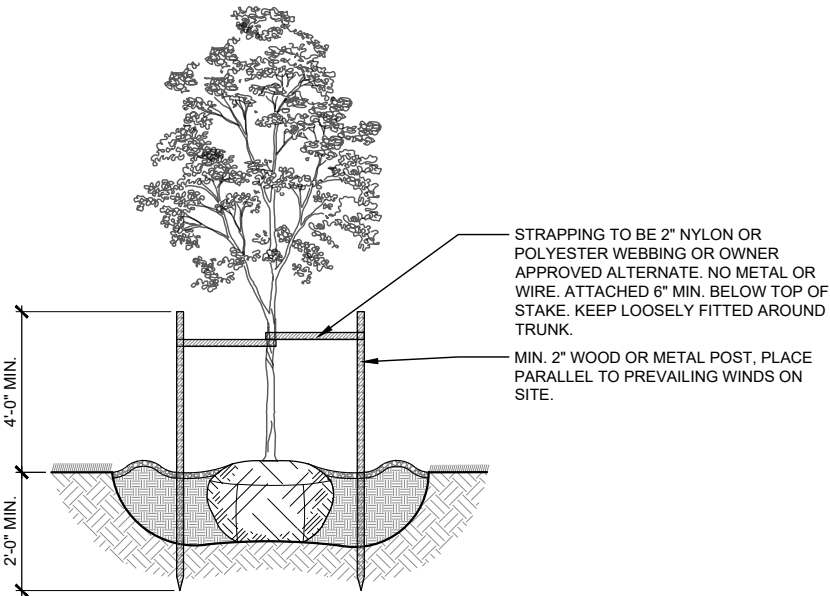
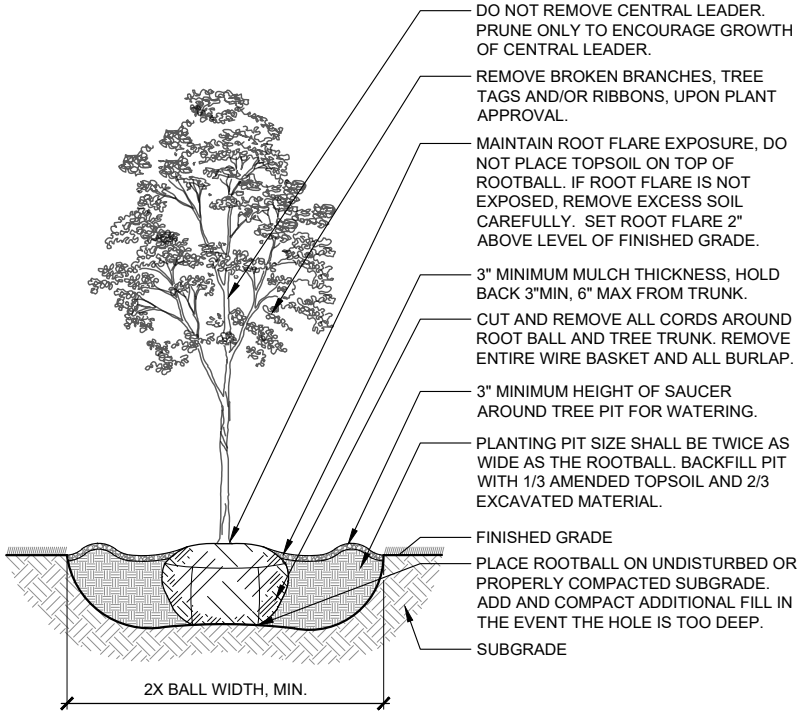
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PROPOSED LANDSCAPING PLAN

PROJECT NO: 20426215
SHEET L201

NOTE:
1. REMOVE AND PROPERLY DISPOSE OF ANY EXCESS EXCAVATED MATERIAL.
2. WRAP TRUNK WITH APPROVED TREE WRAP UP TO FIRST BRANCH. (FALL PLANTING REQUIREMENT).



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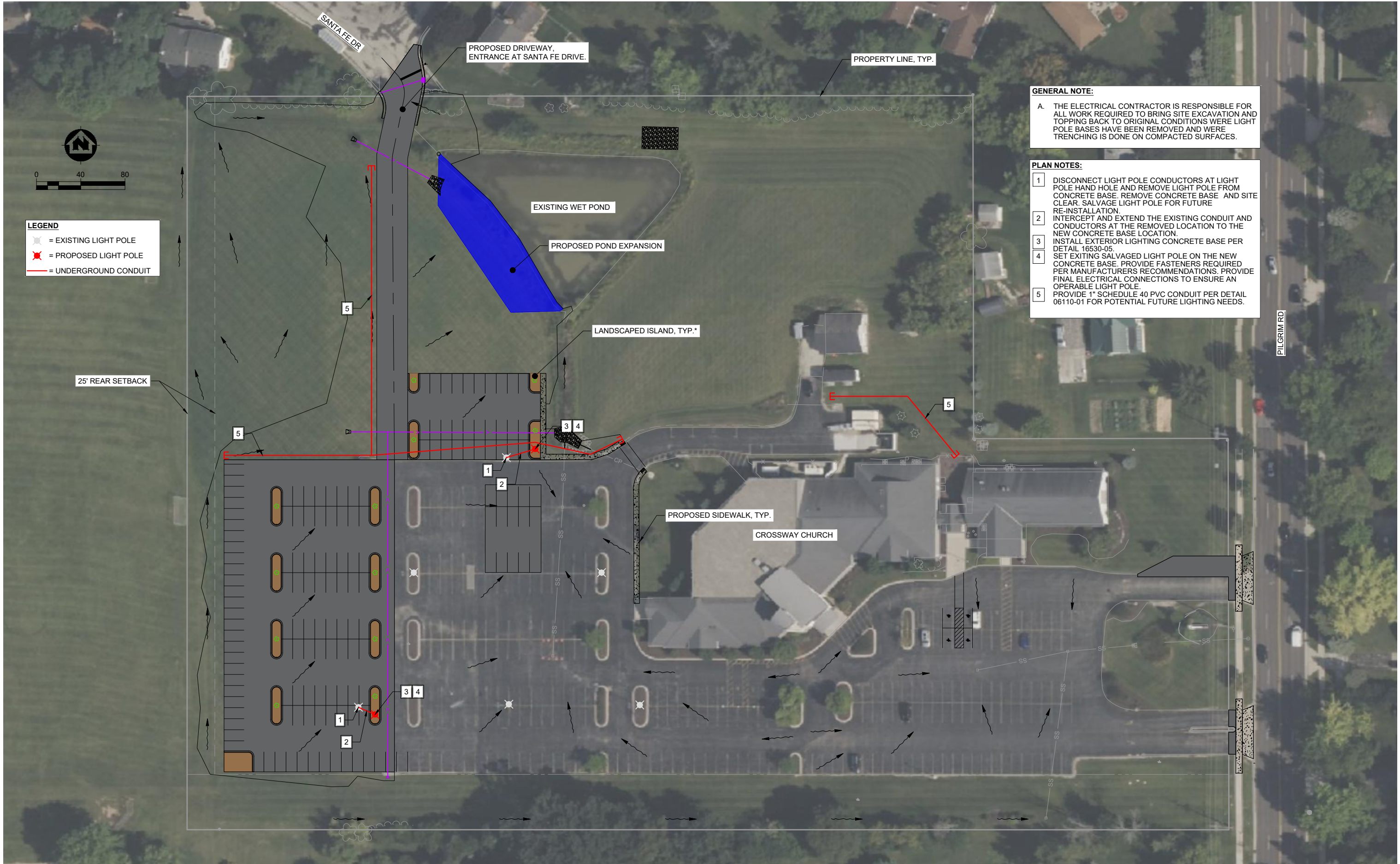


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LANDSCAPING DETAILS

PROJECT NO:
20426215
SHEET
L501



GENERAL NOTE:

A. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL WORK REQUIRED TO BRING SITE EXCAVATION AND TOPPING BACK TO ORIGINAL CONDITIONS WHERE LIGHT POLE BASES HAVE BEEN REMOVED AND WHERE TRENCHING IS DONE ON COMPACTED SURFACES.

- PLAN NOTES:**
- 1 DISCONNECT LIGHT POLE CONDUCTORS AT LIGHT POLE HAND HOLE AND REMOVE LIGHT POLE FROM CONCRETE BASE. REMOVE CONCRETE BASE AND SITE CLEAR. SALVAGE LIGHT POLE FOR FUTURE RE-INSTALLATION.
 - 2 INTERCEPT AND EXTEND THE EXISTING CONDUIT AND CONDUCTORS AT THE REMOVED LOCATION TO THE NEW CONCRETE BASE LOCATION.
 - 3 INSTALL EXTERIOR LIGHTING CONCRETE BASE PER DETAIL 16530-05.
 - 4 SET EXISTING SALVAGED LIGHT POLE ON THE NEW CONCRETE BASE. PROVIDE FASTENERS REQUIRED PER MANUFACTURERS RECOMMENDATIONS. PROVIDE FINAL ELECTRICAL CONNECTIONS TO ENSURE AN OPERABLE LIGHT POLE.
 - 5 PROVIDE 1" SCHEDULE 40 PVC CONDUIT PER DETAIL 06110-01 FOR POTENTIAL FUTURE LIGHTING NEEDS.

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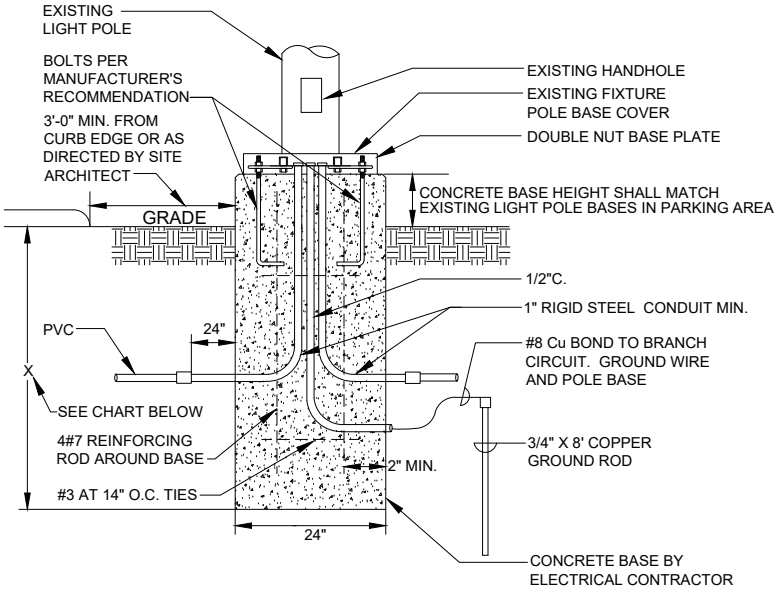


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PROPOSED LIGHTING & ELECTRICAL PLAN

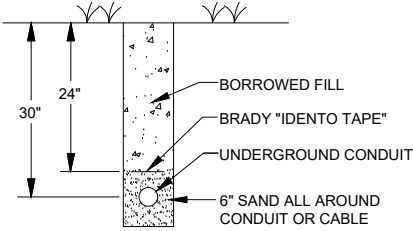
PROJECT NO:
20426215
SHEET
E201



- NOTES:
1. IN UNDISTURBED EARTH, EXCLUDING FILL MATERIAL, A 2'-0" DIA. HOLE WHICH SHALL BE USED AS THE FORM FOR THE CONCRETE BASE SHALL BE DRILLED.
 2. IN EXCAVATED AREAS OR IN EXISTING SOIL CONTAINING FILL OF OBJECTIONABLE MATERIAL, BACKFILL AROUND CONCRETE BASE WITH COMPACTED GRANULAR BACKFILL A MIN. OF 2'-0" IN ALL DIRECTIONS.

POLE HEIGHT IN FEET	BASE DEPTH IN INCHES BELOW GRADE
10'-0"	X = 60" (INCHES)
15'-0"	X = 60" (INCHES)
20'-0"	X = 60" (INCHES)
25'-0"	X = 72" (INCHES)
30'-0"	X = 72" (INCHES)
35'-0"	X = 72" (INCHES)
40'-0"	X = 96" (INCHES)
45'-0"	X = 96" (INCHES)
50'-0"	X = 108" (INCHES)

16530-05 EXTERIOR LIGHTING
CONCRETE BASE DETAIL
NTS



NOTE:
PROVIDE PULL CORDS IN ALL EMPTY CONDUITS.

16110-01 UNDERGROUND CONDUIT DETAIL
NTS

PROJECT DATE: 08-14-2024	DRAWN BY: KEF	NO.	DATE	REVISION	BY
	DESIGNED BY: KEF	-	-	-	-
	CHECKED BY: Init	-	-	-	-
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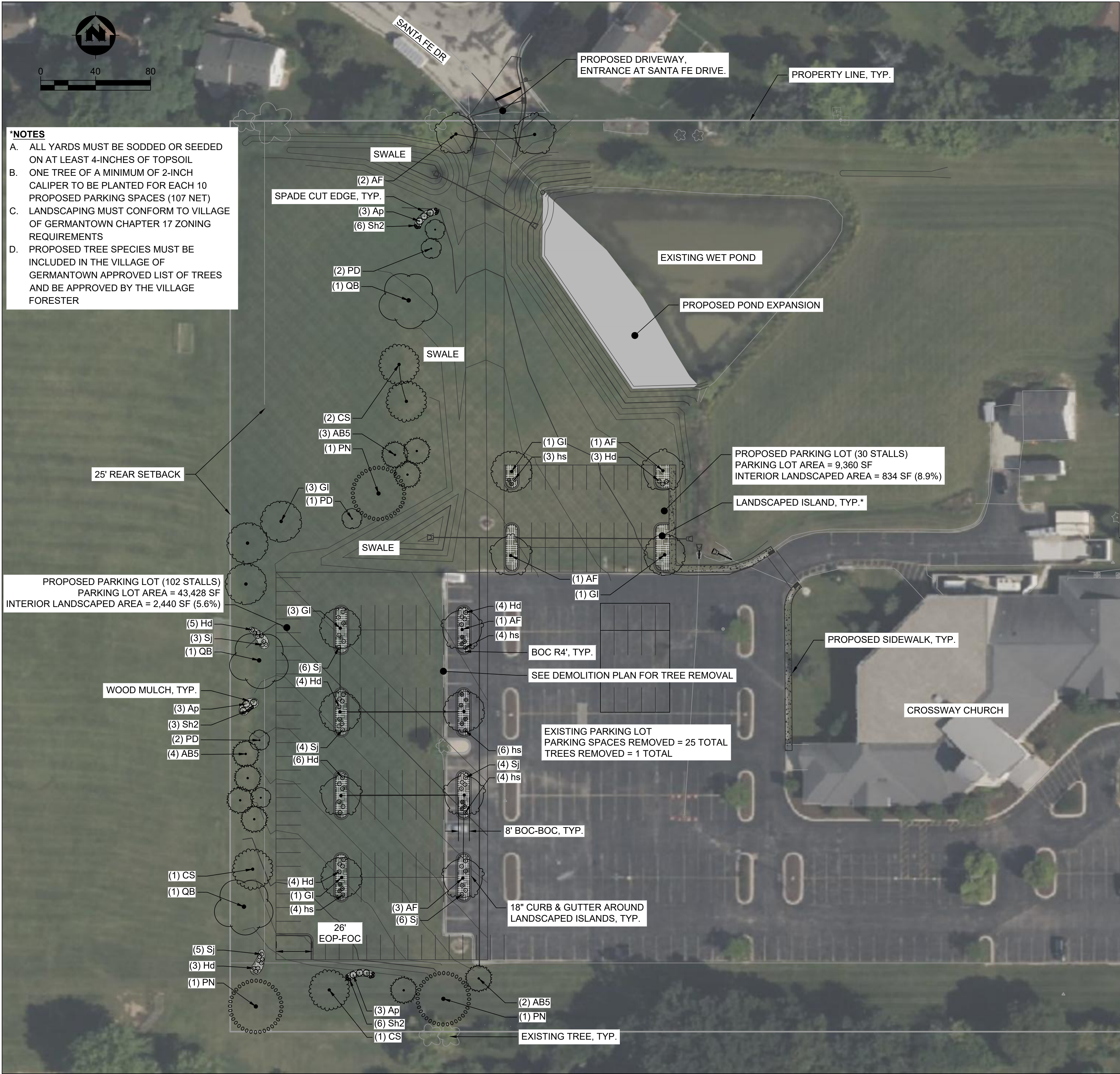


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CROSSWAY CHURCH
GERMANTOWN, WASHINGTON COUNTY, WI

ELECTRICAL DETAILS

PROJECT NO: 20426215
SHEET E501



PLANT SCHEDULE

SYMBOL	CODE	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER	QTY
TREES						
	AF	ACER X FREEMANII 'CELZAM'	CELEBRATION® FREEMAN MAPLE	3" CAL.	B&B	8
	CS	CATALPA SPECIOSA	NORTHERN CATALPA	3" CAL.	B&B	4
	GI	GYMNOCLADUS DIOICUS 'MCKBRANCHED'	DECAF® KENTUCKY COFFEETREE	3" CAL.	B&B	9
	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	2" CAL.	B&B	3
EVERGREEN TREES						
	AB5	ABIES BALSAMEA	BALSAM FIR	2" CAL.	B&B	9
	PD	PICEA GLAUCA 'DENSATA'	BLACK HILLS SPRUCE	6' HT.	B&B	5
	PN	PINUS NIGRA	AUSTRIAN PINE	2" CAL.	B&B	3
SHRUBS						
	Ap	AMELANCHIER ALNIFOLIA PUMILA	DWARF SERVICEBERRY	#3 CONT.	CONT.	9
	Hd	HYPERICUM KALMIANUM 'DEPPE' TM	SUNNY BOULEVARD ST. JOHNSWORT	2 GAL.	CONT.	29
	Sj	SPIRAEA JAPONICA 'NEON FLASH'	NEON FLASH JAPANESE SPIREA	#3 CONT.	CONT.	28
GRASSES						
	hs	HELICTOTRICHON SEMPERVIRENS	BLUE OAT GRASS	#1 CONT.	CONT.	21
	Sh2	SPOROBOLUS HETEROLEPIS	PRAIRIE DROPSEED	#1 CONT.	CONT.	15

PROJECT DATE: 08-23-2024	DRAWN BY: KEF	NO.	DATE	REVISION	BY:
	DESIGNED BY: KEF	-	-	-	-
	CHECKED BY: Init	-	-	-	-
PLOT DATE: 8/23/2024 8:35 AM, G:\20\20426\20426215\05_BIM_CADD_Discipline\06_Civil\Construction Documents\20426215 PROPOSED SITE PLAN.dwg					



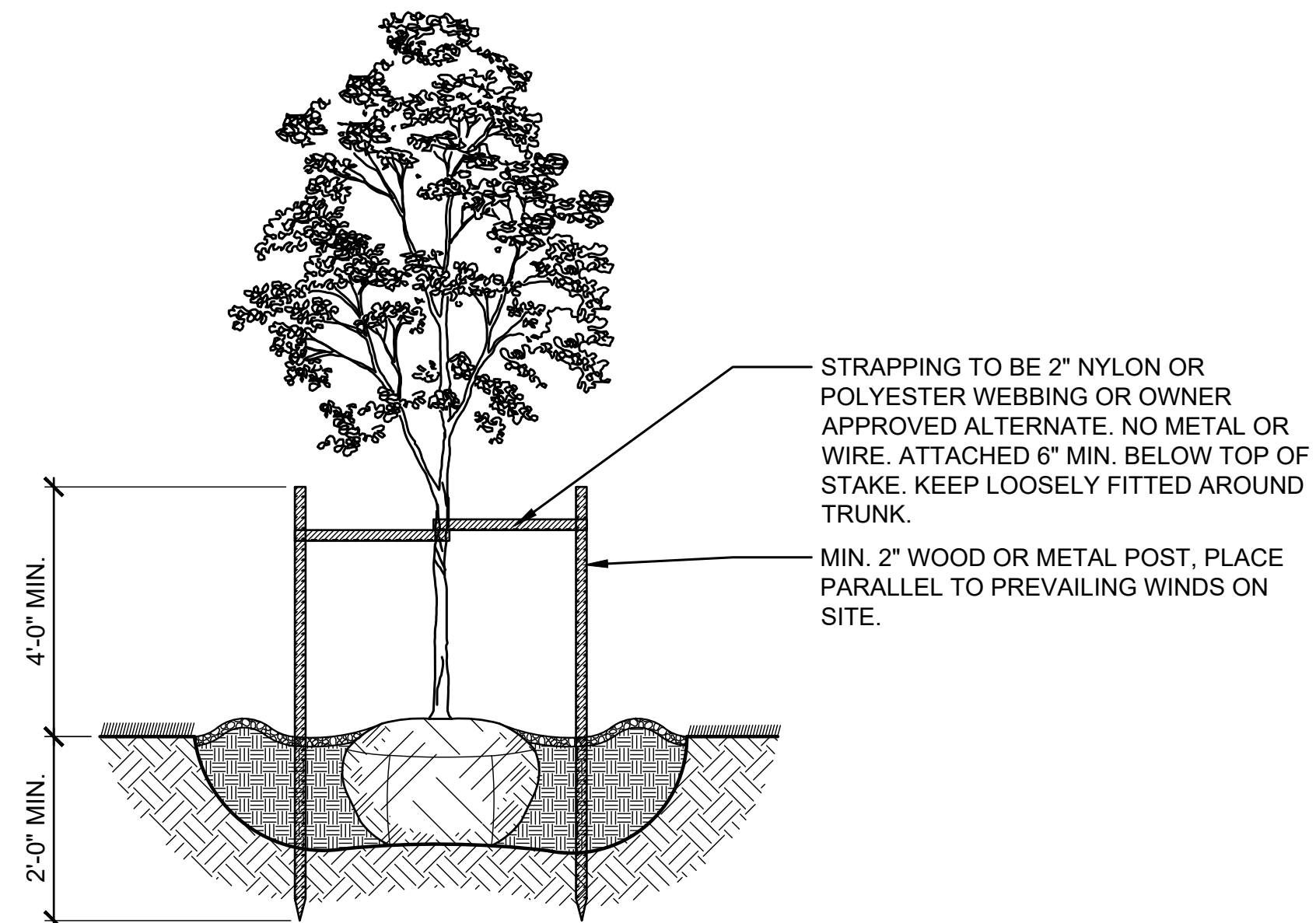
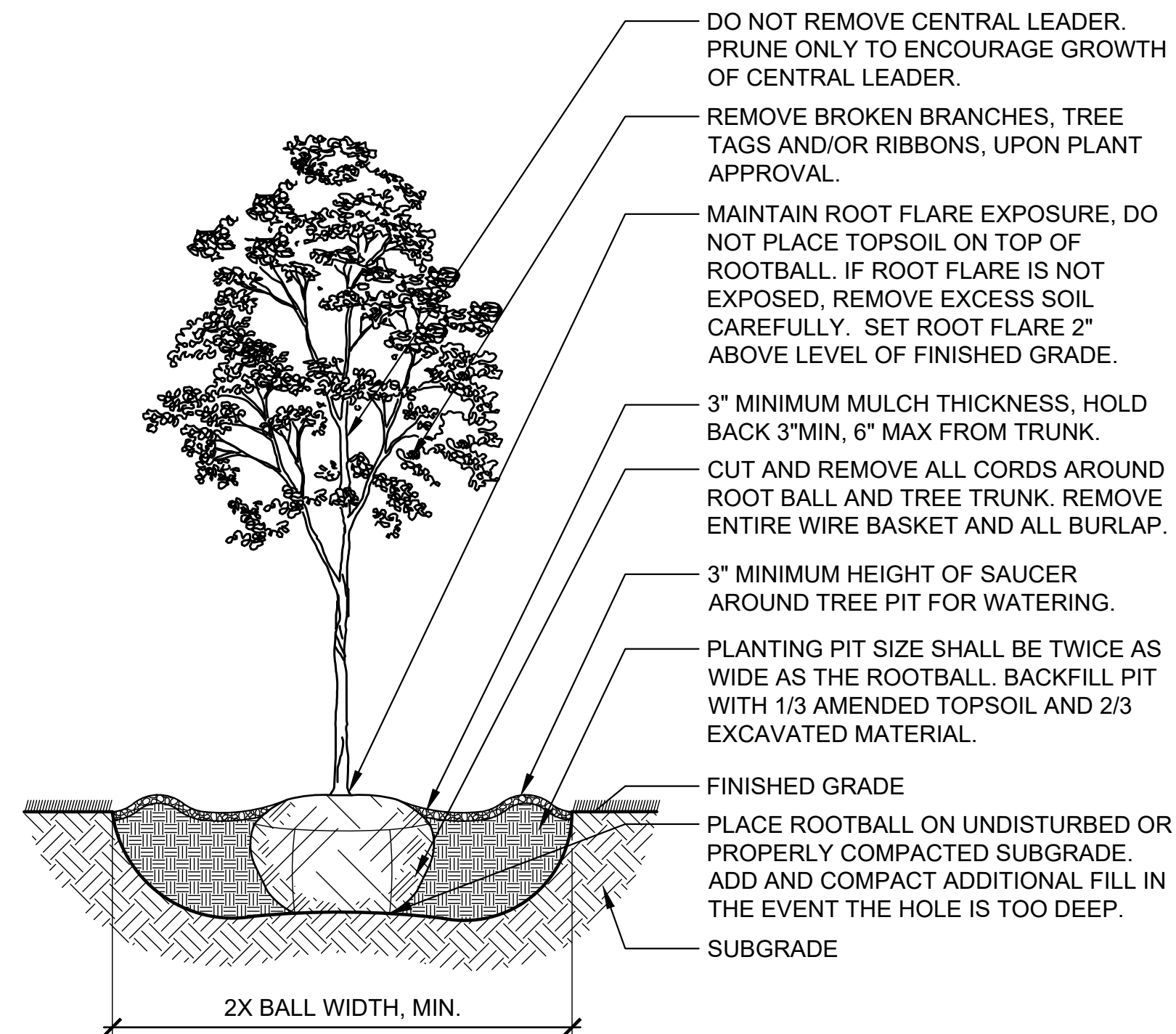
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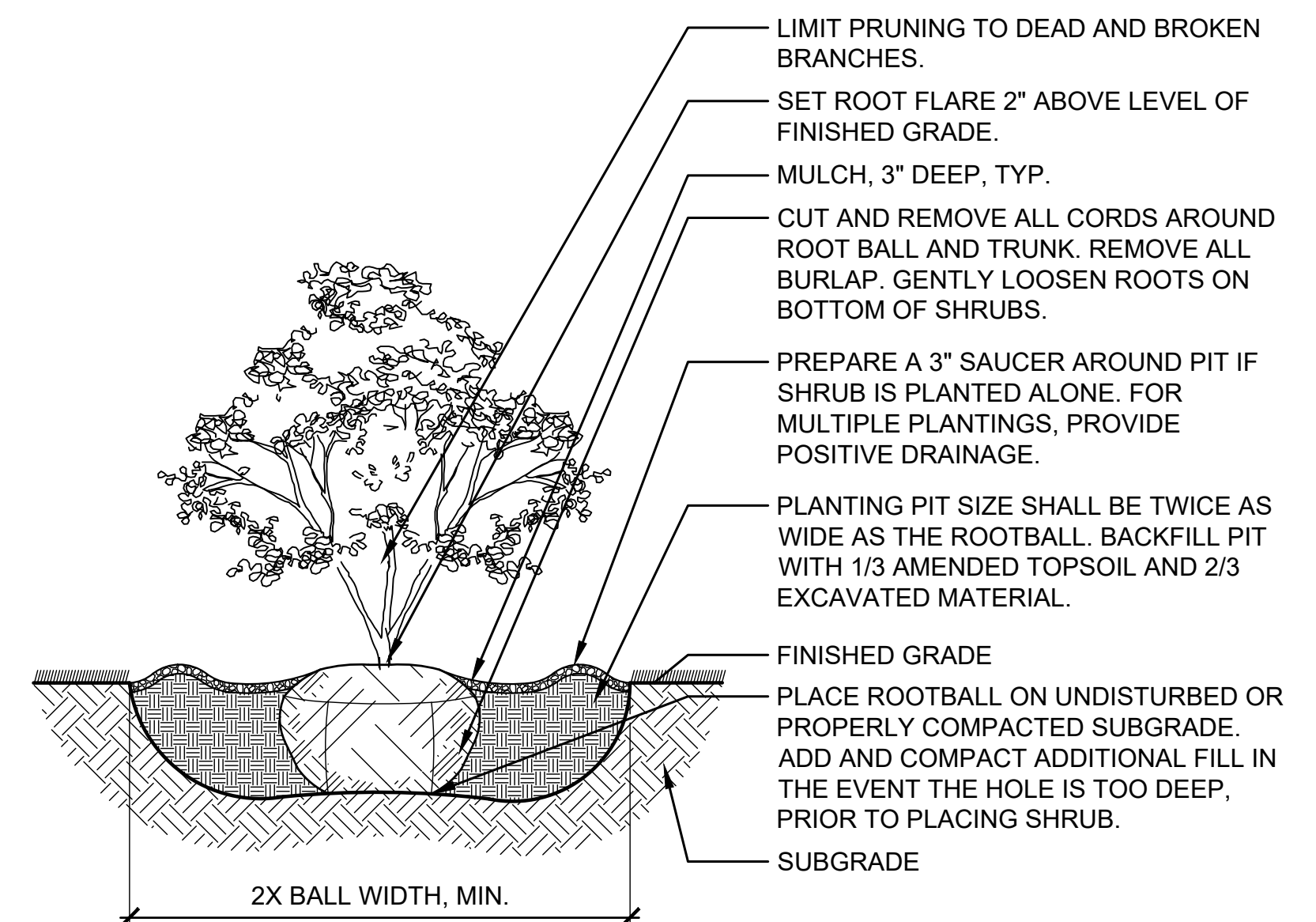
PROPOSED LANDSCAPING PLAN

PROJECT NO:
20426215
SHEET
L201

1. REMOVE AND PROPERLY DISPOSE OF ANY EXCESS EXCAVATED MATERIAL
2. WRAP TRUNK WITH APPROVED TREE WRAP UP TO FIRST BRANCH. (FALL PLANTING REQUIREMENT).

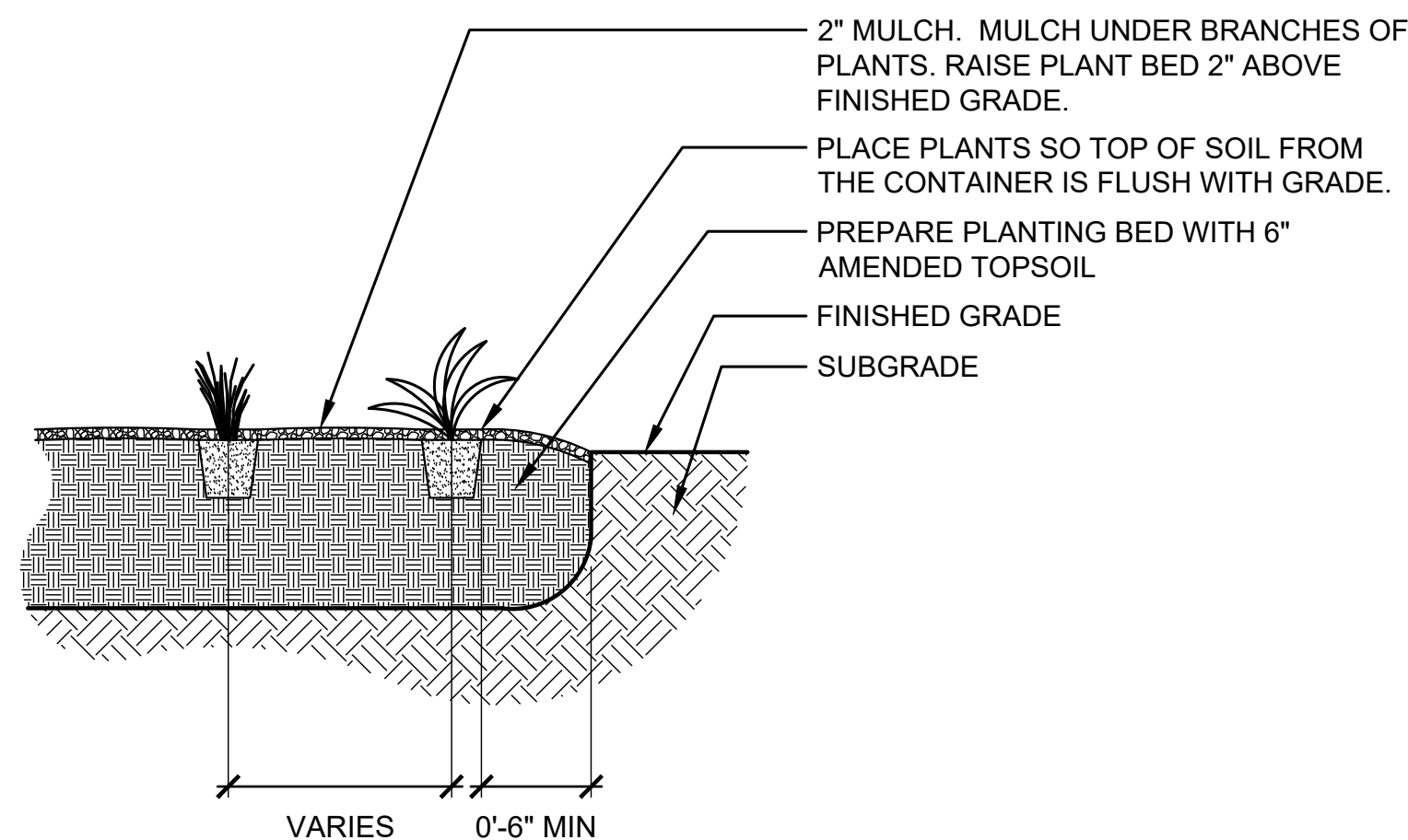


NOTE:
REMOVE AND PROPERLY DISPOSE OF ANY EXCESS EXCAVATED MATERIAL



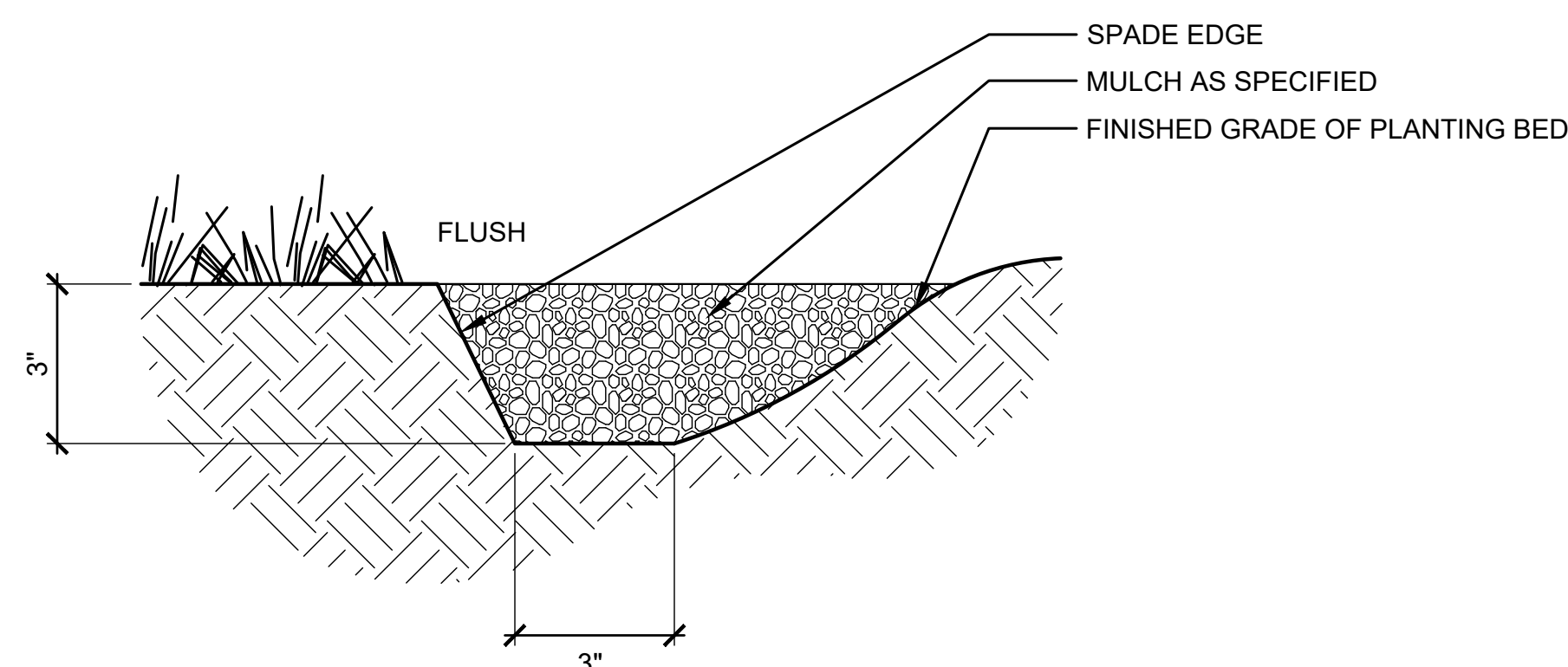
2 SHRUB B&B PLANTING
L500 NTS

NOTE:
REMOVE AND PROPERLY DISPOSE OF
ANY EXCESS EXCAVATED MATERIAL.



4 PERENNIAL PLANTING
L500 NTS

NOTE:
ALL TEXT SHOULD BE CAPITALIZED AND
ALL NOTES AND DIMENSIONS ON LAYER
"C-ANNO-NOTE".



5 SPADE CUT EDGE
L500 NTS

		NO.	DATE	REVISION	BY
PROJECT DATE: 08-14-2024	DRAWN BY: KEF	-	-	-	-
	DESIGNED BY: KEF	-	-	-	-
	CHECKED BY: Init	-	-	-	-

PLOT DATE: 8/23/2024 8:35 AM, G:\20\204262042621505 Bim CADD Discipline\06 Civil\Construction Documents\2042621505 PROPOSED SITE PLAN.dwg



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CROSSWAY CHURCH
GERMANTOWN, WASHINGTON COUNTY, WI

LANDSCAPING DETAILS

PROJECT NO.
20426215

SHEET
L501

**VILLAGE OF GERMANTOWN
APPLICATION FOR EROSION CONTROL PERMIT**

N112 W17001 Mequon Road - P.O. Box 337 - Germantown, WI 53022

Phone (262) 250-4760

PERMIT #E -

The undersigned hereby applies for a permit to build, construct or to install according to the following statement:

1. Owner CrossWay Church (Ben Cartland) Phone 262-255-0702
Address W156N10041 Pilgrim Road City/State Germantown, WI 53022
2. Location of Structure Improvements to Existing Structures Zoning District Institutional
3. Name of Contractor UNKNOWN AT THIS TIME. Phone _____
Address _____ City/State _____
4. Parcel Description: Lot 1 (CSM 6349) Subdivision _____ Parcel No: 341092
5. Description of Land Disturbing Activity:
Excavating or Filling 5000 Cubic Yards Trenching 600 Linear Feet
Grading/Removal of Ground Cover 124,000 Sq. Ft. Total Area Disturbed 152,460 Sq. Ft.
6. Erosion Control Permit Fee \$ 1262.30

CONDITIONS OF APPROVAL

1. Property Owner/Applicant is responsible for compliance with the Erosion Control Ordinance or COMM 21.125 and Conditionally Approved Plan. Owner/Applicant is responsible for activities of any subcontractors which may affect non-compliance situations.
2. Install Erosion Control devices as identified in the Approved Erosion Control Plan.
3. Use of #3 aggregate stone or other approved stone with a minimum 3" diameter required for access drives, 6" depth, 30'-50' length, 14'-20' width.
4. Protect all storm sewer inlets with approved Erosion Control devices.
5. Remove tracking (i.e. sediment) from street at the end of each work day. Maintain all road drainage systems and tracking provisions, stormwater drainage systems, control measures and other facilities identified in the Erosion Control Plan.
6. Repair any siltation or erosion damage to adjoining surfaces and drainageways resulting from land development or disturbing activities.
7. All soil storage piles shall be located at least 25 feet from any downslope road, lake, stream, wetland, ditch, channel or other watercourse.
8. Stock piles that are left for more than seven (7) days should be seeded, covered with a tarp or have erosion control - silt fence/straw bales installed on the downslope side(s) of the stock pile.
9. Inspect all Erosion Control devices after each rain of 0.5 inches or more and at least once each week and make needed repairs.
10. Maintain all Erosion Control devices until disturbed areas are stabilized (seed/sod/mulch disturbed areas as soon as possible.)
11. Keep a copy of the Conditionally Approved Erosion Control Plan on site.

Acceptance of conditions by applicant. (In case of applicant not being the owner of the parcel, the applicant shall act as the agent for the owner and the owner's permission and acceptance of all conditions shall be in force as soon as the applicant is permitted by the owner to proceed with the work outlined herein.)

I hereby certify that I fully understand the provisions of the Village of Germantown Erosion Control Ordinance and that I accept responsibility for carrying out the control plan for the referenced project, as approved by the Village.

In addition to the Conditions of Approval, this permit must be transferred to the new home owner and the site must be stabilized or protected at the time of occupancy. (No occupancy will be granted until the site is stabilized or protected.)

Signed  Print Ben Cartland Phone 262.255.0702
Owner/Applicant

PERMIT APPROVED: _____ Date _____



MSA Erosion Control Plan Narrative & Stormwater Memo



To: Kevin Driscoll, P.E., Village Engineer
From: Kassandra Fritz, Engineer, MSA Professional Services, Inc.
Subject: CrossWay Church Parking Lot Improvements
Date: REVISED August 23, 2024

Introduction

This memorandum summarizes the performance of the stormwater management system for CrossWay Church in the Village of Germantown WI. The site is located in the Village of Germantown, Washington County, WI (SE ¼, NE ¼, Section 34, T09N, R20E).

The entire parcel area is approximately 12.18 acres. It is anticipated that 3.5 acres will be disturbed by construction activity. The proposed project includes the addition of 66,000 sf of impervious area including parking lot expansions, sidewalk installation and replacement, and driveway installation and replacement.

Runoff from the existing site is routed to one of two stormwater basins. Most of the runoff is conveyed to the existing wet pond on the north side of the property through grassed swales and area drains placed in the existing parking lot, the outlet for the wet pond is through an outlet structure that convey storm water to municipal storm sewer along Santa Fe Drive. The southeast corner of the property treats its parking area with a detention basin which outlets into municipal storm sewer on Pilgrim Road. Stormwater not conveyed through swales on the east side of the property flows east towards Pilgrim Road. Site information exhibits showing existing and proposed conditions can be found in **Appendix A**.

The USDA Web Soil Survey shows that the soils in the project area consist of silt loams of hydrologic soil group Type C. The proposed improvements will not disturb any wetlands, Surface Water Data viewer (SWDV) shows an area of wetland on the property, this is an existing stormwater BMP. SWDV and Washington County GIS supplemental site maps can be found **Appendix B**. A summary of the curve numbers used for stormwater calculations can be seen below:

Land Use Type	CN
Pavement (Asphalt/Concrete)	98
Roofs	98
Greenspace/Lawn Areas (Silt Loams, group C)	74
Wet Pond Permanent Pool	100

1230 SOUTH BOULEVARD, BARABOO, WI 53913
(608) 356-2771 (800) 362-4505

FAX: (608) 356-2770 WEB ADDRESS: WWW.MSA-PS.COM

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REPORT\20426215 Stormwater & Erosion Control Memo 2024-08-14.docx

MEMO

August 23, 2024

Stormwater Management Requirements

This site is subject to the post construction standards of the Village of Germantown (Chapter 27 - Post Construction Stormwater Management), Milwaukee Metropolitan Sewerage District (MMSD) (Chapter 13), and the Wisconsin DNR (NR151). Collectively, these standards require:

Peak Discharge Rate Control – Post-development peak discharge rates leaving the site under events ranging from the 1-yr, 2-yr, and 100-yr, 24-hr rainfall must not exceed pre-development rates for the same rainfall events. Post development peak discharge rates shall not exceed allowable runoff release rates for the 2-yr and 100-yr, 24-hr rainfall.

2-year allowable release rate = 9.90 ac (Wet Pond Watershed Area) x 0.15 cfs = 1.48 cfs

100-year allowable release rate = 9.90 ac (Wet Pond Watershed Area) x 0.50 cfs = 4.95 cfs

2-year allowable release rate = 12.18 ac (Entire Site) x 0.15 cfs = 1.83 cfs

100-year allowable release rate = 12.18 ac (Entire Site) x 0.50 cfs = 6.09 cfs

Water Quality Treatment – Stormwater runoff from the site must be treated such that there is an 80% reduction in Total Suspended Solids (TSS).

Infiltration – The site is exempt from infiltration requirements per NR 151.12(5)(c)(6)(a) because the infiltration rate of the soil is less than 0.6 inches/hour.

It is assumed that the existing site and stormwater BMPs, including both existing stormwater ponds, meet the above post construction stormwater standards.

Proposed Stormwater Improvements

Peak discharge rate control and water quality treatment will be provided for the site through improvements of the existing wet pond. The existing 10" outlet pipe includes a restrictor plate with orifice which will be removed and replaced with a 36" standpipe outlet structure with 3" orifice. The existing wet pond is large enough to meet water quality standards, however, it will be expanded above the toe of the safety shelf to meet peak discharge rate requirements. It is assumed that the existing site meets both the 2-year and 100-year allowable release rates. A summary of the existing site HydroCAD model with 2-year and 100-year hydrographs can be found in **Appendix C**. A detail showing proposed pond improvements can be found in **Appendix D**. Areas that flow to the existing east detention basin were not modelled due to minor changes to that area.

Peak Discharge Rate Control – The table below provides a summary comparison of peak discharge rate control for the site. Peak discharge rates were modelled for existing conditions, the proposed site with BMP improvements, and the proposed site without BMP improvements (no changes to the existing pond). A summary of the proposed site HydroCAD models with 2-year and 100-year hydrographs can be found in **Appendix E**.

MEMO

August 23, 2024

Event	Existing Site (cfs)	Proposed Site (cfs)	Proposed Site w/o Pond Improvements (cfs)
1-year	0.28	0.28	0.31
2-year	0.31	0.30	0.34
10-year	0.41	0.39	0.43
100-year	2.20	2.16	4.38

Water Quality Treatment – The proposed improvements will be routed to the existing wet pond. In order for the pond to achieve 80% TSS reduction, a minimum of 9,797.5 lbs of TSS removal is required. The existing pond with proposed improvements provides 11,394.7 lbs, or 93.0% TSS removal. A summary of TSS removal and modeling can be found in **Appendix F**.

USLE Calculations

The project includes mostly parking lot and driveway construction items. For work to be completed in 2024, the maximum flow path will be approximately 170 lineal feet at 2.5% when subgrade is exposed. Subgrade is expected to be covered by gravel/base by September. Areas disturbed during 2024 construction will be restored prior to winter shutdown of the construction site. For work to be completed in 2025, the maximum flow path will be approximately 140 lineal feet at 2.8% when subgrade is exposed. Subgrade is expected to be covered by gravel/base by August. Areas disturbed during 2025 construction will be restored by the end of October 2025 and all restoration work will be reviewed again in the spring of 2026. USLE calculations can be found in **Appendix G**.

Anticipated Construction Schedule

- **2024 Work:** Construction on north parking lot, new driveway to Sante Fe Drive, and the pond expansion.
 - o August 15-16, 2024 – Mobilization and install erosion control devices
 - o August 18-31, 2024 – Bulk grading for parking lot, driveway and pond including culvert installation
 - o September 3-7 – Install gravel for parking lot and driveway
 - o September 10-11 – Complete concrete flatwork and curb installation.
 - o September 12-14 – Fine grading for parking lot and driveway
 - o September 19-20 – Asphalt paving for parking lot and driveway
 - o September 24-25 – Initial restoration of the disturbed ditch and areas around the north parking lot and driveway to Sante Fe including temporary erosion mat and ditch checks/sediment logs/rip rap.
 - o October 31, 2024 Winter shutdown
- **2025 Work:** Construction on the west parking lot and the east driveway entrances to Pilgrim Drive and building construction.
 - o April 1-3, 2025 – Mobilization and install erosion control devices for parking lot and building work
 - o April 7-25, 2025 – Excavation for building foundations and foundation construction
 - o April 21-August 2025 – Building superstructure work

MEMO

August 23, 2024

- o July 21-Aug 8, 2025 – Bulk grading for west parking lot
- o Aug. 11-15, 2025 – Install gravel for west parking lot
- o Aug. 18-22, 2025 – Remove and replace concrete for south entrance to Pilgrim Drive
- o Aug. 25-29, 2025 – Remove and replace concrete for north entrance to Pilgrim Drive
- o Sept. 2-5, 2025 – Complete concrete flatwork and curb for west parking lot and around the building
- o Sept. 9-13, 2025 – Fine grading for parking lot
- o Sept. 16-17, 2025 – Asphalt paving for parking lot and entrance driveways
- o Sept. 18-27, 2025 – Final restoration of site and continued maintenance of 2024 restoration work.
- o October 31, 2025 – Project completion

Construction Phase Erosion Control

Various erosion control measures are included to reduce erosion onsite during construction and after construction is complete.

- Stone Tracking Pad
A tracking pad will be installed on the north side of the project, at the proposed driveway entrance. The tracking pad will measure a minimum of 20-feet wide by 50-feet long according to WDNR technical standard 1057.
- Erosion Mat
Channel erosion mat will be utilized in all areas with side slopes greater than 4:1. Erosion mat shall be installed according to WDNR technical standard 1052 and 1053.
- Silt Fence
Silt fence will be utilized along project construction limits that slope away from the project area. The silt fence will be utilized to prevent soil and other material from leaving the site.
- Sediment Log
Sediment logs will be used along all ditches with concentrated flows.
- Seeding and Mulching
Disturbed soil within the project will be restored with seed, and mulch according to the MSA seeding specification. All fill areas shall be seeded within seven days of the last land disturbing activity at the fill site.
- Inlet Protection
There are numerous inlets and area drains within the project area. All storm inlets within the project area will receive inlet protection. The inlet protection will conform to WDNR Technical Standard 1060.

Reporting

Erosion Control Inspection

- All controls will be inspected at least once per week and within 24-hours of any storm event greater than 0.5-inches. One inspection form shall be completed by the Contractor at the time of inspection.

Minimum Maintenance Requirements (During Construction)

- All measures are to be maintained in good working order. If repairs are necessary, they will be initiated within 24 hours of identification.
- Built up sediment shall be removed from silt fence, sediment logs, and weepers before it reaches a height greater than one-third of that of the BMP in place.
- Silt fences shall be inspected for tears, and to check for proper anchorage and be repaired as necessary.
- Washouts and bare spots shall be repaired in temporary or permanent seeding. Maintenance measures shall be performed to promote healthy vegetative growth.

Long Term Maintenance Requirements

- The inlet structures and area drains shall be inspected every year to check for blockages and accumulation of sediment. All blockages shall be removed along with sediment.
- Curb and gutter shall be inspected yearly for excessive sediment. All excessive sediment shall be removed. Regular street sweeping will eliminate this issue in the long run.

MEMO

August 23, 2024

Appendix A – Site Information Exhibits



WET POND WATERSHED LAND USE BREAKDOWN			
A1	TOTAL	32890 SF	
	ROOFS	24360 SF	
	GREENSPACE	8530 SF	
A2	TOTAL	73290 SF	
	PAVEMENT	48200 SF	
	GREENSPACE	25090 SF	
A3	TOTAL	37200 SF	
	PAVEMENT	37200 SF	
B1	TOTAL	287860 SF	
	ROOFS	2000 SF	
	PAVEMENT	11135 SF	
	GREENSPACE	258600 SF	
	WP PERM POOL	16125 SF	

TOTAL LOT AREA = 533340 SF	
PERVIOUS AREA = 329770 SF	
IMPERVIOUS AREA = 203570 SF	
PERCENT GREENSPACE = 61.8%	
PERCENT IMPERVIOUS = 38.2%	

STAGE	ELEVATION	AREA (SF)
0	882	5000
1	883	5900
2	884	6900
3	885	7900
4	886	9100
5	887	15150
POOL	887.45	16180
6	888	17500
7	889	19700
8	890	22200
9	891	25500
10	892	29800
11	893	34300

PROJECT DATE:	DRAWN BY:	NO.	DATE	REVISION	BY
08-14-2024	KEF	-	-	-	-
	DESIGNED BY:	KEF	-	-	-
	CHECKED BY:	Init	-	-	-
PLOT DATE: 8/15/2024 12:12 PM, G:\20\20426\20426215\04_BIM_CADD_Shared\03_Model_Based Files\20426215 Stormwater.dwg					

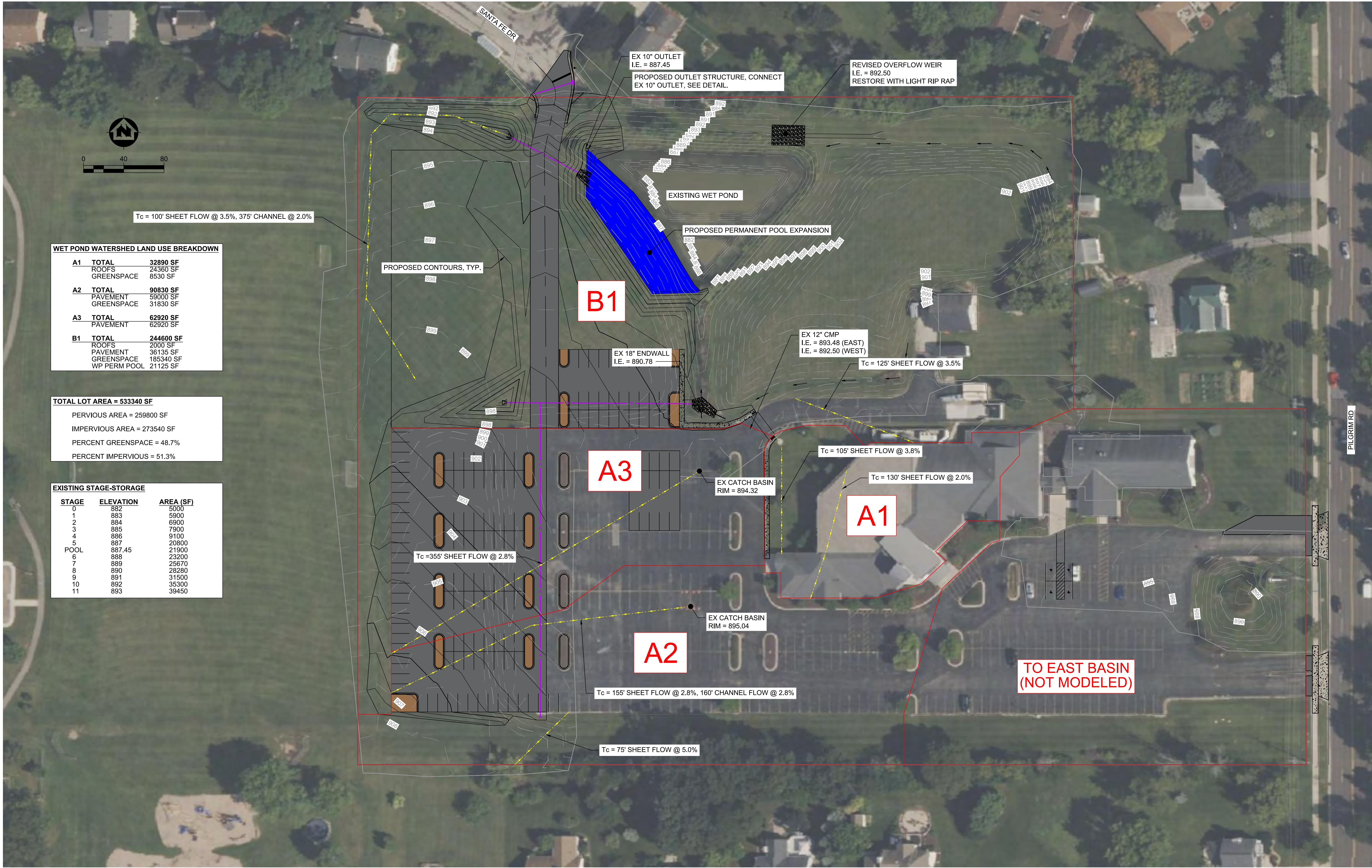


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GERMANTOWN, WASHINGTON COUNTY, WI

STORMWATER EXHIBIT - EXISTING

PROJECT NO.	20426215
SHEET	EX1



WET POND WATERSHED LAND USE BREAKDOWN			
A1	TOTAL	32890 SF	
	ROOFS	24360 SF	
	GREENSPACE	8530 SF	
A2	TOTAL	90830 SF	
	PAVEMENT	59000 SF	
	GREENSPACE	31830 SF	
A3	TOTAL	62920 SF	
	PAVEMENT	62920 SF	
B1	TOTAL	244600 SF	
	ROOFS	2000 SF	
	PAVEMENT	36135 SF	
	GREENSPACE	185340 SF	
	WP PERM POOL	21125 SF	

TOTAL LOT AREA = 533340 SF	
PERVIOUS AREA = 259800 SF	
IMPERVIOUS AREA = 273540 SF	
PERCENT GREENSPACE = 48.7%	
PERCENT IMPERVIOUS = 51.3%	

EXISTING STAGE-STORAGE		
STAGE	ELEVATION	AREA (SF)
0	882	5000
1	883	5900
2	884	6900
3	885	7900
4	886	9100
5	887	20800
POOL	887.45	21900
6	888	23200
7	889	25670
8	890	28280
9	891	31500
10	892	35300
11	893	39450

PROJECT DATE:	DRAWN BY:	NO.	DATE	REVISION	BY
08-14-2024	KEF	-	-	-	-
	DESIGNED BY:	KEF	-	-	-
	CHECKED BY:	Init	-	-	-
PLOT DATE: 8/15/2024 12:12 PM, G:\20\20426\20426215\04_BIM_CADD_Shared\03_Model_Based Files\20426215 Stormwater.dwg					



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STORMWATER EXHIBIT - PROPOSED

PROJECT NO. 20426215
SHEET EX2

MEMO

August 23, 2024

Appendix B – Supplemental Site Maps



CrossWay Church - SWDV Map



Legend

- Wetland Indicators
- Lake Class Areas
- Riverine/ditch Class Areas
- Wetland Class Areas
- Wetland Class Points
 - Dammed pond
 - Excavated pond
 - Filled/draind wetland
 - Wetland too small to delineate
 - Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Lake Class Areas
- Riverine/ditch Class Areas
- Wetland Class Areas
- Wetland Class Points
 - Dammed pond
 - Excavated pond
 - Filled/draind wetland
 - Wetland too small to delineate
 - Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Identifications and Confirmations
- Groundwater Protection Areas
- NRCS Wetspots
- NRCS Wisconsin Soils
 - Soil Mapping Unit
 - Water
- Municipality
- State Boundaries

0.1 0 0.06 0.1 Miles

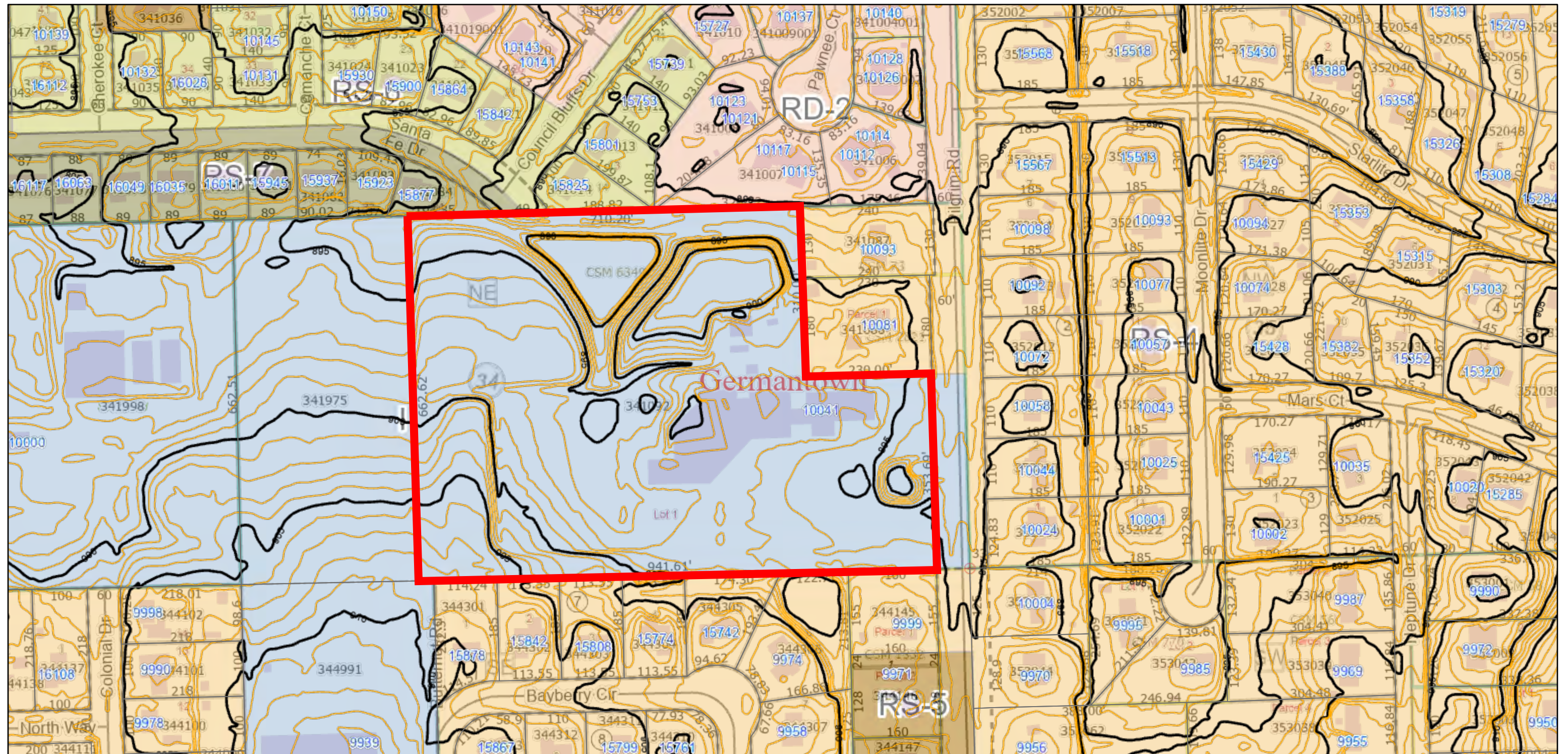
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1: 3,960

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Notes

CROSSWAY CHURCH - SUPPLEMENTAL SITE PLAN (WASHINGTON COUNTY GIS)



5/30/2024, 10:06:25 AM

 Current Parcel
 Address Point

1' Contours

— <all other values>

— Index

index

Intermediate

Urbanized Area 20

Germantown Zoning

RS-4 Single-Family Residential

PS 5 Single Family Residential

RS 3 Single Family Residential

RS-0 Single-Family Residential

RS-7 Single-Family Residential

RD-2 One-Family Residential

0 Institutional

Lot Number

CONFIDENTIAL

Certified Survey Nuff

Condominium Nant

Subdivision Name

Leader Lines

Parcel Taxkey & Acreage

PLSS Boundary

PL SS Section

PL 99-504

11

PL 1

Flat

☐ Certified Survey

 Condominium

Right-of-Way

☐ M...

Local Road Labels

— 1 10 1

Local Road

PLSS Mon

Landhook

Washington County GIS, Washington County

Washington County GIS

Washington County GIS | Washington County | Southeast Wisconsin Regional Planning Commission | Calvin Lawrence, Dennis Weise, Nina Rihn | Washington County, US Census Bureau | Page 48 of 236

MEMO

August 23, 2024

Appendix C – Existing HydroCAD Model



WET POND WATERSHED LAND USE BREAKDOWN

A1	TOTAL	32890 SF
	ROOFS	24360 SF
	GREENSPACE	8530 SF
A2	TOTAL	73290 SF
	PAVEMENT	48200 SF
	GREENSPACE	25090 SF
A3	TOTAL	37200 SF
	PAVEMENT	37200 SF
B1	TOTAL	287860 SF
	ROOFS	2000 SF
	PAVEMENT	11135 SF
	GREENSPACE	258600 SF
	WP PERM POOL	16125 SF

TOTAL LOT AREA = 533340 SF	
PERVIOUS AREA = 329770 SF	
IMPERVIOUS AREA = 203570 SF	
PERCENT GREENSPACE = 61.8%	
PERCENT IMPERVIOUS = 38.2%	

EXISTING STAGE-STORAGE

STAGE	ELEVATION	AREA (SF)
0	882	5000
1	883	5900
2	884	6900
3	885	7900
4	886	9100
5	887	15150
POOL	887.45	16180
6	888	17500
7	889	19700
8	890	22200
9	891	25500
10	892	29800
11	893	34300

PROJECT DATE:	DRAWN BY:	NO.	DATE	REVISION	BY
08-14-2024	KEF	-	-	-	-
	DESIGNED BY:	KEF	-	-	-
	CHECKED BY:	Init	-	-	-
PLOT DATE: 8/15/2024 12:12 PM, G:\20\20426\20426215\04_BIM_CADD_Shared\03_Model_Based Files\20426215 Stormwater.dwg					

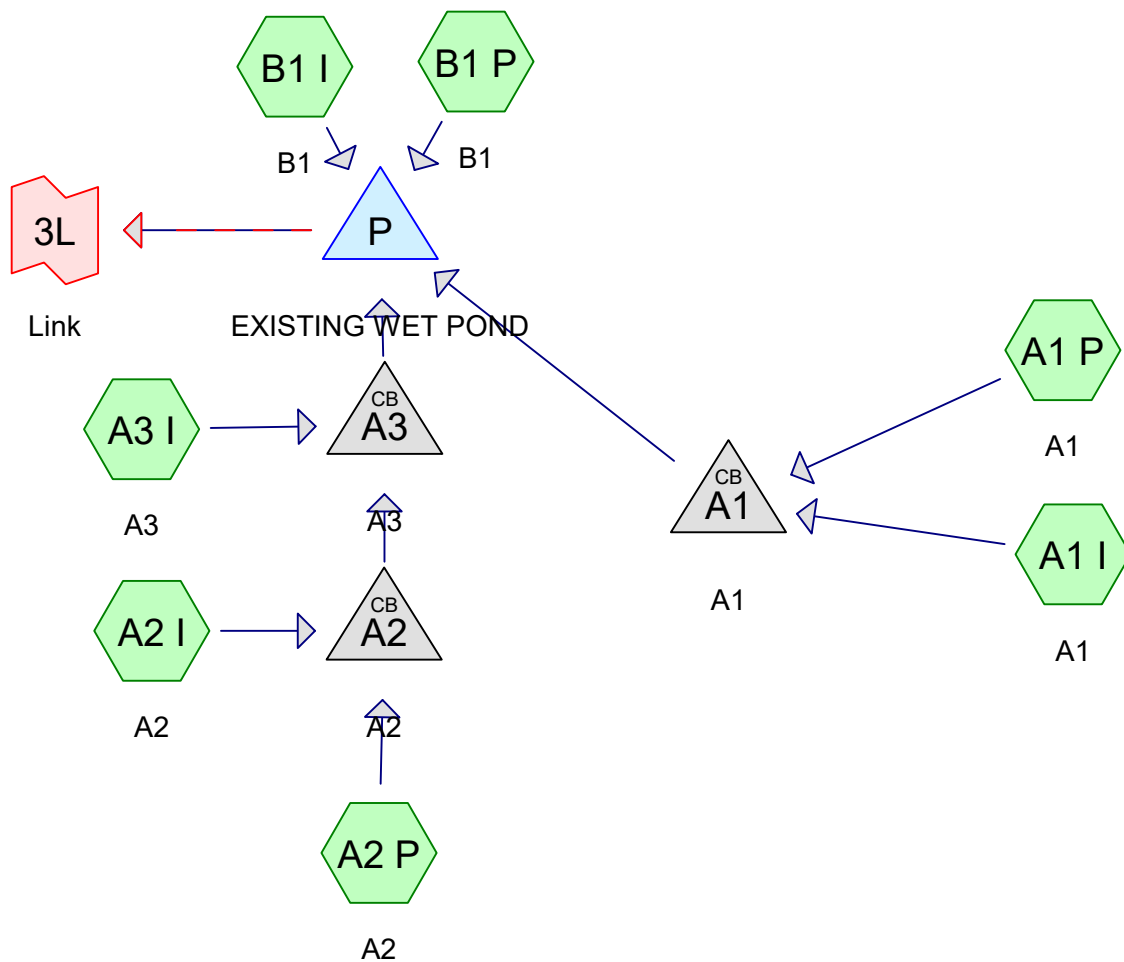


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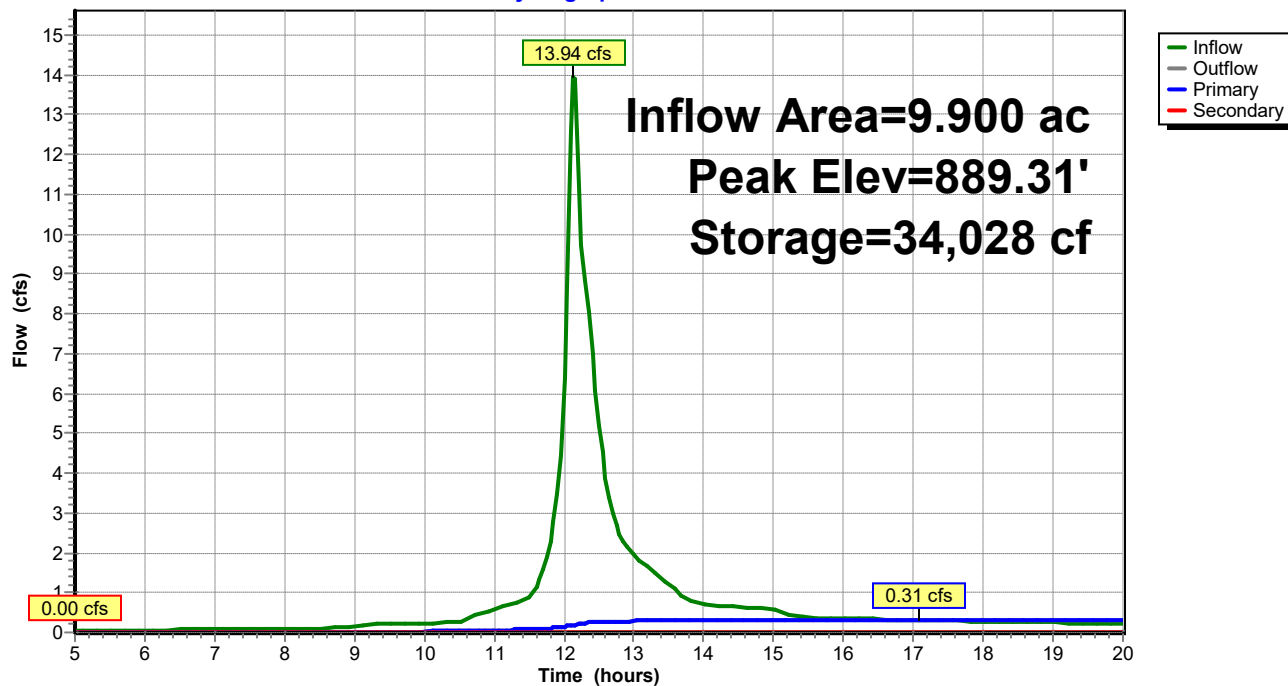
STORMWATER EXHIBIT - EXISTING

PROJECT NO. 20426215
SHEET EX1

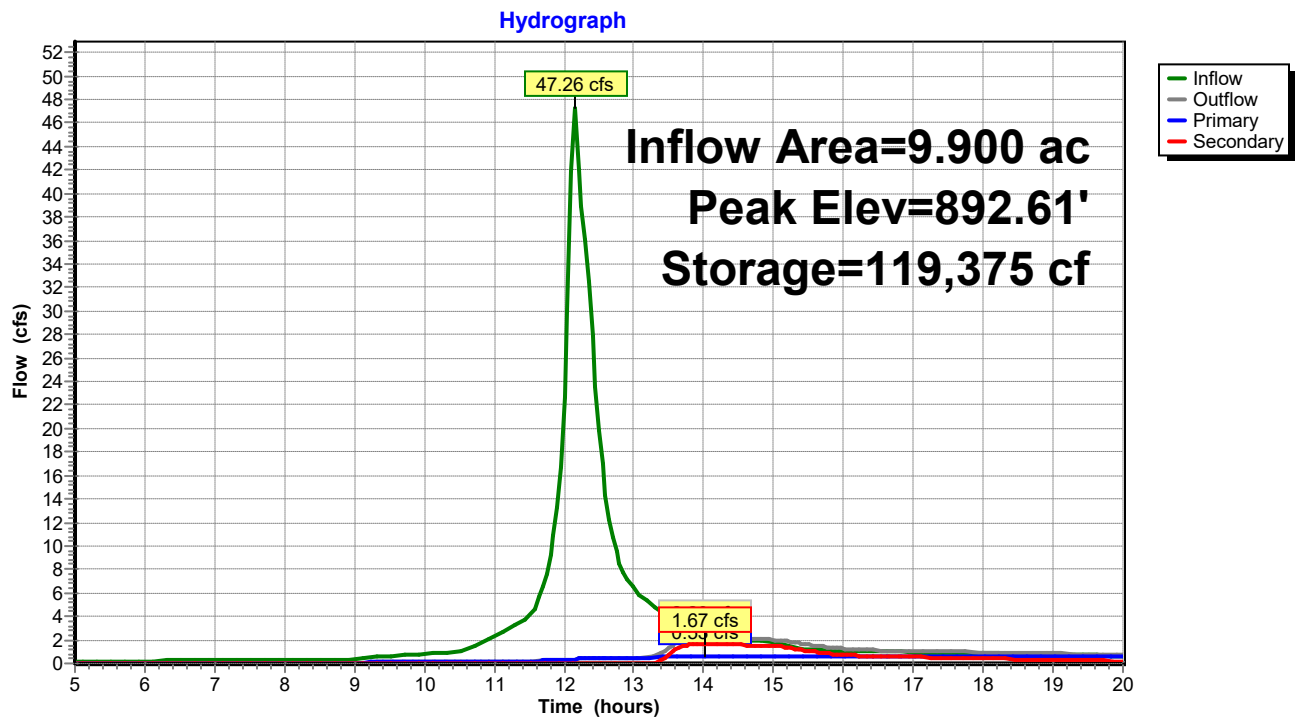


Pond P: EXISTING WET POND

Hydrograph



Pond P: EXISTING WET POND



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=1.86 cfs 0.096 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>0.49"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=0.17 cfs 0.008 af

Subcatchment A2 I: A2 Runoff Area=48,200 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=235' Slope=0.0150 '/' Tc=6.0 min CN=98 Runoff=3.67 cfs 0.189 af

Subcatchment A2 P: A2 Runoff Area=25,090 sf 0.00% Impervious Runoff Depth>0.49"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=0.51 cfs 0.024 af

Subcatchment A3 I: A3 Runoff Area=37,200 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=235' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=2.83 cfs 0.146 af

Subcatchment B1 I: B1 Runoff Area=13,135 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=1.00 cfs 0.052 af

Subcatchment B1 P: B1 Runoff Area=274,725 sf 5.89% Impervious Runoff Depth>0.57"
 Flow Length=624' Tc=19.0 min CN=76 Runoff=3.98 cfs 0.298 af

Pond A1: A1 Peak Elev=894.39' Inflow=2.02 cfs 0.104 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=2.02 cfs 0.104 af

Pond A2: A2 Peak Elev=893.08' Inflow=4.16 cfs 0.213 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=4.16 cfs 0.213 af

Pond A3: A3 Peak Elev=892.68' Inflow=7.00 cfs 0.359 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=7.00 cfs 0.359 af

Pond P: EXISTING WET POND Peak Elev=888.99' Storage=27,750 cf Inflow=11.65 cfs 0.812 af
 Primary=0.28 cfs 0.190 af Secondary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.190 af

Link 3L: Link Inflow=0.28 cfs 0.190 af
 Primary=0.28 cfs 0.190 af

Total Runoff Area = 9.900 ac Runoff Volume = 0.812 af Average Runoff Depth = 0.98"
67.75% Pervious = 6.707 ac 32.25% Impervious = 3.193 ac

Summary for Subcatchment A1 I: A1

Runoff = 1.86 cfs @ 12.13 hrs, Volume= 0.096 af, Depth> 2.05"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 0.17 cfs @ 12.15 hrs, Volume= 0.008 af, Depth> 0.49"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 3.67 cfs @ 12.13 hrs, Volume= 0.189 af, Depth> 2.05"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 48,200	98	Pavement
48,200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	235	0.0150	1.16		Sheet Flow, n= 0.013 P2= 2.65"
3.4	235	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 0.51 cfs @ 12.15 hrs, Volume= 0.024 af, Depth> 0.49"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 25,090	74	LAWN AREA
25,090		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 2.83 cfs @ 12.13 hrs, Volume= 0.146 af, Depth> 2.05"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 37,200	98	Pavement
37,200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	235	0.0280	1.49		Sheet Flow, n= 0.013 P2= 2.65"
2.6	235	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 1.00 cfs @ 12.13 hrs, Volume= 0.052 af, Depth> 2.05"
Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
	13,135	98	Weighted Average
	13,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 3.98 cfs @ 12.31 hrs, Volume= 0.298 af, Depth> 0.57"
Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

	Area (sf)	CN	Description
	258,545	74	>75% Grass cover, Good, HSG C
*	16,180	100	Ex Wet Pond
	274,725	76	Weighted Average
	258,545		94.11% Pervious Area
	16,180		5.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	214	0.0350	0.23		Sheet Flow, Soccer field Grass: Short n= 0.150 P2= 2.65"
3.2	410	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale Grassed Waterway Kv= 15.0 fps
19.0	624	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 1.65" for 1-Year event
Inflow = 2.02 cfs @ 12.13 hrs, Volume= 0.104 af
Outflow = 2.02 cfs @ 12.13 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min
Primary = 2.02 cfs @ 12.13 hrs, Volume= 0.104 af
Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 894.39' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 '/' Cc= 0.900

n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.93 cfs @ 12.13 hrs HW=894.37' (Free Discharge)

↑**1=Culvert** (Inlet Controls 1.93 cfs @ 2.98 fps)

Summary for Pond A2: A2

Inflow Area = 1.683 ac, 65.77% Impervious, Inflow Depth > 1.52" for 1-Year event
 Inflow = 4.16 cfs @ 12.13 hrs, Volume= 0.213 af
 Outflow = 4.16 cfs @ 12.13 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.16 cfs @ 12.13 hrs, Volume= 0.213 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.08' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.98 cfs @ 12.13 hrs HW=893.04' (Free Discharge)

↑**1=Culvert** (Barrel Controls 3.98 cfs @ 4.35 fps)

Summary for Pond A3: A3

Inflow Area = 2.537 ac, 77.29% Impervious, Inflow Depth > 1.70" for 1-Year event
 Inflow = 7.00 cfs @ 12.13 hrs, Volume= 0.359 af
 Outflow = 7.00 cfs @ 12.13 hrs, Volume= 0.359 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.00 cfs @ 12.13 hrs, Volume= 0.359 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 892.68' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.69 cfs @ 12.13 hrs HW=892.64' (Free Discharge)

↑**1=Culvert** (Barrel Controls 6.69 cfs @ 4.92 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 32.25% Impervious, Inflow Depth > 0.98" for 1-Year event
 Inflow = 11.65 cfs @ 12.14 hrs, Volume= 0.812 af
 Outflow = 0.28 cfs @ 16.41 hrs, Volume= 0.190 af, Atten= 98%, Lag= 256.3 min
 Primary = 0.28 cfs @ 16.41 hrs, Volume= 0.190 af
 Routed to Link 3L : Link
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 888.99' @ 16.41 hrs Surf.Area= 19,687 sf Storage= 27,750 cf

Plug-Flow detention time= 293.5 min calculated for 0.190 af (23% of inflow)
 Center-of-Mass det. time= 177.4 min (951.0 - 773.7)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	132,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	16,180	0	0
888.00	17,500	9,262	9,262
889.00	19,700	18,600	27,862
890.00	22,200	20,950	48,812
891.00	25,500	23,850	72,662
892.00	29,800	27,650	100,312
893.00	34,300	32,050	132,362

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 ' S= 0.0093 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.28 cfs @ 16.41 hrs HW=888.99' (Free Discharge)

↑ **1=Culvert** (Passes 0.28 cfs of 2.45 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 5.74 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=887.45' (Free Discharge)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 32.25% Impervious, Inflow Depth > 0.23" for 1-Year event
 Inflow = 0.28 cfs @ 16.41 hrs, Volume= 0.190 af
 Primary = 0.28 cfs @ 16.41 hrs, Volume= 0.190 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=2.10 cfs 0.109 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>0.65"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=0.23 cfs 0.011 af

Subcatchment A2 I: A2 Runoff Area=48,200 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=235' Slope=0.0150 '/' Tc=6.0 min CN=98 Runoff=4.16 cfs 0.216 af

Subcatchment A2 P: A2 Runoff Area=25,090 sf 0.00% Impervious Runoff Depth>0.65"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=0.69 cfs 0.031 af

Subcatchment A3 I: A3 Runoff Area=37,200 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=235' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=3.21 cfs 0.166 af

Subcatchment B1 I: B1 Runoff Area=13,135 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=1.13 cfs 0.059 af

Subcatchment B1 P: B1 Runoff Area=274,725 sf 5.89% Impervious Runoff Depth>0.74"
 Flow Length=624' Tc=19.0 min CN=76 Runoff=5.34 cfs 0.389 af

Pond A1: A1 Peak Elev=894.48' Inflow=2.33 cfs 0.120 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=2.33 cfs 0.120 af

Pond A2: A2 Peak Elev=893.23' Inflow=4.83 cfs 0.247 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=4.83 cfs 0.247 af

Pond A3: A3 Peak Elev=892.86' Inflow=8.04 cfs 0.413 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=8.04 cfs 0.413 af

Pond P: EXISTING WET POND Peak Elev=889.31' Storage=34,028 cf Inflow=13.94 cfs 0.980 af
 Primary=0.31 cfs 0.211 af Secondary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.211 af

Link 3L: Link Inflow=0.31 cfs 0.211 af
 Primary=0.31 cfs 0.211 af

Total Runoff Area = 9.900 ac Runoff Volume = 0.980 af Average Runoff Depth = 1.19"
67.75% Pervious = 6.707 ac 32.25% Impervious = 3.193 ac

Summary for Subcatchment A1 I: A1

Runoff = 2.10 cfs @ 12.13 hrs, Volume= 0.109 af, Depth> 2.34"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 0.23 cfs @ 12.14 hrs, Volume= 0.011 af, Depth> 0.65"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 4.16 cfs @ 12.13 hrs, Volume= 0.216 af, Depth> 2.34"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 48,200	98	Pavement
48,200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	235	0.0150	1.16		Sheet Flow, n= 0.013 P2= 2.65"
3.4	235	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 0.69 cfs @ 12.14 hrs, Volume= 0.031 af, Depth> 0.65"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 25,090	74	LAWN AREA
25,090		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 3.21 cfs @ 12.13 hrs, Volume= 0.166 af, Depth> 2.34"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 37,200	98	Pavement
37,200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	235	0.0280	1.49		Sheet Flow, n= 0.013 P2= 2.65"
2.6	235	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 1.13 cfs @ 12.13 hrs, Volume= 0.059 af, Depth> 2.34"
Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.65"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
	13,135	98	Weighted Average
	13,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 5.34 cfs @ 12.31 hrs, Volume= 0.389 af, Depth> 0.74"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

	Area (sf)	CN	Description
	258,545	74	>75% Grass cover, Good, HSG C
*	16,180	100	Ex Wet Pond
	274,725	76	Weighted Average
	258,545		94.11% Pervious Area
	16,180		5.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	214	0.0350	0.23		Sheet Flow, Soccer field Grass: Short n= 0.150 P2= 2.65"
3.2	410	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale Grassed Waterway Kv= 15.0 fps
19.0	624	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 1.90" for 2-Year event
 Inflow = 2.33 cfs @ 12.13 hrs, Volume= 0.120 af
 Outflow = 2.33 cfs @ 12.13 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.33 cfs @ 12.13 hrs, Volume= 0.120 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 894.48' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 '/' Cc= 0.900

n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=2.23 cfs @ 12.13 hrs HW=894.45' (Free Discharge)

↑1=Culvert (Inlet Controls 2.23 cfs @ 3.14 fps)

Summary for Pond A2: A2

Inflow Area = 1.683 ac, 65.77% Impervious, Inflow Depth > 1.76" for 2-Year event
 Inflow = 4.83 cfs @ 12.13 hrs, Volume= 0.247 af
 Outflow = 4.83 cfs @ 12.13 hrs, Volume= 0.247 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.83 cfs @ 12.13 hrs, Volume= 0.247 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.23' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.62 cfs @ 12.13 hrs HW=893.19' (Free Discharge)

↑1=Culvert (Barrel Controls 4.62 cfs @ 4.47 fps)

Summary for Pond A3: A3

Inflow Area = 2.537 ac, 77.29% Impervious, Inflow Depth > 1.96" for 2-Year event
 Inflow = 8.04 cfs @ 12.13 hrs, Volume= 0.413 af
 Outflow = 8.04 cfs @ 12.13 hrs, Volume= 0.413 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.04 cfs @ 12.13 hrs, Volume= 0.413 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 892.86' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.69 cfs @ 12.13 hrs HW=892.80' (Free Discharge)

↑1=Culvert (Barrel Controls 7.69 cfs @ 5.07 fps)

Summary for Pond P: EXISTING WET POND

20426215 Existing 8.14.2024

MSE 24-hr 3 2-Year Rainfall=2.65"

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Inflow Area = 9.900 ac, 32.25% Impervious, Inflow Depth > 1.19" for 2-Year event
 Inflow = 13.94 cfs @ 12.14 hrs, Volume= 0.980 af
 Outflow = 0.31 cfs @ 17.09 hrs, Volume= 0.211 af, Atten= 98%, Lag= 296.9 min
 Primary = 0.31 cfs @ 17.09 hrs, Volume= 0.211 af
 Routed to Link 3L : Link
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 889.31' @ 17.09 hrs Surf.Area= 20,468 sf Storage= 34,028 cf

Plug-Flow detention time= 295.9 min calculated for 0.211 af (21% of inflow)
 Center-of-Mass det. time= 176.0 min (949.2 - 773.2)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	132,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	16,180	0	0
888.00	17,500	9,262	9,262
889.00	19,700	18,600	27,862
890.00	22,200	20,950	48,812
891.00	25,500	23,850	72,662
892.00	29,800	27,650	100,312
893.00	34,300	32,050	132,362

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 ' S= 0.0093 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.31 cfs @ 17.09 hrs HW=889.31' (Free Discharge)

↑ **1=Culvert** (Passes 0.31 cfs of 2.71 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.31 cfs @ 6.34 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=887.45' (Free Discharge)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 32.25% Impervious, Inflow Depth > 0.26" for 2-Year event
 Inflow = 0.31 cfs @ 17.09 hrs, Volume= 0.211 af
 Primary = 0.31 cfs @ 17.09 hrs, Volume= 0.211 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=3.05 cfs 0.161 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>1.39"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=0.51 cfs 0.023 af

Subcatchment A2 I: A2 Runoff Area=48,200 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=235' Slope=0.0150 '/' Tc=6.0 min CN=98 Runoff=6.04 cfs 0.318 af

Subcatchment A2 P: A2 Runoff Area=25,090 sf 0.00% Impervious Runoff Depth>1.39"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=1.51 cfs 0.067 af

Subcatchment A3 I: A3 Runoff Area=37,200 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=235' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=4.67 cfs 0.246 af

Subcatchment B1 I: B1 Runoff Area=13,135 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=1.65 cfs 0.087 af

Subcatchment B1 P: B1 Runoff Area=274,725 sf 5.89% Impervious Runoff Depth>1.52"
 Flow Length=624' Tc=19.0 min CN=76 Runoff=11.43 cfs 0.798 af

Pond A1: A1 Peak Elev=894.98' Inflow=3.57 cfs 0.184 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=3.57 cfs 0.184 af

Pond A2: A2 Peak Elev=894.64' Inflow=7.55 cfs 0.385 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=7.55 cfs 0.385 af

Pond A3: A3 Peak Elev=893.97' Inflow=12.21 cfs 0.631 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=12.21 cfs 0.631 af

Pond P: EXISTING WET POND Peak Elev=890.56' Storage=61,865 cf Inflow=23.62 cfs 1.700 af
 Primary=0.41 cfs 0.283 af Secondary=0.00 cfs 0.000 af Outflow=0.41 cfs 0.283 af

Link 3L: Link Inflow=0.41 cfs 0.283 af
 Primary=0.41 cfs 0.283 af

Total Runoff Area = 9.900 ac Runoff Volume = 1.700 af Average Runoff Depth = 2.06"
67.75% Pervious = 6.707 ac 32.25% Impervious = 3.193 ac

Summary for Subcatchment A1 I: A1

Runoff = 3.05 cfs @ 12.13 hrs, Volume= 0.161 af, Depth> 3.45"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 0.51 cfs @ 12.14 hrs, Volume= 0.023 af, Depth> 1.39"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 6.04 cfs @ 12.13 hrs, Volume= 0.318 af, Depth> 3.45"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 48,200	98	Pavement
48,200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	235	0.0150	1.16		Sheet Flow, n= 0.013 P2= 2.65"
3.4	235	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 1.51 cfs @ 12.14 hrs, Volume= 0.067 af, Depth> 1.39"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 25,090	74	LAWN AREA
25,090		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 4.67 cfs @ 12.13 hrs, Volume= 0.246 af, Depth> 3.45"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 37,200	98	Pavement
37,200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	235	0.0280	1.49		Sheet Flow, n= 0.013 P2= 2.65"
2.6	235	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 1.65 cfs @ 12.13 hrs, Volume= 0.087 af, Depth> 3.45"
Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.82"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
	13,135	98	Weighted Average
	13,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 11.43 cfs @ 12.30 hrs, Volume= 0.798 af, Depth> 1.52"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

	Area (sf)	CN	Description
	258,545	74	>75% Grass cover, Good, HSG C
*	16,180	100	Ex Wet Pond
	274,725	76	Weighted Average
	258,545		94.11% Pervious Area
	16,180		5.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	214	0.0350	0.23		Sheet Flow, Soccer field Grass: Short n= 0.150 P2= 2.65"
3.2	410	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale Grassed Waterway Kv= 15.0 fps
19.0	624	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 2.92" for 10-Year event
 Inflow = 3.57 cfs @ 12.13 hrs, Volume= 0.184 af
 Outflow = 3.57 cfs @ 12.13 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.57 cfs @ 12.13 hrs, Volume= 0.184 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 894.98' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 '/' Cc= 0.900

n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=3.41 cfs @ 12.13 hrs HW=894.91' (Free Discharge)

↑**1=Culvert** (Inlet Controls 3.41 cfs @ 4.34 fps)

Summary for Pond A2: A2

Inflow Area = 1.683 ac, 65.77% Impervious, Inflow Depth > 2.75" for 10-Year event
 Inflow = 7.55 cfs @ 12.13 hrs, Volume= 0.385 af
 Outflow = 7.55 cfs @ 12.13 hrs, Volume= 0.385 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.55 cfs @ 12.13 hrs, Volume= 0.385 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 894.64' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=7.21 cfs @ 12.13 hrs HW=894.46' (Free Discharge)

↑**1=Culvert** (Barrel Controls 7.21 cfs @ 5.88 fps)

Summary for Pond A3: A3

Inflow Area = 2.537 ac, 77.29% Impervious, Inflow Depth > 2.98" for 10-Year event
 Inflow = 12.21 cfs @ 12.13 hrs, Volume= 0.631 af
 Outflow = 12.21 cfs @ 12.13 hrs, Volume= 0.631 af, Atten= 0%, Lag= 0.0 min
 Primary = 12.21 cfs @ 12.13 hrs, Volume= 0.631 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.97' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=11.67 cfs @ 12.13 hrs HW=893.83' (Free Discharge)

↑**1=Culvert** (Inlet Controls 11.67 cfs @ 6.60 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 32.25% Impervious, Inflow Depth > 2.06" for 10-Year event
 Inflow = 23.62 cfs @ 12.15 hrs, Volume= 1.700 af
 Outflow = 0.41 cfs @ 18.80 hrs, Volume= 0.283 af, Atten= 98%, Lag= 399.2 min
 Primary = 0.41 cfs @ 18.80 hrs, Volume= 0.283 af
 Routed to Link 3L : Link
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 890.56' @ 18.80 hrs Surf.Area= 24,062 sf Storage= 61,865 cf

Plug-Flow detention time= 306.7 min calculated for 0.283 af (17% of inflow)
 Center-of-Mass det. time= 171.4 min (942.4 - 771.0)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	132,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	16,180	0	0
888.00	17,500	9,262	9,262
889.00	19,700	18,600	27,862
890.00	22,200	20,950	48,812
891.00	25,500	23,850	72,662
892.00	29,800	27,650	100,312
893.00	34,300	32,050	132,362

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 ' S= 0.0093 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.41 cfs @ 18.80 hrs HW=890.56' (Free Discharge)

↑ **1=Culvert** (Passes 0.41 cfs of 3.56 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.41 cfs @ 8.32 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=887.45' (Free Discharge)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 32.25% Impervious, Inflow Depth > 0.34" for 10-Year event
 Inflow = 0.41 cfs @ 18.80 hrs, Volume= 0.283 af
 Primary = 0.41 cfs @ 18.80 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=5.15 cfs 0.275 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>3.39"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=1.23 cfs 0.055 af

Subcatchment A2 I: A2 Runoff Area=48,200 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=235' Slope=0.0150 '/' Tc=6.0 min CN=98 Runoff=10.20 cfs 0.545 af

Subcatchment A2 P: A2 Runoff Area=25,090 sf 0.00% Impervious Runoff Depth>3.39"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=3.63 cfs 0.163 af

Subcatchment A3 I: A3 Runoff Area=37,200 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=235' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=7.87 cfs 0.420 af

Subcatchment B1 I: B1 Runoff Area=13,135 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=2.78 cfs 0.148 af

Subcatchment B1 P: B1 Runoff Area=274,725 sf 5.89% Impervious Runoff Depth>3.57"
 Flow Length=624' Tc=19.0 min CN=76 Runoff=26.92 cfs 1.879 af

Pond A1: A1 Peak Elev=896.91' Inflow=6.38 cfs 0.331 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=6.38 cfs 0.331 af

Pond A2: A2 Peak Elev=899.73' Inflow=13.82 cfs 0.707 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=13.82 cfs 0.707 af

Pond A3: A3 Peak Elev=898.35' Inflow=21.69 cfs 1.128 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=21.69 cfs 1.128 af

Pond P: EXISTING WET POND Peak Elev=892.61' Storage=119,375 cf Inflow=47.26 cfs 3.485 af
 Primary=0.53 cfs 0.386 af Secondary=1.67 cfs 0.428 af Outflow=2.20 cfs 0.814 af

Link 3L: Link Inflow=2.20 cfs 0.814 af
 Primary=2.20 cfs 0.814 af

Total Runoff Area = 9.900 ac Runoff Volume = 3.485 af Average Runoff Depth = 4.22"
67.75% Pervious = 6.707 ac 32.25% Impervious = 3.193 ac

Summary for Subcatchment A1 I: A1

Runoff = 5.15 cfs @ 12.13 hrs, Volume= 0.275 af, Depth> 5.91"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 1.23 cfs @ 12.13 hrs, Volume= 0.055 af, Depth> 3.39"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 10.20 cfs @ 12.13 hrs, Volume= 0.545 af, Depth> 5.91"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 48,200	98	Pavement
48,200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	235	0.0150	1.16		Sheet Flow, n= 0.013 P2= 2.65"
3.4	235	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 3.63 cfs @ 12.13 hrs, Volume= 0.163 af, Depth> 3.39"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 25,090	74	LAWN AREA
25,090		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 7.87 cfs @ 12.13 hrs, Volume= 0.420 af, Depth> 5.91"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 37,200	98	Pavement
37,200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	235	0.0280	1.49		Sheet Flow, n= 0.013 P2= 2.65"
2.6	235	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 2.78 cfs @ 12.13 hrs, Volume= 0.148 af, Depth> 5.91"
Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
	13,135	98	Weighted Average
	13,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 26.92 cfs @ 12.29 hrs, Volume= 1.879 af, Depth> 3.57"
Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

	Area (sf)	CN	Description
	258,545	74	>75% Grass cover, Good, HSG C
*	16,180	100	Ex Wet Pond
	274,725	76	Weighted Average
	258,545		94.11% Pervious Area
	16,180		5.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	214	0.0350	0.23		Sheet Flow, Soccer field Grass: Short n= 0.150 P2= 2.65"
3.2	410	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale Grassed Waterway Kv= 15.0 fps
19.0	624	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 5.25" for 100-Year event
Inflow = 6.38 cfs @ 12.13 hrs, Volume= 0.331 af
Outflow = 6.38 cfs @ 12.13 hrs, Volume= 0.331 af, Atten= 0%, Lag= 0.0 min
Primary = 6.38 cfs @ 12.13 hrs, Volume= 0.331 af
Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 896.91' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 '/' Cc= 0.900

n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=6.10 cfs @ 12.13 hrs HW=896.70' (Free Discharge)

↑**1=Culvert** (Inlet Controls 6.10 cfs @ 7.77 fps)

Summary for Pond A2: A2

Inflow Area = 1.683 ac, 65.77% Impervious, Inflow Depth > 5.04" for 100-Year event
 Inflow = 13.82 cfs @ 12.13 hrs, Volume= 0.707 af
 Outflow = 13.82 cfs @ 12.13 hrs, Volume= 0.707 af, Atten= 0%, Lag= 0.0 min
 Primary = 13.82 cfs @ 12.13 hrs, Volume= 0.707 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 899.73' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=13.20 cfs @ 12.13 hrs HW=899.20' (Free Discharge)

↑**1=Culvert** (Barrel Controls 13.20 cfs @ 10.76 fps)

Summary for Pond A3: A3

Inflow Area = 2.537 ac, 77.29% Impervious, Inflow Depth > 5.34" for 100-Year event
 Inflow = 21.69 cfs @ 12.13 hrs, Volume= 1.128 af
 Outflow = 21.69 cfs @ 12.13 hrs, Volume= 1.128 af, Atten= 0%, Lag= 0.0 min
 Primary = 21.69 cfs @ 12.13 hrs, Volume= 1.128 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 898.35' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=20.73 cfs @ 12.13 hrs HW=897.88' (Free Discharge)

↑**1=Culvert** (Inlet Controls 20.73 cfs @ 11.73 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 32.25% Impervious, Inflow Depth > 4.22" for 100-Year event
 Inflow = 47.26 cfs @ 12.15 hrs, Volume= 3.485 af
 Outflow = 2.20 cfs @ 14.01 hrs, Volume= 0.814 af, Atten= 95%, Lag= 111.7 min
 Primary = 0.53 cfs @ 14.01 hrs, Volume= 0.386 af
 Routed to Link 3L : Link
 Secondary = 1.67 cfs @ 14.01 hrs, Volume= 0.428 af
 Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 892.61' @ 14.01 hrs Surf.Area= 32,552 sf Storage= 119,375 cf

Plug-Flow detention time= 274.4 min calculated for 0.813 af (23% of inflow)
 Center-of-Mass det. time= 165.8 min (932.2 - 766.4)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	132,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	16,180	0	0
888.00	17,500	9,262	9,262
889.00	19,700	18,600	27,862
890.00	22,200	20,950	48,812
891.00	25,500	23,850	72,662
892.00	29,800	27,650	100,312
893.00	34,300	32,050	132,362

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 ' S= 0.0093 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.53 cfs @ 14.01 hrs HW=892.61' (Free Discharge)

↑ **1=Culvert** (Passes 0.53 cfs of 4.63 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.53 cfs @ 10.81 fps)

Secondary OutFlow Max=1.67 cfs @ 14.01 hrs HW=892.61' (Free Discharge)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 1.67 cfs @ 0.83 fps)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 32.25% Impervious, Inflow Depth > 0.99" for 100-Year event
 Inflow = 2.20 cfs @ 14.01 hrs, Volume= 0.814 af
 Primary = 2.20 cfs @ 14.01 hrs, Volume= 0.814 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

HYDROCAD POND INPUT SCREENSHOTS

Existing Model Pond:

Edit Pond P - 20426215 Existing 8.14.2024

General | Storage | Outlets | Tailwater | Advanced | Notes

#	Invert (feet)	Description	Routing
1	887.45	Culvert	Primary
2	887.45	Orifice/Grate	Device 1
3	892.50	Broad-Crested Rectangular Weir	Secondary
4			
5			
6			
7			
8			
9			
10			
11			

Tip: For standpipes and other compound outlets, enter the final outlet device FIRST. Click here for details.

Edit Outlet...

Pond P Custom Stage Data Storage

Description: Custom Stage Data

Embed Inside: Nothing

Stage Type:

- ☒ Surface Area
- ☐ Incremental Storage
- ☐ Cumulative Storage

Storage Multiplier: 1.00

Void: 100.0 (%)

Line	Elevation (feet)	Surface-Area (sq-ft)
1	887.45	16,180
2	888.00	17,500
3	889.00	19,700
4	890.00	22,200
5	891.00	25,500
6	892.00	29,800
7	893.00	34,300
8		

Shape: Prismatic

☐ Stage Voids ☐ Use Large units

☒ Recalculate storage at any elevation

Pond P Orifice/Grate Outlet

Description: Orifice/Grate

Routing: Device 1

Invert Elevation: 887.45 (feet)

Discharge Multiplier: 1.00

Flow Scaling: ☐ Proportional

Rows: 1

Opening in:

- ☐ Horizontal Plane = 0°
- ☒ Vertical Plane = 90°
- ☐ Custom Angle: 0-90°

Angle: (degrees)

Discharge Coefficient: 0.600

☒ Use weir flow at low head ☐ Use orifice flow at high head

Orifice (each opening):

- Diameter: 3.0 (inches)
- Width: (inches)
- Height: (inches)

Grate (weir crest):

- Blankets: (inches)
- Width: (inches)
- Height: (inches)

OK Cancel Help Update Sketch

Pond P Culvert Outlet

Description: Culvert

Routing: Primary

Inlet Invert: 887.45 (feet)

Discharge Multiplier: 1.00

Outlet Invert: 886.75 (feet)

Shape: Round

Area = 0.55 sf Perimeter = 2.6'

Length: 75.0 (feet)

Diameter: 10.0 (inches)

Slope: 0.0093 (ft/ft)

Manning's Number: 0.013

Inside Fill: (inches)

Pipe Size Lookup: Select Pipe size

Entrance: ☐ K_e: 0.500

Contraction Coefficient: 0.900

OK Cancel Help

Pond P Broad-Crested Rectangular Weir Outlet

Description: Broad-Crested Rectangular Weir

Routing: Secondary

Invert Elevation: 892.50 (feet)

Crest Length: 18.0 (feet)

Side-Z: (run/rise)

Crest Breadth: 10.0 (feet)

Crest Profile ID#: (none)

Discharge Multiplier: 1.00

Line	Head (feet)	C (English)
1	0.20	2.49
2	0.40	2.56
3	0.60	2.70
4	0.80	2.69
5	1.00	2.68
6	1.20	2.69
7	1.40	2.67
8	1.60	2.64
9		
10		
11		
12		
13		
14		

OK Cancel Help

Proposed Model Pond:

Edit Pond P - 20426215 Proposed 8.14.2024

General | Storage | Outlets | Tailwater | Advanced | Notes |

#	Invert (feet)	Description	Routing
1	887.45	Culvert	Primary
2	887.45	Orifice/Grate	Device 1
3	892.00	Orifice/Grate	Device 1
4	892.50	Broad-Crested Rectangular Weir	Secondary
5			
6			
7			
8			
9			
10			
11			

Tip: For standpipes and other compound outlets, enter the final outlet device FIRST.
Click here for details.

[Edit Outlet...](#)

Pond P Custom Stage Data Storage

Description: Custom Stage Data

☐ Allow Evaporation

Embed Inside: Nothing

Storage Multiplier: 1.00

Voids: 100.0 (%)

Stage Type:

- ☒ Surface Area
- ☐ Incremental Storage
- ☐ Cumulative Storage

Line	Elevation (feet)	Surface-Area (sq-ft)
1	887.45	21,900
2	888.00	23,200
3	889.00	25,670
4	890.00	28,280
5	891.00	31,500
6	892.00	35,300
7	893.00	39,450
8		

Shape: Prismatic

☐ Stage Voids ☐ Use Large units

☒ Recalculate storage at any elevation

Pond P Orifice/Grate Outlet

Description: Orifice/Grate

Routing: Device 1

Invert Elevation: (feet) 887.45

Discharge Multiplier: 1.00

Rows: 1

Opening in:

- ☐ Horizontal Plane = 0°
- ☒ Vertical Plane = 90°
- ☐ Custom Angle: 0-90°

☒ Use weir flow at low head ☐ Set Grate dimensions

Orifice (each opening):

Diameter: (inches) 3.0

Width: (inches)

Height: (inches)

Grate (overall foot):

Diameter: (inches)

Width: (inches)

Height: (inches)

Discharge Coefficient: 0.600

OK Cancel Help

Pond P Culvert Outlet

Description: Culvert

Routing: Primary

Inlet Invert: (feet) 887.45

Discharge Multiplier: 1.00

Outlet Invert: (feet) 886.75

Shape: Round

Area = 0.55 of Perimeter = 2.6'

Length: (feet) 75.0

Diameter: (inches) 10.0

Slope: (ft/ft) 0.0093

Height: (inches)

Top Tread: (inches)

Bottom Radius: (inches)

Manning's Number: 0.013 [Lookup](#)

Inside Fill: (inches)

Pipe Size Lookup: Select Pipe size

Entrance: K_e: 0.500 Contraction Coefficient: 0.900

OK Cancel Help

Pond P Broad-Crested Rectangular Weir Outlet

Description: Broad-Crested Rectangular Weir

Routing: Secondary

Invert Elevation: (feet) 892.50

Crest Length: (feet) 18.0

Side-Z (run/rise)

Crest Breadth: (feet) 10.0

Crest Profile ID# (none)

Discharge Multiplier: 1.00

Line	Head (feet)	C (English)
1	0.20	2.49
2	0.40	2.56
3	0.60	2.70
4	0.80	2.69
5	1.00	2.68
6	1.20	2.69
7	1.40	2.67
8	1.60	2.64
9		
10		
11		
12		
13		
14		

OK Cancel Help

Pond P Orifice/Grate Outlet

Description: Orifice/Grate

Routing: Device 1

Invert Elevation: (feet) 892.00

Discharge Multiplier: 1.00

Rows: 1

Opening in:

- ☐ Horizontal Plane = 0°
- ☒ Vertical Plane = 90°
- ☐ Custom Angle: 0-90°

☒ Use weir flow at low head ☐ Set Grate dimensions

Orifice (each opening):

Diameter: (inches) 36.0

Width: (inches)

Length: (inches)

Grate (overall foot):

Diameter: (inches)

Width: (inches)

Length: (inches)

Discharge Coefficient: 0.600

OK Cancel Help

HYDROCAD INPUT SCREENSHOTS (Tc INPUTS)

Existing Model Pond:

Subcat A1 P Sheet Flow

Description: LAWN

1) Surface Description: 2) Mannings's No: 0.013

3) Flow Length: (feet) 105 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0380 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

Subcat A1 I Sheet Flow

Description: Roof

1) Surface Description: 2) Mannings's No: 0.013

3) Flow Length: (feet) 130 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0200 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

Subcat A2 P Sheet Flow

Description: LAWN

1) Surface Description: 2) Mannings's No: 0.013

3) Flow Length: (feet) 75 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0500 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

Subcat A2 I Sheet Flow

Description: Asphalt

1) Surface Description: 2) Mannings's No: 0.013

3) Flow Length: (feet) 235 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0150 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

Subcat A3 I Sheet Flow

Description: Asphalt

1) Surface Description: 2) Mannings's No: 0.013

3) Flow Length: (feet) 235 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0280 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

Subcat B1 I Sheet Flow

Description: Parking Lot

1) Surface Description: 2) Mannings's No: 0.011

3) Flow Length: (feet) 125 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0350 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

Subcat B1 P Sheet Flow

Description: Field

1) Surface Description: 2) Mannings's No: 0.150

3) Flow Length: (feet) 214 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0350 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

Subcat B1 P Shallow Concentrated Flow

Description: Grassed Swale

1) Surface Description: Velocity Factor: (ft/sec) 15.0

8) Flow Length: (feet) 410 9) Watercourse Slope: (ft/ft) 0.0200

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

Proposed Model:

Subcat A1 P Sheet Flow

Description:
LAWN

1) Surface Description:
[]

2) Mannings's No:
0.013

3) Flow Length: (feet)
105

4) P2 (2yr-24hr Rain) (inches)
2.65

5) Land Slope: (ft/ft)
0.0380

☒ Use Common P2
☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK

Cancel

Help

Subcat A1 I Sheet Flow

Description:
Roof

1) Surface Description:
[]

2) Mannings's No:
0.013

3) Flow Length: (feet)
130

4) P2 (2yr-24hr Rain) (inches)
2.65

5) Land Slope: (ft/ft)
0.0200

☒ Use Common P2
☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK

Cancel

Help

Subcat A2 P Sheet Flow

Description:
LAWN

1) Surface Description:
[]

2) Mannings's No:
0.013

3) Flow Length: (feet)
75

4) P2 (2yr-24hr Rain) (inches)
2.65

5) Land Slope: (ft/ft)
0.0500

☒ Use Common P2
☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK

Cancel

Help

Subcat A2 I Sheet Flow

Description:
Asphalt

1) Surface Description:
[]

2) Mannings's No:
0.013

3) Flow Length: (feet)
155

4) P2 (2yr-24hr Rain) (inches)
2.65

5) Land Slope: (ft/ft)
0.0280

☒ Use Common P2
☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK

Cancel

Help

Subcat A2 I Shallow Concentrated Flow

Description:
[]

1) Surface Description:
Paved

Velocity Factor: (ft/sec)
20.3

8) Flow Length: (feet)
160

9) Watercourse Slope: (ft/ft)
0.0280

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK

Cancel

Help

 Subcat A3 I Sheet Flow

Description: Asphalt

1) Surface Description: 2) Mannings's No: 0.013

3) Flow Length: (feet) 300 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0280 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

 Subcat A3 I Sheet Flow

Description:

1) Surface Description: 2) Mannings's No: 0.013

3) Flow Length: (feet) 55 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0280 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

 Subcat B1 P Sheet Flow

Description: Field

1) Surface Description: 2) Mannings's No: 0.150

3) Flow Length: (feet) 100 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0350 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

 Subcat B1 I Sheet Flow

Description: Parking Lot

1) Surface Description: 2) Mannings's No: 0.011

3) Flow Length: (feet) 125 4) P2 (2yr-24hr Rain) (inches) 2.65

5) Land Slope: (ft/ft) 0.0350 ☒ Use Common P2 ☐ Calculate Length

Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

 Subcat B1 P Shallow Concentrated Flow

Description: Grassed Swale

1) Surface Description: Velocity Factor: (ft/sec) 15.0

8) Flow Length: (feet) 375 9) Watercourse Slope: (ft/ft) 0.0200

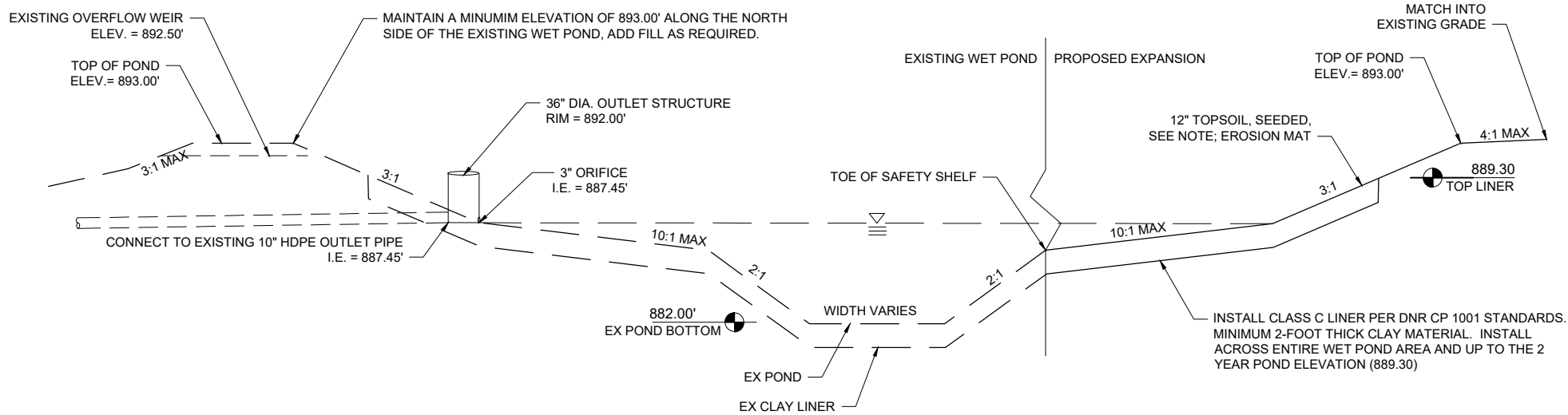
Line numbers correspond to TR-55 Worksheet #3 rev. 6/86

OK Cancel Help

MEMO

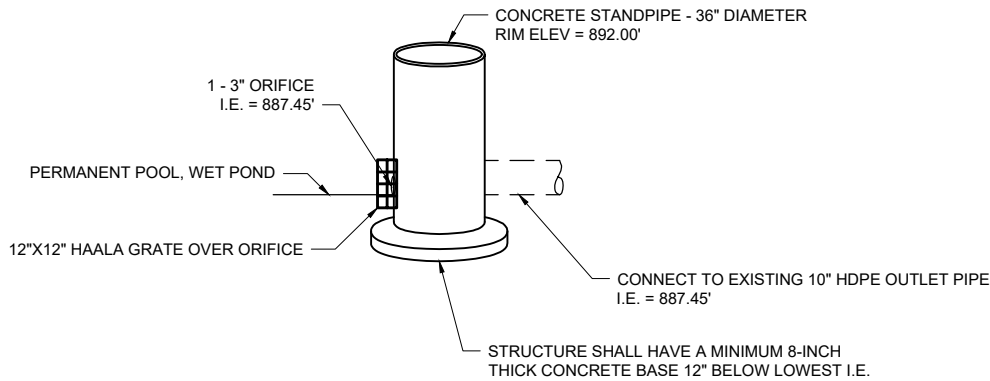
August 23, 2024

Appendix D – Wet Pond Expansion Detail



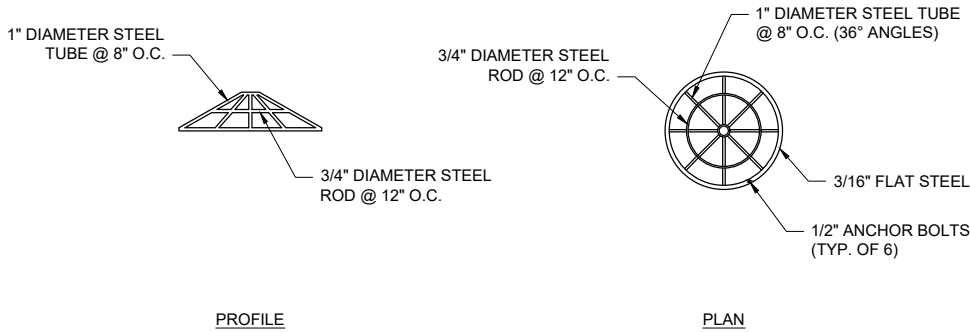
- NOTES:
- TOP OF POND TO BE A MINIMUM OF 4-FEET WIDE
 - WET POND EXPANSION TO OCCUR ABOVE THE TOE OF THE EXISTING SAFETY SHELF

WET POND WITH OUTLET STRUCTURE DETAIL
NO SCALE



NOTE:
THE GRATE FOR THIS OUTLET STRUCTURE SHALL BE EITHER A
NEENAH HIGH CAPACITY GRATE, BEEHIVE GRATE, OR CONE GRATE
AS DETAILED ABOVE. SEE PLAN FOR EXACT ELEVATIONS AND I.E.

WET POND OUTLET STRUCTURE DETAIL
NO SCALE



CONE GRATE DETAIL
NO SCALE

PROJECT DATE:	DRAWN BY:	NO.	DATE	REVISION	BY:
	KEF	-	-	-	-
	DESIGNED BY:	KEF	-	-	-
	CHECKED BY:	Init	-	-	-
PLOT DATE: 6/7/2024 11:19 AM, G:\20\20426\20426215\05_bim_cadd_discipline\06_Civil\construction documents\G2 EROSION CONTROL DETAILS.dwg					



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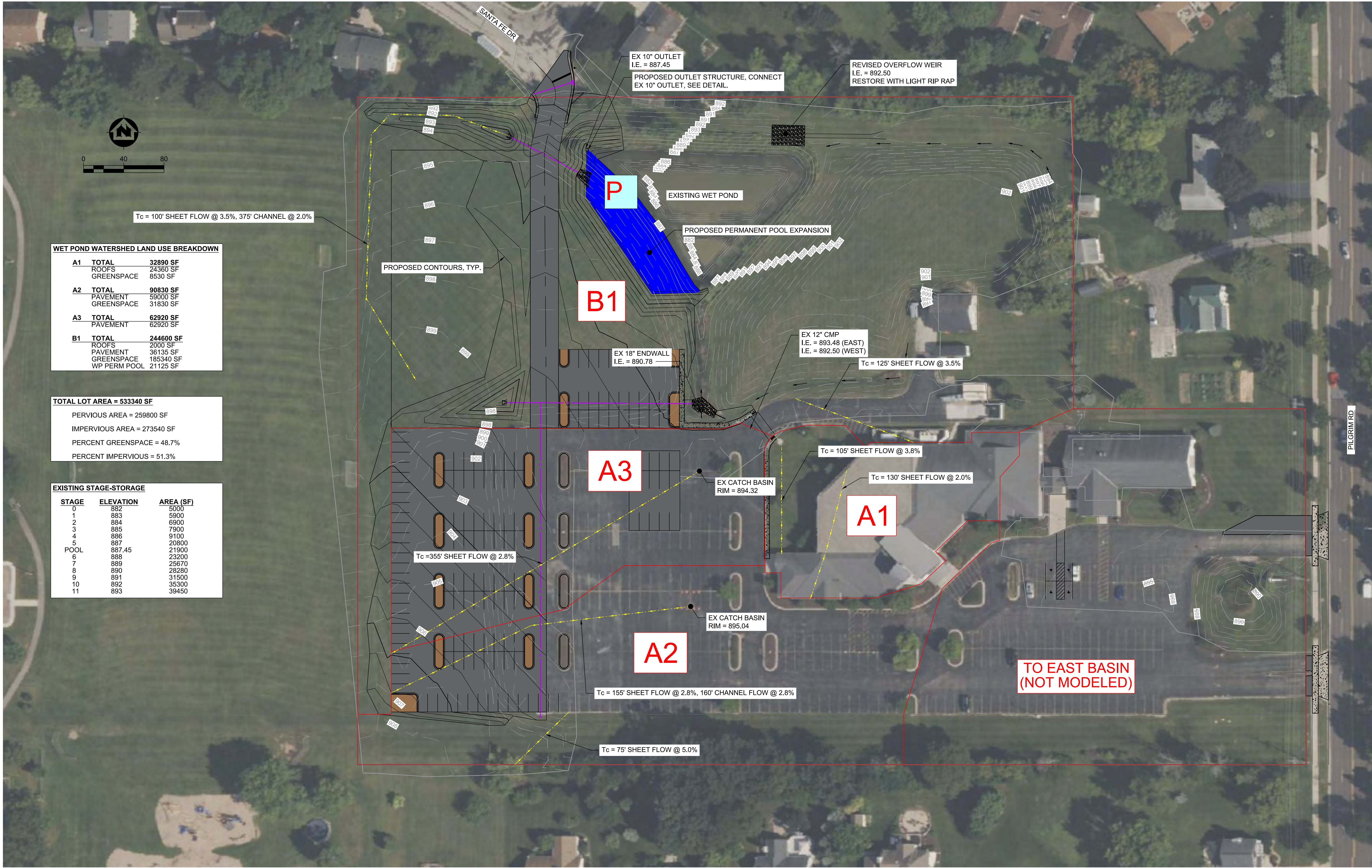
WET POND EXPANSION DETAILS

PROJECT NO:
20426215
SHEET
C506

MEMO

August 23, 2024

Appendix E – Proposed HydroCAD Models



WET POND WATERSHED LAND USE BREAKDOWN			
A1	TOTAL	32890 SF	
	ROOFS	24360 SF	
	GREENSPACE	8530 SF	
A2	TOTAL	90830 SF	
	PAVEMENT	59000 SF	
	GREENSPACE	31830 SF	
A3	TOTAL	62920 SF	
	PAVEMENT	62920 SF	
B1	TOTAL	244600 SF	
	ROOFS	2000 SF	
	PAVEMENT	36135 SF	
	GREENSPACE	185340 SF	
	WP PERM POOL	21125 SF	

TOTAL LOT AREA = 533340 SF	
PERVIOUS AREA = 259800 SF	
IMPERVIOUS AREA = 273540 SF	
PERCENT GREENSPACE = 48.7%	
PERCENT IMPERVIOUS = 51.3%	

EXISTING STAGE-STORAGE		
STAGE	ELEVATION	AREA (SF)
0	882	5000
1	883	5900
2	884	6900
3	885	7900
4	886	9100
5	887	20800
POOL	887.45	21900
6	888	23200
7	889	25670
8	890	28280
9	891	31500
10	892	35300
11	893	39450

PROJECT DATE:	DRAWN BY:	NO.	DATE	REVISION	BY
08-14-2024	KEF	-	-	-	-
	DESIGNED BY:	KEF	-	-	-
	CHECKED BY:	Init	-	-	-
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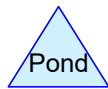
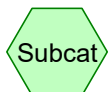
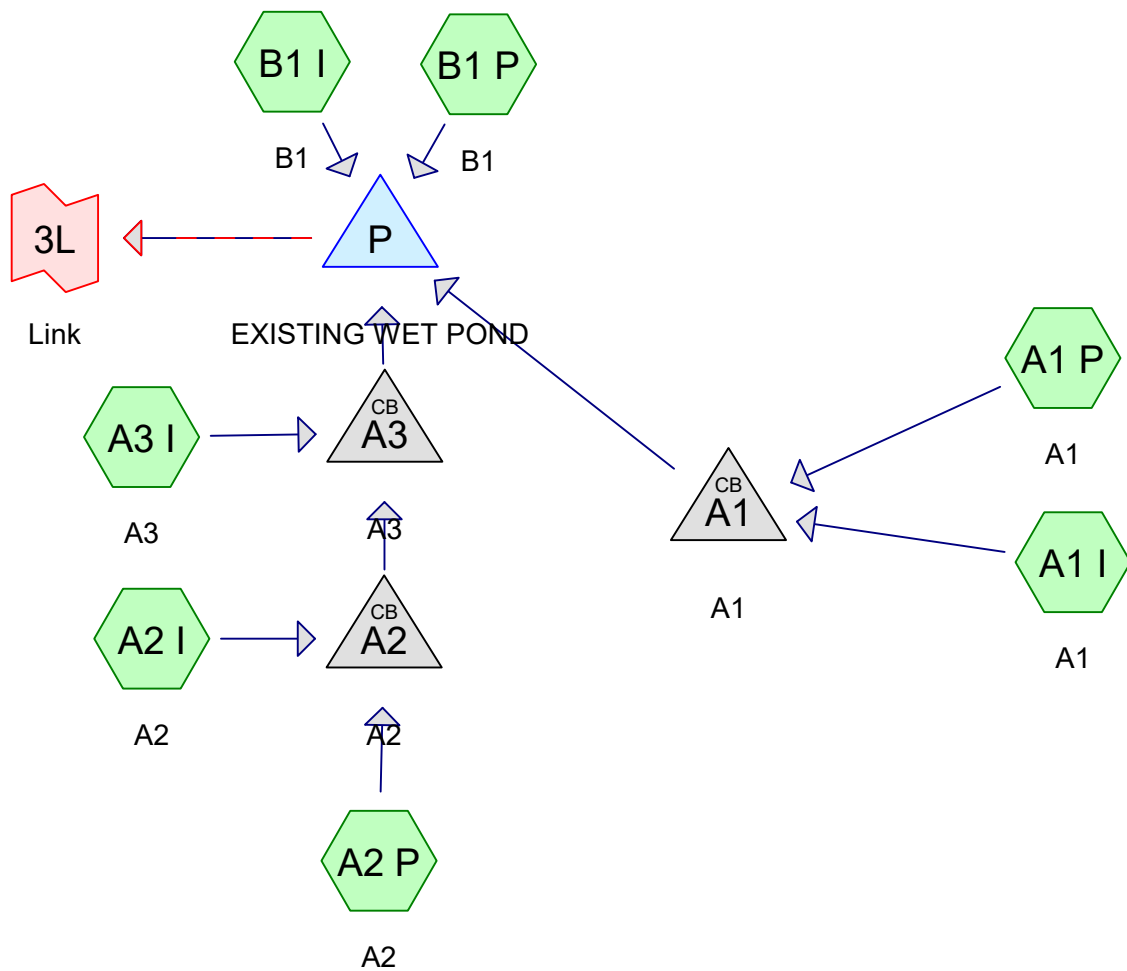


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STORMWATER EXHIBIT - PROPOSED

PROJECT NO.
20426215
SHEET
EX2



Routing Diagram for 20426215 Proposed 8.14.2024
 Prepared by MSA Professional Services, Printed 8/14/2024
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PROPOSED HYDROCAD

20426215 Proposed 8.14.2024

Prepared by MSA Professional Services

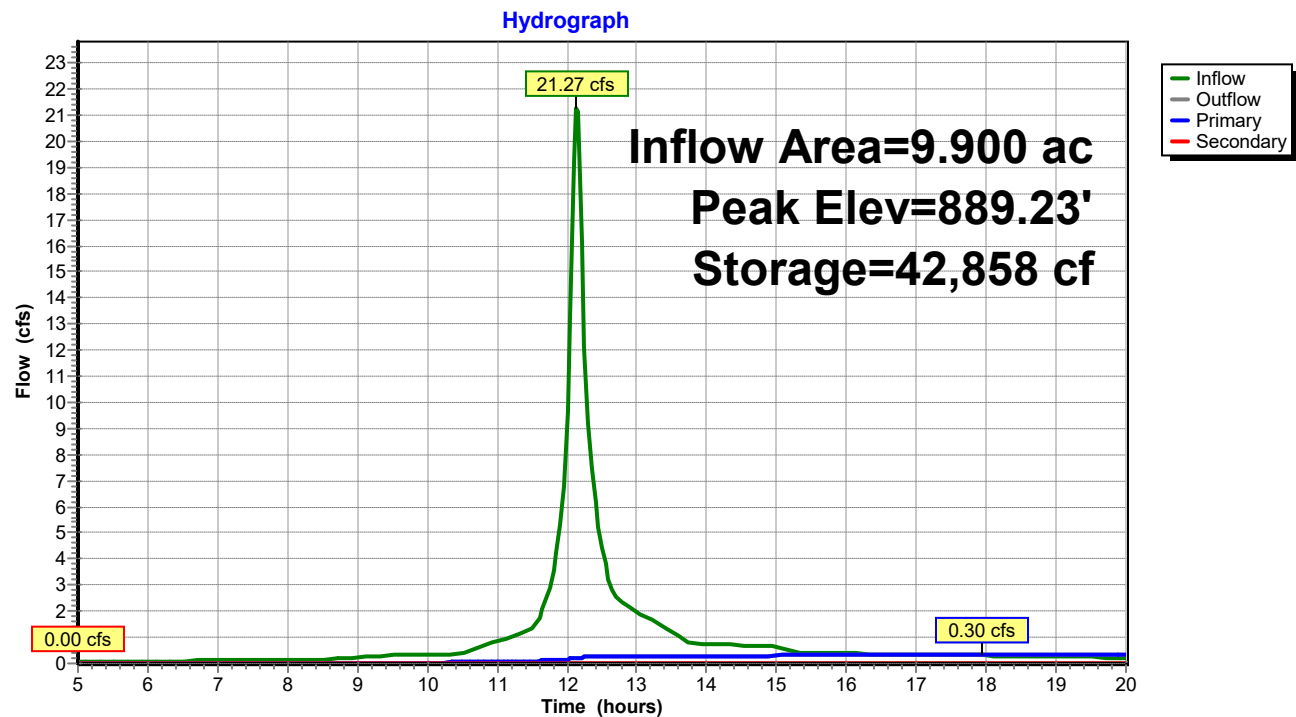
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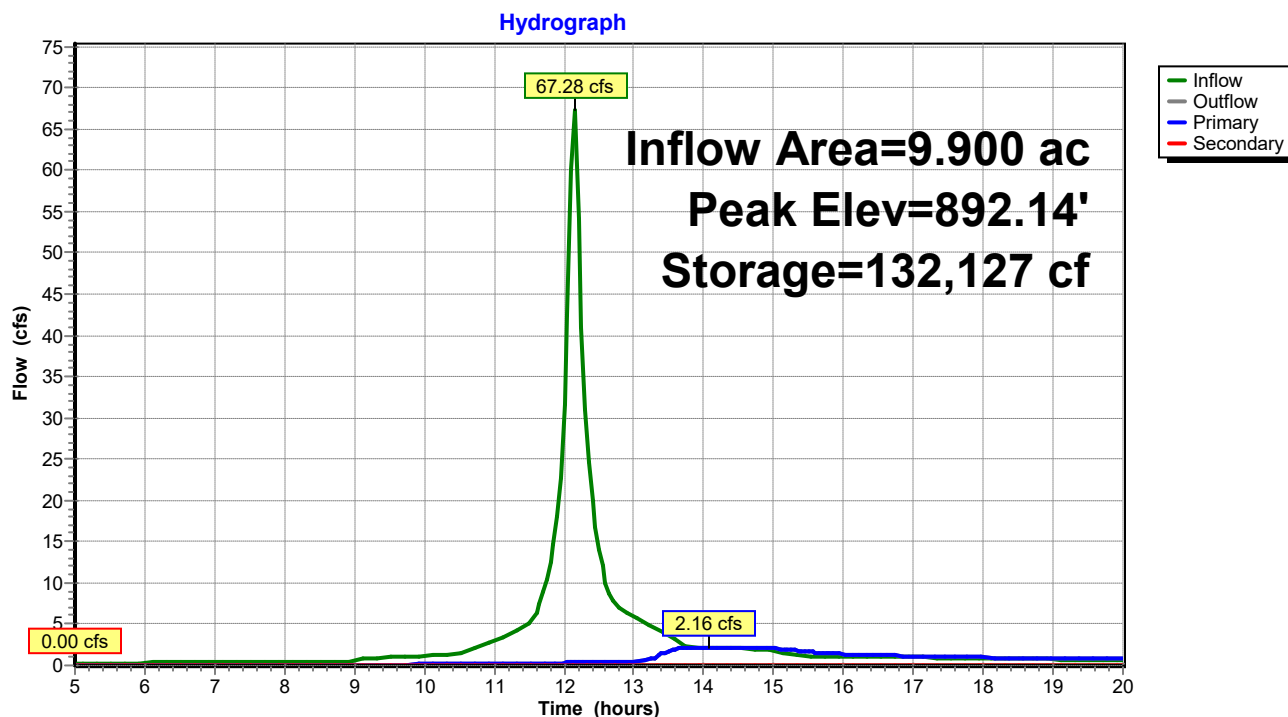
MSE 24-hr 3 2-Year Rainfall=2.65"

Printed 8/14/2024

Page 1

Pond P: EXISTING WET POND



Pond P: EXISTING WET POND

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=1.86 cfs 0.096 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>0.49"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=0.17 cfs 0.008 af

Subcatchment A2 I: A2 Runoff Area=59,000 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=315' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=4.49 cfs 0.232 af

Subcatchment A2 P: A2 Runoff Area=31,830 sf 0.00% Impervious Runoff Depth>0.49"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=0.64 cfs 0.030 af

Subcatchment A3 I: A3 Runoff Area=62,920 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=355' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=4.79 cfs 0.247 af

Subcatchment B1 I: B1 Runoff Area=38,135 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=2.91 cfs 0.150 af

Subcatchment B1 P: B1 Runoff Area=206,465 sf 10.61% Impervious Runoff Depth>0.61"
 Flow Length=475' Tc=11.5 min CN=77 Runoff=4.19 cfs 0.241 af

Pond A1: A1 Peak Elev=894.39' Inflow=2.02 cfs 0.104 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=2.02 cfs 0.104 af

Pond A2: A2 Peak Elev=893.31' Inflow=5.12 cfs 0.262 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=5.12 cfs 0.262 af

Pond A3: A3 Peak Elev=893.37' Inflow=9.91 cfs 0.508 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=9.91 cfs 0.508 af

Pond P: EXISTING WET POND Peak Elev=888.96' Storage=35,778 cf Inflow=17.96 cfs 1.002 af
 Primary=0.28 cfs 0.190 af Secondary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.190 af

Link 3L: Link Inflow=0.28 cfs 0.190 af
 Primary=0.28 cfs 0.190 af

Total Runoff Area = 9.900 ac Runoff Volume = 1.002 af Average Runoff Depth = 1.21"
52.16% Pervious = 5.164 ac 47.84% Impervious = 4.736 ac

Summary for Subcatchment A1 I: A1

Runoff = 1.86 cfs @ 12.13 hrs, Volume= 0.096 af, Depth> 2.05"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 0.17 cfs @ 12.15 hrs, Volume= 0.008 af, Depth> 0.49"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 4.49 cfs @ 12.13 hrs, Volume= 0.232 af, Depth> 2.05"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 59,000	98	Pavement
59,000		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	155	0.0280	1.37		Sheet Flow, n= 0.013 P2= 2.65"
0.8	160	0.0280	3.40		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	315	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 0.64 cfs @ 12.15 hrs, Volume= 0.030 af, Depth> 0.49"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 31,830	74	LAWN AREA
31,830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 4.79 cfs @ 12.13 hrs, Volume= 0.247 af, Depth> 2.05"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 62,920	98	Pavement
62,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	300	0.0280	1.56		Sheet Flow, n= 0.013 P2= 2.65"
0.8	55	0.0280	1.11		Sheet Flow, n= 0.013 P2= 2.65"
4.0	355	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 2.91 cfs @ 12.13 hrs, Volume= 0.150 af, Depth> 2.05"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
*	25,000	98	PROP Pavement
	38,135	98	Weighted Average
	38,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot
					Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 4.19 cfs @ 12.21 hrs, Volume= 0.241 af, Depth> 0.61"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

	Area (sf)	CN	Description
	184,565	74	>75% Grass cover, Good, HSG C
*	21,900	100	Wet Pond
	206,465	77	Weighted Average
	184,565		89.39% Pervious Area
	21,900		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0350	0.19		Sheet Flow, Soccer field
					Grass: Short n= 0.150 P2= 2.65"
2.9	375	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale
					Grassed Waterway Kv= 15.0 fps
11.5	475	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 1.65" for 1-Year event
 Inflow = 2.02 cfs @ 12.13 hrs, Volume= 0.104 af
 Outflow = 2.02 cfs @ 12.13 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.02 cfs @ 12.13 hrs, Volume= 0.104 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 894.39' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 ' S= 0.0117 ' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.93 cfs @ 12.13 hrs HW=894.37' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 1.93 cfs @ 2.98 fps)

Summary for Pond A2: A2

Inflow Area = 2.085 ac, 64.96% Impervious, Inflow Depth > 1.51" for 1-Year event
 Inflow = 5.12 cfs @ 12.13 hrs, Volume= 0.262 af
 Outflow = 5.12 cfs @ 12.13 hrs, Volume= 0.262 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.12 cfs @ 12.13 hrs, Volume= 0.262 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.31' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.89 cfs @ 12.13 hrs HW=893.26' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 4.89 cfs @ 4.51 fps)

Summary for Pond A3: A3

Inflow Area = 3.530 ac, 79.30% Impervious, Inflow Depth > 1.73" for 1-Year event
 Inflow = 9.91 cfs @ 12.13 hrs, Volume= 0.508 af
 Outflow = 9.91 cfs @ 12.13 hrs, Volume= 0.508 af, Atten= 0%, Lag= 0.0 min
 Primary = 9.91 cfs @ 12.13 hrs, Volume= 0.508 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.37' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500

Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.47 cfs @ 12.13 hrs HW=893.27' (Free Discharge)

↑**1=Culvert** (Barrel Controls 9.47 cfs @ 5.36 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 47.84% Impervious, Inflow Depth > 1.21" for 1-Year event
Inflow = 17.96 cfs @ 12.14 hrs, Volume= 1.002 af
Outflow = 0.28 cfs @ 17.41 hrs, Volume= 0.190 af, Atten= 98%, Lag= 316.0 min
Primary = 0.28 cfs @ 17.41 hrs, Volume= 0.190 af
Routed to Link 3L : Link
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 888.96' @ 17.41 hrs Surf.Area= 25,568 sf Storage= 35,778 cf

Plug-Flow detention time= 319.9 min calculated for 0.190 af (19% of inflow)
Center-of-Mass det. time= 185.6 min (947.5 - 761.9)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	164,477 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	21,900	0	0
888.00	23,200	12,402	12,402
889.00	25,670	24,435	36,837
890.00	28,280	26,975	63,812
891.00	31,500	29,890	93,702
892.00	35,300	33,400	127,102
893.00	39,450	37,375	164,477

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	892.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.28 cfs @ 17.41 hrs HW=888.96' (Free Discharge)

↑ **1=Culvert** (Passes 0.28 cfs of 2.42 cfs potential flow)
↑ **2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 5.66 fps)
↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=887.45' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 47.84% Impervious, Inflow Depth > 0.23" for 1-Year event
Inflow = 0.28 cfs @ 17.41 hrs, Volume= 0.190 af
Primary = 0.28 cfs @ 17.41 hrs, Volume= 0.190 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=2.10 cfs 0.109 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>0.65"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=0.23 cfs 0.011 af

Subcatchment A2 I: A2 Runoff Area=59,000 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=315' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=5.09 cfs 0.264 af

Subcatchment A2 P: A2 Runoff Area=31,830 sf 0.00% Impervious Runoff Depth>0.65"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=0.87 cfs 0.040 af

Subcatchment A3 I: A3 Runoff Area=62,920 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=355' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=5.43 cfs 0.281 af

Subcatchment B1 I: B1 Runoff Area=38,135 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=3.29 cfs 0.171 af

Subcatchment B1 P: B1 Runoff Area=206,465 sf 10.61% Impervious Runoff Depth>0.79"
 Flow Length=475' Tc=11.5 min CN=77 Runoff=5.53 cfs 0.312 af

Pond A1: A1 Peak Elev=894.48' Inflow=2.33 cfs 0.120 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=2.33 cfs 0.120 af

Pond A2: A2 Peak Elev=893.80' Inflow=5.95 cfs 0.304 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=5.95 cfs 0.304 af

Pond A3: A3 Peak Elev=893.71' Inflow=11.37 cfs 0.585 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=11.37 cfs 0.585 af

Pond P: EXISTING WET POND Peak Elev=889.23' Storage=42,858 cf Inflow=21.27 cfs 1.187 af
 Primary=0.30 cfs 0.210 af Secondary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.210 af

Link 3L: Link Inflow=0.30 cfs 0.210 af
 Primary=0.30 cfs 0.210 af

Total Runoff Area = 9.900 ac Runoff Volume = 1.187 af Average Runoff Depth = 1.44"
52.16% Pervious = 5.164 ac 47.84% Impervious = 4.736 ac

Summary for Subcatchment A1 I: A1

Runoff = 2.10 cfs @ 12.13 hrs, Volume= 0.109 af, Depth> 2.34"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 0.23 cfs @ 12.14 hrs, Volume= 0.011 af, Depth> 0.65"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 5.09 cfs @ 12.13 hrs, Volume= 0.264 af, Depth> 2.34"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 59,000	98	Pavement
59,000		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	155	0.0280	1.37		Sheet Flow, n= 0.013 P2= 2.65"
0.8	160	0.0280	3.40		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	315	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 0.87 cfs @ 12.14 hrs, Volume= 0.040 af, Depth> 0.65"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 31,830	74	LAWN AREA
31,830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 5.43 cfs @ 12.13 hrs, Volume= 0.281 af, Depth> 2.34"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 62,920	98	Pavement
62,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	300	0.0280	1.56		Sheet Flow, n= 0.013 P2= 2.65"
0.8	55	0.0280	1.11		Sheet Flow, n= 0.013 P2= 2.65"
4.0	355	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 3.29 cfs @ 12.13 hrs, Volume= 0.171 af, Depth> 2.34"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
*	25,000	98	PROP Pavement
	38,135	98	Weighted Average
	38,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot
					Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 5.53 cfs @ 12.21 hrs, Volume= 0.312 af, Depth> 0.79"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

	Area (sf)	CN	Description
	184,565	74	>75% Grass cover, Good, HSG C
*	21,900	100	Wet Pond
	206,465	77	Weighted Average
	184,565		89.39% Pervious Area
	21,900		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0350	0.19		Sheet Flow, Soccer field
					Grass: Short n= 0.150 P2= 2.65"
2.9	375	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale
					Grassed Waterway Kv= 15.0 fps
11.5	475	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 1.90" for 2-Year event
 Inflow = 2.33 cfs @ 12.13 hrs, Volume= 0.120 af
 Outflow = 2.33 cfs @ 12.13 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.33 cfs @ 12.13 hrs, Volume= 0.120 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 894.48' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=2.23 cfs @ 12.13 hrs HW=894.45' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 2.23 cfs @ 3.14 fps)

Summary for Pond A2: A2

Inflow Area = 2.085 ac, 64.96% Impervious, Inflow Depth > 1.75" for 2-Year event
 Inflow = 5.95 cfs @ 12.13 hrs, Volume= 0.304 af
 Outflow = 5.95 cfs @ 12.13 hrs, Volume= 0.304 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.95 cfs @ 12.13 hrs, Volume= 0.304 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.80' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.68 cfs @ 12.13 hrs HW=893.70' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 5.68 cfs @ 4.63 fps)

Summary for Pond A3: A3

Inflow Area = 3.530 ac, 79.30% Impervious, Inflow Depth > 1.99" for 2-Year event
 Inflow = 11.37 cfs @ 12.13 hrs, Volume= 0.585 af
 Outflow = 11.37 cfs @ 12.13 hrs, Volume= 0.585 af, Atten= 0%, Lag= 0.0 min
 Primary = 11.37 cfs @ 12.13 hrs, Volume= 0.585 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.71' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500

Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=10.88 cfs @ 12.13 hrs HW=893.59' (Free Discharge)

↑**1=Culvert** (Barrel Controls 10.88 cfs @ 6.16 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 47.84% Impervious, Inflow Depth > 1.44" for 2-Year event
Inflow = 21.27 cfs @ 12.14 hrs, Volume= 1.187 af
Outflow = 0.30 cfs @ 17.94 hrs, Volume= 0.210 af, Atten= 99%, Lag= 347.9 min
Primary = 0.30 cfs @ 17.94 hrs, Volume= 0.210 af
Routed to Link 3L : Link
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 889.23' @ 17.94 hrs Surf.Area= 26,275 sf Storage= 42,858 cf

Plug-Flow detention time= 325.2 min calculated for 0.210 af (18% of inflow)
Center-of-Mass det. time= 183.9 min (945.1 - 761.2)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	164,477 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	21,900	0	0
888.00	23,200	12,402	12,402
889.00	25,670	24,435	36,837
890.00	28,280	26,975	63,812
891.00	31,500	29,890	93,702
892.00	35,300	33,400	127,102
893.00	39,450	37,375	164,477

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	892.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.30 cfs @ 17.94 hrs HW=889.23' (Free Discharge)

↑ **1=Culvert** (Passes 0.30 cfs of 2.65 cfs potential flow)
↑ **2=Orifice/Grate** (Orifice Controls 0.30 cfs @ 6.20 fps)
↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=887.45' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 47.84% Impervious, Inflow Depth > 0.25" for 2-Year event
Inflow = 0.30 cfs @ 17.94 hrs, Volume= 0.210 af
Primary = 0.30 cfs @ 17.94 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=3.05 cfs 0.161 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>1.39"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=0.51 cfs 0.023 af

Subcatchment A2 I: A2 Runoff Area=59,000 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=315' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=7.40 cfs 0.390 af

Subcatchment A2 P: A2 Runoff Area=31,830 sf 0.00% Impervious Runoff Depth>1.39"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=1.92 cfs 0.085 af

Subcatchment A3 I: A3 Runoff Area=62,920 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=355' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=7.89 cfs 0.416 af

Subcatchment B1 I: B1 Runoff Area=38,135 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=4.78 cfs 0.252 af

Subcatchment B1 P: B1 Runoff Area=206,465 sf 10.61% Impervious Runoff Depth>1.59"
 Flow Length=475' Tc=11.5 min CN=77 Runoff=11.43 cfs 0.629 af

Pond A1: A1 Peak Elev=894.98' Inflow=3.57 cfs 0.184 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=3.57 cfs 0.184 af

Pond A2: A2 Peak Elev=895.75' Inflow=9.30 cfs 0.474 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=9.30 cfs 0.474 af

Pond A3: A3 Peak Elev=895.97' Inflow=17.19 cfs 0.890 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=17.19 cfs 0.890 af

Pond P: EXISTING WET POND Peak Elev=890.32' Storage=73,139 cf Inflow=34.93 cfs 1.954 af
 Primary=0.39 cfs 0.276 af Secondary=0.00 cfs 0.000 af Outflow=0.39 cfs 0.276 af

Link 3L: Link Inflow=0.39 cfs 0.276 af
 Primary=0.39 cfs 0.276 af

Total Runoff Area = 9.900 ac Runoff Volume = 1.954 af Average Runoff Depth = 2.37"
52.16% Pervious = 5.164 ac 47.84% Impervious = 4.736 ac

Summary for Subcatchment A1 I: A1

Runoff = 3.05 cfs @ 12.13 hrs, Volume= 0.161 af, Depth> 3.45"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 0.51 cfs @ 12.14 hrs, Volume= 0.023 af, Depth> 1.39"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 7.40 cfs @ 12.13 hrs, Volume= 0.390 af, Depth> 3.45"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 59,000	98	Pavement
59,000		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	155	0.0280	1.37		Sheet Flow, n= 0.013 P2= 2.65"
0.8	160	0.0280	3.40		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	315	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 1.92 cfs @ 12.14 hrs, Volume= 0.085 af, Depth> 1.39"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 31,830	74	LAWN AREA
31,830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 7.89 cfs @ 12.13 hrs, Volume= 0.416 af, Depth> 3.45"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 62,920	98	Pavement
62,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	300	0.0280	1.56		Sheet Flow, n= 0.013 P2= 2.65"
0.8	55	0.0280	1.11		Sheet Flow, n= 0.013 P2= 2.65"
4.0	355	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 4.78 cfs @ 12.13 hrs, Volume= 0.252 af, Depth> 3.45"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
*	25,000	98	PROP Pavement
	38,135	98	Weighted Average
	38,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot
					Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 11.43 cfs @ 12.20 hrs, Volume= 0.629 af, Depth> 1.59"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

	Area (sf)	CN	Description
	184,565	74	>75% Grass cover, Good, HSG C
*	21,900	100	Wet Pond
	206,465	77	Weighted Average
	184,565		89.39% Pervious Area
	21,900		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0350	0.19		Sheet Flow, Soccer field
					Grass: Short n= 0.150 P2= 2.65"
2.9	375	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale
					Grassed Waterway Kv= 15.0 fps
11.5	475	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 2.92" for 10-Year event
 Inflow = 3.57 cfs @ 12.13 hrs, Volume= 0.184 af
 Outflow = 3.57 cfs @ 12.13 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.57 cfs @ 12.13 hrs, Volume= 0.184 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 894.98' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 ' S= 0.0117 ' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=3.41 cfs @ 12.13 hrs HW=894.91' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 3.41 cfs @ 4.34 fps)

Summary for Pond A2: A2

Inflow Area = 2.085 ac, 64.96% Impervious, Inflow Depth > 2.73" for 10-Year event
 Inflow = 9.30 cfs @ 12.13 hrs, Volume= 0.474 af
 Outflow = 9.30 cfs @ 12.13 hrs, Volume= 0.474 af, Atten= 0%, Lag= 0.0 min
 Primary = 9.30 cfs @ 12.13 hrs, Volume= 0.474 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 895.75' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=8.89 cfs @ 12.13 hrs HW=895.51' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 8.89 cfs @ 7.24 fps)

Summary for Pond A3: A3

Inflow Area = 3.530 ac, 79.30% Impervious, Inflow Depth > 3.03" for 10-Year event
 Inflow = 17.19 cfs @ 12.13 hrs, Volume= 0.890 af
 Outflow = 17.19 cfs @ 12.13 hrs, Volume= 0.890 af, Atten= 0%, Lag= 0.0 min
 Primary = 17.19 cfs @ 12.13 hrs, Volume= 0.890 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 895.97' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500

Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=16.43 cfs @ 12.13 hrs HW=895.68' (Free Discharge)

↑**1=Culvert** (Inlet Controls 16.43 cfs @ 9.30 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 47.84% Impervious, Inflow Depth > 2.37" for 10-Year event
Inflow = 34.93 cfs @ 12.14 hrs, Volume= 1.954 af
Outflow = 0.39 cfs @ 19.34 hrs, Volume= 0.276 af, Atten= 99%, Lag= 432.2 min
Primary = 0.39 cfs @ 19.34 hrs, Volume= 0.276 af
Routed to Link 3L : Link
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 890.32' @ 19.34 hrs Surf.Area= 29,323 sf Storage= 73,139 cf

Plug-Flow detention time= 340.3 min calculated for 0.276 af (14% of inflow)
Center-of-Mass det. time= 177.9 min (936.9 - 759.1)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	164,477 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	21,900	0	0
888.00	23,200	12,402	12,402
889.00	25,670	24,435	36,837
890.00	28,280	26,975	63,812
891.00	31,500	29,890	93,702
892.00	35,300	33,400	127,102
893.00	39,450	37,375	164,477

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	892.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.39 cfs @ 19.34 hrs HW=890.32' (Free Discharge)

↑ **1=Culvert** (Passes 0.39 cfs of 3.41 cfs potential flow)
↑ **2=Orifice/Grate** (Orifice Controls 0.39 cfs @ 7.98 fps)
↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=887.45' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 47.84% Impervious, Inflow Depth > 0.33" for 10-Year event
Inflow = 0.39 cfs @ 19.34 hrs, Volume= 0.276 af
Primary = 0.39 cfs @ 19.34 hrs, Volume= 0.276 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=5.15 cfs 0.275 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>3.39"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=1.23 cfs 0.055 af

Subcatchment A2 I: A2 Runoff Area=59,000 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=315' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=12.48 cfs 0.667 af

Subcatchment A2 P: A2 Runoff Area=31,830 sf 0.00% Impervious Runoff Depth>3.39"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=4.60 cfs 0.206 af

Subcatchment A3 I: A3 Runoff Area=62,920 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=355' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=13.31 cfs 0.711 af

Subcatchment B1 I: B1 Runoff Area=38,135 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=8.07 cfs 0.431 af

Subcatchment B1 P: B1 Runoff Area=206,465 sf 10.61% Impervious Runoff Depth>3.68"
 Flow Length=475' Tc=11.5 min CN=77 Runoff=26.15 cfs 1.455 af

Pond A1: A1 Peak Elev=896.91' Inflow=6.38 cfs 0.331 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=6.38 cfs 0.331 af

Pond A2: A2 Peak Elev=903.57' Inflow=17.08 cfs 0.873 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=17.08 cfs 0.873 af

Pond A3: A3 Peak Elev=904.51' Inflow=30.39 cfs 1.584 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=30.39 cfs 1.584 af

Pond P: EXISTING WET POND Peak Elev=892.14' Storage=132,127 cf Inflow=67.28 cfs 3.800 af
 Primary=2.16 cfs 0.852 af Secondary=0.00 cfs 0.000 af Outflow=2.16 cfs 0.852 af

Link 3L: Link Inflow=2.16 cfs 0.852 af
 Primary=2.16 cfs 0.852 af

Total Runoff Area = 9.900 ac Runoff Volume = 3.800 af Average Runoff Depth = 4.61"
52.16% Pervious = 5.164 ac 47.84% Impervious = 4.736 ac

Summary for Subcatchment A1 I: A1

Runoff = 5.15 cfs @ 12.13 hrs, Volume= 0.275 af, Depth> 5.91"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 1.23 cfs @ 12.13 hrs, Volume= 0.055 af, Depth> 3.39"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 12.48 cfs @ 12.13 hrs, Volume= 0.667 af, Depth> 5.91"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 59,000	98	Pavement
59,000		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	155	0.0280	1.37		Sheet Flow, n= 0.013 P2= 2.65"
0.8	160	0.0280	3.40		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	315	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 4.60 cfs @ 12.13 hrs, Volume= 0.206 af, Depth> 3.39"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 31,830	74	LAWN AREA
31,830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 13.31 cfs @ 12.13 hrs, Volume= 0.711 af, Depth> 5.91"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 62,920	98	Pavement
62,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	300	0.0280	1.56		Sheet Flow, n= 0.013 P2= 2.65"
0.8	55	0.0280	1.11		Sheet Flow, n= 0.013 P2= 2.65"
4.0	355	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 8.07 cfs @ 12.13 hrs, Volume= 0.431 af, Depth> 5.91"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
*	25,000	98	PROP Pavement
	38,135	98	Weighted Average
	38,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot
					Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 26.15 cfs @ 12.20 hrs, Volume= 1.455 af, Depth> 3.68"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

	Area (sf)	CN	Description
	184,565	74	>75% Grass cover, Good, HSG C
*	21,900	100	Wet Pond
	206,465	77	Weighted Average
	184,565		89.39% Pervious Area
	21,900		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0350	0.19		Sheet Flow, Soccer field
					Grass: Short n= 0.150 P2= 2.65"
2.9	375	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale
					Grassed Waterway Kv= 15.0 fps
11.5	475	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 5.25" for 100-Year event
 Inflow = 6.38 cfs @ 12.13 hrs, Volume= 0.331 af
 Outflow = 6.38 cfs @ 12.13 hrs, Volume= 0.331 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.38 cfs @ 12.13 hrs, Volume= 0.331 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 896.91' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 ' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=6.10 cfs @ 12.13 hrs HW=896.70' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 6.10 cfs @ 7.77 fps)

Summary for Pond A2: A2

Inflow Area = 2.085 ac, 64.96% Impervious, Inflow Depth > 5.02" for 100-Year event
 Inflow = 17.08 cfs @ 12.13 hrs, Volume= 0.873 af
 Outflow = 17.08 cfs @ 12.13 hrs, Volume= 0.873 af, Atten= 0%, Lag= 0.0 min
 Primary = 17.08 cfs @ 12.13 hrs, Volume= 0.873 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 903.57' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=16.32 cfs @ 12.13 hrs HW=902.75' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 16.32 cfs @ 13.30 fps)

Summary for Pond A3: A3

Inflow Area = 3.530 ac, 79.30% Impervious, Inflow Depth > 5.39" for 100-Year event
 Inflow = 30.39 cfs @ 12.13 hrs, Volume= 1.584 af
 Outflow = 30.39 cfs @ 12.13 hrs, Volume= 1.584 af, Atten= 0%, Lag= 0.0 min
 Primary = 30.39 cfs @ 12.13 hrs, Volume= 1.584 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 904.51' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500

Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=29.04 cfs @ 12.13 hrs HW=903.60' (Free Discharge)

↑**1=Culvert** (Inlet Controls 29.04 cfs @ 16.43 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 47.84% Impervious, Inflow Depth > 4.61" for 100-Year event
Inflow = 67.28 cfs @ 12.14 hrs, Volume= 3.800 af
Outflow = 2.16 cfs @ 14.07 hrs, Volume= 0.852 af, Atten= 97%, Lag= 115.5 min
Primary = 2.16 cfs @ 14.07 hrs, Volume= 0.852 af
Routed to Link 3L : Link
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 892.14' @ 14.07 hrs Surf.Area= 35,886 sf Storage= 132,127 cf

Plug-Flow detention time= 295.1 min calculated for 0.849 af (22% of inflow)
Center-of-Mass det. time= 175.3 min (930.5 - 755.2)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	164,477 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	21,900	0	0
888.00	23,200	12,402	12,402
889.00	25,670	24,435	36,837
890.00	28,280	26,975	63,812
891.00	31,500	29,890	93,702
892.00	35,300	33,400	127,102
893.00	39,450	37,375	164,477

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	892.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.14 cfs @ 14.07 hrs HW=892.14' (Free Discharge)

↑ **1=Culvert** (Passes 2.14 cfs of 4.40 cfs potential flow)
↑ **2=Orifice/Grate** (Orifice Controls 0.51 cfs @ 10.29 fps)
↑ **3=Orifice/Grate** (Weir Controls 1.63 cfs @ 1.23 fps)

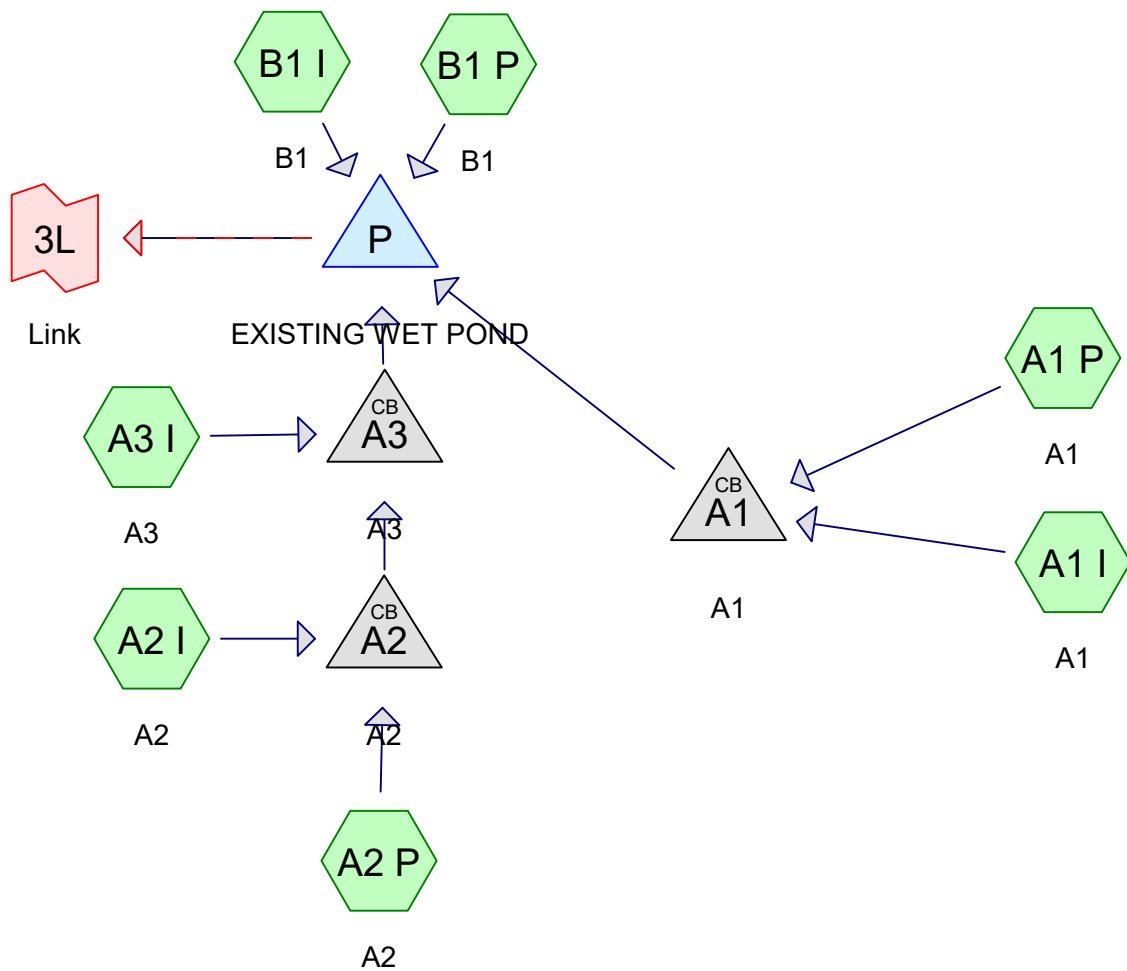
Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=887.45' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 47.84% Impervious, Inflow Depth > 1.03" for 100-Year event
Inflow = 2.16 cfs @ 14.07 hrs, Volume= 0.852 af
Primary = 2.16 cfs @ 14.07 hrs, Volume= 0.852 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Routing Diagram for 20426215 Prop NO POND EXPANSION 8.14.2024
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PROPOSED HYDROCAD W/O
POND EXPANSION

20426215 Prop NO POND EXPANSION 8.14.2024

MSE 24-hr 3 2-Year Rainfall=2.65"

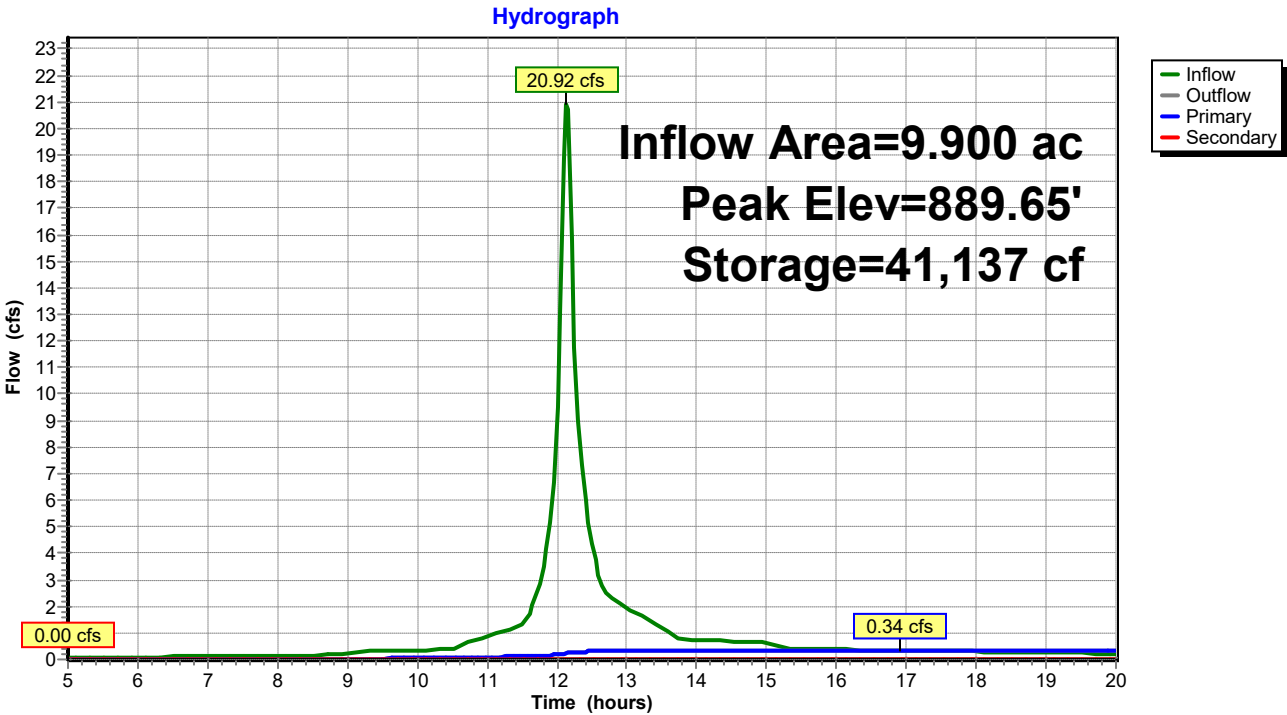
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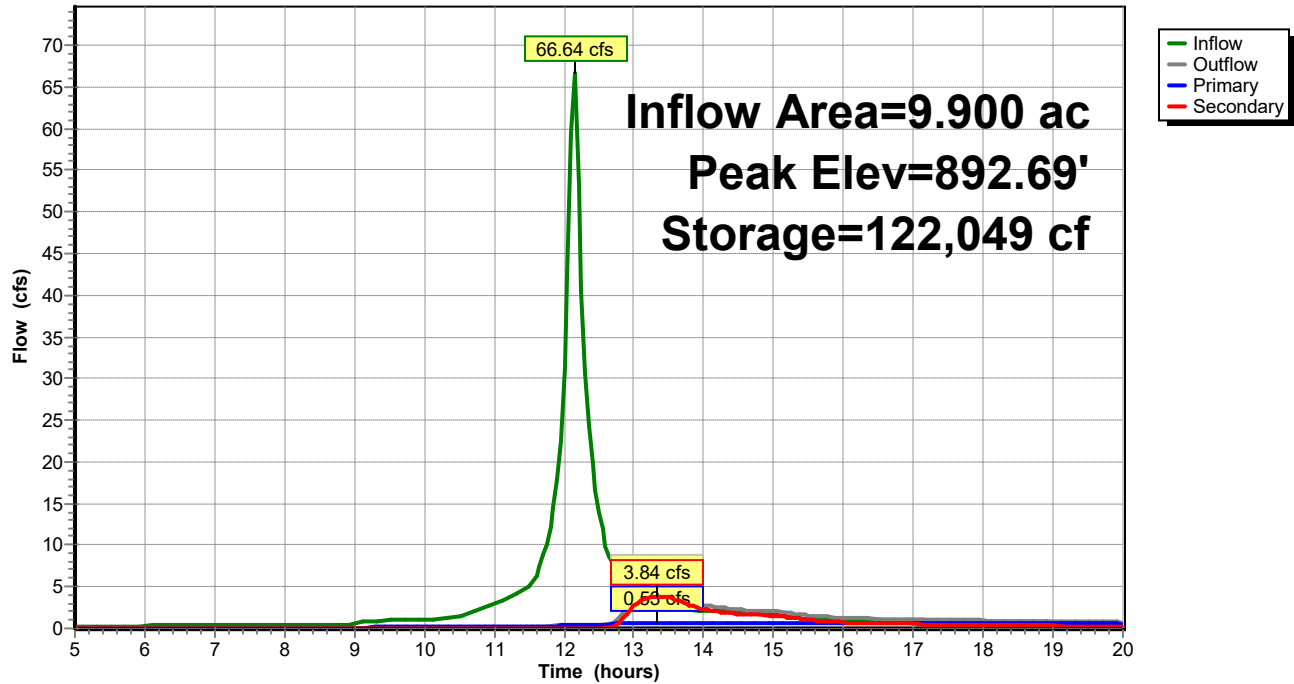
Page 1

Pond P: EXISTING WET POND



Pond P: EXISTING WET POND

Hydrograph



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=1.86 cfs 0.096 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>0.49"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=0.17 cfs 0.008 af

Subcatchment A2 I: A2 Runoff Area=59,000 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=315' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=4.49 cfs 0.232 af

Subcatchment A2 P: A2 Runoff Area=31,830 sf 0.00% Impervious Runoff Depth>0.49"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=0.64 cfs 0.030 af

Subcatchment A3 I: A3 Runoff Area=62,920 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=355' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=4.79 cfs 0.247 af

Subcatchment B1 I: B1 Runoff Area=38,135 sf 100.00% Impervious Runoff Depth>2.05"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=2.91 cfs 0.150 af

Subcatchment B1 P: B1 Runoff Area=206,465 sf 7.84% Impervious Runoff Depth>0.57"
 Flow Length=475' Tc=11.5 min CN=76 Runoff=3.85 cfs 0.224 af

Pond A1: A1 Peak Elev=894.39' Inflow=2.02 cfs 0.104 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=2.02 cfs 0.104 af

Pond A2: A2 Peak Elev=893.31' Inflow=5.12 cfs 0.262 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=5.12 cfs 0.262 af

Pond A3: A3 Peak Elev=893.37' Inflow=9.91 cfs 0.508 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=9.91 cfs 0.508 af

Pond P: EXISTING WET POND Peak Elev=889.32' Storage=34,316 cf Inflow=17.66 cfs 0.986 af
 Primary=0.31 cfs 0.218 af Secondary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.218 af

Link 3L: Link Inflow=0.31 cfs 0.218 af
 Primary=0.31 cfs 0.218 af

Total Runoff Area = 9.900 ac Runoff Volume = 0.986 af Average Runoff Depth = 1.20"
53.48% Pervious = 5.295 ac 46.52% Impervious = 4.605 ac

Summary for Subcatchment A1 I: A1

Runoff = 1.86 cfs @ 12.13 hrs, Volume= 0.096 af, Depth> 2.05"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 0.17 cfs @ 12.15 hrs, Volume= 0.008 af, Depth> 0.49"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 4.49 cfs @ 12.13 hrs, Volume= 0.232 af, Depth> 2.05"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 59,000	98	Pavement
59,000		100.00% Impervious Area

20426215 Prop NO POND EXPANSION 8.14.2024

MSE 24-hr 3 1-Year Rainfall=2.35"

Prepared by MSA Professional Services

Printed 8/14/2024

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	155	0.0280	1.37		Sheet Flow, n= 0.013 P2= 2.65"
0.8	160	0.0280	3.40		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	315	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 0.64 cfs @ 12.15 hrs, Volume= 0.030 af, Depth> 0.49"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 31,830	74	LAWN AREA
31,830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 4.79 cfs @ 12.13 hrs, Volume= 0.247 af, Depth> 2.05"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

Area (sf)	CN	Description
* 62,920	98	Pavement
62,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	300	0.0280	1.56		Sheet Flow, n= 0.013 P2= 2.65"
0.8	55	0.0280	1.11		Sheet Flow, n= 0.013 P2= 2.65"
4.0	355	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 2.91 cfs @ 12.13 hrs, Volume= 0.150 af, Depth> 2.05"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
*	25,000	98	PROP Pavement
	38,135	98	Weighted Average
	38,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot
					Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 3.85 cfs @ 12.21 hrs, Volume= 0.224 af, Depth> 0.57"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-Year Rainfall=2.35"

	Area (sf)	CN	Description
	190,285	74	>75% Grass cover, Good, HSG C
*	16,180	100	Wet Pond
	206,465	76	Weighted Average
	190,285		92.16% Pervious Area
	16,180		7.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0350	0.19		Sheet Flow, Soccer field
					Grass: Short n= 0.150 P2= 2.65"
2.9	375	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale
					Grassed Waterway Kv= 15.0 fps
11.5	475	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 1.65" for 1-Year event
 Inflow = 2.02 cfs @ 12.13 hrs, Volume= 0.104 af
 Outflow = 2.02 cfs @ 12.13 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.02 cfs @ 12.13 hrs, Volume= 0.104 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 894.39' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 ' S= 0.0117 ' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.93 cfs @ 12.13 hrs HW=894.37' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 1.93 cfs @ 2.98 fps)

Summary for Pond A2: A2

Inflow Area = 2.085 ac, 64.96% Impervious, Inflow Depth > 1.51" for 1-Year event
 Inflow = 5.12 cfs @ 12.13 hrs, Volume= 0.262 af
 Outflow = 5.12 cfs @ 12.13 hrs, Volume= 0.262 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.12 cfs @ 12.13 hrs, Volume= 0.262 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.31' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.89 cfs @ 12.13 hrs HW=893.26' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 4.89 cfs @ 4.51 fps)

Summary for Pond A3: A3

Inflow Area = 3.530 ac, 79.30% Impervious, Inflow Depth > 1.73" for 1-Year event
 Inflow = 9.91 cfs @ 12.13 hrs, Volume= 0.508 af
 Outflow = 9.91 cfs @ 12.13 hrs, Volume= 0.508 af, Atten= 0%, Lag= 0.0 min
 Primary = 9.91 cfs @ 12.13 hrs, Volume= 0.508 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.37' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500

Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.47 cfs @ 12.13 hrs HW=893.27' (Free Discharge)

↑**1=Culvert** (Barrel Controls 9.47 cfs @ 5.36 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 46.52% Impervious, Inflow Depth > 1.20" for 1-Year event
Inflow = 17.66 cfs @ 12.14 hrs, Volume= 0.986 af
Outflow = 0.31 cfs @ 16.21 hrs, Volume= 0.218 af, Atten= 98%, Lag= 244.2 min
Primary = 0.31 cfs @ 16.21 hrs, Volume= 0.218 af
Routed to Link 3L : Link
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 889.32' @ 16.21 hrs Surf.Area= 20,503 sf Storage= 34,316 cf

Plug-Flow detention time= 303.6 min calculated for 0.217 af (22% of inflow)
Center-of-Mass det. time= 180.6 min (942.1 - 761.6)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	132,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	16,180	0	0
888.00	17,500	9,262	9,262
889.00	19,700	18,600	27,862
890.00	22,200	20,950	48,812
891.00	25,500	23,850	72,662
892.00	29,800	27,650	100,312
893.00	34,300	32,050	132,362

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.31 cfs @ 16.21 hrs HW=889.32' (Free Discharge)

↑**1=Culvert** (Passes 0.31 cfs of 2.72 cfs potential flow)

↑**2=Orifice/Grate** (Orifice Controls 0.31 cfs @ 6.36 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=887.45' (Free Discharge)

↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 46.52% Impervious, Inflow Depth > 0.26" for 1-Year event
Inflow = 0.31 cfs @ 16.21 hrs, Volume= 0.218 af
Primary = 0.31 cfs @ 16.21 hrs, Volume= 0.218 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=2.10 cfs 0.109 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>0.65"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=0.23 cfs 0.011 af

Subcatchment A2 I: A2 Runoff Area=59,000 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=315' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=5.09 cfs 0.264 af

Subcatchment A2 P: A2 Runoff Area=31,830 sf 0.00% Impervious Runoff Depth>0.65"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=0.87 cfs 0.040 af

Subcatchment A3 I: A3 Runoff Area=62,920 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=355' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=5.43 cfs 0.281 af

Subcatchment B1 I: B1 Runoff Area=38,135 sf 100.00% Impervious Runoff Depth>2.34"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=3.29 cfs 0.171 af

Subcatchment B1 P: B1 Runoff Area=206,465 sf 7.84% Impervious Runoff Depth>0.74"
 Flow Length=475' Tc=11.5 min CN=76 Runoff=5.16 cfs 0.293 af

Pond A1: A1 Peak Elev=894.48' Inflow=2.33 cfs 0.120 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=2.33 cfs 0.120 af

Pond A2: A2 Peak Elev=893.80' Inflow=5.95 cfs 0.304 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=5.95 cfs 0.304 af

Pond A3: A3 Peak Elev=893.71' Inflow=11.37 cfs 0.585 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=11.37 cfs 0.585 af

Pond P: EXISTING WET POND Peak Elev=889.65' Storage=41,137 cf Inflow=20.92 cfs 1.168 af
 Primary=0.34 cfs 0.239 af Secondary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.239 af

Link 3L: Link Inflow=0.34 cfs 0.239 af
 Primary=0.34 cfs 0.239 af

Total Runoff Area = 9.900 ac Runoff Volume = 1.168 af Average Runoff Depth = 1.42"
53.48% Pervious = 5.295 ac 46.52% Impervious = 4.605 ac

Summary for Subcatchment A1 I: A1

Runoff = 2.10 cfs @ 12.13 hrs, Volume= 0.109 af, Depth> 2.34"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 0.23 cfs @ 12.14 hrs, Volume= 0.011 af, Depth> 0.65"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 5.09 cfs @ 12.13 hrs, Volume= 0.264 af, Depth> 2.34"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 59,000	98	Pavement
59,000		100.00% Impervious Area

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MSE 24-hr 3 2-Year Rainfall=2.65"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	155	0.0280	1.37		Sheet Flow, n= 0.013 P2= 2.65"
0.8	160	0.0280	3.40		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	315	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 0.87 cfs @ 12.14 hrs, Volume= 0.040 af, Depth> 0.65"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 31,830	74	LAWN AREA
31,830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 5.43 cfs @ 12.13 hrs, Volume= 0.281 af, Depth> 2.34"
 Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

Area (sf)	CN	Description
* 62,920	98	Pavement
62,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	300	0.0280	1.56		Sheet Flow, n= 0.013 P2= 2.65"
0.8	55	0.0280	1.11		Sheet Flow, n= 0.013 P2= 2.65"
4.0	355	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 3.29 cfs @ 12.13 hrs, Volume= 0.171 af, Depth> 2.34"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
*	25,000	98	PROP Pavement
	38,135	98	Weighted Average
	38,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot
					Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 5.16 cfs @ 12.21 hrs, Volume= 0.293 af, Depth> 0.74"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-Year Rainfall=2.65"

	Area (sf)	CN	Description
	190,285	74	>75% Grass cover, Good, HSG C
*	16,180	100	Wet Pond
	206,465	76	Weighted Average
	190,285		92.16% Pervious Area
	16,180		7.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0350	0.19		Sheet Flow, Soccer field
					Grass: Short n= 0.150 P2= 2.65"
2.9	375	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale
					Grassed Waterway Kv= 15.0 fps
11.5	475	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 1.90" for 2-Year event
 Inflow = 2.33 cfs @ 12.13 hrs, Volume= 0.120 af
 Outflow = 2.33 cfs @ 12.13 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.33 cfs @ 12.13 hrs, Volume= 0.120 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 894.48' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 ' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=2.23 cfs @ 12.13 hrs HW=894.45' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 2.23 cfs @ 3.14 fps)

Summary for Pond A2: A2

Inflow Area = 2.085 ac, 64.96% Impervious, Inflow Depth > 1.75" for 2-Year event
 Inflow = 5.95 cfs @ 12.13 hrs, Volume= 0.304 af
 Outflow = 5.95 cfs @ 12.13 hrs, Volume= 0.304 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.95 cfs @ 12.13 hrs, Volume= 0.304 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.80' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.68 cfs @ 12.13 hrs HW=893.70' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 5.68 cfs @ 4.63 fps)

Summary for Pond A3: A3

Inflow Area = 3.530 ac, 79.30% Impervious, Inflow Depth > 1.99" for 2-Year event
 Inflow = 11.37 cfs @ 12.13 hrs, Volume= 0.585 af
 Outflow = 11.37 cfs @ 12.13 hrs, Volume= 0.585 af, Atten= 0%, Lag= 0.0 min
 Primary = 11.37 cfs @ 12.13 hrs, Volume= 0.585 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 893.71' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500

Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=10.88 cfs @ 12.13 hrs HW=893.59' (Free Discharge)

↑1=Culvert (Barrel Controls 10.88 cfs @ 6.16 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 46.52% Impervious, Inflow Depth > 1.42" for 2-Year event
Inflow = 20.92 cfs @ 12.14 hrs, Volume= 1.168 af
Outflow = 0.34 cfs @ 16.90 hrs, Volume= 0.239 af, Atten= 98%, Lag= 286.0 min
Primary = 0.34 cfs @ 16.90 hrs, Volume= 0.239 af
Routed to Link 3L : Link
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 889.65' @ 16.90 hrs Surf.Area= 21,318 sf Storage= 41,137 cf

Plug-Flow detention time= 308.3 min calculated for 0.239 af (20% of inflow)
Center-of-Mass det. time= 178.5 min (939.5 - 761.0)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	132,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	16,180	0	0
888.00	17,500	9,262	9,262
889.00	19,700	18,600	27,862
890.00	22,200	20,950	48,812
891.00	25,500	23,850	72,662
892.00	29,800	27,650	100,312
893.00	34,300	32,050	132,362

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.34 cfs @ 16.90 hrs HW=889.65' (Free Discharge)

↑1=Culvert (Passes 0.34 cfs of 2.96 cfs potential flow)

↑2=Orifice/Grate (Orifice Controls 0.34 cfs @ 6.93 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=887.45' (Free Discharge)

↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 46.52% Impervious, Inflow Depth > 0.29" for 2-Year event
Inflow = 0.34 cfs @ 16.90 hrs, Volume= 0.239 af
Primary = 0.34 cfs @ 16.90 hrs, Volume= 0.239 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=3.05 cfs 0.161 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>1.39"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=0.51 cfs 0.023 af

Subcatchment A2 I: A2 Runoff Area=59,000 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=315' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=7.40 cfs 0.390 af

Subcatchment A2 P: A2 Runoff Area=31,830 sf 0.00% Impervious Runoff Depth>1.39"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=1.92 cfs 0.085 af

Subcatchment A3 I: A3 Runoff Area=62,920 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=355' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=7.89 cfs 0.416 af

Subcatchment B1 I: B1 Runoff Area=38,135 sf 100.00% Impervious Runoff Depth>3.45"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=4.78 cfs 0.252 af

Subcatchment B1 P: B1 Runoff Area=206,465 sf 7.84% Impervious Runoff Depth>1.52"
 Flow Length=475' Tc=11.5 min CN=76 Runoff=10.92 cfs 0.601 af

Pond A1: A1 Peak Elev=894.98' Inflow=3.57 cfs 0.184 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=3.57 cfs 0.184 af

Pond A2: A2 Peak Elev=895.75' Inflow=9.30 cfs 0.474 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=9.30 cfs 0.474 af

Pond A3: A3 Peak Elev=895.97' Inflow=17.19 cfs 0.890 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=17.19 cfs 0.890 af

Pond P: EXISTING WET POND Peak Elev=890.92' Storage=70,611 cf Inflow=34.45 cfs 1.927 af
 Primary=0.43 cfs 0.311 af Secondary=0.00 cfs 0.000 af Outflow=0.43 cfs 0.311 af

Link 3L: Link Inflow=0.43 cfs 0.311 af
 Primary=0.43 cfs 0.311 af

Total Runoff Area = 9.900 ac Runoff Volume = 1.927 af Average Runoff Depth = 2.34"
53.48% Pervious = 5.295 ac 46.52% Impervious = 4.605 ac

Summary for Subcatchment A1 I: A1

Runoff = 3.05 cfs @ 12.13 hrs, Volume= 0.161 af, Depth> 3.45"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 0.51 cfs @ 12.14 hrs, Volume= 0.023 af, Depth> 1.39"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 7.40 cfs @ 12.13 hrs, Volume= 0.390 af, Depth> 3.45"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 59,000	98	Pavement
59,000		100.00% Impervious Area

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MSE 24-hr 3 10-Year Rainfall=3.82"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	155	0.0280	1.37		Sheet Flow, n= 0.013 P2= 2.65"
0.8	160	0.0280	3.40		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	315	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 1.92 cfs @ 12.14 hrs, Volume= 0.085 af, Depth> 1.39"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 31,830	74	LAWN AREA
31,830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 7.89 cfs @ 12.13 hrs, Volume= 0.416 af, Depth> 3.45"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.82"

Area (sf)	CN	Description
* 62,920	98	Pavement
62,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	300	0.0280	1.56		Sheet Flow, n= 0.013 P2= 2.65"
0.8	55	0.0280	1.11		Sheet Flow, n= 0.013 P2= 2.65"
4.0	355	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 4.78 cfs @ 12.13 hrs, Volume= 0.252 af, Depth> 3.45"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
*	25,000	98	PROP Pavement
	38,135	98	Weighted Average
	38,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot
					Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 10.92 cfs @ 12.20 hrs, Volume= 0.601 af, Depth> 1.52"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-Year Rainfall=3.82"

	Area (sf)	CN	Description
	190,285	74	>75% Grass cover, Good, HSG C
*	16,180	100	Wet Pond
	206,465	76	Weighted Average
	190,285		92.16% Pervious Area
	16,180		7.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0350	0.19		Sheet Flow, Soccer field
					Grass: Short n= 0.150 P2= 2.65"
2.9	375	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale
					Grassed Waterway Kv= 15.0 fps
11.5	475	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 2.92" for 10-Year event
 Inflow = 3.57 cfs @ 12.13 hrs, Volume= 0.184 af
 Outflow = 3.57 cfs @ 12.13 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.57 cfs @ 12.13 hrs, Volume= 0.184 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 894.98' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 ' S= 0.0117 ' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=3.41 cfs @ 12.13 hrs HW=894.91' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 3.41 cfs @ 4.34 fps)

Summary for Pond A2: A2

Inflow Area = 2.085 ac, 64.96% Impervious, Inflow Depth > 2.73" for 10-Year event
 Inflow = 9.30 cfs @ 12.13 hrs, Volume= 0.474 af
 Outflow = 9.30 cfs @ 12.13 hrs, Volume= 0.474 af, Atten= 0%, Lag= 0.0 min
 Primary = 9.30 cfs @ 12.13 hrs, Volume= 0.474 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 895.75' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=8.89 cfs @ 12.13 hrs HW=895.51' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 8.89 cfs @ 7.24 fps)

Summary for Pond A3: A3

Inflow Area = 3.530 ac, 79.30% Impervious, Inflow Depth > 3.03" for 10-Year event
 Inflow = 17.19 cfs @ 12.13 hrs, Volume= 0.890 af
 Outflow = 17.19 cfs @ 12.13 hrs, Volume= 0.890 af, Atten= 0%, Lag= 0.0 min
 Primary = 17.19 cfs @ 12.13 hrs, Volume= 0.890 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 895.97' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500

Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=16.43 cfs @ 12.13 hrs HW=895.68' (Free Discharge)

↑1=Culvert (Inlet Controls 16.43 cfs @ 9.30 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 46.52% Impervious, Inflow Depth > 2.34" for 10-Year event
Inflow = 34.45 cfs @ 12.14 hrs, Volume= 1.927 af
Outflow = 0.43 cfs @ 18.64 hrs, Volume= 0.311 af, Atten= 99%, Lag= 390.1 min
Primary = 0.43 cfs @ 18.64 hrs, Volume= 0.311 af
Routed to Link 3L : Link
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 890.92' @ 18.64 hrs Surf.Area= 25,233 sf Storage= 70,611 cf

Plug-Flow detention time= 322.3 min calculated for 0.311 af (16% of inflow)
Center-of-Mass det. time= 171.8 min (930.9 - 759.1)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	132,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	16,180	0	0
888.00	17,500	9,262	9,262
889.00	19,700	18,600	27,862
890.00	22,200	20,950	48,812
891.00	25,500	23,850	72,662
892.00	29,800	27,650	100,312
893.00	34,300	32,050	132,362

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.43 cfs @ 18.64 hrs HW=890.92' (Free Discharge)

↑1=Culvert (Passes 0.43 cfs of 3.77 cfs potential flow)

↑2=Orifice/Grate (Orifice Controls 0.43 cfs @ 8.81 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=887.45' (Free Discharge)

↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 46.52% Impervious, Inflow Depth > 0.38" for 10-Year event
Inflow = 0.43 cfs @ 18.64 hrs, Volume= 0.311 af
Primary = 0.43 cfs @ 18.64 hrs, Volume= 0.311 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A1 I: A1 Runoff Area=24,360 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=130' Slope=0.0200 '/' Tc=6.0 min CN=98 Runoff=5.15 cfs 0.275 af

Subcatchment A1 P: A1 Runoff Area=8,530 sf 0.00% Impervious Runoff Depth>3.39"
 Flow Length=105' Slope=0.0380 '/' Tc=6.0 min CN=74 Runoff=1.23 cfs 0.055 af

Subcatchment A2 I: A2 Runoff Area=59,000 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=315' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=12.48 cfs 0.667 af

Subcatchment A2 P: A2 Runoff Area=31,830 sf 0.00% Impervious Runoff Depth>3.39"
 Flow Length=75' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=4.60 cfs 0.206 af

Subcatchment A3 I: A3 Runoff Area=62,920 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=355' Slope=0.0280 '/' Tc=6.0 min CN=98 Runoff=13.31 cfs 0.711 af

Subcatchment B1 I: B1 Runoff Area=38,135 sf 100.00% Impervious Runoff Depth>5.91"
 Flow Length=125' Slope=0.0350 '/' Tc=6.0 min CN=98 Runoff=8.07 cfs 0.431 af

Subcatchment B1 P: B1 Runoff Area=206,465 sf 7.84% Impervious Runoff Depth>3.58"
 Flow Length=475' Tc=11.5 min CN=76 Runoff=25.50 cfs 1.415 af

Pond A1: A1 Peak Elev=896.91' Inflow=6.38 cfs 0.331 af
 12.0" Round Culvert n=0.010 L=60.0' S=0.0117 '/' Outflow=6.38 cfs 0.331 af

Pond A2: A2 Peak Elev=903.57' Inflow=17.08 cfs 0.873 af
 15.0" Round Culvert n=0.011 L=135.0' S=0.0050 '/' Outflow=17.08 cfs 0.873 af

Pond A3: A3 Peak Elev=904.51' Inflow=30.39 cfs 1.584 af
 18.0" Round Culvert n=0.011 L=55.0' S=0.0076 '/' Outflow=30.39 cfs 1.584 af

Pond P: EXISTING WET POND Peak Elev=892.69' Storage=122,049 cf Inflow=66.64 cfs 3.760 af
 Primary=0.53 cfs 0.404 af Secondary=3.84 cfs 0.684 af Outflow=4.38 cfs 1.088 af

Link 3L: Link Inflow=4.38 cfs 1.088 af
 Primary=4.38 cfs 1.088 af

Total Runoff Area = 9.900 ac Runoff Volume = 3.760 af Average Runoff Depth = 4.56"
53.48% Pervious = 5.295 ac 46.52% Impervious = 4.605 ac

Summary for Subcatchment A1 I: A1

Runoff = 5.15 cfs @ 12.13 hrs, Volume= 0.275 af, Depth> 5.91"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 24,360	98	ROOFS
24,360		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0200	1.15		Sheet Flow, n= 0.013 P2= 2.65"
1.9	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A1 P: A1

Runoff = 1.23 cfs @ 12.13 hrs, Volume= 0.055 af, Depth> 3.39"
 Routed to Pond A1 : A1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 8,530	74	LAWN AREA
8,530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0380	1.43		Sheet Flow, LAWN n= 0.013 P2= 2.65"
1.2	105	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 I: A2

Runoff = 12.48 cfs @ 12.13 hrs, Volume= 0.667 af, Depth> 5.91"
 Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 59,000	98	Pavement
59,000		100.00% Impervious Area

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MSE 24-hr 3 100-Year Rainfall=6.41"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	155	0.0280	1.37		Sheet Flow, n= 0.013 P2= 2.65"
0.8	160	0.0280	3.40		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	315	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A2 P: A2

Runoff = 4.60 cfs @ 12.13 hrs, Volume= 0.206 af, Depth> 3.39"
Routed to Pond A2 : A2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 31,830	74	LAWN AREA
31,830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0500	1.49		Sheet Flow, LAWN n= 0.013 P2= 2.65"
0.8	75	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment A3 I: A3

Runoff = 13.31 cfs @ 12.13 hrs, Volume= 0.711 af, Depth> 5.91"
Routed to Pond A3 : A3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

Area (sf)	CN	Description
* 62,920	98	Pavement
62,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	300	0.0280	1.56		Sheet Flow, n= 0.013 P2= 2.65"
0.8	55	0.0280	1.11		Sheet Flow, n= 0.013 P2= 2.65"
4.0	355	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 I: B1

Runoff = 8.07 cfs @ 12.13 hrs, Volume= 0.431 af, Depth> 5.91"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

	Area (sf)	CN	Description
*	2,000	98	Ex Roofs
*	11,135	98	Ex Pavement
*	25,000	98	PROP Pavement
	38,135	98	Weighted Average
	38,135		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	125	0.0350	1.64		Sheet Flow, Parking Lot
					Smooth surfaces n= 0.011 P2= 2.65"
1.3	125	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B1 P: B1

Runoff = 25.50 cfs @ 12.20 hrs, Volume= 1.415 af, Depth> 3.58"
 Routed to Pond P : EXISTING WET POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-Year Rainfall=6.41"

	Area (sf)	CN	Description
	190,285	74	>75% Grass cover, Good, HSG C
*	16,180	100	Wet Pond
	206,465	76	Weighted Average
	190,285		92.16% Pervious Area
	16,180		7.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0350	0.19		Sheet Flow, Soccer field
					Grass: Short n= 0.150 P2= 2.65"
2.9	375	0.0200	2.12		Shallow Concentrated Flow, Grassed Swale
					Grassed Waterway Kv= 15.0 fps
11.5	475	Total			

Summary for Pond A1: A1

Inflow Area = 0.755 ac, 74.07% Impervious, Inflow Depth > 5.25" for 100-Year event
 Inflow = 6.38 cfs @ 12.13 hrs, Volume= 0.331 af
 Outflow = 6.38 cfs @ 12.13 hrs, Volume= 0.331 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.38 cfs @ 12.13 hrs, Volume= 0.331 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 896.91' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	893.60'	12.0" Round Culvert L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 893.60' / 892.90' S= 0.0117 ' S= 0.0117 ' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=6.10 cfs @ 12.13 hrs HW=896.70' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 6.10 cfs @ 7.77 fps)

Summary for Pond A2: A2

Inflow Area = 2.085 ac, 64.96% Impervious, Inflow Depth > 5.02" for 100-Year event
 Inflow = 17.08 cfs @ 12.13 hrs, Volume= 0.873 af
 Outflow = 17.08 cfs @ 12.13 hrs, Volume= 0.873 af, Atten= 0%, Lag= 0.0 min
 Primary = 17.08 cfs @ 12.13 hrs, Volume= 0.873 af
 Routed to Pond A3 : A3

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 903.57' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.88'	15.0" Round Culvert L= 135.0' Ke= 0.500 Inlet / Outlet Invert= 891.88' / 891.20' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=16.32 cfs @ 12.13 hrs HW=902.75' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 16.32 cfs @ 13.30 fps)

Summary for Pond A3: A3

Inflow Area = 3.530 ac, 79.30% Impervious, Inflow Depth > 5.39" for 100-Year event
 Inflow = 30.39 cfs @ 12.13 hrs, Volume= 1.584 af
 Outflow = 30.39 cfs @ 12.13 hrs, Volume= 1.584 af, Atten= 0%, Lag= 0.0 min
 Primary = 30.39 cfs @ 12.13 hrs, Volume= 1.584 af
 Routed to Pond P : EXISTING WET POND

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 904.51' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	891.20'	18.0" Round Culvert L= 55.0' Ke= 0.500

Inlet / Outlet Invert= 891.20' / 890.78' S= 0.0076 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=29.04 cfs @ 12.13 hrs HW=903.60' (Free Discharge)

↑1=Culvert (Inlet Controls 29.04 cfs @ 16.43 fps)

Summary for Pond P: EXISTING WET POND

Inflow Area = 9.900 ac, 46.52% Impervious, Inflow Depth > 4.56" for 100-Year event
Inflow = 66.64 cfs @ 12.14 hrs, Volume= 3.760 af
Outflow = 4.38 cfs @ 13.34 hrs, Volume= 1.088 af, Atten= 93%, Lag= 72.0 min
Primary = 0.53 cfs @ 13.34 hrs, Volume= 0.404 af
Routed to Link 3L : Link
Secondary = 3.84 cfs @ 13.34 hrs, Volume= 0.684 af
Routed to Link 3L : Link

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 892.69' @ 13.34 hrs Surf.Area= 32,919 sf Storage= 122,049 cf

Plug-Flow detention time= 243.2 min calculated for 1.088 af (29% of inflow)
Center-of-Mass det. time= 141.4 min (896.9 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	887.45'	132,362 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.45	16,180	0	0
888.00	17,500	9,262	9,262
889.00	19,700	18,600	27,862
890.00	22,200	20,950	48,812
891.00	25,500	23,850	72,662
892.00	29,800	27,650	100,312
893.00	34,300	32,050	132,362

Device	Routing	Invert	Outlet Devices
#1	Primary	887.45'	10.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 887.45' / 886.75' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	887.45'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	892.50'	18.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.53 cfs @ 13.34 hrs HW=892.69' (Free Discharge)

↑1=Culvert (Passes 0.53 cfs of 4.66 cfs potential flow)

↑2=Orifice/Grate (Orifice Controls 0.53 cfs @ 10.89 fps)

Secondary OutFlow Max=3.80 cfs @ 13.34 hrs HW=892.69' (Free Discharge)

↑3=Broad-Crested Rectangular Weir (Weir Controls 3.80 cfs @ 1.09 fps)

Summary for Link 3L: Link

Inflow Area = 9.900 ac, 46.52% Impervious, Inflow Depth > 1.32" for 100-Year event
Inflow = 4.38 cfs @ 13.34 hrs, Volume= 1.088 af
Primary = 4.38 cfs @ 13.34 hrs, Volume= 1.088 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

MEMO

August 23, 2024

Appendix F – TSS Removal Summary

CROSSWAY CHURCH - TSS REMOVAL SUMMARY

A1	Area (Acres)	TSS Generated (lbs)	Required Removal (%)	Required Removal (lbs)
Roofs	0.56	473.3	80%	378.64
Greenspace	0.20	79.9	80%	63.92
Total	0.76	553.20	-	442.56

A2	Area (Acres)	TSS Generated (lbs)	Required Removal (%)	Required Removal (lbs)
Parking Lot	1.35	3496	80%	2796.8
Greenspace	0.73	291.6	80%	233.28
Total	2.09	3787.60	-	3030.08

A3	Area (Acres)	TSS Generated (lbs)	Required Removal (%)	Required Removal (lbs)
Parking Lot	1.44	3729	80%	2983.2
Total	1.44	3729.00		2983.20

B1	Area (Acres)	TSS Generated (lbs)	Required Removal (%)	Required Removal (lbs)
Roofs	0.05	42.3	80%	33.84
Driveway/Sidewalk	0.61	1871	80%	1496.8
Parking Lot	0.22	569.7	80%	455.76
Greenspace	4.24	1694	80%	1355.2
Permanent Pool	0.50	0	0%	0
Total	5.62	4177.00	-	3341.60

Total	9.90	12246.80	-	9797.44
--------------	-------------	-----------------	----------	----------------

Pond - TSS In 12246.00 lbs
Pond - TSS Out 851.3 lbs
TSS Removed 11394.7 lbs

Required TSS Removal	9797.4 lbs
Proposed BMP TSS Removal	11394.7 lbs
Percent Removal	93.0%

TSS CALCULATIONS - 20426215 CROSSWAY CHURCH

Data file name: G:\20\20426\20426215\00_Project Shared
Docs\Permits\WinSLAMM\20426215 Proposed 08.14.2024.mdb
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee Five
Year Rainfall.ran
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1
WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and
Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst
Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst
Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst
Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and
Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt
Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM
Files\WI_GEO03.ppd
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM
Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/02/66 Study period ending date:
12/29/70
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 08-14-2024 Time: 11:29:52

LU# 1 - Commercial: A1 Total area (ac): 0.760
1 - Roofs 1: 0.560 ac. Pitched Connected Source Area PSD
File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.200 ac. Normal Clayey Low
Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
LU# 2 - Commercial: A2 Total area (ac): 2.080
13 - Paved Parking 1: 1.350 ac. Connected Source Area PSD
File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.730 ac. Normal Clayey Low
Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
LU# 3 - Commercial: A3 Total area (ac): 1.440
13 - Paved Parking 1: 1.440 ac. Connected Source Area PSD
File: C:\WinSLAMM Files\NURP.cpz
LU# 4 - Commercial: B1 Total area (ac): 5.620
1 - Roofs 1: 0.050 ac. Pitched Connected Source Area PSD
File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.220 ac. Connected Source Area PSD
File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 0.610 ac. Connected Source Area PSD File:
C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 4.240 ac. Normal Clayey Low
Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.500 ac. Source Area PSD File

Control Practice 1: Wet Detention Pond CP# 1 (DS) - DS Wet Pond # 2

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5.45

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.25

2. Number of orifices: 1

3. Invert elevation above datum (ft): 5.45

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 18

2. Weir crest width (ft): 10

3. Height from datum to bottom of weir opening: 10.50

Outlet type: Vertical Stand Pipe

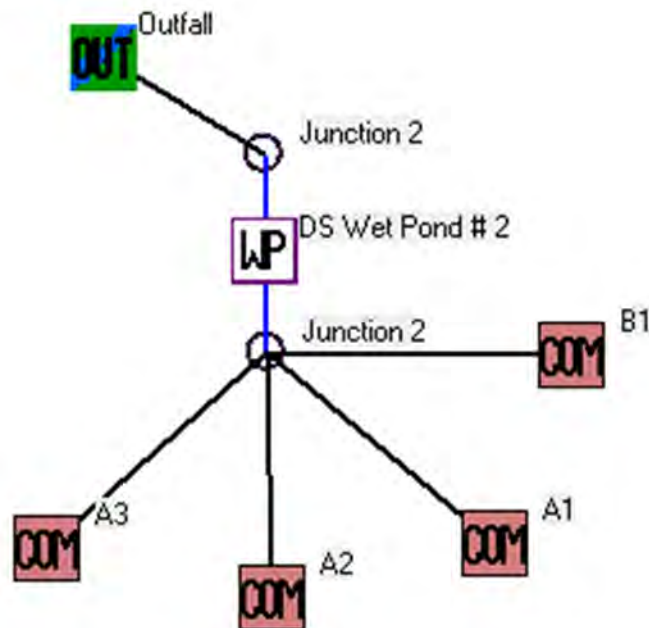
1. Stand pipe diameter (ft): 3

2. Stand pipe height above datum (ft): 10

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.10	0.1140	0.00	0.00
2	1.00	0.1350	0.00	0.00
3	2.00	0.1580	0.00	0.00
4	3.00	0.1810	0.00	0.00
5	4.00	0.2080	0.00	0.00
6	5.00	0.4770	0.00	0.00
7	6.00	0.5320	0.00	0.00
8	7.00	0.5890	0.00	0.00
9	8.00	0.6490	0.00	0.00
10	9.00	0.7230	0.00	0.00
11	10.00	0.8100	0.00	0.00
12	11.00	0.9050	0.00	0.00

Routing Diagram



Wet Pond Input Data

Wet Detention Control Device

Pond Number 1
Drainage System Control Practice

Initial Stage Elevation (ft):

Maximum Inflow into Pond (cfs):

Enter Two Stage Area Values in Rows 1 and 2, and Press to Interpolate

Create Pond Stage-Area Values | Refresh Schematic

Enter fraction (greater than 0) that you want to modify all pond areas by and then select 'Modify Pond Areas' button: | Modify Pond Areas

Copy Pond Data | Paste Pond Data | Recalculate Cumulative Volume

Save or Delete Pond Data to Database File | Get Pond Data From Database File

	Stage (ft)	Area (acres)	Cumulative Volume (ac-ft)
0	0.00	0.0000	0.0000
1	0.10	0.1140	0.006
2	1.00	0.1350	0.118
3	2.00	0.1580	0.264
4	3.00	0.1810	0.434
5	4.00	0.2080	0.628
6	5.00	0.4770	0.971
7	6.00	0.5320	1.475
8	7.00	0.5890	2.036
9	8.00	0.6490	2.655
10	9.00	0.7230	3.341
11	10.00	0.8100	4.107
12	11.00	0.9050	4.965
13			
14			
15			
16			
17			

Only Vertical Dimension to Reference Scale

Add | Sharp Crested Weir

Weir Length (ft):

Height from datum to bottom of weir opening (ft):

Add | V-Notch Weir

Weir Angle (1/20 degrees):

Height from datum to bottom of weir opening (ft):

Number of V-Notch weirs:

Remove | Orifice Set 1

Orifice Diameter (ft):

Invert elevation above datum (ft):

Number of orifices in set:

Add | Orifice Set 2

Orifice Diameter (ft):

Invert elevation above datum (ft):

Number of orifices in set:

Add | Orifice Set 3

Orifice Diameter (ft):

Invert elevation above datum (ft):

Number of orifices in set:

Add | Stone Weeper

Width of bottom of weeper (ft):

Weeper side slope (H:V):

Orifice side slope (H:V):

Orifice bottom side slope (H:V):

Horizontal flow path length at top of weeper (ft):

Average orifice diameter (ft):

Distance from bottom to top of weeper (ft):

Height from datum to bottom of weeper (ft):

Remove | Vertical Stand Pipe

Pipe diameter (ft):

Height above datum (ft):

Month	Evaporation (in/day)	Water Withdraw Rate (ac-ft/day)
Jan	0.00	0.000
Feb	0.00	0.000
Mar	0.00	0.000
Apr	0.00	0.000
May	0.00	0.000
Jun	0.10	0.005
Jul	0.00	0.000
Aug	0.00	0.000
Sep	0.00	0.000
Oct	0.00	0.000
Nov	0.00	0.000
Dec	0.00	0.000

Stage (ft)	Natural Seepage Rate (in/hr)	Other Outflow Rate (cfs)
0.00	0.00	0.000
0.10	0.00	0.000
1.00	0.00	0.000
2.00	0.00	0.000
3.00	0.00	0.000
4.00	0.00	0.000
5.45	0.00	0.000

Remove | Broad Crested Weir (Required)

Weir crest length (ft):

Weir crest width (ft):

Height from datum to bottom of weir opening (ft):

Add | Seepage Basin

Infiltration rate (in/hr):

Width of device (ft):

Length of device (ft):

Invert elevation of seepage basin (ft):

Add | Pump

To Delete This Practice, Right Mouse Click on Icon and Select Delete

Cancel | Continue

Press 'F1' for Help

Control Practice #: 1 | CP Index #: 1

BMP Output Data

Land Uses				Junctions				Control Practices							
Runoff Volume				Part. Solids Yield (lbs)						Part. Solids Conc. (mg/L)					
Data File: G:\20\20426\20426215\SLAMM\20426215 Proposed 08.14.2024.mdb															
Rain File: WisReg - Milwaukee Fi															
Date: 08-14-24 Time: 11:16:35 A															
Site Description:															
Col. #:	2	4	5	6	7	8	9	10	11	12	13	14	15		
Control Practice No.	Control Practice Type	Total Inflow Volume (cf)	Total Outflow Volume (cf)	Percent Volume Reduction	Total Influent Load (lbs)	Total Effluent Load (lbs)	Percent Load Reduction	Flow Weighted Influent Conc (mg/L)	Flow Weighted Effluent Conc (mg/L)	Percent Conc. Reduction	Influent Median Part. Size (microns)	Effluent Median Part. Size (microns)	Notes		
1	Wet Detention Pond	1.777E+06	1.779E+06	-0.113	12246	851.3	93.05	110.4	7.667	93.056	7.80	1.09	No Pond Overflows		

Output Summary

File Name:
G:\20\20426\20426215\00_Project Shared Docs\Permits\WinSLAMM\20426215 Proposed 08.14.2024.mdb

Outfall Output Summary

	Runoff Volume (cu. ft.)	Percent Runoff Reduction	Runoff Coefficient (Rv)	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of All Land Uses without Controls	1.777E+06		0.34	110.4	12246	
Outfall Total with Controls	1.779E+06	-0.11 %	0.34	7.667	851.3	93.05 %

Current File Output: Annualized Total After Outfall Controls 356310 Years in Model Run: 4.99 170.5

Print Output Summary to .csv File

Print Output Summary to Text File

Print Output Summary to Printer

Total Area Modeled (ac)
9.900

Total Control Practice Costs

Capital Cost	N/A
Land Cost	N/A
Annual Maintenance Cost	N/A
Present Value of All Costs	N/A
Annualized Value of All Costs	N/A

Perform Outfall Flow Duration Curve Calculations

Receiving Water Impacts Due To Stormwater Runoff

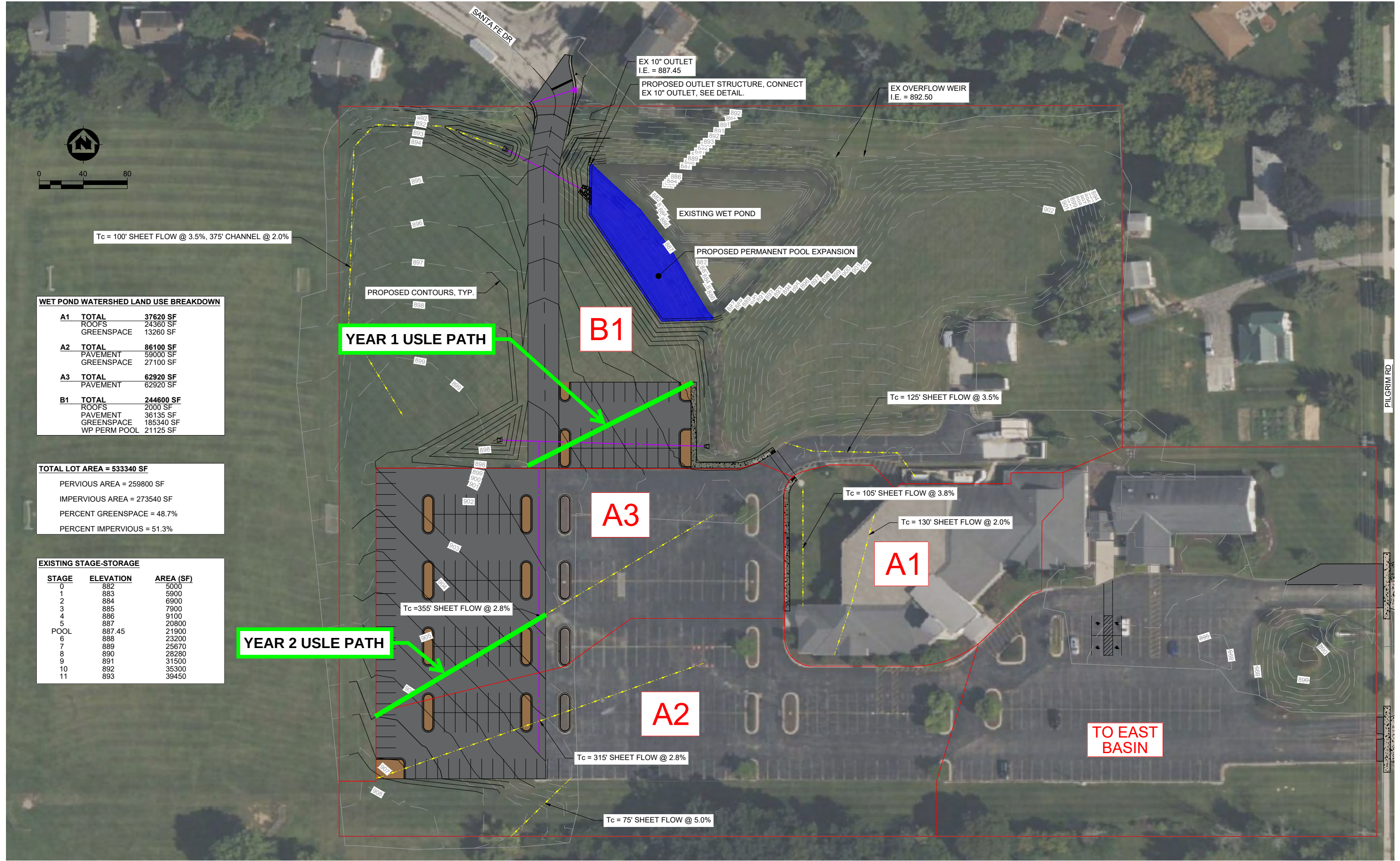
(CWP Impervious Cover Model)

	Calculated Rv	Approximate Urban Stream Classification
Without Controls	0.34	Poor
With Controls	0.34	Poor

MEMO

August 23, 2024

Appendix G – USLE Models



WET POND WATERSHED LAND USE BREAKDOWN

A1	TOTAL	37620 SF
	ROOFS	24360 SF
	GREENSPACE	13260 SF
A2	TOTAL	86100 SF
	PAVEMENT	59000 SF
	GREENSPACE	27100 SF
A3	TOTAL	62920 SF
	PAVEMENT	62920 SF
B1	TOTAL	244600 SF
	ROOFS	2000 SF
	PAVEMENT	36135 SF
B2	TOTAL	185340 SF
	PAVEMENT	185340 SF
	WP PERM POOL	21125 SF

TOTAL LOT AREA = 533340 SF

PERVIOUS AREA = 259800 SF
IMPERVIOUS AREA = 273540 SF
PERCENT GREENSPACE = 48.7%
PERCENT IMPERVIOUS = 51.3%

EXISTING STAGE-STORAGE

STAGE	ELEVATION	AREA (SF)
0	882	5000
1	883	5900
2	884	6900
3	885	7900
4	886	9100
5	887	20800
6	887.45	21900
7	888	23200
8	889	25670
9	890	28280
10	891	31500
11	892	35300
12	893	39450

PROJECT DATE:	DRAWN BY:	NO.	DATE	REVISION	BY:
6/10/2024	KEF	-	-	-	-
	DESIGNED BY:	KEF	-	-	-
	CHECKED BY:	Init	-	-	-

PLOT DATE: 6/10/2024 10:49 AM, G:\2024\26215\04_BIM_CADD_Shared\03_Model_Based Files\20426215 Stormwater.dwg



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CROSSWAY CHURCH IMPROVEMENTS
CROSSWAY CHURCH
GERMANTOWN, WASHINGTON COUNTY, WI

STORMWATER EXHIBIT

PROJECT NO:
20426215
SHEET
EX2



Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

WDNR Version 2.0 (06-29-2017)



YEAR 1

Developer:

CROSSWAY CHURCH (VILLAGE OF GERMANTOWN)

Project:

20426215 CROSSWAY CHURCH IMPROVEMENTS

Date:

05/31/24

County:

Washington

Version 1.0

Activity (1)	Begin Date (2)	End Date (3)	Period % R (4)	Annual R Factor (5)	Sub Soil Texture (6)	Soil Erodibility K Factor (7)	Slope (%) (8)	Slope Length (ft) (9)	LS Factor (10)	Land Cover C Factor (11)	Soil loss A (tons/acre) (12)	SDF (13)	Sediment Control Practice (14)	Sediment Discharge (t/ac) (15)
Bare Ground	08/18/24	10/31/24	23.1%	120	Silt Loam	0.43	2.5%	170	0.28	1.00	3.4	1.076	Silt Fence	2.2
End	10/31/24	-----	-----	-----	-----	-----	2.5%	170	0.28	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	2.5%	170	0.28	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	2.5%	170	0.28	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	2.5%	0	-----	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	0.0%	0	-----	-----	-----	0.000		0.0
TOTAL											3.4		TOTAL	2.2
													% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.

The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.

For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/15-6/1 and 8/1-8/21 Turf, introduced grasses and legumes
Thaw-6/30 Native Grasses, forbs, and legumes

Designed By:	Kassandra Fritz
Date	5/31/2024



Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

WDNR Version 2.0 (06-29-2017)



YEAR 2

Developer:

CROSSWAY CHURCH (VILLAGE OF GERMANTOWN)

Project:

20426215 CROSSWAY CHURCH IMPROVEMENTS

Date:

5/31/2024

County:

Washington

Version 1.0

Activity (1)	Begin Date (2)	End Date (3)	Period % R (4)	Annual R Factor (5)	Sub Soil Texture (6)	Soil Erodibility K Factor (7)	Slope (%) (8)	Slope Length (ft) (9)	LS Factor (10)	Land Cover C Factor (11)	Soil loss A (tons/acre) (12)	SDF (13)	Sediment Control Practice (14)	Sediment Discharge (t/ac) (15)
Bare Ground	07/21/25	09/01/25	24.0%	120	Silt Loam	0.43	2.8%	140	0.30	1.00	3.7	1.047	Inlet Protection	2.7
End	09/01/25	-----	-----	-----	-----	-----	2.8%	140	0.30	-----	-----	0.000	Inlet Protection	0.0
		-----	-----	-----	-----	-----	2.8%	140	0.30	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	2.8%	140	0.30	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	2.8%	0	-----	-----	-----	0.000		0.0
		-----	-----	-----	-----	-----	0.0%	0	-----	-----	-----	0.000		0.0
TOTAL												3.7	TOTAL	2.7
													% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.

The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.

For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

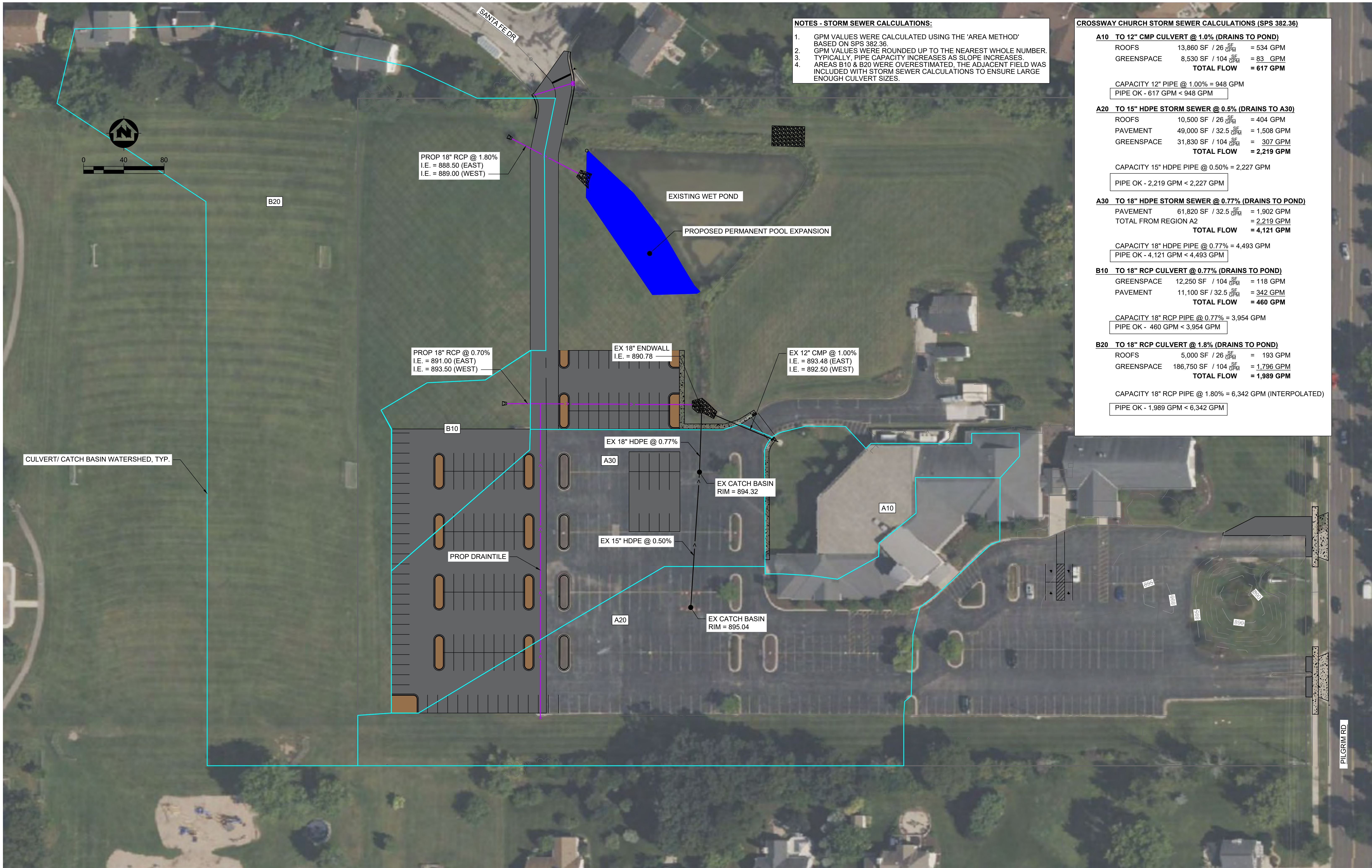
4/15-6/1 and 8/1-8/21 Turf, introduced grasses and legumes
Thaw-6/30 Native Grasses, forbs, and legumes

Designed By:	Kassandra Fritz
Date	5/31/2024

MEMO

August 23, 2024

Appendix H - Storm Sewer Calcs



NOTES - STORM SEWER CALCULATIONS:

1. GPM VALUES WERE CALCULATED USING THE 'AREA METHOD' BASED ON SPS 382.36.
2. GPM VALUES WERE ROUNDED UP TO THE NEAREST WHOLE NUMBER. TYPICALLY, PIPE CAPACITY INCREASES AS SLOPE INCREASES.
3. AREAS B10 & B20 WERE OVERESTIMATED. THE ADJACENT FIELD WAS INCLUDED WITH STORM SEWER CALCULATIONS TO ENSURE LARGE ENOUGH CULVERT SIZES.
- 4.

CROSSWAY CHURCH STORM SEWER CALCULATIONS (SPS 382.36)

A10 TO 12" CMP CULVERT @ 1.0% (DRAINS TO POND)

ROOFS	13,860 SF / 26 $\frac{SF}{GPM}$	=	534 GPM
GREENSPACE	8,530 SF / 104 $\frac{SF}{GPM}$	=	83 $\frac{GPM}{GPM}$
TOTAL FLOW		= 617 GPM	

CAPACITY 12" PIPE @ 1.00% = 948 GPM

PIPE OK - 617 GPM < 948 GPM

A20 TO 15" HDPE STORM SEWER @ 0.5% (DRAINS TO A30)

ROOFS	10,500 SF / 26 $\frac{SF}{GPM}$	=	404 GPM
PAVEMENT	49,000 SF / 32.5 $\frac{SF}{GPM}$	=	1,508 GPM
GREENSPACE	31,830 SF / 104 $\frac{SF}{GPM}$	=	307 GPM
TOTAL FLOW		= 2,219 GPM	

CAPACITY 15" HDPE PIPE @ 0.50% = 2,227 GPM

PIPE OK - 2,219 GPM < 2,227 GPM

A30 TO 18" HDPE STORM SEWER @ 0.77% (DRAINS TO POND)

PAVEMENT	61,820 SF / 32.5 $\frac{SF}{GPM}$	=	1,902 GPM
TOTAL FROM REGION A2		= 2,219 GPM	
TOTAL FLOW		= 4,121 GPM	

CAPACITY 18" HDPE PIPE @ 0.77% = 4,493 GPM

PIPE OK - 4,121 GPM < 4,493 GPM

B10 TO 18" RCP CULVERT @ 0.77% (DRAINS TO POND)

GREENSPACE	12,250 SF / 104 $\frac{SF}{GPM}$	=	118 GPM
PAVEMENT	11,100 SF / 32.5 $\frac{SF}{GPM}$	=	342 GPM
TOTAL FLOW		= 460 GPM	

CAPACITY 18" RCP PIPE @ 0.77% = 3,954 GPM

PIPE OK - 460 GPM < 3,954 GPM

B20 TO 18" RCP CULVERT @ 1.8% (DRAINS TO POND)

ROOFS	5,000 SF / 26 $\frac{SF}{GPM}$	=	193 GPM
GREENSPACE	186,750 SF / 104 $\frac{SF}{GPM}$	=	1,796 GPM
TOTAL FLOW		= 1,989 GPM	

CAPACITY 18" RCP PIPE @ 1.80% = 6,342 GPM (INTERPOLATED)

PIPE OK - 1,989 GPM < 6,342 GPM

PROJECT DATE:	DRAWN BY:	NO.	DATE	REVISION	BY
08-14-2024	KEF	1			
	DESIGNED BY: KEF	2			
	CHECKED BY: Init	3			
PLOT DATE: 8/16/2024 4:51 PM, G:\20\20426\20426215\04_BIM_CADD_Shared\03_Model_Based Files\20426215 Stormwater.dwg					



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CROSSWAY CHURCH IMPROVEMENTS
CROSSWAY CHURCH
GERMANTOWN, WASHINGTON COUNTY, WI

STORM SEWER CALCULATIONS

PROJECT NO. 20426215
SHEET EX3

To: Jeff Retzlaff, Director Comm. Development
From: Brian Kehrli, P.E., MSA
Subject: CrossWay Church Parking Lot Expansion
Date: August 8, 2024

Jeff,

Per your email from Monday, August 8, I offer the following responses.

1. What is happening to the existing landscaped area located in and wrapping around the SW corner of the existing parking lot?
 - a. **There really is no landscaping in this area. There are some assorted rocks/stones that could be a fire pit, but otherwise the area is restored only with grass. The plan is to restore the area with grass at the end of the proposed project as well.**
2. What type & quantity of trees & shrubs are being added within and around the perimeter of the new parking area?
 - a. **Per sheet L201, Landscaping plan associated with the parking lot project, there will be 1 tree planted for each 10 stalls added. There are 107 added parking stalls so 11 trees are required per the ordinance. 12 trees are shown on the sheet L201 to be added as one existing tree will be removed and replaced.**
3. What does the brown color inside the curbed islands represent?
 - a. **The curb/parking lot islands in brown on the plans will be landscaped with bark mulch. One tree will be added to the islands.**
4. A more complete landscape plan is needed.
 - a. **What other landscaping requirements need to be met? Should there be more detail on the landscaping for the islands? More can be added to the Landscaping plans.**
5. What are the days & times of your services and other activities that you anticipate generating traffic that will use the new Sante Fe exit/entrance? Please be specific as to the estimated number of vehicles that will enter/exit the church site before & after services or activities.
 - a. Saturday evenings: 4:30pm
 - b. Sunday morning: 9:00am AND 10:45am
 - c. Christmas Eve Service
 - d. It is estimated that 75 cars per service would utilize the entrance (approximately 25% of the total number of parking stalls available).
6. Will the Sante Fe entrance/exit be gated during non-service/activity days & times to prohibit cut-through traffic and non-church related activity?
 - a. **The goal was to not gate the entrance and keep it free flowing. If there is a requirement to gate the entrance or limit access to Sante Fe Trail, that can be discussed. Allowing access at all times would allow the community to park in the lot when using the park as well.**

MEMO

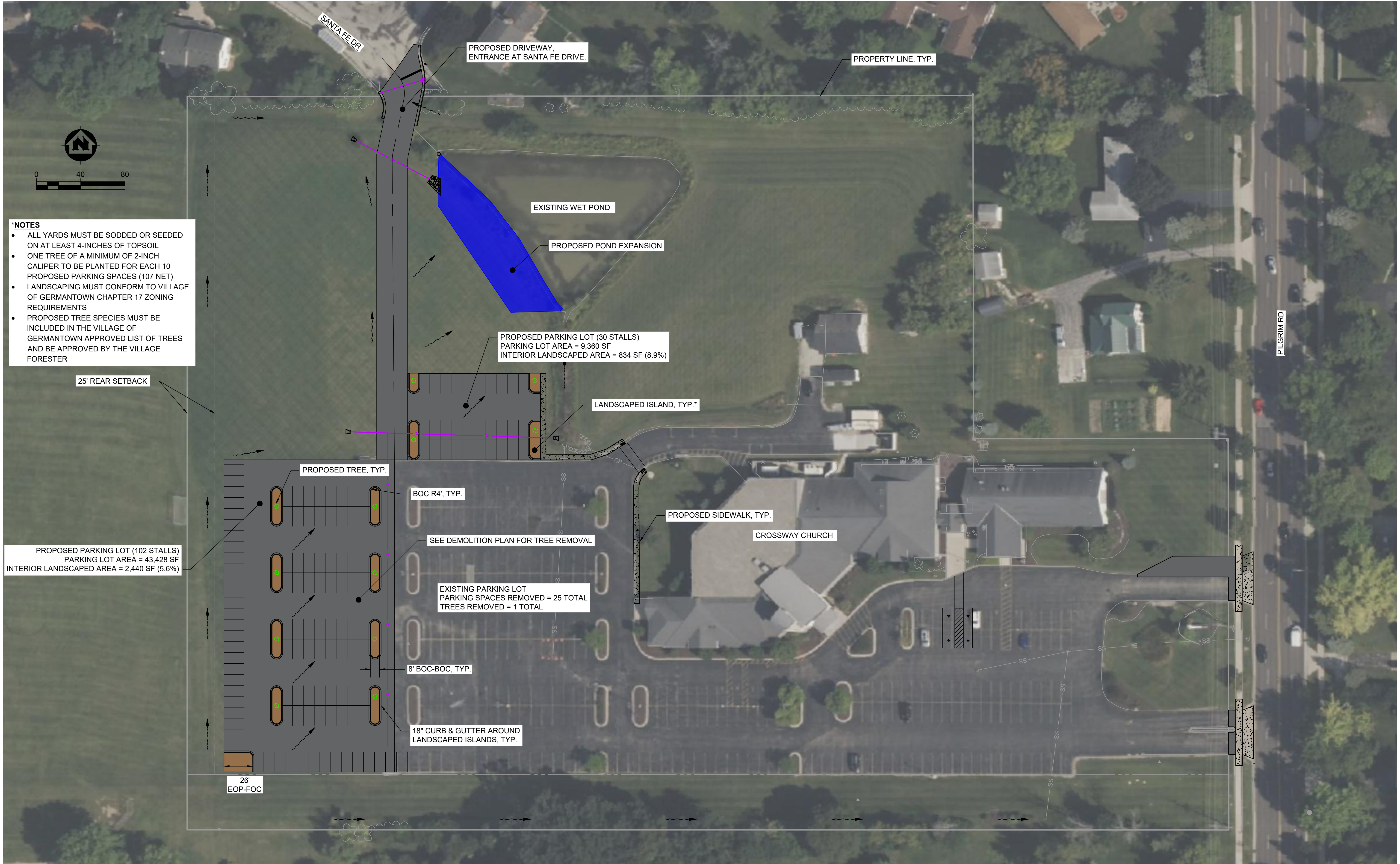
August 8, 2024



SW corner of parking lot looking east.



SW corner of parking lot looking north



- *NOTES**
- ALL YARDS MUST BE SODDED OR SEEDED ON AT LEAST 4-INCHES OF TOPSOIL
 - ONE TREE OF A MINIMUM OF 2-INCH CALIPER TO BE PLANTED FOR EACH 10 PROPOSED PARKING SPACES (107 NET)
 - LANDSCAPING MUST CONFORM TO VILLAGE OF GERMANTOWN CHAPTER 17 ZONING REQUIREMENTS
 - PROPOSED TREE SPECIES MUST BE INCLUDED IN THE VILLAGE OF GERMANTOWN APPROVED LIST OF TREES AND BE APPROVED BY THE VILLAGE FORESTER

PROPOSED PARKING LOT (102 STALLS)
PARKING LOT AREA = 43,428 SF
INTERIOR LANDSCAPED AREA = 2,440 SF (5.6%)

EXISTING PARKING LOT
PARKING SPACES REMOVED = 25 TOTAL
TREES REMOVED = 1 TOTAL

26' EOP-FOC

PROJECT DATE:	DRAWN BY:	NO.	DATE	REVISION	BY:
	KEF	-	-		-
	DESIGNED BY:	KEF	-		-
	CHECKED BY:	Init	-		-
PLOT DATE: 6/10/2024 10:28 AM, G:\20\20426\20426215\05_bim_cadd_discipline\06_Civil\construction documents\20426215 PROPOSED SITE PLAN.dwg					



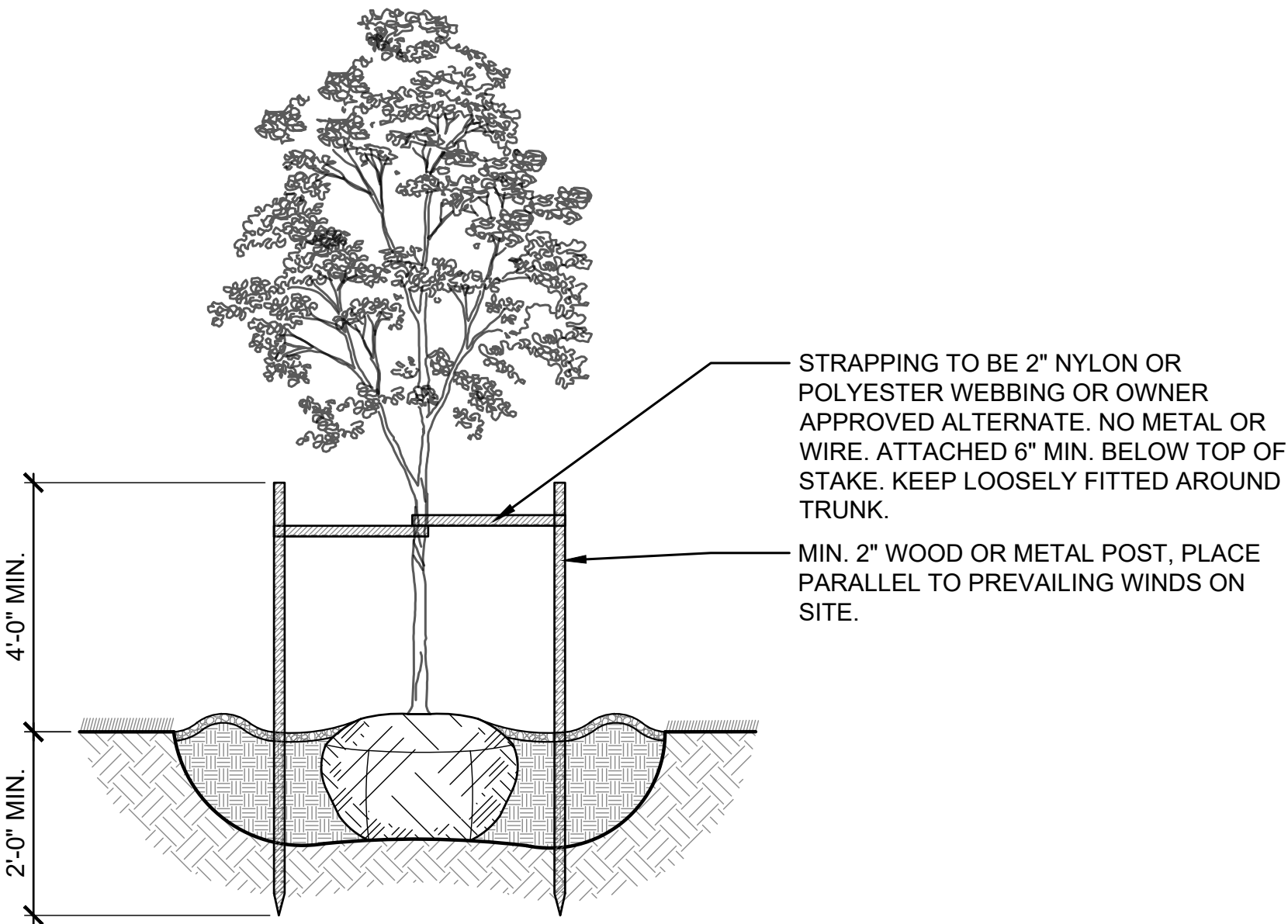
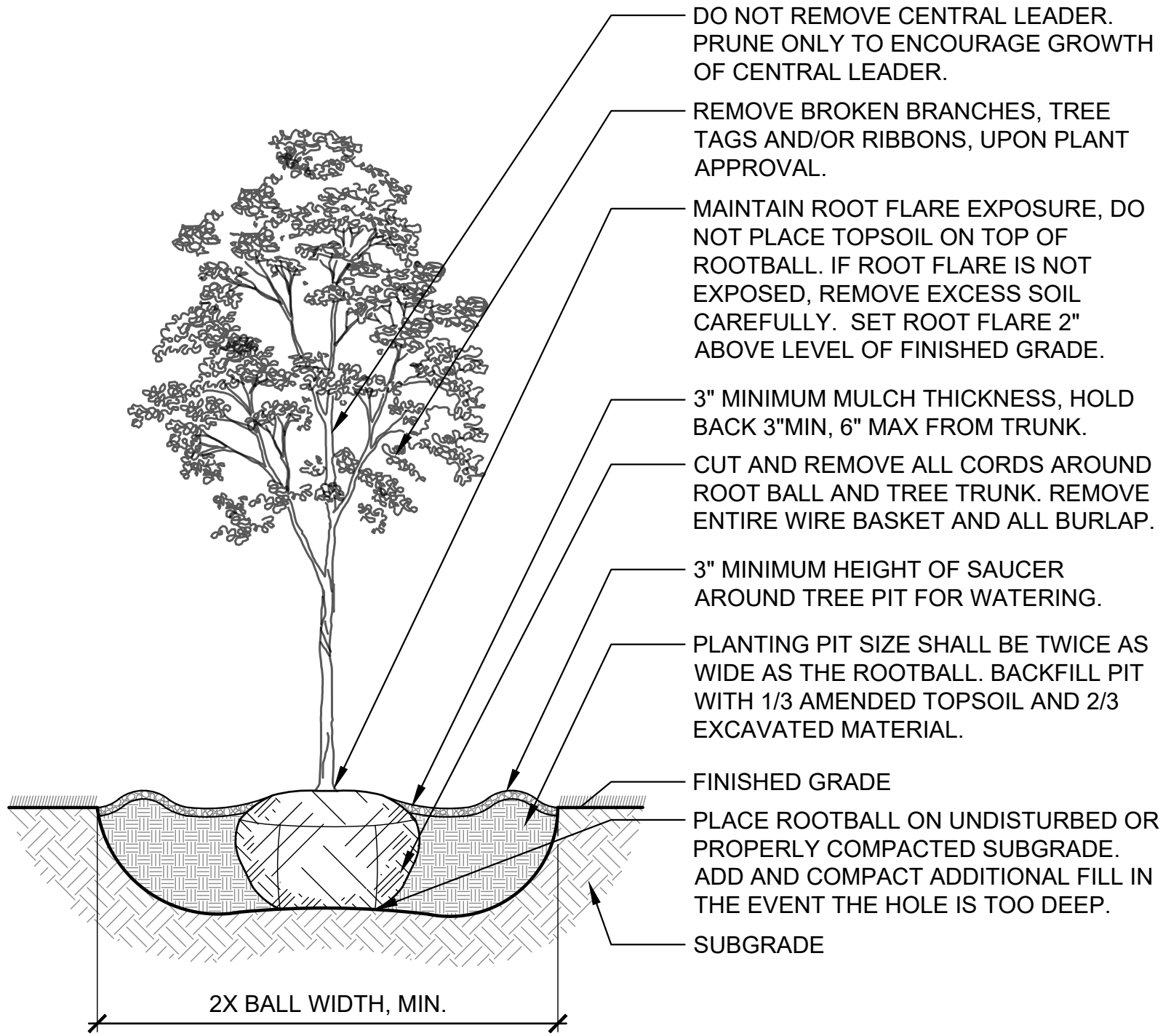
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CROSSWAY CHURCH IMPROVEMENTS
CROSSWAY CHURCH
GERMANTOWN, WASHINGTON COUNTY, WI

PROPOSED LANDSCAPING PLAN

PROJECT NO:
20426215
SHEET
L201

NOTE:
1. REMOVE AND PROPERLY DISPOSE OF ANY EXCESS EXCAVATED MATERIAL
2. WRAP TRUNK WITH APPROVED TREE WRAP UP TO FIRST BRANCH. (FALL PLANTING REQUIREMENT).



PROJECT DATE:	DRAWN BY:	NO.	DATE	REVISION	BY:
	KEF	.	.	.	.
	DESIGNED BY: KEF	.	.	.	.
	CHECKED BY: Init	.	.	.	.
PLOT DATE: 6/10/2024 10:28 AM, G:\20\20426\20426215\05_bim_cadd_discipline\06_Civil\construction documents\20426215 PROPOSED SITE PLAN.dwg					



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CROSSWAY CHURCH IMPROVEMENTS
CROSSWAY CHURCH
GERMANTOWN, WASHINGTON COUNTY, WI

LANDSCAPING DETAILS

PROJECT NO: 20426215
SHEET L501

From: [Brian Kehrli](#)
To: [Jeff Retzlaff](#)
Cc: [Ben Cartland](#); [Emily Girdauskas](#)
Subject: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road
Date: Tuesday, August 20, 2024 3:53:37 PM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[2024-08-20 Sample Landscaping Plan - Screening.pdf](#)

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Jeff,

I believe understand the issue better now. Thanks for the clarification. I missed the requirement for the 5-8 foot buffer/screening requirement. See my comments below. I plan to complete a revised landscaping plan and hope to complete that by noon on Friday. The goal of the plan will be to design clusters of landscaping together, like assorted evergreens then 4-5 landscaping beds with shrubs and flowers, then 3-4 other larger deciduous trees. These clusters would be 20 feet apart from each other and 20 feet from deciduous trees. See attached sketch. Can you confirm the redline is the area where we need the screening?

- In the development of new subdivisions, commercial property, industrial, elderly housing, multifamily and institutional properties, the Village Forester and/or Village Plan Commission will review landscape plans provided by the developer (**provided in the plans**) and shall require that street trees be planted ✓, or payment in lieu of planting (to be made in an amount to be determined by the Village Forester per tree), for any of the streets, parking lots, outlots, parks and other public places contained within or abutting lands henceforth developed and/or subdivided.
- The developer will submit a tree removal plan that shows exact trees proposed to be removed in the new development, and such removals shall be subject to approval of the Forester and/or the Plan Commission. The developer will also provide a plan specifying methods of protecting trees not listed for removal. **Removals plan submitted along with the landscaping plan for the parking lot.**

All developments subject to this section shall be required to comply with minimum landscaping standards, as follows:

~~Residential Development.~~

- ~~All yards sodded or seeded on at least 4 inches of topsoil.~~
- ~~Two trees and/or shrubs per dwelling unit. Trees shall be a minimum of 1½~~

inches in diameter and shrubs shall be a minimum of 3 years old, with placement according to the plan approved under subsection (a) above.

Nonresidential Development.

- All yards sodded or seeded on at least 4 inches of topsoil. ✓
- Trees and shrubbery appropriate for the development, and according to the plan approved under subsection (a) above.
 - **Is this proposed by the developer or determine by the Village?**

Parking Lot Landscaping: In parking lots, at least 5% of the interior parking area shall be landscaped with plantings, and one tree of a minimum 2-inch caliper, for each 10 spaces, all as shall be submitted and approved as part of the plan provided for herein above. Planting required within the parking lot shall be in addition to, and not in lieu of, other planting requirements, such as for street trees.

- **Greater than 5% of the interior lot area is landscaped islands. 12 trees were added to the project to satisfy this requirement. Is it up to the developer to determine the “additional plantings” for each of the islands? At this point would it be better to wait for a comment from the plan commission or propose plantings in the islands? That is mentioned in the landscaping design document from the Village.**

Parking lot street frontage screening and perimeter screening shall be a minimum of 5 feet wide **(8-foot wide in the landscaping design document)**.

Parking lot landscaping shall be located in protected areas, such as along walkways, in center islands, at the ends of bays, or between parking stalls. All landscaping in parking areas and on the street frontage shall be placed so that it will not obstruct sight lines and distances.

- **Trees were added to the islands in the parking lot, 1 per every 10 added stalls.**
- A mixture of hardy flowering and/or decorative evergreen and deciduous trees which shall be selected by the developer from an approved list of types and species of plantings and trees to be provided by the Village, shall be planted. Evergreens shall be used along the perimeter of the lot for screening from adjacent properties, and the deciduous trees for shade within the lot. Areas between trees shall be mulched or planted with shrubs or ground cover. Any landscaped area that will be under the overhang of vehicles shall be mulched or covered with decorative paving material.
 - **The plan is to do this around the south and west edge of the new parking lot basically up to Santa Fe Drive.**



Brian Kehrli, PE | Principal Project Manager
MSA Professional Services, Inc.
(o) (608) 355-8887

(c) (608) 963-2476



From: Brian Kehrli <BKehrli@msa-ps.com>
Sent: Thursday, August 8, 2024 3:18 PM
To: Jeff Retzlaff <jretzlaff@germantownwi.gov>
Cc: Emily Girdauskas <egird@prarch.com>; benc@crosswayc.org
Subject: RE: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road

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Jeff,

Attached is my response to Planning and Zoning staff questions.

The only real question I have is about the landscaping plan. I only saw requirements for trees and nothing else in the ordinance. If I'm missing something, I can revise it. The attached memo responds to the six original questions.

I will be responding to the engineering questions in a separate email.



Brian Kehrli, PE | Principal Project Manager
MSA Professional Services, Inc.
(o) (608) 355-8887
(c) (608) 963-2476

From: Jeff Retzlaff <jretzlaff@germantownwi.gov>
Sent: Thursday, August 8, 2024 1:54 PM
To: Brian Kehrli <BKehrli@msa-ps.com>
Cc: Emily Girdauskas <egird@prarch.com>; benc@crosswayc.org

Subject: [EXTERNAL] RE: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road

If we can get the revised plans & documents by 12 noon tomorrow, we can probably keep the application on the agenda.

Otherwise, the other option I can offer at this point is a special meeting of the PC on August 26. We're trying to keep the approval process moving for a few other proposals as well and it looks like we're going to be having an additional August PC meeting on the 26th.

I recommend we move the parking lot expansion to that meeting.

Thanks.

Jeff

From: Brian Kehrli <BKehrli@msa-ps.com>

Sent: Thursday, August 8, 2024 10:59 AM

To: Jeff Retzlaff <jretzlaff@germantownwi.gov>

Cc: Emily Girdauskas <egird@prarch.com>; benc@crosswayc.org

Subject: RE: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road

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Jeff,

I plan to have some revised drawings and submittal documents for the meeting on Monday. The parking lot needs to be on the agenda for Monday night in order to keep our planned schedule. We just hit a bad week with lots of staff in the field and company meetings all week so that turning around these comments is difficult.



Brian Kehrli, PE | Principal Project Manager

MSA Professional Services, Inc.

(o) (608) 355-8887

(c) (608) 963-2476



From: Jeff Retzlaff <jretzlaff@germantownwi.gov>

Sent: Thursday, August 8, 2024 9:58 AM

To: Brian Kehrli <BKehrli@msa-ps.com>

Cc: Emily Girdauskas <egird@prarch.com>; benc@crosswayc.org

Subject: [EXTERNAL] RE: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road

Brian:

Do you anticipate submitting additional and/or revised information addressing the items below today or tomorrow?

We're preparing our PC meeting agenda and packet materials for next Monday's PC meeting and are wondering if we will be able to put this on the agenda for Aug 12 or move it to Sept 9.

We will need to get revised plans or other information no later than 12 noon on Friday in order to get on the Aug 12 agenda.

Having just talked to Emily G regarding the 2,200 sqft infill addition project for Crossway Church, it may be possible to schedule both for the Sept 9 PC meeting.

Please let me know ASAP.

Thanks.

Jeff

Jeffrey W. Retzlaff, AICP
Director, Community Development Department
Village Planner/Zoning Administrator
jretzlaff@village.germantown.wi.us
1-262-250-4735

How was your experience? [Provide feedback here.](#)

From: Jeff Retzlaff

Sent: Monday, August 5, 2024 11:04 AM

To: Brian Kehrli <BKehrli@msa-ps.com>; Debbie Remich <dremich@germantownwi.gov>

Cc: Emily Girdauskas <egird@prarch.com>; benc@crosswayc.org

Subject: RE: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road

Brian:

I understand that the attached engineering review comments were not forwarded to you. I apologize for the delay.

Please reach out to Brad Seubert or Kevin Driscoll to directly for clarification or to discuss the comments.

Also, please address the following comments from Planning & Zoning Staff:

1. What is happening to the existing landscaped area located in and wrapping around the SW corner of the existing parking lot?
2. What type & quantity of trees & shrubs are being added within and around the perimeter of the new parking are?

3. What does the brown color inside the curbed islands represent?
4. A more complete landscape plan is needed.
5. What are the days & times of your services and other activities that you anticipate generating traffic that will use the new Sante Fe exit/entrance? Please be specific as to the estimated number of vehicles that will enter/exit the church site before & and after services or activities.
6. Will the Sante Fe entrance/exit be gated during non-service/activity days & times to prohibit cut-through traffic and non-church related activity?

Thanks.

Jeffrey W. Retzlaff, AICP
Director, Community Development Department
Village Planner/Zoning Administrator
jretzlaff@village.germantown.wi.us
1-262-250-4735

How was your experience? [Provide feedback here.](#)

From: Brian Kehrli <BKehrli@msa-ps.com>
Sent: Friday, June 14, 2024 3:55 PM
To: Jeff Retzlaff <jretzlaff@germantownwi.gov>; Debbie Remich <dremich@germantownwi.gov>
Cc: Emily Girdauskas <egird@prarch.com>; benc@crosswayc.org; Jordan Yanke <jyanke@germantownwi.gov>; Kevin Driscoll <kdriscoll@Germantownwi.gov>
Subject: RE: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road

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Jeff,

Thank you for this.

Debbie,

I will forward the separate checks next week to the Village.



Brian Kehrli, PE | Principal Project Manager
MSA Professional Services, Inc.
(o) (608) 355-8887
(c) (608) 963-2476
  

From: Jeff Retzlaff <jretzlaff@germantownwi.gov>
Sent: Friday, June 14, 2024 3:53 PM
To: Brian Kehrli <BKehrli@msa-ps.com>; Debbie Remich <dremich@germantownwi.gov>
Cc: Emily Girdauskas <egird@prarch.com>; benc@crosswayc.org; Jordan Yanke <jyanke@germantownwi.gov>; Kevin Driscoll <kdriscoll@Germantownwi.gov>
Subject: [EXTERNAL] RE: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road

We received the information, forwarded it to the correct people, and have copied it to our files.
There's no need to re-send anything at this point.
Separate checks appropriately labeled for each is appreciated.
Thanks.

Jeffrey W. Retzlaff, AICP
Director, Community Development Department
Village Planner/Zoning Administrator
jretzlaff@village.germantown.wi.us
1-262-250-4735

How was your experience? [Provide feedback here.](#)

From: Brian Kehrli <BKehrli@msa-ps.com>
Sent: Friday, June 14, 2024 3:21 PM
To: Debbie Remich <dremich@germantownwi.gov>
Cc: Emily Girdauskas <egird@prarch.com>; benc@crosswayc.org; Jordan Yanke <jyanke@germantownwi.gov>; Kevin Driscoll <kdriscoll@Germantownwi.gov>; Jeff Retzlaff <jretzlaff@germantownwi.gov>
Subject: RE: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road

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Debbie,

I apologize for the confusion on my end with this plan submittal for site improvements at CrossWay Church, W156N10041 Pilgrim Road. I originally sent all information via email to Jeff Retzlaff and Kevin Driscoll on Monday, June 10, 2024 in preparation for the August 12, 2024 plan commission meeting. I understand if the application and supplemental information wasn't forwarded to you. I can send you a full submittal on Monday. Please let me know.

The only other outstanding item now are the fees. We are submitting for Plan Commission review and per Jeff's email below, that fee is \$2,095. I also submitted for an erosion control plan permit which is another \$1,262.30 based on disturbance area. Can I send a check for the total of \$3,357.30 or do these need to be separate checks labeled for each application.

Please let me know about the items above and I will expedite these last remaining items to the Village.

Thank you in advance.



Brian Kehrli, PE | Principal Project Manager

MSA Professional Services, Inc.

(o) (608) 355-8887

(c) (608) 963-2476



From: Jeff Retzlaff <jretzlaff@germantownwi.gov>

Sent: Friday, June 14, 2024 3:09 PM

To: Brian Kehrli <BKehrli@msa-ps.com>; Kevin Driscoll <kdriscoll@Germantownwi.gov>

Cc: Emily Girdauskas <egird@prarch.com>; benc@crosswayc.org; Debbie Remich <dremich@germantownwi.gov>; Jordan Yanke <jyanke@germantownwi.gov>

Subject: [EXTERNAL] RE: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road

Brian:

For future reference, all development applications to be filed, including supplemental information submitted after an initial application is filed, must be sent to (or dropped off) at the Planning & Zoning counter in Village Hall. Applications like the Site Plan application you are submitting are processed through the Community Development Department (Planning & Zoning).

Coordinate all future submittals and direct any questions about the review process with Deb Remich in Planning & Zoning. As the process moves forward, you and your team will work through/with either Jordan Yanke, Associate Planner, or me as Planning & Zoning Staff and other Village department staff involved in the review & approval process, e.g. Kevin Driscoll, Village Engineer.

With that said, your Site Plan application materials (including storm water mgmt) have been received

and are being processed in anticipation of scheduling on the August 12 Plan Commission agenda.
Staff review comments will be prepared and sent to you once available.
With respect to the Site Plan fee, it is \$2,095 payable with a check.
Contact us with questions or concerns.
Thanks.

Jeffrey W. Retzlaff, AICP
Director, Community Development Department
Village Planner/Zoning Administrator
jretzlaff@village.germantown.wi.us
1-262-250-4735

How was your experience? [Provide feedback here.](#)

From: Brian Kehrli <BKehrli@msa-ps.com>
Sent: Monday, June 10, 2024 2:15 PM
To: Kevin Driscoll <kdriscoll@Germantownwi.gov>; Jeff Retzlaff <jretzlaff@germantownwi.gov>
Cc: Emily Girdauskas <egird@prarch.com>; benc@crosswayc.org
Subject: CrossWay Church - Parking Lot Expansion - W156N10041 Pilgrim Road

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Kevin, Jeff,

I believe I have most of the submittal documents for the parking lot expansion, driveway connection to Sante Fe Drive and driveway reconstruction for Pilgrim Drive projects planned for CrossWay Church located at W156N10041 Pilgrim Road. The link below will access a zip folder with the following information:

- 1 – Memo for the site improvements (attached and in the link below)
- 2 – Site Plan Review Application (attached and in the link below)
- 3 – Erosion Control Permit Application
- 4 – Plans for the site work
- 5 – GIS Map showing the site location
- 6 – Storm Water related documents including the permit application

I need some assistance with the site plan review application, specifically the fee. I'm not sure which

fee applies to the site work. The total disturbance area is around 3.5 acres (150,000 sf) if that helps narrow down the type of permit/review required. There is no building addition/remodel included in with this submittal, just the site work. Once I get this fee, I will submit the full fee including the erosion control fee for the submittal. Please let me know how the Village would like the fee (check mailed or an ACH online check/payment, or other).

Please also note, I am working to get the storm water permit signed. I have signed it, but need the owner's signature.

I am available to discuss any part of the project and permit application as needed. Once the Village reviews the permit application and project plans, I assume there will be some changes required. After the changes are completed, we will submit the final hard copies for the plan commission a minimum of 10 days prior to the August 12 meeting.

Document/Application Link:

1. **20426215 Site Plan Review & Stormwater.zip** (33.75 MB) in FileDrop
<https://msa.filegenius.com/downloadPublic/9kcZ8yhcfmldgkz>



Brian Kehrli, PE | Principal Project Manager
MSA Professional Services, Inc.
(o) (608) 355-8887
(c) (608) 963-2476
  

To: Kevin Driscoll, PE, Village Engineer
From: Brian Kehrli, P.E., MSA
Subject: CrossWay Church Parking Lot Addition, Review #1 Comments
Date: August 16, 2024

Items Reviewed:

- | | |
|-------------------------------|------------------|
| 1. Civil Plan Set | Dated: Not dated |
| 2. Stormwater Management Plan | Dated: 6/10/24 |

General Comments:

1. Please respond to each item below. **A written response addressing each item shall be included in your submittal.** OK.
2. The submitted plans have been reviewed for general conformance with State and Village design guidelines. Additional comments could arise as a result of the plan completion and modifications. The items listed below will need to be fully resolved before the Engineering Dept. can recommend a formal approval of the plans and permit for construction. **Noted.**
3. As-builts prepared to Village standards shall be prepared and provided to the Village post-construction (for all applicable items). **Noted.**
4. A professional engineer's original seal is to be affixed, signed and dated on the final set of construction plans. **OK.**
5. Utility permits and permits for work within the ROW are required. Contact the Village engineering department to obtain permits. **We will be contacting the Village shortly to request these.**
6. As a guide to the review response: Items in *italics* are resolved or acknowledged, items in regular font are to be addressed yet, items in **Bold** are additional feedback to remaining original comment. **Noted.**
7. Please date the plans. **OK.**
8. Add a site data table that outlines the disturbed area, existing impervious area, added impervious. **A data table will be added.**

C101 Existing Site

1. Provide an existing site survey with topography stamped by a registered land surveyor. **Existing contours added to the existing site plan. I signed the existing site plan sheet.**

C203 Proposed Site Plan

1. Provide elevations showing proposed ADA parking and route into the building is ADA compliant. **These are added to the grading plan C204.**

C204 Grading Plan

1. Provide additional grading information at the northwest corner of the parking lot to show how water will turn the corner to the east and get into the culvert pipe. This area is intended to flow north to the swale at the north edge of the site. This includes minimal offsite storm water and the storm water from the far west edge of the site.
2. Provide spot elevations in the parking lot. Pavement corners, high points, around the islands, match in points, etc. Added.
3. Provide existing topo for the existing parking lot to east to review drainage patterns. The existing topo is added to the existing site plan in C101. The rest of the parking lot was not surveyed as there were no changes expected.
4. Show overland flow route through the site with large bold arrows. Added.
5. Provide spot elevations to more clearly define the overflow weir from the basin. Add permanent erosion control at the overflow. This information was added to sheet C204.
6. Provide additional spot elevations and existing topo around the Santa Fe Drive intersection. Sheet C508 has numerous spot elevations and all the topo that we shot. A few more spot elevations were added in the intersection outside of the removal limits for reference. What else is desired to be shown?
7. Provide cleanouts on underdrain. Underdrain cleanout and detail provided.
8. Show any fill needed to raise pond berm as noted on the detail. This is added to sheet C204
9. Depression on the west side of the road needs the berm elevation raised to 893 or above to keep that from becoming the overflow. Grading revised.

C501 Erosion Control Details

1. Provide late season stabilization requirements. Late season requirements added.

C507 Driveway Detail – Pilgram Road

1. Provide proposed grading plan. Grades added to this sheet.

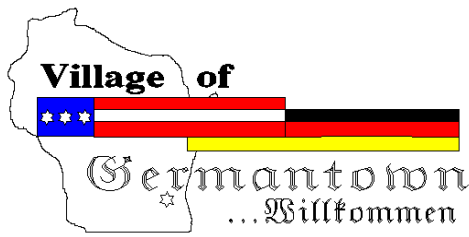
Stormwater Management Plan

1. Show existing topography for the site on the stormwater exhibits OK.
2. Existing stormwater exhibit shows 4 drainage areas, but the calcs include more. Adjust exhibit to match the calcs. The stormwater model was overall split into 4 drainage areas (A1, A2, A3 & B1). In order to properly model Tc and runoff, land use areas are split up by pervious and impervious areas on the HydroCAD model.
3. Calcs include multiple ponds. Label these on the exhibit. The calculations include only the wet pond. The existing catch basins that are located in the parking lot were included with the HydroCAD Model; these are catch basins A2, & A3 in the HydroCAD model. Area A1 includes all of the areas draining to the 12" culvert which drains to the wet pond (this has been adjusted on the model from previously draining to catch basin A2). Catch basin & culvert labels have been added to the exhibit.
4. Review TC times. A1 shows two Tc paths. Other areas show Tc paths running through curb islands. Sheet flow is only allowed until the first turn in direction. Sheet flow is not allowed in channelized flow areas. There are TWO Tc paths for each of the 4 sub watersheds because they are split up by pervious and impervious areas. Tc paths have been updated based on the provided comments.
5. Include Tc calcs printouts from HydroCAD. Tc was modelled as labelled on the stormwater exhibits. Tc less than 6 minutes was overridden to be a minimum Tc of 0.1 hours (6 minutes) per NR151 standards. I have included screenshots of the Tc calculations.
6. Include pond sheets from HydroCAD. I have included screenshots of the pond inputs.
7. Its not clear how the northeastern section of area B1 makes it to the existing basin. It is drained through swales. Flow arrows have been added to the stormwater exhibit.
8. Provide information on the building roof drainage to show how area A1 drains into the basin. The front of the building in A1 drains through area drains to catch basin A2. The building drains to the

MEMO

August 8, 2024

- rear yard which then flows through a 12" culvert northwest to the swale that flows north to the pond. This has been adjusted on the exhibit and stormwater models.
9. The entire site is required to meet the 80% TSS requirement. Including greenspace. The modelled wet pond with proposed expansion removes 93.0% TSS entering the pond, this includes TSS generated from greenspace. I have updated the TSS summary to include 80% TSS removal of greenspace areas in the minimum required removal calculation.
 10. Include the calcs showing how the pound generated by the different source areas was calculated. These were calculated by WinSLAMM. I have included the WinSLAMM excel spreadsheet printout of the particulate solids yields (lbs) at each junction.
 11. Use the Milwaukee rainfall files and correct winter dates in the Slamm model. OK. Winter dates are 12/02-03/12.
 12. Use clayey soil for type C soil per WDNR guidance. OK
 13. Adjust paved parking and driveway for to connected or provide information that they meet the WDNR guidance requirements for disconnected. I have changed all paved and roof areas to connected impervious for the sake of this submittal.
 14. Provide storm sewer calcs. OK.



Engineering Department Memorandum

To : Jeffrey W. Retzlaff, AICP, Planning Director/Zoning Administrator
From : Kevin Driscoll PE, Village Engineer
Date : July 2, 2024
Re : Crossway Church Review #1

Items Reviewed:

- | | |
|-------------------------------|------------------|
| 1. Civil Plan Set | Dated: Not dated |
| 2. Stormwater Management Plan | Dated: 6/10/24 |

General Comments:

1. Please respond to each item below. **A written response addressing each item shall be included in your submittal.**
2. The submitted plans have been reviewed for general conformance with State and Village design guidelines. Additional comments could arise as a result of the plan completion and modifications. The items listed below will need to be fully resolved before the Engineering Dept. can recommend a formal approval of the plans and permit for construction.
3. As-builts prepared to Village standards shall be prepared and provided to the Village post-construction (for all applicable items).
4. A professional engineer's original seal is to be affixed, signed and dated on the final set of construction plans.
5. Utility permits and permits for work within the ROW are required. Contact the Village engineering department to obtain permits.
6. As a guide to the review response: Items in *italics* are resolved or acknowledged, items in regular font are to be addressed yet, items in **Bold** are additional feedback to remaining original comment.
7. Please date the plans.
8. Add a site data table that outlines the disturbed area, existing impervious area, added impervious.

C101 Existing Site

1. Provide an existing site survey with topography stamped by a registered land surveyor.

C203 Proposed Site Plan

1. Provide elevations showing proposed ADA parking and route into the building is ADA compliant.

C204 Grading Plan

1. Provide additional grading information at the northwest corner of the parking lot to show how water will turn the corner to the east and get into the culvert pipe.
2. Provide spot elevations in the parking lot. Pavement corners, high points, around the islands, match in points, etc.
3. Provide existing topo for the existing parking lot to east to review drainage patterns.
4. Show overland flow route through the site with large bold arrows.
5. Provide spot elevations to more clearly define the overflow weir from the basin. Add permanent erosion control at the overflow.
6. Provide additional spot elevations and existing topo around the Santa Fe Drive intersection.
7. Provide cleanouts on underdrain
8. Show any fill needed to raise pond berm as noted on the detail.
9. Depression on the west side of the road needs the berm elevation raised to 893 or above to keep that from becoming the overflow.

C501 Erosion Control Details

1. Provide late season stabilization requirements.

C507 Driveway Detail – Pilgram Road

2. Provide proposed grading plan.

Stormwater Management Plan

3. Show existing topography for the site on the stormwater exhibits
1. Existing stormwater exhibit shows 4 drainage areas, but the calcs include more. Adjust exhibit to match the calcs.
2. Calcs include multiple ponds. Label these on the exhibit.
3. Review TC times. A1 shows two Tc paths. Other areas show Tc paths running through curb islands. Sheet flow is only allowed until the first turn in direction. Sheet flow is not allowed in channelized flow areas.
4. Include Tc calcs printouts from HydroCAD.
5. Include pond sheets from HydroCAD.
6. Its not clear how the northeastern section of area B1 makes it to the existing basin.
7. Provide information on the building roof drainage to show how area A1 drains into the basin.
8. The entire site is required to meet the 80% TSS requirement. Including greenspace.
9. Include the calcs showing how the pound generated by the different source areas was calculated.
10. Use the Milwaukee rainfall files and correct winter dates in the Slamm model.
11. Use clayey soil for type C soil per WDNR guidance.
12. Adjust paved parking and driveway for to connected or provide information that they meet the WDNR guidance requirements for disconnected.
13. Provide storm sewer calcs.

|

To: Kevin Driscoll, PE, Village Engineer
From: Brian Kehrli, P.E., MSA
Subject: CrossWay Church Parking Lot Addition, Review #1 Comments
Date: August 16, 2024

Items Reviewed:

- | | |
|-------------------------------|------------------|
| 1. Civil Plan Set | Dated: Not dated |
| 2. Stormwater Management Plan | Dated: 6/10/24 |

General Comments:

1. Please respond to each item below. **A written response addressing each item shall be included in your submittal.** OK.
2. The submitted plans have been reviewed for general conformance with State and Village design guidelines. Additional comments could arise as a result of the plan completion and modifications. The items listed below will need to be fully resolved before the Engineering Dept. can recommend a formal approval of the plans and permit for construction. **Noted.**
3. As-builts prepared to Village standards shall be prepared and provided to the Village post-construction (for all applicable items). **Noted.**
4. A professional engineer's original seal is to be affixed, signed and dated on the final set of construction plans. **OK.**
5. Utility permits and permits for work within the ROW are required. Contact the Village engineering department to obtain permits. **We will be contacting the Village shortly to request these.**
6. As a guide to the review response: Items in *italics* are resolved or acknowledged, items in regular font are to be addressed yet, items in **Bold** are additional feedback to remaining original comment. **Noted.**
7. Please date the plans. **OK.**
8. Add a site data table that outlines the disturbed area, existing impervious area, added impervious. **A data table will be added.**

C101 Existing Site

1. Provide an existing site survey with topography stamped by a registered land surveyor. **Existing contours added to the existing site plan. I signed the existing site plan sheet.**

C203 Proposed Site Plan

1. Provide elevations showing proposed ADA parking and route into the building is ADA compliant. **These are added to the grading plan C204.**

C204 Grading Plan

1. Provide additional grading information at the northwest corner of the parking lot to show how water will turn the corner to the east and get into the culvert pipe. This area is intended to flow north to the swale at the north edge of the site. This includes minimal offsite storm water and the storm water from the far west edge of the site.
2. Provide spot elevations in the parking lot. Pavement corners, high points, around the islands, match in points, etc. Added.
3. Provide existing topo for the existing parking lot to east to review drainage patterns. The existing topo is added to the existing site plan in C101. The rest of the parking lot was not surveyed as there were no changes expected.
4. Show overland flow route through the site with large bold arrows. Added.
5. Provide spot elevations to more clearly define the overflow weir from the basin. Add permanent erosion control at the overflow. This information was added to sheet C204.
6. Provide additional spot elevations and existing topo around the Santa Fe Drive intersection. Sheet C508 has numerous spot elevations and all the topo that we shot. A few more spot elevations were added in the intersection outside of the removal limits for reference. What else is desired to be shown?
7. Provide cleanouts on underdrain. Underdrain cleanout and detail provided.
8. Show any fill needed to raise pond berm as noted on the detail. This is added to sheet C204
9. Depression on the west side of the road needs the berm elevation raised to 893 or above to keep that from becoming the overflow. Grading revised.

C501 Erosion Control Details

1. Provide late season stabilization requirements. Late season requirements added.

C507 Driveway Detail – Pilgram Road

1. Provide proposed grading plan. Grades added to this sheet.

Stormwater Management Plan

1. Show existing topography for the site on the stormwater exhibits OK.
2. Existing stormwater exhibit shows 4 drainage areas, but the calcs include more. Adjust exhibit to match the calcs. The stormwater model was overall split into 4 drainage areas (A1, A2, A3 & B1). In order to properly model Tc and runoff, land use areas are split up by pervious and impervious areas on the HydroCAD model.
3. Calcs include multiple ponds. Label these on the exhibit. The calculations include only the wet pond. The existing catch basins that are located in the parking lot were included with the HydroCAD Model; these are catch basins A2, & A3 in the HydroCAD model. Area A1 includes all of the areas draining to the 12" culvert which drains to the wet pond (this has been adjusted on the model from previously draining to catch basin A2). Catch basin & culvert labels have been added to the exhibit.
4. Review TC times. A1 shows two Tc paths. Other areas show Tc paths running through curb islands. Sheet flow is only allowed until the first turn in direction. Sheet flow is not allowed in channelized flow areas. There are TWO Tc paths for each of the 4 sub watersheds because they are split up by pervious and impervious areas. Tc paths have been updated based on the provided comments.
5. Include Tc calcs printouts from HydroCAD. Tc was modelled as labelled on the stormwater exhibits. Tc less than 6 minutes was overridden to be a minimum Tc of 0.1 hours (6 minutes) per NR151 standards. I have included screenshots of the Tc calculations.
6. Include pond sheets from HydroCAD. I have included screenshots of the pond inputs.
7. Its not clear how the northeastern section of area B1 makes it to the existing basin. It is drained through swales. Flow arrows have been added to the stormwater exhibit.
8. Provide information on the building roof drainage to show how area A1 drains into the basin. The front of the building in A1 drains through area drains to catch basin A2. The building drains to the

MEMO

August 8, 2024

- rear yard which then flows through a 12" culvert northwest to the swale that flows north to the pond. This has been adjusted on the exhibit and stormwater models.
9. The entire site is required to meet the 80% TSS requirement. Including greenspace. The modelled wet pond with proposed expansion removes 93.0% TSS entering the pond, this includes TSS generated from greenspace. I have updated the TSS summary to include 80% TSS removal of greenspace areas in the minimum required removal calculation.
 10. Include the calcs showing how the pound generated by the different source areas was calculated. These were calculated by WinSLAMM. I have included the WinSLAMM excel spreadsheet printout of the particulate solids yields (lbs) at each junction.
 11. Use the Milwaukee rainfall files and correct winter dates in the Slamm model. OK. Winter dates are 12/02-03/12.
 12. Use clayey soil for type C soil per WDNR guidance. OK
 13. Adjust paved parking and driveway for to connected or provide information that they meet the WDNR guidance requirements for disconnected. I have changed all paved and roof areas to connected impervious for the sake of this submittal.
 14. Provide storm sewer calcs. OK.

SITE PLAN REVIEW
8/26/24 Plan Commission Meeting

CrossWay Church

Village Staff Report & Recommendation

Germantown, Wisconsin

Summary

Emily Girdauskas, Plunkett Raysich Architects, and Ben Cartland, agents for CrossWay Church, property owner, are requesting approval of site development & building plans for a 2,240 sqft building addition and remodeling project for the existing church facility located at W156 N10041 Pilgrim Road.

Property Location: W156 N10041 Pilgrim Road

Agent/

Property Owner: Emily Girdauskas Ben Cartland
Plunkett Raysich CrossWay Church
Milwaukee, WI W156 N10041 Pilgrim Road
 Germantown, WI

Current Zoning: I: Institutional

Adjacent Land Uses		Zoning
North	Residential	Rs-6/Rd-2
South	Residential	Rs-4
East	Residential	Rs-4
West	Institutional (Spassland Park)	I



Proposal

Emily Girdauskas, Plunkett Raysich Architects, and Ben Cartland, agents for CrossWay Church, property owner, are requesting approval of site development & building plans for a 2,240 sqft building addition and remodeling project for the existing church facility located at W156 N10041 Pilgrim Road.

As indicated in the August 8 and August 12 project narratives, the proposed project includes building demolition and a building addition, sidewalk demolition and replacement, and interior remodeling. The entrance to and a portion of the original building built in 1986 will be removed (south elevation). A breezeway that was constructed between the original building and an addition built in 1996 will be removed and replaced with 3,250 of building area constructed between and connecting the two buildings with a new entry, check-in area, toddler classroom, and elevator. A total of 3,250 sqft of building and sidewalk will be replaced with 3,250 sqft of building and sidewalk with no net increase in impervious area.

Exterior materials include split-face CMU block, EIFS, and SmartSide siding painted to match the existing color scheme.

Parking, Access & Traffic Circulation

This project will not change existing parking, access, or traffic circulation on the property.

Storm Water Management

Total area of disturbance for the project is approximately 7,500 sqft with no net increase in impervious area. Consequently, this project will not change nor affect the existing storm water management facilities on the property.

Landscaping & Buffering

Additional landscaping around the building foundation and yard area along the south elevation is proposed. As shown in the landscape plan (Sheet L201), additional plantings that include a variety of ornamental trees, shrubs, grasses and ground cover is proposed.

Lighting. This project will not change existing exterior lighting on the property.

Signage. No new signage is proposed.

Staff Comments**Community Development: Planning & Zoning**

No comment.

Community Development: Building Inspection

State agency (DSPS) approved plans and a \$20,000 occupancy bond are required by Inspection Services at the time of building permit application. The Village of Germantown is an authorized delegated agent of DSPS to provide all commercial plan review and inspection services through SAFEBuilt of WI and the Village of Germantown.

Village Forester

No comment.

Public Works/ Village Engineer/Village Surveyor

No comment.

VILLAGE STAFF RECOMMENDATIONS

APPROVE the site development & building plans for a 2,240 sqft building addition and remodeling project for the CrossWay Church facility located at W156 N10041 Pilgrim Road subject to the following conditions:

1. This approval is for the various plan sheets that comprise the site plan set as noted below and is subject to compliance with all the conditions and requirements set forth herein and subsequently adopted and/or revised by the Plan Commission. Approval is granted for the following unless superseded by subsequent plan sheets approved by Village Staff pursuant to revisions required herein and/or by the Plan Commission:
 - a. *Civil Engineering plans dated August 12, 2024;*
 - b. *Architectural plans dated August 12, 2024;*
 - c. *Landscaping plans dated August 12, 2024*

If revised plan sheets are necessary, each revised sheet shall contain the date of said revision clearly stamped in the lower right corner.

2. All landscaping, screening, grading, and paving improvements shown on the approved site plans shall be installed as proposed prior to issuance of an occupancy permit unless a cash bond or letter of credit in an amount equal to 120 percent of the estimated installation and material costs reviewed and approved by the Village is submitted to the Village as necessary to ensure that installation of the proposed features and improvements will be completed within one (1) year after issuance of the occupancy permit for the shell building.
3. State agency (DSPS) approved plans and a \$20,000 occupancy bond are required by Inspection Services at the time of building permit application. The Village of Germantown is an authorized delegated agent of DSPS to provide all commercial plan review and inspection services through SAFEBuilt of WI and the Village of Germantown.

Village of



Willkommen

Fee must accompany application

- ☒ \$700 Minor Addition
- ☐ \$1,240 Construction <10,000 SF
- ☐ \$2,095 Construction 10,000 SF to 50,000
- ☐ \$3,460 Industrial Construction >50,000 SF
- ☐ \$3,460 Commercial Construction >50,000
- ☐ \$200 Plan Commission Consultation
- ☒ \$125 Fire Department Plan Review

PAID

DATE

8/14/24

CH# 035014 \$825

SITE PLAN REVIEW APPLICATION

Pursuant to Section 17.43 of the Municipal Code

Please read and complete this application carefully. All applications must be signed and dated.

1 APPLICANT OR AGENT

PLUNKETT RAYSICH ARCHITECTS, LLP

EMILY GIRDAUSKAS - ARCHITECT

209 S WATER STREET

MILWAUKEE, WI 53204

Phone (414)410-2916

E-Mail EGIRD@PRARCH.COM

PROPERTY OWNER

CROSSWAY CHURCH

BEN CARTLAND - EXECUTIVE DIR OF OPERATIONS

Phone (262)255-0702

E-Mail BENC@CROSSWAYC.ORG

2 PROPERTY ADDRESS

W156 N10041 PILGRIM ROAD
GERMANTOWN, WI 53022

3 NEIGHBORING USES – Specify name and type of use, e.g. Enviro Tech – Industrial, Smith – Residential, etc.

North	South	East	West
RESIDENTIAL	RESIDENTIAL & COUNTY LINE ELEMENTARY	RESIDENTIAL	SPASSLAND PARK

4 READ AND INITIAL THE FOLLOWING:

X I am aware of the Village of Germantown ordinance requiring fire sprinklers in most new construction.

X I understand that all new development is subject to Impact and/or Connection Fees that must be paid before building permits will be issued.

X I understand that an incomplete application will be withdrawn from the Plan Commission agenda and that all resubmissions to the Plan Commission are subject to a new application fee.

5 SIGNATURES – ALL APPLICATION MUST BE SIGNED BY OWNER!

Emily G. 8/8/2024
Applicant Date

[Signature] 8.8.24
Owner Date

Village of



Germantown

Village of Germantown
Clerk Treasurer
N112W17001 MEQUON ROAD
Germantown, WI 53022
(262) 250-4700
Welcome

08/14/2024 11:19AM Teesa
000685-0002
Payment Effective Date 08/14/2024

MISCELLANEOUS

PLAN COMMISSION REVIEW	
FEEs (GENPLN)	
2024 Item: GENPLN	
1 @ \$825.0000	
PLAN COMMISSION	
REVIEW FEEs (GENPLN)	\$825.00

	\$825.00
Subtotal	\$825.00
Total	\$825.00
CHECK	\$825.00
Check Number 035014	

Change due	\$0.00

Thank you for your payment

Village of Germantown COPY
DUPLICATE RECEIPT

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BENCHMARK TABLE				
POINT #	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP1	3/4" IRON ROD	102,526.39	383,432.39	895.62
CP2	3/4" IRON ROD	102,482.35	383,159.88	897.81
CP3	3/4" IRON ROD	102,308.51	383,408.95	895.86
CP4	3/4" IRON ROD	102,806.50	383,195.94	897.36
CP5	CUT "X" IN CURB	102,633.21	382,753.67	899.43
BM101	BENCHMARK	102,480.72	383,568.07	896.51
BM102	SECTION MONUMENT	102,464.94	383,554.83	893.89

NOT FOR CONSTRUCTION
2024 PLUNKETT RAYSON ARCHITECTS, LLP

PLAN COMMISSION
DATE: 08/12/2024
JOB NO: 230149-02
SHEET NO:

C101

EXISTING SITE PLAN

CROSSWAY CHURCH
INTERIOR RENOVATION & ADDITION
W155 N10041 PILGRIM ROAD, GERMAN TOWN, WI 53022

prad
PLUNKETT RAYSON
ARCHITECTS, LLP

2024 PLUNKETT RAYSON ARCHITECTS, LLP
2301 CONCORD DRIVE, SUITE 200, MADISON, WISCONSIN 53718
608.244.8855
WWW.PRADARCH.COM

BENCHMARK TABLE				
POINT #	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP1	3/4" IRON ROD	102,526.39	383,432.39	895.62
CP2	3/4" IRON ROD	102,492.35	383,159.88	897.81
CP3	3/4" IRON ROD	102,308.51	383,408.95	895.88
CP4	3/4" IRON ROD	102,806.50	383,195.94	897.36
CP5	CUT "X" IN CURB	102,633.21	382,753.67	899.43
BM101	BENCHMARK	102,480.72	383,568.07	896.51
BM102	SECTION MONUMENT	102,464.94	383,554.83	893.89

LOT SUMMARY
GROSS AREA: 552,663 SQAURE FEET (12.69 AC.)
IMPERVIOUS AREA (PRE-2024): 185,605 SF (4.26 AC) (33.5%)
IMPERVIOUS AREA (ADD. PARKING): 236,695 SF (5.50 AC) (43.3%)
IMPERVIOUS AREA (BLDG ADDITION): 236,695 SF (5.50 AC) (43.3%)

NOTE: THE ADDITIONAL PARKING LOT PROJECT IS A SEPARATE PROJECT AND SUBMITTAL TO THE PLAN COMMISSION.



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PLAN COMMISSION
DATE: 08/12/2024
JOB NO: 230149-02
SHEET NO:

C101

EXISTING SITE PLAN

CROSSWAY CHURCH
INTERIOR RENOVATION & ADDITION
W155 N10041 PILGRIM ROAD, GERMAN TOWN, WI 53022

prad
PLUNKETT RAYSICH
ARCHITECTS, LLP

2024 PLUNKETT RAYSICH ARCHITECTS, LLP
2301 CONCORD DRIVE, SUITE 200, MADISON, WISCONSIN 53718
TEL: 608.248.8800
FAX: 608.248.8801
WWW.PRAD-ARCH.COM

10/1/2023
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10/1/2023



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PLAN COMMISSION	
DATE:	08/12/2024
JOB NO:	230149-02
SHEET NO:	

C201

CROSSWAY CHURCH
INTERIOR RENOVATION & ADDITION
W155 N10041 PILGRIM ROAD, GERMAN TOWN, WI 53022

REVISIONS

DEMOLITION PLAN

prad
PLUNKETT RAYSICH
ARCHITECTS, LLP

2024 PLUNKETT RAYSICH ARCHITECTS, LLP
2301 CONCORD DRIVE, SUITE 202, MADISON, WISCONSIN 53713
608.244.8855
1515 WEST WISCONSIN AVENUE, SUITE 200, MILWAUKEE, WISCONSIN 53233
414.444.8855



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C

D

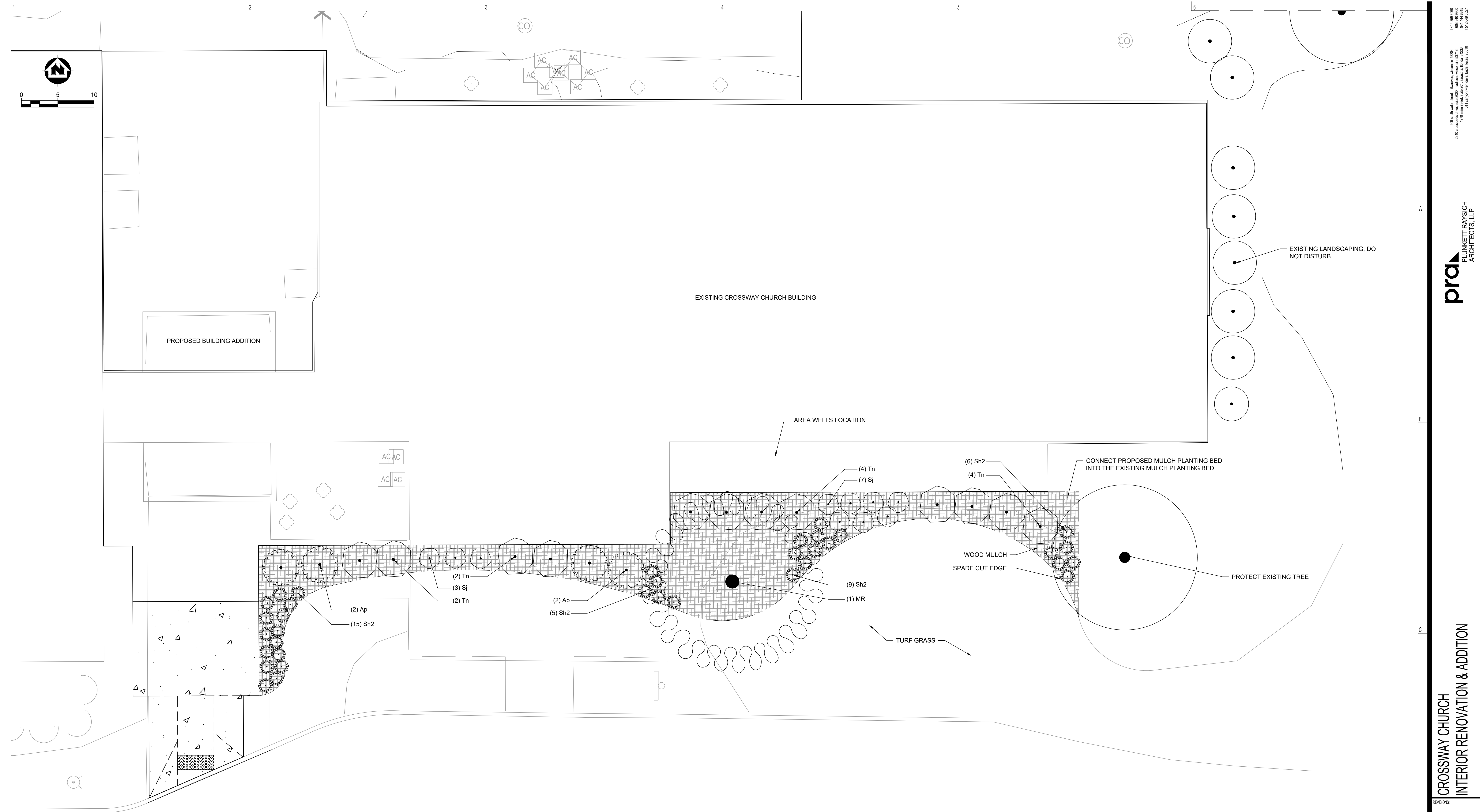
PLAN COMMISSION	
DATE:	08/12/2024
JOB NO:	230149-02

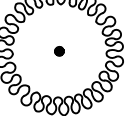
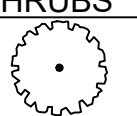
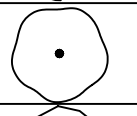
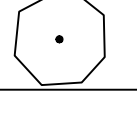
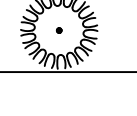
CIVIL DETAILS

W156 N10041 PILGRIM ROAD, GERMANTOWN WI 53022

pro

1414 359 3050
1608 240 9900
1941 444 8845
1512 649 5827



PLANT SCHEDULE							
SYMBOL	CODE	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER		QTY
ORNAMENTAL							
	MR	MALUS X 'ROYAL RAINDROPS'	ROYAL RAINDROPS CRABAPPLE	4' HT.	B&B		2
SHRUBS							
	Ap	AMELANCHIER ALNIFOLIA PUMILA	DWARF SERVICEBERRY	#3 CONT.	CONT.		5
	Sj	SPIRAEA JAPONICA 'NEON FLASH'	NEON FLASH JAPANESE SPIREA	#3 CONT.	CONT.		11
	Tn	TAXUS CUSPIDATA 'NANA'	DWARF JAPANESE YEW	#3 CONT.	CONT.		13
GRASSES							
	Sh2	SPOROBOLUS HETEROLEPIS	PRAIRIE DROPSEED	#1 CONT.	CONT.		36
SYMBOL	CODE	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER	SPACING	QTY
GROUND COVERS							
	Ww	WOOD MULCH	WOOD MULCH	FLAT			875 SF

- PLANTING NOTES:
- CONTRACTOR SHALL STAKE ALL PROPOSED TREE LOCATIONS PRIOR TO PLANTING. CONTRACTOR SHALL THEN NOTIFY THE FIELD ENGINEER AND OWNER ONCE THE STAKING IS COMPLETE FOR A WALK THROUGH REVIEW OF THE TREE LOCATIONS. FINAL TREE LOCATIONS ARE SUBJECT TO MOVING PER FINAL CONSTRUCTION AND LAYOUT. TREES SHALL BE PLANTED A MINIMUM OF 5' FROM ANY WALK OR PAVED EDGE.
 - ALL PLANT MATERIALS SHALL BE OF MATCHING FORMS AND SIZES WITHIN EACH SPECIES AND SIZE DESIGNATION ON THE DRAWINGS.
 - PLANTS SHALL BE PLACED AS DRAWN. NO SUBSTITUTES SHALL BE MADE WITHOUT PRIOR APPROVAL FROM THE LANDSCAPE ARCHITECT.
 - REMOVE AND DISPOSE OF TURF/SOD AND OTHER EXISTING PLANTS, INCLUDING ESTABLISHED WEEDS PRIOR TO SEEDING.
 - CONTRACTOR SHALL PROTECT ALL EXISTING TREES NOT CALLED OUT FOR REMOVAL.
 - ALL LANDSCAPE PLANTING AREAS ADJOINING TURF TO HAVE SPADE EDGE, UNLESS OTHERWISE NOTED.
 - CONTRACTOR RESPONSIBLE FOR EROSION CONTROL IN ALL SEEDED AREAS. ALL DISTURBED AREAS ARE TO BE PROTECTED WITHIN 24 HOURS. DO NOT DISTURB MORE AREA THAN CAN BE COMPLETED AND PROTECTED WITHIN 24 HOURS.
 - PLANTS AND OTHER MATERIALS ARE QUANTIFIED AND SUMMARIZED FOR THE CONVENIENCE OF BIDDING. CONFIRM AND INSTALL SUFFICIENT QUANTITIES TO COMPLETE THE WORK AS DRAWN. NO ADDITIONAL PAYMENTS WILL BE MADE FOR MATERIALS REQUIRED TO COMPLETE THE WORK AS DRAWN.

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NOT FOR CONSTRUCTION
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PLAN COMMISSION
DATE: 08/12/2024
JOB NO: 230149-02
SHEET NO:

L201

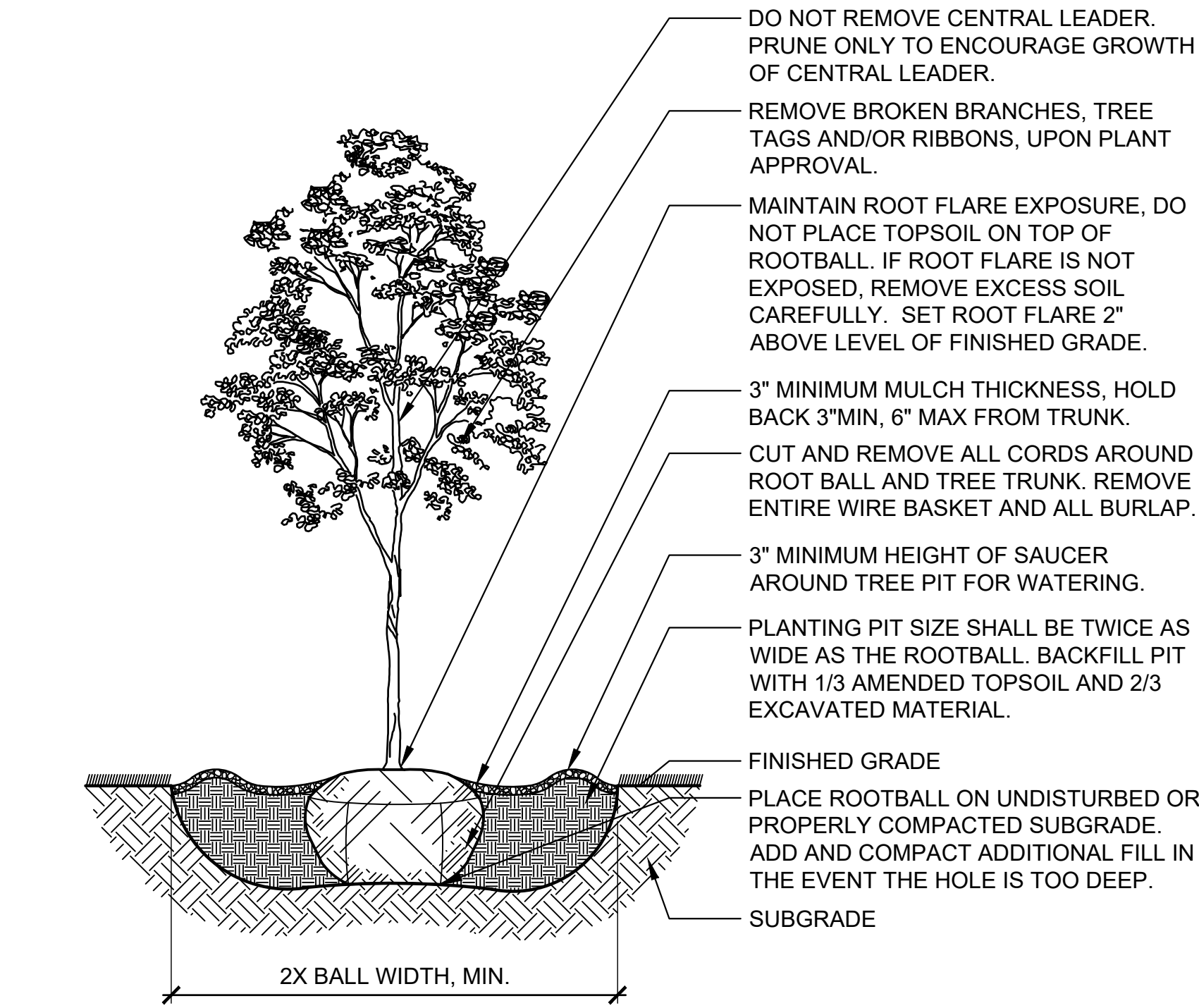
PROPOSED LANDSCAPE PLAN
CROSSWAY CHURCH
INTERIOR RENOVATION & ADDITION
W156 N1004 PILGRIM ROAD, GERMANTOWN, WI 53022

REVISIONS:

prank
PLUNKETT RAYSICH
ARCHITECTS, LLP

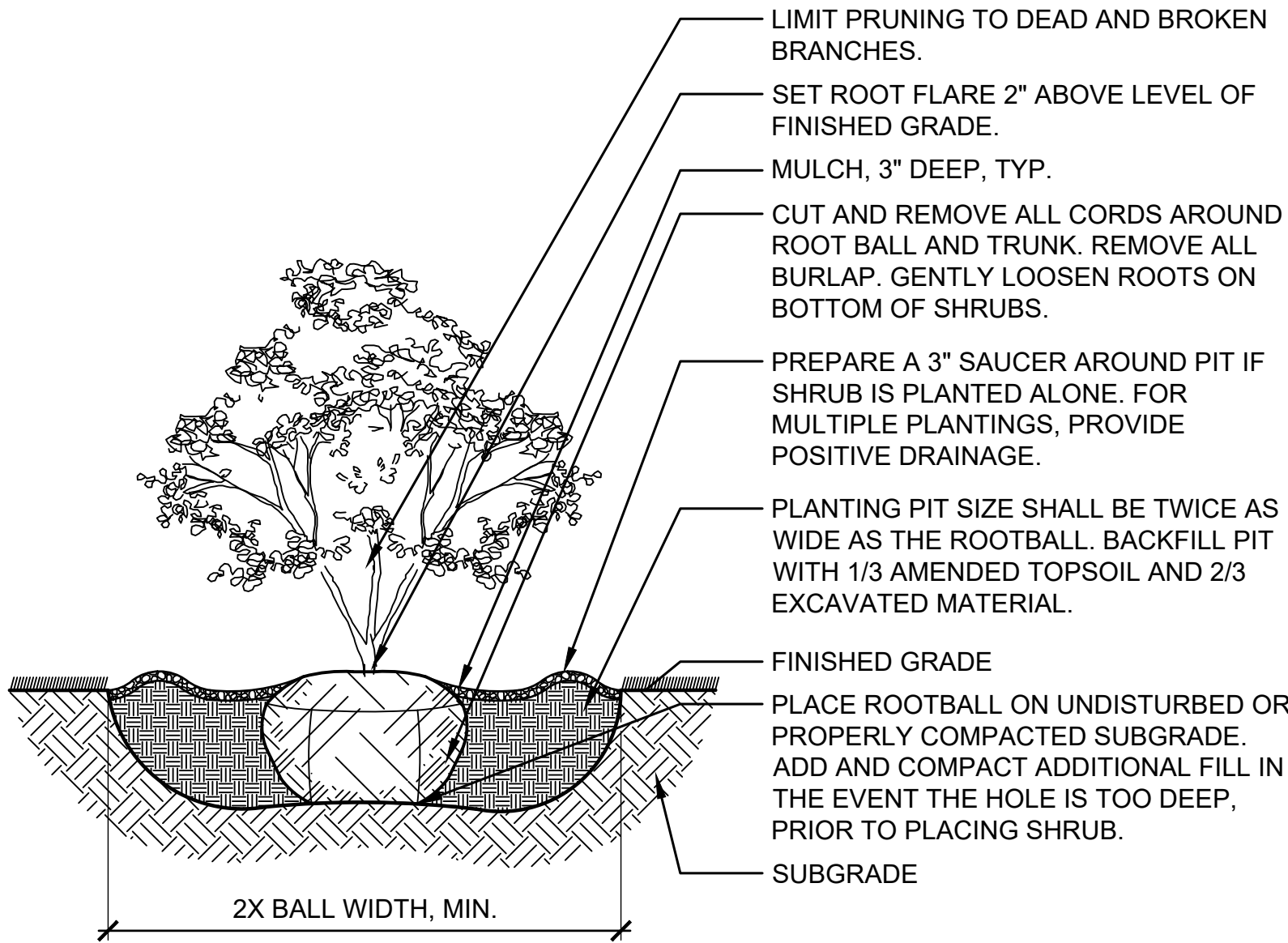
205 South Water Street, Milwaukee, Wisconsin 53204
414.352.3929
1000 2nd Street
23rd Floor
PO Box 1000
Milwaukee, WI 53202
1515 540 5827

NOTE:
1. REMOVE AND PROPERLY DISPOSE OF ANY EXCESS EXCAVATED MATERIAL.
2. WRAP TRUNK WITH APPROVED TREE WRAP UP TO FIRST BRANCH. (FALL PLANTING REQUIREMENT).

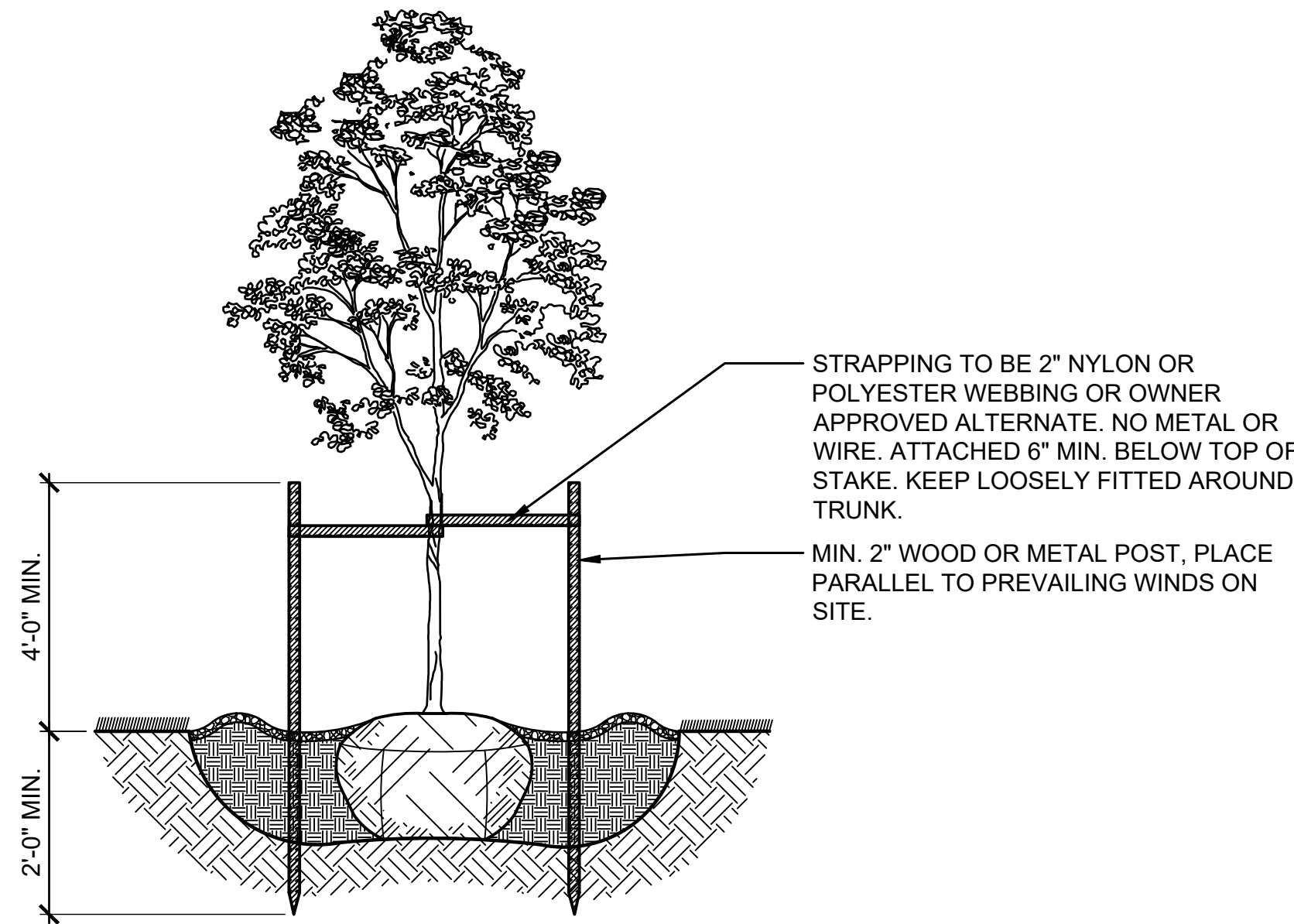


1 DECIDUOUS TREE PLANTING
L500 NTS

NOTE:
REMOVE AND PROPERLY DISPOSE OF ANY EXCESS EXCAVATED MATERIAL.

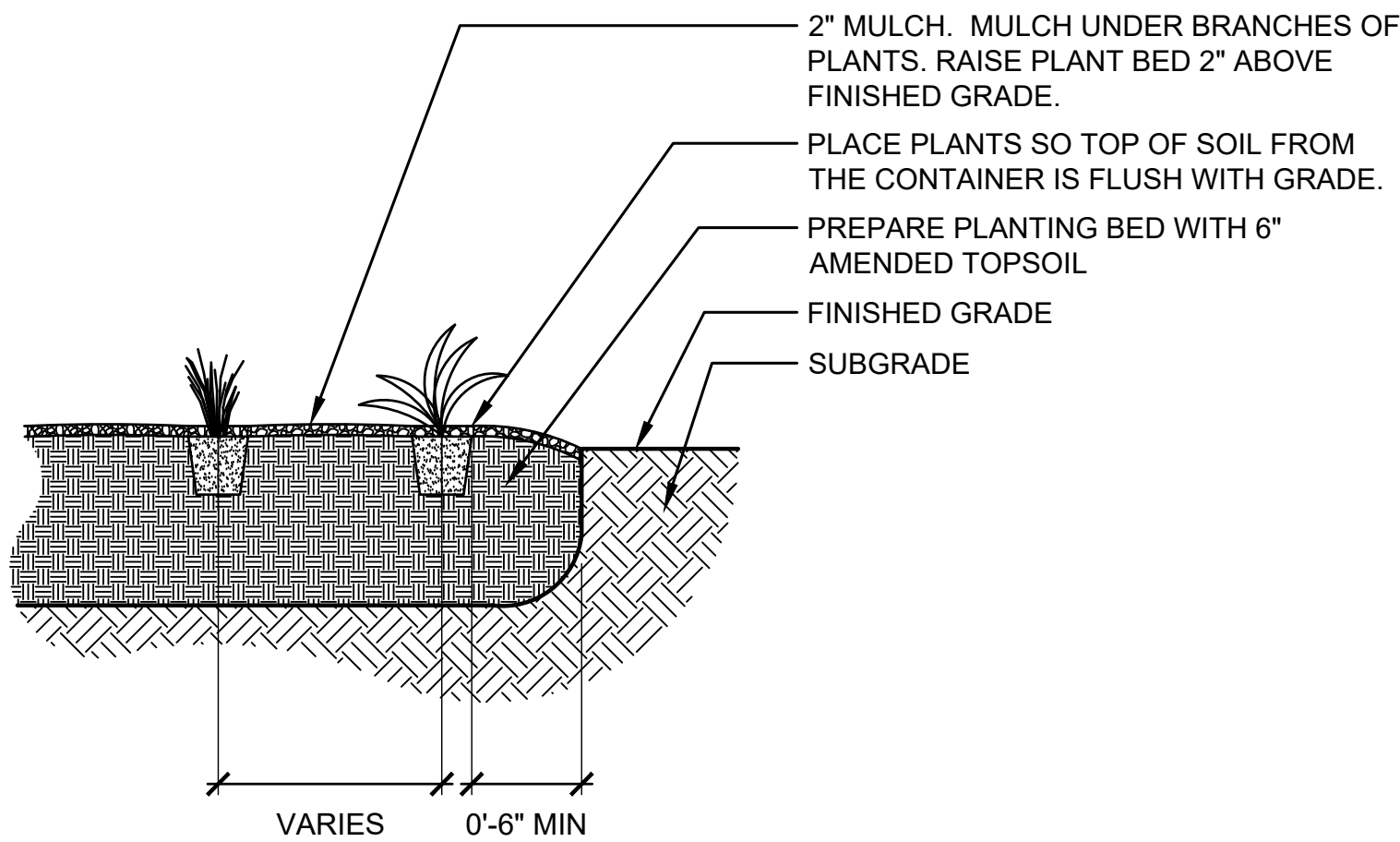


2 SHRUB B&B PLANTING
L500 NTS



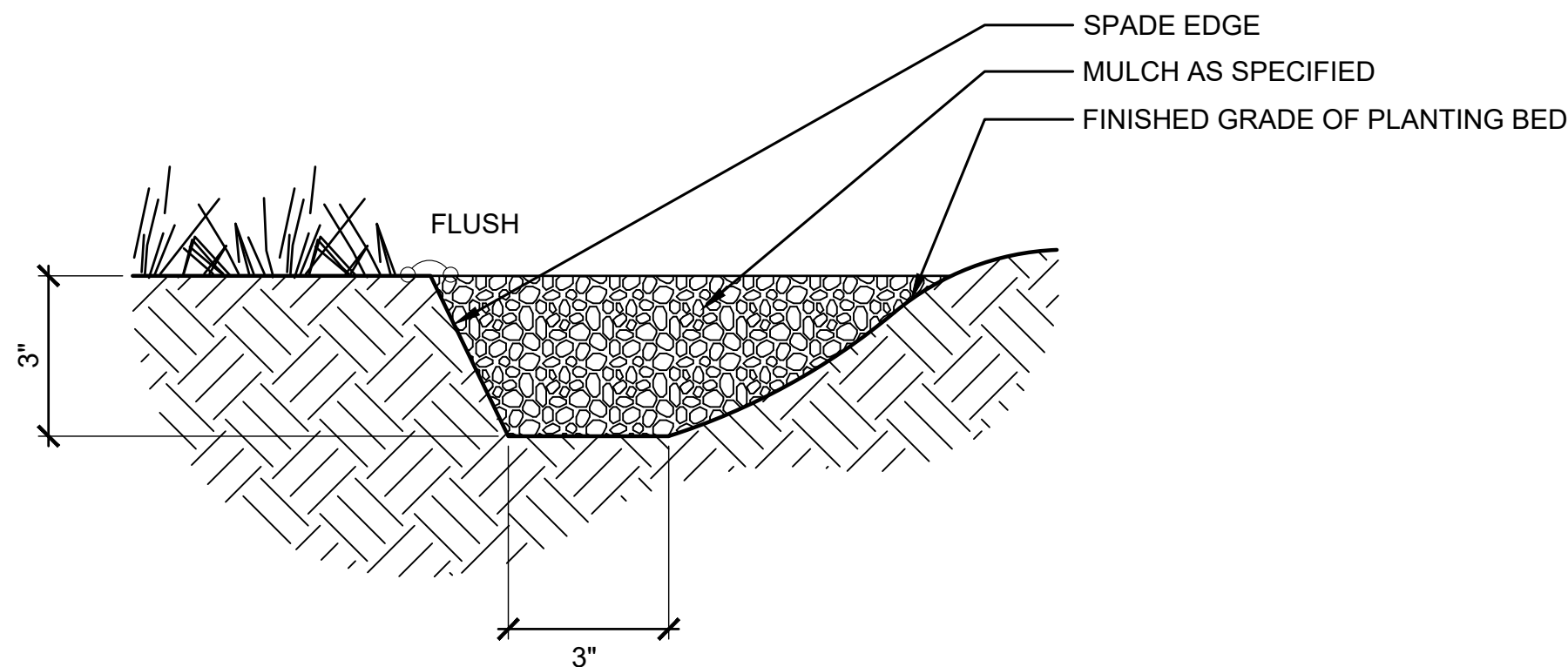
3 DECIDUOUS TREE STAKING
L500 NTS

NOTE:
REMOVE AND PROPERLY DISPOSE OF ANY EXCESS EXCAVATED MATERIAL.

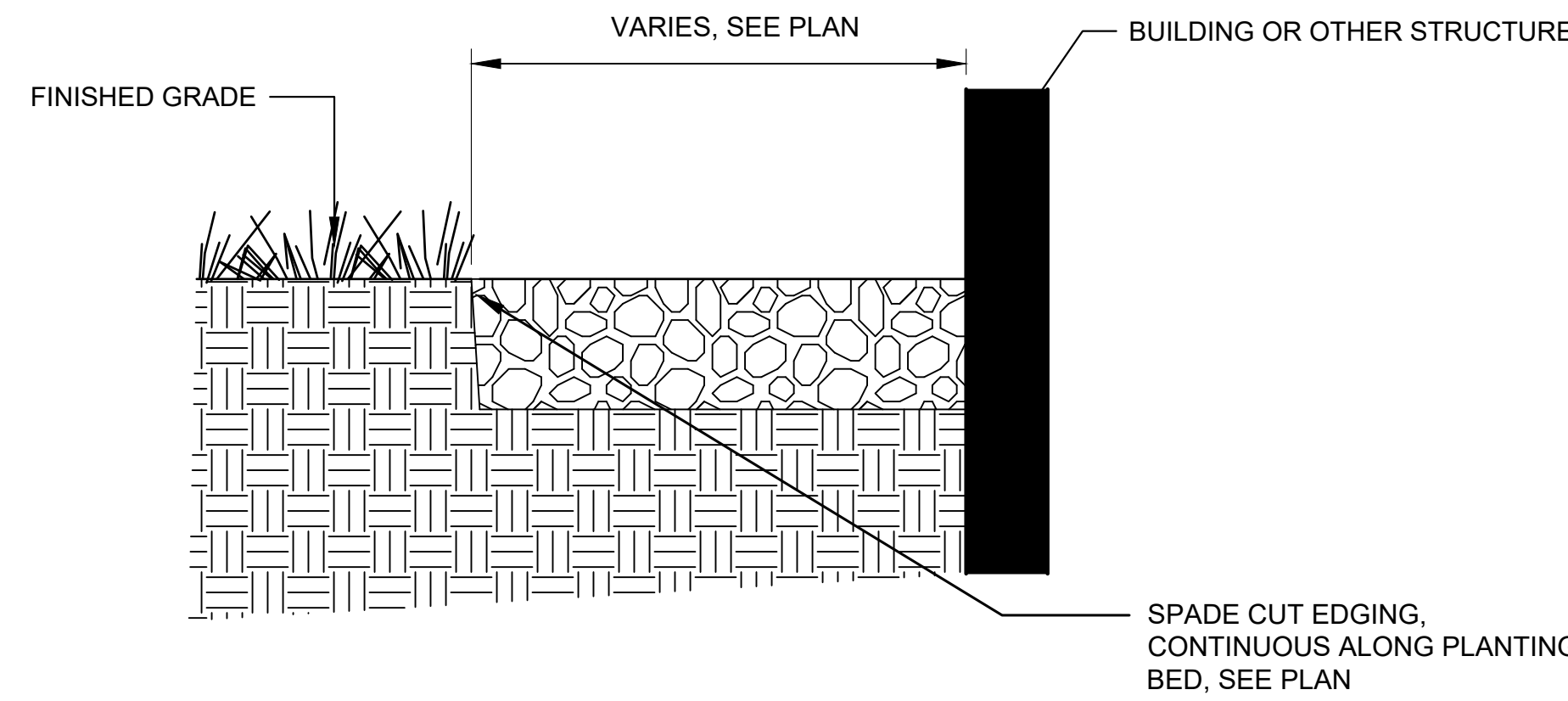


4 PERENNIAL PLANTING
L500 NTS

NOTE:
ALL TEXT SHOULD BE CAPITALIZED AND ALL NOTES AND DIMENSIONS ON LAYER "C-ANNO-NOTE".



5 SPADE CUT EDGE
L500 NTS



6 MULCH AT STRUCTURE DETAIL
L500 NTS

CROSSWAY CHURCH

INTERIOR RENOVATION & ADDITION



209 south water street, milwaukee, wisconsin 53204 t 414 359 3060
2310 crossroads drive, suite 2000, madison, wisconsin 53718 t 608 240 9900
1970 main street, suite 201, sarasota, florida 34236 t 941 444 8845
311 canyon wren drive, buda, texas 78610 t 512 649 5627

W156 N10041 PILGRIM ROAD, GERMANTOWN, WI 53022

SHEET INDEX

GENERAL

000 TITLE SHEET

CIVIL

C101 EXISTING SITE PLAN
C201 DEMOLITION PLAN
C202 PROPOSED SITE & GRADING PLAN

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ARCHITECTURAL

A051 LIFE SAFETY PLANS
A100 DEMOLITION PLANS
A200 FLOOR PLANS
A220 ROOF PLANS
A300 REFLECTED CEILING PLANS
A400 EXTERIOR ELEVATIONS
A500 BUILDING SECTIONS
A501 WALL SECTIONS
A700 STAIR / RAMP / ELEVATOR PLANS / SECTIONS
A800 INTERIOR ELEVATIONS
A891 DOOR SCHEDULE, DOOR TYPES, AND FRAME ELEVATIONS

STRUCTURAL

S001 STRUCTURAL NOTES
S100 FOUNDATION PLAN
S200 ROOF FRAMING PLAN
S800 FOUNDATION DETAILS
S810 FRAMING DETAILS

FIRE PROTECTION

PLUMBING

MECHANICAL

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H100 DEMOLITION FLOOR PLANS
H200 DUCTWORK FLOOR PLANS
H220 ROOF PLAN
H230 PLENUM PLAN
H300 PIPING FLOOR PLANS
H500 DETAILS

ELECTRICAL

E000 ELECTRICAL SYMBOLS AND ABBREVIATIONS
E100 DEMOLITION PLANS - ELECTRICAL
E200 FLOOR PLANS - LIGHTING
E201 FLOOR PLANS - POWER
E400 DETAILS
E401 DETAILS

PROJECT INFORMATION

PROJECT DATE: 08/12/2024
PRA PROJECT NUMBER: 230149-02
DRAWING SET: PLAN COMMISSION

APPLICABLE CODES AND ZONING

2018 WISCONSIN COMMERCIAL BUILDING CODE (SPS 361-366)
2015 INTERNATIONAL EXISTING BUILDING CODE
2015 INTERNATIONAL BUILDING CODE
ASSEMBLY OCCUPANCY, GROUP A-3

ZONING: VILLAGE OF GERMANTOWN ORDINANCES

ZONING DISTRICT: INSTITUTIONAL
ADJACENT ZONING DISTRICTS: RS-4, RS-6, RD-2 AND I
PROPOSED USE: CHURCH

CONSTRUCTION CLASSIFICATION

ADDITION AND LEVEL II ALTERATIONS
TYPE OF CONSTRUCTION, UNPROTECTED, TYPE VB - SPRINKLERED

BUILDING AREA

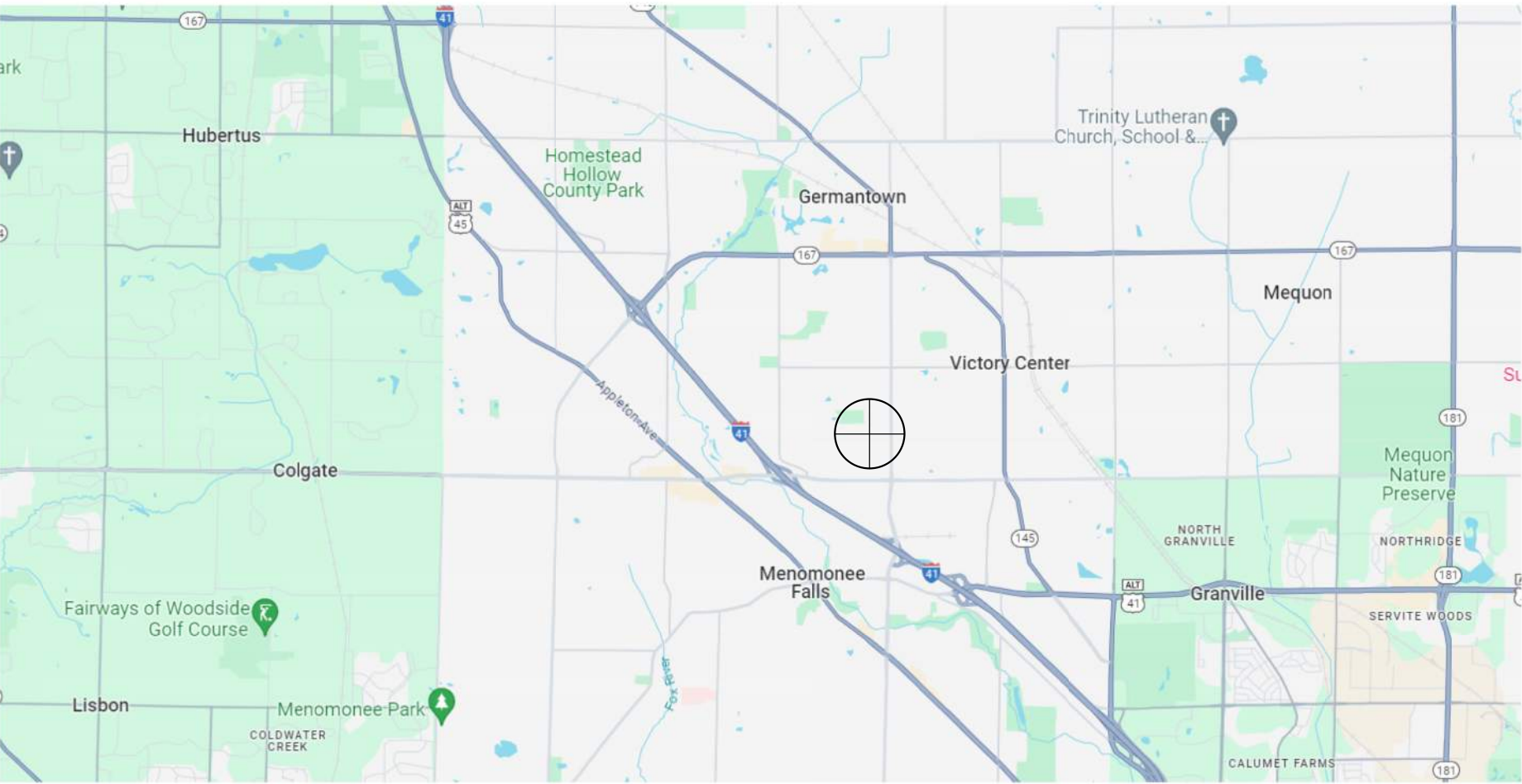
OVERALL FOOTPRINT 14,479 SF

EXISTING
LOWER LEVEL 5,850 SF
FIRST FLOOR 12,138 SF
EXISTING TOTAL 17,988 SF

ADDITIONS
FIRST FLOOR 2,240 SF
ADDITION TOTAL 2,240 SF
BUILDING TOTAL 20,228

ALTERATIONS
LOWER LEVEL 173 SF
LEVEL 2 ALTERATION 173 SF
FIRST FLOOR 298 SF
LEVEL 2 ALTERATION 298 SF
ALTERATION TOTAL 471 SF

PROJECT LOCATION



PROJECT TEAM

CIVIL

MSA PROFESSIONAL SERVICES TEL(414) 296-4333

LANDSCAPE

TEAM MEMBER NAME TEL(414) 555-1234
FAX (OR DELETE)

STRUCTURAL

raSMITH TEL(262) 781-1000

FIRE PROTECTION

MSA PROFESSIONAL SERVICES TEL(414) 296-4333

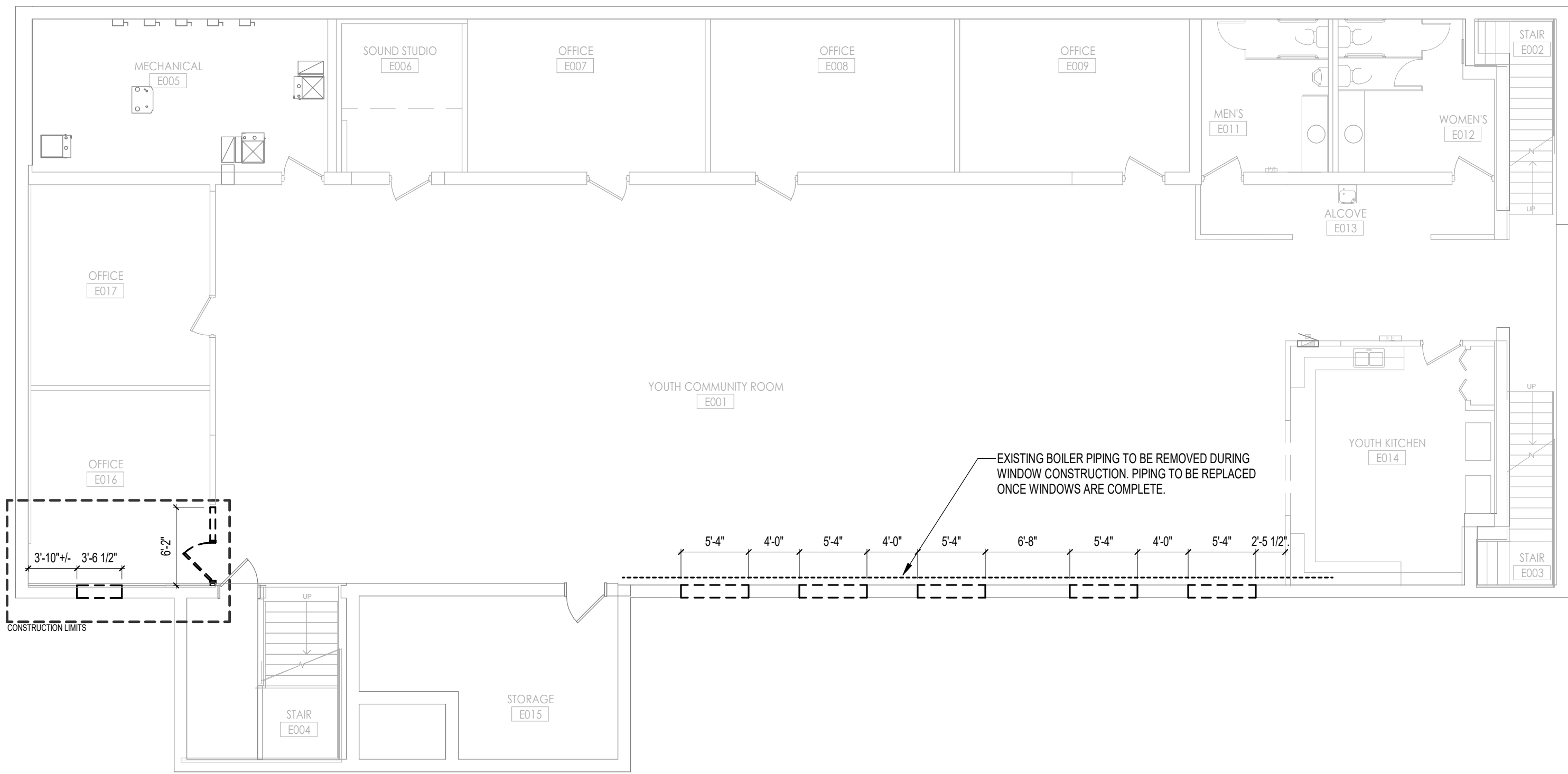
MECHANICAL

MSA PROFESSIONAL SERVICES TEL(414) 296-4333

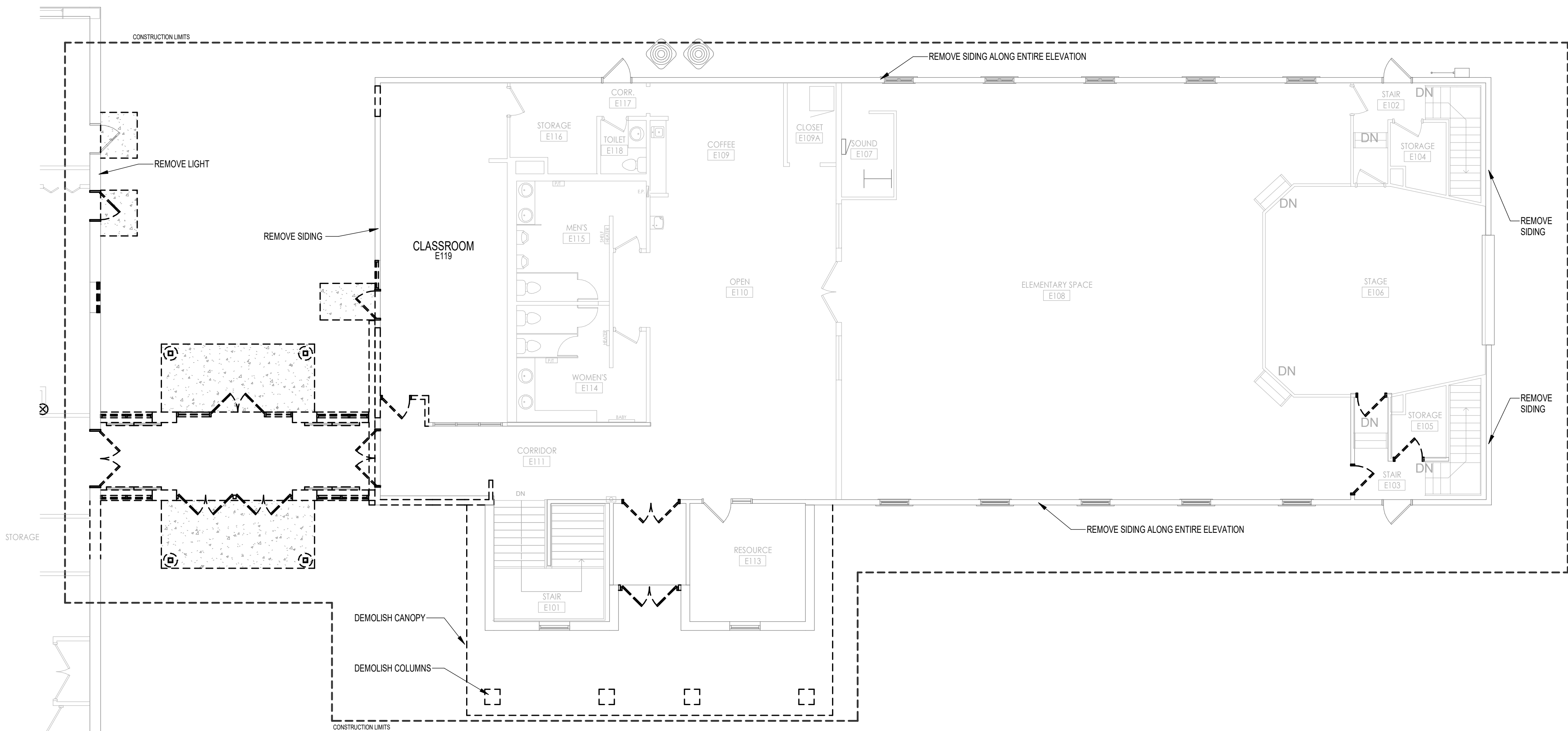
ELECTRICAL

MSA PROFESSIONAL SERVICES TEL(414) 296-4333

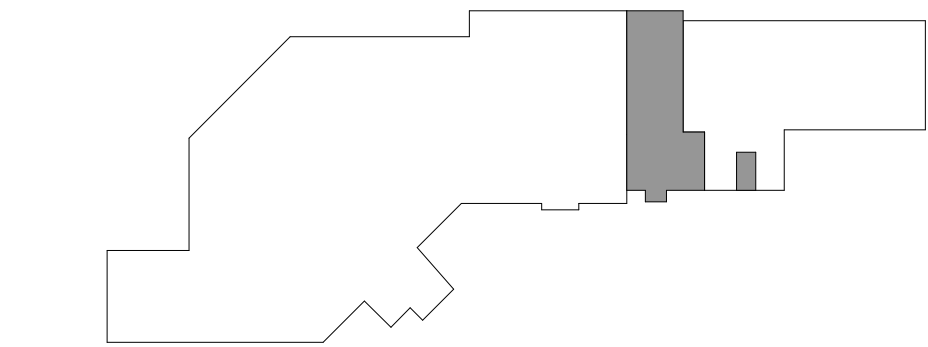




LOWER LEVEL DEMOLITION PLAN
1/8" = 1'-0"



FIRST FLOOR DEMOLITION PLAN
1/8" = 1'-0"



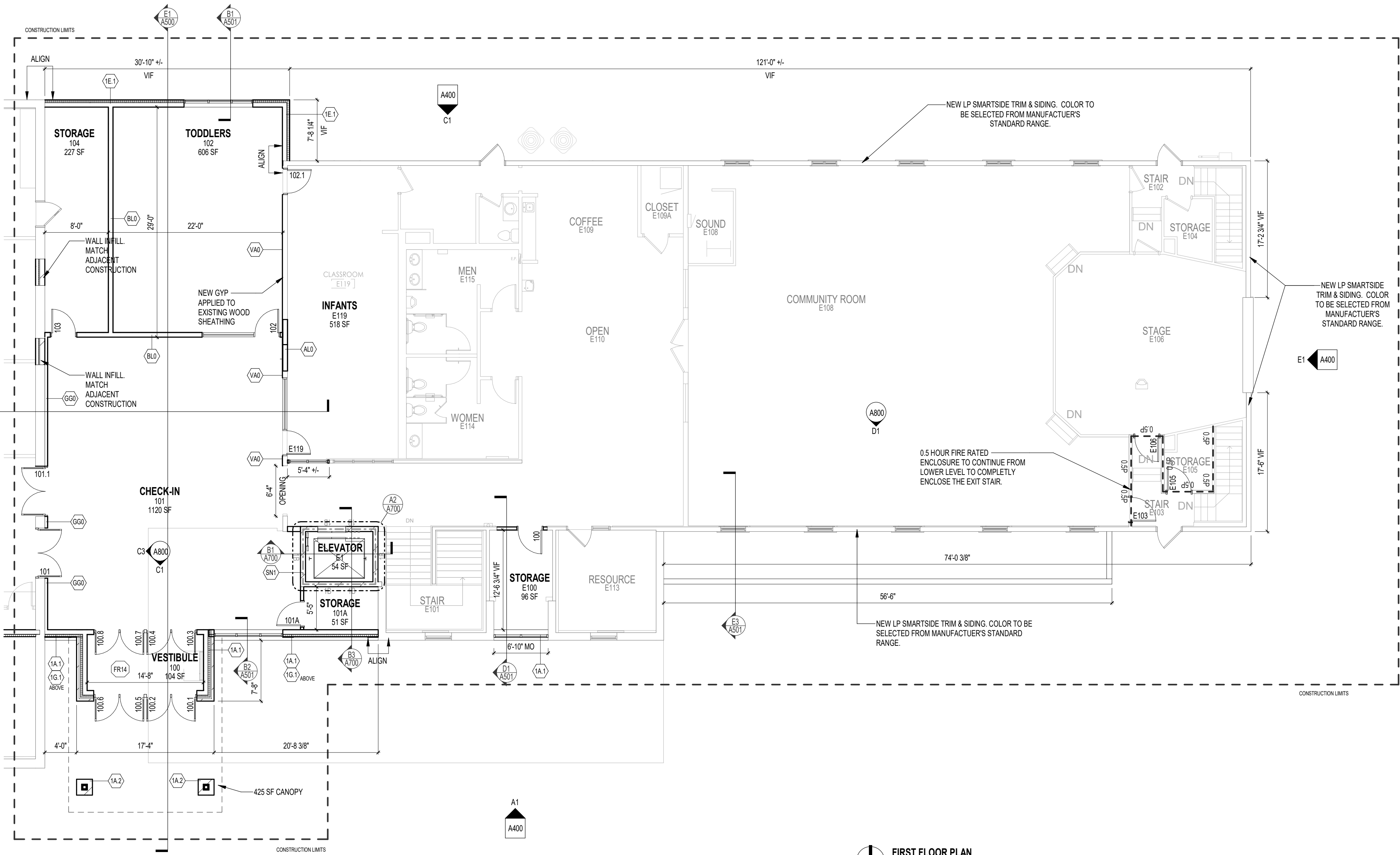
KEY PLAN

DEMOLITION PLAN - SYMBOLS LEGEND			
	EXISTING WALLS TO REMAIN		EXISTING ITEM TO REMAIN
	EXISTING WALLS TO BE REMOVED		EXISTING ITEM TO BE REMOVED
	EXISTING DOOR TO REMAIN		DEMOLITION PLAN KEYNOTE
	EXISTING DOOR TO BE REMOVED		CONSTRUCTION LIMITS
			BEARING WALLS. FIELD VERIFY.

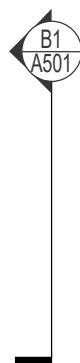
DEMOLITION PLAN - GENERAL NOTES

- A. VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE. PORTIONS OF EXISTING CONSTRUCTION MAY HAVE BEEN REMOVED BY OWNER.
- B. VERIFY EXACT COMPOSITION OF EXISTING WALLS TO BE REMOVED.
- C. REMOVE FLOOR FINISHES, INCLUDING SETTING BED IN CERAMIC TILE AREAS, WHERE NEW FLOORING IS INDICATED IN ROOM FINISH SCHEDULE.
- D. REMOVE SUSPENDED CEILINGS AND RELATED HANGERS, OR GYPSUM BOARD/ PLASTER CEILINGS WHERE NEW CEILINGS ARE INDICATED ON REFLECTED CEILING PLAN OR ROOM FINISH SCHEDULE.
- E. REMOVE ALL COLUMN FINISHES, INCLUDING GYPSUM BOARD AND FURRINGS, FROM EXISTING STRUCTURAL COLUMNS.
- F. REMOVE ALL INTERIOR AND WALL MOUNTED ITEMS IN AREAS TO BE REMODELED (REFER TO ROOM FINISH SCHEDULE) INCLUDING BUT NOT LIMITED TO, WALL AND CEILING TRIM, BASE.
- G. REFER TO PLUMBING, HVAC AND ELECTRICAL PLANS FOR ADDITIONAL DEMOLITION ITEMS AND NOTES. COORDINATE WORK WITH PLUMBING, HVAC AND ELECTRICAL REQUIREMENTS.
- H. COORDINATE DEMOLITION OF LOAD BEARING WALLS WITH STRUCTURAL PLANS.
- I. MAINTAIN CONTINUOUS UTILITY SERVICE TO ALL SPACES IN THE BUILDING NOT AFFECTED BY THIS WORK. COORDINATE WITH OWNER ANY DISRUPTION IN SERVICES REQUIRED TO PERFORM WORK OR TO MODIFY EXISTING PIPING, DUCTWORK OR ANY ASSOCIATED EQUIPMENT.
- J. CONSTRUCT A DUST-PROOF PARTITION TO SEPARATE AREAS OF CONSTRUCTION FROM ADJACENT OCCUPIED AREAS OUTSIDE SCOPE OF CONSTRUCTION. REFER TO DETAIL.
- / - -

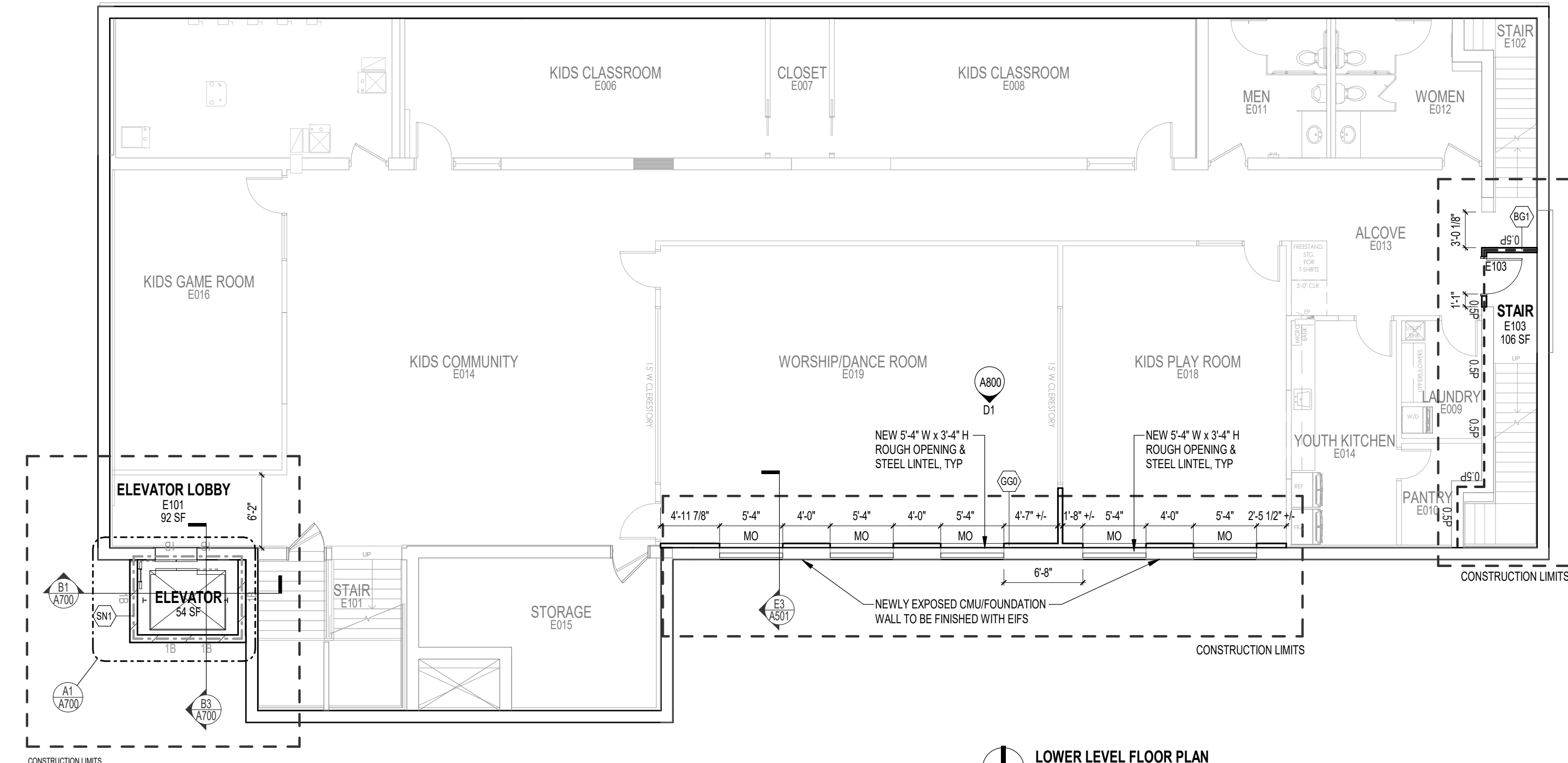
DEMOLITION PLAN NOTES	
MARK	DESCRIPTION



FIRST FLOOR PLAN
1/8" = 1'-0"



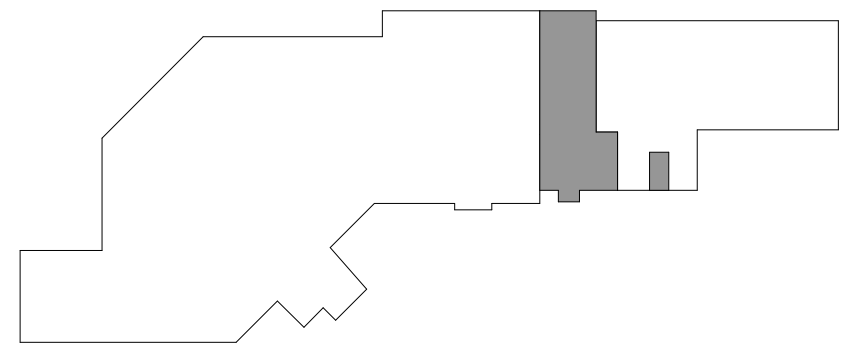
LOWER LEVEL FLOOR PLAN
1/8" = 1'-0"



EXTERIOR WALL TYPES	
MARK	ASSEMBLY DESCRIPTION
1A.1	MASONRY VENEER STUD WALL CONSISTING OF 4" SPLIT FACE CMU, AIR SPACE, 3" RIGID INSULATION, SPRAY APPLIED AIR AND VAPOR BARRIER SYSTEM ON 5/8" EXTERIOR GYPSUM SHEATHING, 6" GALVANIZED COLD FORMED STEEL STUDS @ 16" OC AND ONE LAYER 5/8" GYPSUM BOARD AT INTERIOR FACE. PROVIDE ADJUSTABLE MASONRY VENEER ANCHORS @ 16" OC EACH WAY, CAVITY DRAINAGE MATERIAL, FLASHING, MASONRY EXPANSION AND CONTROL JOINTS. PROVIDE CAVITY WEEPS/VENTS @ 24" OC. COMPARTMENTALIZE THE CAVITY AND PROVIDE CAVITY WEEPS/VENTS AT TOP/BOTTOM OF CAVITY. REFER TO DETAIL XX4XXXX.
1A.2	MASONRY VENEER WALL CONSISTING OF 8" SPLIT FACE CMU, PROVIDE CAVITY DRAINAGE MATERIAL, FLASHING, MASONRY EXPANSION AND CONTROL JOINTS. PROVIDE CAVITY WEEPS/VENTS @ 24" OC. COMPARTMENTALIZE THE CAVITY AND PROVIDE CAVITY WEEPS/VENTS AT TOP/BOTTOM OF CAVITY. REFER TO DETAIL XX4XXXX.
1E.1	SIDING CLAD WALL CONSISTING OF WOOD COMPOSITE LAP SIDING, WEATHER BARRIER/RAINAGE PLANE, 3" NAIL BASE INSULATION, SPRAY APPLIED AIR AND VAPOR BARRIER SYSTEM ON 5/8" EXTERIOR GYPSUM SHEATHING, 6" GALVANIZED COLD FORMED STEEL STUDS @ 16" OC AND ONE LAYER 5/8" GYPSUM BOARD AT INTERIOR FACE.
1G.1	EXTERIOR INSULATION AND FINISH SYSTEM (EIFS) STUD WALL CONSISTING OF XX" INSULATION, EIFS MANUFACTURER'S RECOMMENDED AIR/VAPOR BARRIER SYSTEM ON 5/8" EXTERIOR GYPSUM SHEATHING (EDIT FOR CEMENT BOARD), 6" GALVANIZED COLD FORMED STEEL STUDS @ 16" OC AND ONE LAYER 5/8" GYPSUM BOARD @ INTERIOR FACE.

INTERIOR PARTITION TYPES				
MARK	ASSEMBLY DESCRIPTION	FIRE RATING	UL	INSULATION
AL.0	6" STEEL STUDS @ 16" OC ONE LAYER 5/8" GYPSUM BOARD @ EACH FACE	--	--	--
BG.0	3-5/8" STEEL STUDS @ 16" OC ONE LAYER 5/8" GYPSUM BOARD @ EACH FACE	--	--	3-1/2" SOUND
BG.1	3-5/8" STEEL STUDS @ 16" OC ONE LAYER 5/8" GYPSUM BOARD @ EACH FACE	1 HR	U419	3" MINERAL WOOL BATT
BL.0	6" STEEL STUDS @ 16" OC ONE LAYER 5/8" GYPSUM BOARD @ EACH FACE	--	--	FULL WIDTH SOUND
GQ.0	3-5/8" STEEL STUDS @ 16" OC ONE LAYER 5/8" GYPSUM BOARD	--	--	--
SM.1	6" CONCRETE MASONRY UNITS	1 HR	--	--
VA.0	ONE LAYER DIRECT BONDED 5/8" GYPSUM BOARD.	--	--	--

FLOOR PLAN NOTES	
MARK	DESCRIPTION

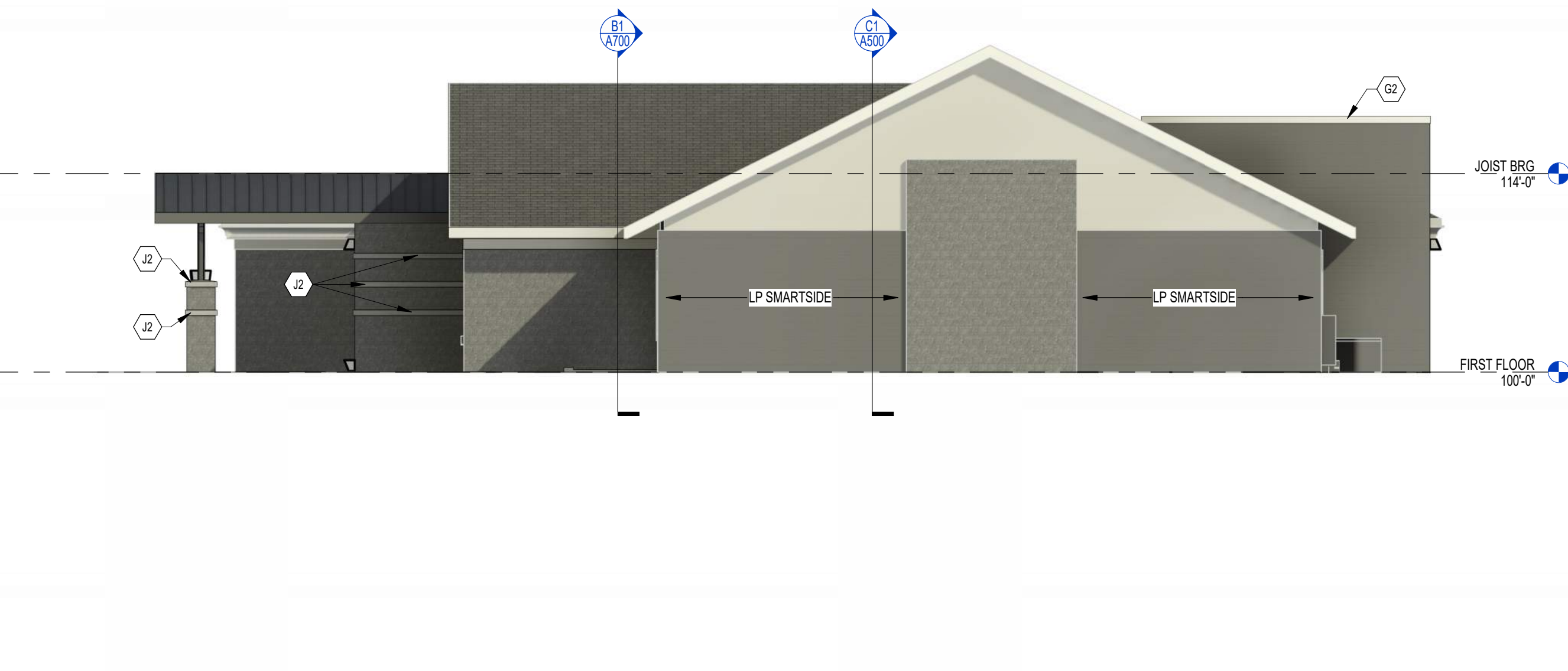
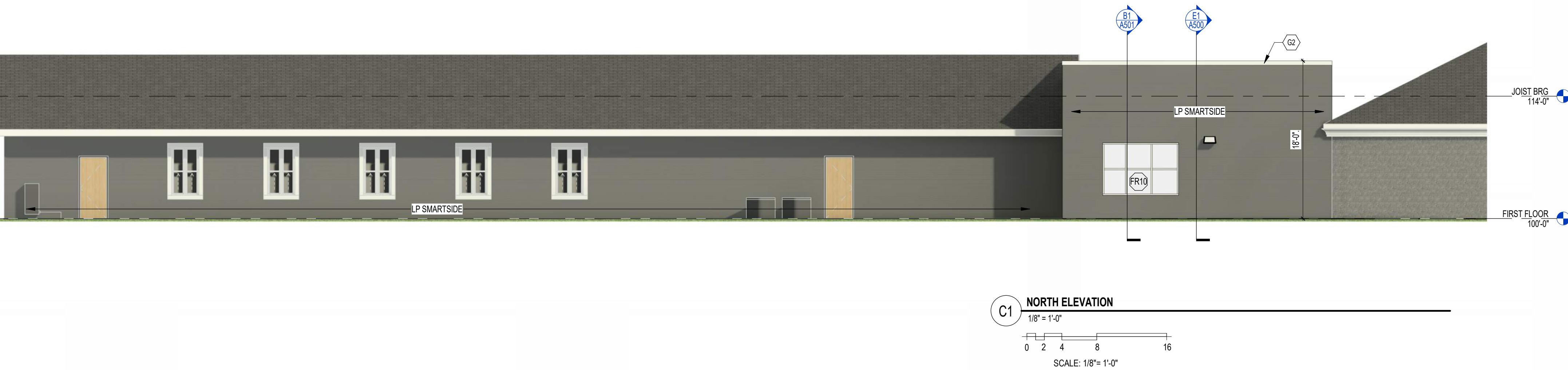
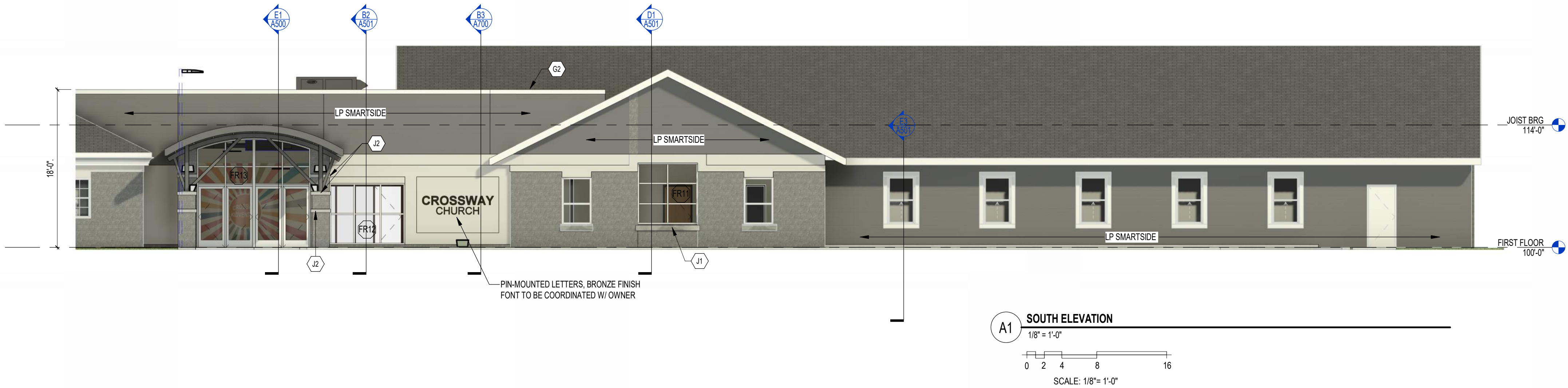


KEY PLAN

FLOOR PLAN SYMBOLS LEGEND	
	EXISTING WALLS TO REMAIN
	EXISTING DOOR TO REMAIN
	SECTION REFERENCE
	EXTERIOR ELEVATION
	INTERIOR ELEVATION
	FLOOR PLAN NOTE
	CONSTRUCTION LIMITS
	30 MINUTE RATED FIRE PARTITION
	ONE HOUR RATED FIRE BARRIER
	NEW WALL/PARTITION
	NEW DOOR
	EXISTING DOOR RECEIVING NEW WORK - REFER TO DOOR SCHEDULE
	DETAIL REFERENCE
	WINDOW TYPE
	WALL/PARTITION TYPE
	SEMI-RECESSED FIRE EXTINGUISHER

- FLOOR PLAN GENERAL NOTES**
- A. DIMENSIONS ON FLOOR PLAN ARE BASED ON FACE OF FINISHED WALL TO FACE OF FINISHED WALL (NOMINAL).
- B. VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE. PORTIONS OF EXISTING CONSTRUCTION MAY HAVE BEEN REMOVED BY OWNER.
- C. PLUMBING FIXTURES ARE SHOWN FOR REFERENCE ONLY. REFER TO PLUMBING DRAWINGS FOR SPECIFIC FIXTURE TYPE AND SIZES.
- D. MAINTAIN CONTINUOUS UTILITY SERVICE TO ALL SPACES IN THE BUILDING NOT AFFECTED BY THIS WORK. COORDINATE WITH OWNER ANY DISRUPTION IN SERVICES REQUIRED TO PERFORM WORK OR TO MODIFY EXISTING PIPING, DUCTWORK OR ANY ASSOCIATED EQUIPMENT.
- E. CONTRACTOR TO VERIFY FLOOR TO FLOOR HEIGHTS.
- GYPSUM BOARD PARTITIONS GENERAL NOTES**
- A. ALL GYPSUM BOARD PARTITIONS SHALL BE (BG.0) UNLESS OTHERWISE NOTED ON FLOOR PLAN.
- B. GYPSUM BOARD PARTITION DIMENSIONS ON FLOOR PLAN ARE BASED ON FACE OF FINISHED PARTITION TO FACE OF FINISHED PARTITION (NOMINAL).
- C. REFER TO GYPSUM BOARD SPECIFICATION FOR LOCATION AND TYPE(S) OF GYPSUM BOARD MATERIAL REQUIRED.
- D. PROVIDE FIRE RATED GYPSUM BOARD AT ALL FIRE RATED PARTITIONS.
- E. SEAL ALL WALL PENETRATIONS AT PERIMETER AND FIRESTOP ALL FIRE RATED PARTITIONS.
- F. EXTEND ALL GYPSUM BOARD PARTITIONS FULL HEIGHT TO UNDERSIDE OF STEEL DECK ABOVE (OR PRECAST PLANK ABOVE IF APPLICABLE). REFER TO DETAIL. PROVIDE HORIZONTAL MASONRY JOINT REINFORCEMENT AT METAL DECK / STRUCTURAL STEEL MEMBER ABOVE. REFER TO DETAIL. / - / - / -

- MASONRY PARTITIONS GENERAL NOTES**
- A. MASONRY PARTITIONS INDICATED WITH THE FOLLOWING HATCH PATTERN:
- B. ALL MASONRY PARTITIONS SHALL BE 8" CONCRETE BLOCK UNLESS OTHERWISE NOTED OR DIMENSIONED. REFER TO FLOOR PLAN FOR PARTITION THICKNESS.
- C. PROVIDE UL RATED CONCRETE BLOCK AT ALL FIRE RATED PARTITIONS.
- D. SEAL ALL WALL PENETRATIONS AT PERIMETER AND FIRESTOP ALL RATED PARTITIONS.
- E. EXTEND CONCRETE BLOCK PARTITIONS FULL HEIGHT TO UNDERSIDE OF STEEL DECK ABOVE (OR PRECAST PLANK ABOVE IF APPLICABLE). REFER TO DETAIL. PROVIDE HORIZONTAL MASONRY JOINT REINFORCEMENT AT 16" OC VERTICALLY. REFER TO STRUCTURAL DRAWINGS FOR VERTICAL REINFORCEMENT REQUIREMENTS.



EXTERIOR ELEVATIONS SYMBOLS LEGEND

- SECTION REFERENCE
ELEVATION NOTE
DETAIL REFERENCE
WINDOW TYPE
CONSTRUCTION KEYNOTE

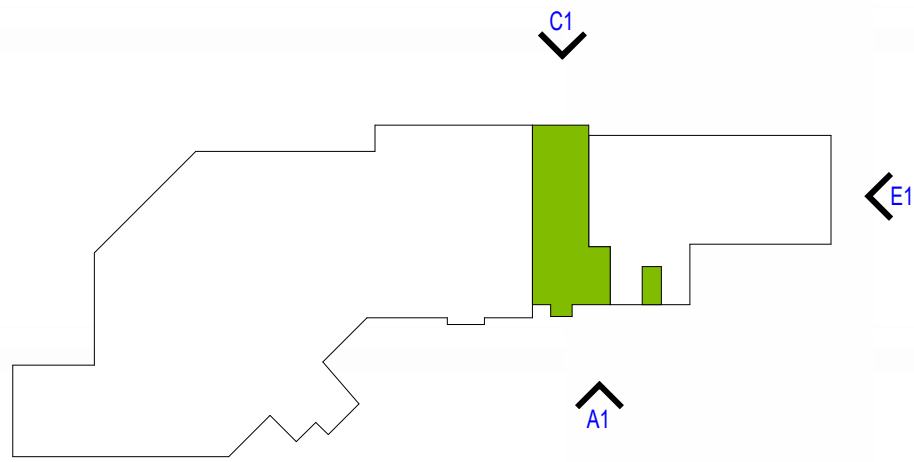
EXTERIOR FINISH PATTERNS

- STANDING SEAM METAL
SPLIT FACE CONCRETE MASONRY UNIT (CMU)
SIDING
EIFS

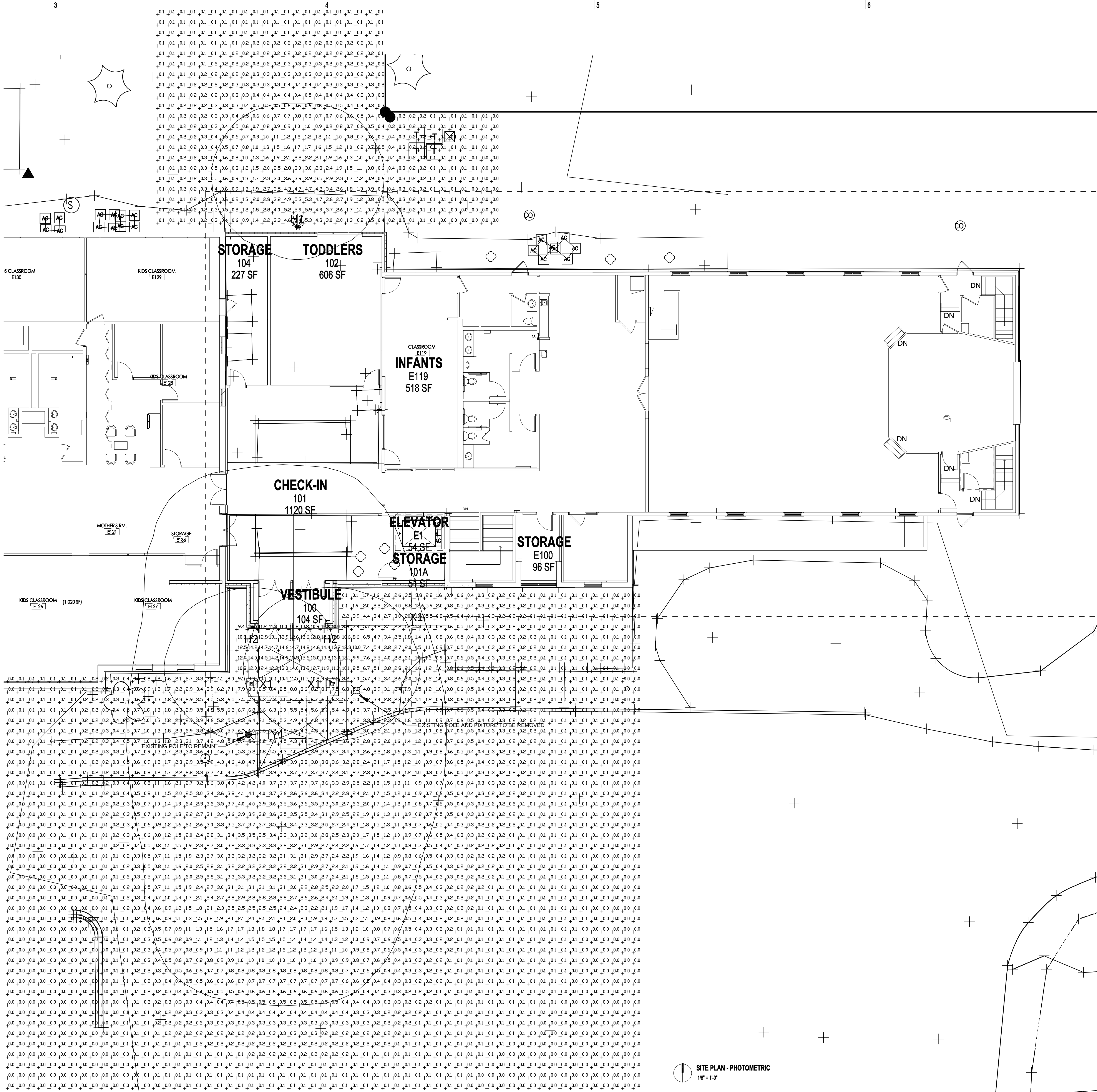
EXTERIOR ELEVATIONS GENERAL NOTES

- A. PAINT ALL EXPOSED STEEL LINTELS TO MATCH ADJACENT MASONRY COLOR
B. REFER TO SHEET A891 FOR WINDOW FRAME ELEVATIONS
C. SEALANT COLORS TO MATCH ADJACENT FINISHED SURFACES
D. PROVIDE CONTROL JOINTS AS SHOWN ON ELEVATIONS AND AT ALL INSIDE CORNERS

EXTERIOR ELEVATION NOTES	
MARK	DESCRIPTION



KEY PLAN



CROSSWAY SITE FIXTURE SCHEDULE				
TYPE	DESCRIPTION	LAMP TYPE	WATTS	CATALOG NUMBER
H1	WALL PACK - SWITCHABLE LUMENS 2,300/5,300/8,500 - SET TO LOW	3K/4K/5K	16/36/69	LITHONIA
H2	WALL PACK - 2000 LUMENS - BATTERY	4000K LED	17	LITHONIA
X1	FLOOD LIGHT - SWITCHABLE LUMENS 1,500/3,000/5,000 - SET TO MEDIUM	3K/4K/5K	9/18/34	IES/1 ALO SWW2 KY D08
Y1	POLE MOUNTED AREA LIGHT - 12,000 LUMENS	4000K LED	97	STREETWORKS
GENERAL NOTES:				1
1. SEE SPECIFICATIONS FOR FIXTURE REQUIREMENTS.				
2. ALTERNATE FIXTURES TO HAVE EQUAL CHARACTERISTICS OF SPECIFIED FIXTURES.				
3. ALL LED FIXTURES TO HAVE A MINIMUM CRI OF 70+.				
4. ARCHITECT TO SELECT STANDARD COLOR AND FINISH.				
PLAN NOTES:				
1. MOUNT ON EXISTING 16" POLE.				

GENERAL NOTES:
1. SITE LIGHTING CALCULATED AT GRADE.



Catalog Number
Notes
Type

Contractor Select™

TWR LED

LED Wall Pack

Adjustable+Switchable+Photocell

The Lithonia Lighting® TWR wall packs combine the power of the latest generation of LEDs in a popular and classic day-form to provide exceptional energy savings. These wall packs give ultimate versatility to both the distributor and contractor by offering 18 configurations in one product with their standard Adjustable Lumen Output (ALO), Switchable color temperature (SWW2), and adjustable photocell (PE) features.

FEATURES:

- Two sizes deliver from 2,300 lumens up to 16,100 lumens, replacing 70W to 400W HID luminaires
- Energy savings of up to 86% when replacing HID wall packs with less than two year paybacks
- Three power levels of adjustable lumen output. Switchable CCT(3000K/4000K/5000K) offers warm, cool and daylight in a single fixture
- Standard photocell can be turned on or off
- IP65 rated, Die-cast aluminum housing and borosilicate glass lens
- Up to 155 LPW



Adjustable Lumen Output
ALO



Switchable CCT
SWW2



Dusk-to-Dawn Operation
PE



Catalog Number	Adjustable Lumen Output ALO			Switchable CCT SWW2	Dusk-to-Dawn Operation PE	Input Voltage	CRI
TWR1 LED ALO SWW2 UVOLT PE DDBTXD	2,300 Lumens	5,300 Lumens	8,500 Lumens*	Switchable 3000K, 4000K*, 5000K	Included Standard, Selectable On*/Off	120-347V	80CRI
TWR2 LED ALO SWW2 UVOLT PE DDBTXD	8,200 Lumens	12,100 Lumens	16,100 Lumens*				

* - Default out of the box settings

Made To Order Options

Ci Code	Input Voltage	Catalog Number	UPC	Number of fixtures per pallet	Traditional Replacement
*280GX1	120-277V	TWR1 LED ALO SWW2 MVOLT PE E7WC DDBTXD	00196183389954	60	70W - 250W HID
*2822T3	480V	TWR2 LED ALO SWW2 480 DDBTXD	00196183765819	32	250W - 400W HID

* Note: Made to order options are available with normal lead time

TWR LED Stock Configurations

Catalog Number	UPC	Ci Code	Number of fixtures per pallet	Traditional Replacement
TWR1 LED ALO SWW2 UVOLT PE DDBTXD	00196183389947	*280GWW	50	70W - 250W HID
TWR2 LED ALO SWW2 UVOLT PE DDBTXD	00196183390028	*280GX5	40	250W - 400W HID



Specifications

INTENDED USE:

The TWR LED combines traditional wall pack design with latest generation LEDs to provide an energy-efficient, low maintenance LED wall pack suitable for replacing up to 400W Metal Halide fixtures. The traditional shape helps maintain building aesthetics when replacing only a portion of your building's wall packs. TWR LED is ideal for outdoor applications such as carports, loading areas, self storage and parking areas.

CONSTRUCTION:

Rugged cast-aluminum housing with bronze polyester powder paint for lasting durability. Door is hinged on the side and can be detached for easy installation and service. Castings are sealed with a one-piece gasket to inhibit the entrance of external contaminants. Rated for outdoor installations, -40°C minimum ambient.

ELECTRICAL:

Light engine consists of long-life, high-efficacy LEDs mounted on an internal aluminum heat sink to maximize heat dissipation and promote long life. LEDs maintain 90% of light output at 50,000 hours of service. (LED lifespan based on IESNA LM-80-08 results and calculated per IESNA TM-21-11 methodology. The UVOLT driver operates on any line voltage from 120-347V (50/60Hz). All luminaires have 6kV surge protection. There are no user serviceable parts. The fixture is supplied with a 0-10V driver and is dimmable by 0-10V controls.

BATTERY SPECS:

Emergency battery backup E7WC is a 7 Watt back up battery that delivers up to 1,000 lumens in emergency mode. The lowest operating temperature is -20°C and is compatible with the MVOLT model TWR1.

INSTALLATION

Designed for wall mounting above four feet from ground. Housing is configured for mounting directly over a standard 4" outlet box (by others) or for surface wiring via any of four convenient 1/2" threaded conduit entry hubs.

LISTINGS:

UL Listed to U.S. and Canadian safety standards for wet locations. Tested in accordance with IESNA LM-79 and LM-80 standards.

DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY:

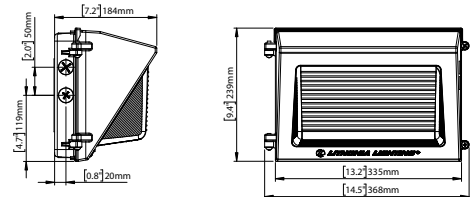
5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Dimensions

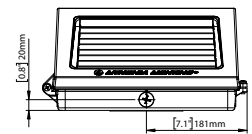
TWR1:

Width: 13.2" / 33.5cm
Height: 9.4" / 23.9cm
Depth: 7.2" / 18.4cm
Weight: 7.5lbs (3.4kg)



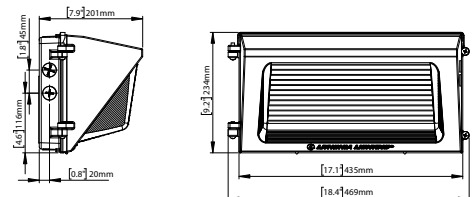
TWR1 E7WC:

Width: 15.25" / 38.74cm
Height: 10.75" / 27.31cm
Depth: 8.75" / 22.23cm
Weight: 9.66lbs (4.38kg)

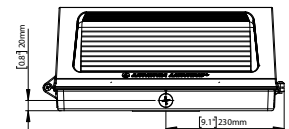


TWR2:

Width: 17.1" / 43.5cm
Height: 9.2" / 23.4cm
Depth: 7.9" / 20.1cm
Weight: 12.1lbs (5.5kg)



All dimensions are inches (centimeters) unless otherwise indicated.





LUMEN OUTPUT:

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of configurations shown within the tolerances described within LM-79.

Size	Lumen Output	Input Wattage	CCT/80CRI	Delivered Lumens	Lumens Per Watt @ 4000K, 80CRI
TWR1	2,300	16W	3000K	2,295	145
			4000K	2,292	
			5000K	2,359	
	5,300	36W	3000K	5,277	151
			4000K	5,347	
			5000K	5,390	
	8,500	59W	3000K	8,400	148
			4000K	8,581	
			5000K	8,523	

Size	Lumen Output	Input Wattage	CCT/80CRI	Delivered Lumens	Lumens Per Watt @ 4000K, 80CRI
TWR2	8,200	55W	3000K	8,132	155
			4000K	8,427	
			5000K	8,290	
	12,100	82W	3000K	11,875	152
			4000K	12,449	
			5000K	12,037	
	16,100	112W	3000K	15,794	147
			4000K	16,270	
			5000K	16,262	



ARC1 LED

Architectural Wall Luminaire



Catalog
Number

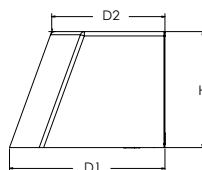
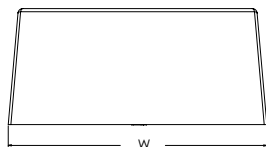
Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

Depth (D1): 6.5"
Depth (D2): 4.75"
Height: 5"
Width: 11"
Weight: 7 lbs
 (without options)



Introduction

The Lithonia Lighting ARC LED wall-mounted luminaires provide both architectural styling and visually comfortable illumination while providing the high energy savings and low initial costs for quick financial payback.

ARC1 delivers up to 3,000 lumens with a soft, non-pixelated light source, creating a visually comfortable environment. The compact size of ARC1, with its integrated emergency battery backup option, is ideal for over-the-door applications.

ARC LED Family Overview

Luminaire	Standard EM, 0°C	Cold EM, -20°C	Approximate Lumens (4000K)				
			P1	P2	P3	P4	P5
ARC1 LED	4W	--	1,500	2,000	3,000	--	--
ARC2 LED	4W	8W	1,500	2,000	3,000	4,000	6,500

Ordering Information

EXAMPLE: ARC1 LED P2 40K MVOLT PE DDBXD

Series	Package	Color Temperature	Voltage	Options	Finish
ARC1 LED	P1 1,500 Lumens	30K 3000K	MVOLT 347 ¹	E4WH Emergency battery backup, CEC compliant (4W, 0°C min) ¹	DDBXD Dark bronze
	P2 2,000 Lumens	40K 4000K		PE Button type photocell for dusk-to-dawn operation	DBLXD Black
	P3 3,000 Lumens	50K 5000K		DMG 0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately) ²	DNAXD Natural aluminum
				SPD6KV 6kV surge protection	DWHXD White
				FAO Field adjustable light output device. Allows for easy adjustment to the desired light levels, from 20% to 100% ²	DSSXD Sandstone
					DDBTXD Textured dark bronze
					DBLBXD Textured black
					DNATXD Textured natural aluminum
					DWHGXD Textured white
					DSSTXD Textured sandstone

Accessories

Ordered and shipped separately.

WSBBW DDBXD U

Surface - mounted back box (specify finish)

NOTES

- 347V not available with E4WH.
- FAO not available with DMG.



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ARC1 LED
 Rev. 03/02/22

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Performance Package	System Watts	30K (3000K, 80 CRI)					40K (4000K, 80 CRI)					50K (5000K, 80 CRI)				
		Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
P1	11W	1,376	127	0	0	0	1,454	134	0	0	0	1,464	135	0	0	0
P2	17W	2,035	121	1	0	1	2,151	128	1	0	1	2,165	129	1	0	1
P3	25W	2,859	117	1	0	1	3,021	123	1	0	1	3,041	124	1	0	1

Electrical Load

Performance Package	System Watts	Current (A)				
		120V	208V	240V	277V	347V
P1	11W	0.111	0.061	0.053	0.047	0.045
P2	17W	0.139	0.081	0.071	0.063	0.060
P3	25W	0.208	0.122	0.108	0.097	0.081

Lumen Output in Emergency Mode (4000K, 80 CRI)

Option	Lumens
E4WH	620

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.04
10°C	50°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.97

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a 25°C ambient, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11). To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

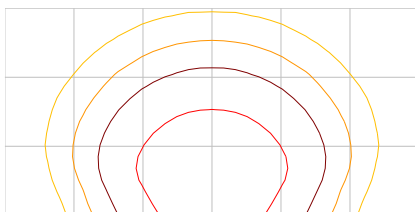
Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	0.97	>0.96	>0.95	>0.91

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit the Lithonia Lighting ARC LED homepage. Tested in accordance with IESNA LM-79 and LM-80 standards.

LEGEND

0.25 fc
0.5 fc
1.0 fc
3.0 fc



MH = 10ft
Grid = 10ft x 10ft

ARC1 LED P3 40K



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ARC1 LED
Rev. 03/02/22

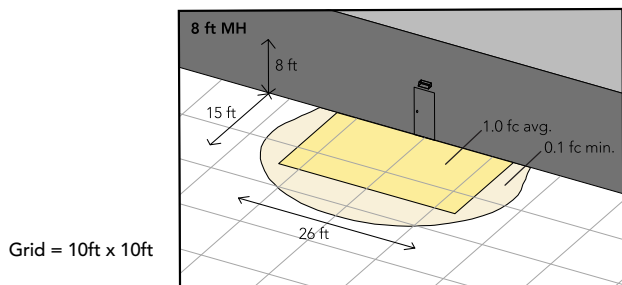
Emergency Egress Options

Emergency Battery Backup

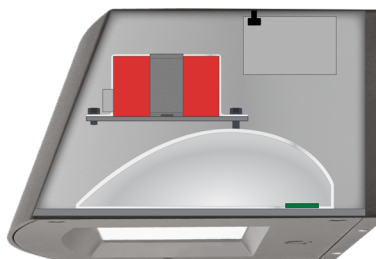
The emergency battery backup is integral to the luminaire — no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product. All emergency battery backup configurations include an independent secondary driver with an integral relay to immediately detect loss of normal power and automatically energize the luminaire. The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time normal power is lost and maintain a minimum of 60% of the light output at the end of 90 minutes.

Applicable codes: NFPA 70/NEC – section 700.16, NFPA 101 Life Safety Code Section 7.9

The example below shows illuminance of 1 fc average and 0.1 fc minimum in emergency mode.



ARC1 LED 40K MVOLT E4WH



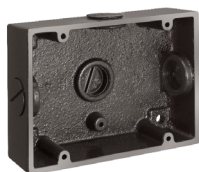
Self-contained solution for clean aesthetic

Mounting, Options & Accessories



E4WH – 4W Emergency Battery Backup

D = 6.5"
H = 5"
W = 11"



BBW – Standard Back Box

D = 1.5"
H = 4"
W = 5.5"

For surface conduit applications.
3/4" conduit entry holes.

FEATURES & SPECIFICATIONS

INTENDED USE

The clean architectural shape of the ARC LED was designed for applications such as hospitals, schools, malls, restaurants, and commercial buildings. The long-life LEDs and driver make this luminaire nearly maintenance-free.

CONSTRUCTION

The die-cast aluminum housing and door act as heat sinks to optimize thermal transfer from the light engine and driver to promote long-life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP65 rating for the luminaire.

FINISH

Exterior painted parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes.

OPTICS

Recessed lens to cut off high angle light and reduce glare. Combination of diffused lens and reflector design has low surface brightness creating a visually comfortable environment with great distribution. LEDs are fully hidden from view to eliminate pixelization and harsh glare. The ARC LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engine consists of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long-life (up to L91/100,000 hours at 25°C). The electronic driver has a power factor of >90%, THD <20%. Luminaire is 0-10V dimmable.

INSTALLATION

The universal wall plate, supplied with the luminaire, fits multiple size junction boxes and supports the luminaire during wiring for easy installation. Built-in wet location wiring compartment on the luminaire to accommodate wiring connections for where there is no junction box. Design can withstand up to a 1.5 G vibration load rating per ANSI C136.31.

LISTINGS

CSA certified to U.S. and Canadian standards. Luminaire is IP65 rated. DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified. International DarkSky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only. Rated for -40°C minimum ambient.

WARRANTY

5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.



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ARC1 LED
Rev. 03/02/22



Catalog Number
Notes
Type

Contractor Select™

ESXF LED

Floodlights

Adjustable+Switchable+Photocell

The Lithonia Lighting® ESXF LED floodlight is a general-purpose flood that offers a wide selection of options and flexibility. Easy access to adjustable lumen output, color switching, and a selectable photocell turns the ESXF into the fixture you need on the spot. With its wide flood (7x7) distribution and DLC performance, the ESXF is a cost-effective solution, great for illuminating yards, driveways, signage, patios, warehouses, and security applications.

FEATURES:

- Five sizes deliver 1,500 up to 50,000 lumens
- Three power levels of adjustable lumen output. Switchable CCT(30K/40K/50K) offers warm, cool and daylight in a single fixture
- Standard photocell can be turned on or off
- IP66 rated, Die-cast aluminum housing
- Two popular mounting options included
- up to 173 LPW



ESXF1 P0 knuckle mount



ESXF1 knuckle mount



ESXF2 knuckle mount



ESXF3 slipfitter mount



ESXF4 slipfitter mount



ESXF5 slipfitter mount



Adjustable Lumen Output
ALO



Switchable CCT
SWW2



Dusk-to-Dawn Operation
PE



Catalog Number	Adjustable Lumen Output ALO			Switchable CCT SWW2	Dusk-to-Dawn Operation PE	Input Voltage	Included Mounting Options	CRI		
ESXF1 P0 SWW2 THK DDB	2500L			Switchable 3000K, 4000K, 5000K	Included Standard, Selectable On/Off	120-277V	Knuckle Only, mounting plate	80CRI		
ESXF1 ALO SWW2 KY DDB	1500L	3000L	5000L			120-277V	Knuckle & Yoke, mounting plate			
ESXF2 ALO SWW2 KY DDB	3500L	5500L	7500L			120-277V	Knuckle & Yoke, mounting plate			
ESXF3 ALO SWW2 YS DDB	8500L	10500L	14000L			120-277V	Yoke & SlipFitter			
ESXF3 ALO SWW2 UVOLT YS DDB						120-347V	Yoke & SlipFitter			
ESXF4 ALO SWW2 YS DDB	16000L	18000L	20000L			120-277V	Yoke & SlipFitter			
ESXF4 ALO SWW2 UVOLT YS DDB						120-347V	Yoke & SlipFitter			
ESXF5 ALO SWW2 UVOLT YS DDB	30000L	40000L	50000L			120-347V	Yoke & SlipFitter			
ESXF5 ALO SWW2 XVOLT YS DDB	30000L	40000L	50000L			277-480V	Yoke & SlipFitter			

More configurations are available. [Click here](#) or visit www.acuitybrands.com and search for ESXF LED.

ESXF Stock Configurations

Catalog Number	UPC	Ci Code	Number of fixtures per pallet	Traditional Replacement
ESXF1 P0 SWW2 THK DDB	00196182393051	*276AL6	400	150W Quartz or 75W HID
ESXF1 ALO SWW2 KY DDB	00196182393204	*276ALH	400	500W Quartz or 150W HID
ESXF2 ALO SWW2 KY DDB	00196182393242	*276ALU	360	500W Quartz or 175W HID
ESXF3 ALO SWW2 YS DDB	00196182393266	*276ALW	144	250W HID
ESXF3 ALO SWW2 UVOLT YS DDB	00196182393273	*276AM0	144	250W HID
ESXF4 ALO SWW2 YS DDB	00196182393280	*276AM2	144	400W HID
ESXF4 ALO SWW2 UVOLT YS DDB	00196182393297	*276AM4	144	400W HID
ESXF5 ALO SWW2 UVOLT YS DDB	00197589243710	*283G2F	32	1000W HID
ESXF5 ALO SWW2 XVOLT YS DDB	00197589243734	*283G2G	32	1000W HID

Accessories: Order as separate catalog number.

ESXF P0 and ESXF1 yoke mount accessory

*276ARA ESXF1YK DDB

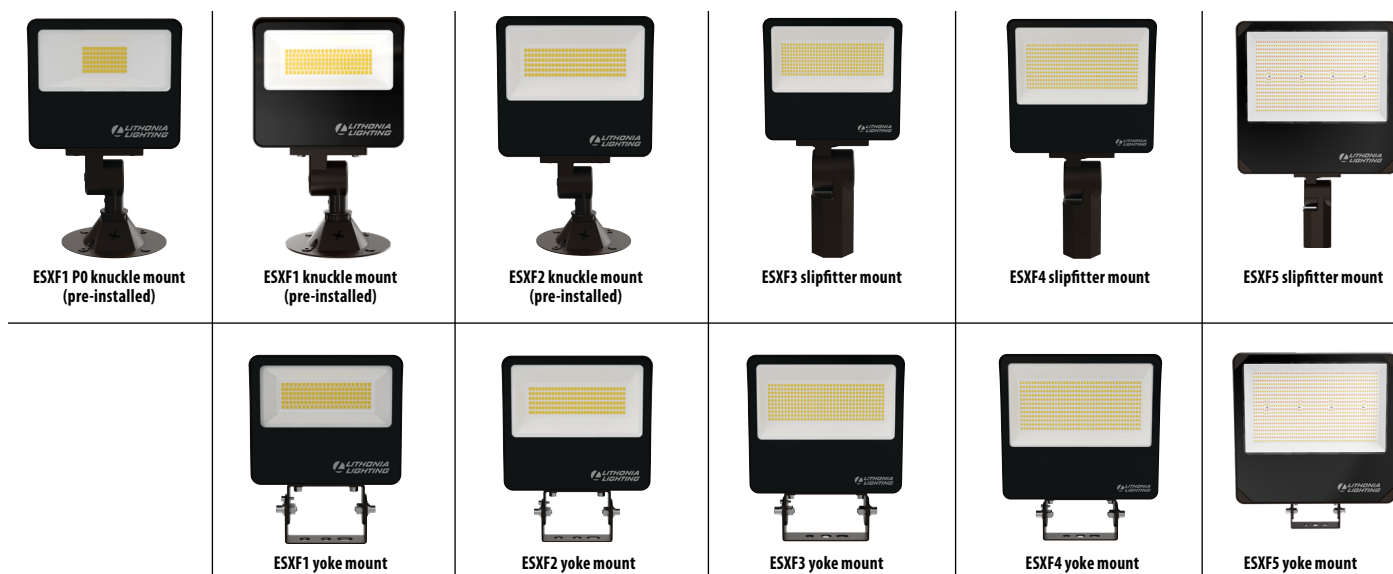
ESXF5 upper/bottom visor accessory

*283G2K ESXF5UBV DDB

[Click here to visit Additional mounting brackets.](#)



Included mounting options by size



Electrical Performance Tables

	Lumen Output	Input Wattage	CCT/80CRI	Delivered Lumens	Lumens Per Watt @ 4000K, 80CRI
ESXF1 P0	2,500L	17W	3000K	2,372	151
			4000K	2,522	
			5000K	2,503	
ESXF1	1,500L	9W	3000K	1,467	171
			4000K	1,560	
			5000K	1,549	
	3,000L	19W	3000K	2,915	162
			4000K	3,099	
			5000K	3,076	
	5,000L	34W	3000K	4,748	147
			4000K	5,047	
			5000K	5,010	

	Lumen Output	Input Wattage	CCT/80CRI	Delivered Lumens	Lumens Per Watt @ 4000K, 80CRI
ESXF2	3,500L	22W	3000K	3,377	163
			4000K	3,591	
			5000K	3,564	
	5,500L	37W	3000K	5,315	151
			4000K	5,651	
			5000K	5,609	
	7,500L	56W	3000K	7,223	137
			4000K	7,680	
			5000K	7,623	

	Lumen Output	Input Wattage	CCT/80CRI	Delivered Lumens	Lumens Per Watt @ 4000K, 80CRI
ESXF5 UVOLT	30,000L	184	3000K	28,596	173
		177	4000K	30,577	
		184	5000K	30,447	
	40,000L	259	3000K	38,079	168
		247	4000K	41,402	
		259	5000K	40,513	
	50,000L	341	3000K	46,678	161
		322	4000K	51,691	
		342	5000K	49,741	

	Lumen Output	Input Wattage	CCT/80CRI	Delivered Lumens	Lumens Per Watt @ 4000K, 80CRI
ESXF3	8,500L	53W	3000K	8,139	163
			4000K	8,653	
			5000K	8,589	
	10,500L	69W	3000K	10,156	156
			4000K	10,797	
			5000K	10,718	
	14,000L	100W	3000K	13,609	145
			4000K	14,469	
			5000K	14,362	

	Lumen Output	Input Wattage	CCT/80CRI	Delivered Lumens	Lumens Per Watt @ 4000K, 80CRI
ESXF4	16,000L	111W	3000K	15,508	148
			4000K	16,487	
			5000K	16,366	
	18,000L	124W	3000K	17,274	148
			4000K	18,365	
			5000K	18,230	
	20,000L	150W	3000K	19,583	139
			4000K	20,819	
			5000K	20,666	

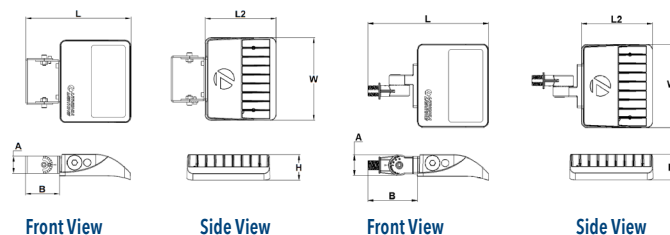
	Lumen Output	Input Wattage	CCT/80CRI	Delivered Lumens	Lumens Per Watt @ 4000K, 80CRI
ESXF5 XVOLT	30,000L	193	3000K	29,949	173
		185	4000K	32,085	
		192	5000K	31,852	
	40,000L	264	3000K	38,777	168
		250	4000K	42,160	
		262	5000K	41,321	
	50,000L	336	3000K	46,644	163
		316	4000K	51,513	
		334	5000K	49,654	



Dimensions

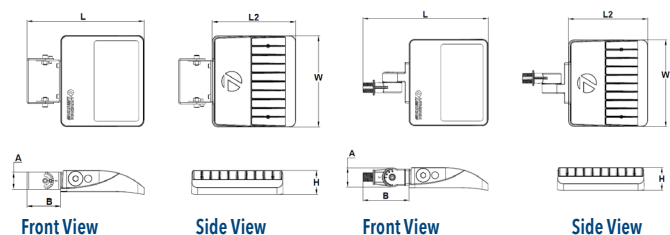
All dimensions are inches (centimeters) unless otherwise indicated.

ESXF1



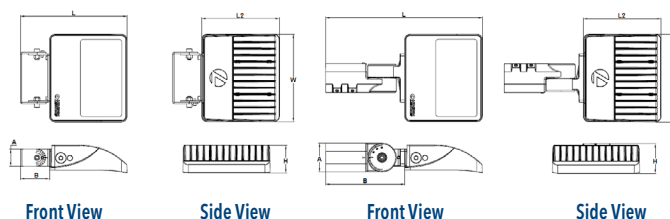
Luminaire	Length (L)	Width (W)	Height (H)	Yoke/Knuckle		L2	Weight
				A (Height)	B (Length)		
	Dimensions in inches" (centimeters)						Pounds (kg)
ESXF1 SWW2 ALO KY (Yoke)	7.65" (27.8cm)	6.04" (15.4cm)	1.86" (4.7cm)	1.26" (3.2cm)	2.48" (6.3cm)	5.17" (13.2cm)	2.31 lbs (1.048 kg)
ESXF1 SWW2 PO/ALO KY (Knuckle)	8.77" (22.3cm)	6.04" (15.4cm)	1.86" (4.7cm)	1.5" (3.8cm)	3.59" (9.1cm)	5.17" (13.2cm)	2.17 lbs (0.986 kg)

ESXF2



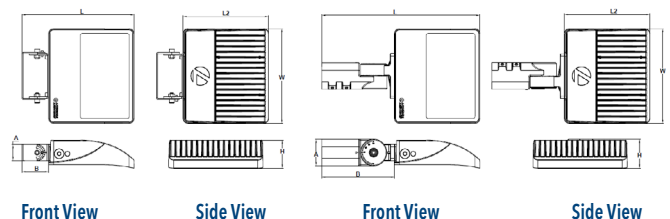
Luminaire	Length (L)	Width (W)	Height (H)	Yoke/Knuckle		L2	Weight
				A (Height)	B (Length)		
	Dimensions in inches" (centimeters)						Pounds (kg)
ESXF2 SWW2 ALO KY (Yoke)	8.64" (21.9cm)	6.75" (17.1cm)	1.8" (4.6cm)	1.26" (3.2cm)	2.48" (6.3cm)	6.16" (15.6cm)	2.92 lbs (1.324 kg)
ESXF2 SWW2 ALO KY (Knuckle)	9.75" (24.8cm)	6.75" (17.1cm)	1.8" (4.6cm)	1.5" (3.8cm)	3.59" (9.1cm)	6.16" (15.6cm)	2.79 lbs (1.264 kg)

ESXF3



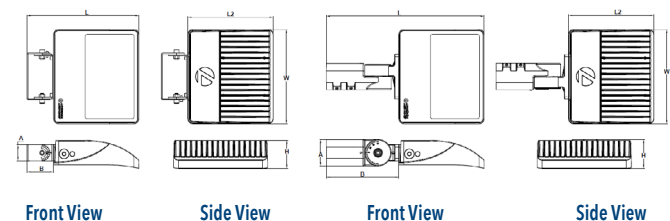
Luminaire	Length (L)	Width (W)	Height (H)	Yoke/Knuckle		L2	Weight
				A (Height)	B (Length)		
	Dimensions in inches" (centimeters)						Pounds (kg)
ESXF3 SWW2 ALO YS (Yoke)	10.54" (19.4cm)	8.95" (22.7cm)	2.84" (7.2cm)	1.77" (4.5cm)	2.99" (7.6cm)	7.97" (20.2cm)	6.21 lbs (2.818 kg)
ESXF3 SWW2 ALO YS (Slipfitter)	16.07" (40.8cm)	8.95" (22.7cm)	3.04" (7.7cm)	2.95" (7.5cm)	8.11" (7.5cm)	7.97" (20.2cm)	6.48 lbs (2.938 kg)

ESXF4



Luminaire	Length (L)	Width (W)	Height (H)	Yoke/Knuckle		L2	Weight
				A (Height)	B (Length)		
	Dimensions in inches" (centimeters)						Pounds (kg)
ESXF4 SWW2 ALO YS (Yoke)	12.54" (31.8cm)	10.54" (26.8cm)	3.12" (7.9cm)	1.77" (4.5cm)	2.99" (7.6cm)	9.55" (24.3cm)	8.17 lbs (3.706 kg)
ESXF4 SWW2 ALO YS (Slipfitter)	17.66" (44.8cm)	10.54" (26.8cm)	3.22" (8.2cm)	2.95" (7.5cm)	8.11" (20.6cm)	9.55" (24.3cm)	8.43 lbs (3.824 kg)

ESXF5



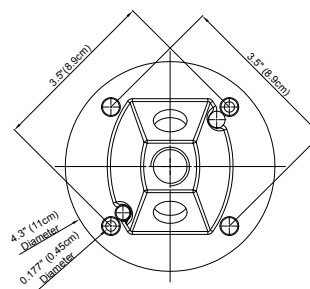
Luminaire	Length (L)	Width (W)	Height (H)	Yoke/Knuckle		L2	Weight
				A (Height)	B (Length)		
	Dimensions in inches" (centimeters)						Pounds (kg)
ESXF5 SWW2 ALO YS (Yoke)	18.6"	16"	3.5"	3"	1.77"	15.6" (39.5cm)	19 lbs (8.62 kg)
ESXF5 SWW2 ALO YS (Slipfitter)	24.5"	16"	3.5"	8.11"	5"	15.6" (39.5cm)	20 lbs (9.07 kg)



EPA Data

	Angle of Tilt	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
ESXF1	Project Area(ft ²)	0.078	0.114	0.15	0.183	0.21	0.231	0.246	0.25	0.25	0.25
	EPA(ft ²)	0.0936	0.1368	0.18	0.2196	0.252	0.2772	0.2952	0.3	0.3	0.3
ESXF2	Project Area(ft ²)	0.09	0.133	0.182	0.226	0.263	0.293	0.314	0.325	0.326	0.32
	EPA(ft ²)	0.108	0.1596	0.2184	0.2712	0.3156	0.3516	0.3768	0.39	0.3912	0.384
ESXF3	Project Area(ft ²)	0.23	0.285	0.383	0.471	0.548	0.608	0.65	0.673	0.674	0.66
	EPA(ft ²)	0.276	0.342	0.4596	0.5652	0.6576	0.7296	0.78	0.8076	0.8088	0.792
ESXF4	Project Area(ft ²)	0.23	0.365	0.494	0.609	0.707	0.785	0.84	0.869	0.87	0.81
	EPA(ft ²)	0.276	0.438	0.5928	0.7308	0.8484	0.942	1.008	1.0428	1.044	0.972
ESXF5	Project Area(ft ²)	0.4	0.5	0.79	1.09	1.36	1.61	1.8	1.94	2.01	2.01
	EPA(ft ²)	0.48	0.6	0.948	1.308	1.632	1.932	2.16	2.328	2.412	2.412

*Includes luminaire and integral mounting arm. Other tenons, arms, brackets or other accessories are not included in this EPA data.





Specifications

INTENDED USE:

The ESXF LED floodlight is designed to provide a cost effective, energy-efficient solution for the one-for-one replacement of existing traditional sources ranging from 150W quartz up to 1000W metal halide. ESXF is well suited for general illumination of parking lots, signage, yards, walkways, landscaping, and other floodlighting applications. ESXF luminaires deliver a uniform, wide flood 7x7 light distribution.

CONSTRUCTION:

The ESXF LED floodlight features sealed die-cast aluminum body and is IP66 listed to withstand moisture and the elements for years to come.

ELECTRICAL:

ESXF features adjustable lumen output include, low, medium, and high. (ESXF P0 static only). Switchable CCT includes between 3000K(warm), 4000K(neutral) or 5000K(daylight) and a selectable dusk to dawn photocell that automatically turns the fixture on in the evening and off the next morning.

Standard 6kV surge protection tested in accordance to ANSI/IEEE C62.41.2)Category C. ESXF LED luminaires use MVOLT (120-277V) as well as UVOLT (120-347V) or XVOLT (277-480V) on select models. Adjustable lumen output is achieved with 0-10V continuous dimming capable drivers, ensuring system power factor >90% and THD <20%. L90 ≥ 36,000 hours at 25C ambient.

INSTALLATION:

ESXF1 and ESXF2 ship with ½ NPS threaded knuckle mount factory installed and can be mounted to conduit bodies or to 4" electrical boxes using the provided round mounting plate. Yoke mounts can be easily changed in the field to mount to any solid surfaces (ESXF1 P0 yoke purchased separately).

ESXF3, ESXF4, and ESXF5 include a yoke mounting for solid surface mounting and an integral slipfitter that mates with standard 2 3/8" tenons for pole-top mounting. All models ship standard with 18" SO cord.

LISTINGS:

CSA certified to U.S. and Canadian standards. Luminaire is IP66 rated. Rated for -40°C minimum ambient.

WARRANTY:

5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.



Factory settings
Lumen Output: High
CCT: 4000K
Photocell: On

DESCRIPTION

The Ridgeview™ LED area roadway luminaire is the compact, efficient, economical approach to LED area lighting. A pure blend of traditional form and LED efficiency; the Ridgeview luminaire provides functional, low profile design with excellent operating performance. Patent pending modular LightBAR technology delivers uniform and energy conscious illumination to parking lots and perimeter security lighting applications.

Catalog #		Type
Project		
Comments		Date
Prepared by		

SPECIFICATION FEATURES

Construction

Rugged one-piece, die-cast aluminum housing secures the thermally conductive LED panel and electrical chamber. Low profile, 3G vibration rated compact design minimizes wind load requirements. Extruded aluminum frame secured with stainless steel hardware confines the LightBAR panel to the thermally conductive housing. The unique glide bracket LightBAR panel allows for easy access to the electrical chamber.

Optics

Choice of twelve patented, high-efficiency AccuLED Optic™ technology manufactured from injection-molded acrylic. Optics are precisely designed to shape the distribution the distribution, maximizing efficiency and application spacing. AccuLED Optic technology, creates consistent distributions with the scalability to meet customized application requirements. Offered Standard in 4000K (+/- 275K) CCT and minimum 70 CRI. Optional 3000K CCT, 5000K CCT and 5700K CCT. For the ultimate level of spill light control, an optional house-side shield

accessory can be field or factory installed. The house-side shield is designed to seamlessly integrate with the SL2, SL3 or SL4 optics.

Electrical

LED drivers mount to die-cast aluminum back housing for optimal heat sinking, operation efficacy, and prolonged life. Standard drivers feature electronic universal voltage (120-277V 50/60Hz), 347V 60Hz or 480V 60Hz operation, greater than 0.9 power factor, less than 20% harmonic distortion, and is suitable for operation in -40°C to 40°C ambient environments. All fixtures are shipped standard with 10kV/10kA common – and differential – mode surge protection. LightBARs feature and IP66 enclosure rating and maintain greater than 95% lumen maintenance at 60,000 hours per IESNA TM-21. Occupancy sensor and dimming options available.

Mounting

Cast aluminum 6" arm includes bolt guides allowing for easy position of the fixture during installation to pole. Standard single carton packaging of housing,

square pole arm and round pole adapter provide contractor friendly installation. Wall mount models feature a cast aluminum arm that is directly mounted to a 4" supplied wall plate secured with set screws.

Finish

Components finished in a five-stage super TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. Standard color is bronze. Optional colors include black, grey, white, dark platinum and graphite metallic. RAL and custom color matches available. Options to meet Buy American and other domestic preference requirements.

Warranty

Five-year warranty.



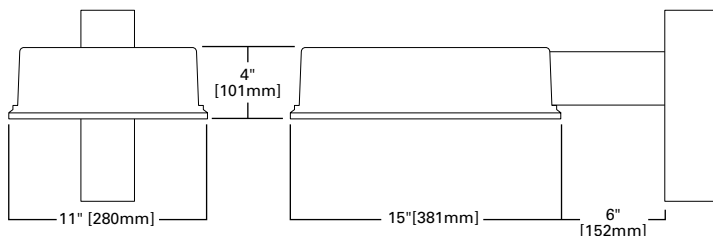
RDG RIDGEVIEW

1 - 4 LightBARs
Solid State LED

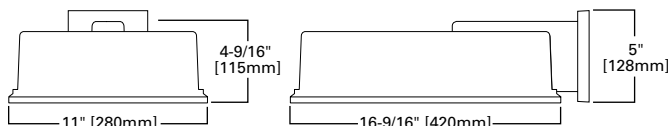
AREA LUMINAIRE

DIMENSIONS

POLE MOUNT



WALL MOUNT



CERTIFICATIONS

UL/cUL Listed
LM79 / LM80 Compliant
3G Vibration Rated
IP65 Fixture Rating
IP66 LightBARs
ISO 9001

ENERGY DATA

Electronic LED Driver

>0.9 Power Factor
<20% Total Harmonic Distortion
120-277V/50 & 60Hz, 347V/60Hz,
480V/60Hz
-40°C Minimum Temperature
40°C Ambient Temperature Rating
50°C (Optional) Ambient Temperature
Rating

EPA

Effective Projected Area: (Sq. Ft.)
Without Arm: 0.48
With Arm: 0.67

SHIPPING DATA

Approximate Net Weight:
12.5 lbs (5.8 kgs.)

POWER AND LUMENS BY BAR COUNT (21 LED LIGHTBARS)

Number of LightBARs		E01	E02	E03	E04
Drive Current		350mA Drive Current			
Power (Watts)		25W	52W	75W	97W
Current @ 120V (A)		0.22	0.44	0.63	0.82
Current @ 277V (A)		0.10	0.20	0.28	0.36
Power (Watts)		31W	58W	82W	99W
Current @ 347V (A)		0.11	0.19	0.28	0.29
Current @ 480V (A)		0.09	0.15	0.20	0.21
T2	Lumens	2,999	5,997	8,996	11,994
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3
T3	Lumens	2,986	5,972	8,957	11,943
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3
T4	Lumens	2,939	5,877	8,816	11,754
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G2	B2-U0-G3
5MQ	Lumens	3,108	6,215	9,323	12,431
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2
5WQ	Lumens	3,066	6,131	9,197	12,262
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2
5XQ	Lumens	3,092	6,184	9,276	12,368
	BUG Rating	B2-U0-G1	B3-U0-G2	B3-U0-G3	B4-U0-G3
SL2	Lumens	2,928	5,856	8,784	11,712
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2
SL3	Lumens	2,969	5,937	8,906	11,875
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2
SL4	Lumens	2,882	5,764	8,646	11,528
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2
RW	Lumens	3,004	6,007	9,011	12,015
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3
SLL/SLR	Lumens	2,693	5,387	8,080	10,774
	BUG Rating	B1-U0-G2	B1-U0-G2	B1-U0-G3	B2-U0-G3

POWER AND LUMENS BY BAR COUNT (7 LED LIGHTBARS)

Number of LightBARs		F01	F02	F03	F04
Drive Current		1A Drive Current			
Power (Watts)		26W	55W	78W	102W
Current @ 120V (A)		0.22	0.46	0.66	0.86
Current @ 277V (A)		0.10	0.21	0.29	0.37
Power (Watts)		32W	60W	85W	105W
Current @ 347V (A)		0.11	0.19	0.28	0.30
Current @ 480V (A)		0.09	0.15	0.21	0.22
T2	Lumens	2,475	4,951	7,426	9,902
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3
T3	Lumens	2,465	4,930	7,395	9,859
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3
T4	Lumens	2,426	4,852	7,278	9,704
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G2	B2-U0-G2
5MQ	Lumens	2,565	5,131	7,696	10,262
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2
5WQ	Lumens	2,531	5,061	7,592	10,123
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2
5XQ	Lumens	2,553	5,105	7,658	10,210
	BUG Rating	B2-U0-G1	B3-U0-G2	B3-U0-G3	B4-U0-G3
SL2	Lumens	2,417	4,834	7,251	9,668
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G2	B2-U0-G2
SL3	Lumens	2,451	4,901	7,352	9,803
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G2	B2-U0-G2
SL4	Lumens	2,379	4,758	7,138	9,517
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G2	B2-U0-G2
RW	Lumens	2,480	4,959	7,439	9,918
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3
SLL/SLR	Lumens	2,224	4,447	6,671	8,894
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G3	B1-U0-G3

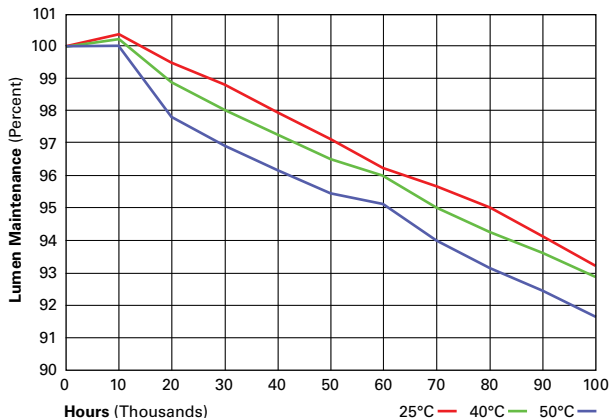
LUMEN MAINTENANCE

Ambient Temperature	25,000 Hours*	50,000 Hours*	60,000 Hours*	100,000 Hours	Theoretical L70 (Hours)
25°C	> 99%	> 97%	> 96%	> 93%	> 450,000
40°C	> 98%	> 97%	> 96%	> 92%	> 425,000
50°C	> 97%	> 96%	> 95%	> 91%	> 400,000

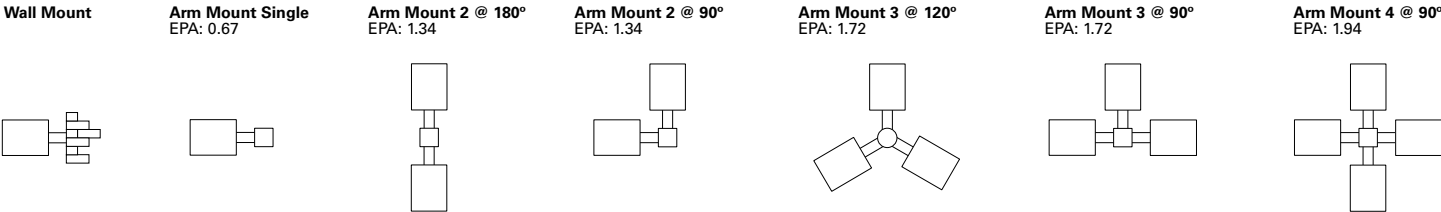
* Per IESNA TM-21 data.

LUMEN MULTIPLIER

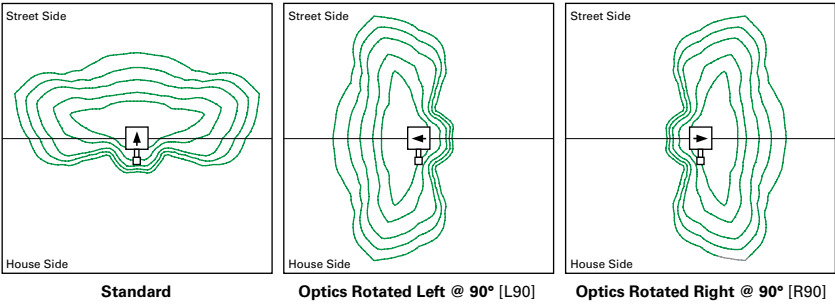
Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99
50°C	0.96



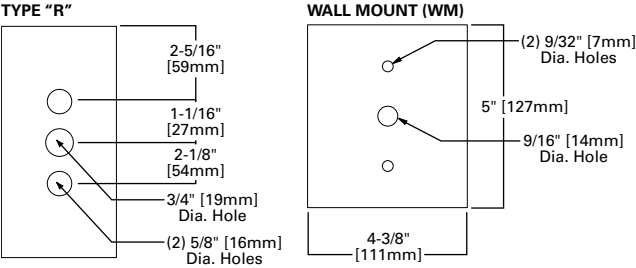
MOUNTING CONFIGURATIONS AND EPAS



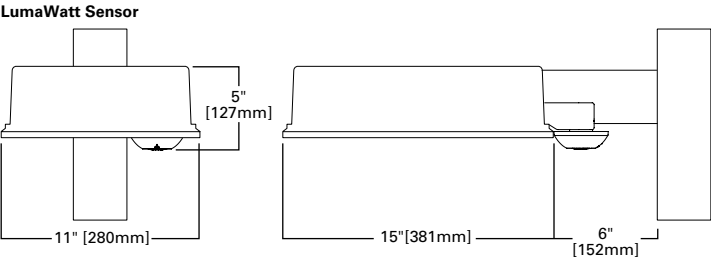
OPTIC ORIENTATION



DRILLING PATTERNS



OPTIONAL WIRELESS CONTROL



ORDERING INFORMATION

Sample Number: RDG-E04-LED-E-U-T3-BZ

Product Family ^{1,2}	Number of LightBARs ^{3,4}	Lamp Type	Ballast Type	Voltage	Distribution	Color
RDG =Ridgeview BAA-RDG =Ridgeview Buy American Act Compliant ²¹ TAA-RDG =Ridgeview Trade Agreements Act Compliant ²¹	E01 =(1) 21 LED LightBAR E02 =(2) 21 LED LightBARs E03 =(3) 21 LED LightBARs E04 =(4) 21 LED LightBARs F01 =(1) 7 LED LightBAR F02 =(2) 7 LED LightBARs F03 =(3) 7 LED LightBARs F04 =(4) 7 LED LightBARs	LED =Solid State Light Emitting Diodes	E =Electronic D =Dimming	U =Universal (120-277V) 8 =480V ^{5,6} 9 =347V ⁵	T2 =Type II T3 =Type III T4 =Type IV SL2 =Type II with Spill Control SL3 =Type III with Spill Control SL4 =Type IV with Spill Control RW =Rectangular Wide 5MQ =Type V Square Medium 5WQ =Type V Square Wide 5XQ =Type V Square Extra Wide SLL =90° Spill Light Eliminator Left SLR =90° Spill Light Eliminator Right	AP =Grey BZ =Bronze BK =Black DP =Dark Platinum GM =Graphite Metallic WH =White
Options (Add as Suffix)				Accessories (Order Separately) ^{19,22}		
R90 =Optics Rotated Right 90° L90 =Optics Rotated Left 90° 4 =NEMA Twistlock Photocontrol Receptacle 4N7 =7-PIN NEMA Twistlock Photocontrol Receptacle ⁷ U =UL and cUL Listed 2L =Two Circuits ⁸ 7030 =70 CRI / 3000K ⁹ 7050 =70 CRI / 5000K ⁹ 7060 =70 CRI / 5700K ⁹ 8030 =80 CRI / 3000K ⁹ WM =Wall Mount Arm ¹⁰ P =Button Type Photocontrol ¹¹ BBLEDCLD =UL924 Cold Battery Backup (Specify Voltage) ¹² HA =50°C High Ambient Temperature Rating ¹³ MS-LXX =Motion Sensor for ON/OFF Operation ¹⁴ MS/X-LXX =Motion Sensor for Bi-Level Switching ^{7,15} DIMRF-LW =Enlighted Wireless Sensor, Wide Lens for 8' - 16' Mounting Height ^{7,16,17} DIMRF-LN =Enlighted Wireless Sensor, Narrow Lens for 16' - 40' Mounting Height ^{7,16,17} LCF =LightBAR Cover Plate Matches Housing Finish HSS =Factory Installed House Side Shield ¹⁸				SA1175-XX =Single Tenon Adapter for 3-1/2" O.D. Tenon SA1176-XX =2@180° Tenon Adapter for 3-1/2" O.D. Tenon SA1177-XX =3@120° Tenon Adapter for 3-1/2" O.D. Tenon SA1178-XX =4@90° Tenon Adapter for 3-1/2" O.D. Tenon SA1179-XX =2@90° Tenon Adapter for 3-1/2" O.D. Tenon SA1180-XX =2@120° Tenon Adapter for 3-1/2" O.D. Tenon SA1181-XX =3@90° Tenon Adapter for 3-1/2" O.D. Tenon SA1182-XX =Single Tenon Adapter for 2-3/8" O.D. Tenon SA1183-XX =2@180° Tenon Adapter for 2-3/8" O.D. Tenon SA1184-XX =3@120° Tenon Adapter for 2-3/8" O.D. Tenon SA1185-XX =4@90° Tenon Adapter for 2-3/8" O.D. Tenon SA1186-XX =2@90° Tenon Adapter for 2-3/8" O.D. Tenon SA1187-XX =3@90° Tenon Adapter for 2-3/8" O.D. Tenon OA/RA1016 =NEMA Twistlock Photocontrol - Multi-Tap OA/RA1014 =NEMA Twistlock Photocontrol - 120V OA1223 =10kV Circuit Module Replacement OA/RA1013 =Photocontrol Shorting Cap LB/HSS-21 =Field Installed House Side Shield for "E" LightBARs ^{18,20} LB/HSS-07 =Field Installed House Side Shield for "F" LightBARs ^{18,20}		

NOTES:

- Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
- 6" Arm and round pole adapter included with fixture.
- 21 LED LightBAR powered at 350mA, 7 LED LightBAR powered at 1A.
- Lumen values based upon 4000K CCT, 350mA or 1A drive current, 25°C ambient operating temperature.
- Not available with two circuit option.
- Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase Four Wire Delta and Three Phase Two Wire Corner Grounded Delta systems).
- Order with dimming driver.
- 2L option not available in 347V or 480V. Low-level output varies with LightBAR count. Requires quantity of two or more LightBARs.
- Extended lead times apply. See website for IES files.
- Wall mount arm and mounting plate included with fixture.
- Specify voltage. Available in 120, 277, 208 or 240V.
- Specify 120V or 277V. Available with E01 or F01 configurations only. 25°C ambient operating temperature.
- HA not available with BBLEDCLD or MS-LXX or MS/X-LXX options. Limit three LightBARs with HA option.
- Sensor housed in external box mounted to the luminaire. Replace XX with mounting height in feet for proper lens selection (e.g., MS-L20). Not available with HA option. Consult factory for more information.
- Motion sensor for bi-level switching. Sensor housed in external box mounted to the luminaire. Available in E02-E04 and F02-F04 configurations. Replace X with number of bars operating in low output mode (must select a number of bars at least one less than the number of bars in the fixture to operate in low output mode) and replace XX with fixture mounting height for proper lens selection (e.g., MS/3-L20). Not available with HA option. Consult factory for more information.
- Enlighted wireless sensors are factory installed only requiring network components RF-EM-1, RF-GW-1 and RF-ROUT-1 in appropriate quantities. See www.cooperlighting.com for Enlighted application information.
- Only available in pole mount configuration.
- Only for use with SL2, SL3 and SL4 distributions. Not available with L90 or R90 options.
- Replace XX with color designation.
- One required for each LightBAR. Not available with L90 or R90 options.
- Only product configurations with these designated prefixes are built to be compliant with the Buy American Act of 1933 (BAA) or Trade Agreements Act of 1979 (TAA), respectively. Please refer to DOMESTIC.PREFERENCES website for more information. Components shipped separately may be separately analyzed under domestic preference requirements.
- Accessories sold separately will be separately analyzed under domestic preference requirements. Consult factory for further information.

BUSINESS OF THE PLAN COMMISSION

MEETING DATE: August 26, 2024

PLACEMENT: Ordinance

ITEM TITLE: Community Development Department - Ordinance Amending Section 1.29(1) of the Germantown Municipal Code to Amend the Membership of the Plan Commission. (ACTION)

SUBMITTED BY: Brian Sajdak, Attorney

SUMMARY EXPLANATION:

The proposed ordinance accomplishes multiple things. First, it creates an advisory position on the Plan Commission for a representative of the school district. This position was recommended in the Utilities & Community Facilities section of the Implementation chapter of the 2050 Plan. Having a school district representative will help the Village understand the school district's position as it relates to development within the Village, while also providing a liaison to the School Board to help the District to plan for future development. The ordinance allows the School Board to appoint a non-resident which would cover the situation where the School Board appointed someone in the Superintendent's office who may not be a resident.

The second change is to clean up the code to reflect the statute, best practices and Village historical practice. First, by statute, the Plan Commission should be 7 voting members. The ordinance eliminates the language that provides for "at least" 7 members to match the statute. Next, the ordinance changes the appointment of the Trustee member to match historical practice wherein the Village President has nominated the Trustee member at the organizational meeting in April subject to Village Board confirmation.

Finally, the ordinance removes the provision allowing for any Trustee to fill a spot on the Plan Commission to create a quorum. This provision is problematic for multiple reasons. First, unlike other situations in the statutes which expressly call for alternate members (e.g., Board of Review; Board of Appeals, etc.) no such provision exists for the Plan Commission. Second, the code does not presently call for a named alternate, but instead allows any Trustee to sit on the Plan Commission for any regular member. As such, particularly savvy members of the Plan Commission could potentially game the outcome of Commission actions by deciding to hold a special meeting at a date and time that members who may hold an opposite point of view may not be able to attend, thereby allowing friendly Trustees to act instead. Similarly, the statute provides that there must be a minimum of three citizen members of the Commission. While allowing a Trustee to act as an alternate may not expressly violate this rule, there is substantial risk that a court reviewing an action of the Plan Commission may rule that it is nonetheless a violation and then overturn the action. As such, good governance and best practices suggests that this provision (which in recent history has been infrequently used) should be eliminated.

NOTE: A public hearing of the proposed text amendment is not a requirement because the code being amended is not the Zoning or Subdivision Code.

ATTACHMENT:

1. Ordinance Amending PC membership re School District

STAFF RECOMMENDATION:

A motion to recommend approval of the ordinance as proposed to the Village Board.

ACTION BY Committee:

AN ORDINANCE AMENDING SECTION 1.29(1) OF THE GERMANTOWN
MUNICIPAL CODE TO AMEND THE MEMBERSHIP OF THE PLAN COMMISSION

WHEREAS, Wis. Stat. § 62.23(1)(a) authorizes the Village Board to establish the membership of the plan commission by ordinance; and

WHEREAS, the Village Board previously adopted section 1.29(1) which establishes the membership of the plan commission; and

WHEREAS, the Village Board wishes to amend that section to better reflect the statute and best practices, and also to add for Germantown School District representation; and

WHEREAS, the Village Board has determined that proper membership of the plan commission furthers the public health, safety and welfare of the community;

NOW, THEREFORE, the Village Board of the Village of Germantown, Wisconsin, do ordain as follows:

SECTION I

Section 1.29(1) of the Germantown Municipal Code is amended to read as follows
(NOTE: Added text is double underlined; Deleted text is struck-through):

- (1) **MEMBERSHIP.** The Plan Commission shall consist of ~~at least 7~~ regular members who shall receive such compensation as the Village Board determines, as follows. One regular member shall be the Village President who shall be the Chairman. One regular member shall be a Trustee nominated by the Village President and confirmed by the Village Board ~~elected annually by a majority vote of the Village Board~~ at the organizational meeting in April. The other regular members shall be citizen members of recognized experience and qualifications appointed by the Village President, subject to confirmation by the Village Board; the citizen members shall serve for staggered 3-year terms with each term commencing May 1, except that, for the purpose of preserving 3-year staggered terms, in 2007 the citizen appointee for the position previously filled by Chairman of the Park and Recreation Commission shall be appointed to an initial one-year term, and the citizen appointee for the position previously filled by the Village Engineer, shall be appointed for an initial 2-year term. In addition to the 7 regular members, the Germantown School Board may appoint one representative to serve

a 1-year term on the Plan Commission as a non-voting, unpaid, ex officio member commencing annually on May 1. The ex officio School District representative shall be either a member of the School Board or an employee in the District Superintendent's office, but need not be a resident of Germantown. The ex officio school district member shall not be counted for purposes of determining the existence of a quorum. ~~In the event that there is a lack of quorum of the Plan Commission due to absence or recusal of any member, any Trustee may temporarily sit on the Plan Commission in order to create a quorum and permit business to be transacted.~~

SECTION II

The terms and provisions of this ordinance are severable. Should any term or provision of this ordinance be found to be invalid by a court of competent jurisdiction, the remaining terms and provisions shall remain in full force and effect.

SECTION III

All ordinances or parts of ordinances contravening the terms of this ordinance are hereby to that extent repealed.

SECTION IV

This ordinance shall take effect and be in full force upon its passage and the day after its publication.

Introduced by _____ on September 3, 2024.

Adopted: September 3, 2024 Vote: Ayes: Nays: Absent:

Dean Wolter, Village President

ATTEST:

Donna Ott, Village Clerk

ORDINANCE NO. _____-24
Page 3

Approved as to form:

Brian C. Sajdak, Village Attorney

Published:

HOLY HILL GATEWAY DISTRICT MASTER PLAN REQUEST FOR PROPOSALS (RFP)

8/26/24 Plan Commission Meeting

Germantown Community Development Department

Village Staff Report

Germantown, Wisconsin

Around this time last year, the Plan Commission began the process of reviewing proposals and recommending the selection of a consultant to prepare master plans for the Holy Hill Gateway District and the Freistadt District (the original RFP provided for one combined master plan for both or two separate master plans). However, prior to completing the selection process, the overall effort was put on hold due to uncertainty surrounding the Village's application for and approval of a proposed public frontage road east of US41 south of Holy Hill Road (referred to now as "High Point Pass"). It was decided by staff that, because a potential railroad crossing would play a critical role in determining what land use(s) would be most appropriate for the Freistadt District south of the railroad and east of US41, the master plan process would be put on hold until after the Village's railroad crossing application was submitted and action on that application was taken by WisDOT and the Office of the Commissioner of Railroads (OCR).

As of today, the Village has not yet filed the necessary application materials for the proposed railroad crossing. The primary reason for the delay is that the Village does not yet own the right-of-way needed for the High Point Pass frontage road from Holy Hill road south to the railroad. Acquisition of the 2-acre outlot by the Village, that currently provides private driveway access to the Holy Hill Self-Storage property, is expected to occur in the coming weeks.

However, it is expected that the review process for the Village's railroad crossing application may take several months after it has been filed. For this reason, Staff is recommending that the Holy Hill Gateway District master plan project be separated from the Freistadt District master plan project and proceed as a separate project.

The original Request for Proposals (RFP) has been revised to remove the Freistadt Road District component (copy attached). Staff is requesting that the Plan Commission review and approve the revised RFP and timeline for completion of this master plan project.

Request for Proposals

Holy Hill Gateway District Master Plan

SECTION I. Introduction & Purpose

This request for proposals (RFP) is issued by the Village of Germantown for the purpose of securing a qualified planning or design consultant to prepare a master plan to guide future development and land use in each of the following areas in the Village:

1. **Holy Hill Gateway District.** A rapidly developing highway interchange area with warehousing/distribution, light industrial and undeveloped agricultural land that includes approximately 930 acres located east of the I-41 @ Holy Hill Road interchange in the northwest part of the Village.

The goal is to develop and adopt a master plan for the HHG District that presents in general terms the preferred type, density, relative location, format, architectural design, and timing of future development and land use consistent with the Village's 2050 Comprehensive Plan. Further, the master plan is expected to address the need for and location of potential public improvements, e.g. new and/or extended roads, park & recreation facilities, storm water management facilities. The master plan should also address measures necessary to protect and enhance existing environmentally sensitive features and land use compatibility within the District and between the District and abutting neighborhoods, districts and corridors as defined in the 2050 Plan.

The master plan will be developed as a refinement to and adopted as a component of the Village's 2050 Comprehensive Plan. The master plan will form the basis for developing and/or revising the Village's zoning, land division and other development regulations that apply to future development and land use in the District.

Given ongoing and significant development pressure in the Holy Hill Gateway District, development of a master plan for the district is a high priority. Consequently, the Village prefers that the master plan process be conducted and be completed within a nine (9) month time period.

SECTION II. Background

2050 Comprehensive Plan

The "[Village of Germantown 2050 Comprehensive Plan](#)" (the "2050 Plan") was adopted in September, 2022 with the primary purpose *"to act as a roadmap for the Village of Germantown as it navigates upcoming change, growth, and development. Realizing the vision and goals presented in this plan will require that the Village face challenging decisions about where and how to grow and what services will best serve the residents of today and tomorrow."*

With that in mind, future land use planning for the Village under the 2050 Plan is intended to follow a "Neighborhood/District/Corridor" place-based approach with two components: a Future Land Use Plan Map and a Future Land Use Table.

The 2050 Future Land Use Plan Map (see Exhibit 1) shows the Village as a series of thirty-two (32) places or neighborhoods, districts, and corridors (hereafter "NDCs") that have or are intended to have the same or a similar pattern and type of land use, cultural, environmental, and economic character, and identity.

Unlike a typical land use planning approach, the 2050 Future Land Use Table (see Exhibit 2) does not assign a single acceptable land use to a particular parcel. Rather, the Future Land Use Table identifies a list of eleven preferred land uses, preferred design criteria and maximum density allowances. For each NDC, each of the preferred land uses is assigned a degree of desirability:

- "Desirable" uses should be encouraged because they are consistent with, support, and enhance the desired character of the NDC
- "Allowable" uses are generally considered appropriate for the area but may require additional consideration and/or specific modification or developed features to be compatible with other uses in the NDC
- "Undesirable" uses should not be encouraged but may still be acceptable for the NDC under special circumstances

This approach gives the Village staff, Plan Commission and Village Board an adaptable and flexible framework to discuss, evaluate and respond to unique development proposals in the village.

In addition to the 2050 Future Land Use Plan Map and Table, an objective of the 2050 Plan is to develop individual "master" or "neighborhood" plans for each of the 32 NDCs in the Village. It is intended that each master plan will provide a greater level of detail in terms of guiding the preferred type, amount, density, relative location and timing of future development, public improvements and environmental protection than presented in the 2050 Plan.

Depending on the specific conditions, character and needs of each NDC, each master plan is intended to address additional implementation objectives identified in the Implementation Chapter of the 2050 Plan to one degree or another, including:

- Design Guidelines for Industrial & Commercial Sites & Buildings
- Land use compatibility & buffer requirements
- Environmental protection requirements
- Residential housing opportunities & affordability
- Park & recreational trails & facilities
- Public improvement needs, timing & financing alternatives

Each master plan for the Holy Hill Gateway District and the Freistadt District is expected to address the objectives listed above to one degree or another.

Holy Hill Gateway District

The Holy Hill Gateway District is approximately 930 acres in area and lies adjacent to and east of I-41 near the Holy Hill Road interchange (see Exhibit 3). This District has had a significant amount of light industrial, warehousing & distribution development along the Holy Hill Road corridor as a direct result of the Village creating Tax Increment District No. 8 (TID#8) north of Holy Hill Road and expanding Tax Increment District No. 7 (TID#7) south of Holy Hill Road. Since 2018, approximately 2.1 million sqft of industrial building space has been developed in the Holy Hill Gateway District for warehousing & distribution, light manufacturing & assembly uses. As set forth in the 2050 Plan, the Holy Hill Gateway District is intended to continue developing as an industrial and mixed-use commercial district with light industrial, warehouse/distribution, and corporate office uses with highway-oriented hospitality & retail uses located near the Holy Hill Road interchange and mixed-use commercial retail and high-density residential uses adjacent to and along the I-41 corridor.

Public investment and improvements include a new 177' high, 500,000-gal elevated water storage tank (Tower #4) and a 420' deep well (Well #12) that are expected to be operational in 2024. Holy Hill Road was also recently widened to a 4-lane divided cross-section with signalized intersections at Gateway Crossing and Goldendale Road. Existing development is served by municipal water and sewer south of Rockfield Road and west of Goldendale Road. Future public improvements include the construction of a frontage road east of and parallel to I-41 from Bonniwell Road south through the Holy Hill Gateway District across Holy Hill Road and the WSOR railroad to Freistadt Road (also through the Freistadt District that lies to the south). Other local and collector road needs within the Holy Hill District is expected to be identified as part of the master plan process.

The Holy Hill Gateway District abuts the Village's "Rural Preservation District" and "Woodside Neighborhood" to the north and the "Isabelle Farms Neighborhood" and "Dheinsville Neighborhood" to the south and east. All these areas surrounding the Holy Hill Gateway district contain low-density, single-family residential and/or undeveloped agricultural land. An objective of the master plan process is to address the transition between these areas, potentially incompatible land uses, and alternative buffering and setback requirements along the common boundaries for the Holy Hill Gateway District and the abutting district and neighborhoods.

Opportunity Areas

The Holy Hill Gateway District is identified in the 2050 Plan as one of two critical "opportunity areas" in the Village that present the greatest potential for change in the Village over the next 30 years. As part of the 2050 Plan process, the Village determined that land in these districts should be reserved for development comprised of light industrial, commercial warehousing & distribution, commercial and high-density residential land uses.

The 2050 Plan includes a conceptual land use plan or "vision" for both the Holy Hill Gateway and Freistadt Districts (see Exhibit 5) that presents a plan for the type and relative location of the preferred land uses and major public road and recreational trail improvements within the Holy Hill Gateway and Freistadt Districts. It is intended that this conceptual "vision" will guide future development and land use in the interim until a detailed master plan is developed and adopted for each district (or one master plan for both).

With respect to the master plan process, it is intended that this "vision" will be the starting point for discussing the type, amount, density, relative location of future development in the Holy Hill

Gateway District. To that end, it is expected that, at a minimum, a general level of market research and evaluation of market demand and other economic considerations affecting the preferred land uses within these districts will be conducted to ensure the preferred development and land uses included in the master plan for each district are realistic, reasonably attainable, and sustainable.

SECTION III. Master Plan Objectives

The master plan process is intended to evaluate and address several objectives, including but not limited to the following:

1. Evaluate and reaffirm (or revise as necessary) the preferred land uses for the District as set forth in the 2050 Future Land Use Plan Map and Table and in the conceptual “vision” plan in Exhibit 5 (including the preferred land use categories, preferred site design, and maximum residential density).
2. Prepare detailed maps, tables, renderings, and other graphics indicating the appropriate type, amount, location, mix, density/intensity, format, architectural design, and timing of development and land uses (light industrial, warehouse & distribution, retail, hospitality & service-oriented commercial, office, residential, mixed-use, open space, utilities, roads, trails, etc.) that are appropriate for and likely to succeed within the District.
3. Identify opportunities and adopt specific strategies, including but not limited to zoning and subdivision code revisions, to implement one or more objectives and tasks identified in the 2050 Plan Implementation Chapter, including, but not limited to:
 - a. Developing & adopting specific design guidelines for industrial & commercial sites & buildings
 - b. Identifying potential land use incompatibility issues with abutting neighborhoods and developing specific buffering & setback requirements
 - c. Identifying environmentally sensitive features and adopting specific protection requirements
 - d. Address the demand/need for owner-occupied and rental residential housing, mixed-use developments, including Washington County’s “NextGen Housing” Initiative
4. Identify existing developed properties and land uses within the District that may be inconsistent with the preferred land uses set forth in 2050 Plan, properties that may be underused relative to the potential value of the property or importance to achieving the 2050 Plan “vision”, or otherwise have the potential for redevelopment.
5. Identify the location of future transportation infrastructure, including the location and design characteristics of future local, collector, and arterials roadways, off-road recreational trails, and appropriate streetscaping enhancements, e.g. lighting, sidewalks, terraces, crosswalks, benches, receptacles, bike racks, etc. .
6. Identify specific strategies, e.g. plan policies, zoning and subdivision code revisions, public and private infrastructure improvements, land acquisition, alternative public and private funding sources, etc., to implement the master plan and to ensure future land use and development occurs in a cost-effective and sustainable manner.
7. Develop and adopt the master plan based in part on public input obtained from a broad set of community stakeholders including the Village Board, Plan Commission, residents, property and business owners, real estate and development professionals, and typically unrepresented stakeholders and silent supporters or objectors.

SECTION IV. Scope of Work

It is expected that the consultant will provide the Village specific recommendations regarding the final scope of the project and overall planning process, as well as, specific tasks and deliverables based on their expertise and experience completing similar district, neighborhood and corridor scale land use & development planning projects. The final project scope, as well as, the specific elements to be included in and the organization and format of the master plan document will be determined by the consultant in cooperation with the Village once the consultant is selected. However, the master plans should address or otherwise incorporate the following:

Planning Area Identification & Background

Identification of the recommended planning area boundary. A description of the planning area, including a summary of prior planning activities and relevant planning documents and studies, existing natural resources and infrastructure, issues & opportunities within the districts, etc. This includes both Village plans and any relevant plans adopted by regional or other entities such as SEWRPC, MMSD, and Washington County. While the goal is to develop a master plan for the Holy Hill Gateway District, given the need to evaluate potential land use incompatibilities and develop appropriate buffering and setback requirements between the Holy Hill Gateway District and the abutting areas to the north, east and south, the planning area may need to extend beyond the District boundaries in certain locations.

Existing Conditions & Property Redevelopment Analysis

The consultant shall perform a combination of land use, zoning, demographic, economic development and market analyses and assessments to evaluate and document existing conditions within the Districts including the identification of existing developed properties and land uses within the Districts that may be inconsistent with the 2050 Plan preferred land uses, are currently underused relative to the potential value of the property, or otherwise have the potential for redevelopment.

2050 Plan Consistency

The master plan should discuss how it is consistent with and furthers the 2050 Plan and other existing plans adopted by the Village, including the Comprehensive Outdoor Recreation Plan.

Intergovernmental Cooperation

The planning process should include an opportunity for other local governments to participate, particularly Germantown School District, the Village of Richfield, Washington County, the Southeast Wisconsin Regional Planning Commission (SEWRPC), the Milwaukee Metropolitan Sewerage District (MMSD), and the Department of Natural Resources (DNR). The master plan should document how it furthers intergovernmental cooperation, addresses any intergovernmental issues raised through the planning process, and how those issues were resolved.

Natural Resources

The plan should evaluate existing natural resources, environmental corridors, any known threatened or endangered species, heritage trees, high quality woodlands, topography and steep slopes, floodplains, wetlands, high groundwater areas that may be limiting factors to or affected by development, soils, prairies or meadows. The plan should identify any environmental corridors (as defined by SEWRPC) and identify required and recommended protection and preservation regulations these resources and environmental corridors.

Market and Economic Development Analysis

Development of the master plan should consider the market and economic conditions of the recommended preferred land uses to ensure the land uses are realistically attainable and likely to be successful.

Transportation Network Analysis

The master plan should include a general analysis of the suitability and capacity of the existing and proposed future transportation and pedestrian networks and include a proposed road, sidewalk, recreational trail network (and any realistic alternative modes of travel) necessary to provide efficient and cost-effective circulation and connectivity within District, to adjacent districts and neighborhoods in the Village, and to the surrounding regional transportation network. The proposed network should include street design principles to follow for any new streets proposed, including recommendations for street width, bicycle and pedestrian facilities, and streetscaping.

Preferred Land Use Plan, Conceptual Renderings and Site Plans

The consultant shall develop a preferred land use plan as part of the master plan for the District. The Preferred Land Use Plan should include more detail regarding land use categories, maps, concepts, policies, and recommendations that in the 2050 Plan and District profile. This may include recommendations regarding the location of preferred land uses, development density and intensity, preferred building materials or styles, recommended building height, floor area ratios, principal building setbacks, minimum or maximum parking requirements, and other typical zoning code requirements. The master plan should include the use of representative images, conceptual renderings, and scaled site plans for specific properties or land use categories. The creation of roadway conceptual cross sections should also be included. It is expected that the preferred land use plan will be developed after evaluating several alternative development and transportation network scenarios, preferred land use maps, and conceptual renderings and site plans for review and consideration by the Village as part of an iterative planning process.

Specific properties or areas in the Holy Hill Gateway District that should have conceptual renderings and site plans prepared include, but are not limited to:

1. Holy Hill Storage & MLG properties in the southeast quadrants of the Holy Hill Road @ I-41 interchange;
2. Properties along the proposed frontage road (High Point Pass) from Bonniwell Road (north terminus) to Holy Hill Road (continuing south into the Freistadt District to the railroad)
3. The recommended cross-section(s) around the perimeter of the Holy Hill Gateway District depicting the recommended setback depth, berming, and landscape buffering requirements along the common boundary with the abutting neighborhoods

Design Guidelines

The consultant shall prepare zoning code level site, building and landscaping design principles & guidelines for the preferred land uses and (re)development in the Districts. This should include representative renderings, photos and dimensioned illustrations to adequately convey the design principles & principles. The consultant should also identify recommended street and streetscaping enhancements within the District.

Implementation Strategies

Describe implementation strategies including amendments to the Village's existing zoning and subdivision codes, capital improvement plan, outdoor recreation plan, etc., that will be necessary to implement the master plan. Identify strategies for addressing affordable housing, sustainability, or transportation related recommendations. Identify potential implementation, timelines, and marketing

strategies to redevelop the potential redevelopment sites identified earlier in the planning process. Provide preliminary cost estimates for proposed recommendations and where applicable estimated impacts to future property values and tax increment generation. Identify specific funding programs or potential partners, including public or private, that would be applicable to Germantown.

Mapping

The master plan should contain multiple maps to clearly and adequately present the preferred land uses and development within the District including, but not limited to, the following:

- Project/Planning Area Boundary
- Location Map within Germantown and relative to abutting Neighborhoods, Districts & Corridors
- Existing Land Use & Zoning Map
- Natural Resources Map including wetlands, floodplains, steep slopes, hydric soils, surface water, woodlands, SEWRPC defined environmental corridors, etc.
- Existing and Future Public Facilities Map including public roads, utilities, e.g. sewer, water, etc., facilities, stormwater management areas, park & recreation facilities, landscaping, buffering and streetscaping improvements
- Potential Redevelopment Site/Property Map
- Future Land Use Map showing the locations of the preferred land uses including conceptual locations for road improvements, bike and pedestrian facilities, park expansions, drainage areas and stormwater management facilities, etc.

SECTION V. Deliverables

The consultant shall prepare a final master plan document that contains those items described in the final Scope of Services. The master plan document shall be user friendly, incorporating graphics, tables, maps, renderings and other visual components while minimizing text to present a clear and concise document. The final master plan documents should be completed in a manner that can be integrated with and/or appended to the 2050 Plan and other master plans.

The consultant shall provide the Village with one (1) digital copy of the final master plan document and all supporting documents created during the planning process in both the original format (preferably Microsoft Word or compatible) and PDF format, including all maps, GIS data and GIS maps, graphics, or tables used to create the master plan documents. The consultant shall provide the Village with one (1) hard copy of the final master plan document. Preliminary or draft versions of all documents, including surveys, maps, renderings, may be provided in PDF format provided they are reproducible on standard paper in color or black & white at a size not to exceed 11" x 17". The consultant is responsible for printing any/all hard copy presentation and public engagement materials unless mutually agreed to with the Village.

SECTION VI. Minimum Consulting Services Required

The consultant selected for the project will be expected to provide a range of municipal land use planning and development-related services to complete the project including, but not necessarily limited to:

1. Demonstrated experience in the development of neighborhood plans for municipalities of a similar size, population, and (ideally) with similar development pressures and challenges, including experience conducting economic development and commercial retail market analysis and studies, residential housing analysis and studies, and transportation network analysis. To meet these expectations, a consultant may consist of a multidisciplinary team of planners, housing professionals, economic development professionals, commercial broker and real estate professionals, landscape architects, and/or civil engineers.
2. Understanding of and ability to incorporate relevant requirements into the planning process in conformance with the Wis. Stats. 62.23 pertaining to comprehensive planning, including the incorporation of necessary background information and trends, and the preparation and conduct of a statute-compliant public participation process.
3. Demonstrated experience preparing and conducting in-person, virtual and web-based presentations, public hearings, workshops, charettes, surveys and other public participation opportunities and tools that may be needed or proposed in the planning process. Ability to provide innovative and cost-effective approaches to educating and obtaining input from residents, stakeholders, property owners, business owners/operators, and typically unrepresented stakeholders and "silent" supporters or objectors.

The above are minimum requirements for the project and are not intended to be a complete list of the services, skills and experiences that may be necessary to complete the project or used to evaluate consultant proposals.

SECTION VII. Proposal Format, Submittal & Content Requirements

Format & Location

All proposals should adhere to or reflect the content and sequence of information described in this RFP document. The proposal shall not exceed 25 pages. If the proposal is too large to submit via email, please submit via Drop Box or other filesharing service mutually agreed to prior to 4:00pm on the submittal deadline date. Alternatively, a proposal may be submitted in an electronic format via a USB flash drive provided it is received at the Planning & Zoning Services counter in Village Hall before the submittal deadline.

Submit a complete electronic version of the consultant's proposal in PDF format via email to the Village of Germantown, Director of Community Development at the email address listed below:

Jeffrey W. Retzlaff, AICP, Director, Community Development Department
N112 W17001 Mequon Road
Germantown, WI 53022
262-250-4735
Email address: jretzlaff@germantownwi.org

Submittal Deadline Date

Proposals in response to this RFP must be received before 4:00pm CST on Friday, October 4, 2024. Proposals received after this date/time will not be accepted. The consultant is responsible for verifying that their proposal has been received before the submittal deadline date.

Proposal Content

The proposal should include all the information necessary for the Village to evaluate and the proposal and make a decision. Failure of the consultant to provide specific, detailed information may result in its proposal being rejected in favor of a sufficiently detailed proposal. Any necessary exhibits or other information, including information not specifically requested in this RFP that the consultant feels would be helpful to the evaluation and decision-making process should be attached at the end of the proposal. At a minimum, the proposal shall include the following components:

1. Qualification Details
 - a. Cover Letter – Including, but not limited to a statement of understanding and approach to the project. Consultants shall clearly identify whether they are submitting a proposal for completion of only one master plan or both. The cover letter should include the address, telephone number, and e- mail address of the contact person(s) and each person authorized to represent the consultant in negotiations. Unless the consultant is an individual, all proposals must be signed with a firm/company/partnership/entity name and by a responsible officer or employee indicating that officer or employee's authorization to commit the consultant to the terms of the proposal.
 - b. Experience – A summary of at least five similar or relevant neighborhood, district, or corridor master plan projects for a comparable municipality that the consultant has completed within the last seven years. Electronic links to full copies of said projects can be provided and are encouraged.

- c. References – Provide three to five municipal client references for which the consultant has provided similar planning services within the last seven years. Include the municipality name, contact person name, email address and telephone number, and a brief description of the services provided.
2. Project Details
 - a. Scope of Work – A complete and concise description of the approach to be taken to complete the project and address the items listed in Sections III. And IV. above, including any draft and final deliverables. An explanation of any variances from the proposed Scope of Work outlined in Section IV. and any insights into the project gained as a result of preparing the proposal or from past project experiences.
3. Project Management Details
 - a. Key Personnel – A list or organization chart of personnel directly assigned to the project, including any sub-consultants, along with their responsibilities for this project and resumes. Clearly illustrate the responsibilities and lines of communication and authority relative to your project management team. Describe your plan to interface with Village staff. The Consultant's Project Manager, who will be responsible for planning, coordinating, and conducting the majority of the work, including meeting attendance with Village Staff and Plan Commission must be identified and committed to the project. The Village reserves the right to approve Consultant's Project Manager and any requested personnel and subcontractor changes during the project.
 - b. Quality Control – Describe quality control measures and processes to ensure the project requirements are achieved within the project budget and schedule.
 - c. Village Staff Commitments – Identification of those items within the Scope of Work for which the consultant anticipates assistance by Village Staff. Village Staff will serve as the point of contact for public inquires during the planning process, will attend all public meetings, will maintain a project website, and provide public outreach of planning activities through existing Village social media outlets, electronic and community newsletters (if any are employed for the project). Village Staff can also assist in providing existing GIS data as available.
 - d. Project Schedule – A proposed schedule that indicates project meetings, milestones by phases or tasks, delivery of draft and final project deliverables, and overall timeline for completion of the master plan.
4. Public Engagement Plan
 - a. Engagement Plan - The proposal should include a preliminary public engagement plan with recommended methods and strategies to disseminate information and obtain public input as part of the overall planning process, including, but not limited to, any in-person, virtual or web-based presentations, public hearings, workshops, charettes, surveys and other public participation events, opportunities and tools that may be needed as part of the planning process. The engagement plan should be designed to provide innovative and cost-effective approaches to educating and obtaining input from residents, stakeholders, property owners, business owners/operators, and typically unrepresented stakeholders and "silent" supporters or objectors. The engagement plan will be finalized through discussions between the consultant and the Village. The overall process, techniques, technology, media, meetings, workshops, charettes, etc. to be employed to guide public engagement should be addressed in the consultant proposal.

5. Meetings & Communication

- a. Meetings - It is anticipated that a minimum of five (5) public meetings led by the consultant will be included in the planning process, although the consultant has the flexibility to provide an engagement plan and meeting schedule it feels is appropriate for the project. The consultant is expected to prepare any/all materials required for any public meetings and be responsible for setting up and testing any technology beyond that available for use through the Village. Village staff will post agendas and minutes using our agenda management software as needed.
- b. Communication with Village - The proposal should also build in appropriate contact meetings with Village staff and the Plan Commission which will serve as the “steering” committee for the project. The consultant is expected to coordinate and communicate with Village Staff on an ongoing basis throughout the planning process. Given different characteristics, stakeholders, etc., in each District, the consultant may need to consider separate public meetings for each master plan.

6. Project Cost and Labor Hours

- a. Cost – the proposal should include a “not to exceed” cost estimate to complete the project. The project budget range is \$65,000. This budget range reflects what the Village believes is appropriate for the type and scale of the project. The consultant may submit a proposal with a total cost that is outside of this range but must give information explaining why the proposed cost is outside the range. Innovative approaches, techniques, tools or additional tasks that exceed the intent of the Master Plan Objectives and Scope of Work set forth herein are acceptable if the consultant feels the benefits are justified or considered necessary to complete the project. If the scope and/or cost for such innovations or additional tasks increase the overall cost of the project beyond the project budget range, such innovations and tasks should be broken out and presented as additional services or alternatives with separate cost estimates in the proposal to be discussed with and considered by the Village.
- b. The Village will withhold a minimum 10% of the estimated contract value until all work has been satisfactorily completed.
- c. Estimated Labor Hours – A summary of estimated labor hours by task, or phase, that clearly identifies the project team members, their hourly rate, and the number of hours performed by each participant organized by task or phase.
- d. Additional Scope/Fees – The proposal should include the total cost, hours per employee, and hourly rates, etc. for any additional services not identified as needed to complete the basic scope of work.

7. Supplemental Information

- a. Any other information deemed necessary by the consultant to respond to the requirements of this RFP.

SECTION VIII. Proposal Evaluation and Consultant Selection

Evaluation Process

All proposals received before the submittal deadline date will be evaluated by the “RFP Evaluation Team” comprised of the Village Administrator, Community Development Director, Public Works Director, Village Engineer, and Village President. The RFP Evaluation Team will make a recommendation to the Plan Commission who will, in turn, make a recommendation to the Village Board for final selection of a consultant.

The RFP Evaluation Team is free to make any recommendations it determines to be in the best interest of the Village. Any inaccuracies in or misrepresentations of the information contained in a proposal or other errors may result in the rejection of a proposal.

The Village may select up to three (3) consultants for a pre-selection interview. Consultant must agree to appear at the pre-selection interview at no cost, if required. The Village will not reimburse a consultant for any costs incurred for the preparation of a proposal or during the selection process.

Proposal Evaluation Criteria

During the evaluation process, the RFP Evaluation Team may require a consultant to answer specific questions orally or in writing regarding their proposal. Selection of a consultant will be based on the overall strength and responsiveness of each proposal and not on any single factor such as cost. The RFP Evaluation Team, Plan Commission and Village Board will evaluate each proposal using the following criteria (but may consider other criteria it deems relevant to make their recommendation or selection):

- Qualifications and demonstrated experience of the consultant providing the same or similar planning consulting services for comparable master plan projects, including the qualifications, capability, and experience of the key personnel to be assigned to the project
- Proposed approach to the project, including the consultants demonstrated understanding of the master plan objectives, scope of work, proposed project schedule, appropriateness and uniqueness of the proposed approach, methods, techniques, and tools to be used for the project
- The proposed public engagement plan
- Proposed schedule and cost to provide the services necessary to complete the project

Timeline

The following timeline is anticipated with respect to the release of this RFP, proposal submittal, proposal review & evaluation, and consultant selection (but subject to change at the Village’s discretion):

Request for Proposal Release Date	Sept 4, 2024
Deadline for submittal of consultant questions	Sept 18, 2024
Village responses to consultant questions	Sept 20, 2024
Proposal Submittal Deadline Date	Oct 4, 2024
RFP Evaluation Team Proposal Review & Recommendation	Oct 11, 2024
Plan Commission Proposal Review	Oct 14, 2024
Plan Commission Pre-Selection Interviews and Recommendation	Oct 28, 2024
Village Board Consideration and Consultant Selection	Nov 4, 2024
Negotiate & Finalize Project Contract	Nov 5-15, 2024
Project Commencement & Kick-Off Meeting	Dec 2, 2024

The Village reserves the right to adjust the timeline as necessary for any reason.

SECTION IX. Consultant Questions

The Village will only accept written questions concerning the RFP and master plan project(s). Questions should be submitted via email on or before 4:00pm on Set 18, 2024. Include “Master Plan RFP Questions” in the subject line to ensure Village staff receives your question(s). Email all questions to the Community Development Director at the email address provided in Section VIII above.

The Village will respond in writing to all questions received. A copy of all consultant questions received and the Village’s responses will be made available by email on or before Sept 20, 2024, to all consultants who submit questions or who request a copy by email prior to the question submittal deadline date.

SECTION X. Additional Terms and Conditions

There is no expressed or implied obligation that the Village will reimburse consultants for any expenses incurred in preparing proposals or participating in the selection process in response to this RFP. Materials submitted by consultants are subject to public inspection under Wisconsin law and any language purporting to render the entire proposal confidential or proprietary will be ineffective and will be disregarded.

The Village will not discriminate against individuals due to sex, race, religion, creed, color, national origin, age, disability, sexual orientation, ancestry, marital status, arrest or conviction record, military service, or any other characteristics protected by law. This applies to all consultants submitting proposals to this project and their sub-consultants.

The Village reserves the right to retain all proposals submitted and to use any idea in a proposal regardless of whether the proposal and consultant were selected. Submission of a proposal indicates acceptance by the consultant of all terms and conditions in this RFP unless clearly and specifically noted in the proposal submitted and confirmed in the contract between the Village and the consultant.

All property rights, including publication rights of all reports produced by the consultant selected in connection with services performed for this project shall be vested in the Village.

The Village reserves the right to reject any or all proposals submitted for any reason.