VILLAGE OF MCFARLAND *NOTICE OF PUBLIC MEETING*

# Public Utilities Committee

**Tuesday, September 15, 2020** **6:00 PM** **McFarland Municipal Center**
*Community Room*

AGENDA

You are invited to this meeting through a Zoom webinar. The Public is strongly encouraged to watch and participate in these meetings remotely through either the webinar or telephone options listed below.

***PLEASE CLICK THE LINK BELOW TO JOIN THE ZOOM WEBINAR:***
https://us02web.zoom.us/j/84212592344

***Or by Telephone:*** +1 (312) 626-6799

***Webinar ID:*** 842 1259 2344

1. CALL TO ORDER, ROLL CALL.
2. PUBLIC APPEARANCES.
3. APPROVAL OF MINUTES.
   a. Discussion and action regarding the minutes from the joint Public Works and Public Utilities meeting held on August 10, 2020.
   b. Discussion and action regarding the minutes from the Public Utilities meeting held on August 18, 2020.
4. BUSINESS.
   a. Discussion and action to make a recommendation to the Village Board regarding the final plat of Rosewood Fields Final Plat including public improvements.
   b. Discussion and action to make a recommendation to the Village Board regarding the final design and authorize the Eastside Interceptor project for bidding.
   c. Discussion regarding special assessments and cost recovery method(s) for the Eastside Interceptor project.
   d. Discussion and action to make a recommendation to the Village Board regarding a request for a private septic and well for a new single family residence located on Lot 2 CSM #14495, 3365 Siggelkow Road.
   e. Presentation of the Public Works Monthly Report from the Director.
5. SCHEDULE NEXT MEETING DATE.
   a. Tuesday October 20, 2020 at 6:00 p.m.

6. ADJOURNMENT.

This meeting notice constitutes an official meeting of the above referenced group and was posted in accordance with all applicable laws related to Open Meetings Law. It is possible that members of and possibly a quorum of members of other governmental bodies of the municipality may be in attendance at the above stated meeting to gather information. No action will be taken by any governmental body at the above stated meeting other than the governmental body specifically referred to above in this notice. Upon reasonable notice, efforts will be made to accommodate the needs of disabled individuals. For additional information or to request this service, contact the McFarland Municipal Center at (608) 838-3153 or cassandra.suettinger@mcfarland.wi.us.

VILLAGE OF MCFARLAND

**Joint Public Works and Public Utilities Committee Minutes**

Monday August 10, 2020 – 6:00 P.M.

1. CALL TO ORDER, ROLL CALL

   The meeting was called to order by Village Trustee and Public Utilities Committee Chairperson Eric Kryzenske at 6:00 p.m. The meeting was held via Zoom.

   Members present: Carolyn Clow, Justin Rupert, Chris Fredrick, Marv Meyers, Eric Kryzenske, Marc Nielsen, Mary Pat Lytle, Jerry Adrian, Pauline Boness (due to technical issues was disconnected at approximately 6:24 p.m.).

   Staff present: Jim Hessling (Director of Public Works/Utilities), Aimee Irwin (Assistant to the Director), Tim Stieve (Town & Country Engineering), Matt Schuenke (Village Administrator)

2. PUBLIC APPEARANCES

   None

3. BUSINESS
   a. <u>Discussion and action to make a recommendation to the Village Board regarding the addition of water main replacement on N. Autumn Lane to the 2020 Street and Utility Improvement project(s) and authorizing related change order.</u>
      - Tim Stieve summarized the 2020 Street and Utility Improvement project for N. Autumn Lane. Work was to be completed on N. Autumn Lane from Main Street to Timber Lane focusing on water main improvements and pavement work. During the construction at this location a couple water main breaks occurred which caused those involved to step back and re-evaluate the water main.
      - Tim Stieve presented the proposed options for the water main replacement. The first option involves the current contractor to add the water main replacement to the current project. The second option is to delay the replacement to a future year. Tim noted that by choosing option two there may be increased cost implications.
      - Committee members discussed the two options. Mary Pat Lytle clarified how the additional expense would be financed. Matt Schuenke stated that it would be via a capital allocation within the Water Utility from cash and cash equivalents. Chris Fredrick asked how the sanitary sewer's condition is in this location. Jim Hessling stated this was televised during the recent breaks and appears to be in good condition. Chris Fredrick asked if the curb stop work was

included in the proposal provided by G-Pro. Tim Stieve stated this item was omitted and likely would add an estimated $10,000. Chris Fredrick asked if the G-Pro proposal presented is reasonable. Tim Stieve stated the proposal overall is reasonable for a 8" water main with the per lineal foot arriving lower than what G-Pro bid the original project at. Committee members discussed previous years restoration concerns related to grass and specified materials. Tim Stieve acknowledged that restoration has been a concern in the past but hopes that diligent monitoring of the work and materials should improve this concern.

- Motion by Carolyn Clow recommending the addition of water main replacement on N. Autumn Lane to G-Pro in the amount of $308,022.58 with a 10% contingency to the Village Board. Seconded by Chris Fredrick. Motion passed 8-0-1 (Pauline Boness experienced technical issues and was unable to participate in the motion vote)

4. ADJOURNMENT
   a. Motion by Chris Fredrick to adjourn at 6:34 p.m. Seconded by Marv Meyers. Motion passed 8-0-0.

Respectfully submitted by Aimee Irwin

VILLAGE OF MCFARLAND

**Public Utilities Committee Minutes**

Tuesday August 18, 2020 – 6:00 P.M.

1. CALL TO ORDER, ROLL CALL

   The meeting was called to order by Village Trustee and Chairperson Eric Kryzenske at 6:00 p.m.

   Members present: Pauline Boness, Chris Fredrick, Marc Nielsen, Mary Pat Lytle, Village Trustee Carolyn Clow (arrived at 6:02 pm)

   Staff present: Matt Schuenke (Village Administrator), Jim Hessling (Director of Public Works), Aimee Irwin (Assistant to the Director), Brian Berquist (Town & Country Engineering), Tim Stieve (Town & County Engineering), Lee Igl (Streets & Utilities Superintendent)

2. PUBLIC APPEARANCES

   None.

3. APPROVAL OF MINUTES
   a. Discussion and action regarding the minutes from the Public Utilities Committee held on July 21, 2020.
      - Motion by Eric Kryzenske to approve the minutes as presented. Seconded by Mary Pat Lytle. Motion passed 5-0-0
4. BUSINESS
   a. Discussion and action to make a recommendation to the Village Board regarding the annual CMAR application for 2019.
      - Jim Hessling provided background regarding the annual Compliance Maintenance Annual Report (CMAR) as required by the DNR.
      - Committee members discussed the presented report. Carolyn Clow clarified if the Eastside Interceptor cost estimate was for only planning or for the entire project. Jim Hessling stated the cost estimate was for the entire project. Carolyn Clow asked for clarification on what televising was completed. Jim Hessling provided that the televising included was work not completed by the Village in 2019; only on a sporadic and as needed basis. Eric Kryzenske asked if the Village has any legally binding documents that address new sewer and building sewer design, construction, installation, testing and inspection. Jim Hessling stated that this currently does not exist.
      - Motion by Chris Fredrick to recommend acceptance of the annual CMAR application for 2019 to the Village Board. Seconded by Carolyn Clow. Motion passed 6-0-0.
   b. Discussion on 60% plan design for Eastside Interceptor project.

- Brian Berquist & Tim Stieve provided background regarding the presented 60% plan design.
- Committee members discussed the provided plans. Eric Kryzenske asked if the pathway on the plan allows for water flow through the wetland areas. Tim Stieve responded that these areas will have appropriate rock or other material or the pathway will be elevated to accommodate water flow. Pauline Boness asked why the pipe was not located in the right-of-way of County Highway AB. Tim Stieve stated that there is an available easement. Brian Berquist added that the presented location is deeper than the right-of-way area. Mary Pat Lytle asked if an asphalt pathway is possible through a wetland area. Tim Stieve stated that an alternative analysis will need to be completed and final approval by the DNR would be required. Committee members discussed the location of the pipe as it relates to the easements. Matt Schuenke responded that the plans are the proposed location of the pipe and acquiring the easements in some areas would need to occur. Chris Fredrick asked if the petroleum line is being crossed and if a casing would be required. Brian Berquist stated that the line would be crossed on the proposed plans however a casing is not required. Chris Fredrick asked if the project would be phased or completed at one time. Matt Schuenke provided that either scenario is possible, phasing or all at once. Carolyn Clow asked if there would be borrowing to finance this project. Matt Schuenke stated that the financing would come from the sanitary sewer utility and included in the 2021 borrowing. Carolyn Clow requested additional forecasting information related to the project.
- No action taken on this item.

c. <u>Discussion and schedule a public input session regarding 60% plan design of Eastside Interceptor project.</u>
   - Matt Schuenke provided background regarding public input sessions. The Highway MN Phase 4 road project will be hosting an online forum on Monday August 31st instead of an open house. On the same night we would look to host the public input session for the Eastside Interceptor separate from the Highway MN project.
   - No action taken on this item. Public Input session is scheduled for August 31, 2020 at 6:00 p.m. for the Eastside Interceptor.

d. <u>Presentation of the Public Works Monthly Report from the Director.</u>
   - Jim Hessling provided an update on public works activities in the Village for the month of July 2020

5. SCHEDULE NEXT MEETING DATE
   a. Tuesday September 15, 2020 at 6:00 p.m.
6. ADJOURNMENT
   a. Motion to adjourn by Carolyn Clow at 7:32 p.m. Seconded by Pauline Boness. Motion passed 6-0-0.

Respectfully submitted by Aimee Irwin

VILLAGE OF
McFarland

**VILLAGE BOARD SUMMARY SHEET**

**MEETING DATE:** **Tuesday, September 15, 2020**

**SECTION:** **Business**

**DEPARTMENT:** **Administration**

**CONTACT:** **Andrew Bremer, Comm & Eco Dev Director**

**AGENDA ITEM:** **Discussion and action to make a recommendation to the Village Board regarding the final plat of Rosewood Fields Final Plat including public improvements.**

**PREVIOUS ACTION:**
May 26, 2020, Village Board approval of the Preliminary Plat for Rosewood Fields subdivision and Ordinance 2016-16, an ordinance rezoning the plat area from A-1 Agriculture Transition to PDD-GP General Plan and PDD-DP Detailed Plan Approved.
May 12, 2020, Joint Public Works and Public Utilities review and recommendation of the Preliminary Plat for Rosewood Fields subdivision.

**ISSUE SUMMARY:**
**Background and Meeting Purpose**
Veridian Homes (VH Rosewood Fields LLC) has petitioned the Village for approval of a Final Plat for the proposed Rosewood Fields subdivision. The plat is approximately 36.29 acres in size and is located along the west side of CTH AB, north of the railroad. Veridian has an option to purchase the property from Utterback Limited Partnership.

On May 12th, 2020 a joint Public Works and Public Utility meeting was held to review and provide a recommendation to the Village Board regarding the Preliminary Plat for Rosewood Fields. On May 20th, 2020, the Village Board conditionally approved the Preliminary Plat.

The purpose of the September 15th Public Utilities meeting is to provide a recommendation to the Village Board regarding the Final Plat, in particular those aspects of the final plat related to utility layout and design.

**Summary of Proposed Development**
The packet includes a copy of the Final Plat, which consists of 117 residential lots, of which 107 will be for single family units and 10 will be for twin units (two attached dwellings separated by zero lot line). Twenty four (24) of the single family lots would have their driveways accessed by a private alley (Outlot 2) to be maintained by the Rosewood Fields Homeowners Association.

VILLAGE OF
McFarland

The final plat includes 138,198 square feet (3.17 acres) of land dedicated as public park space (Outlot 3). There is an additional 8.2 acres of wetland, stormwater, and passive open space in Outlots 1, 4 & 5. A proposed off-road trail would run through Outlots 1, 3, and 4, from Prairie Wood Drive to the railroad crossing at CTH AB. Future development of lands south of the railroad would provide continued off-road connections to the Lower Yahara River Trail. The proposed neighborhood park and trail will be developed as part of Phase 1 of the subdivision development. Build-out of all lots is anticipated to occur over a 5-6 year period based on market conditions. The packet includes a copy of Exhibits G and M which illustrate the master land use and phasing plan for the subdivision.

The final plat is generally consistent with the prior approved preliminary plat. There is a new private outlot proposed, Outlot 6, which consists of one-half of a 50-foot wide gas pipeline easement near lots 107-117. The preliminary plat had shown this area as an easement rather than an outlot.

**Consistency with Village Subdivision Ordinances (Utilities)**
The packet includes a copy of the Engineering Plans, Storm Water Management Report, and Storm Sewer Sizing Report. The Village Engineer has reviewed these documents and provided a letter outlining recommend conditions of approval to address compliance with Village requirements, best management practices, and conditions of approval from the prior preliminary plat review.

**FINANCIAL/BUDGET IMPACT:**
Coinciding with the development of this plat, the Village has been working on the design of a sewer interceptor to extend from Devils Lake Way through adjacent lands south of the railroad to and through this proposed subdivision to serve additional developable lands. This project and associated costs, appear as a separate agenda item. The developer will be responsible for those portions of this project that benefit their property. The developer will also be responsible for paying for other utility, street, trail, and park improvements within the development. Assuming at least an average assessment value of $325,000 for each lot would yield approximately $250K in annual property tax payments to the Village upon full build-out. Additional revenue from park impact fees, library impact fees, and public water impact fees would be payable to the Village as well. Specific requirements will be addressed as part of a development agreement to be approved with the final plat.

**VILLAGE PLAN REFERENCE:**
**Consistency with Village Land Use Plan**
Included in the packet is a copy of the Village's East Side Neighborhood Growth Area Concept Development Plan, marked Exhibit C. This plan was adopted in 2008 and incorporated into the Village's 2017 Comprehensive Plan. The area of the final plat is outlined on the map. The ESNGA plan as developed in 2008, and identified the property for Traditional Residential Development, with a minimum of 4 units per acre; proposed net density is 4.7 units per acre. The neighborhood plan further identified the continuation of Tuscobia Trail to CTH AB,

Village of McFarland

connectivity of new local streets to connect to undeveloped adjacent lands to the north, and the provision of park and stormwater management areas along the south side of Tuscobia Trail and on the west side of the property adjacent to the existing Park View Estates subdivision. The final plat is generally consistent with the Village's ESNGA plan.

**ORDINANCE REFERENCE:**

Chapter 56, Subdivisions

**BOARD, COMMISSION OR COMMITTEE RECOMMENDATION:**

Recommend approval of the proposed Rosewood Fields Final Plat with those conditions as provided in the Village Engineer's Rosewood Fields Development - Zoning Submittal Review letter dated September 11, 2020.

**ATTACHMENTS:**

1. Rosewood Fields Final Plat Village Engineer Ltr_09.11.2020
2. Exhibit C, Rosewood Fields ESNGA (August 25, 2020)
3. Exhibit G, Rosewood Fields Master Plan (August 25, 2020)
4. Exhibit M, Rosewood Fields Phasing Plan (August 25, 2020)
5. 03 - RF Final Plat - Village Submittal 2020.08.24
6. 04 - RF - CCRs 2020.08.25
7. 06 - RF Engineering Plan Set 2020.08.25
8. 07 - RF SWMP report 2020.08.25
9. 08 - RF Storm Sewer Sizing 2020.08.25

TOWN & COUNTRY ENGINEERING, INC.

September 11, 2020

Mr. Andrew Bremer, AICP
Community & Economic Development Director
Village of McFarland
5915 Milwaukee Street
P.O. Box 110
McFarland, WI 53558

Subject: Rosewood Fields Development – Final Plat Submittal Review (updated)

Dear Andrew:

We have received the set of documents included in the August 27, 2020 Final Plat Submittal for proposed new residential development slightly south of CTH MN, north of the railroad tracks and west of CTH AB for a project called Rosewood Fields. The plans and stormwater management report have been reviewed from a public works perspective. Our comments are shown below, organized by the appropriate document and/or drawing sheet number.

**General Items**
Previous reviews have already discussed the desire to bring a sanitary sewer interceptor and transmission water main through the project to accommodate future development. The Village has typically reimbursed the developer for the invoiced costs of incremental upsizing in materials, and we would recommend that here.

**Engineering Plans**
Sheet 2

- There are several areas with overlapping contour labels. These should be spread out to make it easier to read.
- There have been resident concerns about the existing tress along the west property line of Outlot 1. The woodline is now shown, but it should more clearly identify which areas will require removal.

Sheet 3

- The proposed right-of-way width is 60 feet, consistent with Village minimum standards and also recent residential streets. This will allow for on-street parking on both sides of the street and ample (7.5 foot) terrace space for tree plantings, if desired.

Sheet 4

- The invert elevations of the existing culverts under the railroad and CTH AB should be labelled to ensure adequate drainage to those locations.
- The proposed sanitary sewer interceptor is shown. Depending on the Village's (and developer's) desired schedule, the Village may need to construct the interceptor prior to the developer's phasing.

Sheet 5

- The proposed path alignment between Lots 10 and 11 could be tough to snow plow. We recommend the path continue more generally north-south, with an additional connection to Drangonfly Way.

Sheet 6

- Some water main along the CTH AB corridor is shown, running from Tuscobia Trail to the south. However, none is shown north of Tuscobia Trail. Village practice has been to extend sewer and water mains along new development frontage. This is not as critical along this section of CTH AB because the east side is wetland (and undevelopable), however there are some parcels to the north. We recommend either an 8-inch line be extended north, or some escrow be created to fund future construction.

Sheet 8 through 26

- At mid-block lowpoints, we recommend two stormwater inlets on each side of the street along with depressing the sidewalk to minimize ponding depth when the inlets are plugged or overwhelmed.
- Sewer Manholes shown at 10 feet deep should be lowered 1 foot (to 11 feet deep) to better allow for basement drains.
- The actual inverts of the 12-inch interceptor sewer may need adjusting as the Village's sewer plans evolve. We will keep in touch with the developer on this.
- Manhole 29 should be shifted west to allow the Rosewood Drive watermain to better avoid the inlet.
- Sewer manholes should all be placed at the road centerline.
- The 10-inch sewer coming from Tuscobia Trail and going up Dragonfly Way should be constructed at minimum slopes to maximize depth for future needs.
- The intersection at CTH AB will need to be reviewed and approved by Dane County Highway Department. This will likely require bypass/acceleration/deceleration lanes and bike lanes.

Sheet 7 and 14

- Temporary street dead-ends should include a hammerhead turnaround and the temporary fire hydrants should utilize a 90 degree bend and be placed to the side for the roadway.

**Certified Survey Map & Preliminary Plat**

An easement to the Village is included on the west side CTH AB up to Tuscobia Trail. This will accommodate both the interceptor sewer route coming from Devil's Lake Way, and a path for recreation and future sewer maintenance. We will need to confirm that the overlapping easement (with Wisconsin Power and Light for a gas main) does not create any issues.

As mentioned above, additional dedication along CTH AB may be required by the Dane County Highway Department to accommodate the necessary turn/acceleration/deceleration lanes.

We recommend that mailbox locations be shown as easements on private properties. This eliminates the need for the Village to become involved in lawn mowing, snow removal, or future replacement of the boxes or concrete slabs underneath.

On Sheet 2 Prairie Wood Drive is mislabeled as Vintage Birch Way.

The label for Outlot 5 should also include "public bike path easement over the entire lot", similar to Outlots 1 & 4, along with "Village Utilities" to allow for potential water main there.

The note about lowest building opening elevations should be expanded to include all parcels that abut stormwater conveyance and management areas. Instead of referring to the approved stormwater management plan, the actual elevations for each affected lot should be shown on the plat itself to make it easier for future homeowners (and the Village) to confirm openings.

The Public Drainage Easement Detail refers to an incorrect note. This can be cleared up with note that states: "There shall be no changes in drainage or elevations with the easements for drainage purposes without the written approval of the Village of McFarland."

**Stormwater Management Plan**

The stormwater management design as proposed will meet the Village, County, and State performance standards. The previously requested cross-sections of the bypass channel have been provided. There are some outstanding items that are still needed prior to recommending Village approval:

- Inlet 204.2 and 300.3 are shown to have very high flow rates with significant flow bypassing it. The developer should confirm these are correct, or add additional inlets.
- An exhibit showing the extent of overland water flow during a 100-year storm and 150-year storm (as discussed at Village Committee meetings) with all storm sewers plugged must be provided to ensure water does not enter private properties.

- Lowest building opening elevations must be calculated for each lot adjacent to stormwater conveyance and management areas based on the 100-year storm water level, plus 2 feet of freeboard.

Please feel free to contact us with any questions or comments regarding this review.

Very truly yours,
TOWN & COUNTRY ENGINEERING, INC.

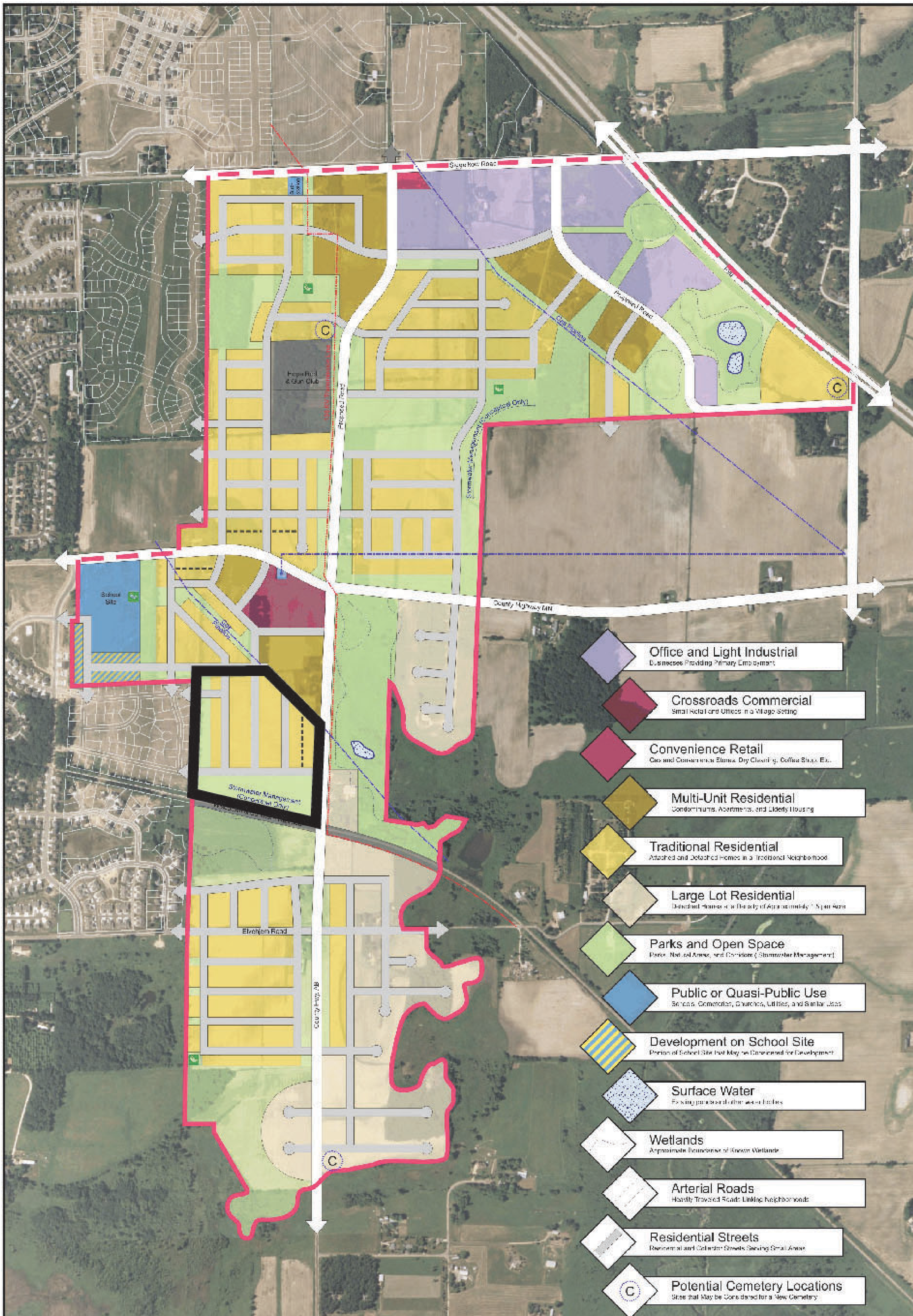
Brian R. Berquist, P.E.
President

cc: Mr. Jim Hessling, Director of Public Works, Village of McFarland *(5915 Milwaukee Street, P.O. Box 110, McFarland, WI 53558)*

Mr. Matthew Schuenke, Administrator, Village of McFarland *(5915 Milwaukee Street, P.O. Box 110, McFarland, WI 53558)*

Mr. Dan Day, Donofrio, Kottke & Associates, Inc. *(7530 Westward Way, Madison, WI 53717)*

BRB:brb
J:\JOB#S\McFarland\MC-171-M6 Veridian-Utterback Development\Admin\Review Letter 2.docx




**Village of McFarland - East Side Neighborhood Growth Area - Concept Development Plan**

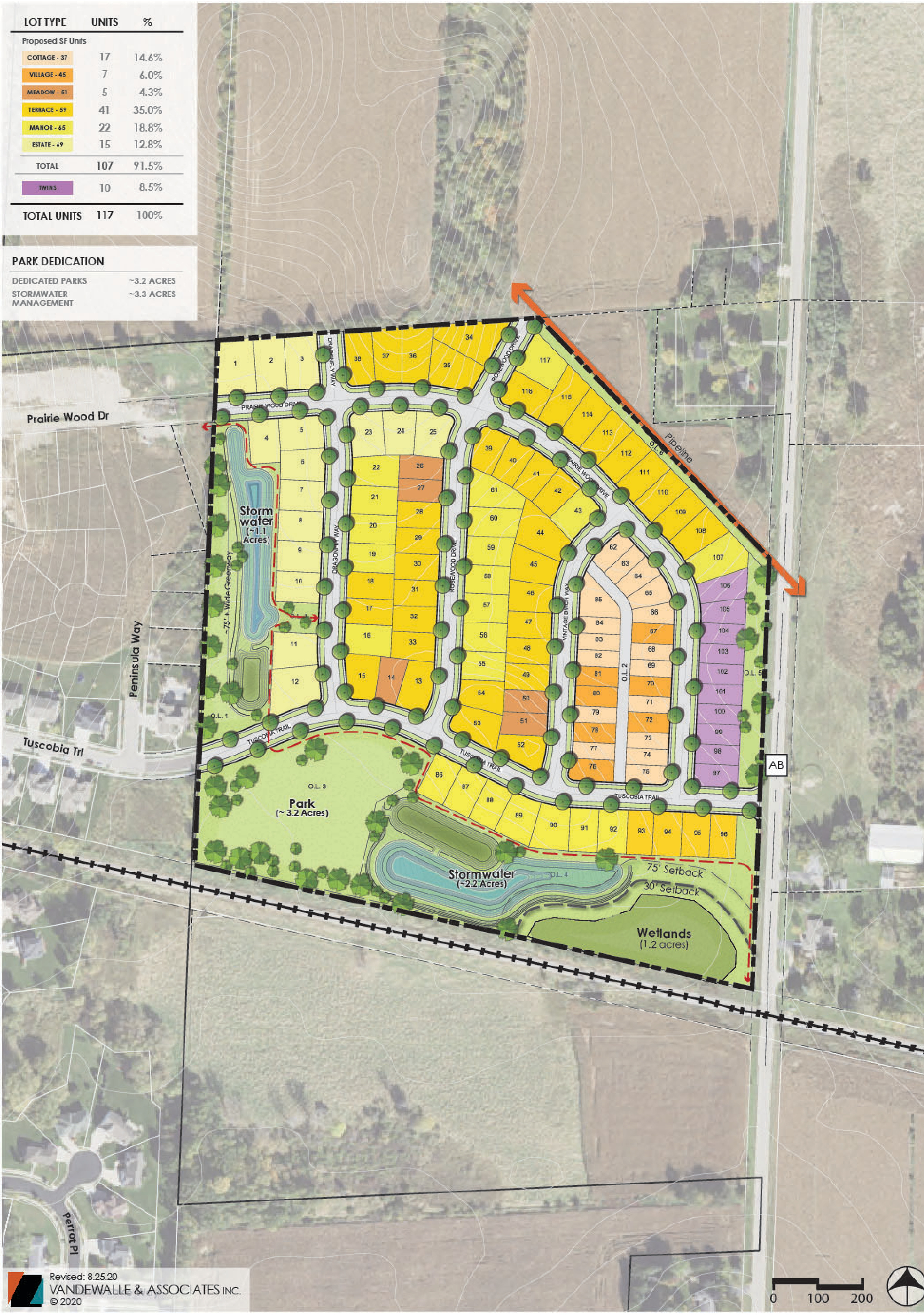
*R.A. Smith & Associates, Inc.*

**EXHIBIT C: EAST SIDE NEIGHBORHOOD GROWTH AREA PLAN**

# ROSEWOOD FIELDS

## MCFARLAND, WISCONSIN

VERIDIAN HOMES




| LOT TYPE | UNITS | % |
|---|---|---|
| Proposed SF Units | | |
| COTTAGE - 37 | 17 | 14.6% |
| VILLAGE - 45 | 7 | 6.0% |
| MEADOW - 51 | 5 | 4.3% |
| TERRACE - 59 | 41 | 35.0% |
| MANOR - 65 | 22 | 18.8% |
| ESTATE - 69 | 15 | 12.8% |
| TOTAL | 107 | 91.5% |
| TWINS | 10 | 8.5% |
| TOTAL UNITS | 117 | 100% |

| PARK DEDICATION | |
|---|---|
| DEDICATED PARKS | ~3.2 ACRES |
| STORMWATER MANAGEMENT | ~3.3 ACRES |

**EXHIBIT G: MASTER PLAN**

# ROSEWOOD FIELDS
## MCFARLAND, WISCONSIN

VERIDIAN HOMES

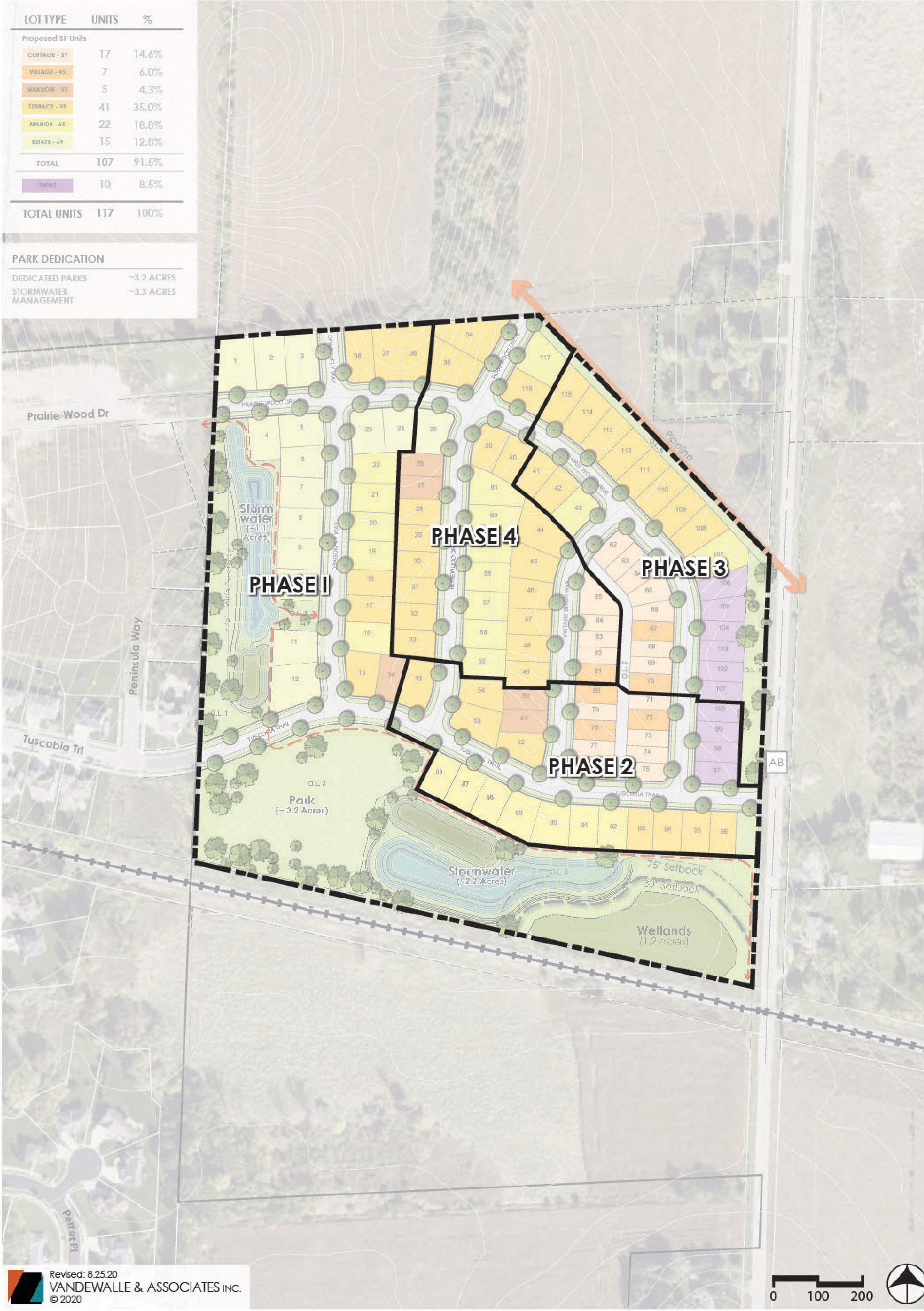



**EXHIBIT M: CONCEPTUAL PHASING PLAN**

# Rosewood Fields

## MCFARLAND, WISCONSIN

VERIDIAN HOMES

There are no objections to this plat with respect to Secs. 236.15, 236.16, 236.20 and 236.21(1) and (2), Wis. Stats. as provided by s. 236.12, Wis. Stats.

Certified ________________, 20_____

Department of Administration

# ROSEWOOD FIELDS

LOT 2, CERTIFIED SURVEY MAP NO. _____________,

LOCATED IN NORTHEAST QUARTER OF THE SOUTHEAST QUARTER AND THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 2, TOWNSHIP 6 NORTH, RANGE 10 EAST, VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN



D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT


FN:19-07-114

SHEET 1 OF 3

There are no objections to this plat with respect to Secs. 236.15, 236.16, 236.20 and 236.21(1) and (2), Wis. Stats. as provided by s. 236.12, Wis. Stats.

Certified ________________, 20_____

Department of Administration

# ROSEWOOD FIELDS

## LOT 2, CERTIFIED SURVEY MAP NO. _______________,

### LOCATED IN NORTHEAST QUARTER OF THE SOUTHEAST QUARTER AND THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 2, TOWNSHIP 6 NORTH, RANGE 10 EAST, VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

Found 1-1/4" rebar

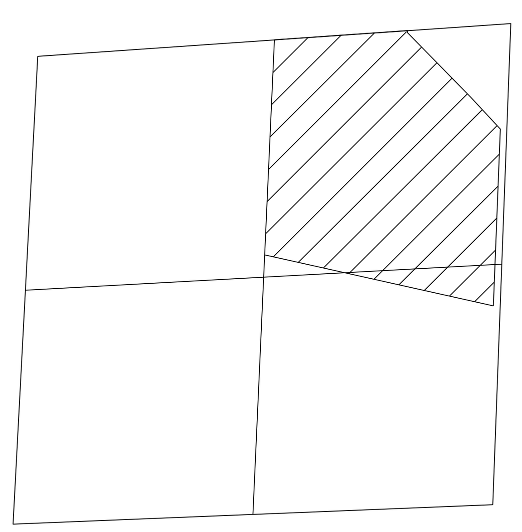
Found 1" iron pipe

Found 3/4" rebar

Placed 1-1/4" x 18" solid round iron rebar stake, weighing 4.30 lbs/ft. All other lot and outlot corners are marked with 3/4"x 18" solid round iron rebar stakes, weighing 1.50 lbs/ft.

Public utility easement (5' wide unless otherwise dimensioned). Utility easements as herein set forth are for the use of PUBLIC BODIES and PRIVATE PUBLIC UTILITIES having the right to serve the area.

( ) Recorded as information


LOCATION MAP
NOT TO SCALE

LEGAL DESCRIPTION

I, Brett T. Stoffregan, Professional Land Surveyor S-2742 do hereby certify that in full compliance with the provisions of Chapter 236 of the Wisconsin State Statutes and the Subdivision Regulations of the Village of McFarland, and under the direction of the owners listed below, I have surveyed, divided and mapped "Rosewood Fields" and that such plat correctly represents all the exterior boundaries and the subdivision of the land surveyed as is described as follows:

Lot 2, Certified Survey Map No. ______, recorded in Volume __ of Certified Survey Maps on pages ______ as Document Number _______, in the Dane County Register of Deeds Office, located in the NE1/4 of the SE1/4 and the SE1/4 of the SE1/4 of Section 2, T6N, R10E, Village of McFarland, Dane County, Wisconsin. Containing 1,578,919 square feet (36.247 acres),

Dated this_______day of________________, 2020

Brett T. Stoffregan, Professional Land Surveyor S-2742


D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT


FN:19-07-114

There are no objections to this plat with respect to Secs. 236.15, 236.16, 236.20 and 236.21(1) and (2), Wis. Stats. as provided by s. 236.12, Wis. Stats.

Certified ________________, 20_____

Department of Administration

# ROSEWOOD FIELDS

## LOT 2, CERTIFIED SURVEY MAP NO. ______________,

## LOCATED IN NORTHEAST QUARTER OF THE SOUTHEAST QUARTER AND THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 2, TOWNSHIP 6 NORTH, RANGE 10 EAST, VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

### OWNER'S CERTIFICATE

VH Rosewood Fields, LLC a limited liability company duly organized and existing under and by virtue of the laws of the State of Wisconsin, as owner, does hereby certify that said limited liability company caused the land described on this plat to be surveyed, divided, mapped and dedicated as represented on this plat.

VH Rosewood Fields, LLC does further certify that this plat is required by S236.10 or S236.12 Wisconsin Statutes to be submitted to the following agencies for approval or objection:

Department of Administration
Village Board, Village of McFarland
Dane County Zoning and Land Regulation Committee

In witness whereof, VH Rosewood Fields, LLC has caused these presents to be signed by its official member(s) of said limited liability company at Madison, Wisconsin this________day of________________________, 2020.

VH Rosewood Fields, LLC

_________________________________

STATE OF WISCONSIN)
COUNTY OF DANE ) S.S

Personally came before me this_____________day of_______________________, 2020, the above named member(s) of the above named MREC VH Juniper Ridge, LLC to me known to be the person(s) who executed the foregoing instrument and acknowledged the same.

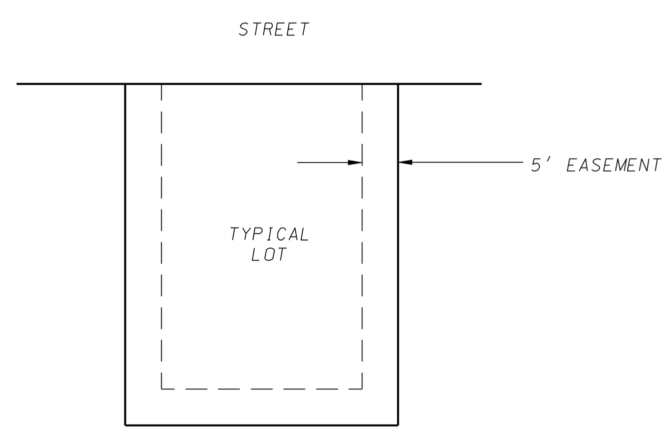
My Commission expires____________________________________________
Notary Public, Dane County, Wisconsin

### NOTES

1. Lots 7-12 and 86-94 are subject to minimum unprotected building foundation opening elevations (M.O.E). Said elevation is 2 feet above the peak water elevation during the 100-year storm event, based on the approved stormwater management plan.

2 Lots 1-117 within this plat are subject to public easements for drainage purposes which shall be a minimum of 5 feet in width measured from the property line to the interior of each lot except that the easements shall be 12 feet in width on the perimeter of the plat, The common side lots line of Lots 97/98, 99/100, 101/102, 103/104 and 105/106 shall not be subject to said drainge easements.
Easements shall not be required on property lines shared with greenways, alleys or public streets. No buildings, driveways, or retaining walls shall be placed in any easement for drainage purposes. Fences may be placed in the easement only if they do not impede the anticipated flow of water.

3. Distances shown along curves are chord lengths.




1. Easements are not required on lines shared with streets, alleys or greenways.

PUBLIC DRAINAGE EASEMENT DETAIL
NOT TO SCALE
SEE NOTE 1

### VILLAGE BOARD RESOLUTION

Resolved that the plat of "Rosewood Fields" located in the Vilage of McFarland, Dane County, Wisconsin, having been approved by the Village Board, is hereby approved and that said resolution further provided for acceptance of those lands and rights dedicated by said "Rosewood Fields" to the Village for public use.

_________________________________
Cassandra Suettinger, Clerk, Village of McFarland, Dane County, Wisconsin

### VILLAGE OF MCFARLAND TREASURER'S CERTIFICATE

I, Eric C. Rindfleisch, being the duly appointed, qualified, and acting Treasurer of the Village of McFarland, Dane County, Wisconsin, do hereby certify that, in accordance with the records in my office, there are no unpaid taxes or unpaid special assessments as of this_______day of____________________, 2020 on any of the lands included in the plat of "Rosewood Fields".

_________________________________
Cassandra Suettinger, Treasurer, Village of McFarland, Dane County, Wisconsin

### COUNTY TREASURER'S CERTIFICATE

I, Adam Gallagher, being the duly elected, qualified, and acting treasurer of the County of Dane, do hereby certify that in accordance with the records in my office, there are no unpaid taxes or special assessments as of this_________day of______________________________ , 2015 affecting the land included in "Rosewood Fields".

_________________________________
Adam Gallagher, Treasurer, Dane County, Wisconsin

### REGISTER OF DEEDS CERTIFICATE

Received for recording this________________day of________________________________________________, 2020 at

o'clock___.M. and recorded in Volume_________________of Plats on Pages________________as

Document Number____________________________________.

_________________________________
Kristi Chlebowski, Dane County Register of Deeds

### CURVE TABLE

| CURVE NUMBER | LOT | RADIUS (FEET) | CHORD (FEET) | ARC (FEET) | CHORD BEARING | CENTRAL ANGLE | TANGENT BEARING |
|---|---|---|---|---|---|---|---|
| 1 | | 170.00 | 19.48 | 19.80 | S00°42'05"W | 06°34'14" | |
| 2 | | 460.00 | 64.61 | 64.67 | S01°26'36"E | 08°03'16" | |
| 3 | | 15.00 | 19.91 | 21.77 | S36°06'41"W | 83°09'50" | OUT-S77°41'36"W |
| 4 | | 363.00 | 63.02 | 63.10 | S72°42'48"W | 09°57'36" | |
| 5 | | 570.00 | 72.55 | 72.60 | S71°22'55"W | 07°17'48" | OUT-S75°01'50"W |
| 6 | | 170.00 | 69.76 | 70.26 | S14°25'28"W | 23°40'52" | OUT-S26°15'54"W |
| 7 | | 15.00 | 20.92 | 23.14 | S70°27'59"W | 88°24'10" | OUT-N65°19'56"W |
| 8 | | 363.00 | 146.61 | 147.63 | N76°58'58"W | 23°18'04" | OUT-N88°38'00"W |
| | 13 | 363.00 | 53.33 | 53.38 | N69°32'42"W | 08°25'32" | |
| | 14 | 363.00 | 48.33 | 48.37 | N77°34'30"W | 07°38'04" | |
| | 15 | 363.00 | 53.33 | 53.38 | N69°32'42"W | 08°25'32" | |
| 9 | | 15.00 | 19.91 | 21.77 | N47°03'07"W | 83°09'46" | |
| 10 | | 400.00 | 56.18 | 56.23 | N01°26'36"W | 08°03'16" | |
| | 15 | 400.00 | 27.88 | 27.89 | N03°28'23"W | 03°59'42" | |
| | 16 | 400.00 | 28.33 | 28.34 | N00°33'15"W | 04°03'34" | |
| 11 | | 230.00 | 26.36 | 26.38 | N00°42'05"W | 06°34'14" | |
| | 22 | 230.00 | 21.48 | 21.49 | N00°05'35"W | 05°21'14" | |
| | 23 | 230.00 | 4.88 | 4.88 | N03°22'42"W | 01°13'00" | |
| 12 | | 570.00 | 151.17 | 151.62 | S86°21'59"E | 15°14'26" | OUT-S78°44'46"E |
| | 23 | 570.00 | 0.31 | 0.31 | S86°01'44"E | 00°01'52" | |
| | 24 | 570.00 | 77.12 | 77.18 | S89°55'24"E | 07°45'28" | |
| | 25 | 570.00 | 74.08 | 74.13 | S82°28'19"E | 07°27'06" | |
| 13 | | 15.00 | 23.73 | 27.37 | S26°28'16"E | 104°33'00" | OUT-S25°48'14"E |
| 14 | | 230.00 | 92.57 | 93.21 | S14°11'38"W | 23°13'12" | |
| | 25 | 230.00 | 79.11 | 79.50 | S15°54'04"W | 19°48'20" | |
| | 26 | 230.00 | 13.70 | 13.71 | S04°17'28"W | 03°24'52" | |
| 15 | | 15.00 | 18.20 | 19.56 | S66°25'17"W | 74°41'46" | OUT-N76°13'50"W |
| 16 | | 630.00 | 172.70 | 173.25 | N86°06'31"W | 15°45'22" | |
| | 35 | 630.00 | 87.97 | 88.04 | N80°14'02"W | 08°00'24" | |
| | 36 | 630.00 | 59.00 | 59.02 | N86°55'16"W | 05°22'04" | |
| | 37 | 630.00 | 48.17 | 48.18 | S88°12'15"W | 04°22'54" | |
| 17 | | 170.00 | 85.19 | 86.10 | N17°05'37"E | 27°01'10" | OUT-N31°36'12"E |
| 18 | | 15.00 | 19.12 | 20.73 | N71°11'24"E | 79°10'24" | OUT-S69°13'24"E |
| 19 | | 570.00 | 257.25 | 259.48 | S56°10'55"E | 26°04'58" | |
| | 39 | 570.00 | 52.57 | 52.59 | S60°37'16"E | 05°17'10" | |
| | 40 | 570.00 | 65.94 | 65.98 | S60°37'16"E | 06°37'56" | |
| | 41 | 570.00 | 65.94 | 65.98 | S53°59'20"E | 06°37'56" | |
| | 42 | 570.00 | 65.94 | 65.98 | S47°21'24"E | 06°37'56" | |
| | 43 | 570.00 | 8.95 | 8.95 | S43°35'26"E | 00°54'00" | |
| 20 | | 230.00 | 173.34 | 177.73 | S24°43'18"W | 44°16'32" | |
| | 43 | 230.00 | 45.62 | 45.70 | S41°10'03"W | 11°23'02" | |
| | 44 | 230.00 | 52.00 | 52.11 | S28°59'05"W | 12°58'54" | |
| | 45 | 230.00 | 56.00 | 56.14 | S15°30'05"W | 13°59'06" | |
| | 46 | 230.00 | 23.77 | 23.78 | S05°32'47"W | 05°55'30" | |
| 21 | | 170.00 | 31.59 | 31.64 | S07°54'56"W | 10°39'48" | |
| 22 | | 15.00 | 23.18 | 26.49 | S63°50'21"W | 101°11'02" | OUT-N65°34'08"W |
| 23 | | 247.00 | 8.50 | 8.50 | N64°35'00"W | 01°58'16" | |
| 24 | | 15.00 | 21.19 | 23.53 | N18°41'01"W | 89°53'42" | OUT-N26°15'50"E |
| 25 | | 230.00 | 94.38 | 95.06 | N14°25'26"E | 23°40'48" | |
| | 53 | 230.00 | 45.96 | 46.03 | N20°31'48"E | 11°28'04" | |
| | 54 | 230.00 | 48.93 | 49.02 | N08°41'24"E | 12°12'44" | |
| 26 | | 170.00 | 132.10 | 135.67 | S20°16'42"E | 45°43'28" | |
| | 64 | 170.00 | 26.25 | 26.27 | S38°42'46"E | 08°51'20" | |
| | 65 | 170.00 | 66.92 | 67.36 | S22°56'00"E | 22°42'12" | |
| | 66 | 170.00 | 41.92 | 42.03 | S04°29'56"E | 14°09'56" | |
| 27 | | 15.00 | 23.09 | 26.35 | N37°05'04"W | 100°39'48" | |
| 28 | | 230.00 | 42.74 | 42.81 | N07°54'56"E | 10°39'48" | |
| | 76 | 230.00 | 12.94 | 12.94 | N11°38'09"E | 03°13'22" | |
| | 77 | 230.00 | 29.85 | 29.87 | N06°18'15"E | 07°26'26" | |
| 29 | | 170.00 | 128.12 | 131.37 | N24°43'18"E | 44°16'32" | |
| | 85 | 170.00 | 62.85 | 63.22 | N13°14'14"E | 21°18'24" | |
| | OL2 | 170.00 | 27.39 | 27.42 | N28°30'41"E | 09°14'30" | |
| | 62 | 170.00 | 40.63 | 40.73 | N39°59'45"E | 13°43'38" | |
| 30 | | 76.00 | 59.05 | 60.65 | N20°16'42"W | 45°43'28" | |
| | 66 | 76.00 | 18.90 | 18.95 | N04°33'38"W | 14°17'20" | |
| | 65 | 76.00 | 29.50 | 29.69 | N22°22'56"W | 22°22'56" | |
| | 64 | 76.00 | 12.00 | 12.01 | N38°36'50"W | 09°03'12" | |
| 31 | | 50.00 | 38.85 | 39.90 | S20°16'42"E | 45°43'28" | |
| 32 | | 630.00 | 80.18 | 80.23 | N71°22'54"E | 07°17'48" | |
| 33 | | 303.00 | 249.55 | 257.20 | S87°56'56"E | 48°38'08" | |
| 34 | | 307.00 | 126.53 | 127.44 | S75°31'25"E | 23°47'06" | |
| | 89 | 307.00 | 56.51 | 56.59 | S68°54'41"E | 10°33'38" | |
| | 90 | 307.00 | 66.55 | 66.68 | S80°24'49"E | 12°26'38" | |
| | 91 | 307.00 | 4.18 | 4.18 | S87°01'33"E | 00°46'50" | |
| 35 | | 25.00 | 35.25 | 39.12 | S42°35'21"E | 89°39'14" | |
| 36 | | 25.00 | 35.46 | 39.42 | S47°24'39"W | 90°20'46" | |
| 37 | | 230.00 | 178.72 | 183.55 | N20°16'42"W | 45°43'28" | |
| | 105 | 230.00 | 38.91 | 38.95 | N02°16'05"W | 09°42'14" | |
| | 106 | 230.00 | 44.18 | 44.24 | N12°37'51"W | 11°01'18" | |
| | 107 | 230.00 | 59.80 | 59.97 | N25°36'41"W | 14°56'22" | |
| | 108 | 230.00 | 40.33 | 40.38 | N38°06'39"W | 10°03'34" | |
| 38 | | 630.00 | 271.99 | 274.14 | N55°36'24"W | 24°55'56" | OUT-N68°04'22"W |
| | 112 | 630.00 | 19.33 | 19.33 | N44°01'11"W | 01°45'30" | |
| | 113 | 630.00 | 57.19 | 57.21 | N47°30'01"W | 05°12'10" | |
| | 114 | 630.00 | 57.19 | 57.21 | N52°42'11"W | 05°12'10" | |
| | 115 | 630.00 | 57.04 | 57.05 | N57°53'56"W | 05°11'20" | |
| | 116 | 630.00 | 83.28 | 83.34 | N64°16'59"W | 07°34'46" | |
| 39 | | 15.00 | 22.49 | 25.43 | N19°29'59"W | 97°08'46" | |


D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT


FN:19-07-114

Document No.

# ROSEWOOD FIELDS
## DECLARATION OF PROTECTIVE COVENANTS, CONDITIONS AND RESTRICTIONS

## VILLAGE OF MCFARLAND, DANE COUNTY, WI.

Return to:
**Angie Christensen**
**Veridian Homes**
**6801 South Towne Drive**
**Madison, WI 53713**

**See Exhibit "B"**
**(Parcel Identification Numbers)**

## PREAMBLE

This Declaration of Protective Covenants, Conditions and Restrictions (the "**Declaration**") made this ______ day of _______, 20__, by VH Rosewood Fields LLC, a Wisconsin Limited Liability Company (collectively, hereinafter referred to as the **"Declarant"**) and/or its successors and assigns.

**WHEREAS,** Declarant is the owner of real property legally described as the plat of Rosewood Fields (the **"Plat"**) located in the Village of McFarland, Dane County, Wisconsin, more particularly described and depicted in Exhibit "A" attached hereto and incorporated herein by reference, and desires to build thereon a planned development with housing units (the "**Development**"); and

**WHEREAS,** Declarant desires to provide for the maintenance and enhancement of property values and amenities in said Development, and for the preservation of the properties and improvements thereon, as well as, for the preservation of said Development's distinctive style, and to prevent the erection, or maintenance of poorly designed or constructed improvements; and

**WHEREAS,** to the above end, Declarant desires to subject said real property, to the covenants, restrictions, easements, charges and liens hereinafter set forth, each and all of which is and are for the benefit of said property and each owner thereof; and

**WHEREAS,** Declarant has thought it desirable for the efficient maintenance and preservation of the values of said Development to create an Association to which should be delegated and assigned the powers of owning, maintaining and administering the Common Property and facilities, as set forth below, and administering and enforcing the covenants and restrictions, and collecting and disbursing the Assessments and charges as hereinafter or in the future created or established, and promoting the health, welfare and recreation of the Development's residents. Declarant will incorporate the Rosewood Fields Homeowners Association, Inc. a non-profit, non-stock corporation, under the laws of the State of Wisconsin (the **"Association")** for such purposes;

**NOW, THEREFORE,** the Declarant declares that the following real property legally described and depicted in Exhibit "A", attached hereto and incorporated herein by reference, will and shall be sold, transferred and conveyed subject to the easements, covenants, restrictions, assessments, charges and liens hereinafter set forth.

## PART A
## ASSOCIATION MATTERS

**A-1) Definitions.**

**A)** "Association" shall mean and refer to as Rosewood Fields Homeowners Association, Inc., and its successors and assigns.

**B)** "Common Property" shall mean those areas located in the Development which are not contained within a Lot and which the Declarant or the Association, as the case may be, shall be required to maintain in accordance with agreements between Declarant and the Village of McFarland, or pursuant to applicable Village of McFarland rules, regulations and ordinances, until such time as maintenance of such areas is turned over to the Village of McFarland and the Village of McFarland accepts such maintenance. Areas within the Development which will initially constitute Common Property include, but are not limited to, storm water management and park areas.

**C)** "Declarant" shall mean and refer to VH Rosewood Fields LLC; a Wisconsin Limited Liability Company and/or their successors and assigns.

**D)** "Lot" shall mean and refer to the lands described as Rosewood Fields as described and depicted in Exhibit "A", now owned by Declarant, but which Declarant in the future intends to convey to purchasers who shall thereupon become members of the Association. The term "Property" or "Properties" shall be synonymous with the term Lot.

**E)** "Owner" shall mean and refer to the record owner, whether one or more persons or entities, of the fee simple title to any of the Properties described in Exhibit "A". A purchaser of any of said Properties by land contract shall be referred to as "Owner" instead of the land contract vendor.

**F)** "Occupant" shall mean and refer to the occupant of any of the Properties who shall either be an Owner or a lessee who holds a written lease having an initial term of twelve months or more.

**G)** "Subdivision" shall refer to the lands described in Exhibit "A". The term "Subdivision" is synonymous with the term "Development".

**A-2) Membership and Voting Rights.**

**A) Members.** Declarant will incorporate the Association. Each Owner of a Lot shall automatically become a member of the Association. By acceptance of the Deed or other instrument of conveyance, the Owner(s) of each Lot consent to such Owner's membership in the Association whether or not specified on the deed to the Owner. Membership in the Association is appurtenant to each Lot. Each Owner of a Lot shall automatically be entitled to the benefits and subject to the burdens relating to such membership in the Association. The Association shall have authority to manage the Common Property. Persons or entities, including a land contract vendor, who hold an interest merely as security for the performance of an obligation, shall not be members of the Association. Tenants of Properties who are not Owners shall not be members of the Association. To the extent that Declarant owns any Lot, Declarant shall be a member of the Association until such ownership terminates.

**B) Voting Rights.**

**1)** Each member shall be entitled to one vote for each Lot owned except as set forth in A-2(B) (2) below.

**2)** When there is more than one Owner of a Lot, said Owners shall only be entitled to one collective vote for each Lot. There shall be no fractional votes or voting. When there is more than one Owner of any Lot, the vote attributable to such ownership must be cast unanimously by all the Owners of that Lot, or it shall not be considered for any purpose.

**C) Proxies.** Any Member may vote by proxy. All proxies shall be in writing and signed by the Owner or in cases where there is more than one Owner, by all Owners of the Lot.

**D) Articles of Incorporation and By-Laws.** The purposes and powers of the Association and the rights and obligations with respect to the members thereof, shall be governed by the Articles of Incorporation and By-Laws of the Association; provided, however, that such Articles of Incorporation and By-Laws shall be subject to, and shall not contravene, the terms, conditions, benefits and burdens set forth in this Declaration.

**E) First Year's Operating Expenses.** Commencing on the date established for the payment of assessments under Section A-4(B)(1), Declarant shall pay to the Association an amount equal to the estimated operating expenses of the Association for a period of one (1) year, less assessments on Lots owned by Declarant actually paid to the Association for the one (1) year period of time. Said payment may be made in a lump sum or in twelve (12) monthly installments, at Declarant's option. Prior to said date, Declarant shall be solely responsible for payment of all maintenance expenses.

**A-3) Description.**

**A) Responsibility for Assessments.** Declarant shall turn over to the Association, at the time control is turned over to the Members, any surplus received by the Association of income over expenses. Assessments shall be based on the number of assessment units (an "A**ssessment Unit"**), which are assigned to Lots in the Development based upon their intended use at the present time. The number of Assessment Units for a particular Lot will be divided by the total number of Assessment Units in the Development to arrive at a particular Lot's percentage share (**"Percentage Interest"**) of assessments for common area maintenance and other expenses, which the Association is permitted to assess to members under the Declaration. The Declarant shall be responsible for payment of assessments on Lots owned by Declarant, only at such time as a Declarant owned Lot has been improved with street, utilities and such other improvements as are necessary to permit commencement of construction on such Lot. For the purposes of the following table, a single family residence shall be deemed a Dwelling Unit.

| | Use | Number of Assessment Units |
|---|---|---|
| **1)** | Single Family: | One (1) per Dwelling Unit. |
| **2)** | Twins (2 unit residential) | One (1) per Dwelling Unit (each side defined as a dwelling unit) |

**B)** **Association Management.** The Association is required to retain a professional property management company with the experience necessary to perform the duties of the Association (the **"Management Company"**). The Association shall enter into a management contract (the **"Management Contract"**) with the Management Company on such terms and conditions as the Association and the Management Company shall agree. The initial Management Company is DSI Real Estate Group, Inc., a Wisconsin Corporation, which is affiliated with the Declarant by reason of common ownership. The Management Contract between DSI Real Estate Group, Inc. and the Association has not been negotiated on an arm's length basis.

**C)** **General Fund.** As used herein, the term **"Surplus"** shall mean the amount by which assessments collected by the Management Company on behalf of the Association to pay for common expenses relating to the Property exceed the common expenses for the fiscal year in question. The Management Company shall deposit and hold any Surplus in the Association's operating account maintained by the Management Company. The Surplus, in the discretion of the Association working in conjunction with the Management Company, may be applied to future Association expenses as they become due, but there shall be no obligation on either the Association's or the Management Company's part to return the Surplus to lot owners.

**D)** **Percentage Interest for Condemnation or Insurance Proceeds.** For the purposes of establishing an Owner's percentage of insurance proceeds or condemnation awards in the event any portion of the Common Property is completely destroyed or taken by eminent domain and is not reconstructed, each Owner shall have a percentage interest in the insurance or condemnation proceeds equal to the Percentage Interest of such Owner in the Common Property.

**E)** **Conveyance, Lease or Encumbrance of Percentage Interest.** Any deed, mortgage, lease or other instrument purporting to convey, encumber or lease for a period of time in excess of one (1) year (a **"Lease"**) any Lot shall be deemed to include the Owner's Percentage Interest in the Common Property and in the insurance proceeds or condemnation awards even though such interest is not expressly described or referred to therein. The conveyance, encumbrance or Lease of an Owner's Percentage Interest in the Common Property independent of the appurtenant Lot and the conveyance, encumbrance or Lease of an appurtenant Lot independent of the Owner's Percentage Interest in the Common Property shall be prohibited.

**F)** **Ownership.** The Common Property is dedicated to the Village of McFarland for the purposes described in the Plat

**G)** **Damage or Destruction of Common Property by Owner.** In the event any Common Property is damaged or destroyed by an Owner or any of his guests, lessees, tenants, licensees, agents or member(s) of his family, including pets, said Owner does hereby irrevocably authorize the Association to repair said damage. The Association shall repair and restore any damaged area to its former condition. The amount necessary for said repair shall become a special assessment upon the Property of said Owner.

**A-4) <u>Maintenance of Common Property</u>**

**A) <u>Maintenance Requirements.</u>**

**1)** Responsible Party. The Declarant or the Association shall provide for the care, operation, management, maintenance and repair of the Common Property, until maintenance obligations are assumed by the Village of McFarland. The Common Property shall be maintained in good and safe condition, in accordance with the agreements between Declarant and the Village, as well as applicable Village ordinances, rules and regulations.

**2)** General Responsibilities. Maintenance shall include, but not be limited to, responsibility for landscaping and lawn care, trash, snow removal including shoveling with particular attention being paid to cross walk ramps and islands, improvements to common areas, upkeep of storm water management facilities which may include detention basins and drainage swales, common property lighting and/or other common property utility charges and any special street design features or traffic calming features.

**3)** Specific Responsibilities. Certain streets within the Property may include special traffic islands and traffic calming measures within the public right-of-way. The Association shall be responsible, at the Association's sole cost and expense, for the maintenance and upkeep of such physical traffic measures. Such maintenance and upkeep shall be performed at the discretion of the Association except to the extent required by the Village of McFarland, and shall include landscaping, snow and ice removal. If the special street design features or landscaping are not maintained, the Village of McFarland will give notice to the Association that it is not being maintained. If the Association does not respond to the notice within sixty (60) days, the Village may modify the physical traffic measures to minimize maintenance needs; including replacing landscaped surfaces with asphalt. The Association and persons involved with the maintenance and upkeep of the special traffic measures shall indemnify and hold harmless the Village of McFarland and its boards and commissions, and their officers, agents and employees from and against all claims, demands, loss or liability of any kind, type or description, related to the maintenance and upkeep of the special traffic measures.

**4)** In order to carry out its maintenance obligations, the Association may enter into a contract with a reputable property management company (**"Management Company"),** pursuant to which contract the Management Company shall assume the maintenance obligations of the Association as provided herein.

**5)** Any and all expenses incurred by the Management Company, on behalf of and pursuant to its contract with the Association, in connection with the management and maintenance of the Common Property and administration of the Association shall be deemed to be common expenses (**"Common Expenses"),** including, without limitation, expenses incurred for: landscaping and lawn care; snow shoveling and plowing; improvements to the Common Property; common grounds security lighting; municipal utility services for Common Property enforcement of this Declaration (including attorneys' fees); and maintenance and management salaries and wages.

**B) Assessments.**

**1)** The Association, or the Management Company, on its behalf, shall levy annual general assessments (**"General Assessments"**) against each Lot beginning January 1, 2016 or the purpose of maintaining a fund from which Common Expenses may be paid. The General Assessments against each Lot shall be assessed according to their Percentage Interests in the Common Property. General Assessments shall be due in advance on the first day of each year, or in such other manner as the Association may set forth in the Bylaws. Any General Assessment not paid when due shall bear annual interest at a rate of ten percent (10%) until paid and, together with interest, collection costs, and reasonable attorneys' fees, shall constitute a lien on the Lot on which it is assessed.

**2)** The Association, or the Management Company, on behalf of and pursuant to its contract with the Association, may, whenever necessary or appropriate, levy special assessments (**"Special Assessments"**) against the Lots for deficiencies in the case of destruction or condemnation, for defraying the cost of improvements to the Common Property or for any other purpose for which the Association and/or the Management Company may determine a Special Assessment is necessary or appropriate for the improvement or benefit of the Subdivision. Special Assessments shall be paid at such time and in such manner as the Association or the Management Company may determine. Any Special Assessment or installment not paid when due shall bear annual interest at a rate of ten percent (10%) until paid and, together with the interest, collection costs and reasonable attorneys' fees, shall constitute a lien on the Lot on which it is assessed.

**3)** The Association, or the Management Company, on behalf of and pursuant to its contract with the Association, shall have the right to collect all General and Special Assessments and such sums shall constitute a lien on such Lot. The Owner of a Lot, or any portion thereof, shall be personally obligated to pay such charges which were assessed or accrued upon the land owned during the period of Ownership. The Association or the Management Company, on behalf of and pursuant to its contract with the Association, may commence an action against any Owner personally obligated to pay the charges or to foreclose the lien for such charge against any Lots. Any such foreclosure action may be brought at the Association election, either in the same manner as an action to foreclose a real estate mortgage, or as a proceeding to enforce a statutory maintenance lien as provided in Section 779.70, Wis. Stats., to the extent said Section is applicable. Any lien in favor of the Association/Management Company securing unpaid charges arising by virtue of this Declaration shall be subject and subordinate to the lien of any mortgage whether the mortgage is executed or recorded prior to or after the creation of such lien.

**C) Subordination of the Lien to Mortgages.** The lien of the assessments provided for herein shall be subordinate to the lien of any first mortgage. Sale or transfer of any Property shall not release the assessment lien. However, the sale or transfer of any Property pursuant to mortgage foreclosure or any proceeding in lieu thereof shall extinguish the lien of such assessment(s) as to payments which become due prior to such sale or transfer. No sale or transfer pursuant to foreclosure or proceedings in lieu thereof shall relieve such Property from liability from any assessments thereafter becoming due or from the lien thereof.

**D) Joint and Several Liabilities of Grantor and Grantee.** Upon a voluntary conveyance, the grantee of a Property shall be jointly and severally liable with the grantor for all unpaid assessments against the grantor as provided in this Declaration up to the time of conveyance, without prejudice to the grantee's right to recover from the grantor the amount paid by the grantee therefore. However, any such grantee shall be entitled to a statement from the Association setting forth the amount of such unpaid assessment and any such grantee shall not be liable for, nor shall the Property conveyed be subject to a lien for, any unpaid assessments against the grantor pursuant to this Declaration in excess of the amount therein set forth.

## PART B
## CONDITIONS, COVENANTS AND RESTRICTIONS

**B-1)** **Applicability.** The following provisions in this Part B shall apply to all Lots and Outlots, as described in Exhibit "A" and such other Lots or Outlots as may, in the future, be subjected to this Declaration, as the same may be amended from time to time, by Declarant in the sole exercise of Declarant's discretion.

**B-2)** **Land Use And Building Type.** Only the following designated uses for all private Lots and Outlot 3 shall be permitted. The remaining Outlots are dedicated to the Village and uses are noted for informational purposes only.

**A)** Lots 1-96 and 107-117 shall be used for single family residential purposes. No building shall be erected, altered, placed or permitted to remain on any Lot other than one detached single family dwelling unit not to exceed two and one-half stories in height. Each dwelling unit shall have an attached or detached garage of a size to be approved by the Committee, as that term is defined below. The size of a dwelling unit to be constructed on specific Lots shall not be less than the minimum size to be established hereinafter.

**B)** Lots 97-106 shall be used for twin single family homes.

**C)** Outlots 1 is dedicated to the public for stormwater management and conveyance..

**D)** Outlot 2 shall be for private alley purposes and shall be maintained by the Association.

**E)** Outlot 3 is dedicated to the public for park purposes

**F)** Outlot 4 is dedicated to the public for storm water management and open space.

**G)** Outlot 5 and 6 are dedicated for private open space and shall be maintained by the Association.

**H)** **Lease Requirements.**
**1)** *Lease Requirements.* An Owner may rent its dwelling by written Lease (a "Lease"), provided that

**a)** The term of any such Lease shall not be less than six (6) months;

**b)** The Owner has obtained the prior written approval of the Association to the proposed tenant and the terms of the proposed Lease, and the written approval for any proposed extension of the Lease; and

**c)** The Lease contains a statement obligating all tenants to abide by this Declaration, the Articles, the Bylaws, and the Rules and Regulations, providing that the Lease is subject and subordinate to those instruments; and

**d)** The Lease provides that any default arising out of the tenant's failure to abide by the Declaration, the Articles, the Bylaws, and the Rules and Regulations shall be enforceable by the Association as a third-party beneficiary to the Lease and that the Association shall have, in addition to all rights and remedies provided under the Declaration, the Articles, the Bylaws and the Rules and Regulations, the right to evict the tenant and/or terminate the Lease should any such violation continue for a period of ten (10) days following delivery of written notice to the Owner and the tenant specifying the violation.

**2)** *Standard for Approval of Lease and Tenant*. The Association may withhold approval on any reasonable basis, including, but not limited to: the failure of the Lease terms to comply with all provisions of this Declaration, the Articles, the Bylaws, and the Rules and Regulations; the past failure of the Owner, the tenant or tenant's guests to abide by all provisions of this Declaration, the Articles, the Bylaws, and the Rules and Regulations; and the past use by Owner, the tenant or its invitees or guests of any part of the Lot in a manner offensive or objectionable to the Association or other occupants of the Property by reason of noise, odors, vibrations, or nuisance.

**3)** *Violations / Remedies*.

**a)** During the term of any Lease of all or any part of a Lot, each Owner of such Lot shall remain liable for the compliance of the Lot, such Owner and all tenants of the Lot with all provisions of this Declaration, the Bylaws, and the Rules and Regulations of the Association, and shall be responsible for securing such compliance from the tenants of the Lot. The Association may require that a copy of each Lease of all or any part of a Lot be filed with the Association.

**b)** In the event that an Owner leases out its dwelling or any portion of its Lot in violation of this provision, the Association may impose a daily fine up to the greater of (i) an amount equal to the daily rental amount being charged by Owner to its tenant and (ii) $100 (this daily fine shall be adjusted up every five years by 5%).

In addition to any fines imposed under this Section, the Owner shall reimburse the Association for all costs incurred by the Association, including attorneys' fees, incurred to enforce this Section, any action the Association takes under this Section B-2)G) against Owner or Owner's tenant, and to collect any outstanding amounts owed by Owner to the Association."

Uses, other than the uses set forth in this section B-2, shall not be permitted on the Lots or Outlots, as applicable, without the prior written approval of the Declarant and Committee (defined in Section B-3 below), as appropriate. After Declarant control of the Association has terminated, approval from the Association and the Committee shall be required.

Except as otherwise provided herein, no buildings, signs or other structures incidental to the use of any Outlot, which have been approved in advance by the Committee, may be constructed on any Outlot.

All rights-of-way noted on the Plat shall be dedicated as permanent public streets and rights-of-way and shall be improved in accordance with agreements entered into between the Declarant and the municipality in which the Development is located.

**B-3)** **<u>Architectural Control</u>.** No building shall be erected, placed or altered on any Lot until the construction plans and specifications and a plan showing the location of the structure have been approved by a majority of the Architectural Control Committee (the **"Committee"**) as to quality of workmanship and materials, harmony of external design with existing structures, and as to location with respect to topography and finish grade elevation. There shall be a variation in building elevations on adjacent Lots. Approval shall be as provided below.

**B-4)** **<u>Dwellings and Landscaping</u>.** The landscaping to be installed on all Lots must meet or exceed the minimum number of points for foundation planting and cumulative total landscaping points, including foundation planting points as set forth hereafter as described in Exhibit "C", attached hereto and incorporated herein by reference and further described in the Design Guidelines. The number of points attributable to various elements of the landscaping to be installed shall be determined by reference to Exhibit "D", attached hereto and incorporated herein by reference and further referenced in the Design Guidelines. The structure and the minimum landscaping requirements shall be completed within nine (9) months after issuance of a building permit. Landscape installed by the Declarant may or may not meet the minimum number of required points. All driveways shall be of concrete and shall be installed within nine (9) months after substantial completion of the structure. No outbuilding or accessory building of any nature shall be erected on any Lot with the exception of detached garages approved by the Committee in advance of construction. No above-ground swimming pools shall be permitted. All Lot areas not used as a building site, or under cultivation as a family garden, shall be planted with grass seed or shall be sodded, and shall be maintained on a regular seasonal basis, including mowing of a frequency of not less than once every fourteen (14) days during the lawn growing season. Maintenance of all improvements on a Lot shall be performed by the Owner. Maintenance shall include, but not be limited to, watering, pruning and routine fertilizing and mulching of all plantings and plant beds, replacement of dead, dying and/or diseased trees and shrubs, prompt removal of weeds, trash and debris from plant beds and areas adjacent to shrubs and trees so as to keep said landscaping in a healthy, attractive and neat condition.

If the Owner of any Lot, after reasonable notice, fails or refuses to install landscaping as described herein, or maintain it as required above, the Committee, through its duly authorized agents or employees, shall have the right to enter upon said Lot at reasonable hours to perform said landscaping and/or maintenance. The costs of the materials and labor to perform such landscaping and/or maintenance shall be assessed against said Lot in accordance with the terms of Section A-4 (B)(2) above, which assessment may be foreclosed or collected in accordance with the terms hereof or collected as provided herein.

**B-5)** **<u>Vehicle and/or Equipment Storage</u>.** No inoperable, dilapidated or junk vehicles of any nature may be kept upon any Lot except in a fully enclosed garage. The exterior storage of boats, trailers, travel trailers, campers, motorcycles, recreational vehicles, automobiles or trucks, portable moving and storage containers, mini storage or on-site storage containers (collectively, without limitation by reason of enumeration **"Equipment"**), of any nature is prohibited whether or not screened from public view. No Equipment shall be parked or stored on lawns. The temporary storage of vehicles in a drive area for the purpose of loading or unloading for a period not to exceed twelve (12) hours is permitted. No commercial vehicles, including trucks, semi-trailers, trailers, may be stored or parked overnight on or in front of said Lots except in an enclosed garage

**B-6)** **Construction On Adjoining Lots.** Nothing contained herein shall be construed to prohibit the construction of a residential dwelling or private garage partially on one Lot and partially on an adjoining Lot without regard to side yards between adjoining Lots, provided that all such Lots are owned by the same person or persons.

**B-7)** **Easements.**

**A)** No structure, planting, or other materials shall be placed or permitted to remain within any easement of record (an **"Easement"**) if any, which may damage or interfere with the installation and maintenance of utilities, or which may change, obstruct or retard the flow of water or the direction of such flow through the Easement or through such other drainage channels or swales that may have been created by the Plat or otherwise. The Easements located on each Lot and all improvements therein shall be maintained continuously by the owner of the Lot, except for those improvements for which a public authority or utility company is responsible.

**B)** The Intra-block drainage Easement shall be graded with the construction of each principal structure in accordance with the approved Stormwater Drainage Plan on file with the Village Engineer and the Zoning Administration, as amended in accordance with the Village Ordinances.

**C)** Public utility easements six feet (6') wide (unless otherwise noted on the Plat). Utility easements as herein set forth on the Plat are for the use of public and private utilities having the right-of-way to serve the area.

**D)** All lots within this plat are subject to a non-exclusive easement for drainage purposes which shall be a minimum of six feet (6') in width measured from the property line to the interior of each lot except that the easement shall be twelve feet (12') in width on the perimeter of the Plat. Easements shall not be required on the property lines shared with greenways or public streets.

**E)** **Temporary Construction Easement.** Each Lot which has been made subject to this Declaration (for the purposes of this paragraph each Lot described herein shall be referred to as the **"Primary Lot"**) is hereby made subject to a temporary, non-exclusive easement over, under, upon, across and through so much of the side yards of the Primary Lot as may be necessary for the safe and code compliant construction of a basement, including but not limited to footings, foundation and basement walls, on the adjoining Lot (the **"Adjoining Lot"**). The purpose of this Temporary Construction Easement is to permit Declarant to adequately slope and provide lateral support to the walls of the basement excavation in question so as to protect against cave-ins and loss of lateral support, and it shall be broadly construed to effectuate such purpose. This Temporary Construction Easement shall remain in effect for so long as it is needed to permit construction of the basement on the Adjoining Lot in a safe and code compliant manner. After completion, Declarant shall backfill the excavated area, compact such backfill in accordance with good construction practices, and restore the area affected by this easement to the condition existing immediately preceding the excavation, including replacement of sod, trees, shrubs and other landscaping, at no expense to the Owner of the Adjoining Lot (collectively **"Restoration"**). This Temporary Construction Easement shall, without further notice, terminate upon completion of said Restoration.

**F)** Lots 97-106 shall be subject to a Declaration of Party Wall Agreement. The Lots described are proposed twin homes which are two homes that share a party wall and roof with each other.

**G)** Certain Lots will feature groped mailboxes (CBU – cluster box units) on each Lot and will have a recorded Multi-User Mailbox Easement for these Lots. The selected Lots for the CBU's will be determined by each constructed phase and will be noted in the Neighborhood Disclosure Addendum A for Buyer's notification at the time the Sales Contract is signed.

**H)** Outlots 1 and 4 are subject to a public bike path easement over the entire outlot.

**I)** Outlot 4 will be subject to a Sign and Landscaping Easement and will be maintained by the Association.

**J)** Outlot 5 is subject to a public stormwater easement over the entire oulot.

**K)** Outlot 6 will be subject to a 25 foot (25') wide gas pipeline easement in conjunction with a 25' foot (25') wide gas pipeline easement on the adjacent property.

**L)** Lots 89-90 and 94-95 will be subject to a 20 foot (20') wide (10' on each Lot) public storm sewer easement.

**B-8)** **<u>Slope and Swale Areas</u>.**

**A)** The graded slopes and swales as established by Declarant shall remain as permanent. Within these slopes and swales, no structure, planting or other material shall be placed or permitted to remain, or other activities undertaken which may damage or interfere with established slope and swale ratios, create erosion or sliding problems or which may change the direction of flow of drainage channels or obstruct or retard the flow of water through drainage channels. The slopes and swales of each Lot and all improvements in them shall be maintained continuously by the Owner of a Lot, at the Owner's sole expense, except for those improvements for which a public authority or utility company is responsible.

**B)** In order to control run off, all down spouts and down spout extenders are to drain into a permeable area such as grass or a planting bed.

**C)** Declarant and the Village of McFarland have agreed to a certain Storm Water Management Plan. In the event of conflict between any plans and such Storm Water Management Plan, the Storm Water Management Plan shall control. Declarant and the Association shall each have the right to enter upon any Lot at any time for the purpose of inspection, maintenance or correction of any drainage condition and the Lot Owner shall be responsible for the cost thereof.

**D)** Any disputes relating to drainage swales, drainage or other surface water issues, shall be resolved by the Board of Directors of the Association, which may seek the advice of the Village Engineer of the Village of McFarland. The Association shall establish procedures by which such decisions can be heard by the Board of Directors and decided by said Board.

**B-9)** **<u>Nuisances</u>.** No noxious or offensive activity shall be carried on upon any Lot, nor shall anything be done thereon which may be or may become an annoyance or nuisance to the neighborhood or which may have a detrimental effect on the value of other Lots and/or improvements.

**B-10) Temporary Structures.** No structure of a temporary character, trailer, basement, tent, shack, garage, barn or other outbuilding shall be used on any Lot at any time as a residence, either temporarily or permanently.

**B-11) Signs.** No sign of any kind shall be displayed to the public view on any Lot except, one professional sign of not more than one square foot, one sign of not more than six square feet advertising the property for sale or rent or signs without regard to size used by the Declarant, a builder or licensed real estate broker to advertise the property during the construction and sales period or to identify the subdivision and/or its Declarant.

**B-12) Entrance Sign.** It is contemplated there will be an entrance monument sign and associated easement in Outlot 4 of the Plat. The sign and easement associated with the sign will be owned by the Association. The Association will be responsible for the maintenance of said sign to include watering, mowing and basic landscape requirements. The Association is responsible for determining whether said signs shall remain in place and assess all owners in the neighborhood of any future replacement cost after Declarant turns over control of the Association to the Owners

**B-13) Animals.** No animals, livestock or poultry of any kind shall be raised, bred or kept on any Lot, except that dogs, cats or other household pets may be kept, provided that they are not kept, bred or maintained for any commercial purpose. No animal enclosure, house, pen or fences or similar device shall be placed on any Lot without the prior written approval of the Committee which may require special landscaping and screening.

**B-14) Garbage and Refuse Disposal.** No Lot shall be used or maintained as a dumping ground for rubbish. Trash, garbage or other waste shall not be kept except in sanitary containers. No incinerators shall be permitted. Other equipment for the storage or disposal of such material shall be kept in a clean and sanitary condition. No trash, building materials, debris, leaves, lawn clippings, rocks or earth shall be placed in any Outlot.

**B-15) Sight Distance at Intersections.** No fence, wall, hedge or shrub planting which obstructs sight lines at elevations between 30" and 72" above the roadways shall be placed or permitted to remain on any corner Lot within the triangular area formed by the street property lines and a line connecting them at points twenty five (25) feet from the intersection of the street lines, or in the case of a rounded property corner, from the intersection of the street property lines extended. The same sight-line limitations shall apply on any Lot within ten (10) feet from the intersection of a street property line with the edge of a driveway. No tree shall be permitted to remain within such distances of such intersections unless the foliage line is maintained at sufficient height to prevent obstruction of such sight lines.

**B-16) Mailboxes and posts.** Based on new, recently adopted requirements of the United States Postal Service, the Rosewood Fields platted lots will receive mail by using CBU's (cluster box units) instead of curb side mailboxes on newly constructed homesites. These new requirements will phase out curb side mailboxes nationwide solely at the Postal Service's discretion.

**B-17) Notices to Owners.** The following information is being put of record in order to give record notice to all Owners, mortgagees and other persons and entities having an interest in the Property:

**A)** Private: Private Alleys (collectively, "Alleys") are shown on the Plat as Outlots. Said Alley will be dedicated to the Association. The cost of the maintenance of the Alleys shall be the responsibility of the Association. Certain Lots in the Development border Alleys, which are intended to serve as the access to such Lots. Restrictions on the Alleys are summarized as follows:

**1)** There will be no public trash, leaf or recycled material pick-up service in said Alleys, but instead, there will be one or more trash pick-up collection points designated by the Declarant to be used by Owners of a Lot bordering the Alleys in question. Trash pick-up may initially be provided by the Association and charged as an expense of the Association, but such arrangement may be changed to provide for public or some other method of trash pick-up at a future time as determined by the Declarant or the Association. All trash receptacles to include recycling receptacles must be removed from the Alleys within 24 hours after trash or recycled material pick-up.

**2)** Mailboxes for homes located on the Alleys may be clustered at one end of the Alleys in question or clustered at various locations along the public street. Location and placement of the mailboxes is the sole discretion of the United States Postal Service.

**3)** Snow removal, repair and replacement of Alleys will be the responsibility of the Association.

**4)** Homes with garage access to a private alley are required to have two (2) "coach" lights on each side of the garage door, which will be wired to a photo electric eye for automatic use from dusk to dawn. The lights have been pre-selected by Declarant. There are four (4) selections available. It is the Buyer's responsibility to maintain the lights so that they are always operational.

**B)** Plantings, flower beds, and entry signs (including utility installations connected therewith) constructed and installed by Declarant, if any, shall be deemed a part of the Common Property. The Association is obligated to maintain any entry feature; maintenance shall include electrical charges (if any), sign repair and maintenance of the landscaping including mowing of all lawns and grass areas. The cost of maintenance of said Common Property shall be an assessment against all of the Property in the subdivision in accordance with the Declaration, for so long as such maintenance is necessary or required adversely affects the natural flow of surface or underground waters with in the area permitted.

**C)** Notice is hereby given that as of the date hereof there is an active railroad on certain lands in close proximity to the subdivision, and that the foregoing railroad operation may have an effect on the use, enjoyment and market value of Lots in the subdivision, and in particular, those Lots located in close proximity to the railroad. Each buyer should familiarize themselves with the location of their Lot and its proximity to the railroad operation.

**B-18) <u>Improvements Within Easements</u>.** Any improvements (for example, fences, landscaping) located within any part of a Lot which is subject to a utility easement is subject to removal at the Owner's expense for utility maintenance and other reasons as determined by the party benefitted by the easement. Reinstallation of any improvement would be at the Owner's cost and would also be subject to the discretion of the party benefitted by the easement and is subject to terms and conditions as set forth on the final plat.

## PART C
## ARCHITECTURAL CONTROL COMMITTEE

**C-1) Membership.** Declarant shall establish an Architectural Control Committee (the **"Committee"**) consisting of three (3) members. So long as Declarant has title to any Lot subject to this Declaration, the Committee shall be appointed by Declarant. After Declarant no longer has title to any Lot within the Development or at such earlier time as determined by the Declarant, the initial members of the Committee shall resign and the Association shall elect three (3) Owners to serve on the Committee. At any time, Declarant may elect to surrender the selection of the members of the Committee to the Association.

A majority of the Committee may designate a representative to act for it. In the event of the death or resignation of any member of the Committee, the remaining members shall have full authority to designate a successor.

The Committee appointed hereunder shall serve for the time period specified in paragraph C-10, below. Any Committee member may resign prior to said date. Such resignation shall be effective upon receipt. If a resignation shall occur, prior to turning over control of the Committee, then the remaining members of the Committee may appoint a replacement.

**C-2) Architectural Control.** No structure, whether residence, accessory building, tennis or sport court, swimming pool, decks, patios, antenna (whether located on a structure or on a Lot), flag pole, wall, fence, landscaping, recreational equipment or other improvements, including exterior colors and materials to be applied to said improvements, shall be constructed, maintained or performed upon any Lot and no alteration or repainting of the exterior of a structure shall be made unless complete Architectural Review Application (**"Application"**) Plans, specification and plot plans therefore shall have been submitted to and approved in writing by a majority of the Committee. Approval shall also be required for location of improvements with respect to topography and finish grade elevation. Said Application, plans, specifications and plot plans shall show the exterior design, height, building materials and color scheme thereof, the location of the structure plotted horizontally and vertically, the location and size of driveways, the plans for required landscaping, and the grading plan. A copy of such Application, plan specifications and plot plans as finally approved shall be deposited with the Committee. The Application can be found on the Veridian Homes website www.veridianhomes.com. Select Homeowner Resources (located on the top toolbar), select Architectural Control Committee and select the appropriate application for your request.

**C-3) Plan Review.** The Committee shall review said Application, plans and specifications as to quality of workmanship and materials, harmony of external design with existing or proposed structures and as to location with respect to topography and finish grade elevation. The Committee shall use the guidelines set forth in this Declaration as an aid in exercising its architectural control responsibilities hereunder, but nothing contained herein or therein shall limit the Committee's discretion to grant variances from or make changes to, the guidelines, as they shall determine in the sole exercise of their discretion.

**C-4) Procedure.**

**A)** Neither the members of the Committee nor its designated representative shall be entitled to any compensation for services performed pursuant to this covenant for the initial approval of a residential structure. Thereafter, said Committee may charge a "request for action" or "approval" fee not to exceed Fifty and no/100 Dollars ($50.00) for each such request or approval. The Committee's approval or disapproval, as required in these Covenants, shall be in writing. In the event the Committee fails to provide, in writing, approval or disapproval within thirty (30) days after application, plans and specifications or any other matters requiring approval have been submitted to it, the request shall be deemed denied.

**B)** A submission will not be complete, and the thirty (30)-day approval time, as applicable, set forth above shall not commence until all documents required herein have been submitted. All such submissions shall be made to the Committee at the address set forth in this Declaration or to such other address that the Committee may designate.

**C)** The Committee shall have the sole right to reject any Application and plans which, in the judgment and sole opinion of a majority of its members are not in conformity with this Declaration; or are not desirable for aesthetic reasons; or are not in harmony with buildings located on the surrounding Lots; or are not in conformity with the general purposes of this Declaration.

**D)** The Committee shall exercise its sole approval authority and discretion in good faith and each Owner, by acceptance of a deed to, or any other interest in, a Lot, agrees to hold the Committee harmless from any perceived discrepancies in the Committee's good-faith performance of its duties. Refusal of approval of plans by the Committee may be based on any grounds, including purely aesthetic grounds, which in the sole discretion of the Committee shall be deemed sufficient.

**E)** The Committee may set its own operating procedures consistent with this Declaration and any limitations hereafter imposed by the Association. The costs of operating the Committee shall be assessed by the Association as Common Property expenses, except as permitted below. The Committee may engage consultants (e.g., architects, engineers or attorneys) either on a general or on a case-by-case basis, and the costs thereof may be charged to an applicant. The members of the Committee shall not draw any compensation for serving thereon but may be reimbursed for expenses incurred in performing their duties. All funds relating to the Committee shall be handled by the Association.

**C-5)** **Separate Village Approval**. Matters which require approval of the Committee may also require approval of the Village of McFarland. Obtaining approval from the Committee and the Village of McFarland is solely the responsibility of the Owner desiring approval. Approval of Plans by the Committee shall not be deemed approval by the Village of McFarland and approval by the Village of McFarland shall not be deemed approval by the Committee.

**C-6)** **Records.** Until such time as a replacement Committee is designated, all plans, applications and requests shall be submitted to said Committee at the following address:

Rosewood Fields Homeowners Association, Inc.
Architectural Control Committee
6801 South Towne Drive
Madison, Wisconsin 53713

**C-7)** **Committee Liability.** Neither the Committee nor any member thereof shall be liable for damages to any person submitting request for approval or to any Owner of any Lot by reason of any action, failure to act, approval, disapproval or failure to approve or disapprove with regard to such requests. The Committee is not responsible for ensuring that the application and plans submitted by an Owner are in compliance with applicable laws, rules, regulations, ordinances or customary and typical building practices. The Committee does not review plans for structural design.

**C-8) Indemnification.** Each member or former member of the Committee, together with the personal representatives and heirs of each such person, shall be indemnified by the Association against all loss, costs, damages and expenses, including reasonable attorney's fees, asserted against, incurred by or imposed in connection with or resulting from any claim, action, suit or proceeding, including criminal proceedings, to which such person is made or threatened to be made a party by reason of service as a member thereof, except as to matters resulting in a final determination of gross negligence or willful misconduct on the part of such member. In the event of settlement of such proceeding, indemnification shall be provided only in connection with such matters covered by the settlement as to which the Association is advised by counsel that the person to be indemnified has not been guilty of gross negligence or willful misconduct in the performance of such person as a member in the matter involved. This right of indemnification shall be in addition to all other rights and defenses. All liabilities, losses, damages, costs and expenses incurred or suffered by the Association in connection with this indemnification shall be a Common Property expense. Nothing in this Section C-8 shall be deemed an indemnification of such person with respect to such person's status as an Owner, occupant or otherwise.

**C-9) Variance.** The Committee shall have the power and absolute discretion to authorize a variance from any of the requirements of this Declaration if it finds that the strict application thereof would, in its sole discretion and opinion, result in difficulties or undue hardship to the Lot owner or in the event the architecture of the proposed Lot improvement is such as to present, in its opinion, a particularly pleasing appearance compatible with other houses in the development.

**C-10) Successor to Committee.** Declarant may turn over control of the Committee to the Members of the Association at any time, and shall turn over control when Declarant no longer has any ownership interest in the Property. At such time as Declarant turns over Committee control, the Association's Board of Directors shall designate not less than three (3) or more than five (5) Members of the Association to serve and act as the Committee for all purposes hereunder.

## PART D
## DESIGN GUIDELINES

### D-1) Single Family Dwelling Units.

**A) Architectural Character.** Architecture within the Development will be developed with a variety of American vernacular architectural styles in mind. These architectural styles, while not a comprehensive list, will offer a unique mixture of styles for the development, and will be applied with proportions and character in mind. The overall character of the development will be created so that the architectural styles are compatible and the overall cohesion of styles will help foster a unique setting without stifling the architectural creativity on the individual building level, creating a varied but integrated community. Identical floor plans with the same elevation style shall not be located within 7 sites to assure this variety. The following are examples of styles permitted:

| | | | | |
|---|---|---|---|---|
| Cottage | Craftsman | Four Square | Farmhouse | Salt Box |
| Prairie | Shingle | Traditional | Victorian | Southern Traditional |

The requirements as itemized in the following section will be used as applicable to the context of the specific architectural style. Declarant reserves the right to grant variances in its sole discretion. Where Village zoning is more restrictive, such requirements will govern.

**B)** **<u>Front Porch</u>.** Usable front porches are encouraged as both visual and functional design elements.

**1)** A usable open front porch is defined as having a minimum depth of 6'-0", and a minimum width of 8'-0".

**2)** Porch post style should be consistent with the overall architectural style of the home. Minimum standard porch design details include the following; porch posts or alternate per plan, porch balustrades, when provided, of nominal 2" x 2" square wood at a maximum of six inches (6") on center; and newel posts that are compatible with the design of the column posts. Porch columns and railings shall be painted to match the trim color of the house.

**C)** **<u>Garage</u>**.

**1)** There shall be a minimum of a two (2) car, 20' x 20' garage per dwelling unit.

**2)** The maximum garage width exposed on the front elevation shall be no greater than fifty percent (50%) of the overall building width.

**3)** On homes with a front-entry garage face must be set back a minimum of 2'-0" from the front elevation unless applicable zoning ordinances require a greater setback.

**4)** Tandem, split or side entry garages are encouraged for three (3) or four (4) car garages. For three (3) car front entry garages, the third stall must have a minimum setback of the greater of 2' from the two-car garage line or as required by compatible roof design. Garage width must comply with zoning and the design guideline standards of 50% of overall building width.

**5)** The garage door shall be a raised panel design painted to match the siding on the home. The use of windows in the door, appropriate to the architectural style, is encouraged. The maximum single garage door size is 8' x 18".

**D)** **<u>Ornamental Design Elements</u>.**

**1)** Ornamental design elements, such as dormers, shutters, window wrap window grids, gable vents, pilasters, pediments, etc., shall be used in a manner consistent with the overall architectural style of the home and with emphasis on elevations exposed to public space.

**2)** Window wrap or shutters and window grids are required on front and other primary elevations facing a public space. Gable vents, 5" horizontal vinyl trim, and/or eyebrow roofs are required on front elevation gables greater than 10'-0" in width and are encouraged on other gables as deemed appropriate by the Architectural Control Committee.

**3)** The shutters shall be wood or polystyrene with colors as approved by the Architectural Control Committee or of other material or color as deemed acceptable by the Architectural Control Committee. Panel or louver design shutters shall be used as appropriate to home materials & style.

**4)** The window wrap and corner trim shall be a minimum 3½" vinyl or composite material as approved by the Architectural Control Committee and used with box outs or when part of the standard plan.

**5)** Gable vents shall be the NuWood triangle or peaked series or equivalent for the front elevation, and side elevations facing a public street, or other design approval by the Architectural Control Committee. Other gable ornamentation as appropriate to architectural style may be allowed or required by the Architectural Control Committee.

**E)** **<u>Roof/Facias/Soffits/Eaves.</u>**

**1)** Roof Standards:

**a)** Roof design must be consistent with the overall architectural style of the home. Roof forms and pitches as established on individual styles may not be altered without approval by the Architectural Control Committee.

**b)** Roof material shall be Owens Corning Oakridge 30 architectural shingle or equal and in colors as approved by the Architectural Control Committee.

**c)** Use of an eyebrow roof or projecting gable is required at brick walls not extending into a gable and are encouraged, as appropriate, at double gable returns and porch column caps.

**d)** Hip roof design, porches or other elements deemed appropriate by the Architectural Control Committee may be used in lieu of specific gable requirements.

**2)** Fascia, Soffit and Eave Standards:

**a)** Facia shall be 6" minimum aluminum with colors as approved by the Architectural Control Committee, wood or composite material may be used when appropriate to the architectural style.

**b)** Aluminum soffit and eave color shall match facia.

**c)** A minimum 12" overhang is required at typical eaves and gable ends. However, 6" is allowable with projections less then 6'-0" in width, such as the fireplace chase and a small bay window, and beyond structure line at open porches. Larger overhangs may be required as appropriate to the architectural style.

**F)** **<u>Exterior Wall Surfaces.</u>**

**1)** Siding material shall be premium vinyl or composite material as approved by the Architectural Control Committee. Shingle or vertical board and batten siding is encouraged for accent areas appropriate to the style of the home. Colors shall be approved by the Architectural Control Committee.

**2)** Windows may be vinyl; vinyl clad, aluminum clad or wood with colors as approved by the Architectural Control Committee.

**3)** Variation of wall planes on primary elevations is encouraged as appropriate to overall building style and massing.

**4)** Any elevations facing public streets or spaces shall have a minimum of three (3) windows with wrap trim or shutters and window grills as appropriate and one (1) gable vent at all gable ends.

**5)** The use of brick or stone is encouraged as appropriate to architectural style. When brick is used, it shall be on full wall surfaces from foundation to eaves or on a two-story elevation at least to the second floor windowsill line. When brick is used, a soldier course window heads and rowlock sills are required. Additional details (i.e. projecting belt course and projecting corner accents) are encouraged as appropriate. Stone may be used as full wall surfaces or as a base course to first floor sill line. Brick or stone facing must return a minimum of 2'-4" when terminated at an outside corner.

**6)** Brick or stone material and color selections shall be as approved by the Committee and harmonious with overall neighborhood palette, as well as with the specific home design.

**D-2) <u>Other Improvements</u>.**

**A) <u>Fences</u>** All fencing must receive prior written approval of the Committee and shall comply with any requirements set out below. The Committee may also require the installation and maintenance of landscape materials for screening and aesthetic purposes. All fence material shall be constructed of vinyl. Zoning approval and/or building permit from the Village of McFarland may be required to construct fencing. Committee approval does not supercede the need for any municipal approvals or permits.

1) Fencing may consist of vinyl. The fence style permitted is the PlyGem Stratford Vinyl, depicted in Exhibit "E".

**a)** All fencing shall be erected finish side out (i.e. pickets on the outside of the rail facing the street or neighboring lot).

**b)** Posts shall be spaced a minimum of 72" and a maximum of 96" on center. Rails shall be discontinuous and abut into the posts.

**c)** Gates are permitted and shall be consistent with the fencing style. All gates shall open into the lot. Gates may be required for access to utility easements and access easements that are dedicated on the plat.

**d)** Fencing color by PlyGem Fence/Railing of White is the only color allowed for vinyl material.

**2)** Appropriate uses of fencing:

**a)** Fencing shall be limited to rear and side yards only.

**b)** Fencing shall meet up with the corners of the home or garage and may not project past the front face of home or garage.

**c)** Only one fence is permitted along adjoining properties. Corners of adjoining properties fencing shall intersect at common corners.

**d)** Fencing at side yards of corner lots shall be placed a minimum of 6 inches from the property line (approximately 1 foot from sidewalk) for all zoning classifications.

**3)** Inappropriate use of fencing:

**a)** Fencing in front yards shall not be permitted.

**b)** Fencing shall not occur in freestanding segments or be placed arbitrarily.

**c)** Fencing shall not meet porch or deck corners.

**d)** Fencing shall not interfere with utility equipment. Your utility companies shall be consulted for current requirements and the most restrictive shall apply.

**B)** **<u>Decks</u>.** All decks must receive prior written approval of the Committee and shall comply with any requirements set out below. The Committee may also require the installation and maintenance of landscape materials for screening and aesthetic purposes. A zoning approval or building permit from the Village of McFarland may be required to construct a deck. Committee approval does not supercede the need for any municipal approvals or permits.

**1)** Appropriate deck design shall incorporate the following criteria:

**a)** Deck(s) shall be proportionate in size to the footprint of the dwelling

**b)** Deck(s) shall be proportionate in length and width

**c)** Deck(s) shall not project past the rear or side yard setbacks

**d)** Deck(s) at side yards of corner lots may not project past the corner of the home or garage for that side facing the street.

**e)** Deck(s) must be stained or painted

**2)** Inappropriate deck design:

**a)** Deck(s) in front yards shall not be permitted.

**b)** Deck(s) shall not occur in freestanding segments or be placed arbitrarily on the lot.

**c)** Deck(s) shall not interfere with utility equipment. Your utility companies shall be consulted for current requirements and the most restrictive shall apply.

**C)** **<u>Outbuildings</u>.** No outbuilding, shed or accessory building of any nature shall be erected on any Lot, with the exception of a detached garage that is the only garage on the lot and is approved by the Committee prior to construction. Secondary units (granny flats) above detached garages may be allowed with prior written approval from the ACC.

**D)** **Antennae/Wind Powered Electric Generators.** No wind powered electric generators, exterior television, radio receiving or transmission antennae, satellite signal receiving station or dish shall be placed or maintained upon any portion of a Lot without prior written approval of the Committee.

**1)** Appropriate antennae or satellite dish placement:

**a)** Only one antennae or satellite dish shall be allowed per lot.

**b)** The location of the satellite dish can be any of the following and shall not be visible from the curb directly in front of the home:

i. On a pole in the backyard and located close to the home.

ii. Attached to the deck.

iii. On the rear roof line of the home.

1. A satellite dish shall not project past the uppermost roof ridgeline. This method is not recommended by the Committee as you may have water infiltration issues if the dish is not property installed and roof repairs may not be covered under the applicable roof warranty.

**2)** Inappropriate antennae or satellite dish placement:

**a)** Antennae or satellite dish in front or side yards shall not be permitted.

**b)** Antennae or satellite dish shall not interfere with utility equipment.

**E)** **Firewood Storage.** No firewood or woodpile shall be kept on any lot unless it is neatly stacked, placed in the rear yard and screened from street view by plantings or a fence first approved in writing by the Committee.

**F)** **Solar Collectors.** No active solar collector or apparatus may be installed on any Lot unless such installation is first approved in writing by the Committee, which shall consider the aesthetic and sun reflection effects on neighboring structures. Solar collectors or apparatus installed flat against or parallel to the plane of the roof shall be preferred.

**G)** **Lighting.** Exterior lighting installed on any Lot shall either by indirect or of such controlled focus and intensity that such lighting will not disturb the residents of adjacent Lots.

**H)** **Landscaping Requirements.** Pursuant to Section B-4 of the Declaration of Conditions, Covenants and Restrictions, Developer hereby imposes upon all Lots described in Exhibit "A", attached hereto and incorporated herein by reference, the requirement that the Owners thereof install landscaping on such Lots which meets or exceeds the minimum number of points for landscaping set forth in Exhibit "C". The number of points attributable to various elements of the landscaping to be installed shall be determined by reference to Exhibit "D", attached hereto and incorporated herein by reference. All terms, covenants and conditions of Section B-4 of the Declaration of Conditions, Covenants and Restrictions, as amended herein, shall be applicable to the landscaping to be installed pursuant to the terms of this paragraph. Landscape installed by the Declarant may or may not meet the minimum number required.

## PART E
## GENERAL PROVISIONS

**E-1)** **Term.** This Declaration shall run with the Property and Common Property, and shall be binding on Declarant and all Members and their successors and assigns, and all persons claiming under them for a period of twenty-five (25) years from the date recorded, after which time said Declaration shall be extended automatically for successive periods of five (5) years each unless an instrument signed by a majority of the Members agreeing to change said Covenants in whole or in part or to terminate the same.

**E-2)** **Enforcement.** The Declarant (or either one of them if more than one), Architectural Control Committee or any Owner shall have the right to enforce by any proceedings at law or in equity all restrictions, conditions and covenants created or imposed herein, against any person or persons violating or attempting to violate any covenant, by any action to either restrain violation or to recover damages, or both including reasonable attorney fees. Failure to enforce any covenant, condition or restriction herein shall in no event be deemed a waiver of the right to do so thereafter. In the event of a violation of this Declaration the Committee shall have the right to assess and collect from the violating party a fine for such violation equal to the greater of (i) the actual damages suffered on account of the violation, or (ii) the sum of $100.00 per day for each day the violation remains outstanding plus (iii) all costs of collection and enforcement, including actual attorney fees.

**E-3)** **Severability.** Invalidation of any one of these covenants by judgment or court order shall in no way affect any of the other provisions which shall remain in full force and effect.

**E-4)** **Model Homes.** So long as Declarant shall own any Lot in the Development, Declarant shall be permitted to maintain model homes in the Development, including therein a sales office for the purpose of sales and marketing of its homes.

**E-5)** **Parade of Homes.** So long as Developer shall own any Lots in the Development, or condominium units in any condominium located within the Development (collectively a "Lot/Unit"). Developer reserves the right to submit some or all of said Lots/Units as a site for the Parade of Home and/or the Parade of Condominiums of the Madison Area Builders Association (the "Parade"). In the event that some or all of said Lots/Units are selected as a site for a Parade, this Declaration of Protective Covenants, Conditions and Restrictions shall, as to the Lots/Units enrolled in the Parade, for a limited period of time ending 48 hours after the conclusion of the Parade, be deemed temporarily altered and modified, to the extent necessary, to permit the Madison Area Builders Association to hold its Parade in this Development pursuant to the then current Parade Rules and Checklist of the Madison Area Builders Association. All purchasers of Lots/Units, and/or their successors and assigns, shall take title subject to this specific reservation by the Developer and shall waive all rights to object to violations of this Declaration of Protective Covenants, Conditions and Restrictions by the Developer, the Madison Area Builders Association, or any of the builders or participants in the Parade for the period of the Parade as set forth above, including the closing of any public or private streets in the Parade area. All Lot/Unit owners appoint the Developer their attorney-in-fact to execute all necessary petitions; applications and consents to facilitate said street closings for the Parade.

**E-6) Governing Law.** This Declaration shall be construed and enforced in accordance with the terms of the laws of the State of Wisconsin. The terms of this Declaration are not intended to replace or affect any applicable laws, ordinances, rules or regulations of the Village of McFarland.

**E-7) Wet Basins**. Wet Basins within the dedicated storm water management facilities may not permanently contain water due to weather conditions and will not be filled by the Village.

**E-8) Notices.**

**A)** Notices to Declarant shall be given to Declarant at the following address: 6801 South Towne Drive, Madison, WI 53713.

**B)** Notices to an Owner of any Lot within the Development shall be given in care of the street address of the Lot.

**C)** Any party may change its address by written notice given to the other parties. Party, its successors and/or assigns, may change said addresses by notice properly given hereunder.

**E-9) Amendment and Release.** At any time until Declarant conveys all of the Lots which comprise the entire Property, or turns control of the Association over to its Members, whichever occurs first, Declarant may modify, amend, alter and grant variances to this Declaration without the consent of any Member, Owner or Occupant, their Mortgagees or any other party, including the Association and its Board of Directors. These restrictions or any part thereof may be cancelled, released or amended in writing as to the entire Plat or any part thereof by the Declarant at any time until Declarant conveys all of the Lots or until the Declarant turns over control to the Committee, whichever comes first. After the Declarant has sold all of the Lots or otherwise released or assigned his right to enforce the Declaration, then this Declaration or any part thereof may be released, cancelled, amended or waived hereof. Notwithstanding the foregoing or anything else set forth herein, amendments to the following sections of this Declaration shall also require the approval of the Village of McFarland as restrictions for public benefit pursuant to §236.293 Wis. Stats., in order to be effective: Sections B-7, B-8, B-14, B-17, C-5, E-1 and this Section E-9.

**E-10) No Waiver.** Whenever a waiver, consent or approval is required or permitted herein, it must be express and in writing; no waiver, consent or approval shall be implied. Failure to enforce any provision of this Declaration shall not operate as a waiver of any such provision or any other provision of this Declaration.

**E-11) Number and Gender**. Whenever used herein, unless the context shall otherwise provide, the singular shall include the plural, the plural shall include the singular, and the use of any gender shall include all genders.

**E-12) Including**. Whenever used herein, the term "including" preceding a list of one or more items shall indicate that the list contains examples of a general principle and is not intended as an exhaustive listing.

**E-13) Captions.** The captions and article and section headings in this Declaration are intended for convenience and reference only and in no way define or limit the scope or intent of the various provisions hereof.

**E-14) Remedies.** All remedies herein are cumulative.

[Signature Page Follows]

**IN WITNESS WHEREOF**, the said VH Rosewood Fields LLC Wisconsin Limited Liability Companies has caused these presents to be signed and sealed this ____ day of _____, 20__.

**VH Rosewood Fields LLC**
**By: VH Holdings, LLC, Its Sole Member**

By: ________________________________________
Chris Ehlers, Authorized Signatory

**ACKNOWLEDGMENT**

**STATE OF WISCONSIN )**
**) ss**
**COUNTY OF DANE )**

Personally came before me this ______ day of _______, 20__, Chris Ehlers the Authorized Signatory of VH Rosewood Fields LLC a Wisconsin Limited Liability Company, to me know to be such persons and officers who executed the foregoing instrument and acknowledged that they executed the same as such officers, by its authority for the purposes therein contained.

__________________________________
Notary Public
Dane County, Wisconsin
My Commission Expires: ___________, 20__

**CONSENT TO DECLARATION OF**
**COVENANTS AND RESTRICTIONS**

The undersigned, _______ Bank, hereby consents to the forgoing Declaration of Conditions, Covenants and Restrictions for the plat Rosewood Fields. This consent does not limit, restrict or affect in any way Mortgagee's rights, interest and remedies regarding Mortgagee's interest in the Property.

Dated at Madison, Wisconsin this ______ day of _______________, 20__.

By: ___________________________________________

**ACKNOWLEDGMENT**

**STATE OF WISCONSIN )**
**) ss.**
**COUNTY OF DANE )**

Personally came before me this _______ day of ______________, 20__, the above named _____ _____________________________________, to me known to be the person(s) who executed the foregoing instrument and acknowledged the same.

___________________________________________
Notary Public
County of Dane, State of Wisconsin
My Commission Expires: _______________

# Exhibit “A”

## Description of Rosewood Fields Lots

Lots 1-117, Outlots 1-6, Rosewood Fields, Village of McFarland, Dane County, Wisconsin

# Exhibit "B"

PINs:

# EXHIBIT "C"

## Total Minimum Points for Landscaping

| Lot(s) | Minimum Points for Foundation Plantings | Total Minimum Points for Landscaping |
|---|---|---|
| 13, 15, 17-18, 28-42, 44-49, 52-54, 93-96, 108-116 | 350 | 500 |
| 1-12, 16, 19-25, 43, 55-61, 86-92, 107, 117 | 400 | 550 |

**EXHIBIT "D"**

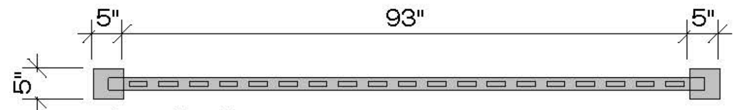
## Landscaping Elements

| Elements | | Point Schedule |
|---|---|---|
| A) | *Small Shade Trees (balled and burlaped)* ........ (1.5"-2" caliper at 6" from the roots) | *50* |
| B) | *Medium Shade Trees (balled and burlaped)* ........ (2"-3" caliper at 6" from the roots) | *100* |
| C) | *Large Shade Trees (balled and burlaped)* ........ (3"-4" caliper at 6" from the roots) | *150* |
| D) | *Extra-Large Shade Trees (balled and burlaped)* ........ (4" + caliper at 6" from the roots) | *200* |
| E) | *Ornamental Trees (balled and burlaped)* ........ (1.5"-2" caliper at 6" from the roots) | *50* |
| F) | *Small Evergreen Trees* ........ (3' to 4.5' when planted) | *25* |
| G) | *Medium Evergree Trees* ........ (5' to 6.5' when planted) | *50* |
| H) | *Large Evergreen Trees* ........ (7' + when planted) | *100* |
| I) | *Evergreen Shrubs* ........ (18" minimum diameter) | *20* |
| J) | *Small Deciduous Shrubs* ........ (18" to 35" in diameter) | *10* |
| K) | *Medium Deciduous Shrubs* ........ (35" to 60" in diameter) | *15* |
| L) | *Large Deciduous Shrubs (balled and burlaped)* ........ (60" or greater in diameter) | *25* |
| M) | *Decorative Retaining Walls* ........ (Points are per face foot. Boulders, timbers, and stones only – no concrete walls included.) | *10* |
| N) | *Paver Stone Walks, Paths or Patios* ........ (Points per square foot – no driveways included.) | *1* |
| O) | *Planting Beds* ........ (Points per square foot – must be decorative stone or mulch.) | *1* |

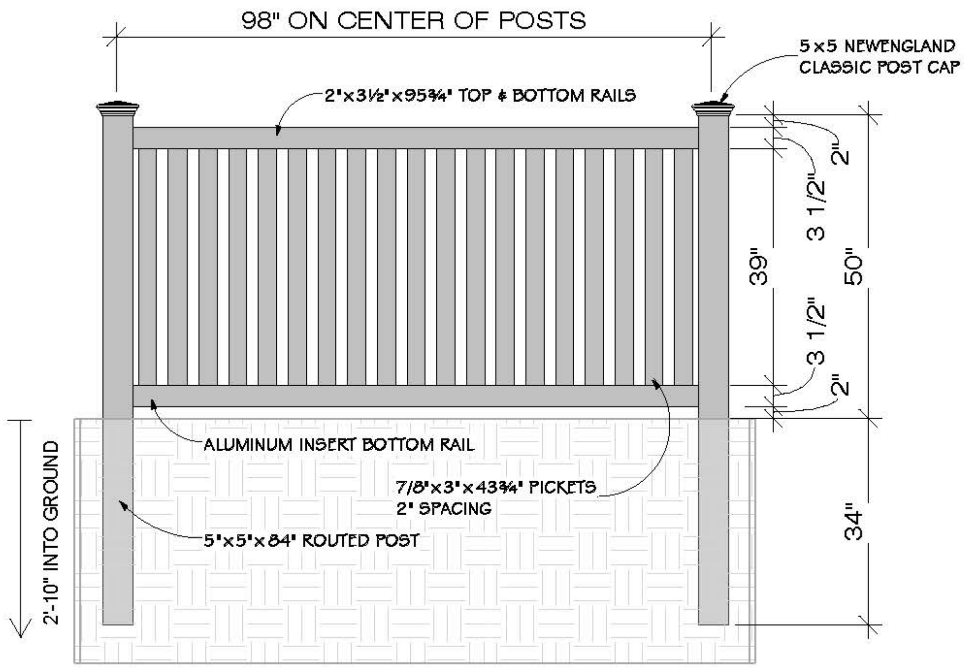
The final point totals must consist of a balanced variety of the listed elements acceptable to the Architectural Control Committee. Existing vegetation, trees and shrubs may be included in the point totals if they are properly protected and maintained during the construction process and located as such on the landscape plans submitted to the Architectural Control Committee for approval.

**EXHIBIT "E"**

# STRATFORD




Fence Top View




Fence Elevation

NOTE:

MANDATORY REQUIREMENTS (NO VARIANCE WILL BE ALLOWED)

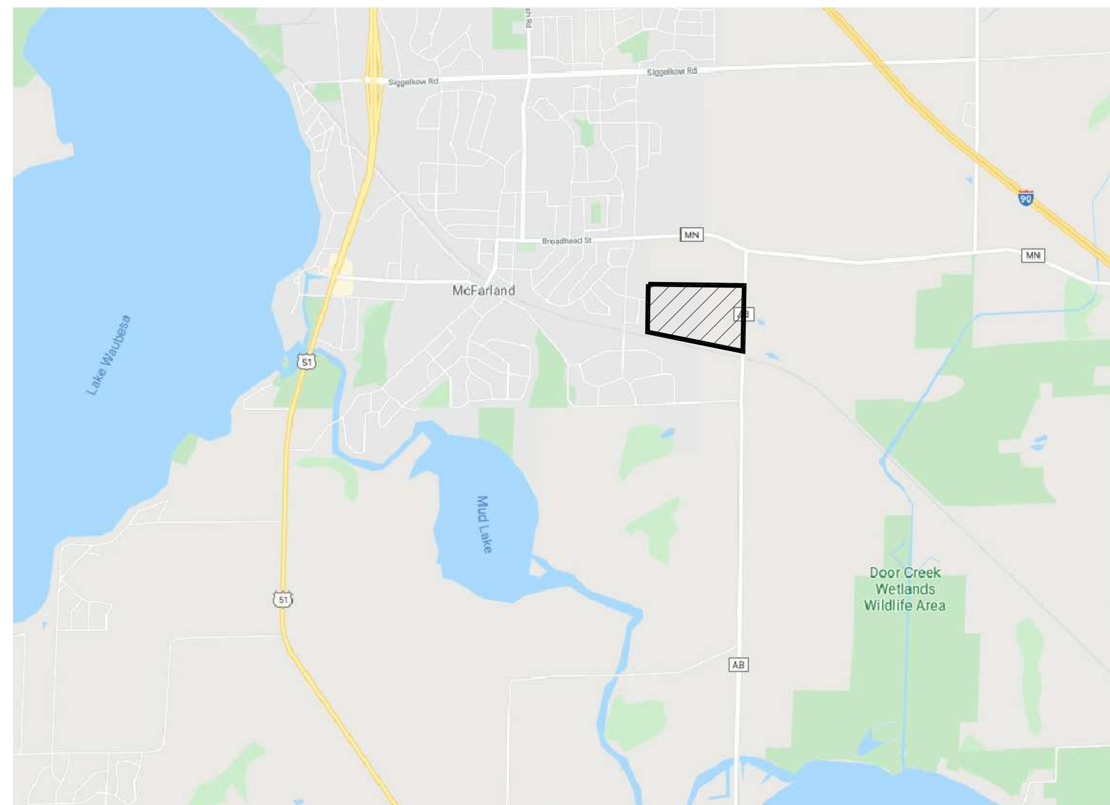
- FENCE MUST BE VINYL
- VINYL COLOR: WHITE
- FENCE STYLE IS A PLYGEM PRODUCT (STRATFORD)

- CUSTOM BUILT ON THE JOBSITE
- INSTALLED WITH METAL BRACKETS THAT ATTACH TO POST AND SCREW INTO STRINGERS

VERIDIAN HOMES

6801 South Towne Drive
Madison, WI 53713
Phone 608.226.3100
Fax 608.226.0600

# ROSEWOOD FIELDS
## ENGINEERING PLANS
### VILLAGE OF MCFARLAND
### DANE COUNTY, WISCONSIN




PROJECT LOCATION

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

Sheet List Table

| Sheet Number | Sheet Title |
|---|---|
| 1 of 26 | COVER SHEET |
| 2 of 26 | OVERALL GRADING PLAN |
| 3 of 26 | SITE GRADING PLAN |
| 4 of 26 | SITE GRADING PLAN |
| 5 of 26 | UTILITY SCHEMATIC |
| 6 of 26 | UTILITY SCHEMATIC |
| 7 of 26 | DRAGONFLY WAY |
| 8 of 26 | DRAGONFLY WAY |
| 9 of 26 | OUTLOT 2 |
| 10 of 26 | PRAIRIE WOOD DRIVE |
| 11 of 26 | PRAIRIE WOOD DRIVE |
| 12 of 26 | PRAIRIE WOOD DRIVE |
| 13 of 26 | PRAIRIE WOOD DRIVE |
| 14 of 26 | ROSEWOOD DRIVE |
| 15 of 26 | ROSEWOOD DRIVE |
| 16 of 26 | TUSCOBIA TRAIL |
| 17 of 26 | TUSCOBIA TRAIL |
| 18 of 26 | TUSCOBIA TRAIL |
| 19 of 26 | VINTAGE BIRCH WAY |
| 20 of 26 | VINTAGE BIRCH WAY |
| 21 of 26 | MULTI USE PATH |
| 22 of 26 | MULTI USE PATH |
| 23 of 26 | MULTI USE PATH |
| 24 of 26 | MULTI USE PATH |
| 25 of 26 | DETAILS |
| 26 of 26 | DETAILS |

NOT FOR CONSTRUCTION

FN: 20-05-132 ISSUE DATE: 08-25-20 SHEET 1 of 26

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

COVER SHEET

ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

DATE: 08-25-20
REVISED:

DRAWN BY: KWB

FN: 20-05-132

Sheet Number:
1 of 26

File: U:\User\2005132\Drawings\Cover.dwg Layout1 Plotted: Aug 25, 2020 - 3:34pm


D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

OVERALL GRADING PLAN

# ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

SCALE: 1"= 150'
(PAGE SIZE: 11x17)

DATE: 08-25-20
REVISED:

DRAWN BY: KWB

FN: 20-05-132

Sheet Number:
2 of 26

File: U:\User\2005132\Drawings\Overall Grading.dwg Grading Plotted: Aug 25, 2020 - 3:38pm


## GRADING & EROSION CONTROL NOTES

1. INSTALL EROSION CONTROL MEASURES PRIOR TO ANY SITE WORK, INCLUDING GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIALS AS SHOWN ON PLAN.
2. EROSION CONTROL MEASURES SHALL BE INSTALLED PER THE VILLAGE OF MCFARLAND STANDARD SPECIFICATIONS.
3. EROSION CONTROL IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR. EROSION CONTROL MEASURES AS SHOWN ON THE APPROVED PLAN SHALL BE CONSIDERED MINIMUM PRECAUTIONS THAT WILL BE ALLOWED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECOGNIZING AND CORRECTING EROSION PROBLEMS THAT ARE A RESULT OF CONSTRUCTION ACTIVITIES.
4. INSPECTIONS, REPORTING AND MAINTENANCE OF ALL EROSION CONTROL MEASURES SHALL BE PER THE VILLAGE OF MCFARLAND REQUIREMENTS TO ENSURE PROPER FUNCTION OF EROSION CONTROLS AT ALL TIMES. EROSION CONTROL MEASURES ARE TO BE IN WORKING ORDER AT THE END OF EACH WORK DAY.
5. INSPECT EROSION CONTROL MEASURES AFTER EACH 1/2" OR GREATER RAINFALL. REPAIR ANY DAMAGE OBSERVED DURING THE INSPECTION.
6. NO SITE GRADING OUTSIDE OF THE LIMITS OF DISTURBANCE OR DOWNSTREAM OF SILT FENCE.
7. EROSION CONTROL MEASURES SHALL BE REMOVED ONLY AFTER SITE CONSTRUCTION IS COMPLETE WITH ALL SOIL SURFACES HAVING AN ESTABLISHED VEGETATIVE COVER
8. INSTALL INLET PROTECTION IN ALL STORM SEWER INLETS AND CATCH BASINS THAT MAY RECEIVE RUNOFF FROM DISTURBED AREAS.
9. CUT AND FILL SLOPES SHALL BE NO GREATER THAN 3:1
10. SLOPES EXCEEDING 4:1 SHALL BE STABILIZED WITH CLASS I, TYPE B EROSION MATTING AND ALL DRAINAGE SWALES SHALL BE STABILIZED WITH CLASS II, TYPE B EROSION MATTING.
11. ALL INCIDENTAL MUD TRACKING OFF-SITE ONTO ADJACENT PUBLIC THOROUGHFARES SHALL BE CLEANED UP AND REMOVED BY THE END OF EACH WORKING DAY USING PROPER DISPOSAL METHODS.
12. PREVENT EXCESSIVE DUST FROM LEAVING THE CONSTRUCTION SITE IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
13. INSTALL EROSION CONTROLS ON THE DOWNSTREAM SIDE OF STOCKPILES.
14. VELOCITY CHECKS SHALL BE PLACED AS SHOWN WHEN THE ROAD SUBGRADE IS ESTABLISHED. CHECKS SHALL BE INSTALLED PER DETAIL PROVIDED AND MAINTAINED THROUGH STABILIZATION. NUMBER AND LOCATION OF CHECKS SHOWN ON PLANS IS MINIMUM REQUIRED. FIELD CONDITIONS MAY WARRANT ADDITIONAL VELOCITY CHECKS AS REQUIRED BY VILLAGE INSPECTOR OR ENGINEER.
15. ALL DISTURBED AREAS SHALL RECEIVE A MINIMUM OF 6" OF TOPSOIL, FERTILIZER, SEED AND MULCH. SEED MIXTURE SHALL BE WISCONSIN DOT SEED MIX #40 OR EQUIVALENT APPLIED AT A RATE OF 5 POUNDS PER 1000 SQFT ON ALL DISTURBED AREAS. ANNUAL RYEGRASS AT A RATE OF 1½ POUNDS PER 1000 SQFT SHALL BE ADDED TO THE THE MIXTURE. FERTILIZER SHALL BE PLACED PER A SOIL TEST. THE INFILTRATION AREA SHALL BE SEEDED WITH A SEED MIX TOLERANT OF FLUCTUATING WATER CONDITIONS.
16. DEWATERING, IF APPLICABLE, SHALL BE CONDUCTED PER WDNR STORM WATER MANAGEMENT TECHNICAL STANDARD 1061.
17. ADDITIONAL EROSION CONTROL MEASURES AS REQUESTED BY THE DNR, VILLAGE ENGINEER OR THE OWNERS REPRESENTATIVE SHALL BE INSTALLED WITHIN 24 HRS.
18. ANY CHANGES TO THIS EROSION CONTROL PLAN MUST BE APPROVED BY THE VILLAGE OF MCFARLAND.

## LEGEND

- 2020 GRADING LIMITS
- PHASE LIMITS
- PLAT LIMITS
- RIGHT-OF-WAY
- LOT LINE
- EXISTING FENCE
- PROPOSED CONCRETE CURB & GUTTER
- EXISTING PAVEMENT
- 900 EXISTING INDEX CONTOUR
- 902 EXISTING INTERMEDIATE CONTOUR
- 900 PROPOSED INDEX CONTOUR
- 902 PROPOSED INTERMEDIATE CONTOUR
- PROPOSED STORM SEWER
- SILT FENCE
- VELOCITY CHECK
- EARTHEN BERM
- STONE WEEPER
- EROSION MAT
- INLET PROTECTION

EROSION CONTROL TO BE DESIGNED WHEN PHASING IS DETERMINED.

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

SITE GRADING PLAN

ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

SCALE: 1" = 100'
(PAGE SIZE: 11x17)

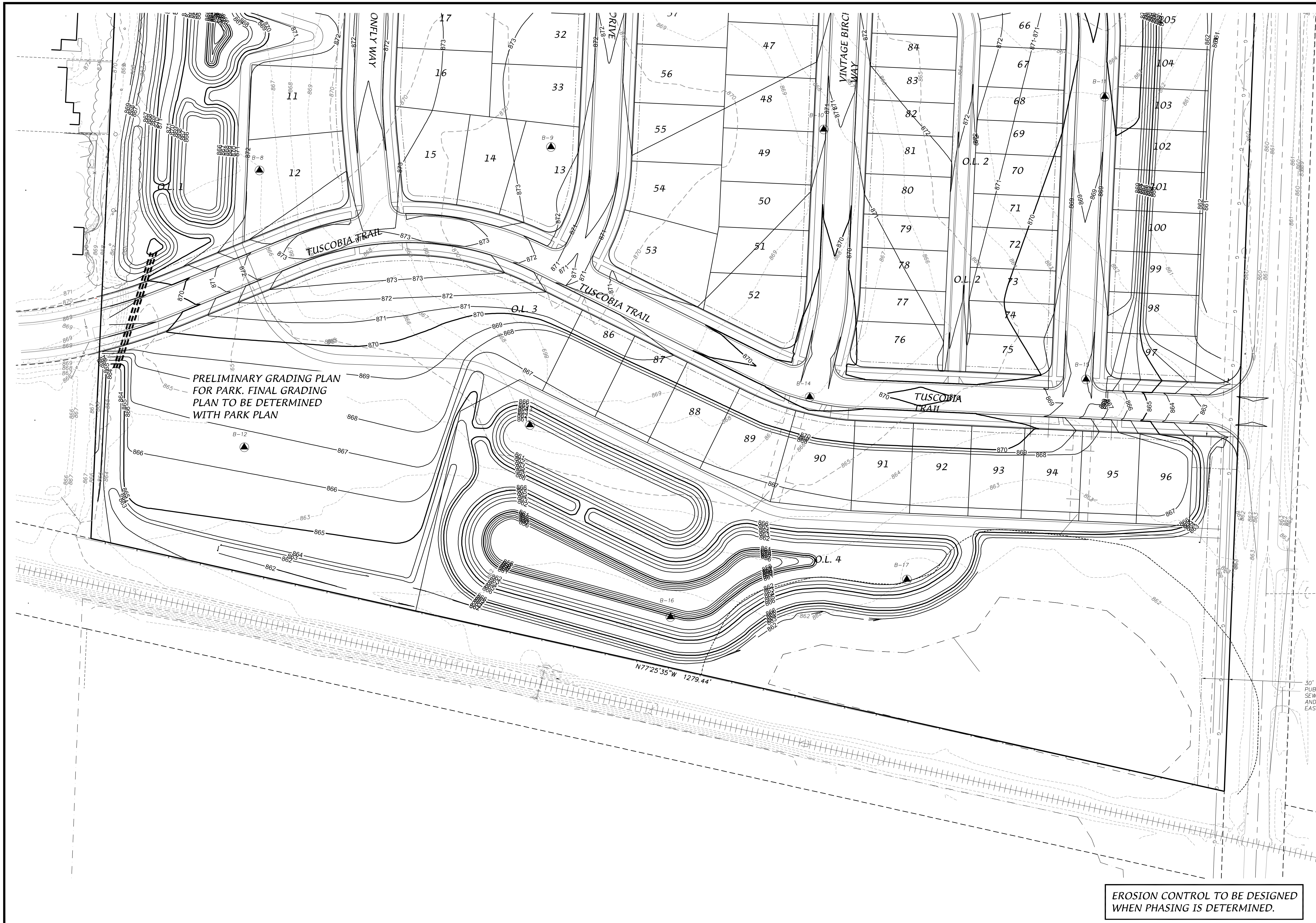
DATE: 08-25-20
REVISED:

DRAWN BY: KWB

FN: 20-05-132

Sheet Number:
3 of 26

File: U:\User\2005132\Drawings\GEC.dwg GEC Plotted: Aug 25, 2020 - 4:20pm




D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

SITE GRADING PLAN

# ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

SCALE: 1"= 100'
(PAGE SIZE: 11x17)

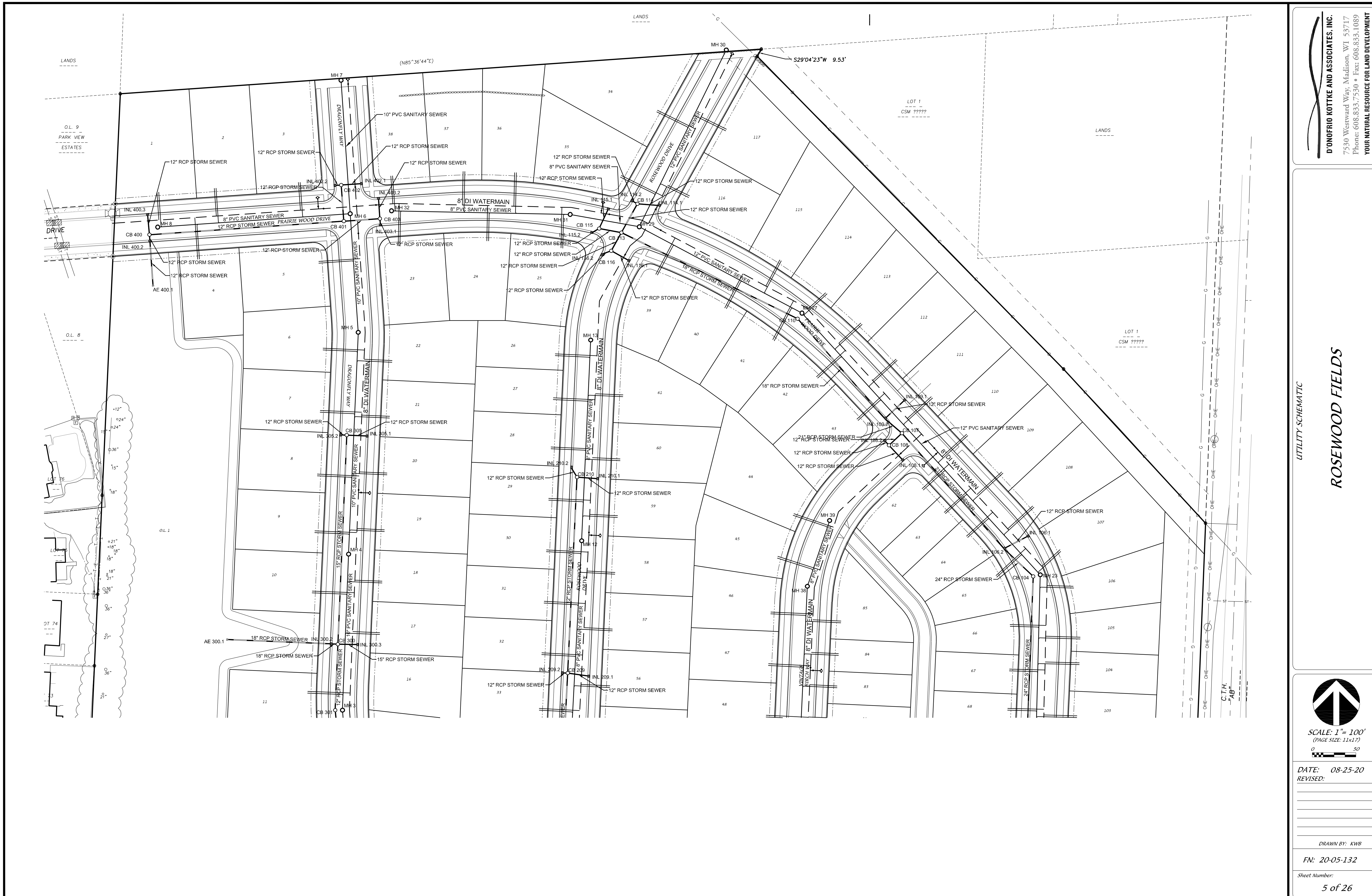
DATE: 08-25-20
REVISED:

DRAWN BY: KWB

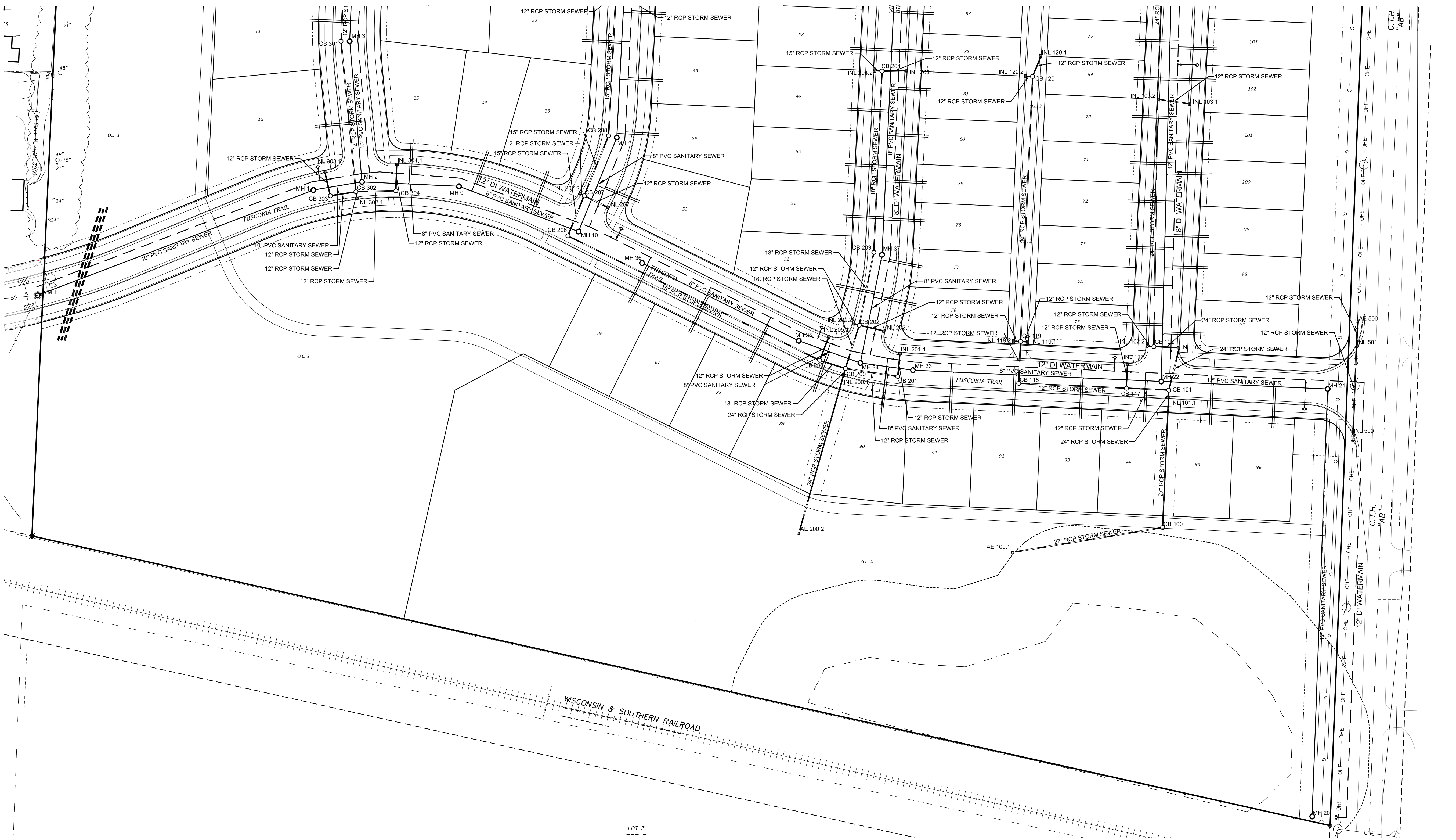
FN: 20-05-132

Sheet Number:
4 of 26

File: U:\User\2005132\Drawings\GEC.dwg GEC (2) Plotted: Aug 25, 2020 - 4:21pm




File: U:\User\2005132\Drawings\Utility Schematic.dwg Utility Plotted: Aug 25, 2020 - 3:51pm




D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

UTILITY SCHEMATIC

# ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

SCALE: 1"= 100'
(PAGE SIZE: 11x17)
0 50

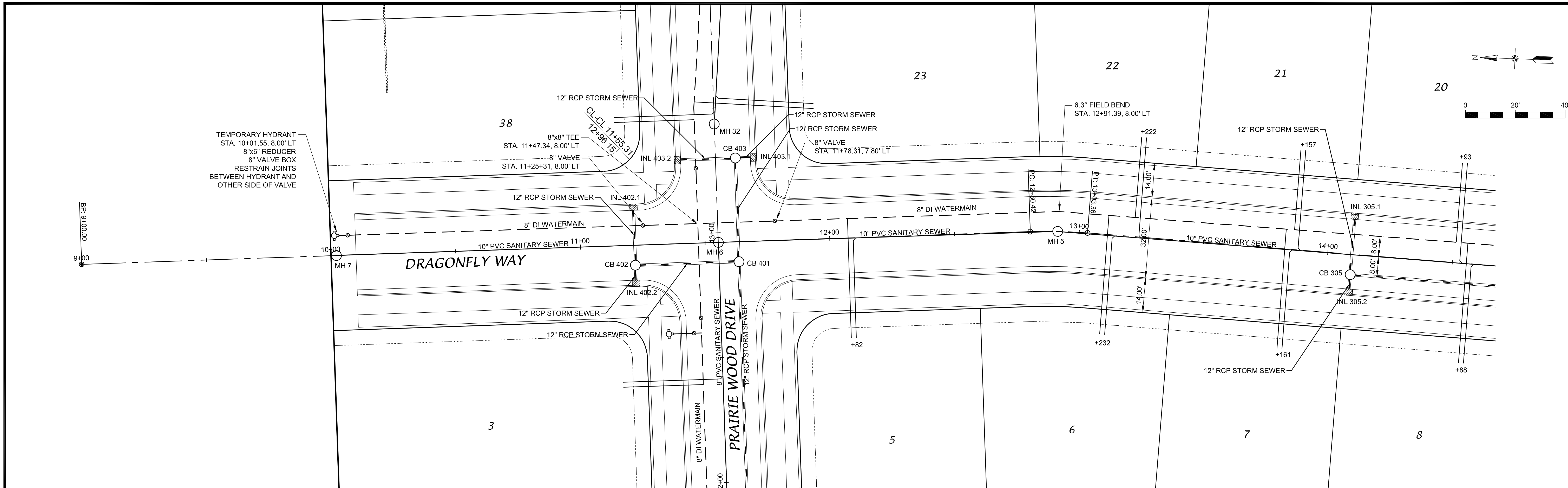
DATE: 08-25-20
REVISED:

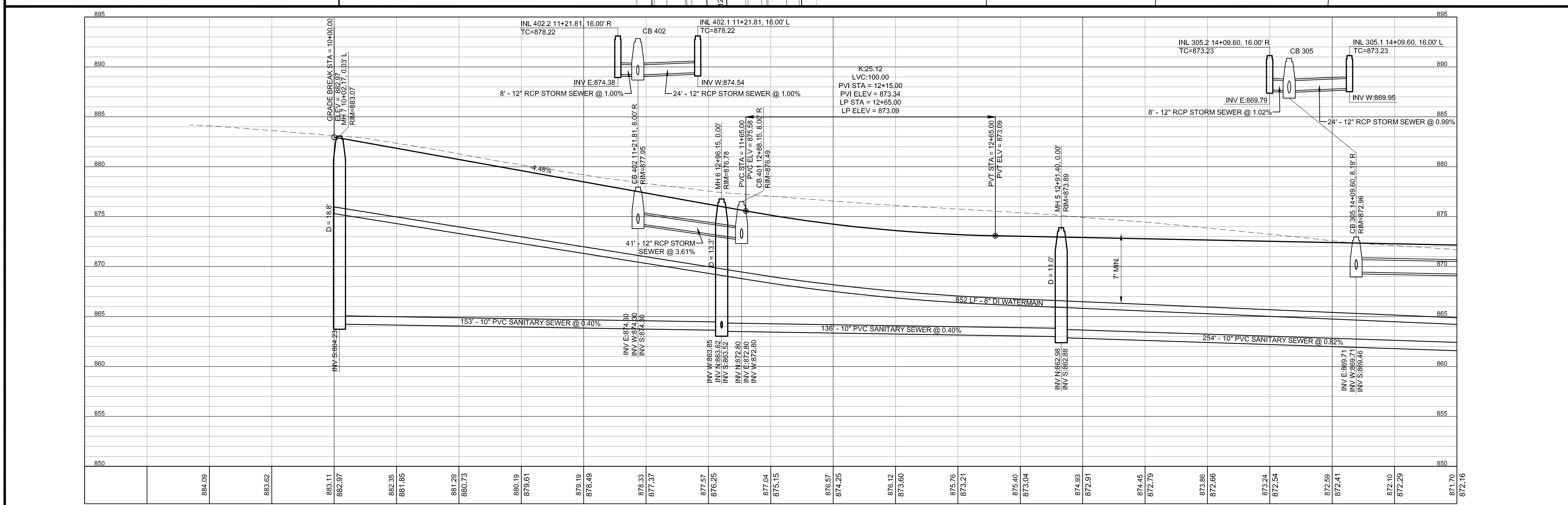
DRAWN BY: KWB

FN: 20-05-132

Sheet Number:
6 of 26

File: U:\User\2005132\Drawings\Utility Schematic.dwg Utility (2) Plotted: Aug 25, 2020 - 3:52pm





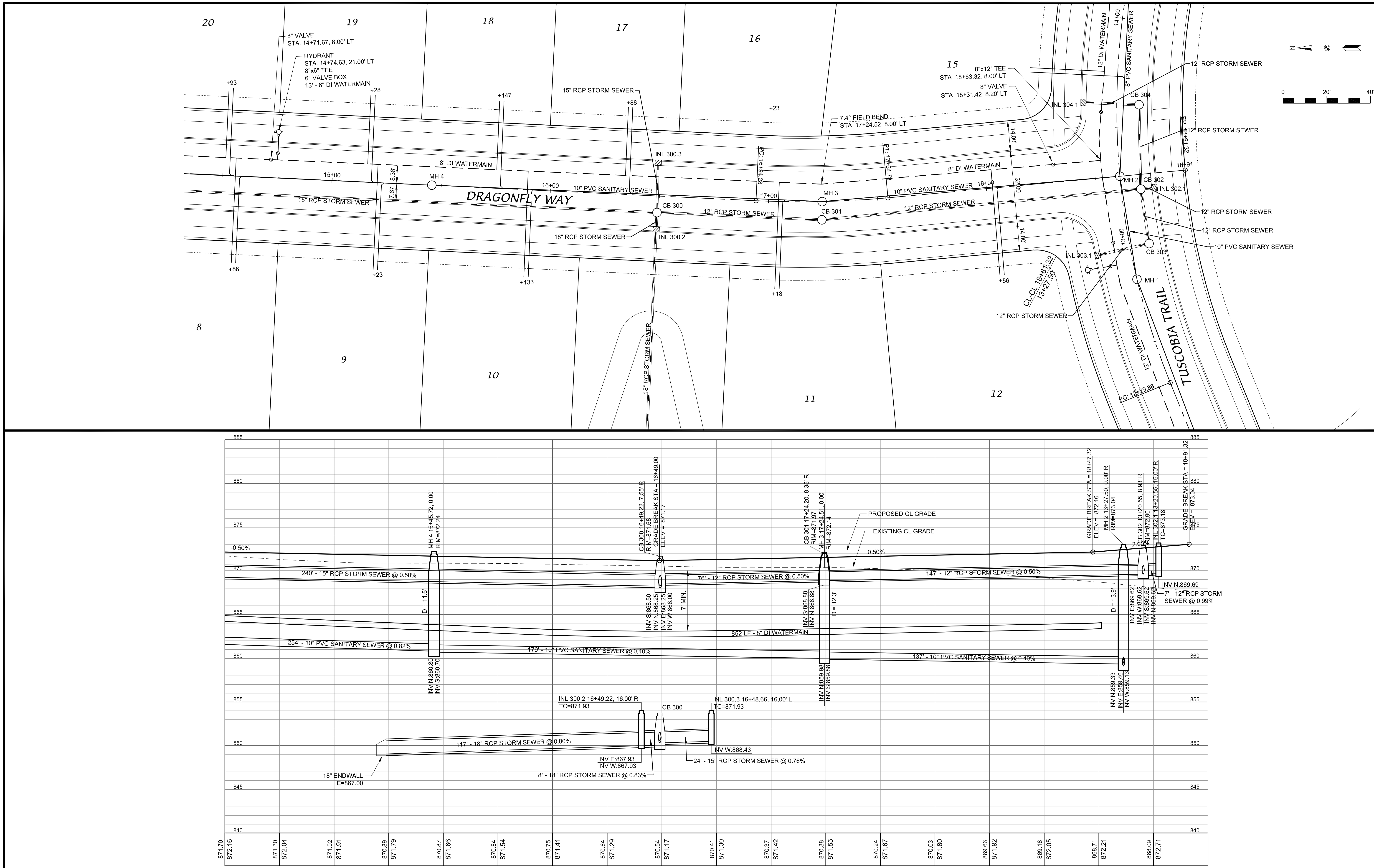

File: U:\User\2005132\Drawings\Dragonfly Way.dwg Dragonfly Way Plotted: Aug 25, 2020 - 4:00pm

FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

DRAGONFLY WAY
SHEET: 7 of 26




File: U:\User\2005132\Drawings\Dragonfly Way.dwg Dragonfly Way (1) Plotted: Aug 25, 2020 - 4:01pm

FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

DRAGONFLY WAY
SHEET: 8 of 26

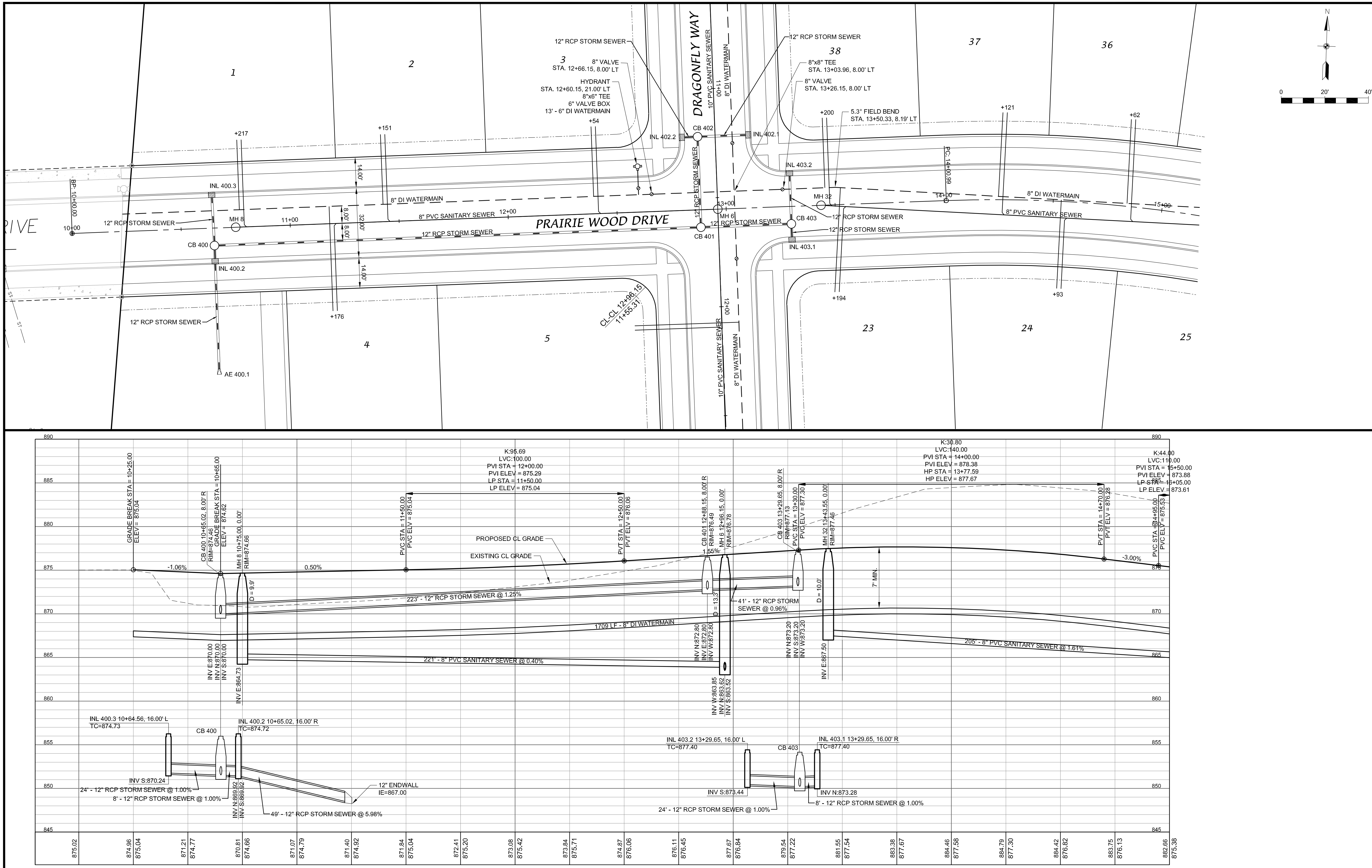

File: U:\User\2005132\Drawings\Outlot 2.dwg Outlot 2 Plotted: Aug 25, 2020 - 4:08pm

FN: 20-05-132 DATE: 08-25-20 REV:

ROSEWOOD FIELDS

OUTLOT 2

SHEET: 9 of 26



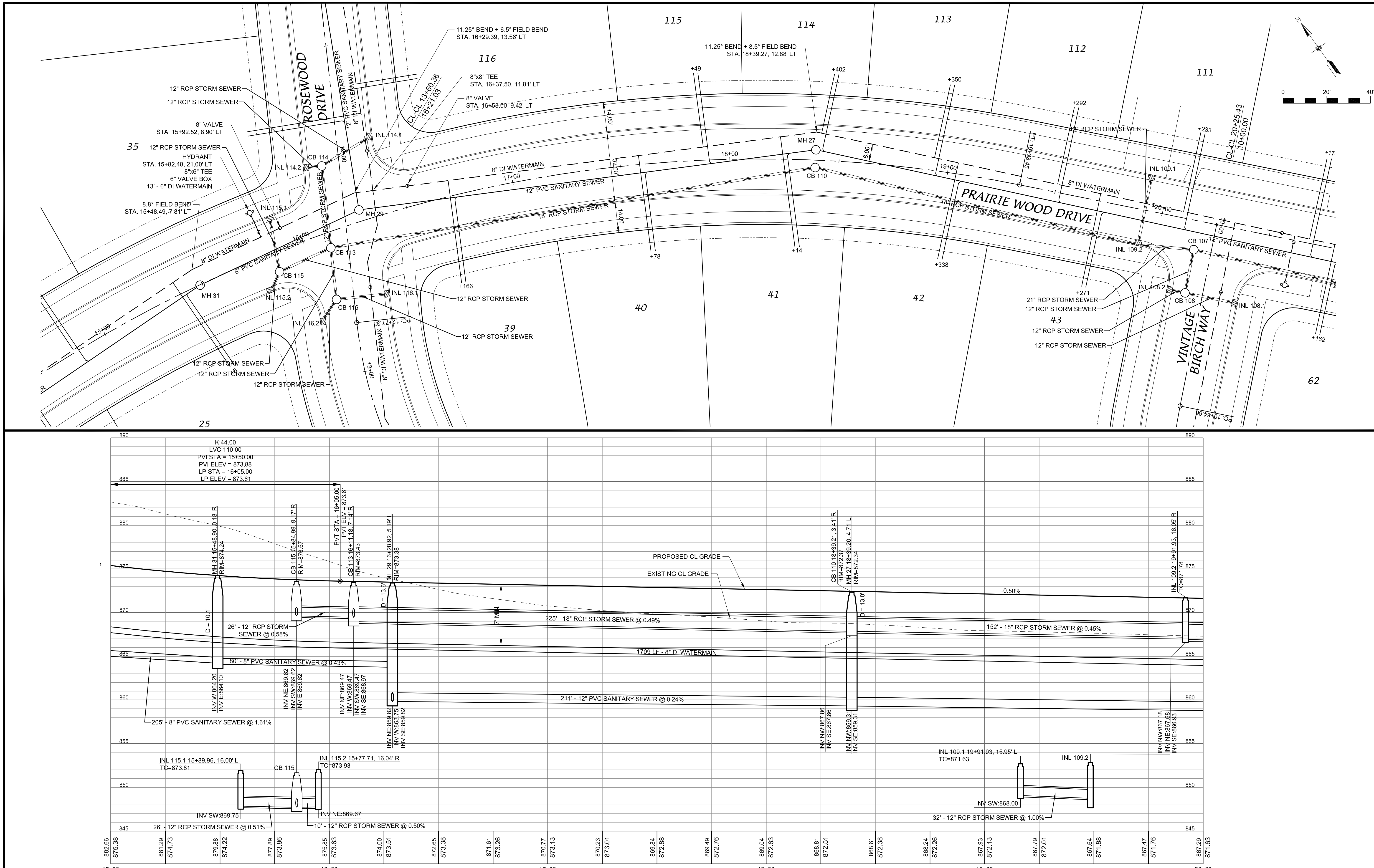

File: U:\User\2005132\Drawings\Prairie Wood.dwg Prairie Wood Plotted: Aug 25, 2020 - 4:12pm

FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

PRAIRIE WOOD DRIVE
SHEET: 10 of 26



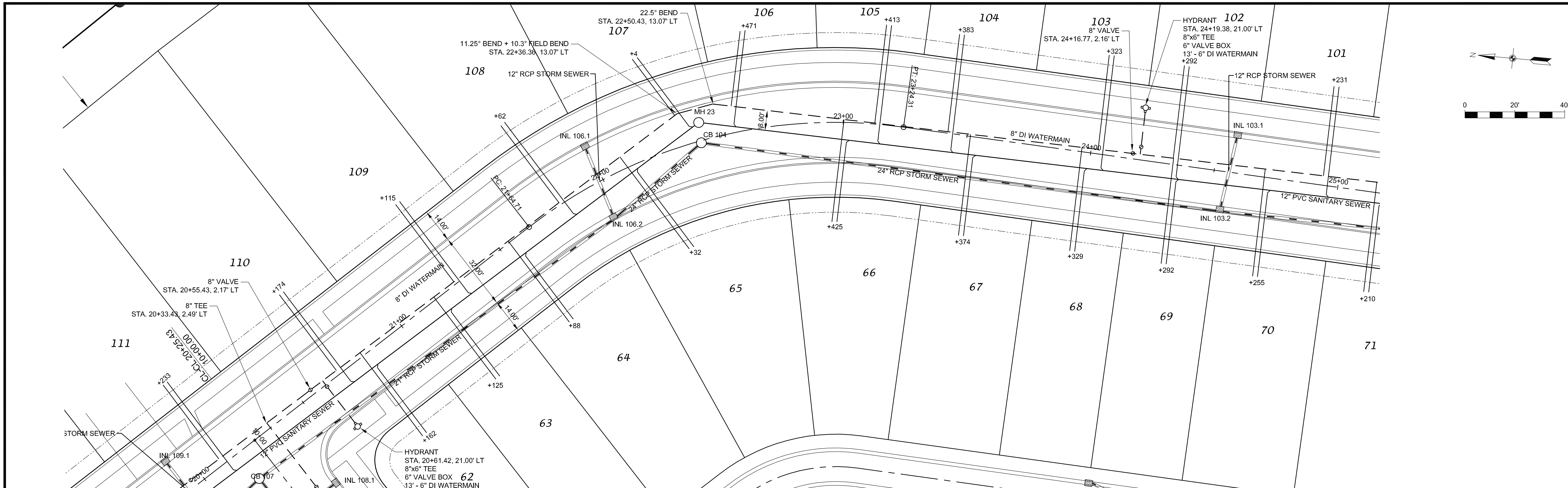

File: U:\User\2005132\Drawings\Prairie Wood.dwg Prairie Wood (1) Plotted: Aug 25, 2020 - 4:13pm

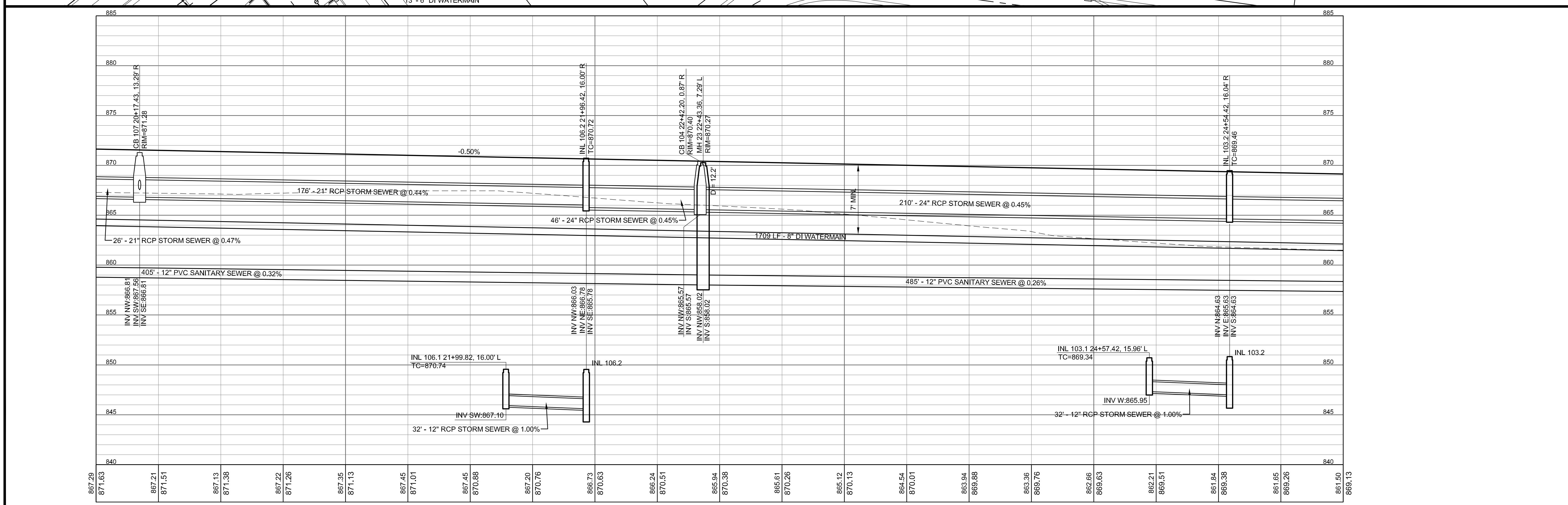
FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

PRAIRIE WOOD DRIVE
SHEET: 11 of 26





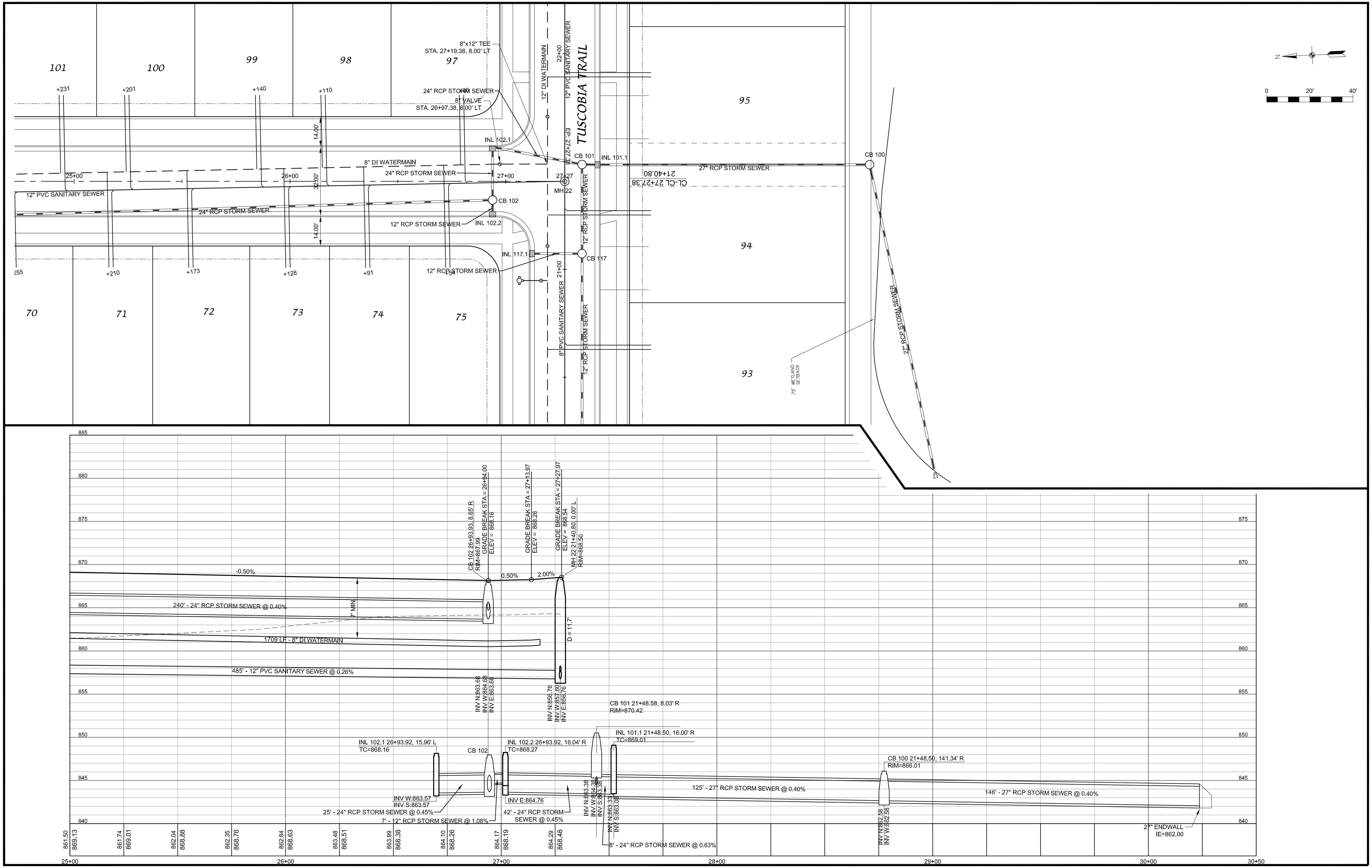
File: U:\User\2005132\Drawings\Prairie Wood.dwg Prairie Wood (2) Plotted: Aug 25, 2020 - 4:14pm

FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

PRAIRIE WOOD DRIVE
SHEET: 12 of 26



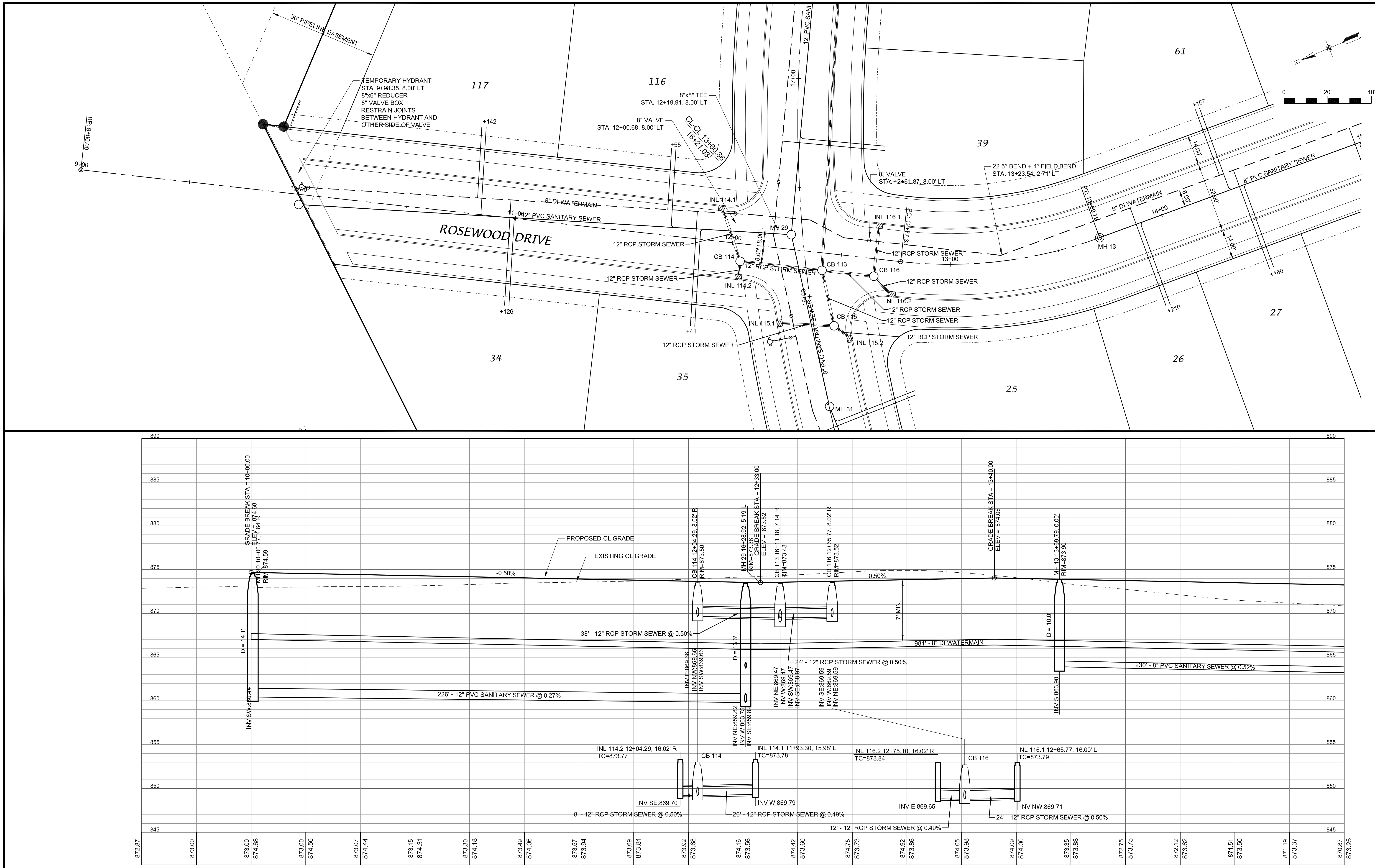

File: U:\User\2005132\Drawings\Prairie Wood.dwg Prairie Wood (3) Plotted: Aug 25, 2020 - 4:15pm

FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

PRAIRIE WOOD DRIVE
SHEET: 13 of 26



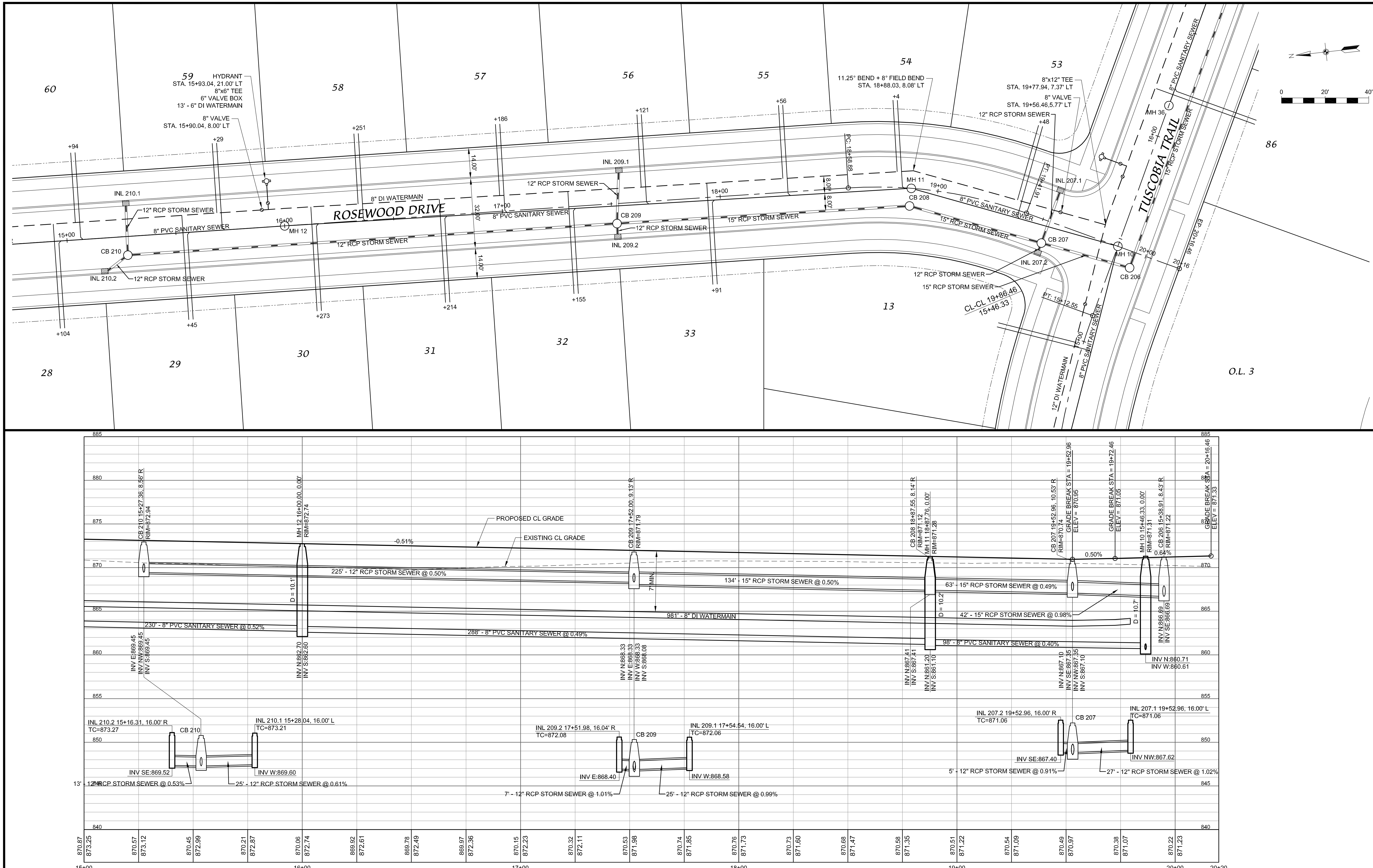

File: U:\User\2005132\Drawings\Rosewood Drive.dwg Rosewood Plotted: Aug 25, 2020 - 4:30pm

FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

ROSEWOOD DRIVE
SHEET: 14 of 26



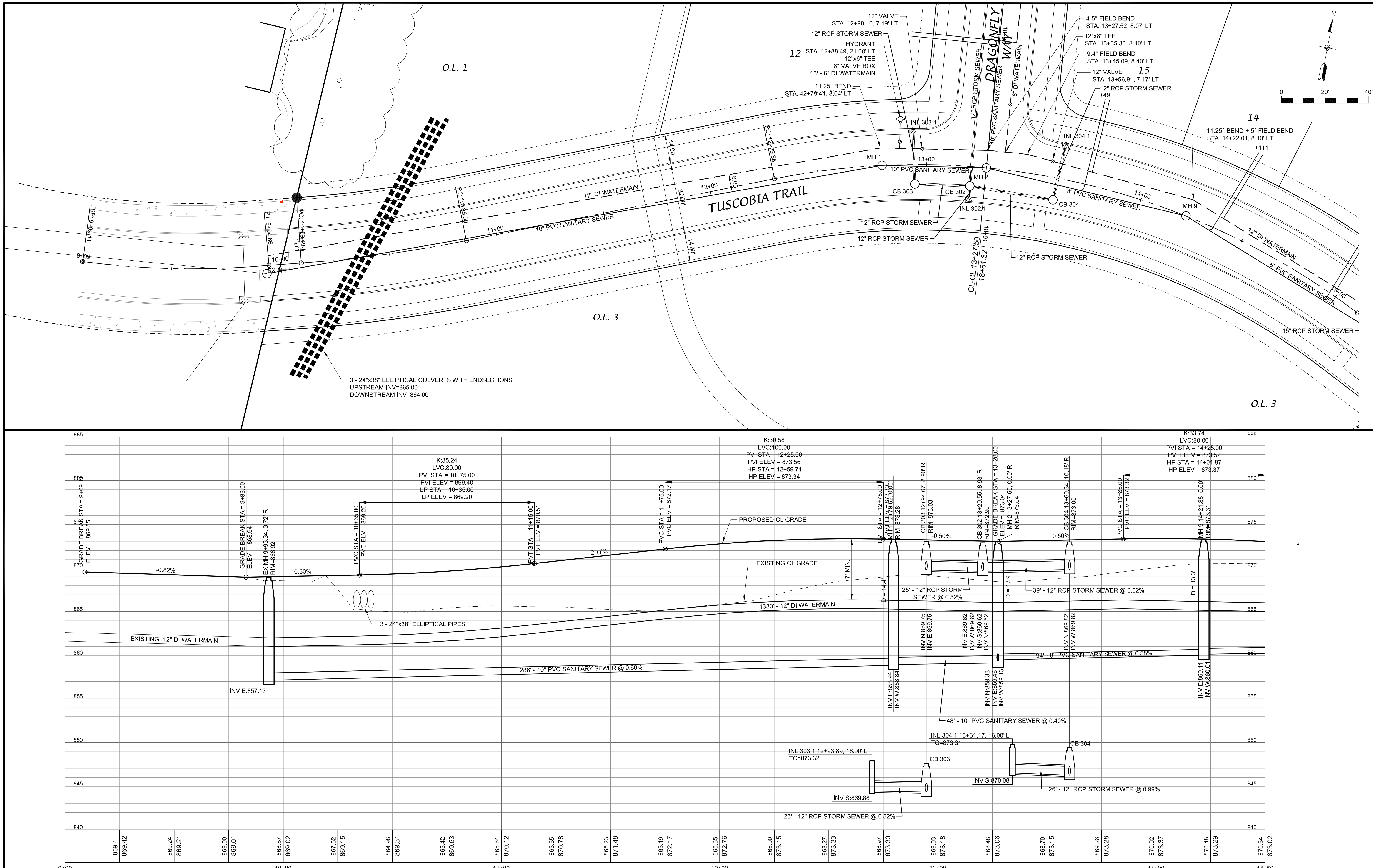

File: U:\User\2005132\Drawings\Rosewood Drive.dwg Rosewood (1) Plotted: Aug 25, 2020 - 4:31pm

FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

ROSEWOOD DRIVE
SHEET: 15 of 26



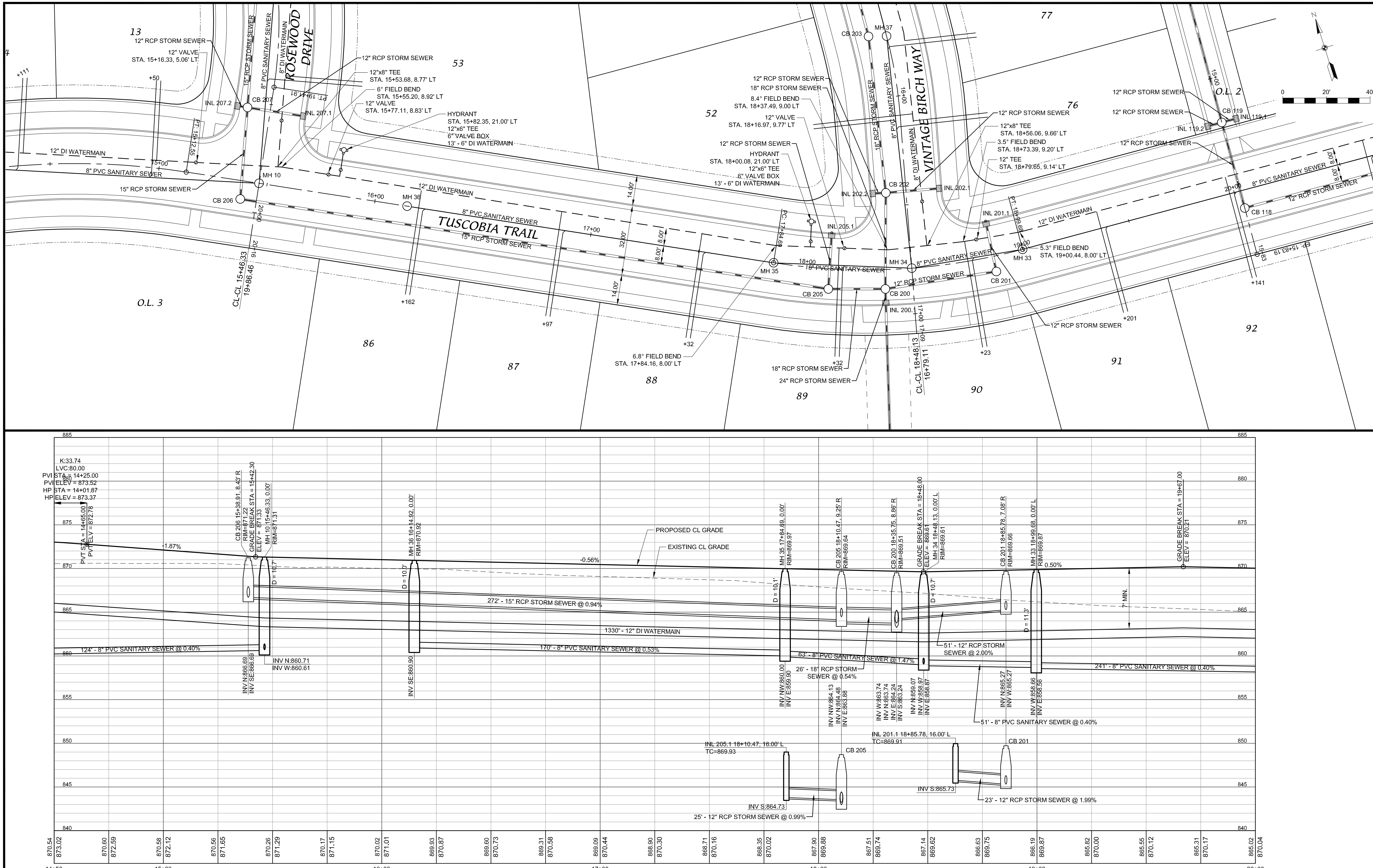

File: U:\User\2005132\Drawings\Tuscobia Trail.dwg Tuscobia Plotted: Aug 25, 2020 - 4:39pm

FN: 20-05-132 DATE: 08-25-20 REV:

ROSEWOOD FIELDS

TUSCOBIA TRAIL

SHEET: 16 of 26



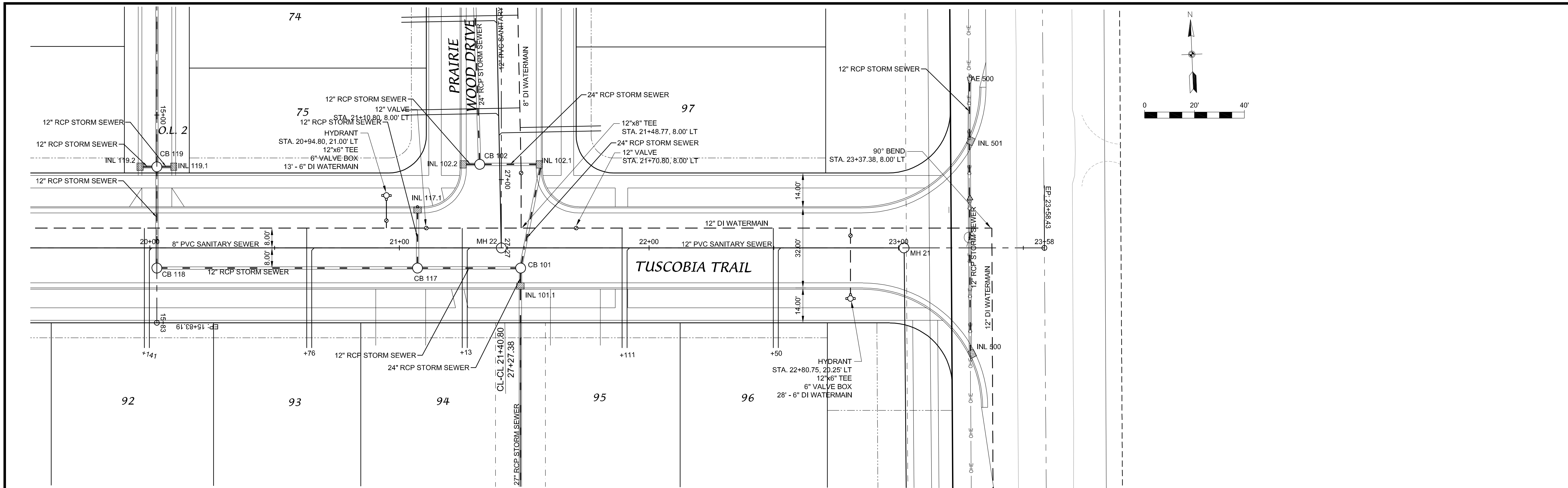

File: U:\User\2005132\Drawings\Tuscobia Trail.dwg Tuscobia (1) Plotted: Aug 25, 2020 - 4:41pm

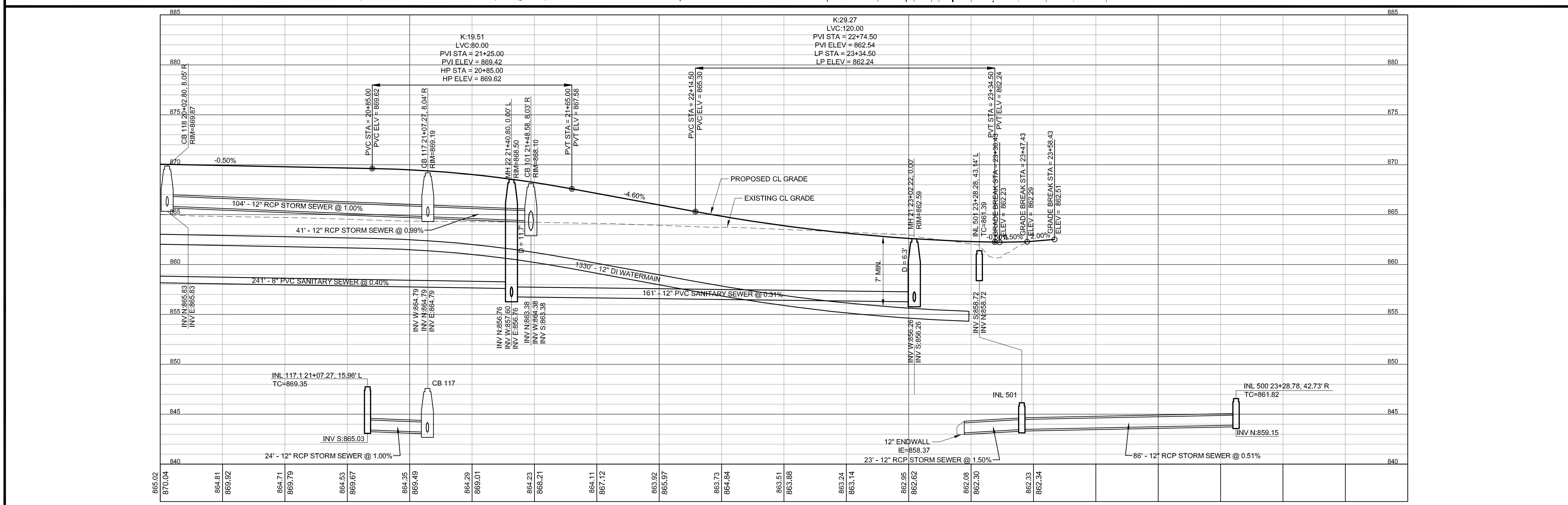
FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

TUSCOBIA TRAIL
SHEET: 17 of 26





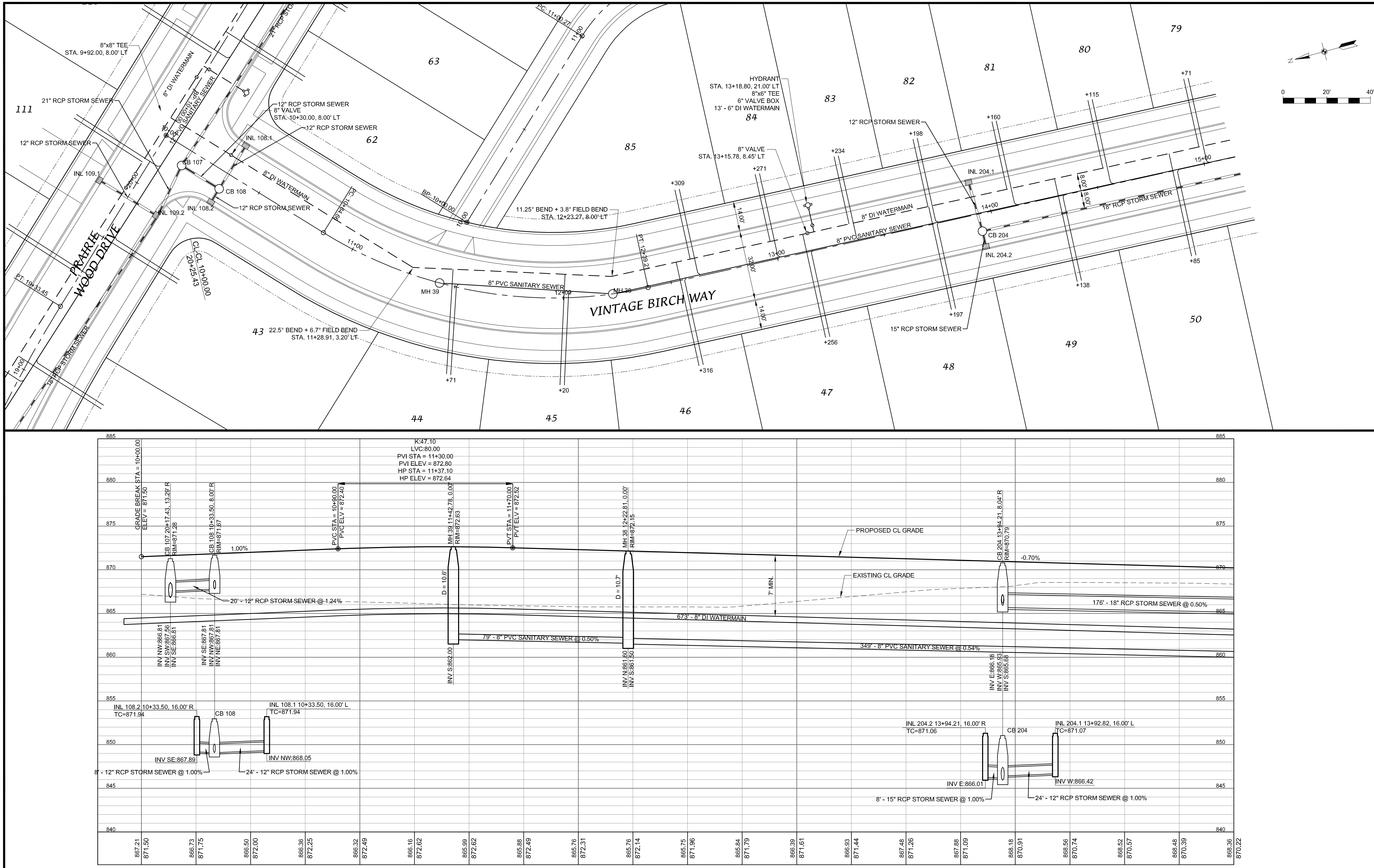
File: U:\User\2005132\Drawings\Tuscobia Trail.dwg Tuscobia (2) Plotted: Aug 25, 2020 - 4:45pm

FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

TUSCOBIA TRAIL
SHEET: 18 of 26



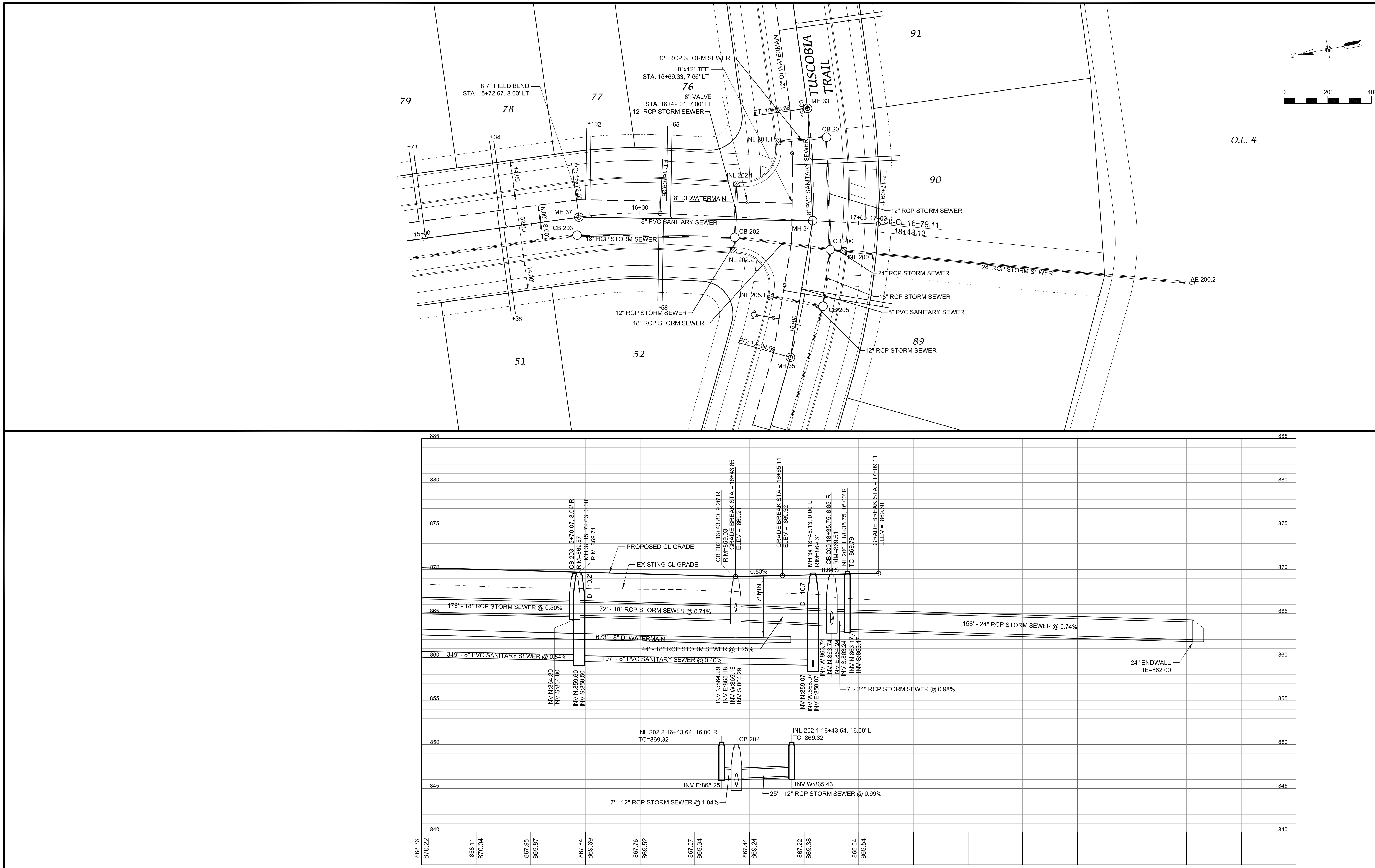

File: U:\User\2005132\Drawings\Vintage Birch Way.dwg Vintage Birch Plotted: Aug 25, 2020 - 5:07pm

FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

VINTAGE BIRCH WAY
SHEET: 19 of 26





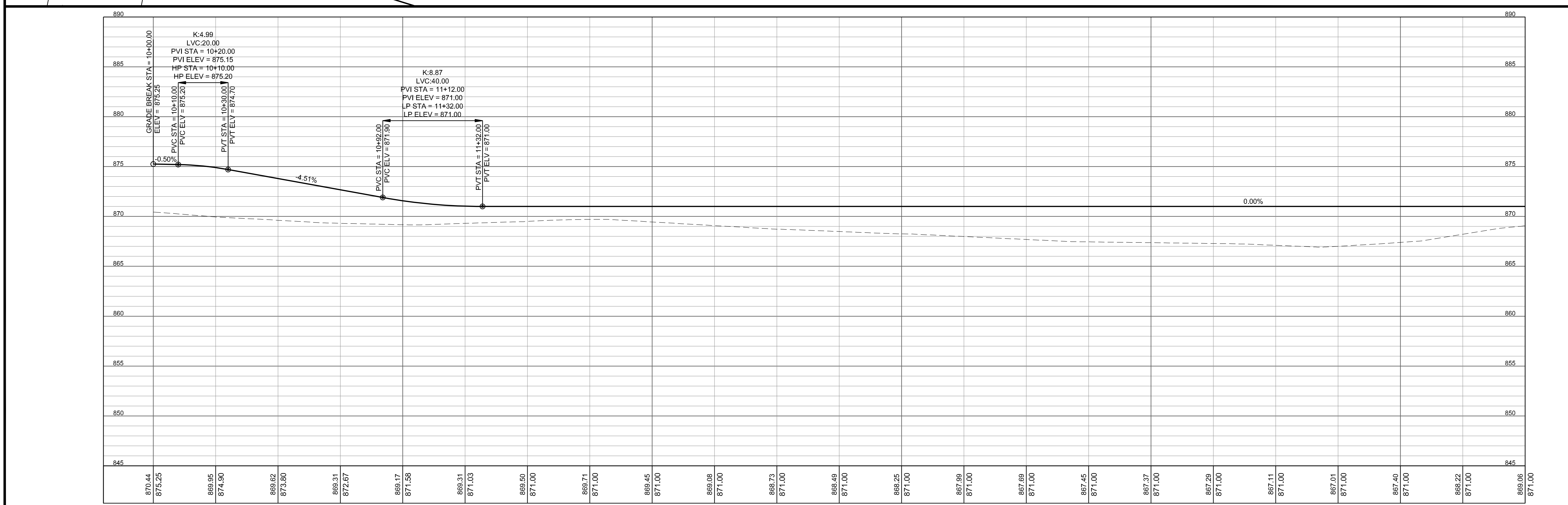

FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

VINTAGE BIRCH WAY

SHEET: 20 of 26

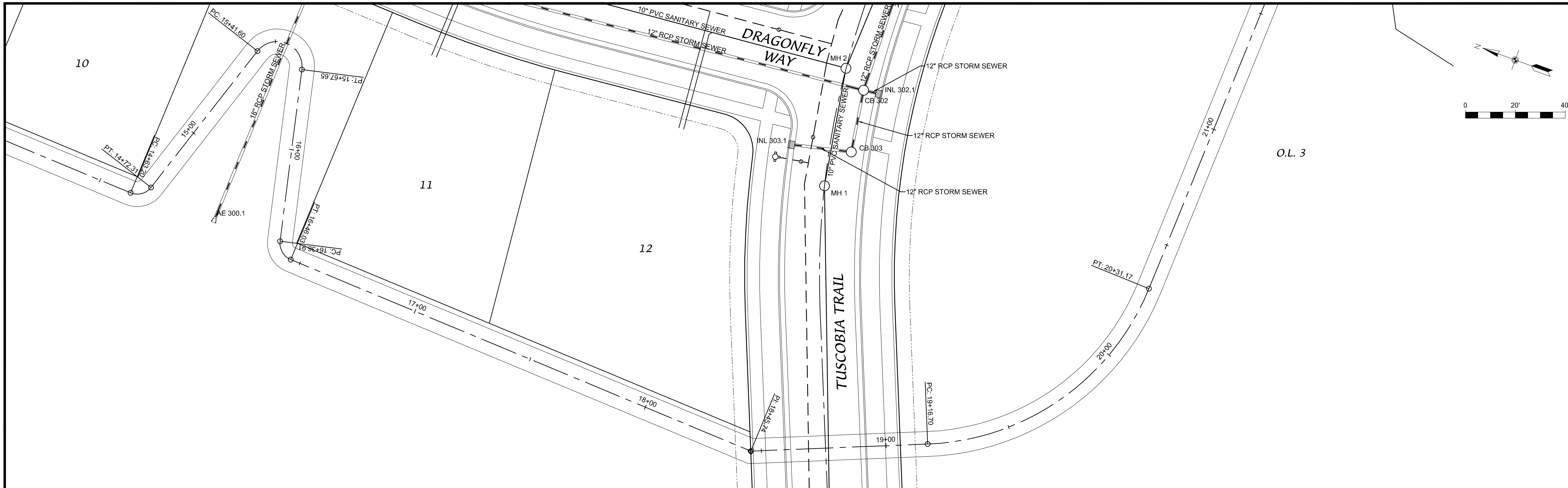



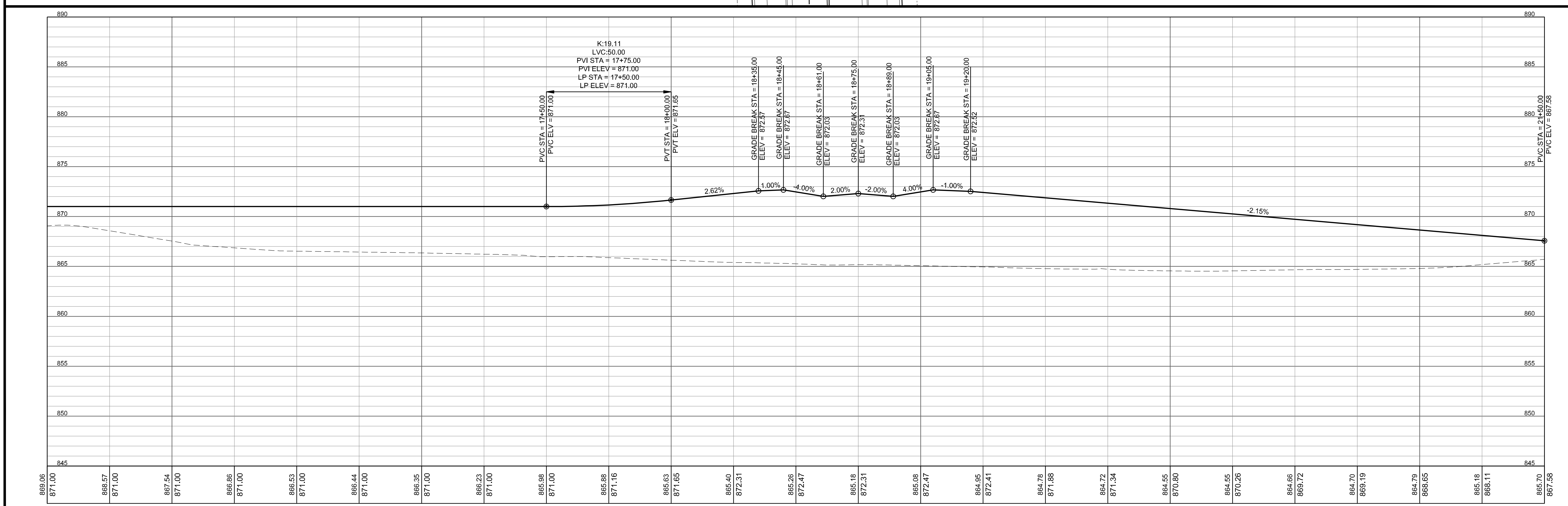

File: U:\User\2005132\Drawings\Multi Use Path.dwg Multi Use Path Plotted: Aug 25, 2020 - 5:09pm

FN: 20-05-132 DATE: 08-25-20 REV:

ROSEWOOD FIELDS

MULTI USE PATH
SHEET: 21 of 26





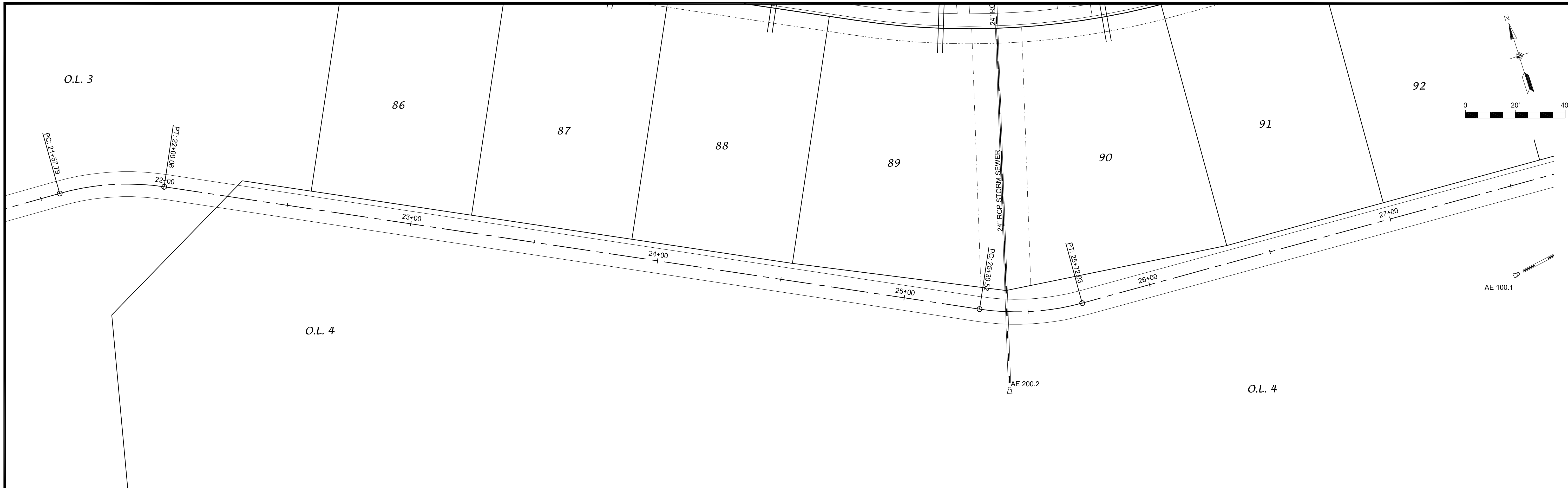

File: U:\User\2005132\Drawings\Multi Use Path.dwg Multi Use Path (1) Plotted: Aug 25, 2020 - 5:10pm

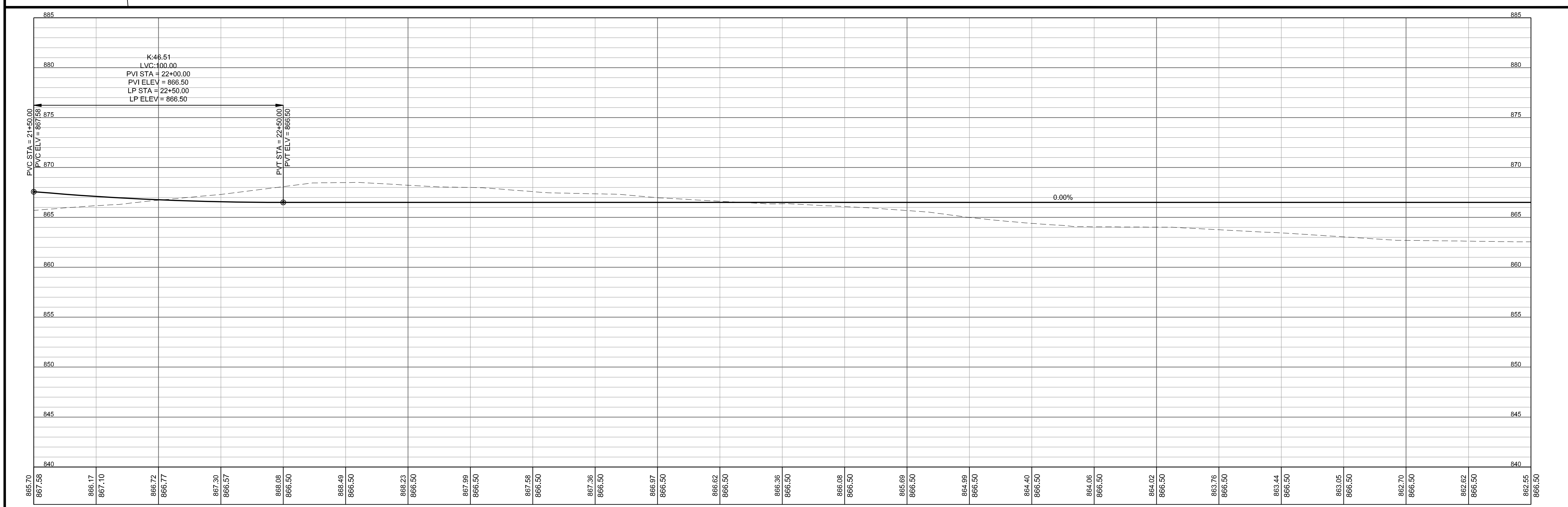
FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

MULTI USE PATH
SHEET: 22 of 26



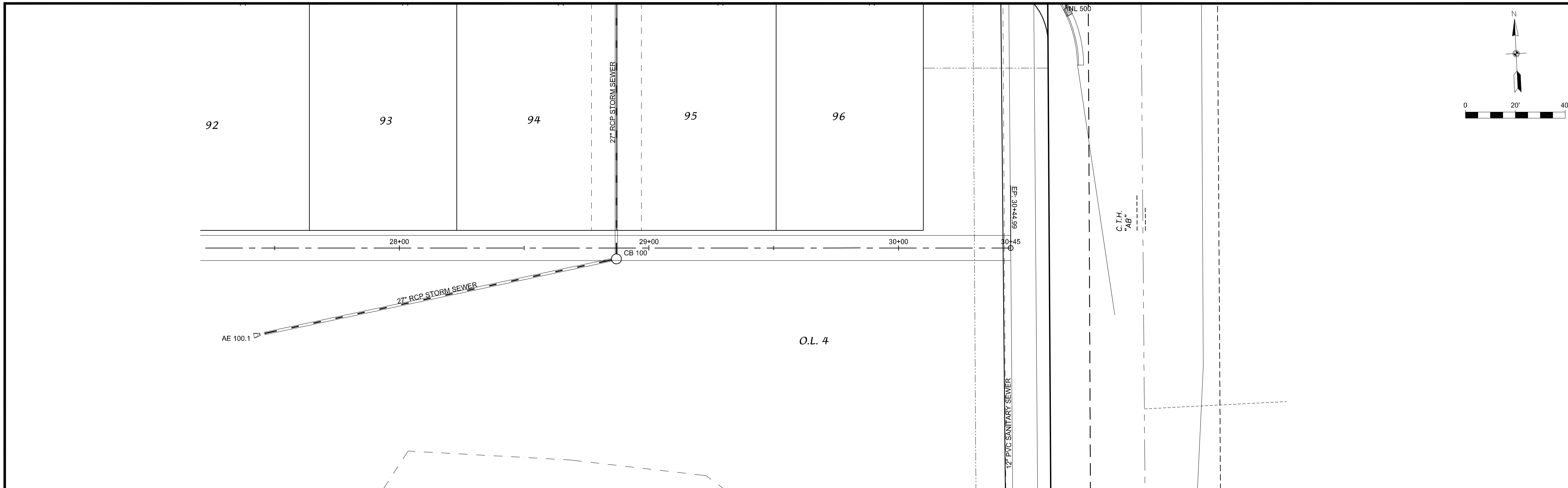

File: U:\User\2005132\Drawings\Multi Use Path.dwg Multi Use Path (2) Plotted: Aug 25, 2020 - 5:10pm

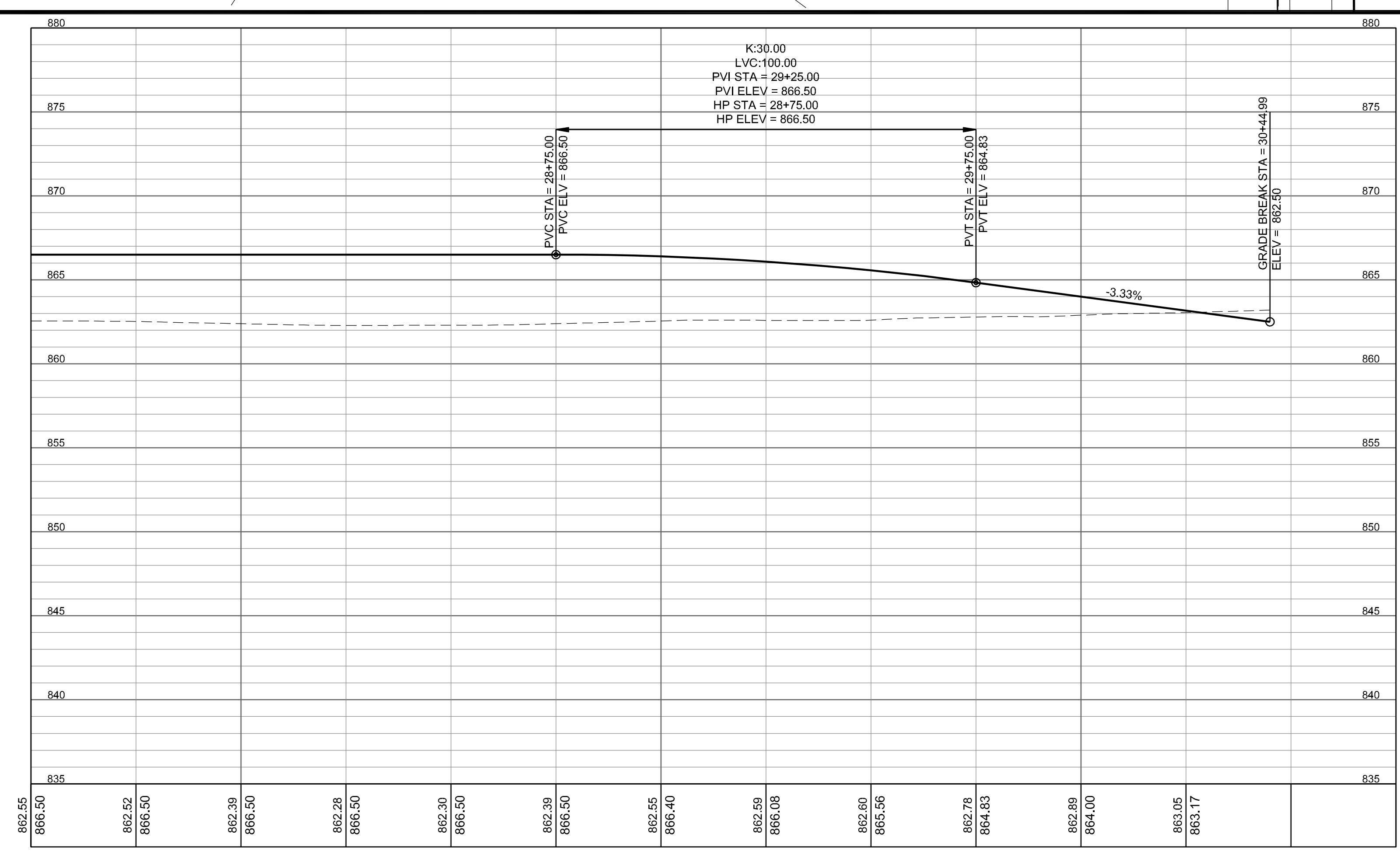
FN: 20-05-132

DATE: 08-25-20
REV:

ROSEWOOD FIELDS

MULTI USE PATH
SHEET: 23 of 26



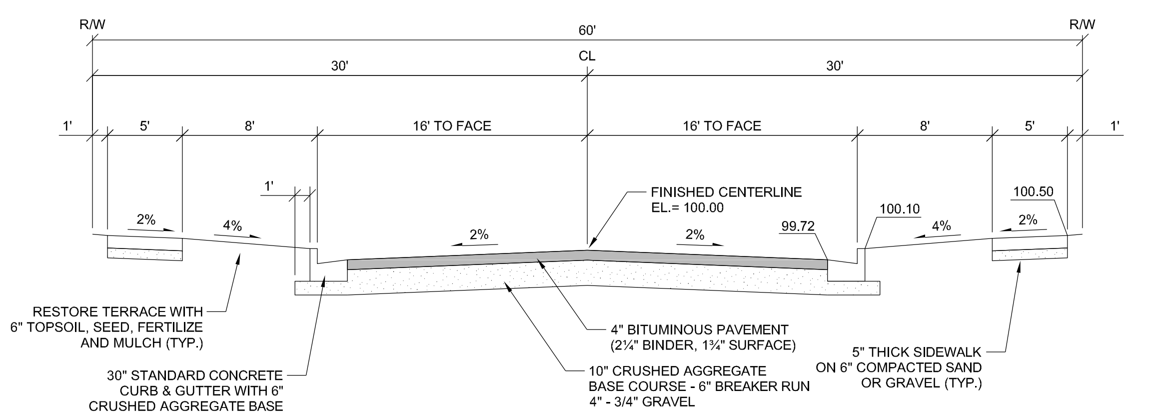

File: U:\User\2005132\Drawings\Multi Use Path.dwg Multi Use Path (3) Plotted: Aug 25, 2020 - 5:12pm

FN: 20-05-132

DATE: 08-25-20
REV:

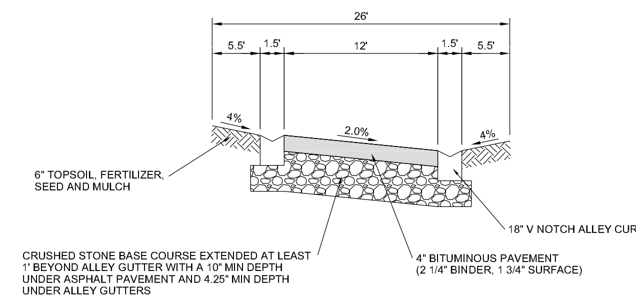
ROSEWOOD FIELDS

MULTI USE PATH
SHEET: 24 of 26

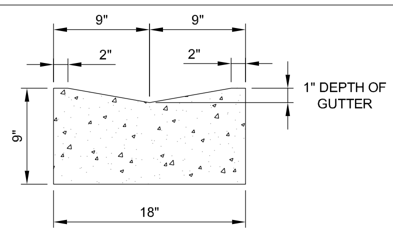



## TYPICAL FINISHED SECTION - 60' R.O.W.

PRAIRIE WOOD DRIVE, ROSEWOOD DRIVE, TUSCOBIA TRAIL, DRAGONFLY WAY, VINTAGE BIRCH WAY

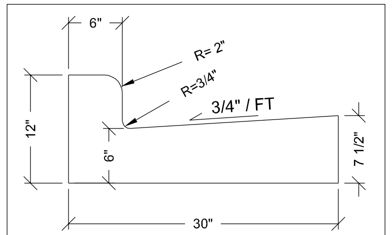



## TYPICAL ALLEY SECTION



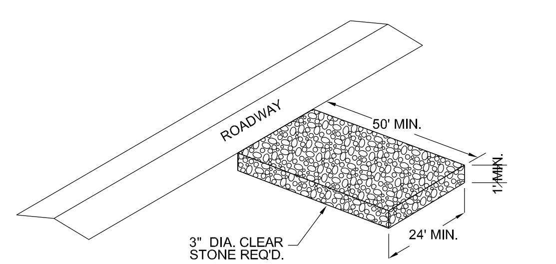

## 18" V NOTCH ALLEY CURB

NOT TO SCALE



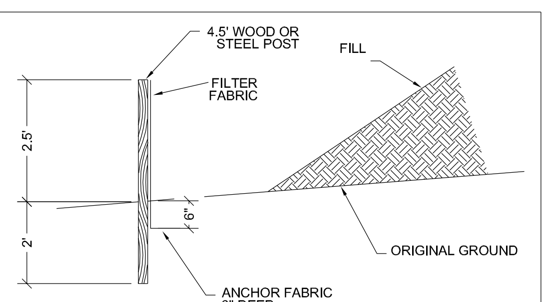

## 30" CURB & GUTTER

NOT TO SCALE



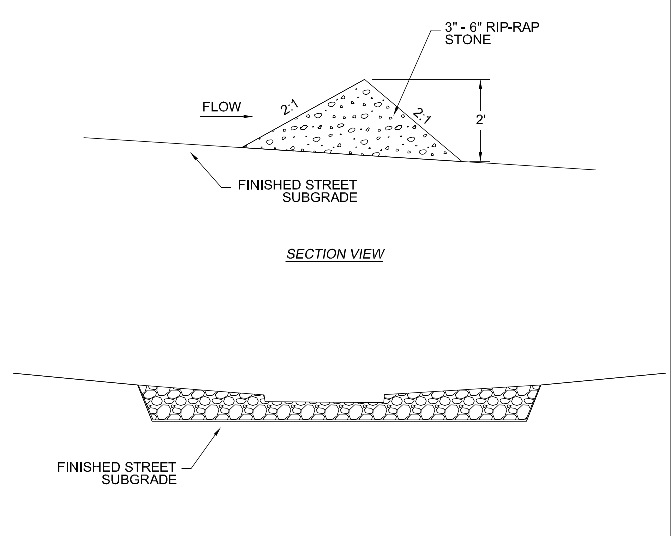

## STONE TRACKING PAD DETAIL

NOT TO SCALE




## SILT FENCE DETAIL

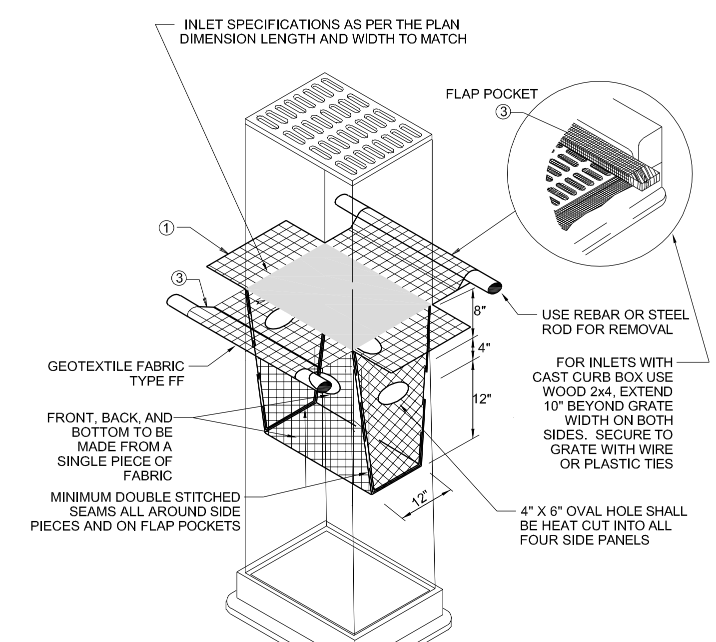
NOT TO SCALE




NOTE:
1) VELOCITY CHECK SHALL BE CLEANED OUT AND ALL PLUGGED ROCK REMOVED AND REPLACED AS NEEDED WHEN CHECK IS 50% FULL OF SEDIMENT.

## VELOCITY CHECK

NOT TO SCALE

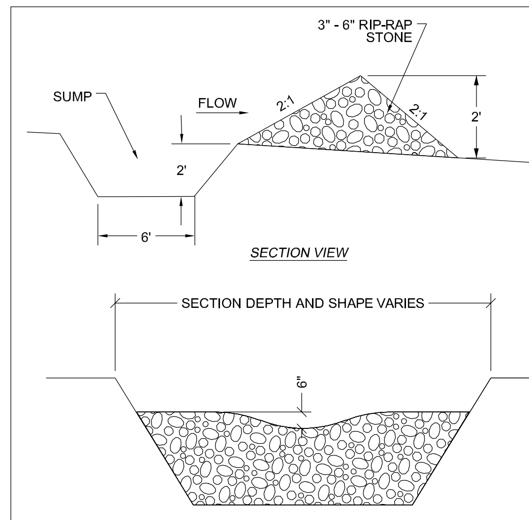



NOTES:

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.

## TYPE D INLET PROTECTION

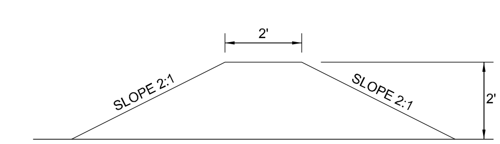
NOT TO SCALE




NOTES:
1) SUMP SHALL BE CLEANED OUT AND ALL PLUGGED ROCK REMOVED AND REPLACED AS NEEDED WHEN SUMP IS 50% FULL OF SEDIMENT.

## STONE WEEPER

NOT TO SCALE




## EARTHEN BERM

NOT TO SCALE


D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT


DETAILS

ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

DATE: 08-25-20
REVISED:

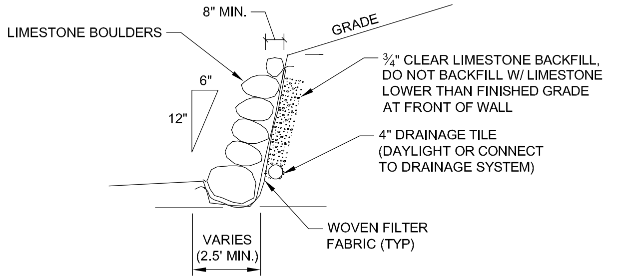
DRAWN BY: KWB

FN: 20-05-132

Sheet Number:
25 of 26

File: U:\User\2005132\Drawings\Details.dwg Details Plotted: Aug 25, 2020 - 4:48pm

NOTES:
1.) NOTE FILTER FABRIC TO BE PLACED BEHIND THE WALL UNLESS OTHERWISE SPECIFIED
2.) MAXIMUM HEIGHT OF SINGLE COURSE OF WALL TO BE 7 FEET. IF RETAINING WALLS GREATER THAN 7' HIGH ARE NEEDED, MUTIPLE COURSES OF WALL WILL BE USED WITH A 6' WIDE BENCH BETWEEN COURSES.



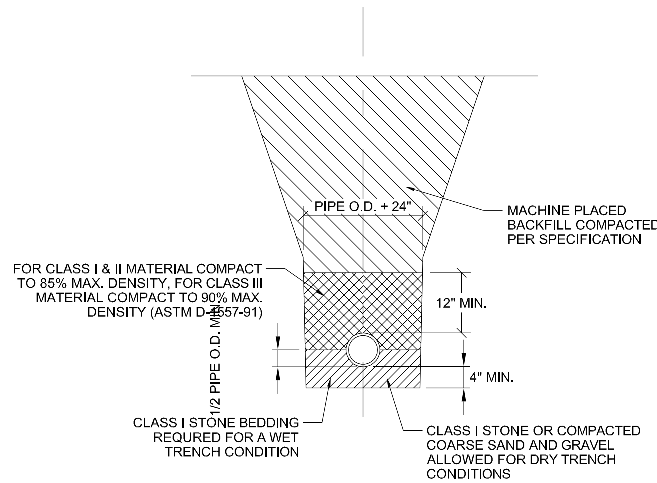

## RETAINING WALL DETAIL
NOT TO SCALE

NOTES:

CLASS I MATERIAL: ANGULAR ¼" TO ¾" GRADED STONE

CLASS II MATERIAL: COARSE SANDS AND GRAVELS

CLASS III MATERIAL: FINE SAND AND CLAYEY GRAVELS, INCLUDING FINE SANDS, SAND-CLAY MIXTURES AND GRAVEL-CLAY MIXTURES



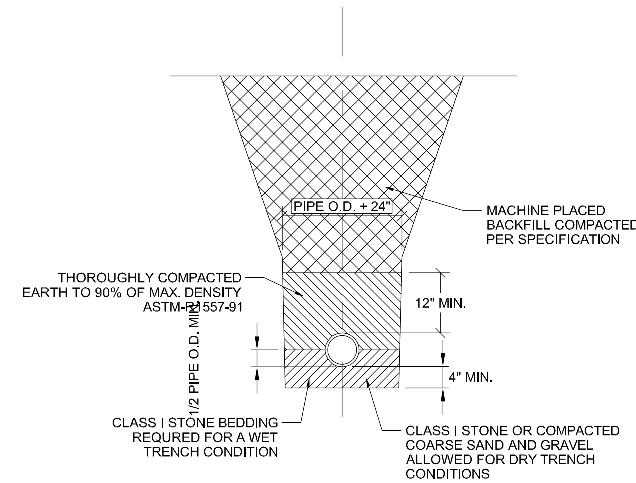

## CLASS I, II & III BEDDING DETAIL
FLEXIBLE PIPE - PVC, ABS, HDPE. - ASTM D-3321
NOT TO SCALE

NOTES:

CLASS I MATERIAL: ANGULAR ¼" TO ¾" GRADED STONE

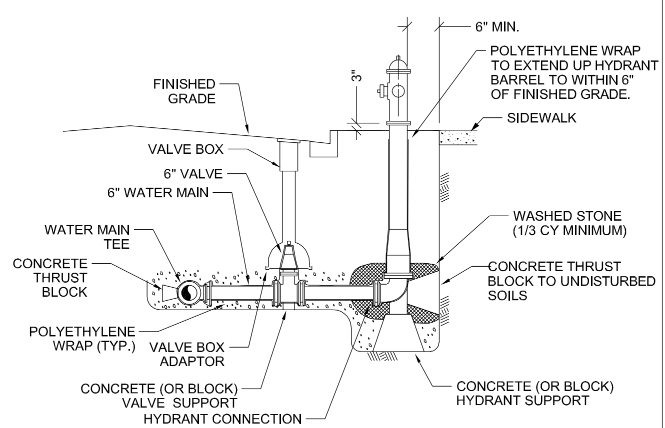
CLASS II MATERIAL: COARSE SANDS AND GRAVELS

CLASS III MATERIAL: FINE SAND AND CLAYEY GRAVELS, INCLUDING FINE SANDS, SAND-CLAY MIXTURES AND GRAVEL-CLAY MIXTURES

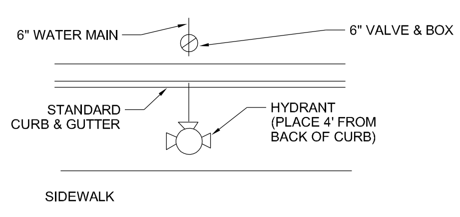



## CLASS 'C' BEDDING DETAIL
RIGID WALL PIPE - RCP, D.I., ETC. - ASTM C-12
NOT TO SCALE

NOTES:
1. HYDRANT SHALL BE WATEROUS PACER MODEL WB-67 OR MUELLER SUPER CENTURIAN A423.
2. HYDRANT BURY TO BE 7'-0".
3. HYDRANT TO BE LOCATED 4' FROM BACK OF CURB.
4. ALL JOINTS BETWEEN THE HYDRANT CONNECTION & WATER MAIN TEE TO BE RESTRAINED WITH MEGA-LUGS OR LOCKING GASKETS. HYDRANT CONNECTION TO BE MEGA LUGGED TO WATER MAIN.

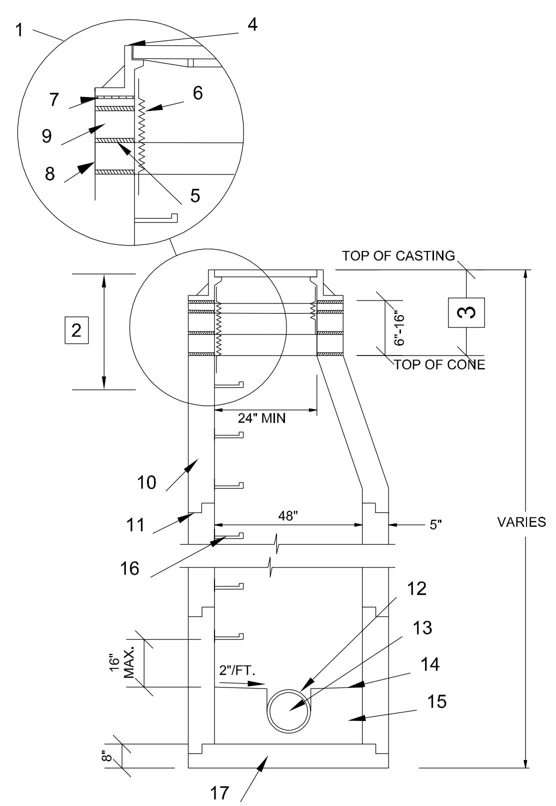



*PROFILE VIEW*




*PLAN VIEW*

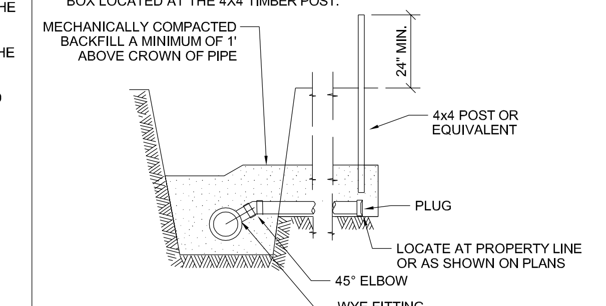
## HYDRANT SETTING
NOT TO SCALE




1. WHEN MANHOLES ARE LOCATED UNDER PAVEMENTS, THE TOP OF THE MANHOLE FRAME SHALL BE ADJUSTED TO WITHIN ¼" BELOW THE PAVEMENT GRADE. THE FINAL ADJUSTMENT SHALL BE MADE BY SHIMMING THE FRAME TO GRADE AND SETTING THE FRAME IN THE BED OF MORTAR.
2. TOP MANHOLE STEP SHALL BE PLACED IN THE CONE AT A MAXIMUM OF 28" FROM THE TOP OF THE FRAME.
3. ADJUST AS NECESSARY TO MEET PLAN GRADE, MAXIMUM HEIGHT OF CHIMNEY AND CASTING SHALL BE 24" AND THE MINIMUM HEIGHT SHALL BE 12" (A MINIMUM OF ONE ADJUSTMENT RING SHALL BE USED)
4. MANHOLE FRAME & LID - SEE SPEC.
5. PRE-MOLDED BUTYL BASE SEALANT PLACED CONTINUOUSLY AROUND ENTIRE PERIMETER OF THE RINGS REQUIRED COMMENCING BETWEEN EACH RING AND TERMINATING BETWEEN BOTTOM RING AND TOP OF CONE.
6. INTERNAL FRAME CHIMNEY SEAL.
7. SET MANHOLE FRAME WITH MORTAR.
8. COVER OUTSIDE OF CHIMNEY FROM FRAME TO CONE WITH TROWEL GRADE BUTYL BASED SEALANT. OVERLAP CONE SECTION A MIN. OF 4".
9. CONCRETE ADJUSTMENT RING SHALL HAVE A MAXIMUM THICKNESS OF 6" AND A MINIMUM THICKNESS OF 2", RINGS SHALL BE SUPPLIED IN ½" INCREMENTS (THICKNESS) TO ALLOW ADJUSTMENT OF THE FRAME TO WITHIN ¼" OF PLAN GRADE. ADJUSTMENT RINGS SHALL BE REINFORCED AS REQUIRED IN ASTM C-478. THE OUTSIDE DIAMETER OF RINGS SHALL BE UNIFORM AND EQUAL TO OR LESS THAN THE TOP OF THE CONE. THE WALL THICKNESS OF THE RINGS SHALL BE EQUAL THE WALL THICKNESS OF THE MANHOLE SECTIONS. WHEN ASSEMBLED, THE TOP OF THE CONE, THE RINGS, AND THE FRAME SHALL BE ALIGNED VERTICALLY WITH NO PROTRUSIONS.
10. PRECAST CONCRETE MANHOLE SECTIONS, TYPICAL, CONFORMING TO ASTM C-478.
11. WATERTIGHT JOINT, TYPICAL, WITH GASKETS CONFORMING TO C-443, OR JOINTS SEALED WITH MASTIC JOINTING COMPOUND.
12. PRESS SEAL GASKET, KOR-N-SEAL GASKET OR EQUAL.
13. SANITARY SEWER-SIZE, NUMBER OF CONNECTIONS TO MANHOLE, ORIENTATION, AND ELEVATION SHOWN ON PLAN.
14. BENCH SLOPE 2 IN/FT.
15. STANDARD MANHOLE INVERT TO CROWN OF THE PIPE, SEE FILE NO. 13 OF "STANDARD SPECIFICATIONS".
16. MANHOLE STEP, TYPICAL, SEE FILE NO. 15 "STANDARD SPECIFICATIONS".
17. PRECAST BASE.

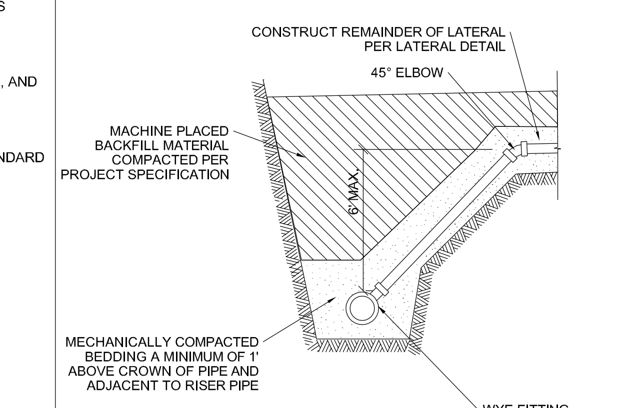
## SANITARY SEWER MANHOLE
NOT TO SCALE

NOTES:
1. SEWER LATERAL TO BE PLACE AT 1/8 TO ) INCH PER FOOT SLOPE.
2. SEWER LATERAL MATERIAL TO BE THE SAME AS THE MAIN LINE MATERIAL.
3. RISERS ARE REQUIRED WHERE SEWER LATERAL IS GREATER THAN 10 FEET DEEP.
4. TRACE WIRE IS REQUIRED. TRACE WIRE TO TERMINATE IN TRACE WIRE TERMINAL BOX LOCATED AT THE 4X4 TIMBER POST.




## SANITARY SEWER LATERAL
NOT TO SCALE

NOTES:
1. SEWER LATERAL WYE TO BE PLACED AT A 45° ANGLE FROM HORIZONTAL.
2. RISER TO BE CONSTRUCTED AT 45° ANGLE FROM HORIZONTAL TO THE PROPOSED ELEVATION OF THE SEWER LATERAL.
3. SEWER RISER MATERIAL TO BE THE SAME AS THE MAIN LINE MATERIAL.
4. TRACE WIRE IS REQUIRED. TRACE WIRE TO TERMINATE IN TRACE WIRE TERMINAL BOX LOCATED AT TEH 4X4 TIMBER POST.




## SANITARY LATERAL RISER
NOT TO SCALE


D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT


ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

DETAILS

DATE: 08-25-20
REVISED:

DRAWN BY: KWB

FN: 20-05-132

Sheet Number:
26 of 26

File: U:\User\2005132\Drawings\Details.dwg Details 1 Plotted: Aug 25, 2020 - 4:48pm

# ROSEWOOD FIELDS
# VILLAGE OF MCFARLAND
# COUNTY HWY AB
# DANE COUNTY, WISCONSIN

# STORM WATER MANAGEMENT REPORT

**OWNER**

**VH Rosewood Fields, LLC**
**c/o Chris Ehlers**
**6801 South Towne Drive**
**Madison, WI 53713**

**August 24, 2020**

**PREPARED BY**
**D'Onofrio, Kottke & Associates, Inc.**
**7530 Westward Way**
**Madison, Wisconsin 53717**
**608.833.7530**

**FN: 19-04-113**

# TABLE OF CONTENTS



<u>EXHIBITS</u>



<u>APPENDICES</u>

# INTRODUCTION

The intent of this report is to provide details on how the proposed "Rosewood Fields" residential plat will be developed so that it is constructed in accordance with applicable storm water management standards.

The proposed development is approximately a 36 acre residential plat located in the Village of McFarland. The site is located to the east of the Park View Estates plat, north of the Wisconsin and Southern railroad tracks and west of County Hwy AB in the NE ¼ of the SE ¼ of Section 2 Township 06N, Range 10E. More specifically parcel number 0610-024-8070-0. A project location map can be found in Exhibit #1.

The existing layout of the site consists mostly of agricultural tilled land with surface water generally draining to the south and east sides of the site and eventually out of the plat. The drainage is split by a ridge running through the middle of the site from the north to south. In developed conditions the plat will create single family lots, 2-stormwater outlots and open space/parkland. The runoff from the plat will mostly be routed to wet detention/infiltration basin systems for stormwater treatment prior to leaving the site. The soil conditions on site consist of hydrologic soil group type B soils, with some type C soils. A site soils map can be found in Exhibit #2.

The proposed future improvements for this plat require land disturbing activity in excess of one acre and the future cumulative addition of 20,000 square feet of impervious surface area. Therefore, according to the Village of McFarland and State of Wisconsin ordinances, the site requires storm water management approvals and permits.

# STANDARDS & RESULTS

The proposed development requires the following storm water management performance standards.

**Sediment Control**

**Standard:** Reduce, to the maximum extent practical, total suspended solids load leaving the site by eighty percent (80%) based on the average annual rainfall.

**Design Results:** Sediment from the site will be reduced by 80% by routing the site runoff through two wet detention basin/infiltration basin systems prior to leaving the site. A minimum of 60% of the sediment will be removed by the wet detention basins prior to entering the infiltration basins. WinSLAMM was used to model the sediment load reduction. The basin system was sized to compensate for any stormwater that drains directly offsite. See appendix B for sediment reduction calculations.

**Temperature Control**

**Standard:** For development of sites within thermally sensitive areas, provisions and practices to reduce the temperature of the storm water runoff shall be included.

**Design Results:** The proposed site does not fall within a defined thermally sensitive area.

**Runoff Rate Control**

**Standard:** For new developments, storm water management practices shall be designed and implemented to maintain post-development peak runoff discharge rates at predevelopment rates for the 1, 2, 10, 25 and 100 year-24 hour design storm events.

**Design Results:** The proposed detention basin system was designed to maintain the development's existing peak runoff rates for the 1, 2, 10, 25 and 100 year- 24 hour storm events. The peak flow comparison chart for the site can be found in the stormwater management measures section of this report and the HydroCAD output can be found within Appendix D. The soil curve number for the post development lawn areas has been dropped by a soil class to 71.

The existing and proposed runoff curve numbers used for this development are as follows:

| Description | CN |
|---|---|
| Existing Type B Soil | 58 |
| Existing Type C Soil | 71 |
| Impervious Area | 98 |
| Proposed 60% Impervious Residential | 87 |
| Proposed 70% Impervious Residential | 90 |
| Proposed Park Area/ Assumed 10% Impervious | 74 |
| Proposed 10% Impervious Lightly Disturbed Areas | 62 |

Along with analyzing the plat drainage information, the offsite stormwater draining through and around the site was also included in the model.

**Infiltration**

**Standard**: For new developments, design practices to infiltrate sufficient runoff volume so the post-development infiltration volume shall be at least 90% of the predevelopment infiltration volume.

**Design Results:** The proposed development was designed to meet the 90% stayon requirement for the plat through two infiltration basins. The infiltration basins were sized using WinSLAMM modeling software. A minimum of 60% sediment reduction will occur in the proposed wet detention basin cells prior to entering the designed infiltration basins. The basin system was sized to compensate for any stormwater that drains directly offsite. The infiltration design calculations can be found in Appendix C.

# STORM WATER MANAGEMENT MEASURES

The proposed plat was modeled as five drainage areas in developed conditions and as two drainage areas in pre-developed conditions. The stormwater from the site will be treated by routing runoff to two wet detention/infiltration basin systems located at the west and southeast sides of the plat. Peak flow, sediment reduction, and stayon requirements will be met for the entire plat with this system.

HydroCAD Stormwater Modeling software has been used to analyze the stormwater runoff characteristics for the development. HydroCAD uses the TR-55 methodology for determining peak discharge rates. The model output shows the runoff leaving the site in existing and proposed conditions. The site was designed to utilize two combination wet detention basin and infiltration basin systems prior to leaving the site in proposed conditions. In these systems, the wet detention chamber in each basin will limit flow into the infiltration basin chamber for the 1yr-24hr storm event to remove sediment before entering the infiltration basin. During larger storms, the two chambers in the basin systems will act as one basin to limit peak flow from the site (see basin details in Appendix A).The detention and infiltration basins were modeled dynamically to better represent the elevations of the two chambers working together. The peak flow results from the stormwater modeling and basin design are shown in the chart on the next page. The chart shows the proposed results from each individual drainage area along with a comparison of the overall existing and proposed peak flows leaving at the edge of the site. The detention basin system will maintain the combined existing peak runoff rates leaving the plat on south, east and overall for the 1, 2, 10, 25 and 100 year- 24 hour storm events.

The offsite west, northeast and north drainage areas were also included in this model to show how the offsite water will be routed through the site. A bypass channel was sized to route this offsite water around the west side of the site, through three culverts under Tuscobia Trail and eventually to the south where it flows in existing conditions. The west drainage was analyzed to show that stormwater elevation draining through the bypass channel and across Tuscobia Trail will be 2' lower than the existing window sill openings along the western properties for a 100 year event. See exhibit 9 for cross-section information for this area.

Infiltration modeling for the site was calculated using WinSLAMM software and meets the 90% predevelopment standard per the ordinance. The infiltration basins will be implemented when at a minimum 75% of the plat area draining to the basin is complete. WinSLAMM was also used to perform the sediment reduction calculations for the proposed basin system. Appendix B contains the calculation results. The stormwater management system will provide 80% sediment removal for the plat.

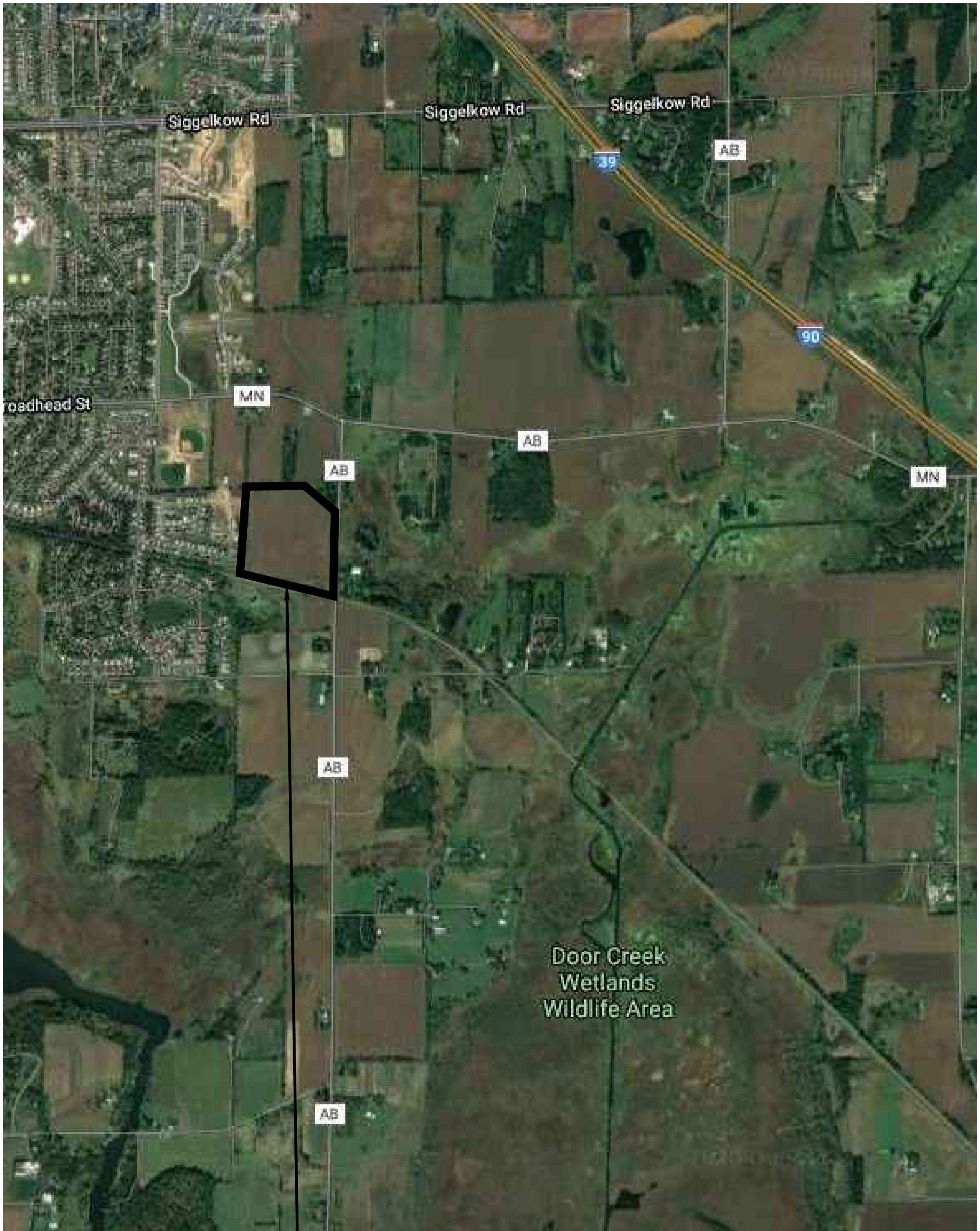
# PEAK FLOW COMPARISION CHART

| 24-HR STORM EVENT (PEAK FLOW IN CFS)-PEAK FLOW COMPARISION | | | | | |
|---|---|---|---|---|---|
| | 1YR | 2YR | 10YR | 25YR | 100YR |
| TOTAL EXISTING COMBINED FLOW THOUGH SITE | 4.35 | 9.71 | 45.73 | 83.98 | 166.65 |
| TOTAL PROPOSED COMBINED FLOW WITH BASIN TREATMENT | 2.78 | 6.08 | 32.03 | 64.48 | 127.06 |
| TOTAL PROPOSED COMBINED FLOW WITHOUT DETENTION | 47.07 | 58.98 | 109.30 | 153.43 | 241.31 |
| | | | | | |
| TOTAL EXISTING FLOW LEAVING SOUTH SIDE OF SITE | 3.09 | 7.09 | 34.57 | 64.14 | 128.47 |
| TOTAL PROPOSED/TREATED FLOW LEAVING SOUTH SIDE OF SITE | 2.29 | 5.10 | 28.85 | 58.68 | 116.15 |
| | | | | | |
| TOTAL EXISTING FLOW LEAVING EAST SIDE OF SITE | 1.53 | 3.22 | 13.70 | 24.07 | 45.72 |
| TOTAL PROPOSED FLOW LEAVING EAST SIDE OF SITE | 1.07 | 2.09 | 7.66 | 12.86 | 23.52 |
| | | | | | |
| OFFSITE FLOWS | | | | | |
| EXISTING WEST OFFSITE DRAINAGE | 0.40 | 0.97 | 5.42 | 10.27 | 20.81 |
| EXISTING NW OFFSITE DRAINAGE | 1.34 | 3.20 | 16.34 | 30.61 | 61.96 |
| EXISTING N OFFSITE DRAINAGE | 0.59 | 1.00 | 2.96 | 4.70 | 8.21 |
| EXISTING NE OFFSITE DRAINAGE | 0.86 | 1.72 | 6.22 | 10.39 | 18.89 |
| FLOW TO WEST BYPASS CHANNEL | 1.68 | 4.02 | 20.37 | 38.23 | 77.65 |
| | | | | | |
| PRO FLOWS DIRECTLY OFFSITE | | | | | |
| PRO SOUTH DIRECTLY OFFSITE | 0.66 | 1.22 | 4.24 | 7.11 | 13.05 |
| PRO EAST DIRECTLY OFFSITE | 0.29 | 0.55 | 1.94 | 3.24 | 5.94 |
| | | | | | |
| WEST WET DETENTION BASIN: OUTLET = 867.0, TOP OF BERM = 871.0 | | | | | |
| PROPOSED FLOW INTO DETENTION | 13.72 | 17.15 | 30.36 | 40.49 | 58.97 |
| ROUTED DETENTION | 0.44 | 0.50 | 4.06 | 11.60 | 22.34 |
| ELEVATION | 868.26 | 868.58 | 869.19 | 869.44 | 870.06 |
| WEST INFILTRATION BASIN: BOTTOM = 866.0, OUTLET = 867.0, TOP OF BERM = 871.0 | | | | | |
| ROUTED INFILTRATION OFFSITE | 0.41 | 0.47 | 2.84 | 6.11 | 9.14 |
| ELEVATION | 867.27 | 867.30 | 867.88 | 868.74 | 869.97 |
| TUSCOBIA TRAIL STREET CROSSING: STREET OVERFLOW LOW POINT= 869.55, 3-38"X24" CULVERTS INV = 865.00 | | | | | |
| ROUTED THROUGH STREET CROSSING | 1.77 | 4.10 | 20.61 | 42.99 | 85.20 |
| ELEVATION | 865.26 | 865.40 | 865.95 | 866.45 | 867.43 |
| EAST WET DETENTION BASIN: OUTLET = 862.0, TOP OF BERM = 866.0 | | | | | |
| PROPOSED FLOW INTO DETENTION | 33.13 | 40.59 | 67.99 | 88.35 | 124.79 |
| ROUTED DETENTION | 1.85 | 2.11 | 16.76 | 25.39 | 58.85 |
| ELEVATION | 863.55 | 863.90 | 864.50 | 864.97 | 865.63 |
| EAST INFILTRATION BASIN: BOTTOM = 861.0, OUTLET = 862.0, TOP OF BERM = 866.0 | | | | | |
| ROUTED INFILTRATION OFFSITE | 1.56 | 1.82 | 8.24 | 10.85 | 19.36 |
| ELEVATION | 862.54 | 862.60 | 863.64 | 864.35 | 865.58 |

# CONCLUSIONS

As the results indicate, the storm water management system for the proposed development meets the Village of McFarland and State of Wisconsin Ordinances. The peak flow, sediment control and infiltration requirements will be met for this site at the time of development.

# EXHIBITS




PROJECT LOCATION

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.

7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089

YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

LOCATION MAP

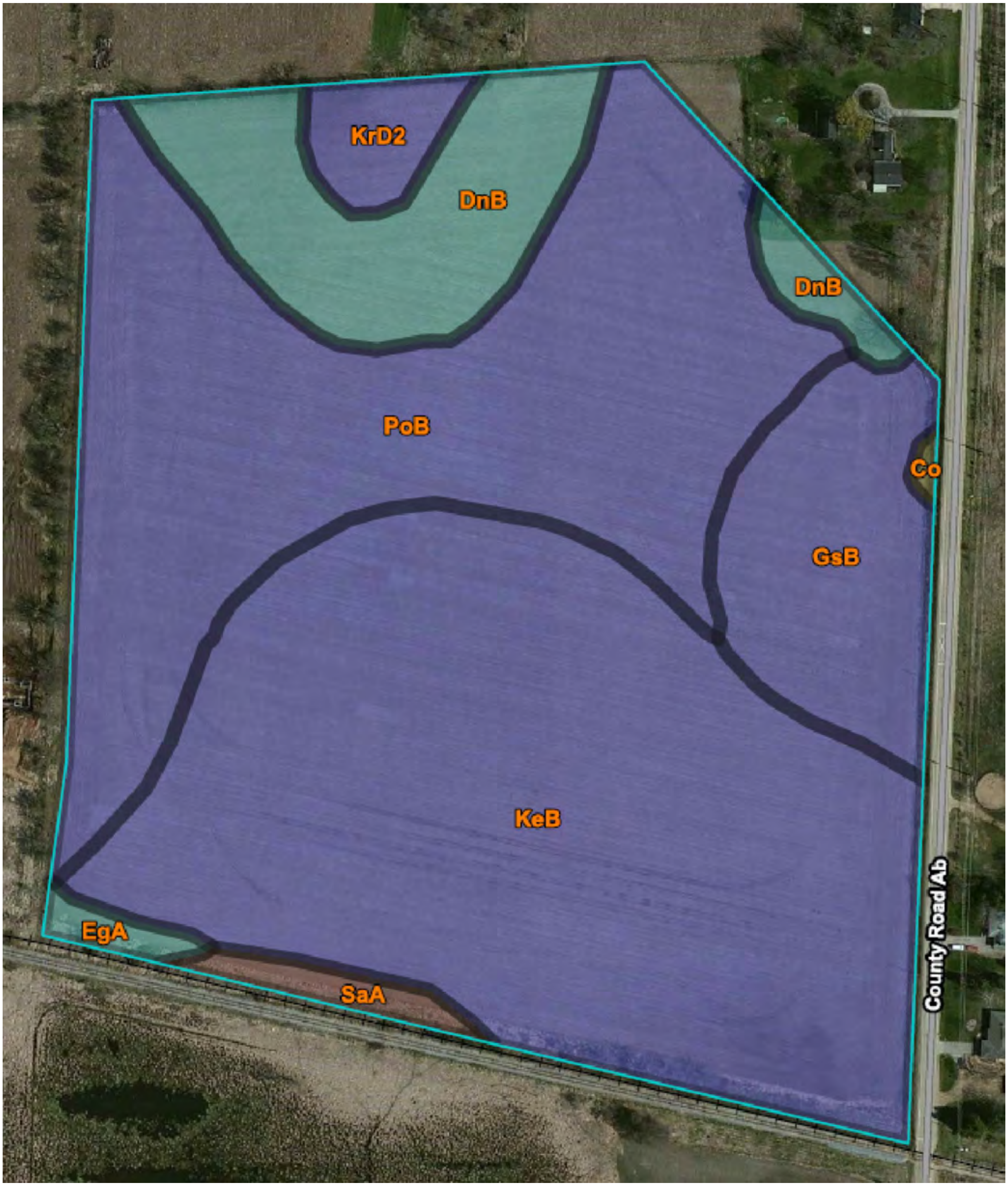
# ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, WISCONSIN

DRAWN BY: GVP

EXHIBIT 1

U:\USER\1904113\ENGINEERING\SWMP\1904113 SWMP.DWG




D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

SOILS MAP

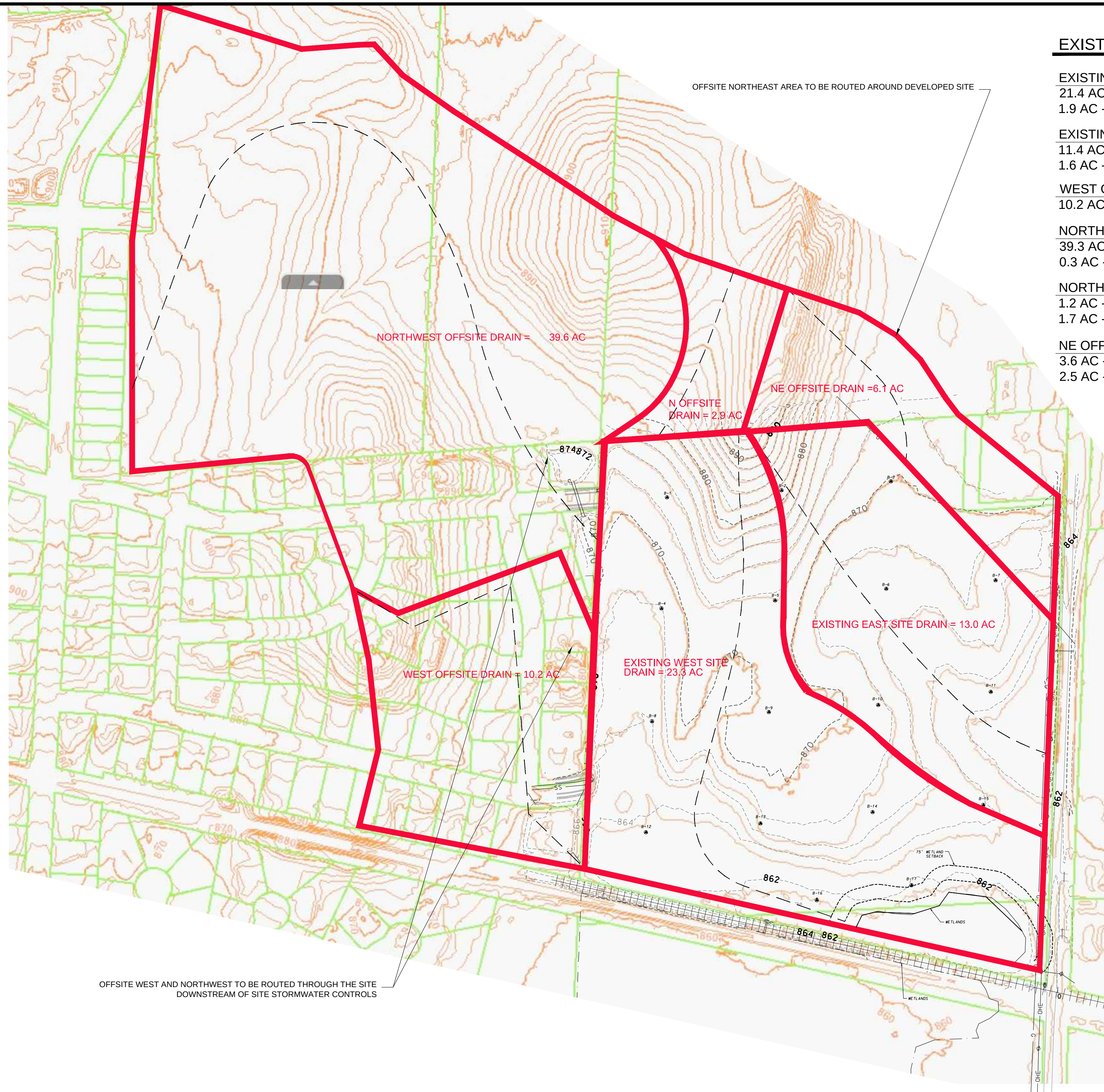
ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, WISCONSIN

DRAWN BY: GVP

EXHIBIT 2

U:\USER\1904113\ENGINEERING\SWMP\1904113 SWMP.DWG




## EXISTING DRAINAGE BASIN INFORMATION

EXISTING WEST SITE DRAINAGE AREA = 23.3 AC
21.4 AC - EXISTING TYPE B= CN 58
1.9 AC - EXISTING TYPE C= CN 71

EXISTING EAST SITE DRAINAGE AREA = 13.0 AC
11.4 AC - EXISTING TYPE B= CN 58
1.6 AC - EXISTING TYPE C= CN 71

WEST OFFSITE DRAINAGE AREA = 10.2 AC
10.2 AC - EXISTING TYPE B= CN 58

NORTHWEST OFFSITE DRAINAGE AREA = 39.6 AC
39.3 AC - EXISTING TYPE B= CN 58
0.3 AC - EXISTING TYPE C= CN 71

NORTH OFFSITE DRAINAGE AREA = 2.9 AC
1.2 AC - EXISTING TYPE B= CN 58
1.7 AC - EXISTING TYPE C= CN 71

NE OFFSITE DRAINAGE AREA = 6.1 AC
3.6 AC - EXISTING TYPE B= CN 58
2.5 AC - EXISTING TYPE C= CN 71


D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT


EXISTING REGIONAL DRAINAGE PLAN
ROSEWOOD FIELDS
COUNTY HWY AB
VILLAGE OF MCFARLAND, WISCONSIN

0 160

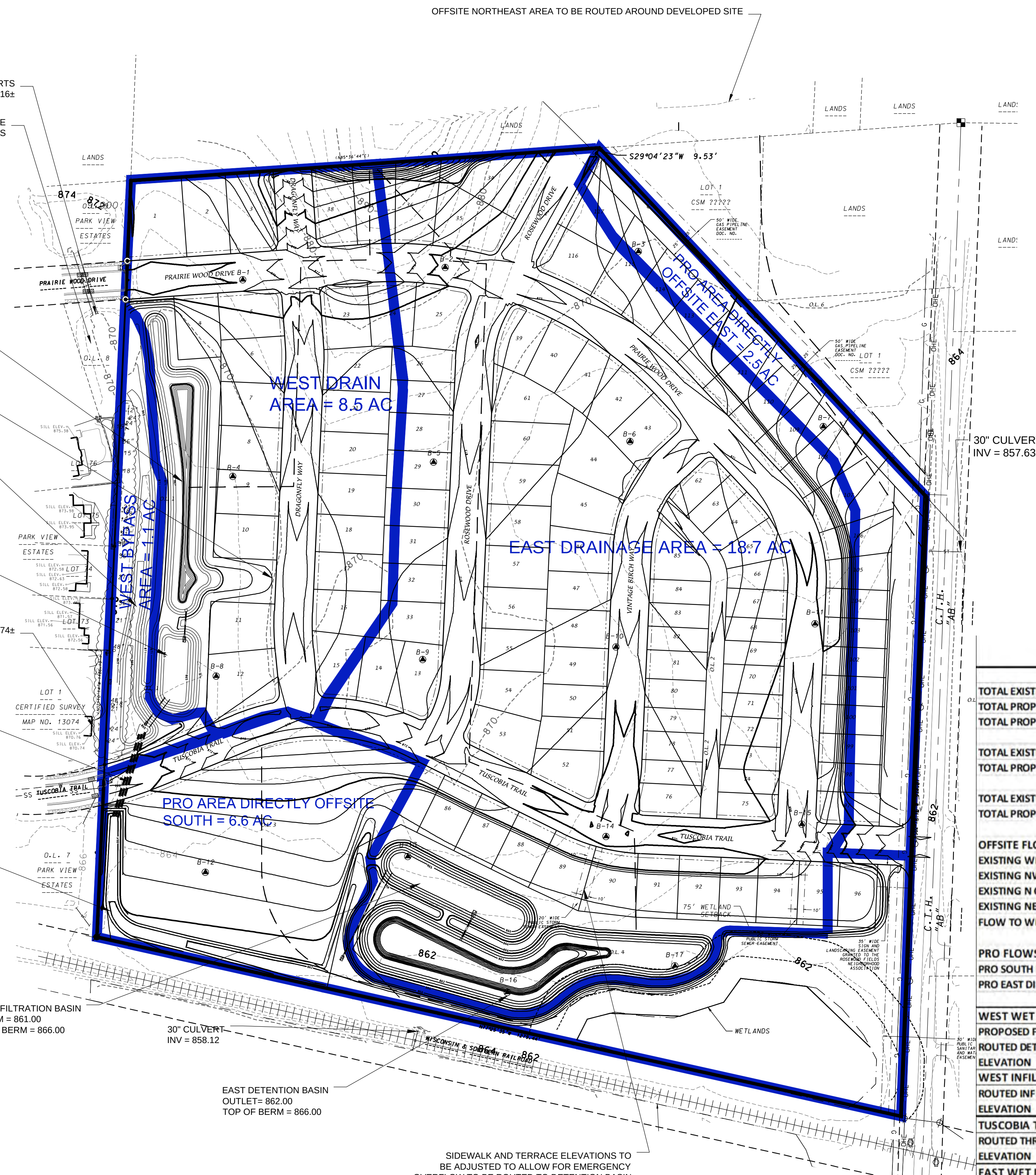
DATE: 08/24/20
REVISED:

DRAWN BY: GVP

FN: 19-04-114

Sheet Number:
Exhibit 3

File: U:\User\1904113\Engineering\SWMP\1904113 SWMP.dwg Existing Drainage Plotted: Aug 24, 2020 - 9:20pm




## EXISTING SITE DRAINAGE BASIN INFORMATION

EXISTING DRAINAGE AREA = 36.3 AC

| | |
|---|---|
| 32.8 AC - EXISTING TYPE B= | CN 58 |
| 3.5 AC - EXISTING TYPE C= | CN 71 |

## PROPOSED SITE DRAINAGE BASIN INFORMATION

PROPOSED WEST DRAINAGE AREA =7.4 AC.

| | |
|---|---|
| 6.0 AC - 60% IMPERVIOUS RESIDENTIAL = | CN 87 |
| 1.2 AC - OUTLOT AREA (10% IMP) = | CN 74 |
| 0.2 AC - WET BASIN = | CN 98 |

PROPOSED WEST BYPASS AREA = 1.1 AC.

| | |
|---|---|
| 1.1 AC - OUTLOT AREA (10% IMP) = | CN 74 |

PROPOSED EAST DRAINAGE AREA = 18.7 AC.

| | |
|---|---|
| 12.9 AC - 60% IMPERVIOUS RESIDENTIAL = | CN 87 |
| 3.6 AC - 70% IMPERVIOUS ALLEY RESIDENTIAL = | CN 90 |
| 1.5 AC - OUTLOT AREA (10% IMP) = | CN 74 |
| 0.7 AC - WEST BASIN = | CN 98 |

PROPOSED AREA DIRECTLY OFFSITE EAST = 2.5 AC.

| | |
|---|---|
| 2.4 AC - 10% IMP (LIGHTLY DISTURBED/DEEP TILL)= | CN 62 |
| 0.1 AC - 70% IMP ROW AREA = | CN 90 |

PROPOSED AREA DIRECTLY OFFSITE SOUTH = 6.6 AC.

| | |
|---|---|
| 6.2 AC - ASSUME 10% IMP (LIGHTLY DISTURBED)= | CN 62 |
| 0.2 AC - 40% IMP YARD AREA= | CN 82 |
| 0.2 AC - 70% IMP ROW AREA = | CN 90 |

**24-HR STORM EVENT (PEAK FLOW IN CFS)-PEAK FLOW COMPARISION**

| | 1YR | 2YR | 10YR | 25YR | 100YR |
|---|---|---|---|---|---|
| TOTAL EXISTING COMBINED FLOW THOUGH SITE | 4.35 | 9.71 | 45.73 | 83.98 | 166.65 |
| TOTAL PROPOSED COMBINED FLOW WITH BASIN TREATMENT | 2.78 | 6.08 | 32.03 | 64.48 | 127.06 |
| TOTAL PROPOSED COMBINED FLOW WITHOUT DETENTION | 47.07 | 58.98 | 109.30 | 153.43 | 241.31 |
| | | | | | |
| TOTAL EXISTING FLOW LEAVING SOUTH SIDE OF SITE | 3.09 | 7.09 | 34.57 | 64.14 | 128.47 |
| TOTAL PROPOSED/TREATED FLOW LEAVING SOUTH SIDE OF SITE | 2.29 | 5.10 | 28.85 | 58.68 | 116.15 |
| | | | | | |
| TOTAL EXISTING FLOW LEAVING EAST SIDE OF SITE | 1.53 | 3.22 | 13.70 | 24.07 | 45.72 |
| TOTAL PROPOSED FLOW LEAVING EAST SIDE OF SITE | 1.07 | 2.09 | 7.66 | 12.86 | 23.52 |
| | | | | | |
| **OFFSITE FLOWS** | | | | | |
| EXISTING WEST OFFSITE DRAINAGE | 0.40 | 0.97 | 5.42 | 10.27 | 20.81 |
| EXISTING NW OFFSITE DRAINAGE | 1.34 | 3.20 | 16.34 | 30.61 | 61.96 |
| EXISTING N OFFSITE DRAINAGE | 0.59 | 1.00 | 2.96 | 4.70 | 8.21 |
| EXISTING NE OFFSITE DRAINAGE | 0.86 | 1.72 | 6.22 | 10.39 | 18.89 |
| FLOW TO WEST BYPASS CHANNEL | 1.68 | 4.02 | 20.37 | 38.23 | 77.65 |
| | | | | | |
| **PRO FLOWS DIRECTLY OFFSITE** | | | | | |
| PRO SOUTH DIRECTLY OFFSITE | 0.66 | 1.22 | 4.24 | 7.11 | 13.05 |
| PRO EAST DIRECTLY OFFSITE | 0.29 | 0.55 | 1.94 | 3.24 | 5.94 |
| | | | | | |
| **WEST WET DETENTION BASIN: OUTLET = 867.0, TOP OF BERM = 871.0** | | | | | |
| PROPOSED FLOW INTO DETENTION | 13.72 | 17.15 | 30.36 | 40.49 | 58.97 |
| ROUTED DETENTION | 0.44 | 0.50 | 4.06 | 11.60 | 22.34 |
| ELEVATION | 868.26 | 868.58 | 869.19 | 869.44 | 870.06 |
| **WEST INFILTRATION BASIN: BOTTOM = 866.0, OUTLET = 867.0, TOP OF BERM = 871.0** | | | | | |
| ROUTED INFILTRATION OFFSITE | 0.41 | 0.47 | 2.84 | 6.11 | 9.14 |
| ELEVATION | 867.27 | 867.30 | 867.88 | 868.74 | 869.97 |
| **TUSCOBIA TRAIL STREET CROSSING: STREET OVERFLOW LOW POINT= 869.55, 3-38"X24" CULVERTS INV = 865.00** | | | | | |
| ROUTED THROUGH STREET CROSSING | 1.77 | 4.10 | 20.61 | 42.99 | 85.20 |
| ELEVATION | 865.26 | 865.40 | 865.95 | 866.45 | 867.43 |
| **EAST WET DETENTION BASIN: OUTLET = 862.0, TOP OF BERM = 866.0** | | | | | |
| PROPOSED FLOW INTO DETENTION | 33.13 | 40.59 | 67.99 | 88.35 | 124.79 |
| ROUTED DETENTION | 1.85 | 2.11 | 16.76 | 25.39 | 58.85 |
| ELEVATION | 863.55 | 863.90 | 864.50 | 864.97 | 865.63 |
| **EAST INFILTRATION BASIN: BOTTOM = 861.0, OUTLET = 862.0, TOP OF BERM = 866.0** | | | | | |
| ROUTED INFILTRATION OFFSITE | 1.56 | 1.82 | 8.24 | 10.85 | 19.36 |
| ELEVATION | 862.54 | 862.60 | 863.64 | 864.35 | 865.58 |

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

PROPOSED SITE DRAINAGE PLAN

ROSEWOOD FIELDS
COUNTY HWY AB

VILLAGE OF MCFARLAND, WISCONSIN

0 100

DATE: 08/24/20
REVISED:

DRAWN BY: GVP

FN: 19-04-113

Sheet Number:
Exhibit 4

EX OFFISTE 2-29"X45" CULVERTS
INVERT = 869.44

OFFSITE WEST AND NORTHWEST TO BE ROUTED THROUGH THE SITE DOWNSTREAM OF SITE STORMWATER CONTROLS

WEST BYPASS CHANNEL
SECTION @ 0.75%
NOT TO SCALE

WEST BYBASS CHANNEL

PROPOSED WEST DETENTION BASIN

TOP OF POND BERM - 871.00, AREA = 32,596 SQFT
TOP OF WET POND/OUTLET - 867.00, AREA = 15,467 SQFT
BOTTOM OF WET POND - 861.00

WEST DETENTION BASIN OUTLET STRUCTURES ROUTED TO INFILTRATION BASIN:
48" STANDPIPE
RIM = 869.00
W/4" ORIFICE @ 867.00
18" OUTLET PIPE @ 866.00

30' EQUALIZATION BERM @ 869.75

SIDEWALK AND TERRACE ELEVATIONS TO BE ADJUSTED TO ALLOW FOR EMERGENCY OVERFLOW TO BE ROUTED TO DETENTION BASIN

WEST INFILTRATION BASIN OUTLET STRUCTURES:
1-15" CULVERTS @ 867.00
5' OVERFLOW WEIR @ 870.00
8" CAPPED EMERGENCY DRAIN(DAYLIGHT) @ 866.00

PROPOSED WEST INFILTRATION BASIN W/ 12" DEPRESSION ZONE

3,624 SQFT @ 866.00
10,466 SQFT (TOP OF BERM) @ 871.00

3- 24"x38" ELLIPTICAL CULVERTS WITH ENDSECTIONS
UPSTREAM INV = 865.00
DOWNSTREAM INV = 864.00
STREET OVERFLOW 869.55±
(100YR WATER ELEV (6.66" IN 24HRS) = 867.43 )
(150 YR OVERFLOW ELEV (7.10 IN 24HRS) = 867.82)

SOUTHWEST BYPASS CHANNEL
SECTION @ 0.75%
NOT TO SCALE

SOUTHWEST BYPASS CHANNEL

EX OFFISTE 24" CULVERT
INV = 864.80

PROPOSED EAST INFILTRATION BASIN W/ 12" DEPRESSION ZONE

8,400 SQFT @ 861.00
19,855 SQFT (TOP OF BERM) @ 866.00

INFILTRATION BASIN OUTLET STRUCTURES:
1-18" CULVERTS @ 862.00
8" CAPPED EMERGENCY DRAIN(DAYLIGHT) @ 861.00

4' OVERFLOW WEIR @ 865.00


EX 30" CULVERT
INV = 857.63

EX 30" CULVERT
INV = 858.12

PROPOSED EAST DETENTION BASIN

TOP OF POND BERM - 866.00, AREA = 50,568 SQFT
TOP OF WET POND/OUTLET - 862.00, AREA = 30,928SQFT
BOTTOM OF WET POND - 856.00

EAST DETENTION BASIN OUTLET STRUCTURES ROUTED TO INFILTRATION BASIN:
48" STANDPIPE
RIM = 864.00
W/8" ORIFICE @ 862.00
24" OUTLET PIPE @ 861.00

20' EQUALIZATION BERM @ 864.75

SIDEWALK AND TERRACE ELEVATIONS TO BE ADJUSTED TO ALLOW FOR EMERGENCY OVERFLOW TO BE ROUTED TO DETENTION BASIN

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

DETENTION/INFILTRATION BASIN LAYOUT

ROSEWOOD FIELDS
COUNTY HWY AB

VILLAGE OF MCFARLAND, WISCONSIN

0 100

DATE: 08/24/20
REVISED:

DRAWN BY: GVP

FN: 19-04-113

Sheet Number:
Exhibit 5

File: U:\User\1904113\Engineering\SWMP\1904113 SWMP.dwg Proposed Basin Layout Ex 5 Plotted: Aug 25, 2020 - 10:36am


D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

AERIAL MAP

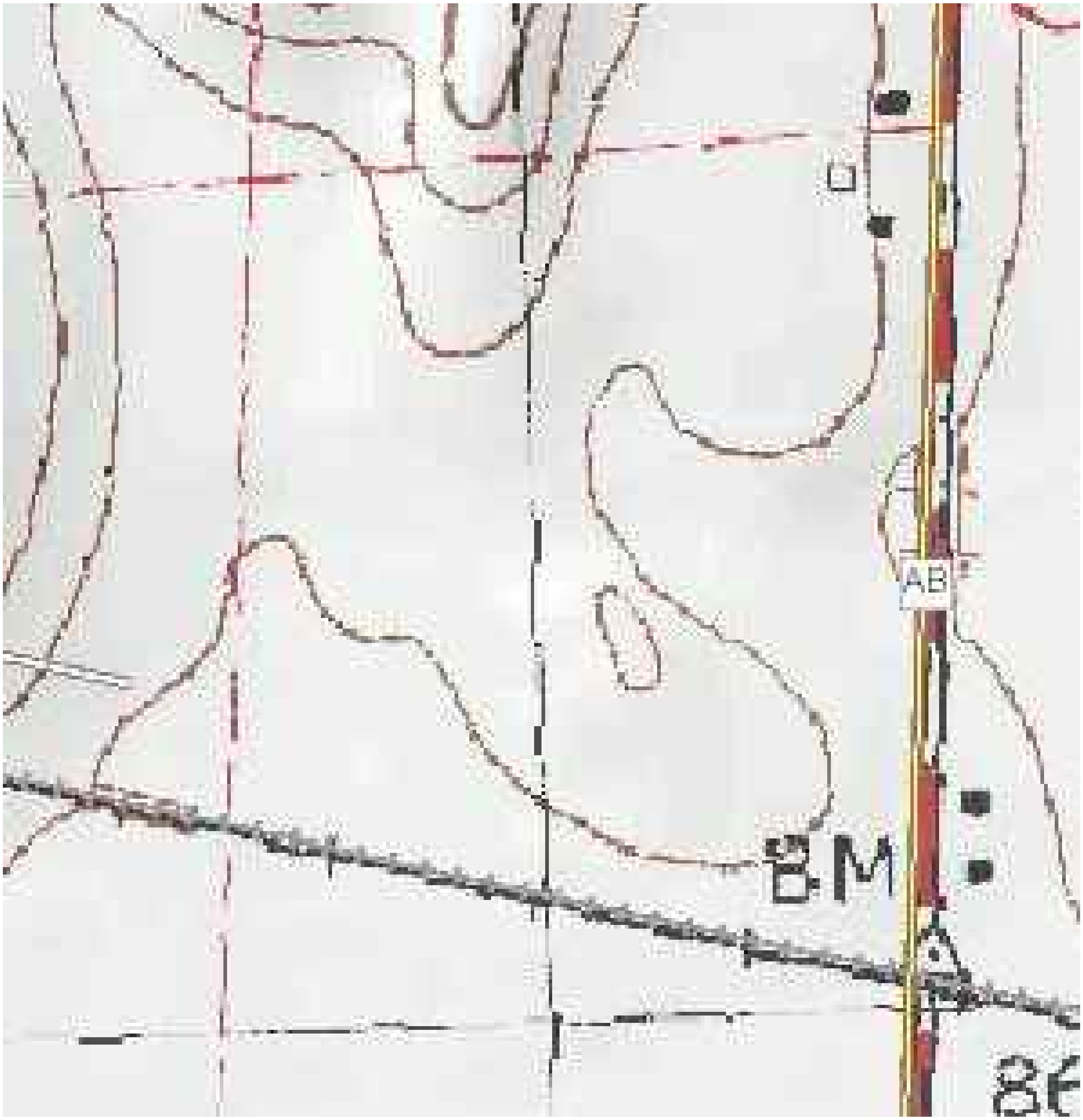
# UTTERBACK PROPERTY

VILLAGE OF MCFARLAND, WISCONSIN

DRAWN BY: GVP

EXHIBIT 6

U:\USER\1904113\ENGINEERING\SWMP\1904113 SWMP.DWG





D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT


USGS MAP

ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, WISCONSIN

DRAWN BY: GVP

EXHIBIT 7

U:\USER\1904113\ENGINEERING\SWMP\1904113 SWMP.DWG


*WETLAND INDICATOR MAP*

# *ROSEWOOD FIELDS*

*VILLAGE OF MCFARLAND, WISCONSIN*

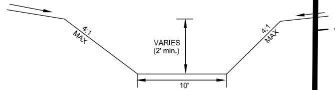
**D'ONOFRIO KOTTKE AND ASSOCIATES, INC.**

7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
**YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT**

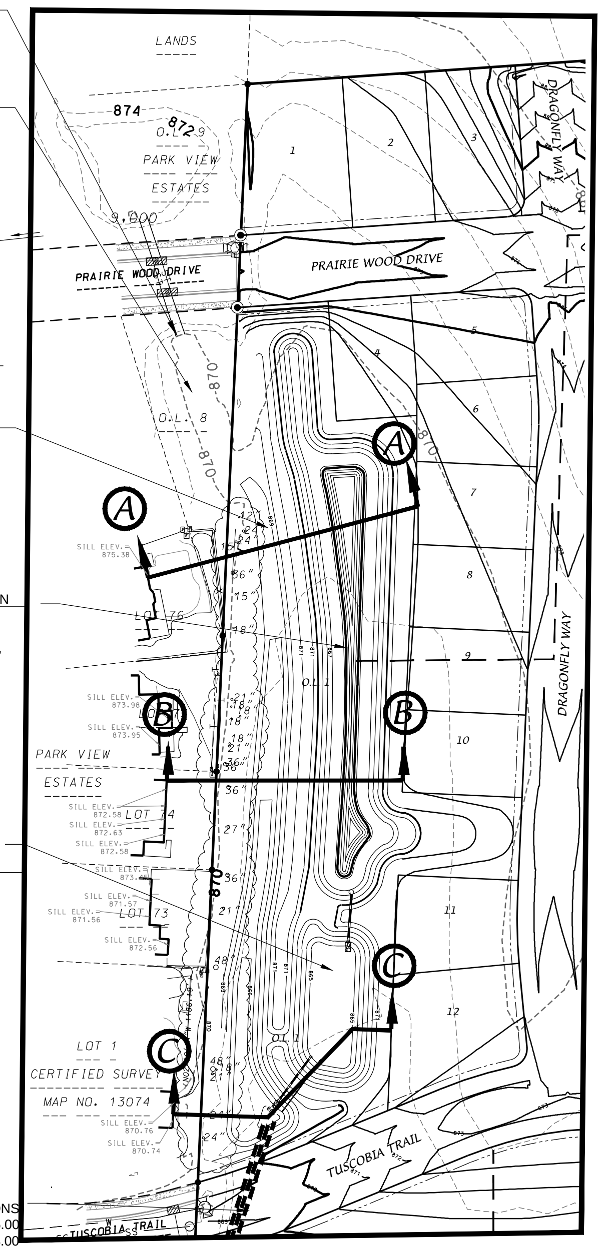
*DRAWN BY: GVP*

*EXHIBIT 8*

U:\USER\1904113\ENGINEERING\SWMP\1904113 SWMP.DWG

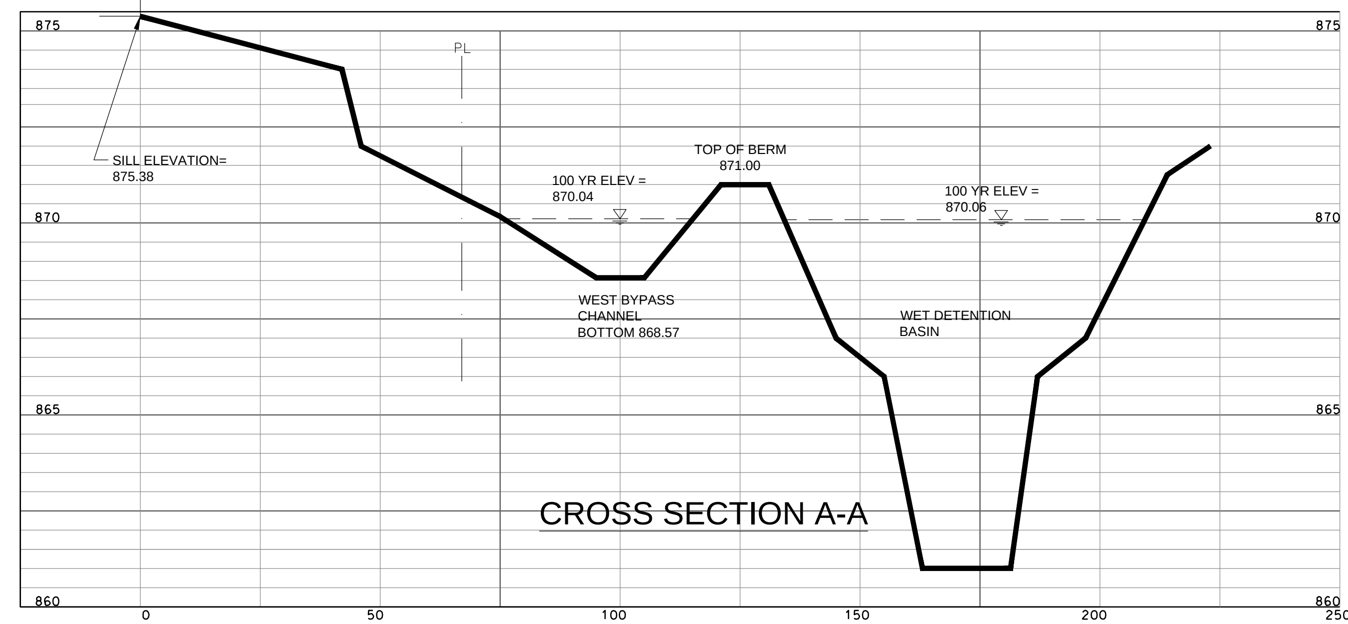



WEST BYPASS CHANNEL
SECTION @ 0.75%
NOT TO SCALE

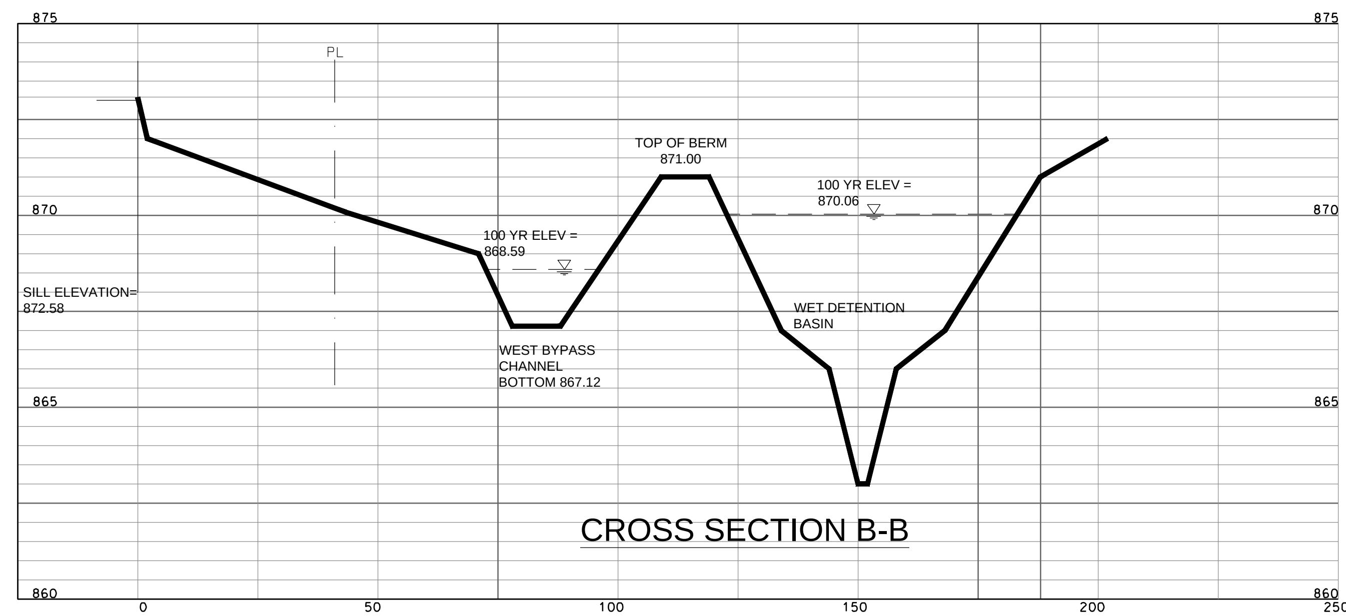



PLAN VIEW

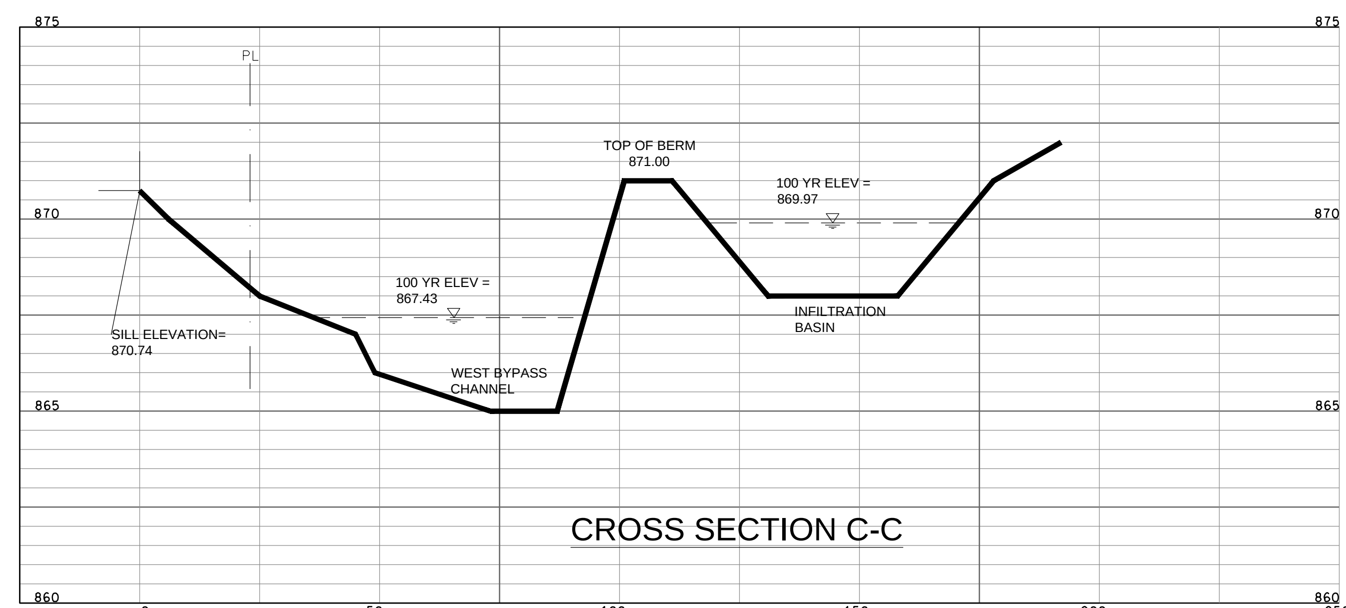
WEST STORMWATER CROSS SECTIONS




CROSS SECTION A-A




CROSS SECTION B-B




CROSS SECTION C-C

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

WEST DETENTION BASIN & BYPASS CHANNEL CROSS-SECTION EXHIBIT

ROSEWOOD FIELDS
COUNTY HWY AB

VILLAGE OF MCFARLAND , WISCONSIN

DATE: 08/24/20
REVISED:

DRAWN BY: GVP

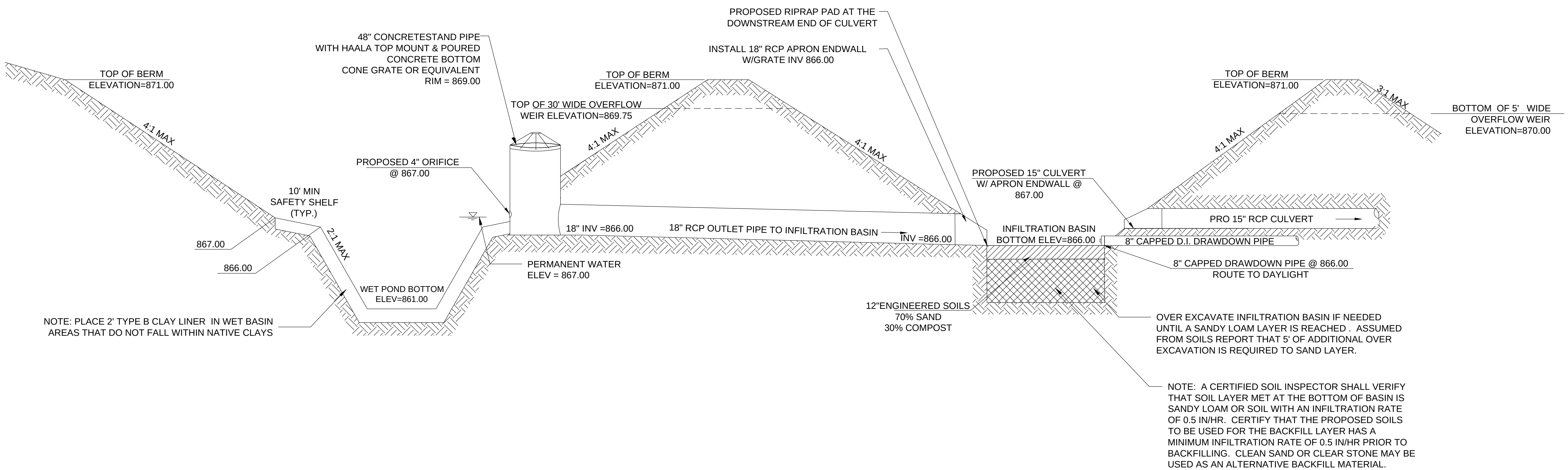
FN: 19-04-113

Sheet Number:
Exhibit 9

File: U:\User\1904113\Engineering\SWMP\1904113 SWMP.dwg West Crosssection Plotted: Aug 25, 2020 - 10:42am

# APPENDIX A

## DETENTION POND & INFLITRATION BASIN DETAILS




PROFILE VIEW

PROPOSED WEST WET DETENTION BASIN & INFILTRATION BASIN

NOT TO SCALE


D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT


WEST WET DETENTION AND INFILTRATION BASIN DETAIL

ROSEWOOD FIELDS
COUNTY HWY AB

VILLAGE OF MCFARLAND, WISCONSIN

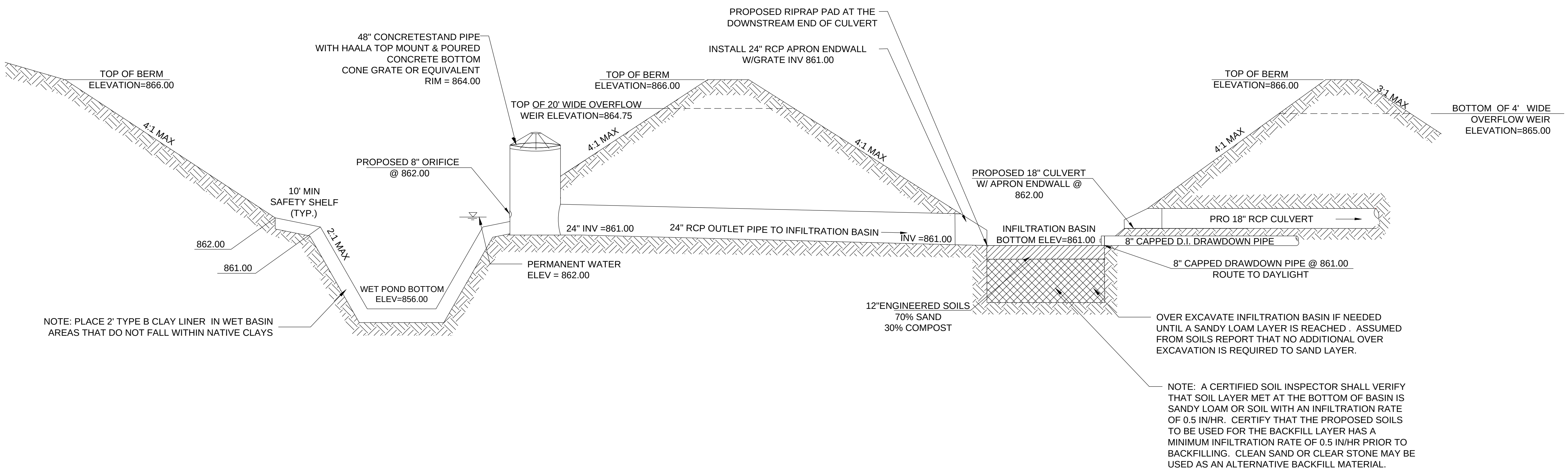
DATE: 08/24/20
REVISED:

DRAWN BY: GVP

FN: 19-04-113

Sheet Number:
APP A-1

File: U:\User\1904113\Engineering\SWMP\1904113 SWMP.dwg A-1 W Basin Detail Plotted: Aug 24, 2020 - 9:22pm




PROFILE VIEW

PROPOSED EAST WET DETENTION BASIN & INFILTRATION BASIN

NOT TO SCALE

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

EAST WET DETENTION AND INFILTRATION BASIN DETAIL

ROSEWOOD FIELDS
COUNTY HWY AB

VILLAGE OF MCFARLAND, WISCONSIN

DATE: 08/24/20
REVISED:

DRAWN BY: GVP

FN: 19-04-113

Sheet Number:
APP A-2

File: U:\User\1904113\Engineering\SWMP\1904113 SWMP.dwg A-2 E Basin Detail Plotted: Aug 24, 2020 - 9:23pm

# APPENDIX B

## SEDIMENT REDUCTION CALCULATIONS

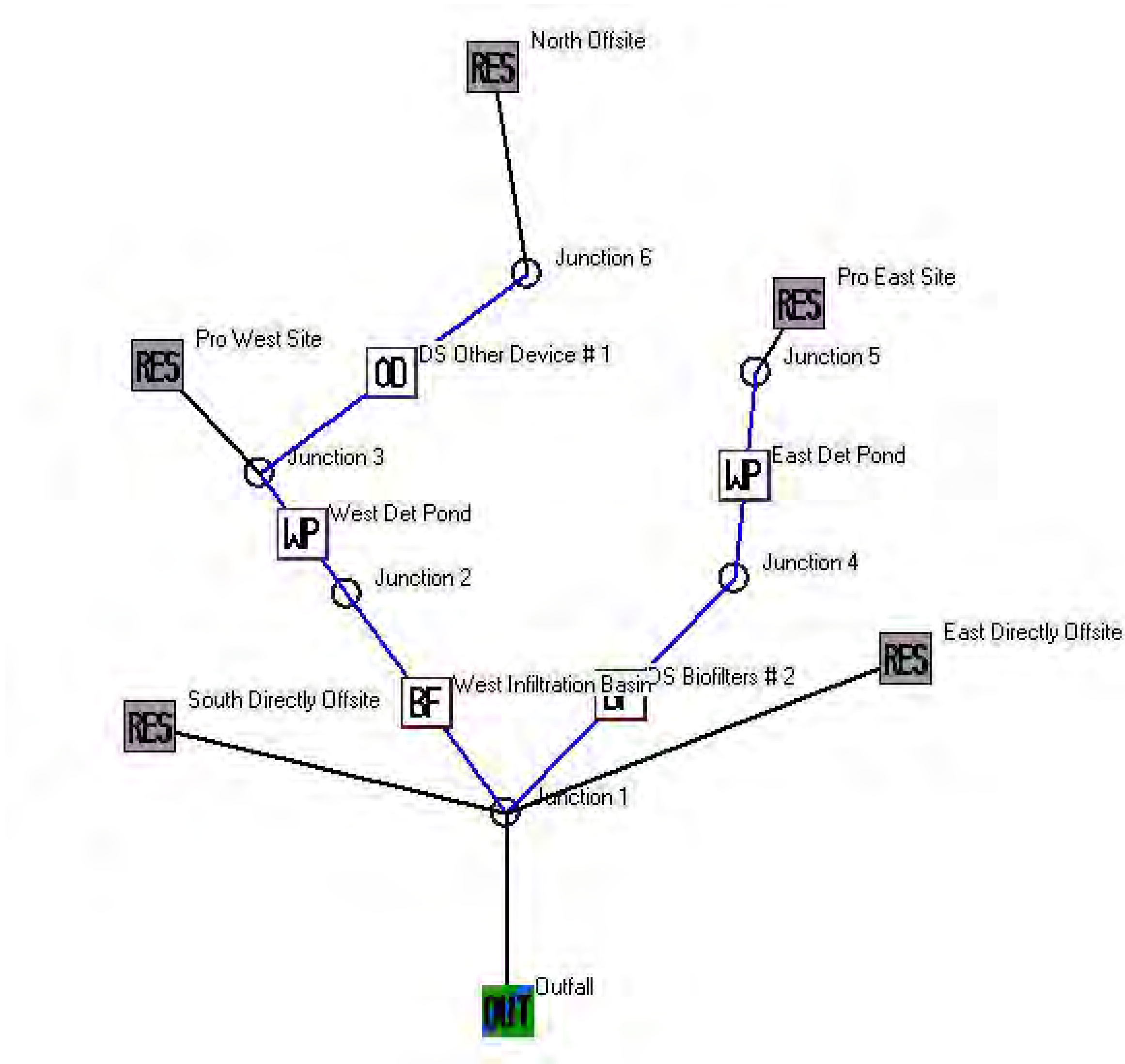
## DETENTION BASIN
## SEDIMENTATION REDUCTION CALCULATIONS (WINSLAMM)

### WinSlamm Design

The following WinSlamm design shows that 80% of sediment is being removed from the proposed site

**Total site sediment reduction in developed conditions = <u>83.56%</u>**

### Model Schematic:



# Model Input Information:

**Data file name: U:\User\1904113\Engineering\SWMP\Sed Pro Utterback Slamm.mdb**
**WinSLAMM Version 10.4.1**
**Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.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.ppdx**
**Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv**
**Cost Data file name:**
**If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations**
**Seed for random number generator: -42**
**Study period starting date: 01/01/81 Study period ending date: 12/31/81**
**Start of Winter Season: 12/02 End of Winter Season: 03/12**
**Date: 08-24-2020 Time: 16:48:39**
**Site information:**

**LU# 1 - Residential: Pro West Site Total area (ac): 8.500**
**1 - Roofs 1: 1.190 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**2 - Roofs 2: 0.610 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**25 - Driveways 1: 0.790 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**31 - Sidewalks 1: 0.230 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**37 - Streets 1: 1.010 ac. Intermediate Street Length = 0.768 curb-mi Street Width (assuming two curb-mi per street mile) = 21.69922 ft**
**Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**45 - Large Landscaped Areas 1: 4.180 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**70 - Water Body Areas: 0.490 ac. Source Area PSD File:**

**LU# 2 - Residential: Pro East Site Total area (ac): 18.700**
**1 - Roofs 1: 3.390 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**2 - Roofs 2: 1.740 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**25 - Driveways 1: 2.260 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**31 - Sidewalks 1: 0.150 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**37 - Streets 1: 2.870 ac. Intermediate Street Length = 1.713 curb-mi Street Width (assuming two curb-mi per street mile) = 27.64448 ft**
**Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**45 - Large Landscaped Areas 1: 7.390 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**70 - Water Body Areas: 0.900 ac. Source Area PSD File:**

**LU# 3 - Residential: South Directly Offsite Total area (ac): 6.600**
**1 - Roofs 1: 0.050 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**2 - Roofs 2: 0.030 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**31 - Sidewalks 1: 0.620 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**37 - Streets 1: 0.040 ac. Intermediate Street Length = 0.044 curb-mi Street Width (assuming two curb-mi per street mile) = 15 ft**
**Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**45 - Large Landscaped Areas 1: 5.860 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**

**LU# 4 - Residential: East Directly Offsite Total area (ac): 2.500**
**31 - Sidewalks 1: 0.240 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**37 - Streets 1: 0.070 ac. Intermediate Street Length = 0.044 curb-mi Street Width (assuming two curb-mi per street mile) = 26.25 ft**
**Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**
**45 - Large Landscaped Areas 1: 2.190 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**

**LU# 5 - Residential: North Offsite Total area (ac): 2.900**
**45 - Large Landscaped Areas 1: 2.900 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**

**Control Practice 1: Wet Detention Pond CP# 1 (DS) - West Det Pond**
**Particle Size Distribution file name: Not needed - calculated by program**
**Initial stage elevation (ft): 6**
**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): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 6
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 30
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 7.75
Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 4
2. Stand pipe height above datum (ft): 7
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 | 0.0195 | 0.00 | 0.00 |
| 2 | 1.00 | 0.0344 | 0.00 | 0.00 |
| 3 | 2.00 | 0.0569 | 0.00 | 0.00 |
| 4 | 3.00 | 0.0894 | 0.00 | 0.00 |
| 5 | 4.00 | 0.1220 | 0.00 | 0.00 |
| 6 | 5.00 | 0.1560 | 0.00 | 0.00 |
| 7 | 6.00 | 0.3550 | 0.00 | 0.00 |
| 8 | 7.00 | 0.4490 | 0.00 | 0.00 |
| 9 | 8.00 | 0.5470 | 0.00 | 0.00 |
| 10 | 9.00 | 0.6460 | 0.00 | 0.00 |
| 11 | 10.00 | 0.7480 | 0.00 | 0.00 |

Control Practice 2: Biofilter CP# 1 (DS) - West Infiltration Basin
1. Top area (square feet) = 10466
2. Bottom aea (square feet) = 3624
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0
Soil Data Soil Type Fraction in Eng. Soil
Biofilter Outlet/Discharge Characteristics:
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 5
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 4
Outlet type: Surface Discharge Pipe
1. Surface discharge pipe outlet diameter (ft): 1.25
2. Pipe invert elevation above datum (ft): 1
3. Number of surface pipe outlets: 1

Control Practice 3: Wet Detention Pond CP# 2 (DS) - East Det Pond
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 6
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): 0.67
2. Number of orifices: 1
3. Invert elevation above datum (ft): 6
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 20
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 8.75
Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 4
2. Stand pipe height above datum (ft): 8

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 | 0.2030 | 0.00 | 0.00 |
| 2 | 1.00 | 0.2380 | 0.00 | 0.00 |
| 3 | 2.00 | 0.2750 | 0.00 | 0.00 |
| 4 | 3.00 | 0.3130 | 0.00 | 0.00 |
| 5 | 4.00 | 0.3520 | 0.00 | 0.00 |
| 6 | 5.00 | 0.3900 | 0.00 | 0.00 |
| 7 | 6.00 | 0.7100 | 0.00 | 0.00 |
| 8 | 7.00 | 0.8190 | 0.00 | 0.00 |
| 9 | 8.00 | 0.9310 | 0.00 | 0.00 |
| 10 | 9.00 | 1.0440 | 0.00 | 0.00 |
| 11 | 10.00 | 1.1610 | 0.00 | 0.00 |

Control Practice 4: Biofilter CP# 2 (DS) - DS Biofilters # 2

1. Top area (square feet) = 19855
2. Bottom aea (square feet) = 8400
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 10
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 4

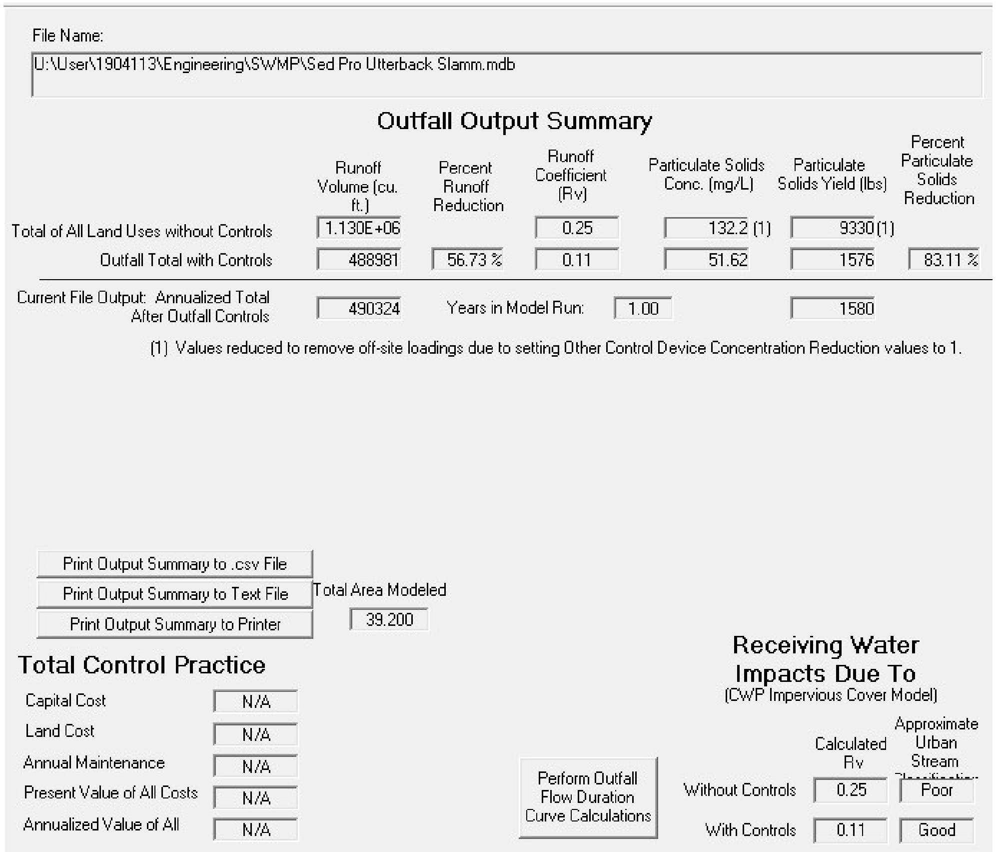
Outlet type: Surface Discharge Pipe

1. Surface discharge pipe outlet diameter (ft): 1.5
2. Pipe invert elevation above datum (ft): 1
3. Number of surface pipe outlets: 1

Control Practice 5: Other Device CP# 1 (DS) - DS Other Device # 1

Fraction of drainage area served by device (ac) = 1.00
Particulate Concentration reduction fraction = 1.00
Filterable Concentration reduction fraction = 0.00
Runoff volume reduction fraction = 0

# Output Sediment Reduction:




**Total site sediment reduction in developed conditions = <u>83.11%</u>**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Data File: U:\User\1904113\Engamm.mdb | | | | | | | |
| Rain File: WisReg - Madison WI | | | | | | | |
| Date: 08-24-20 Time: 4:50:26 PM | | | | | | | |
| Site Description: | | | | | | | |
| Col. #: | 2 | 4 | 5 | 6 | 7 | 8 | 9 |
| 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 |
| 1 | Wet Detention Pond | 310884 | 311720 | -0.269 | 2521 | 332.0 | 86.83 |
| 2 | Biofilter | 311720 | 115685 | 62.89 | 332.0 | 152.1 | 54.19 |
| 3 | Wet Detention Pond | 750693 | 752823 | -0.284 | 5899 | 1091 | 81.51 |
| 4 | Biofilter | 752823 | 304609 | 59.54 | 1091 | 513.1 | 52.97 |
| 5 | Other Device | 18203 | 18203 | 0 | 258.0 | 0 | 100.0 |

The chart above shows that over 60% sediment reduction will occur prior to the infiltration basins.

# APPENDIX C

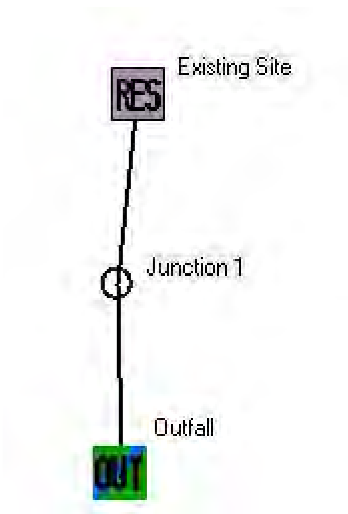
## INFILTRATION DESIGN

# INFILTRATION SIZING FOR THE PROPOSED PLAT

Methodology: To meet infiltration requirements, the following will show that the infiltration design will meet stayon requirements for the site. To establish the infiltration requirements, the site was modeled using WinSLAMM in existing conditions to establish an existing stayon value first. A target stayon value was established as 90% of the existing value per the ordinance. As shown in the following calculations; The site will meet the required infiltration performance standard in developed conditions

# WinSLAMM Model to Establish Stayon Requirements

### Model Schematic:




## Model Input Information:

**Data file name: U:\User\1904113\Engineering\SWMP\Ex Utterback Slamm.mdb**
**WinSLAMM Version 10.4.1**
**Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.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.ppdx**
**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: 01/01/81 Study period ending date: 12/31/81**
**Start of Winter Season: 12/02 End of Winter Season: 03/12**
**Date: 04-02-2020 Time: 16:48:49**
**Site information:**

**LU# 1 - Residential: Existing Site Total area (ac): 36.300**
**45 - Large Landscaped Areas 1: 36.300 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz**

## Output Existing Stayon From Plat:

Data File: U:\User\1904113\Engineering\SWMP\Ex Utterback Slamm.mdb
Rain File: WisReg - Madison WI 1981.RAN
Date: 04-02-20 Time: 4:50:34 PM
Site Description:

Runoff Volume Total (cf) at the Outfall

| Rain Number | Start Date | Rain Total (in) | Outfall Total (cf) | Rv | Total Losses (in.) |
|---|---|---|---|---|---|
| 73 | 08/28/81 | 0.04 | 0 | 0.000 | 0.04 |
| 74 | 08/31/81 | 0.03 | 0 | 0.000 | 0.03 |
| 75 | 08/31/81 | 1.52 | 10760 | 0.054 | 1.44 |
| 76 | 09/07/81 | 0.89 | 5048 | 0.043 | 0.85 |
| 77 | 09/11/81 | 0.08 | 0 | 0.000 | 0.08 |
| 78 | 09/16/81 | 0.03 | 0 | 0.000 | 0.03 |
| 79 | 09/21/81 | 0.45 | 1398 | 0.024 | 0.44 |
| 80 | 09/24/81 | 0.90 | 5117 | 0.043 | 0.86 |
| 81 | 09/26/81 | 0.12 | 0 | 0.000 | 0.12 |
| 82 | 09/28/81 | 0.10 | 0 | 0.000 | 0.10 |
| 83 | 09/29/81 | 0.16 | 0 | 0.000 | 0.16 |
| 84 | 09/30/81 | 0.36 | 825.6 | 0.017 | 0.35 |
| 85 | 10/01/81 | 0.01 | 0 | 0.000 | 0.01 |
| 86 | 10/04/81 | 0.15 | 0 | 0.000 | 0.15 |
| 87 | 10/05/81 | 0.04 | 0 | 0.000 | 0.04 |
| 88 | 10/05/81 | 0.02 | 0 | 0.000 | 0.02 |
| 89 | 10/09/81 | 0.14 | 0 | 0.000 | 0.14 |
| 90 | 10/13/81 | 1.20 | 8238 | 0.052 | 1.14 |
| 91 | 10/15/81 | 0.02 | 0 | 0.000 | 0.02 |
| 92 | 10/17/81 | 0.95 | 5464 | 0.044 | 0.91 |
| 93 | 10/18/81 | 0.06 | 0 | 0.000 | 0.06 |
| 94 | 10/21/81 | 0.06 | 0 | 0.000 | 0.06 |
| 95 | 10/21/81 | 0.01 | 0 | 0.000 | 0.01 |
| 96 | 10/24/81 | 0.01 | 0 | 0.000 | 0.01 |
| 97 | 10/31/81 | 0.01 | 0 | 0.000 | 0.01 |
| 98 | 11/05/81 | 0.04 | 0 | 0.000 | 0.04 |
| 99 | 11/15/81 | 0.07 | 0 | 0.000 | 0.07 |
| 100 | 11/18/81 | 0.05 | 0 | 0.000 | 0.05 |
| 101 | 11/19/81 | 0.26 | 230.8 | 0.007 | 0.26 |
| 102 | 11/23/81 | 0.18 | 0 | 0.000 | 0.18 |
| 103 | 11/25/81 | 0.89 | 5048 | 0.043 | 0.85 |
| 104 | 11/30/81 | 0.37 | 900.6 | 0.018 | 0.36 |
| 105 | 12/03/81 | - | - | - | - |
| 106 | 12/14/81 | - | - | - | - |
| 107 | 12/20/81 | - | - | - | - |
| 108 | 12/26/81 | - | - | - | - |
| 109 | 12/31/81 | - | - | - | - |
| Minimum: | | 0.00 | 0 | 0.000 | 0.01 |
| Maximum: | | 2.59 | 68256 | 0.200 | 2.07 |
| Average: | | 0.26 | 2090 | 0.012 | 0.25 |
| Total: | | 28.81 | 227858 | | 27.09 |

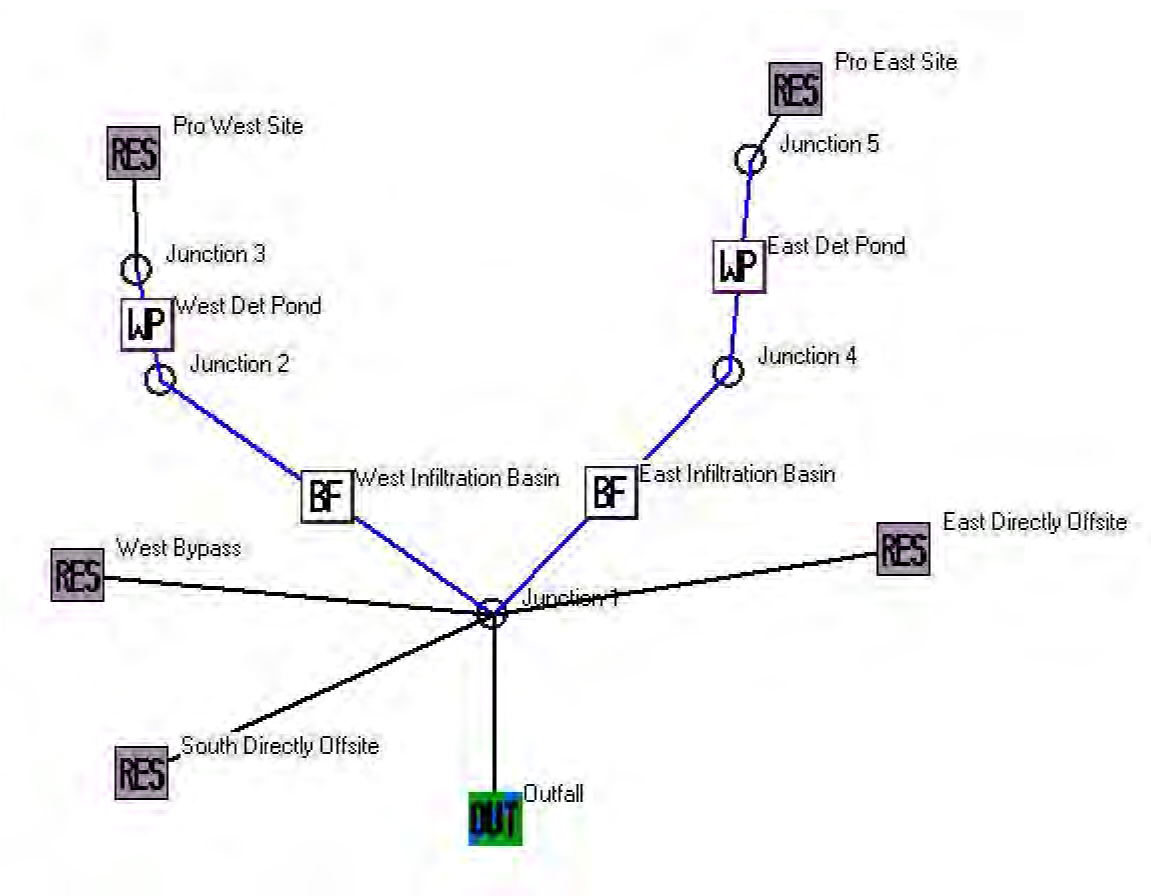
The plat has **<u>27.09</u>** inches of stayon in existing conditions. 90% of 27.09 inches = **<u>24.4 inches of stayon required</u>** to meet stayon requirements for the plat.

## Proposed Infiltration Design:

Proposed Site Infiltration Design:
Stayon Required = 24.4 inches
Note: Assume 0.5 in/hr infiltration can be attained

### WinSlamm Design

## Model Schematic:




## Model Input Information:

**Data file name: U:\User\1904113\Engineering\SWMP\Pro Utterback Slamm.mdb**
**WinSLAMM Version 10.4.1**
**Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.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.ppdx**
**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: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 04-02-2020 Time: 16:56:40
Site information:

LU# 1 - Residential: Pro West Site Total area (ac): 7.400
1 - Roofs 1: 1.190 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
2 - Roofs 2: 0.610 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 0.790 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.120 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 1.010 ac. Intermediate Street Length = 0.768 curb-mi Street Width (assuming two curb-mi per street mile) = 21.69922 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 3.190 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.490 ac. Source Area PSD File:

LU# 2 - Residential: Pro East Site Total area (ac): 18.700
1 - Roofs 1: 3.390 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
2 - Roofs 2: 1.740 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 2.260 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.150 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 2.870 ac. Intermediate Street Length = 1.713 curb-mi Street Width (assuming two curb-mi per street mile) = 27.64448 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 7.390 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.900 ac. Source Area PSD File:

LU# 3 - Residential: South Directly Offsite Total area (ac): 6.600
1 - Roofs 1: 0.050 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
2 - Roofs 2: 0.030 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.620 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 0.040 ac. Intermediate Street Length = 0.044 curb-mi Street Width (assuming two curb-mi per street mile) = 15 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 5.860 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Residential: East Directly Offsite Total area (ac): 2.500
31 - Sidewalks 1: 0.240 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 0.070 ac. Intermediate Street Length = 0.044 curb-mi Street Width (assuming two curb-mi per street mile) = 26.25 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 2.190 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 5 - Residential: West Bypass Total area (ac): 1.100
31 - Sidewalks 1: 0.110 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.990 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Wet Detention Pond CP# 1 (DS) - West Det Pond
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 6
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): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 6
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 30
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 7.75
Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 4
2. Stand pipe height above datum (ft): 7
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 | 0.0190 | 0.00 | 0.00 |
| 2 | 1.00 | 0.0340 | 0.00 | 0.00 |

| | | | | |
|---|---|---|---|---|
| 3 | 2.00 | 0.0560 | 0.00 | 0.00 |
| 4 | 3.00 | 0.0890 | 0.00 | 0.00 |
| 5 | 4.00 | 0.1220 | 0.00 | 0.00 |
| 6 | 5.00 | 0.1560 | 0.00 | 0.00 |
| 7 | 6.00 | 0.3550 | 0.00 | 0.00 |
| 8 | 7.00 | 0.4490 | 0.00 | 0.00 |
| 9 | 8.00 | 0.5470 | 0.00 | 0.00 |
| 10 | 9.00 | 0.6460 | 0.00 | 0.00 |
| 11 | 10.00 | 0.7480 | 0.00 | 0.00 |

**Control Practice 2: Biofilter CP# 1 (DS) - West Infiltration Basin**

1. Top area (square feet) = 10466
2. Bottom aea (square feet) = 3624
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 5
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 4

Outlet type: Surface Discharge Pipe

1. Surface discharge pipe outlet diameter (ft): 1.25
2. Pipe invert elevation above datum (ft): 1
3. Number of surface pipe outlets: 1

**Control Practice 3: Wet Detention Pond CP# 2 (DS) - East Det Pond**

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 6

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): 0.67
2. Number of orifices: 1
3. Invert elevation above datum (ft): 6

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 20
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 8.75

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 4
2. Stand pipe height above datum (ft): 8

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 | 0.2030 | 0.00 | 0.00 |
| 2 | 1.00 | 0.2380 | 0.00 | 0.00 |
| 3 | 2.00 | 0.2750 | 0.00 | 0.00 |
| 4 | 3.00 | 0.3130 | 0.00 | 0.00 |
| 5 | 4.00 | 0.3520 | 0.00 | 0.00 |
| 6 | 5.00 | 0.3900 | 0.00 | 0.00 |
| 7 | 6.00 | 0.7100 | 0.00 | 0.00 |
| 8 | 7.00 | 0.8190 | 0.00 | 0.00 |
| 9 | 8.00 | 0.9310 | 0.00 | 0.00 |
| 10 | 9.00 | 1.0440 | 0.00 | 0.00 |
| 11 | 10.00 | 1.1610 | 0.00 | 0.00 |

**Control Practice 4: Biofilter CP# 2 (DS) - East Infiltration Basin**

1. Top area (square feet) = 19855
2. Bottom aea (square feet) = 8400
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 10
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 4

Outlet type: Surface Discharge Pipe

1. Surface discharge pipe outlet diameter (ft): 1.5
2. Pipe invert elevation above datum (ft): 1
3. Number of surface pipe outlets: 1

# Proposed Infiltration Design:

| | | | | | |
|---|---|---|---|---|---|
| Data File: U:\User\1904113\Engineering\SWMP\Pro Utterback Slamm.mdb | | | | | |
| Rain File: WisReg - Madison WI 1981.RAN | | | | | |
| Date: 04-02-20 Time: 4:59:15 PM | | | | | |
| Site Description: | | | | | |
| | | | | | |
| | | | | | |
| Runoff Volume Total (cf) at the Outfall | | | | | |
| | | | | | |
| Rain Number | Start Date | Rain Total (in) | Outfall Total (cf) | Rv | Total Losses (in.) |
| 73 | 08/28/81 | 0.04 | 99.17 | 0.019 | 0.04 |
| 74 | 08/31/81 | 0.03 | 0.6224 | 0.000 | 0.03 |
| 75 | 08/31/81 | 1.52 | 34950 | 0.174 | 1.25 |
| 76 | 09/07/81 | 0.89 | 11971 | 0.102 | 0.80 |
| 77 | 09/11/81 | 0.08 | 21.02 | 0.002 | 0.08 |
| 78 | 09/16/81 | 0.03 | 0.6224 | 0.000 | 0.03 |
| 79 | 09/21/81 | 0.45 | 575.2 | 0.010 | 0.45 |
| 80 | 09/24/81 | 0.90 | 7729 | 0.065 | 0.84 |
| 81 | 09/26/81 | 0.12 | 40.53 | 0.003 | 0.12 |
| 82 | 09/28/81 | 0.10 | 30.18 | 0.002 | 0.10 |
| 83 | 09/29/81 | 0.16 | 55.90 | 0.003 | 0.16 |
| 84 | 09/30/81 | 0.36 | 370.6 | 0.008 | 0.36 |
| 85 | 10/01/81 | 0.01 | 0.06915 | 0.000 | 0.01 |
| 86 | 10/04/81 | 0.15 | 51.97 | 0.003 | 0.15 |
| 87 | 10/05/81 | 0.04 | 7.682 | 0.001 | 0.04 |
| 88 | 10/05/81 | 0.02 | 0.2766 | 0.000 | 0.02 |
| 89 | 10/09/81 | 0.14 | 48.10 | 0.003 | 0.14 |
| 90 | 10/13/81 | 1.20 | 27507 | 0.174 | 0.99 |
| 91 | 10/15/81 | 0.02 | 0.2766 | 0.000 | 0.02 |
| 92 | 10/17/81 | 0.95 | 19095 | 0.153 | 0.81 |
| 93 | 10/18/81 | 0.06 | 526.3 | 0.067 | 0.06 |
| 94 | 10/21/81 | 0.06 | 13.64 | 0.002 | 0.06 |
| 95 | 10/21/81 | 0.01 | 0.06915 | 0.000 | 0.01 |
| 96 | 10/24/81 | 0.01 | 0.06915 | 0.000 | 0.01 |
| 97 | 10/31/81 | 0.01 | 0.06915 | 0.000 | 0.01 |
| 98 | 11/05/81 | 0.04 | 7.682 | 0.001 | 0.04 |
| 99 | 11/15/81 | 0.07 | 17.14 | 0.002 | 0.07 |
| 100 | 11/18/81 | 0.05 | 10.48 | 0.002 | 0.05 |
| 101 | 11/19/81 | 0.26 | 161.0 | 0.005 | 0.26 |
| 102 | 11/23/81 | 0.18 | 63.94 | 0.003 | 0.18 |
| 103 | 11/25/81 | 0.89 | 7125 | 0.061 | 0.84 |
| 104 | 11/30/81 | 0.37 | 396.0 | 0.008 | 0.37 |
| 105 | 12/03/81 | - | - | - | - |
| 106 | 12/14/81 | - | - | - | - |
| 107 | 12/20/81 | - | - | - | - |
| 108 | 12/26/81 | - | - | - | - |
| 109 | 12/31/81 | - | - | - | - |
| Minimum: | | 0.00 | 0 | 0.000 | 0.01 |
| Maximum: | | 2.59 | 114005 | 0.334 | 1.72 |
| Average: | | 0.26 | 4344 | 0.026 | 0.23 |
| Total: | | 28.81 | 473485 | | 25.23 |

**<u>25.2 inches of stayon attained on the site in proposed conditions.</u>** This exceeds 24.4 inches required in developed conditions

Note: DNR conservation practice standard 1003 states that ponding depth must infiltrate within the maximum allowable draw down period of 24 hours. From the DNR's technical note for sizing infiltration basins, drawdown time is calculated as a function of depression zone vs. infiltration rate.

Depth/kd = Drawdown Time

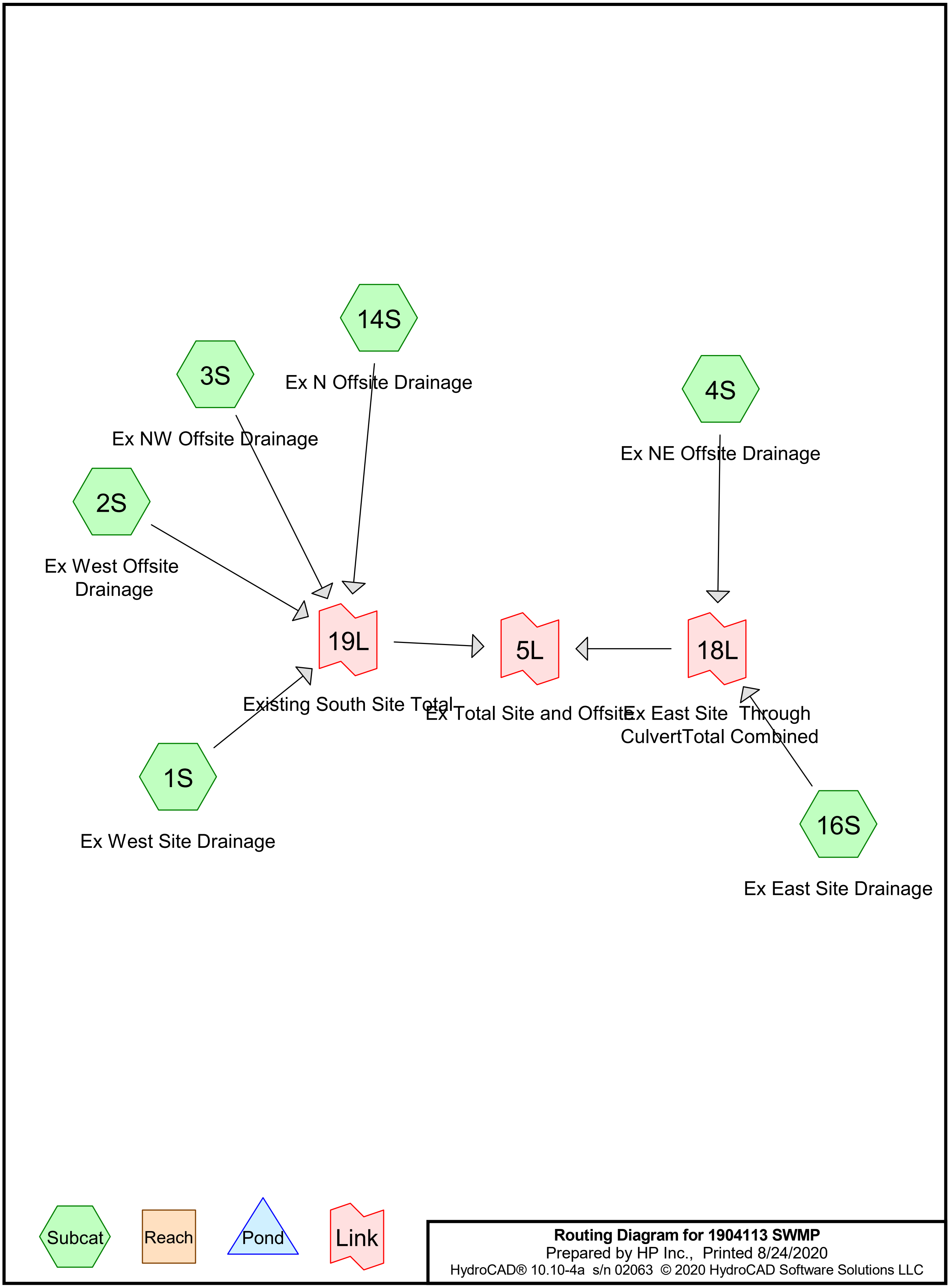
12" is maximum depression zone, and 0.5in/hr is the minimum infiltration rate within the infiltration basin.

12" depression zone/0.50 in/hr = 24 hours is the maximum drawdown after rainfall event.

# APPENDIX D

## HYDROCAD OUTPUT

# Existing Hydrocad




**Routing Diagram for 1904113 SWMP**
Prepared by HP Inc., Printed 8/24/2020
HydroCAD® 10.10-4a s/n 02063 © 2020 HydroCAD Software Solutions LLC

## Summary for Subcatchment 1S: Ex West Site Drainage

Runoff = 1.12 cfs @ 12.65 hrs, Volume= 0.292 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 21.400 | 58 | Type B Soils |
| * | 1.900 | 71 | Type C Soils |
| | 23.300 | 59 | Weighted Average |
| | 23.300 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 9.4 | 1,000 | 0.0140 | 1.77 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 1.1 | 300 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 24.9 | 1,600 | Total | | | |

## Summary for Subcatchment 2S: Ex West Offsite Drainage

Runoff = 0.40 cfs @ 12.62 hrs, Volume= 0.111 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 10.200 | 58 | Type B Soils |
| | 10.200 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 2.4 | 400 | 0.0350 | 2.81 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 3.9 | 1,100 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.7 | 1,800 | Total | | | |

## Summary for Subcatchment 3S: Ex NW Offsite Drainage

Runoff = 1.34 cfs @ 12.85 hrs, Volume= 0.432 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 39.300 | 58 | Type B Soils |
| * | 0.300 | 71 | Type C Soils |
| | 39.600 | 58 | Weighted Average |
| | 39.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 24.0 | 300 | 0.0167 | 0.21 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 8.3 | 1,000 | 0.0180 | 2.01 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 1.0 | 1,100 | 0.0100 | 18.85 | 376.98 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.010 |
| 33.3 | 2,400 | Total | | | |

## Summary for Subcatchment 4S: Ex NE Offsite Drainage

Runoff = 0.86 cfs @ 12.31 hrs, Volume= 0.122 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.600 | 58 | Type B Soils |
| * | 2.500 | 71 | Type C Soils |
| | 6.100 | 63 | Weighted Average |
| | 6.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 11.7 | 300 | 0.1000 | 0.43 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.2 | 200 | 0.0100 | 1.50 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 13.9 | 500 | Total | | | |

## Summary for Subcatchment 14S: Ex N Offsite Drainage

Runoff = 0.59 cfs @ 12.40 hrs, Volume= 0.078 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.200 | 58 | Type B Soils |
| * | 1.700 | 71 | Type C Soils |
| | 2.900 | 66 | Weighted Average |
| | 2.900 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 19.9 | 300 | 0.0267 | 0.25 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 1.1 | 200 | 0.0400 | 3.00 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 21.0 | 500 | Total | | | |

## Summary for Subcatchment 16S: Ex East Site Drainage

Runoff = 0.84 cfs @ 12.54 hrs, Volume= 0.185 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 11.400 | 58 | Type B Soils |
| * | 1.600 | 71 | Type C Soils |
| | 13.000 | 60 | Weighted Average |
| | 13.000 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.3 | 300 | 0.0733 | 0.38 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 6.6 | 700 | 0.0140 | 1.77 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 0.7 | 200 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.6 | 1,200 | Total | | | |

## Summary for Link 5L: Ex Total Site and Offsite

| | | | |
|---|---|---|---|
| Inflow Area = | 95.100 ac, | 0.00% Impervious, Inflow Depth = 0.15" | for 1yr 24hr event |
| Inflow = | 4.35 cfs @ | 12.63 hrs, Volume= | 1.221 af |
| Primary = | 4.35 cfs @ | 12.63 hrs, Volume= | 1.221 af, Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 18L: Ex East Site Through CulvertTotal Combined

| | | | |
|---|---|---|---|
| Inflow Area = | 19.100 ac, | 0.00% Impervious, Inflow Depth = 0.19" | for 1yr 24hr event |
| Inflow = | 1.53 cfs @ | 12.45 hrs, Volume= | 0.308 af |
| Primary = | 1.53 cfs @ | 12.45 hrs, Volume= | 0.308 af, Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 19L: Existing South Site Total

| | | | |
|---|---|---|---|
| Inflow Area = | 76.000 ac, | 0.00% Impervious, Inflow Depth = 0.14" | for 1yr 24hr event |
| Inflow = | 3.09 cfs @ | 12.71 hrs, Volume= | 0.914 af |
| Primary = | 3.09 cfs @ | 12.71 hrs, Volume= | 0.914 af, Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Subcatchment 1S: Ex West Site Drainage

Runoff = 2.56 cfs @ 12.53 hrs, Volume= 0.486 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 21.400 | 58 | Type B Soils |
| * | 1.900 | 71 | Type C Soils |
| | 23.300 | 59 | Weighted Average |
| | 23.300 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 9.4 | 1,000 | 0.0140 | 1.77 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 1.1 | 300 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 24.9 | 1,600 | Total | | | |

## Summary for Subcatchment 2S: Ex West Offsite Drainage

Runoff = 0.97 cfs @ 12.49 hrs, Volume= 0.191 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 10.200 | 58 | Type B Soils |
| | 10.200 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 2.4 | 400 | 0.0350 | 2.81 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 3.9 | 1,100 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.7 | 1,800 | Total | | | |

## Summary for Subcatchment 3S: Ex NW Offsite Drainage

Runoff = 3.20 cfs @ 12.70 hrs, Volume= 0.740 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 39.300 | 58 | Type B Soils |
| * | 0.300 | 71 | Type C Soils |
| | 39.600 | 58 | Weighted Average |
| | 39.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 24.0 | 300 | 0.0167 | 0.21 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 8.3 | 1,000 | 0.0180 | 2.01 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 1.0 | 1,100 | 0.0100 | 18.85 | 376.98 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.010 |
| 33.3 | 2,400 | Total | | | |

## Summary for Subcatchment 4S: Ex NE Offsite Drainage

Runoff = 1.72 cfs @ 12.28 hrs, Volume= 0.187 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.600 | 58 | Type B Soils |
| * | 2.500 | 71 | Type C Soils |
| | 6.100 | 63 | Weighted Average |
| | 6.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 11.7 | 300 | 0.1000 | 0.43 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 2.2 | 200 | 0.0100 | 1.50 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 13.9 | 500 | Total | | | |

## Summary for Subcatchment 14S: Ex N Offsite Drainage

Runoff = 1.00 cfs @ 12.37 hrs, Volume= 0.114 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.200 | 58 | Type B Soils |
| * | 1.700 | 71 | Type C Soils |
| | 2.900 | 66 | Weighted Average |
| | 2.900 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 19.9 | 300 | 0.0267 | 0.25 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 1.1 | 200 | 0.0400 | 3.00 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 21.0 | 500 | Total | | | |

## Summary for Subcatchment 16S: Ex East Site Drainage

Runoff = 1.85 cfs @ 12.43 hrs, Volume= 0.301 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 11.400 | 58 | Type B Soils |
| * | 1.600 | 71 | Type C Soils |
| | 13.000 | 60 | Weighted Average |
| | 13.000 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.3 | 300 | 0.0733 | 0.38 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 6.6 | 700 | 0.0140 | 1.77 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 0.7 | 200 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.6 | 1,200 | Total | | | |

## Summary for Link 5L: Ex Total Site and Offsite

Inflow Area = 95.100 ac, 0.00% Impervious, Inflow Depth = 0.25" for 2yr 24hr event
Inflow = 9.71 cfs @ 12.54 hrs, Volume= 2.019 af
Primary = 9.71 cfs @ 12.54 hrs, Volume= 2.019 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 18L: Ex East Site Through CulvertTotal Combined

Inflow Area = 19.100 ac, 0.00% Impervious, Inflow Depth = 0.31" for 2yr 24hr event
Inflow = 3.22 cfs @ 12.37 hrs, Volume= 0.488 af
Primary = 3.22 cfs @ 12.37 hrs, Volume= 0.488 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 19L: Existing South Site Total

Inflow Area = 76.000 ac, 0.00% Impervious, Inflow Depth = 0.24" for 2yr 24hr event
Inflow = 7.09 cfs @ 12.60 hrs, Volume= 1.531 af
Primary = 7.09 cfs @ 12.60 hrs, Volume= 1.531 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Subcatchment 1S: Ex West Site Drainage

Runoff = 12.44 cfs @ 12.42 hrs, Volume= 1.467 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 21.400 | 58 | Type B Soils |
| * | 1.900 | 71 | Type C Soils |
| | 23.300 | 59 | Weighted Average |
| | 23.300 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 9.4 | 1,000 | 0.0140 | 1.77 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 1.1 | 300 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 24.9 | 1,600 | Total | | | |

## Summary for Subcatchment 2S: Ex West Offsite Drainage

Runoff = 5.42 cfs @ 12.36 hrs, Volume= 0.600 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 10.200 | 58 | Type B Soils |
| | 10.200 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 2.4 | 400 | 0.0350 | 2.81 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 3.9 | 1,100 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.7 | 1,800 | Total | | | |

## Summary for Subcatchment 3S: Ex NW Offsite Drainage

Runoff = 16.34 cfs @ 12.56 hrs, Volume= 2.330 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 39.300 | 58 | Type B Soils |
| * | 0.300 | 71 | Type C Soils |
| | 39.600 | 58 | Weighted Average |
| | 39.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 24.0 | 300 | 0.0167 | 0.21 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 8.3 | 1,000 | 0.0180 | 2.01 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 1.0 | 1,100 | 0.0100 | 18.85 | 376.98 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.010 |
| 33.3 | 2,400 | Total | | | |

## Summary for Subcatchment 4S: Ex NE Offsite Drainage

Runoff = 6.22 cfs @ 12.24 hrs, Volume= 0.492 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.600 | 58 | Type B Soils |
| * | 2.500 | 71 | Type C Soils |
| | 6.100 | 63 | Weighted Average |
| | 6.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 11.7 | 300 | 0.1000 | 0.43 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.2 | 200 | 0.0100 | 1.50 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 13.9 | 500 | Total | | | |

## Summary for Subcatchment 14S: Ex N Offsite Drainage

Runoff = 2.96 cfs @ 12.34 hrs, Volume= 0.276 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.200 | 58 | Type B Soils |
| * | 1.700 | 71 | Type C Soils |
| | 2.900 | 66 | Weighted Average |
| | 2.900 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 19.9 | 300 | 0.0267 | 0.25 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 1.1 | 200 | 0.0400 | 3.00 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 21.0 | 500 | Total | | | |

## Summary for Subcatchment 16S: Ex East Site Drainage

Runoff = 8.43 cfs @ 12.35 hrs, Volume= 0.874 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 11.400 | 58 | Type B Soils |
| * | 1.600 | 71 | Type C Soils |
| | 13.000 | 60 | Weighted Average |
| | 13.000 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.3 | 300 | 0.0733 | 0.38 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 6.6 | 700 | 0.0140 | 1.77 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 0.7 | 200 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.6 | 1,200 | Total | | | |

## Summary for Link 5L: Ex Total Site and Offsite

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 95.100 ac, | 0.00% Impervious, | Inflow Depth = 0.76" | for 10yr 24hr event | |
| Inflow = | 45.73 cfs @ | 12.42 hrs, | Volume= | 6.038 af | |
| Primary = | 45.73 cfs @ | 12.42 hrs, | Volume= | 6.038 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 18L: Ex East Site Through CulvertTotal Combined

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 19.100 ac, | 0.00% Impervious, | Inflow Depth = 0.86" | for 10yr 24hr event | |
| Inflow = | 13.70 cfs @ | 12.30 hrs, | Volume= | 1.365 af | |
| Primary = | 13.70 cfs @ | 12.30 hrs, | Volume= | 1.365 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 19L: Existing South Site Total

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 76.000 ac, | 0.00% Impervious, | Inflow Depth = 0.74" | for 10yr 24hr event | |
| Inflow = | 34.57 cfs @ | 12.46 hrs, | Volume= | 4.673 af | |
| Primary = | 34.57 cfs @ | 12.46 hrs, | Volume= | 4.673 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Subcatchment 1S: Ex West Site Drainage

Runoff = 22.79 cfs @ 12.40 hrs, Volume= 2.408 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 21.400 | 58 | Type B Soils |
| * | 1.900 | 71 | Type C Soils |
| | 23.300 | 59 | Weighted Average |
| | 23.300 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 9.4 | 1,000 | 0.0140 | 1.77 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 1.1 | 300 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 24.9 | 1,600 | Total | | | |

## Summary for Subcatchment 2S: Ex West Offsite Drainage

Runoff = 10.27 cfs @ 12.34 hrs, Volume= 0.998 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 10.200 | 58 | Type B Soils |
| | 10.200 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 2.4 | 400 | 0.0350 | 2.81 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 3.9 | 1,100 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.7 | 1,800 | Total | | | |

## Summary for Subcatchment 3S: Ex NW Offsite Drainage

Runoff = 30.61 cfs @ 12.53 hrs, Volume= 3.875 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 39.300 | 58 | Type B Soils |
| * | 0.300 | 71 | Type C Soils |
| | 39.600 | 58 | Weighted Average |
| | 39.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 24.0 | 300 | 0.0167 | 0.21 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 8.3 | 1,000 | 0.0180 | 2.01 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 1.0 | 1,100 | 0.0100 | 18.85 | 376.98 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.010 |
| 33.3 | 2,400 | Total | | | |

## Summary for Subcatchment 4S: Ex NE Offsite Drainage

Runoff = 10.39 cfs @ 12.23 hrs, Volume= 0.770 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.600 | 58 | Type B Soils |
| * | 2.500 | 71 | Type C Soils |
| | 6.100 | 63 | Weighted Average |
| | 6.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 11.7 | 300 | 0.1000 | 0.43 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.2 | 200 | 0.0100 | 1.50 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 13.9 | 500 | Total | | | |

## Summary for Subcatchment 14S: Ex N Offsite Drainage

Runoff = 4.70 cfs @ 12.33 hrs, Volume= 0.419 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.200 | 58 | Type B Soils |
| * | 1.700 | 71 | Type C Soils |
| | 2.900 | 66 | Weighted Average |
| | 2.900 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 19.9 | 300 | 0.0267 | 0.25 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 1.1 | 200 | 0.0400 | 3.00 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 21.0 | 500 | Total | | | |

## Summary for Subcatchment 16S: Ex East Site Drainage

Runoff = 15.08 cfs @ 12.33 hrs, Volume= 1.416 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 11.400 | 58 | Type B Soils |
| * | 1.600 | 71 | Type C Soils |
| | 13.000 | 60 | Weighted Average |
| | 13.000 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.3 | 300 | 0.0733 | 0.38 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 6.6 | 700 | 0.0140 | 1.77 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 0.7 | 200 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.6 | 1,200 | Total | | | |

## Summary for Link 5L: Ex Total Site and Offsite

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 95.100 ac, | 0.00% Impervious, | Inflow Depth = 1.25" | for 25yr 24hr event | |
| Inflow = | 83.98 cfs @ | 12.40 hrs, | Volume= | 9.886 af | |
| Primary = | 83.98 cfs @ | 12.40 hrs, | Volume= | 9.886 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 18L: Ex East Site Through CulvertTotal Combined

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 19.100 ac, | 0.00% Impervious, | Inflow Depth = 1.37" | for 25yr 24hr event | |
| Inflow = | 24.07 cfs @ | 12.29 hrs, | Volume= | 2.186 af | |
| Primary = | 24.07 cfs @ | 12.29 hrs, | Volume= | 2.186 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 19L: Existing South Site Total

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 76.000 ac, | 0.00% Impervious, | Inflow Depth = 1.22" | for 25yr 24hr event | |
| Inflow = | 64.14 cfs @ | 12.43 hrs, | Volume= | 7.700 af | |
| Primary = | 64.14 cfs @ | 12.43 hrs, | Volume= | 7.700 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Subcatchment 1S: Ex West Site Drainage

Runoff = 45.16 cfs @ 12.38 hrs, Volume= 4.413 af, Depth= 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 21.400 | 58 | Type B Soils |
| * | 1.900 | 71 | Type C Soils |
| | 23.300 | 59 | Weighted Average |
| | 23.300 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 9.4 | 1,000 | 0.0140 | 1.77 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 1.1 | 300 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 24.9 | 1,600 | Total | | | |

## Summary for Subcatchment 2S: Ex West Offsite Drainage

Runoff = 20.81 cfs @ 12.32 hrs, Volume= 1.854 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 10.200 | 58 | Type B Soils |
| | 10.200 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 2.4 | 400 | 0.0350 | 2.81 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 3.9 | 1,100 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.7 | 1,800 | Total | | | |

## Summary for Subcatchment 3S: Ex NW Offsite Drainage

Runoff = 61.96 cfs @ 12.50 hrs, Volume= 7.198 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 39.300 | 58 | Type B Soils |
| * | 0.300 | 71 | Type C Soils |
| | 39.600 | 58 | Weighted Average |
| | 39.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 24.0 | 300 | 0.0167 | 0.21 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 8.3 | 1,000 | 0.0180 | 2.01 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 1.0 | 1,100 | 0.0100 | 18.85 | 376.98 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.010 |
| 33.3 | 2,400 | Total | | | |

## Summary for Subcatchment 4S: Ex NE Offsite Drainage

Runoff = 18.89 cfs @ 12.23 hrs, Volume= 1.347 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.600 | 58 | Type B Soils |
| * | 2.500 | 71 | Type C Soils |
| | 6.100 | 63 | Weighted Average |
| | 6.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 11.7 | 300 | 0.1000 | 0.43 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 2.2 | 200 | 0.0100 | 1.50 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 13.9 | 500 | Total | | | |

## Summary for Subcatchment 14S: Ex N Offsite Drainage

Runoff = 8.21 cfs @ 12.32 hrs, Volume= 0.710 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.200 | 58 | Type B Soils |
| * | 1.700 | 71 | Type C Soils |
| | 2.900 | 66 | Weighted Average |
| | 2.900 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 19.9 | 300 | 0.0267 | 0.25 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 1.1 | 200 | 0.0400 | 3.00 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 21.0 | 500 | Total | | | |

## Summary for Subcatchment 16S: Ex East Site Drainage

Runoff = 29.14 cfs @ 12.32 hrs, Volume= 2.563 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 11.400 | 58 | Type B Soils |
| * | 1.600 | 71 | Type C Soils |
| | 13.000 | 60 | Weighted Average |
| | 13.000 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.3 | 300 | 0.0733 | 0.38 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 6.6 | 700 | 0.0140 | 1.77 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 0.7 | 200 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.6 | 1,200 | Total | | | |

### Summary for Link 5L: Ex Total Site and Offsite

Inflow Area = 95.100 ac, 0.00% Impervious, Inflow Depth = 2.28" for 100yr 24hr event
Inflow = 166.65 cfs @ 12.38 hrs, Volume= 18.085 af
Primary = 166.65 cfs @ 12.38 hrs, Volume= 18.085 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

### Summary for Link 18L: Ex East Site Through CulvertTotal Combined

Inflow Area = 19.100 ac, 0.00% Impervious, Inflow Depth = 2.46" for 100yr 24hr event
Inflow = 45.72 cfs @ 12.28 hrs, Volume= 3.910 af
Primary = 45.72 cfs @ 12.28 hrs, Volume= 3.910 af, Atten= 0%, Lag= 0.0 min

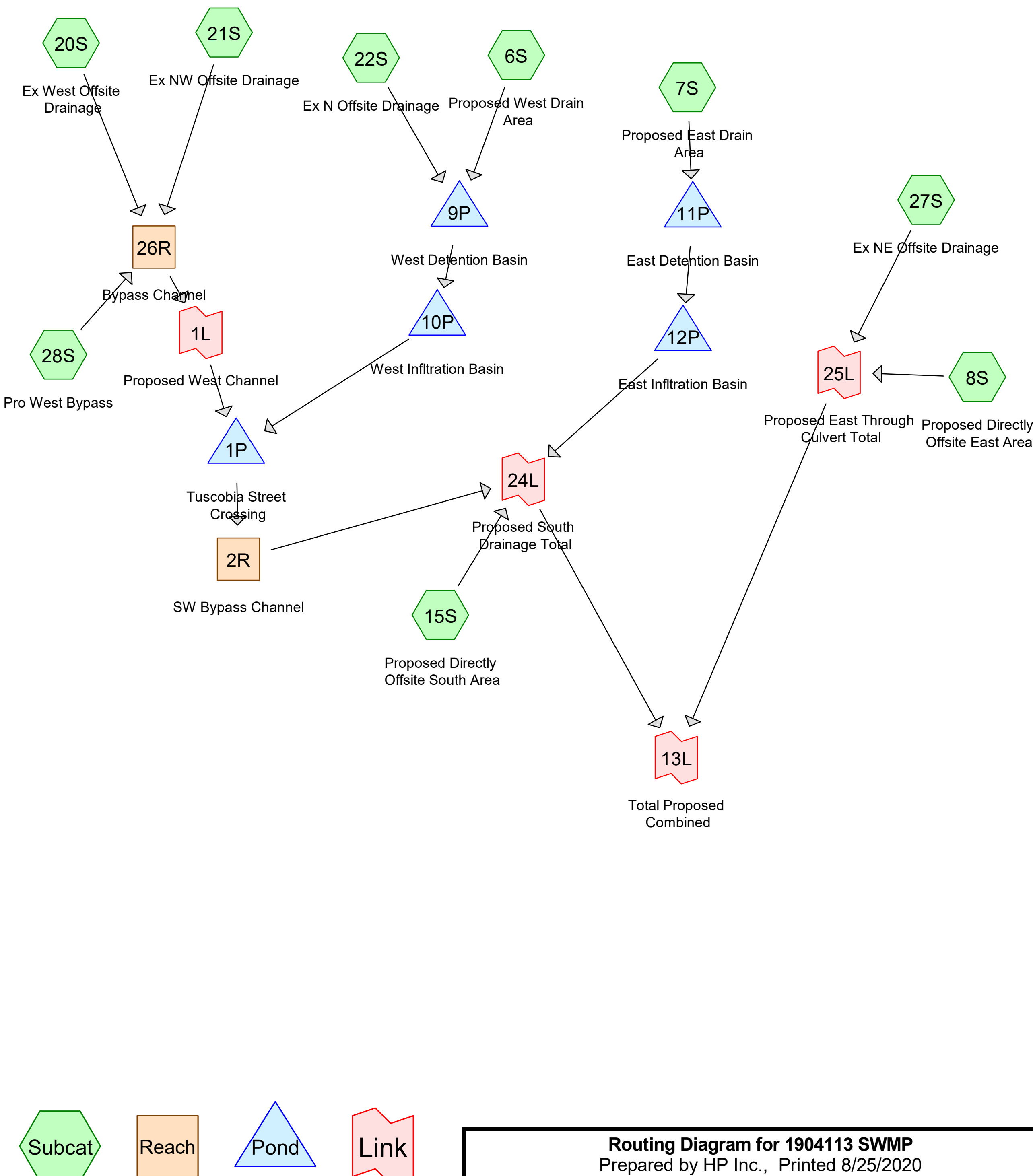
Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

### Summary for Link 19L: Existing South Site Total

Inflow Area = 76.000 ac, 0.00% Impervious, Inflow Depth = 2.24" for 100yr 24hr event
Inflow = 128.47 cfs @ 12.41 hrs, Volume= 14.176 af
Primary = 128.47 cfs @ 12.41 hrs, Volume= 14.176 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

# Proposed Hydrocad




**Routing Diagram for 1904113 SWMP**
Prepared by HP Inc., Printed 8/25/2020
HydroCAD® 10.10-4a s/n 02063 © 2020 HydroCAD Software Solutions LLC

## Summary for Subcatchment 6S: Proposed West Drain Area

Runoff = 13.63 cfs @ 12.14 hrs, Volume= 0.722 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 6.000 | 87 | 60% Impervious Residential |
| * | 1.200 | 74 | 10% Impervious OL Area |
| * | 0.200 | 98 | Wet Basin |
| | 7.400 | 85 | Weighted Average |
| | 7.200 | | 97.30% Pervious Area |
| | 0.200 | | 2.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0800 | 0.31 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 0.3 | 100 | 0.0600 | 4.97 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 0.9 | 550 | 0.0180 | 9.66 | 30.35 | **Pipe Channel, Pipe**<br>24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'<br>n= 0.013 |
| 6.5 | 750 | Total | | | |

## Summary for Subcatchment 7S: Proposed East Drain Area

Runoff = 33.13 cfs @ 12.18 hrs, Volume= 2.030 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 12.900 | 87 | 60% Impervious Residential |
| * | 3.600 | 90 | 70% Impervious Residential |
| * | 1.500 | 74 | 10% Impervious OL |
| * | 0.700 | 98 | Wet Basin |
| | 18.700 | 87 | Weighted Average |
| | 18.000 | | 96.26% Pervious Area |
| | 0.700 | | 3.74% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.4 | 150 | 0.0800 | 0.34 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 0.3 | 100 | 0.0600 | 4.97 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 2.3 | 1,200 | 0.0150 | 8.82 | 27.71 | **Pipe Channel, Pipe**<br>24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'<br>n= 0.013 |
| 10.0 | 1,450 | Total | | | |

## Summary for Subcatchment 8S: Proposed Directly Offsite East Area

Runoff = 0.29 cfs @ 12.49 hrs, Volume= 0.050 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 2.400 | 62 | 10% Impervious Lightly Disturbed/Restored |
| * | 0.100 | 90 | 70% Imp ROW area |
| | 2.500 | 63 | Weighted Average |
| | 2.500 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 21.3 | 200 | 0.0100 | 0.16 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.3 | 400 | 0.0200 | 2.87 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 23.6 | 600 | Total | | | |

## Summary for Subcatchment 15S: Proposed Directly Offsite South Area

Runoff = 0.66 cfs @ 12.64 hrs, Volume= 0.132 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 6.200 | 62 | 10% Impervious Lightly Disturbed/Restored |
| * | 0.200 | 82 | 40% Imp yard area |
| * | 0.200 | 90 | 70% Imp ROW area |
| | 6.600 | 63 | Weighted Average |
| | 6.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 29.5 | 300 | 0.0100 | 0.17 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 3.3 | 400 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 32.8 | 700 | Total | | | |

## Summary for Subcatchment 20S: Ex West Offsite Drainage

Runoff = 0.40 cfs @ 12.62 hrs, Volume= 0.111 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 10.200 | 58 | Type B Soils |
| | 10.200 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.4 | 400 | 0.0350 | 2.81 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 3.9 | 1,100 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.7 | 1,800 | Total | | | |

## Summary for Subcatchment 21S: Ex NW Offsite Drainage

Runoff = 1.34 cfs @ 12.85 hrs, Volume= 0.432 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 39.300 | 58 | Type B Soils |
| * | 0.300 | 71 | Type C Soils |
| | 39.600 | 58 | Weighted Average |
| | 39.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 24.0 | 300 | 0.0167 | 0.21 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 8.3 | 1,000 | 0.0180 | 2.01 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 1.0 | 1,100 | 0.0100 | 18.85 | 376.98 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.010 |
| 33.3 | 2,400 | Total | | | |

## Summary for Subcatchment 22S: Ex N Offsite Drainage

Runoff = 0.59 cfs @ 12.40 hrs, Volume= 0.078 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.200 | 58 | Type B Soils |
| * | 1.700 | 71 | Type C Soils |
| | 2.900 | 66 | Weighted Average |
| | 2.900 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 19.9 | 300 | 0.0267 | 0.25 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 1.1 | 200 | 0.0400 | 3.00 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 21.0 | 500 | Total | | | |

## Summary for Subcatchment 27S: Ex NE Offsite Drainage

Runoff = 0.86 cfs @ 12.31 hrs, Volume= 0.122 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.600 | 58 | Type B Soils |
| * | 2.500 | 71 | Type C Soils |
| | 6.100 | 63 | Weighted Average |
| | 6.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 11.7 | 300 | 0.1000 | 0.43 | | **Sheet Flow, Sheet**<br>Range   n= 0.130   P2= 2.84" |
| 2.2 | 200 | 0.0100 | 1.50 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway   Kv= 15.0 fps |
| 13.9 | 500 | Total | | | |

## Summary for Subcatchment 28S: Pro West Bypass

Runoff = 1.00 cfs @ 12.14 hrs,  Volume= 0.055 af,  Depth=  0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4  1yr 24hr Rainfall=2.49"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.100 | 74 | OL Area 10% Imp |
| | 1.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | | | | | **Direct Entry, TC** |

## Summary for Reach 2R: SW Bypass Channel

Inflow Area = 61.200 ac,  0.33% Impervious,  Inflow Depth =  0.21"  for  1yr 24hr event
Inflow = 1.77 cfs @ 12.97 hrs,  Volume= 1.063 af
Outflow = 1.76 cfs @ 13.04 hrs,  Volume= 1.063 af,  Atten= 1%,  Lag= 4.3 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Max. Velocity= 0.96 fps,  Min. Travel Time= 5.3 min
Avg. Velocity = 0.47 fps,  Avg. Travel Time= 10.9 min

Peak Storage= 562 cf @ 13.04 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 11.38'
Bank-Full Depth= 2.00'  Flow Area= 36.0 sf,  Capacity= 142.48 cfs

10.00'  x  2.00'  deep channel,  n= 0.040
Side Slope Z-value= 4.0 '/'   Top Width= 26.00'
Length= 305.0'   Slope= 0.0075 '/'
Inlet Invert= 864.00',  Outlet Invert= 861.70'

‡

## Summary for Reach 26R: Bypass Channel

Inflow Area = 50.900 ac, 0.00% Impervious, Inflow Depth = 0.14" for 1yr 24hr event
Inflow = 1.82 cfs @ 12.81 hrs, Volume= 0.599 af
Outflow = 1.77 cfs @ 12.95 hrs, Volume= 0.599 af, Atten= 3%, Lag= 8.5 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Max. Velocity= 0.96 fps, Min. Travel Time= 9.2 min
Avg. Velocity = 0.49 fps, Avg. Travel Time= 18.1 min

Peak Storage= 980 cf @ 12.95 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 11.38'
Bank-Full Depth= 2.00' Flow Area= 36.0 sf, Capacity= 142.54 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 530.0' Slope= 0.0075 '/'
Inlet Invert= 869.00', Outlet Invert= 865.00'

‡

## Summary for Pond 1P: Tuscobia Street Crossing

Inflow Area = 61.200 ac, 0.33% Impervious, Inflow Depth = 0.21" for 1yr 24hr event
Inflow = 1.77 cfs @ 12.95 hrs, Volume= 1.063 af
Outflow = 1.77 cfs @ 12.97 hrs, Volume= 1.063 af, Atten= 0%, Lag= 1.1 min
Primary = 1.77 cfs @ 12.97 hrs, Volume= 1.063 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 865.26' @ 12.97 hrs Surf.Area= 789 sf Storage= 129 cf

Plug-Flow detention time= 1.7 min calculated for 1.063 af (100% of inflow)
Center-of-Mass det. time= 1.7 min ( 1,233.1 - 1,231.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 865.00' | 51,515 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 865.00 | 194 | 0 | 0 |
| 866.00 | 2,455 | 1,325 | 1,325 |
| 867.00 | 5,342 | 3,899 | 5,223 |
| 868.00 | 9,972 | 7,657 | 12,880 |
| 869.00 | 15,610 | 12,791 | 25,671 |
| 870.00 | 36,077 | 25,844 | 51,515 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 865.00' | **38.0" W x 24.0" H, R=31.2" Elliptical RCP_Elliptical 38x24 X 3.00**<br>L= 135.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 865.00' / 864.00' S= 0.0074 '/' Cc= 0.900<br>n= 0.013, Flow Area= 5.10 sf |
| #2 | Primary | 869.55' | **Asymmetrical Weir, C= 3.27**<br>Offset (feet) 0.00 25.00 50.00 75.00 100.00 125.00 168.00<br>Elev. (feet) 870.14 869.96 869.75 869.55 869.56 869.69 870.14 |

**Primary OutFlow** Max=1.77 cfs @ 12.97 hrs HW=865.26' TW=864.17' (Dynamic Tailwater)
**1=RCP_Elliptical 38x24** (Inlet Controls 1.77 cfs @ 1.46 fps)
**2=Asymmetrical Weir** ( Controls 0.00 cfs)

## Summary for Pond 9P: West Detention Basin

Inflow Area = 10.300 ac, 1.94% Impervious, Inflow Depth = 0.93" for 1yr 24hr event
Inflow = 13.72 cfs @ 12.14 hrs, Volume= 0.800 af
Outflow = 0.44 cfs @ 15.14 hrs, Volume= 0.756 af, Atten= 97%, Lag= 180.2 min
Primary = 0.44 cfs @ 15.14 hrs, Volume= 0.756 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 868.26' @ 15.14 hrs Surf.Area= 20,686 sf Storage= 22,708 cf

Plug-Flow detention time= 669.3 min calculated for 0.756 af (94% of inflow)
Center-of-Mass det. time= 642.1 min ( 1,473.4 - 831.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 867.00' | 95,625 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 867.00 | 15,467 | 0 | 0 |
| 868.00 | 19,599 | 17,533 | 17,533 |
| 869.00 | 23,831 | 21,715 | 39,248 |
| 870.00 | 28,163 | 25,997 | 65,245 |
| 871.00 | 32,596 | 30,380 | 95,625 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 866.00' | **18.0" Round Culvert**<br>L= 50.0' RCP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 866.00' / 866.00' S= 0.0000 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.77 sf |
| #2 | Device 1 | 867.00' | **4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 869.00' | **48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #4 | Primary | 869.75' | **30.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.44 cfs @ 15.14 hrs HW=868.26' TW=866.96' (Dynamic Tailwater)
**1=Culvert** (Passes 0.44 cfs of 7.94 cfs potential flow)
**2=Orifice/Grate** (Orifice Controls 0.44 cfs @ 5.03 fps)
**3=Orifice/Grate** ( Controls 0.00 cfs)
**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 10P: West Infltration Basin

Inflow Area = 10.300 ac, 1.94% Impervious, Inflow Depth > 0.88" for 1yr 24hr event
Inflow = 0.44 cfs @ 15.14 hrs, Volume= 0.756 af
Outflow = 0.41 cfs @ 18.56 hrs, Volume= 0.661 af, Atten= 8%, Lag= 205.4 min
Discarded = 0.07 cfs @ 18.56 hrs, Volume= 0.197 af
Primary = 0.34 cfs @ 18.56 hrs, Volume= 0.464 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 867.27' @ 18.56 hrs Surf.Area= 5,085 sf Storage= 5,517 cf

Plug-Flow detention time= 288.3 min calculated for 0.661 af (87% of inflow)
Center-of-Mass det. time= 155.9 min ( 1,629.3 - 1,473.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 866.00' | 34,052 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 866.00 | 3,624 | 0 | 0 |
| 867.00 | 4,745 | 4,185 | 4,185 |
| 868.00 | 6,000 | 5,373 | 9,557 |
| 869.00 | 7,386 | 6,693 | 16,250 |
| 870.00 | 8,876 | 8,131 | 24,381 |
| 871.00 | 10,466 | 9,671 | 34,052 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 866.00' | **0.500 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 860.00' |
| #2 | Primary | 867.00' | **15.0" Round Culvert**<br>L= 50.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 867.00' / 866.50' S= 0.0100 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.23 sf |
| #3 | Primary | 870.00' | **5.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Discarded OutFlow** Max=0.07 cfs @ 18.56 hrs HW=867.27' (Free Discharge)
**1=Exfiltration** ( Controls 0.07 cfs)

**Primary OutFlow** Max=0.34 cfs @ 18.56 hrs HW=867.27' TW=865.18' (Dynamic Tailwater)
**2=Culvert** (Barrel Controls 0.34 cfs @ 2.59 fps)
**3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 11P: East Detention Basin

```
Inflow Area =      18.700 ac,   3.74% Impervious,  Inflow Depth =   1.30"    for  1yr 24hr event
Inflow      =     33.13 cfs @  12.18 hrs,  Volume=           2.030 af
Outflow     =      1.85 cfs @  13.66 hrs,  Volume=           1.953 af,  Atten= 94%,  Lag= 89.0 min
Primary     =      1.85 cfs @  13.66 hrs,  Volume=           1.953 af
```

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 863.55' @ 13.66 hrs Surf.Area= 38,370 sf Storage= 53,718 cf

Plug-Flow detention time= 447.3 min calculated for 1.953 af (96% of inflow)
Center-of-Mass det. time= 427.0 min ( 1,246.9 - 819.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 162,500 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 30,928 | 0 | 0 |
| 863.00 | 35,693 | 33,311 | 33,311 |
| 864.00 | 40,550 | 38,122 | 71,432 |
| 865.00 | 45,509 | 43,030 | 114,462 |
| 866.00 | 50,568 | 48,039 | 162,500 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 861.00' | **24.0" Round Culvert**<br>L= 50.0' RCP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 861.00' / 861.00' S= 0.0000 '/' Cc= 0.900<br>n= 0.013, Flow Area= 3.14 sf |
| #2 | Device 1 | 862.00' | **8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 864.00' | **48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #4 | Primary | 864.75' | **20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=1.85 cfs @ 13.66 hrs HW=863.55' TW=861.97' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.85 cfs of 13.93 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.85 cfs @ 5.31 fps)
  - **3=Orifice/Grate** ( Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 12P: East Infltration Basin

```
Inflow Area =      18.700 ac,   3.74% Impervious,  Inflow Depth >   1.25"    for  1yr 24hr event
Inflow      =      1.85 cfs @  13.66 hrs,  Volume=           1.953 af
Outflow     =      1.56 cfs @  16.50 hrs,  Volume=           1.778 af,  Atten= 16%,  Lag= 170.3 min
Discarded   =      0.16 cfs @  16.50 hrs,  Volume=           0.447 af
Primary     =      1.39 cfs @  16.50 hrs,  Volume=           1.331 af
```

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2

Peak Elev= 862.54' @ 16.50 hrs Surf.Area= 11,691 sf Storage= 15,484 cf

Plug-Flow detention time= 254.6 min calculated for 1.777 af (91% of inflow)
Center-of-Mass det. time= 161.8 min ( 1,408.7 - 1,246.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 861.00' | 69,661 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 861.00 | 8,400 | 0 | 0 |
| 862.00 | 10,501 | 9,451 | 9,451 |
| 863.00 | 12,689 | 11,595 | 21,046 |
| 864.00 | 14,977 | 13,833 | 34,879 |
| 865.00 | 17,366 | 16,172 | 51,050 |
| 866.00 | 19,855 | 18,611 | 69,661 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 861.00' | **0.500 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 855.00' |
| #2 | Primary | 862.00' | **18.0" Round Culvert**<br>L= 50.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.50' S= 0.0100 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.77 sf |
| #3 | Primary | 865.00' | **4.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Discarded OutFlow** Max=0.16 cfs @ 16.50 hrs HW=862.54' (Free Discharge)
└─**1=Exfiltration** ( Controls 0.16 cfs)

**Primary OutFlow** Max=1.39 cfs @ 16.50 hrs HW=862.54' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 1.39 cfs @ 3.58 fps)
└─**3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 1L: Proposed West Channel

Inflow Area = 50.900 ac, 0.00% Impervious, Inflow Depth = 0.14" for 1yr 24hr event
Inflow = 1.77 cfs @ 12.95 hrs, Volume= 0.599 af
Primary = 1.77 cfs @ 12.95 hrs, Volume= 0.599 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 13L: Total Proposed Combined

Inflow Area = 95.100 ac, 0.95% Impervious, Inflow Depth = 0.34" for 1yr 24hr event
Inflow = 2.78 cfs @ 12.91 hrs, Volume= 2.699 af
Primary = 2.78 cfs @ 12.91 hrs, Volume= 2.699 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 24L: Proposed South Drainage Total

| | | | | | | |
|---|---|---|---|---|---|---|
| Inflow Area = | 86.500 ac, | 1.04% Impervious, | Inflow Depth = | 0.35" | for 1yr 24hr event | |
| Inflow = | 2.29 cfs @ | 17.08 hrs, | Volume= | 2.526 af | | |
| Primary = | 2.29 cfs @ | 17.08 hrs, | Volume= | 2.526 af, | Atten= 0%, | Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 25L: Proposed East Through Culvert Total

| | | | | | | |
|---|---|---|---|---|---|---|
| Inflow Area = | 8.600 ac, | 0.00% Impervious, | Inflow Depth = | 0.24" | for 1yr 24hr event | |
| Inflow = | 1.07 cfs @ | 12.35 hrs, | Volume= | 0.173 af | | |
| Primary = | 1.07 cfs @ | 12.35 hrs, | Volume= | 0.173 af, | Atten= 0%, | Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Subcatchment 6S: Proposed West Drain Area

Runoff = 16.92 cfs @ 12.14 hrs, Volume= 0.897 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 6.000 | 87 | 60% Impervious Residential |
| * | 1.200 | 74 | 10% Impervious OL Area |
| * | 0.200 | 98 | Wet Basin |
| | 7.400 | 85 | Weighted Average |
| | 7.200 | | 97.30% Pervious Area |
| | 0.200 | | 2.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0800 | 0.31 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 0.3 | 100 | 0.0600 | 4.97 | | **Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps |
| 0.9 | 550 | 0.0180 | 9.66 | 30.35 | **Pipe Channel, Pipe** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 |
| 6.5 | 750 | Total | | | |

## Summary for Subcatchment 7S: Proposed East Drain Area

Runoff = 40.59 cfs @ 12.18 hrs, Volume= 2.494 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 12.900 | 87 | 60% Impervious Residential |
| * | 3.600 | 90 | 70% Impervious Residential |
| * | 1.500 | 74 | 10% Impervious OL |
| * | 0.700 | 98 | Wet Basin |
| | 18.700 | 87 | Weighted Average |
| | 18.000 | | 96.26% Pervious Area |
| | 0.700 | | 3.74% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.4 | 150 | 0.0800 | 0.34 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 0.3 | 100 | 0.0600 | 4.97 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 2.3 | 1,200 | 0.0150 | 8.82 | 27.71 | **Pipe Channel, Pipe**<br>24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'<br>n= 0.013 |
| 10.0 | 1,450 | Total | | | |

## Summary for Subcatchment 8S: Proposed Directly Offsite East Area

Runoff = 0.55 cfs @ 12.44 hrs, Volume= 0.077 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 2.400 | 62 | 10% Impervious Lightly Disturbed/Restored |
| * | 0.100 | 90 | 70% Imp ROW area |
| | 2.500 | 63 | Weighted Average |
| | 2.500 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 21.3 | 200 | 0.0100 | 0.16 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.3 | 400 | 0.0200 | 2.87 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 23.6 | 600 | Total | | | |

## Summary for Subcatchment 15S: Proposed Directly Offsite South Area

Runoff = 1.22 cfs @ 12.59 hrs, Volume= 0.202 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 6.200 | 62 | 10% Impervious Lightly Disturbed/Restored |
| * | 0.200 | 82 | 40% Imp yard area |
| * | 0.200 | 90 | 70% Imp ROW area |
| | 6.600 | 63 | Weighted Average |
| | 6.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 29.5 | 300 | 0.0100 | 0.17 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 3.3 | 400 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 32.8 | 700 | Total | | | |

## Summary for Subcatchment 20S: Ex West Offsite Drainage

Runoff = 0.97 cfs @ 12.49 hrs, Volume= 0.191 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 10.200 | 58 | Type B Soils |
| | 10.200 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.4 | 400 | 0.0350 | 2.81 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 3.9 | 1,100 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.7 | 1,800 | Total | | | |

## Summary for Subcatchment 21S: Ex NW Offsite Drainage

Runoff = 3.20 cfs @ 12.70 hrs, Volume= 0.740 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 39.300 | 58 | Type B Soils |
| * | 0.300 | 71 | Type C Soils |
| | 39.600 | 58 | Weighted Average |
| | 39.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 24.0 | 300 | 0.0167 | 0.21 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 8.3 | 1,000 | 0.0180 | 2.01 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 1.0 | 1,100 | 0.0100 | 18.85 | 376.98 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.010 |
| 33.3 | 2,400 | Total | | | |

## Summary for Subcatchment 22S: Ex N Offsite Drainage

Runoff = 1.00 cfs @ 12.37 hrs, Volume= 0.114 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.200 | 58 | Type B Soils |
| * | 1.700 | 71 | Type C Soils |
| | 2.900 | 66 | Weighted Average |
| | 2.900 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 19.9 | 300 | 0.0267 | 0.25 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 1.1 | 200 | 0.0400 | 3.00 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 21.0 | 500 | Total | | | |

## Summary for Subcatchment 27S: Ex NE Offsite Drainage

Runoff = 1.72 cfs @ 12.28 hrs, Volume= 0.187 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.600 | 58 | Type B Soils |
| * | 2.500 | 71 | Type C Soils |
| | 6.100 | 63 | Weighted Average |
| | 6.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 11.7 | 300 | 0.1000 | 0.43 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.2 | 200 | 0.0100 | 1.50 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 13.9 | 500 | Total | | | |

## Summary for Subcatchment 28S: Pro West Bypass

Runoff = 1.38 cfs @ 12.14 hrs, Volume= 0.074 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.100 | 74 | OL Area 10% Imp |
| | 1.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | | | | | **Direct Entry, TC** |

## Summary for Reach 2R: SW Bypass Channel

Inflow Area = 61.200 ac, 0.33% Impervious, Inflow Depth > 0.32" for 2yr 24hr event
Inflow = 4.10 cfs @ 12.76 hrs, Volume= 1.650 af
Outflow = 4.07 cfs @ 12.81 hrs, Volume= 1.650 af, Atten= 1%, Lag= 2.8 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Max. Velocity= 1.30 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.54 fps, Avg. Travel Time= 9.5 min

Peak Storage= 958 cf @ 12.81 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 12.26'
Bank-Full Depth= 2.00' Flow Area= 36.0 sf, Capacity= 142.48 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 305.0' Slope= 0.0075 '/'
Inlet Invert= 864.00', Outlet Invert= 861.70'

## Summary for Reach 26R: Bypass Channel

Inflow Area = 50.900 ac, 0.00% Impervious, Inflow Depth = 0.24" for 2yr 24hr event
Inflow = 4.22 cfs @ 12.66 hrs, Volume= 1.005 af
Outflow = 4.11 cfs @ 12.74 hrs, Volume= 1.005 af, Atten= 3%, Lag= 4.7 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Max. Velocity= 1.30 fps, Min. Travel Time= 6.8 min
Avg. Velocity = 0.56 fps, Avg. Travel Time= 15.7 min

Peak Storage= 1,673 cf @ 12.74 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 12.27'
Bank-Full Depth= 2.00' Flow Area= 36.0 sf, Capacity= 142.54 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 530.0' Slope= 0.0075 '/'
Inlet Invert= 869.00', Outlet Invert= 865.00'

‡

## Summary for Pond 1P: Tuscobia Street Crossing

Inflow Area = 61.200 ac, 0.33% Impervious, Inflow Depth > 0.32" for 2yr 24hr event
Inflow = 4.11 cfs @ 12.74 hrs, Volume= 1.651 af
Outflow = 4.10 cfs @ 12.76 hrs, Volume= 1.650 af, Atten= 0%, Lag= 1.0 min
Primary = 4.10 cfs @ 12.76 hrs, Volume= 1.650 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 865.40' @ 12.76 hrs Surf.Area= 1,105 sf Storage= 262 cf

Plug-Flow detention time= 1.5 min calculated for 1.650 af (100% of inflow)
Center-of-Mass det. time= 1.3 min ( 1,216.8 - 1,215.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 865.00' | 51,515 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 865.00 | 194 | 0 | 0 |
| 866.00 | 2,455 | 1,325 | 1,325 |
| 867.00 | 5,342 | 3,899 | 5,223 |
| 868.00 | 9,972 | 7,657 | 12,880 |
| 869.00 | 15,610 | 12,791 | 25,671 |
| 870.00 | 36,077 | 25,844 | 51,515 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 865.00' | **38.0" W x 24.0" H, R=31.2" Elliptical RCP_Elliptical 38x24 X 3.00** L= 135.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 865.00' / 864.00' S= 0.0074 '/' Cc= 0.900 n= 0.013, Flow Area= 5.10 sf |
| #2 | Primary | 869.55' | **Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 25.00 50.00 75.00 100.00 125.00 168.00 Elev. (feet) 870.14 869.96 869.75 869.55 869.56 869.69 870.14 |

**Primary OutFlow** Max=4.10 cfs @ 12.76 hrs HW=865.40' TW=864.28' (Dynamic Tailwater)
├─**1=RCP_Elliptical 38x24** (Inlet Controls 4.10 cfs @ 1.82 fps)
└─**2=Asymmetrical Weir** ( Controls 0.00 cfs)

## Summary for Pond 9P: West Detention Basin

| | | | | |
|---|---|---|---|---|
| Inflow Area = | 10.300 ac, | 1.94% Impervious, | Inflow Depth = 1.18" | for 2yr 24hr event |
| Inflow = | 17.15 cfs @ | 12.14 hrs, Volume= | 1.011 af | |
| Outflow = | 0.50 cfs @ | 15.21 hrs, Volume= | 0.950 af, | Atten= 97%, Lag= 184.5 min |
| Primary = | 0.50 cfs @ | 15.21 hrs, Volume= | 0.950 af | |

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 868.58' @ 15.21 hrs Surf.Area= 22,045 sf Storage= 29,569 cf

Plug-Flow detention time= 742.3 min calculated for 0.950 af (94% of inflow)
Center-of-Mass det. time= 711.9 min ( 1,538.3 - 826.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 867.00' | 95,625 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 867.00 | 15,467 | 0 | 0 |
| 868.00 | 19,599 | 17,533 | 17,533 |
| 869.00 | 23,831 | 21,715 | 39,248 |
| 870.00 | 28,163 | 25,997 | 65,245 |
| 871.00 | 32,596 | 30,380 | 95,625 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 866.00' | **18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 866.00' / 866.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf |
| #2 | Device 1 | 867.00' | **4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 869.00' | **48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #4 | Primary | 869.75' | **30.0' 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=0.50 cfs @ 15.21 hrs HW=868.58' TW=867.12' (Dynamic Tailwater)
**1=Culvert** (Passes 0.50 cfs of 9.48 cfs potential flow)
**2=Orifice/Grate** (Orifice Controls 0.50 cfs @ 5.72 fps)
**3=Orifice/Grate** ( Controls 0.00 cfs)
**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 10P: West Infltration Basin

| | | | | |
|---|---|---|---|---|
| Inflow Area = | 10.300 ac, | 1.94% Impervious, Inflow Depth > | 1.11" | for 2yr 24hr event |
| Inflow = | 0.50 cfs @ | 15.21 hrs, Volume= | 0.950 af | |
| Outflow = | 0.47 cfs @ | 18.20 hrs, Volume= | 0.847 af, | Atten= 6%, Lag= 179.1 min |
| Discarded = | 0.07 cfs @ | 18.20 hrs, Volume= | 0.201 af | |
| Primary = | 0.40 cfs @ | 18.20 hrs, Volume= | 0.645 af | |

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 867.30' @ 18.20 hrs Surf.Area= 5,117 sf Storage= 5,645 cf

Plug-Flow detention time= 250.6 min calculated for 0.846 af (89% of inflow)
Center-of-Mass det. time= 129.0 min ( 1,667.3 - 1,538.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 866.00' | 34,052 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 866.00 | 3,624 | 0 | 0 |
| 867.00 | 4,745 | 4,185 | 4,185 |
| 868.00 | 6,000 | 5,373 | 9,557 |
| 869.00 | 7,386 | 6,693 | 16,250 |
| 870.00 | 8,876 | 8,131 | 24,381 |
| 871.00 | 10,466 | 9,671 | 34,052 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 866.00' | **0.500 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 860.00' |
| #2 | Primary | 867.00' | **15.0" Round Culvert**<br>L= 50.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 867.00' / 866.50' S= 0.0100 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.23 sf |
| #3 | Primary | 870.00' | **5.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Discarded OutFlow** Max=0.07 cfs @ 18.20 hrs HW=867.30' (Free Discharge)
**1=Exfiltration** ( Controls 0.07 cfs)

**Primary OutFlow** Max=0.40 cfs @ 18.20 hrs HW=867.30' TW=865.21' (Dynamic Tailwater)
**2=Culvert** (Barrel Controls 0.40 cfs @ 2.71 fps)
**3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 11P: East Detention Basin

```
Inflow Area =      18.700 ac,   3.74% Impervious,  Inflow Depth =   1.60"    for  2yr 24hr event
Inflow      =      40.59 cfs @  12.18 hrs,  Volume=          2.494 af
Outflow     =       2.11 cfs @  13.68 hrs,  Volume=          2.409 af,  Atten= 95%,  Lag= 90.3 min
Primary     =       2.11 cfs @  13.68 hrs,  Volume=          2.409 af
```

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 863.90' @ 13.68 hrs Surf.Area= 40,085 sf Storage= 67,574 cf

Plug-Flow detention time= 476.8 min calculated for 2.407 af (97% of inflow)
Center-of-Mass det. time= 459.0 min ( 1,274.0 - 815.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 162,500 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 30,928 | 0 | 0 |
| 863.00 | 35,693 | 33,311 | 33,311 |
| 864.00 | 40,550 | 38,122 | 71,432 |
| 865.00 | 45,509 | 43,030 | 114,462 |
| 866.00 | 50,568 | 48,039 | 162,500 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 861.00' | **24.0" Round Culvert**<br>L= 50.0' RCP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 861.00' / 861.00' S= 0.0000 '/' Cc= 0.900<br>n= 0.013, Flow Area= 3.14 sf |
| #2 | Device 1 | 862.00' | **8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 864.00' | **48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #4 | Primary | 864.75' | **20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=2.11 cfs @ 13.68 hrs HW=863.90' TW=862.15' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.11 cfs of 16.45 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 2.11 cfs @ 6.03 fps)
  └─**3=Orifice/Grate** ( Controls 0.00 cfs)
└─**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 12P: East Infltration Basin

```
Inflow Area =      18.700 ac,   3.74% Impervious,  Inflow Depth >   1.55"    for  2yr 24hr event
Inflow      =       2.11 cfs @  13.68 hrs,  Volume=          2.409 af
Outflow     =       1.82 cfs @  16.32 hrs,  Volume=          2.216 af,  Atten= 14%,  Lag= 158.3 min
Discarded   =       0.17 cfs @  16.32 hrs,  Volume=          0.458 af
Primary     =       1.65 cfs @  16.32 hrs,  Volume=          1.759 af
```

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2

Peak Elev= 862.60' @ 16.32 hrs Surf.Area= 11,811 sf Storage= 16,128 cf

Plug-Flow detention time= 219.2 min calculated for 2.215 af (92% of inflow)
Center-of-Mass det. time= 135.0 min ( 1,409.0 - 1,274.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 861.00' | 69,661 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 861.00 | 8,400 | 0 | 0 |
| 862.00 | 10,501 | 9,451 | 9,451 |
| 863.00 | 12,689 | 11,595 | 21,046 |
| 864.00 | 14,977 | 13,833 | 34,879 |
| 865.00 | 17,366 | 16,172 | 51,050 |
| 866.00 | 19,855 | 18,611 | 69,661 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 861.00' | **0.500 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 855.00' |
| #2 | Primary | 862.00' | **18.0" Round Culvert**<br>L= 50.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.50' S= 0.0100 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.77 sf |
| #3 | Primary | 865.00' | **4.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Discarded OutFlow** Max=0.17 cfs @ 16.32 hrs HW=862.60' (Free Discharge)
└─**1=Exfiltration** ( Controls 0.17 cfs)

**Primary OutFlow** Max=1.65 cfs @ 16.32 hrs HW=862.60' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 1.65 cfs @ 3.72 fps)
└─**3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 1L: Proposed West Channel

Inflow Area = 50.900 ac, 0.00% Impervious, Inflow Depth = 0.24" for 2yr 24hr event
Inflow = 4.11 cfs @ 12.74 hrs, Volume= 1.005 af
Primary = 4.11 cfs @ 12.74 hrs, Volume= 1.005 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 13L: Total Proposed Combined

Inflow Area = 95.100 ac, 0.95% Impervious, Inflow Depth > 0.49" for 2yr 24hr event
Inflow = 6.08 cfs @ 12.72 hrs, Volume= 3.874 af
Primary = 6.08 cfs @ 12.72 hrs, Volume= 3.874 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 24L: Proposed South Drainage Total

| | | | | |
|---|---|---|---|---|
| Inflow Area = | 86.500 ac, | 1.04% Impervious, Inflow Depth > 0.50" | for 2yr 24hr event | |
| Inflow = | 5.10 cfs @ | 12.77 hrs, Volume= | 3.611 af | |
| Primary = | 5.10 cfs @ | 12.77 hrs, Volume= | 3.611 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 25L: Proposed East Through Culvert Total

| | | | | |
|---|---|---|---|---|
| Inflow Area = | 8.600 ac, | 0.00% Impervious, Inflow Depth = 0.37" | for 2yr 24hr event | |
| Inflow = | 2.09 cfs @ | 12.30 hrs, Volume= | 0.264 af | |
| Primary = | 2.09 cfs @ | 12.30 hrs, Volume= | 0.264 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Subcatchment 6S: Proposed West Drain Area

Runoff = 29.12 cfs @ 12.14 hrs, Volume= 1.565 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 6.000 | 87 | 60% Impervious Residential |
| * | 1.200 | 74 | 10% Impervious OL Area |
| * | 0.200 | 98 | Wet Basin |
| | 7.400 | 85 | Weighted Average |
| | 7.200 | | 97.30% Pervious Area |
| | 0.200 | | 2.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0800 | 0.31 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 0.3 | 100 | 0.0600 | 4.97 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 0.9 | 550 | 0.0180 | 9.66 | 30.35 | **Pipe Channel, Pipe**<br>24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'<br>n= 0.013 |
| 6.5 | 750 | Total | | | |

## Summary for Subcatchment 7S: Proposed East Drain Area

Runoff = 67.99 cfs @ 12.17 hrs, Volume= 4.238 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 12.900 | 87 | 60% Impervious Residential |
| * | 3.600 | 90 | 70% Impervious Residential |
| * | 1.500 | 74 | 10% Impervious OL |
| * | 0.700 | 98 | Wet Basin |
| | 18.700 | 87 | Weighted Average |
| | 18.000 | | 96.26% Pervious Area |
| | 0.700 | | 3.74% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.4 | 150 | 0.0800 | 0.34 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 0.3 | 100 | 0.0600 | 4.97 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 2.3 | 1,200 | 0.0150 | 8.82 | 27.71 | **Pipe Channel, Pipe**<br>24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'<br>n= 0.013 |
| 10.0 | 1,450 | Total | | | |

## Summary for Subcatchment 8S: Proposed Directly Offsite East Area

Runoff = 1.94 cfs @ 12.38 hrs, Volume= 0.201 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 2.400 | 62 | 10% Impervious Lightly Disturbed/Restored |
| * | 0.100 | 90 | 70% Imp ROW area |
| | 2.500 | 63 | Weighted Average |
| | 2.500 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 21.3 | 200 | 0.0100 | 0.16 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.3 | 400 | 0.0200 | 2.87 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 23.6 | 600 | Total | | | |

## Summary for Subcatchment 15S: Proposed Directly Offsite South Area

Runoff = 4.24 cfs @ 12.51 hrs, Volume= 0.532 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 6.200 | 62 | 10% Impervious Lightly Disturbed/Restored |
| * | 0.200 | 82 | 40% Imp yard area |
| * | 0.200 | 90 | 70% Imp ROW area |
| | 6.600 | 63 | Weighted Average |
| | 6.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 29.5 | 300 | 0.0100 | 0.17 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 3.3 | 400 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps |
| 32.8 | 700 | Total | | | |

## Summary for Subcatchment 20S: Ex West Offsite Drainage

Runoff = 5.42 cfs @ 12.36 hrs, Volume= 0.600 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 10.200 | 58 | Type B Soils |
| | 10.200 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet** Range n= 0.130 P2= 2.84" |
| 2.4 | 400 | 0.0350 | 2.81 | | **Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps |
| 3.9 | 1,100 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.7 | 1,800 | Total | | | |

## Summary for Subcatchment 21S: Ex NW Offsite Drainage

Runoff = 16.34 cfs @ 12.56 hrs, Volume= 2.330 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 39.300 | 58 | Type B Soils |
| * | 0.300 | 71 | Type C Soils |
| | 39.600 | 58 | Weighted Average |
| | 39.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 24.0 | 300 | 0.0167 | 0.21 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 8.3 | 1,000 | 0.0180 | 2.01 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 1.0 | 1,100 | 0.0100 | 18.85 | 376.98 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.010 |
| 33.3 | 2,400 | Total | | | |

## Summary for Subcatchment 22S: Ex N Offsite Drainage

Runoff = 2.96 cfs @ 12.34 hrs, Volume= 0.276 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.200 | 58 | Type B Soils |
| * | 1.700 | 71 | Type C Soils |
| | 2.900 | 66 | Weighted Average |
| | 2.900 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 19.9 | 300 | 0.0267 | 0.25 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 1.1 | 200 | 0.0400 | 3.00 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 21.0 | 500 | Total | | | |

## Summary for Subcatchment 27S: Ex NE Offsite Drainage

Runoff = 6.22 cfs @ 12.24 hrs, Volume= 0.492 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.600 | 58 | Type B Soils |
| * | 2.500 | 71 | Type C Soils |
| | 6.100 | 63 | Weighted Average |
| | 6.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 11.7 | 300 | 0.1000 | 0.43 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.2 | 200 | 0.0100 | 1.50 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 13.9 | 500 | Total | | | |

## Summary for Subcatchment 28S: Pro West Bypass

Runoff = 2.94 cfs @ 12.13 hrs, Volume= 0.152 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.100 | 74 | OL Area 10% Imp |
| | 1.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | | | | | **Direct Entry, TC** |

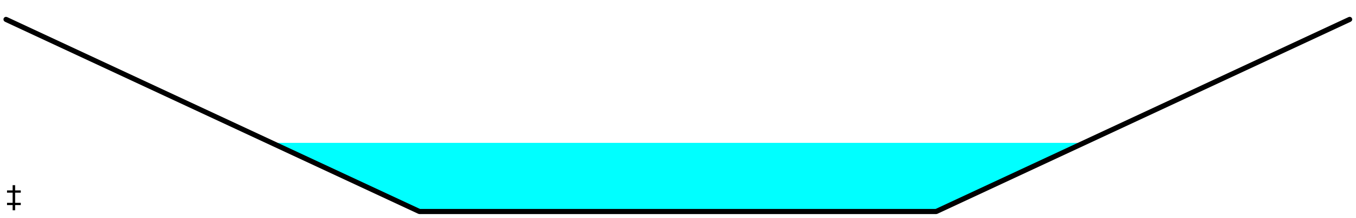
## Summary for Reach 2R: SW Bypass Channel

Inflow Area = 61.200 ac, 0.33% Impervious, Inflow Depth > 0.88" for 10yr 24hr event
Inflow = 20.61 cfs @ 12.59 hrs, Volume= 4.472 af
Outflow = 20.52 cfs @ 12.61 hrs, Volume= 4.470 af, Atten= 0%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Max. Velocity= 2.24 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 7.3 min

Peak Storage= 2,798 cf @ 12.61 hrs
Average Depth at Peak Storage= 0.71' , Surface Width= 15.71'
Bank-Full Depth= 2.00' Flow Area= 36.0 sf, Capacity= 142.48 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 305.0' Slope= 0.0075 '/'
Inlet Invert= 864.00', Outlet Invert= 861.70'



‡

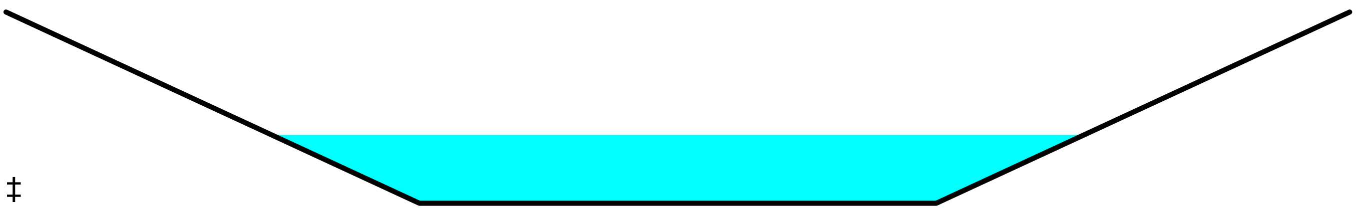
## Summary for Reach 26R: Bypass Channel

Inflow Area = 50.900 ac, 0.00% Impervious, Inflow Depth = 0.73" for 10yr 24hr event
Inflow = 20.89 cfs @ 12.52 hrs, Volume= 3.083 af
Outflow = 20.64 cfs @ 12.57 hrs, Volume= 3.083 af, Atten= 1%, Lag= 2.7 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Max. Velocity= 2.24 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 11.9 min

Peak Storage= 4,880 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.72' , Surface Width= 15.73'
Bank-Full Depth= 2.00' Flow Area= 36.0 sf, Capacity= 142.54 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 530.0' Slope= 0.0075 '/'
Inlet Invert= 869.00', Outlet Invert= 865.00'



‡

## Summary for Pond 1P: Tuscobia Street Crossing

Inflow Area = 61.200 ac, 0.33% Impervious, Inflow Depth > 0.88" for 10yr 24hr event
Inflow = 20.64 cfs @ 12.57 hrs, Volume= 4.473 af
Outflow = 20.61 cfs @ 12.59 hrs, Volume= 4.472 af, Atten= 0%, Lag= 1.0 min
Primary = 20.61 cfs @ 12.59 hrs, Volume= 4.472 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 865.95' @ 12.59 hrs Surf.Area= 2,341 sf Storage= 1,203 cf

Plug-Flow detention time= 1.2 min calculated for 4.469 af (100% of inflow)
Center-of-Mass det. time= 1.0 min ( 1,064.9 - 1,063.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 865.00' | 51,515 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 865.00 | 194 | 0 | 0 |
| 866.00 | 2,455 | 1,325 | 1,325 |
| 867.00 | 5,342 | 3,899 | 5,223 |
| 868.00 | 9,972 | 7,657 | 12,880 |
| 869.00 | 15,610 | 12,791 | 25,671 |
| 870.00 | 36,077 | 25,844 | 51,515 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 865.00' | **38.0" W x 24.0" H, R=31.2" Elliptical RCP_Elliptical 38x24 X 3.00**<br>L= 135.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 865.00' / 864.00' S= 0.0074 '/' Cc= 0.900<br>n= 0.013, Flow Area= 5.10 sf |
| #2 | Primary | 869.55' | **Asymmetrical Weir, C= 3.27**<br>Offset (feet) 0.00 25.00 50.00 75.00 100.00 125.00 168.00<br>Elev. (feet) 870.14 869.96 869.75 869.55 869.56 869.69 870.14 |

**Primary OutFlow** Max=20.59 cfs @ 12.59 hrs HW=865.95' TW=864.71' (Dynamic Tailwater)
**1=RCP_Elliptical 38x24** (Inlet Controls 20.59 cfs @ 2.87 fps)
**2=Asymmetrical Weir** ( Controls 0.00 cfs)

## Summary for Pond 9P: West Detention Basin

Inflow Area = 10.300 ac, 1.94% Impervious, Inflow Depth = 2.14" for 10yr 24hr event
Inflow = 30.36 cfs @ 12.14 hrs, Volume= 1.841 af
Outflow = 4.06 cfs @ 12.77 hrs, Volume= 1.718 af, Atten= 87%, Lag= 37.8 min
Primary = 4.06 cfs @ 12.77 hrs, Volume= 1.718 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 869.19' @ 12.78 hrs Surf.Area= 24,665 sf Storage= 43,914 cf

Plug-Flow detention time= 615.8 min calculated for 1.716 af (93% of inflow)
Center-of-Mass det. time= 583.2 min ( 1,397.0 - 813.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 867.00' | 95,625 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 867.00 | 15,467 | 0 | 0 |
| 868.00 | 19,599 | 17,533 | 17,533 |
| 869.00 | 23,831 | 21,715 | 39,248 |
| 870.00 | 28,163 | 25,997 | 65,245 |
| 871.00 | 32,596 | 30,380 | 95,625 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 866.00' | **18.0" Round Culvert**<br>L= 50.0' RCP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 866.00' / 866.00' S= 0.0000 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.77 sf |
| #2 | Device 1 | 867.00' | **4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 869.00' | **48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #4 | Primary | 869.75' | **30.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=4.06 cfs @ 12.77 hrs HW=869.19' TW=867.17' (Dynamic Tailwater)
**1=Culvert** (Passes 4.06 cfs of 11.87 cfs potential flow)
**2=Orifice/Grate** (Orifice Controls 0.60 cfs @ 6.84 fps)
**3=Orifice/Grate** (Weir Controls 3.47 cfs @ 1.43 fps)
**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 10P: West Infltration Basin

| | | | | |
|---|---|---|---|---|
| Inflow Area = | 10.300 ac, | 1.94% Impervious, | Inflow Depth > 2.00" | for 10yr 24hr event |
| Inflow = | 4.06 cfs @ | 12.77 hrs, Volume= | 1.718 af | |
| Outflow = | 2.84 cfs @ | 13.46 hrs, Volume= | 1.604 af, Atten= 30%, Lag= 41.7 min | |
| Discarded = | 0.08 cfs @ | 13.46 hrs, Volume= | 0.214 af | |
| Primary = | 2.75 cfs @ | 13.46 hrs, Volume= | 1.390 af | |

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 867.88' @ 13.46 hrs Surf.Area= 5,846 sf Storage= 8,830 cf

Plug-Flow detention time= 159.9 min calculated for 1.604 af (93% of inflow)
Center-of-Mass det. time= 68.7 min ( 1,465.7 - 1,397.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 866.00' | 34,052 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 866.00 | 3,624 | 0 | 0 |
| 867.00 | 4,745 | 4,185 | 4,185 |
| 868.00 | 6,000 | 5,373 | 9,557 |
| 869.00 | 7,386 | 6,693 | 16,250 |
| 870.00 | 8,876 | 8,131 | 24,381 |
| 871.00 | 10,466 | 9,671 | 34,052 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 866.00' | **0.500 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 860.00' |
| #2 | Primary | 867.00' | **15.0" Round Culvert**<br>L= 50.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 867.00' / 866.50' S= 0.0100 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.23 sf |
| #3 | Primary | 870.00' | **5.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Discarded OutFlow** Max=0.08 cfs @ 13.46 hrs HW=867.88' (Free Discharge)
**1=Exfiltration** ( Controls 0.08 cfs)

**Primary OutFlow** Max=2.75 cfs @ 13.46 hrs HW=867.88' TW=865.66' (Dynamic Tailwater)
**2=Culvert** (Barrel Controls 2.75 cfs @ 4.21 fps)
**3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 11P: East Detention Basin

Inflow Area = 18.700 ac, 3.74% Impervious, Inflow Depth = 2.72" for 10yr 24hr event
Inflow = 67.99 cfs @ 12.17 hrs, Volume= 4.238 af
Outflow = 16.76 cfs @ 12.49 hrs, Volume= 4.142 af, Atten= 75%, Lag= 18.8 min
Primary = 16.76 cfs @ 12.49 hrs, Volume= 4.142 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 864.50' @ 12.50 hrs Surf.Area= 43,015 sf Storage= 92,201 cf

Plug-Flow detention time= 360.7 min calculated for 4.139 af (98% of inflow)
Center-of-Mass det. time= 348.4 min ( 1,150.9 - 802.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 162,500 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 30,928 | 0 | 0 |
| 863.00 | 35,693 | 33,311 | 33,311 |
| 864.00 | 40,550 | 38,122 | 71,432 |
| 865.00 | 45,509 | 43,030 | 114,462 |
| 866.00 | 50,568 | 48,039 | 162,500 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 861.00' | **24.0" Round Culvert**<br>L= 50.0' RCP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 861.00' / 861.00' S= 0.0000 '/' Cc= 0.900<br>n= 0.013, Flow Area= 3.14 sf |
| #2 | Device 1 | 862.00' | **8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 864.00' | **48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #4 | Primary | 864.75' | **20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=16.75 cfs @ 12.49 hrs HW=864.50' TW=862.49' (Dynamic Tailwater)
—**1=Culvert** (Passes 16.75 cfs of 21.17 cfs potential flow)
—**2=Orifice/Grate** (Orifice Controls 2.38 cfs @ 6.81 fps)
—**3=Orifice/Grate** (Weir Controls 14.37 cfs @ 2.30 fps)
—**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 12P: East Infltration Basin

Inflow Area = 18.700 ac, 3.74% Impervious, Inflow Depth > 2.66" for 10yr 24hr event
Inflow = 16.76 cfs @ 12.49 hrs, Volume= 4.142 af
Outflow = 8.24 cfs @ 13.21 hrs, Volume= 3.934 af, Atten= 51%, Lag= 43.4 min
Discarded = 0.22 cfs @ 13.21 hrs, Volume= 0.489 af
Primary = 8.02 cfs @ 13.21 hrs, Volume= 3.445 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2

Peak Elev= 863.64' @ 13.21 hrs Surf.Area= 14,163 sf Storage= 29,692 cf

Plug-Flow detention time= 147.0 min calculated for 3.934 af (95% of inflow)
Center-of-Mass det. time= 85.2 min ( 1,236.1 - 1,150.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 861.00' | 69,661 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 861.00 | 8,400 | 0 | 0 |
| 862.00 | 10,501 | 9,451 | 9,451 |
| 863.00 | 12,689 | 11,595 | 21,046 |
| 864.00 | 14,977 | 13,833 | 34,879 |
| 865.00 | 17,366 | 16,172 | 51,050 |
| 866.00 | 19,855 | 18,611 | 69,661 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 861.00' | **0.500 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 855.00' |
| #2 | Primary | 862.00' | **18.0" Round Culvert**<br>L= 50.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.50' S= 0.0100 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.77 sf |
| #3 | Primary | 865.00' | **4.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Discarded OutFlow** Max=0.22 cfs @ 13.21 hrs HW=863.64' (Free Discharge)
└─**1=Exfiltration** ( Controls 0.22 cfs)

**Primary OutFlow** Max=8.02 cfs @ 13.21 hrs HW=863.64' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 8.02 cfs @ 5.16 fps)
└─**3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 1L: Proposed West Channel

Inflow Area = 50.900 ac, 0.00% Impervious, Inflow Depth = 0.73" for 10yr 24hr event
Inflow = 20.64 cfs @ 12.57 hrs, Volume= 3.083 af
Primary = 20.64 cfs @ 12.57 hrs, Volume= 3.083 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 13L: Total Proposed Combined

Inflow Area = 95.100 ac, 0.95% Impervious, Inflow Depth > 1.15" for 10yr 24hr event
Inflow = 32.03 cfs @ 12.63 hrs, Volume= 9.139 af
Primary = 32.03 cfs @ 12.63 hrs, Volume= 9.139 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 24L: Proposed South Drainage Total

Inflow Area = 86.500 ac, 1.04% Impervious, Inflow Depth > 1.17" for 10yr 24hr event
Inflow = 28.85 cfs @ 12.66 hrs, Volume= 8.446 af
Primary = 28.85 cfs @ 12.66 hrs, Volume= 8.446 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 25L: Proposed East Through Culvert Total

Inflow Area = 8.600 ac, 0.00% Impervious, Inflow Depth = 0.97" for 10yr 24hr event
Inflow = 7.66 cfs @ 12.26 hrs, Volume= 0.693 af
Primary = 7.66 cfs @ 12.26 hrs, Volume= 0.693 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Subcatchment 6S: Proposed West Drain Area

Runoff = 38.28 cfs @ 12.13 hrs, Volume= 2.083 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 6.000 | 87 | 60% Impervious Residential |
| * | 1.200 | 74 | 10% Impervious OL Area |
| * | 0.200 | 98 | Wet Basin |
| | 7.400 | 85 | Weighted Average |
| | 7.200 | | 97.30% Pervious Area |
| | 0.200 | | 2.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0800 | 0.31 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 0.3 | 100 | 0.0600 | 4.97 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 0.9 | 550 | 0.0180 | 9.66 | 30.35 | **Pipe Channel, Pipe**<br>24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'<br>n= 0.013 |
| 6.5 | 750 | Total | | | |

## Summary for Subcatchment 7S: Proposed East Drain Area

Runoff = 88.35 cfs @ 12.17 hrs, Volume= 5.574 af, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 12.900 | 87 | 60% Impervious Residential |
| * | 3.600 | 90 | 70% Impervious Residential |
| * | 1.500 | 74 | 10% Impervious OL |
| * | 0.700 | 98 | Wet Basin |
| | 18.700 | 87 | Weighted Average |
| | 18.000 | | 96.26% Pervious Area |
| | 0.700 | | 3.74% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.4 | 150 | 0.0800 | 0.34 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 0.3 | 100 | 0.0600 | 4.97 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 2.3 | 1,200 | 0.0150 | 8.82 | 27.71 | **Pipe Channel, Pipe**<br>24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'<br>n= 0.013 |
| 10.0 | 1,450 | Total | | | |

## Summary for Subcatchment 8S: Proposed Directly Offsite East Area

Runoff = 3.24 cfs @ 12.37 hrs, Volume= 0.316 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 2.400 | 62 | 10% Impervious Lightly Disturbed/Restored |
| * | 0.100 | 90 | 70% Imp ROW area |
| | 2.500 | 63 | Weighted Average |
| | 2.500 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 21.3 | 200 | 0.0100 | 0.16 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.3 | 400 | 0.0200 | 2.87 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 23.6 | 600 | Total | | | |

## Summary for Subcatchment 15S: Proposed Directly Offsite South Area

Runoff = 7.11 cfs @ 12.50 hrs, Volume= 0.833 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 6.200 | 62 | 10% Impervious Lightly Disturbed/Restored |
| * | 0.200 | 82 | 40% Imp yard area |
| * | 0.200 | 90 | 70% Imp ROW area |
| | 6.600 | 63 | Weighted Average |
| | 6.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 29.5 | 300 | 0.0100 | 0.17 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 3.3 | 400 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 32.8 | 700 | Total | | | |

## Summary for Subcatchment 20S: Ex West Offsite Drainage

Runoff = 10.27 cfs @ 12.34 hrs, Volume= 0.998 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 10.200 | 58 | Type B Soils |
| | 10.200 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.4 | 400 | 0.0350 | 2.81 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 3.9 | 1,100 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.7 | 1,800 | Total | | | |

## Summary for Subcatchment 21S: Ex NW Offsite Drainage

Runoff = 30.61 cfs @ 12.53 hrs, Volume= 3.875 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 39.300 | 58 | Type B Soils |
| * | 0.300 | 71 | Type C Soils |
| | 39.600 | 58 | Weighted Average |
| | 39.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 24.0 | 300 | 0.0167 | 0.21 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 8.3 | 1,000 | 0.0180 | 2.01 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 1.0 | 1,100 | 0.0100 | 18.85 | 376.98 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.010 |
| 33.3 | 2,400 | Total | | | |

## Summary for Subcatchment 22S: Ex N Offsite Drainage

Runoff = 4.70 cfs @ 12.33 hrs, Volume= 0.419 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.200 | 58 | Type B Soils |
| * | 1.700 | 71 | Type C Soils |
| | 2.900 | 66 | Weighted Average |
| | 2.900 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 19.9 | 300 | 0.0267 | 0.25 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 1.1 | 200 | 0.0400 | 3.00 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 21.0 | 500 | Total | | | |

## Summary for Subcatchment 27S: Ex NE Offsite Drainage

Runoff = 10.39 cfs @ 12.23 hrs, Volume= 0.770 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.600 | 58 | Type B Soils |
| * | 2.500 | 71 | Type C Soils |
| | 6.100 | 63 | Weighted Average |
| | 6.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 11.7 | 300 | 0.1000 | 0.43 | | **Sheet Flow, Sheet**<br>Range   n= 0.130   P2= 2.84" |
| 2.2 | 200 | 0.0100 | 1.50 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway   Kv= 15.0 fps |
| 13.9 | 500 | Total | | | |

## Summary for Subcatchment 28S: Pro West Bypass

Runoff = 4.21 cfs @ 12.13 hrs, Volume= 0.217 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4  25yr 24hr Rainfall=5.01"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.100 | 74 | OL Area 10% Imp |
| | 1.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | | | | | **Direct Entry, TC** |

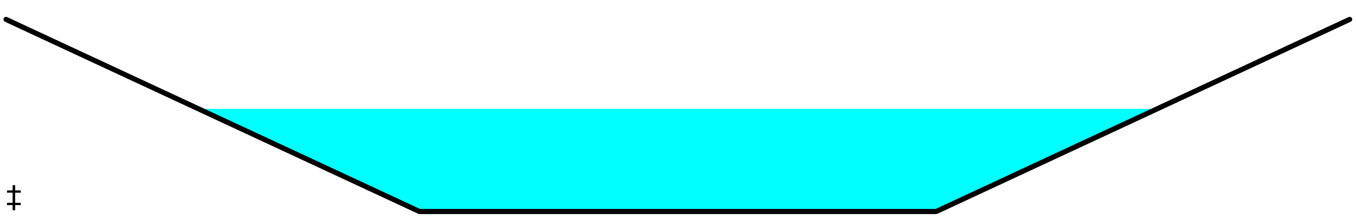
## Summary for Reach 2R: SW Bypass Channel

Inflow Area = 61.200 ac, 0.33% Impervious, Inflow Depth > 1.40" for 25yr 24hr event
Inflow = 42.99 cfs @ 12.57 hrs, Volume= 7.121 af
Outflow = 42.88 cfs @ 12.59 hrs, Volume= 7.118 af, Atten= 0%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Max. Velocity= 2.81 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 6.8 min

Peak Storage= 4,659 cf @ 12.59 hrs
Average Depth at Peak Storage= 1.07' , Surface Width= 18.56'
Bank-Full Depth= 2.00'  Flow Area= 36.0 sf, Capacity= 142.48 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 305.0' Slope= 0.0075 '/'
Inlet Invert= 864.00', Outlet Invert= 861.70'



‡

## Summary for Reach 26R: Bypass Channel

Inflow Area = 50.900 ac, 0.00% Impervious, Inflow Depth = 1.20" for 25yr 24hr event
Inflow = 39.04 cfs @ 12.48 hrs, Volume= 5.091 af
Outflow = 38.68 cfs @ 12.52 hrs, Volume= 5.091 af, Atten= 1%, Lag= 2.8 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Max. Velocity= 2.72 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 10.6 min

Peak Storage= 7,530 cf @ 12.52 hrs
Average Depth at Peak Storage= 1.01' , Surface Width= 18.09'
Bank-Full Depth= 2.00' Flow Area= 36.0 sf, Capacity= 142.54 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 530.0' Slope= 0.0075 '/'
Inlet Invert= 869.00', Outlet Invert= 865.00'

‡

## Summary for Pond 1P: Tuscobia Street Crossing

Inflow Area = 61.200 ac, 0.33% Impervious, Inflow Depth > 1.40" for 25yr 24hr event
Inflow = 43.11 cfs @ 12.55 hrs, Volume= 7.121 af
Outflow = 42.99 cfs @ 12.57 hrs, Volume= 7.121 af, Atten= 0%, Lag= 1.3 min
Primary = 42.99 cfs @ 12.57 hrs, Volume= 7.121 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 866.45' @ 12.57 hrs Surf.Area= 3,744 sf Storage= 2,709 cf

Plug-Flow detention time= 1.1 min calculated for 7.116 af (100% of inflow)
Center-of-Mass det. time= 1.0 min ( 990.6 - 989.6 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 865.00' | 51,515 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 865.00 | 194 | 0 | 0 |
| 866.00 | 2,455 | 1,325 | 1,325 |
| 867.00 | 5,342 | 3,899 | 5,223 |
| 868.00 | 9,972 | 7,657 | 12,880 |
| 869.00 | 15,610 | 12,791 | 25,671 |
| 870.00 | 36,077 | 25,844 | 51,515 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 865.00' | **38.0" W x 24.0" H, R=31.2" Elliptical RCP_Elliptical 38x24 X 3.00**<br>L= 135.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 865.00' / 864.00' S= 0.0074 '/' Cc= 0.900<br>n= 0.013, Flow Area= 5.10 sf |
| #2 | Primary | 869.55' | **Asymmetrical Weir, C= 3.27**<br>Offset (feet) 0.00 25.00 50.00 75.00 100.00 125.00 168.00<br>Elev. (feet) 870.14 869.96 869.75 869.55 869.56 869.69 870.14 |

**Primary OutFlow** Max=42.95 cfs @ 12.57 hrs HW=866.45' TW=865.07' (Dynamic Tailwater)
**1=RCP_Elliptical 38x24** (Inlet Controls 42.95 cfs @ 3.65 fps)
**2=Asymmetrical Weir** ( Controls 0.00 cfs)

## Summary for Pond 9P: West Detention Basin

| | | | | |
|---|---|---|---|---|
| Inflow Area = | 10.300 ac, | 1.94% Impervious, | Inflow Depth = 2.91" | for 25yr 24hr event |
| Inflow = | 40.49 cfs @ | 12.14 hrs, Volume= | 2.502 af | |
| Outflow = | 11.60 cfs @ | 12.38 hrs, Volume= | 2.367 af, | Atten= 71%, Lag= 14.6 min |
| Primary = | 11.60 cfs @ | 12.38 hrs, Volume= | 2.367 af | |

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 869.44' @ 12.51 hrs Surf.Area= 25,732 sf Storage= 50,125 cf

Plug-Flow detention time= 467.3 min calculated for 2.367 af (95% of inflow)
Center-of-Mass det. time= 439.6 min ( 1,246.9 - 807.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 867.00' | 95,625 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 867.00 | 15,467 | 0 | 0 |
| 868.00 | 19,599 | 17,533 | 17,533 |
| 869.00 | 23,831 | 21,715 | 39,248 |
| 870.00 | 28,163 | 25,997 | 65,245 |
| 871.00 | 32,596 | 30,380 | 95,625 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 866.00' | **18.0" Round Culvert**<br>L= 50.0' RCP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 866.00' / 866.00' S= 0.0000 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.77 sf |
| #2 | Device 1 | 867.00' | **4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 869.00' | **48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #4 | Primary | 869.75' | **30.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=11.68 cfs @ 12.38 hrs HW=869.42' TW=867.48' (Dynamic Tailwater)
**1=Culvert** (Passes 11.68 cfs of 11.85 cfs potential flow)
**2=Orifice/Grate** (Orifice Controls 0.59 cfs @ 6.71 fps)
**3=Orifice/Grate** (Weir Controls 11.10 cfs @ 2.11 fps)
**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 10P: West Infltration Basin

Inflow Area = 10.300 ac, 1.94% Impervious, Inflow Depth > 2.76" for 25yr 24hr event
Inflow = 11.60 cfs @ 12.38 hrs, Volume= 2.367 af
Outflow = 6.11 cfs @ 13.14 hrs, Volume= 2.252 af, Atten= 47%, Lag= 45.5 min
Discarded = 0.11 cfs @ 13.14 hrs, Volume= 0.222 af
Primary = 6.00 cfs @ 13.14 hrs, Volume= 2.031 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 868.74' @ 13.14 hrs Surf.Area= 7,026 sf Storage= 14,377 cf

Plug-Flow detention time= 122.1 min calculated for 2.251 af (95% of inflow)
Center-of-Mass det. time= 48.8 min ( 1,295.7 - 1,246.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 866.00' | 34,052 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 866.00 | 3,624 | 0 | 0 |
| 867.00 | 4,745 | 4,185 | 4,185 |
| 868.00 | 6,000 | 5,373 | 9,557 |
| 869.00 | 7,386 | 6,693 | 16,250 |
| 870.00 | 8,876 | 8,131 | 24,381 |
| 871.00 | 10,466 | 9,671 | 34,052 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 866.00' | **0.500 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 860.00' |
| #2 | Primary | 867.00' | **15.0" Round Culvert**<br>L= 50.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 867.00' / 866.50' S= 0.0100 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.23 sf |
| #3 | Primary | 870.00' | **5.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Discarded OutFlow** Max=0.11 cfs @ 13.14 hrs HW=868.74' (Free Discharge)
**1=Exfiltration** ( Controls 0.11 cfs)

**Primary OutFlow** Max=6.00 cfs @ 13.14 hrs HW=868.74' TW=866.00' (Dynamic Tailwater)
**2=Culvert** (Barrel Controls 6.00 cfs @ 4.89 fps)
**3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 11P: East Detention Basin

Inflow Area = 18.700 ac, 3.74% Impervious, Inflow Depth = 3.58" for 25yr 24hr event
Inflow = 88.35 cfs @ 12.17 hrs, Volume= 5.574 af
Outflow = 25.39 cfs @ 12.36 hrs, Volume= 5.472 af, Atten= 71%, Lag= 11.1 min
Primary = 25.39 cfs @ 12.36 hrs, Volume= 5.472 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 864.97' @ 12.47 hrs Surf.Area= 45,376 sf Storage= 113,247 cf

Plug-Flow detention time= 308.2 min calculated for 5.472 af (98% of inflow)
Center-of-Mass det. time= 297.5 min ( 1,093.5 - 796.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 162,500 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 30,928 | 0 | 0 |
| 863.00 | 35,693 | 33,311 | 33,311 |
| 864.00 | 40,550 | 38,122 | 71,432 |
| 865.00 | 45,509 | 43,030 | 114,462 |
| 866.00 | 50,568 | 48,039 | 162,500 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 861.00' | **24.0" Round Culvert**<br>L= 50.0' RCP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 861.00' / 861.00' S= 0.0000 '/' Cc= 0.900<br>n= 0.013, Flow Area= 3.14 sf |
| #2 | Device 1 | 862.00' | **8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 864.00' | **48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #4 | Primary | 864.75' | **20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=25.38 cfs @ 12.36 hrs HW=864.93' TW=862.91' (Dynamic Tailwater)
**1=Culvert** (Inlet Controls 21.53 cfs @ 6.85 fps)
**2=Orifice/Grate** (Passes < 2.39 cfs potential flow)
**3=Orifice/Grate** (Passes < 36.93 cfs potential flow)
**4=Broad-Crested Rectangular Weir** (Weir Controls 3.84 cfs @ 1.06 fps)

## Summary for Pond 12P: East Infltration Basin

Inflow Area = 18.700 ac, 3.74% Impervious, Inflow Depth > 3.51" for 25yr 24hr event
Inflow = 25.39 cfs @ 12.36 hrs, Volume= 5.472 af
Outflow = 10.85 cfs @ 13.10 hrs, Volume= 5.259 af, Atten= 57%, Lag= 44.7 min
Discarded = 0.26 cfs @ 13.10 hrs, Volume= 0.511 af
Primary = 10.59 cfs @ 13.10 hrs, Volume= 4.748 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2

Peak Elev= 864.35' @ 13.10 hrs Surf.Area= 15,806 sf Storage= 40,219 cf

Plug-Flow detention time= 122.9 min calculated for 5.255 af (96% of inflow)
Center-of-Mass det. time= 72.3 min ( 1,165.8 - 1,093.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 861.00' | 69,661 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 861.00 | 8,400 | 0 | 0 |
| 862.00 | 10,501 | 9,451 | 9,451 |
| 863.00 | 12,689 | 11,595 | 21,046 |
| 864.00 | 14,977 | 13,833 | 34,879 |
| 865.00 | 17,366 | 16,172 | 51,050 |
| 866.00 | 19,855 | 18,611 | 69,661 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 861.00' | **0.500 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 855.00' |
| #2 | Primary | 862.00' | **18.0" Round Culvert**<br>L= 50.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.50' S= 0.0100 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.77 sf |
| #3 | Primary | 865.00' | **4.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Discarded OutFlow** Max=0.26 cfs @ 13.10 hrs HW=864.35' (Free Discharge)
└─**1=Exfiltration** ( Controls 0.26 cfs)

**Primary OutFlow** Max=10.59 cfs @ 13.10 hrs HW=864.35' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 10.59 cfs @ 5.99 fps)
└─**3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 1L: Proposed West Channel

Inflow Area = 50.900 ac, 0.00% Impervious, Inflow Depth = 1.20" for 25yr 24hr event
Inflow = 38.68 cfs @ 12.52 hrs, Volume= 5.091 af
Primary = 38.68 cfs @ 12.52 hrs, Volume= 5.091 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 13L: Total Proposed Combined

Inflow Area = 95.100 ac, 0.95% Impervious, Inflow Depth > 1.74" for 25yr 24hr event
Inflow = 64.48 cfs @ 12.57 hrs, Volume= 13.786 af
Primary = 64.48 cfs @ 12.57 hrs, Volume= 13.786 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 24L: Proposed South Drainage Total

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 86.500 ac, | 1.04% Impervious, | Inflow Depth > 1.76" | for 25yr 24hr event | |
| Inflow = | 58.68 cfs @ | 12.59 hrs, | Volume= | 12.700 af | |
| Primary = | 58.68 cfs @ | 12.59 hrs, | Volume= | 12.700 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 25L: Proposed East Through Culvert Total

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 8.600 ac, | 0.00% Impervious, | Inflow Depth = 1.52" | for 25yr 24hr event | |
| Inflow = | 12.86 cfs @ | 12.25 hrs, | Volume= | 1.086 af | |
| Primary = | 12.86 cfs @ | 12.25 hrs, | Volume= | 1.086 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Subcatchment 6S: Proposed West Drain Area

Runoff = 54.75 cfs @ 12.13 hrs, Volume= 3.039 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 6.000 | 87 | 60% Impervious Residential |
| * | 1.200 | 74 | 10% Impervious OL Area |
| * | 0.200 | 98 | Wet Basin |
| | 7.400 | 85 | Weighted Average |
| | 7.200 | | 97.30% Pervious Area |
| | 0.200 | | 2.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0800 | 0.31 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 0.3 | 100 | 0.0600 | 4.97 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 0.9 | 550 | 0.0180 | 9.66 | 30.35 | **Pipe Channel, Pipe**<br>24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'<br>n= 0.013 |
| 6.5 | 750 | Total | | | |

## Summary for Subcatchment 7S: Proposed East Drain Area

Runoff = 124.79 cfs @ 12.17 hrs, Volume= 8.027 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 12.900 | 87 | 60% Impervious Residential |
| * | 3.600 | 90 | 70% Impervious Residential |
| * | 1.500 | 74 | 10% Impervious OL |
| * | 0.700 | 98 | Wet Basin |
| | 18.700 | 87 | Weighted Average |
| | 18.000 | | 96.26% Pervious Area |
| | 0.700 | | 3.74% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.4 | 150 | 0.0800 | 0.34 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 0.3 | 100 | 0.0600 | 4.97 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 2.3 | 1,200 | 0.0150 | 8.82 | 27.71 | **Pipe Channel, Pipe**<br>24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'<br>n= 0.013 |
| 10.0 | 1,450 | Total | | | |

## Summary for Subcatchment 8S: Proposed Directly Offsite East Area

Runoff = 5.94 cfs @ 12.35 hrs, Volume= 0.552 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 2.400 | 62 | 10% Impervious Lightly Disturbed/Restored |
| * | 0.100 | 90 | 70% Imp ROW area |
| | 2.500 | 63 | Weighted Average |
| | 2.500 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 21.3 | 200 | 0.0100 | 0.16 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.3 | 400 | 0.0200 | 2.87 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 23.6 | 600 | Total | | | |

## Summary for Subcatchment 15S: Proposed Directly Offsite South Area

Runoff = 13.05 cfs @ 12.48 hrs, Volume= 1.457 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 6.200 | 62 | 10% Impervious Lightly Disturbed/Restored |
| * | 0.200 | 82 | 40% Imp yard area |
| * | 0.200 | 90 | 70% Imp ROW area |
| | 6.600 | 63 | Weighted Average |
| | 6.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 29.5 | 300 | 0.0100 | 0.17 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 3.3 | 400 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, Shallow**<br>Paved Kv= 20.3 fps |
| 32.8 | 700 | Total | | | |

## Summary for Subcatchment 20S: Ex West Offsite Drainage

Runoff = 20.81 cfs @ 12.32 hrs, Volume= 1.854 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 10.200 | 58 | Type B Soils |
| | 10.200 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 14.4 | 300 | 0.0600 | 0.35 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.4 | 400 | 0.0350 | 2.81 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 3.9 | 1,100 | 0.0100 | 4.71 | 94.24 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.040 |
| 20.7 | 1,800 | Total | | | |

## Summary for Subcatchment 21S: Ex NW Offsite Drainage

Runoff = 61.96 cfs @ 12.50 hrs, Volume= 7.198 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 39.300 | 58 | Type B Soils |
| * | 0.300 | 71 | Type C Soils |
| | 39.600 | 58 | Weighted Average |
| | 39.600 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 24.0 | 300 | 0.0167 | 0.21 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 8.3 | 1,000 | 0.0180 | 2.01 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 1.0 | 1,100 | 0.0100 | 18.85 | 376.98 | **Channel Flow, Channel**<br>Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.010 |
| 33.3 | 2,400 | Total | | | |

## Summary for Subcatchment 22S: Ex N Offsite Drainage

Runoff = 8.21 cfs @ 12.32 hrs, Volume= 0.710 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.200 | 58 | Type B Soils |
| * | 1.700 | 71 | Type C Soils |
| | 2.900 | 66 | Weighted Average |
| | 2.900 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 19.9 | 300 | 0.0267 | 0.25 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 1.1 | 200 | 0.0400 | 3.00 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 21.0 | 500 | Total | | | |

## Summary for Subcatchment 27S: Ex NE Offsite Drainage

Runoff = 18.89 cfs @ 12.23 hrs, Volume= 1.347 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.600 | 58 | Type B Soils |
| * | 2.500 | 71 | Type C Soils |
| | 6.100 | 63 | Weighted Average |
| | 6.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 11.7 | 300 | 0.1000 | 0.43 | | **Sheet Flow, Sheet**<br>Range n= 0.130 P2= 2.84" |
| 2.2 | 200 | 0.0100 | 1.50 | | **Shallow Concentrated Flow, Shallow**<br>Grassed Waterway Kv= 15.0 fps |
| 13.9 | 500 | Total | | | |

## Summary for Subcatchment 28S: Pro West Bypass

Runoff = 6.60 cfs @ 12.13 hrs, Volume= 0.343 af, Depth= 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.100 | 74 | OL Area 10% Imp |
| | 1.100 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | | | | | **Direct Entry, TC** |

## Summary for Reach 2R: SW Bypass Channel

Inflow Area = 61.200 ac, 0.33% Impervious, Inflow Depth > 2.48" for 100yr 24hr event
Inflow = 85.20 cfs @ 12.55 hrs, Volume= 12.646 af
Outflow = 85.08 cfs @ 12.57 hrs, Volume= 12.643 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Max. Velocity= 3.43 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 6.1 min

Peak Storage= 7,572 cf @ 12.57 hrs
Average Depth at Peak Storage= 1.54' , Surface Width= 22.30'
Bank-Full Depth= 2.00' Flow Area= 36.0 sf, Capacity= 142.48 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 305.0' Slope= 0.0075 '/'
Inlet Invert= 864.00', Outlet Invert= 861.70'

## Summary for Reach 26R: Bypass Channel

Inflow Area = 50.900 ac, 0.00% Impervious, Inflow Depth = 2.21" for 100yr 24hr event
Inflow = 78.97 cfs @ 12.45 hrs, Volume= 9.395 af
Outflow = 78.38 cfs @ 12.49 hrs, Volume= 9.395 af, Atten= 1%, Lag= 2.0 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Max. Velocity= 3.35 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 9.3 min

Peak Storage= 12,405 cf @ 12.49 hrs
Average Depth at Peak Storage= 1.47' , Surface Width= 21.78'
Bank-Full Depth= 2.00' Flow Area= 36.0 sf, Capacity= 142.54 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 530.0' Slope= 0.0075 '/'
Inlet Invert= 869.00', Outlet Invert= 865.00'

‡

## Summary for Pond 1P: Tuscobia Street Crossing

Inflow Area = 61.200 ac, 0.33% Impervious, Inflow Depth > 2.48" for 100yr 24hr event
Inflow = 86.83 cfs @ 12.49 hrs, Volume= 12.646 af
Outflow = 85.20 cfs @ 12.55 hrs, Volume= 12.646 af, Atten= 2%, Lag= 3.5 min
Primary = 85.20 cfs @ 12.55 hrs, Volume= 12.646 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 867.43' @ 12.55 hrs Surf.Area= 7,315 sf Storage= 7,919 cf

Plug-Flow detention time= 1.2 min calculated for 12.646 af (100% of inflow)
Center-of-Mass det. time= 1.1 min ( 932.9 - 931.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 865.00' | 51,515 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 865.00 | 194 | 0 | 0 |
| 866.00 | 2,455 | 1,325 | 1,325 |
| 867.00 | 5,342 | 3,899 | 5,223 |
| 868.00 | 9,972 | 7,657 | 12,880 |
| 869.00 | 15,610 | 12,791 | 25,671 |
| 870.00 | 36,077 | 25,844 | 51,515 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 865.00' | **38.0" W x 24.0" H, R=31.2" Elliptical RCP_Elliptical 38x24 X 3.00** L= 135.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 865.00' / 864.00' S= 0.0074 '/' Cc= 0.900 n= 0.013, Flow Area= 5.10 sf |
| #2 | Primary | 869.55' | **Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 25.00 50.00 75.00 100.00 125.00 168.00 Elev. (feet) 870.14 869.96 869.75 869.55 869.56 869.69 870.14 |

**Primary OutFlow** Max=85.18 cfs @ 12.55 hrs HW=867.43' TW=865.54' (Dynamic Tailwater)
**1=RCP_Elliptical 38x24** (Inlet Controls 85.18 cfs @ 5.57 fps)
**2=Asymmetrical Weir** ( Controls 0.00 cfs)

## Summary for Pond 9P: West Detention Basin

Inflow Area = 10.300 ac, 1.94% Impervious, Inflow Depth = 4.37" for 100yr 24hr event
Inflow = 58.97 cfs @ 12.14 hrs, Volume= 3.749 af
Outflow = 22.34 cfs @ 12.31 hrs, Volume= 3.603 af, Atten= 62%, Lag= 10.6 min
Primary = 22.34 cfs @ 12.31 hrs, Volume= 3.603 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 870.06' @ 12.38 hrs Surf.Area= 28,435 sf Storage= 66,980 cf

Plug-Flow detention time= 335.8 min calculated for 3.603 af (96% of inflow)
Center-of-Mass det. time= 314.7 min ( 1,113.5 - 798.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 867.00' | 95,625 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 867.00 | 15,467 | 0 | 0 |
| 868.00 | 19,599 | 17,533 | 17,533 |
| 869.00 | 23,831 | 21,715 | 39,248 |
| 870.00 | 28,163 | 25,997 | 65,245 |
| 871.00 | 32,596 | 30,380 | 95,625 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 866.00' | **18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 866.00' / 866.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf |
| #2 | Device 1 | 867.00' | **4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 869.00' | **48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #4 | Primary | 869.75' | **30.0' 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=22.34 cfs @ 12.31 hrs HW=870.05' TW=868.65' (Dynamic Tailwater)
**1=Culvert** (Inlet Controls 10.05 cfs @ 5.69 fps)
**2=Orifice/Grate** (Passes < 0.50 cfs potential flow)
**3=Orifice/Grate** (Passes < 44.06 cfs potential flow)
**4=Broad-Crested Rectangular Weir** (Weir Controls 12.30 cfs @ 1.38 fps)

## Summary for Pond 10P: West Infltration Basin

Inflow Area = 10.300 ac, 1.94% Impervious, Inflow Depth > 4.20" for 100yr 24hr event
Inflow = 22.34 cfs @ 12.31 hrs, Volume= 3.603 af
Outflow = 9.14 cfs @ 12.73 hrs, Volume= 3.488 af, Atten= 59%, Lag= 25.0 min
Discarded = 0.15 cfs @ 12.73 hrs, Volume= 0.237 af
Primary = 9.00 cfs @ 12.73 hrs, Volume= 3.251 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 869.97' @ 12.73 hrs Surf.Area= 8,838 sf Storage= 24,158 cf

Plug-Flow detention time= 91.7 min calculated for 3.486 af (97% of inflow)
Center-of-Mass det. time= 39.4 min ( 1,153.0 - 1,113.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 866.00' | 34,052 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 866.00 | 3,624 | 0 | 0 |
| 867.00 | 4,745 | 4,185 | 4,185 |
| 868.00 | 6,000 | 5,373 | 9,557 |
| 869.00 | 7,386 | 6,693 | 16,250 |
| 870.00 | 8,876 | 8,131 | 24,381 |
| 871.00 | 10,466 | 9,671 | 34,052 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 866.00' | **0.500 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 860.00' |
| #2 | Primary | 867.00' | **15.0" Round Culvert**<br>L= 50.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 867.00' / 866.50' S= 0.0100 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.23 sf |
| #3 | Primary | 870.00' | **5.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Discarded OutFlow** Max=0.15 cfs @ 12.73 hrs HW=869.97' (Free Discharge)
**1=Exfiltration** ( Controls 0.15 cfs)

**Primary OutFlow** Max=9.00 cfs @ 12.73 hrs HW=869.97' TW=867.08' (Dynamic Tailwater)
**2=Culvert** (Barrel Controls 9.00 cfs @ 7.33 fps)
**3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 11P: East Detention Basin

Inflow Area = 18.700 ac, 3.74% Impervious, Inflow Depth = 5.15" for 100yr 24hr event
Inflow = 124.79 cfs @ 12.17 hrs, Volume= 8.027 af
Outflow = 58.85 cfs @ 12.29 hrs, Volume= 7.919 af, Atten= 53%, Lag= 7.3 min
Primary = 58.85 cfs @ 12.29 hrs, Volume= 7.919 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2
Peak Elev= 865.63' @ 12.62 hrs Surf.Area= 48,684 sf Storage= 144,018 cf

Plug-Flow detention time= 253.7 min calculated for 7.919 af (99% of inflow)
Center-of-Mass det. time= 245.5 min ( 1,033.0 - 787.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 162,500 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 30,928 | 0 | 0 |
| 863.00 | 35,693 | 33,311 | 33,311 |
| 864.00 | 40,550 | 38,122 | 71,432 |
| 865.00 | 45,509 | 43,030 | 114,462 |
| 866.00 | 50,568 | 48,039 | 162,500 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 861.00' | **24.0" Round Culvert**<br>L= 50.0' RCP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 861.00' / 861.00' S= 0.0000 '/' Cc= 0.900<br>n= 0.013, Flow Area= 3.14 sf |
| #2 | Device 1 | 862.00' | **8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 864.00' | **48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #4 | Primary | 864.75' | **20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=58.59 cfs @ 12.29 hrs HW=865.58' TW=864.21' (Dynamic Tailwater)
**1=Culvert** (Inlet Controls 17.69 cfs @ 5.63 fps)
**2=Orifice/Grate** (Passes < 1.97 cfs potential flow)
**3=Orifice/Grate** (Passes < 70.78 cfs potential flow)
**4=Broad-Crested Rectangular Weir** (Weir Controls 40.89 cfs @ 2.45 fps)

## Summary for Pond 12P: East Infltration Basin

Inflow Area = 18.700 ac, 3.74% Impervious, Inflow Depth > 5.08" for 100yr 24hr event
Inflow = 58.85 cfs @ 12.29 hrs, Volume= 7.919 af
Outflow = 19.36 cfs @ 12.67 hrs, Volume= 7.699 af, Atten= 67%, Lag= 22.4 min
Discarded = 0.33 cfs @ 12.67 hrs, Volume= 0.550 af
Primary = 19.04 cfs @ 12.67 hrs, Volume= 7.149 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs / 2

Peak Elev= 865.58' @ 12.67 hrs Surf.Area= 18,806 sf Storage= 61,513 cf

Plug-Flow detention time= 101.8 min calculated for 7.699 af (97% of inflow)
Center-of-Mass det. time= 63.1 min ( 1,096.2 - 1,033.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 861.00' | 69,661 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 861.00 | 8,400 | 0 | 0 |
| 862.00 | 10,501 | 9,451 | 9,451 |
| 863.00 | 12,689 | 11,595 | 21,046 |
| 864.00 | 14,977 | 13,833 | 34,879 |
| 865.00 | 17,366 | 16,172 | 51,050 |
| 866.00 | 19,855 | 18,611 | 69,661 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 861.00' | **0.500 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 855.00' |
| #2 | Primary | 862.00' | **18.0" Round Culvert**<br>L= 50.0' RCP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.50' S= 0.0100 '/' Cc= 0.900<br>n= 0.013, Flow Area= 1.77 sf |
| #3 | Primary | 865.00' | **4.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Discarded OutFlow** Max=0.33 cfs @ 12.67 hrs HW=865.58' (Free Discharge)
└─**1=Exfiltration** ( Controls 0.33 cfs)

**Primary OutFlow** Max=19.03 cfs @ 12.67 hrs HW=865.58' TW=0.00' (Dynamic Tailwater)
├─**2=Culvert** (Inlet Controls 14.31 cfs @ 8.10 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 4.72 cfs @ 2.04 fps)

## Summary for Link 1L: Proposed West Channel

Inflow Area = 50.900 ac, 0.00% Impervious, Inflow Depth = 2.21" for 100yr 24hr event
Inflow = 78.38 cfs @ 12.49 hrs, Volume= 9.395 af
Primary = 78.38 cfs @ 12.49 hrs, Volume= 9.395 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 13L: Total Proposed Combined

Inflow Area = 95.100 ac, 0.95% Impervious, Inflow Depth > 2.92" for 100yr 24hr event
Inflow = 127.06 cfs @ 12.53 hrs, Volume= 23.147 af
Primary = 127.06 cfs @ 12.53 hrs, Volume= 23.147 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 24L: Proposed South Drainage Total

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 86.500 ac, | 1.04% Impervious, | Inflow Depth > 2.95" | for 100yr 24hr event | |
| Inflow = | 116.15 cfs @ | 12.56 hrs, | Volume= | 21.249 af | |
| Primary = | 116.15 cfs @ | 12.56 hrs, | Volume= | 21.249 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

## Summary for Link 25L: Proposed East Through Culvert Total

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 8.600 ac, | 0.00% Impervious, | Inflow Depth = 2.65" | for 100yr 24hr event | |
| Inflow = | 23.52 cfs @ | 12.24 hrs, | Volume= | 1.899 af | |
| Primary = | 23.52 cfs @ | 12.24 hrs, | Volume= | 1.899 af, | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 1.00-48.01 hrs, dt= 0.03 hrs

# APPENDIX E

## SOILS REPORT

CGC, Inc.
Construction • Geotechnical
Consulting Engineering/Testing

January 6, 2020
C19482

Mr. Chris Ehlers
VH Acquisitions, LLC
6801 South Towne Drive
Madison, WI 53713

Re: Geotechnical Exploration Report
Proposed Residential Development
Utterback Property – CTH AB
Town of Dunn, Dane County, Wisconsin

Dear Mr. Ehlers:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the subsurface exploration program for the above-referenced project. The purpose of this exploration program was to evaluate the subsurface conditions within proposed roadways and stormwater management areas and to provide geotechnical recommendations regarding site preparation, utility and pavement design/construction. Preliminary stormwater and residential foundation design recommendations are also included. We are sending you an electronic copy of this report, and we can mail a paper copy upon request. An electronic copy is also being sent to Mr. Dan Day at D'Onofrio Kottke and Associates.

## PROJECT AND SITE DESCRIPTIONS

We understand a residential development is proposed for an approximately 54-acre site on the west side of CTH AB, about 1,500 ft south of the intersection with CTH MN, in the Town of Dunn, Dane County, Wisconsin. The project area, which is currently farmland, is to be annexed into the Village of McFarland. Based on publicly-available topographic data (DCiMap, 1-ft contour lines), existing site grades generally slope from north-central parts of the site down towards the southeast, with current ground surface elevations ranging from about EL 896 to 862 ft. The site is bounded by railroad tracks to the south, and a lowland area is present to the south of the tracks, with lowest ground surface elevations in that area near EL 859 to 860 ft, based on DCiMap 1-ft contour lines.

Although in the early planning stages, we understand the project will include the construction of roads, utilities, stormwater management areas and, ultimately, single family homes. Proposed site grading information was not available at the time of this evaluation.

2921 Perry Street, Madison WI 53713
Telephone: 608/288-4100
FAX: 608/288-7887

## SUBSURFACE CONDITIONS

Subsurface conditions for this study were explored by drilling 17 Standard Penetration Test (SPT) soil borings to planned depths between 15 and 20 ft below current site grades at locations selected and field-staked by D'Onofrio Kottke personnel, who also surveyed the ground surface elevations at the boring locations. The borings were conducted on December 11 and 12, 2019 by GeoServe (under subcontract to CGC), using a track-mounted (ATV) Geoprobe 7822DT rotary drill rig equipped with hollow stem augers and an automatic SPT hammer. Note that auger and split-spoon refusal occurred in Boring 15 at about 12.5 ft below the ground surface on apparent bedrock. The specific procedures used for drilling and sampling are described in Appendix A, and the boring locations are shown in plan on the Soil Boring Location Exhibit presented in Appendix B.

The subsurface profiles at the boring locations varied to some degree across the site, but the following strata were generally encountered (in descending order):

- About 12 to 36 in. of ***topsoil***; followed by
- About 2 to 5.5 ft of generally stiff to very stiff ***lean clay*** and ***sandy lean clay***, typically softening somewhat with depth or grading to loose to medium dense ***clayey sand***; over
- Very loose to very dense ***sand and gravel*** strata, containing variable amounts of fines and scattered cobbles/boulders, to the maximum depths explored in the majority of the borings; except where
- Loose to medium dense ***silt*** and ***silty to clayey sand*** or medium stiff to very stiff ***lean to silty clay*** layers were present towards the bottom of Borings 5, 15, 16 and 17; underlain by
- Very dense, ***probable highly weathered to weathered sandy dolomite bedrock*** to the level of auger/split-spoon refusal in Boring 15.

Natural moisture contents in representative samples from the shallow lean clay layers ranged from 22.9% to 29.8%, while sandier lean clay specimens were determined to have natural moisture contents of 12.0% to 18.2%. A sample obtained from the deeper cohesive/fine-grained soils encountered in Boring 15 was tested for its liquid and plastic (Atterberg) limits to aid in its classification, with a liquid limit of 17% and a plasticity index of 1 corresponding to USCS classification of low-plasticity silt (ML). Based on natural moisture contents, pocket penetrometer readings ($q_p$; an estimate of the unconfined compressive strength of cohesive soils) and SPT blow counts (N-values), the on-site cohesive and fine-grained soils should generally be considered slightly to moderately compressible.

In addition, particle size distribution (gradation) was determined on a sand sample from Boring 13. With a P200 ('fines') content of 3.5%, the sample classifies as poorly-graded sand (SP) and fine sand (FS) per the USCS and USDA classification systems, respectively.

Note that occasional organic seams were found to be interbedded with the sand soils in Borings 15 and 17.

As mentioned above, probable highly weathered to weathered sandy dolomite bedrock was encountered below a depth of about 10.5 ft in Boring 15 (corresponding to approximately EL 853.6 ft), extending to the level of auger and split-spoon refusal on probable harder/more competent bedrock at about 12.5 ft below the ground surface (corresponding to approximately EL 851.6 ft). In addition, the clay soils encountered in Boring 5 below a depth of about 19 ft and the clayey/silty sand below about 13 ft in Boring 17 were classified as possible highly weathered/decomposed bedrock. It must be noted that the sampling procedure can disturb/degrade weathered bedrock, making it difficult to determine the depth to bedrock in some areas.

Groundwater was encountered in the majority of the borings during and upon the completion of drilling at depths between about 4 and 13 ft, corresponding to approximately EL 855 to 863 ft, with the average groundwater level at about EL 859 ft. Groundwater levels were also measured in Borings 13, 16 and 17 about one day after the completion of drilling, at which point the water was observed about 2.0 to 6.0 ft below current site grades, corresponding to approximately EL 859.2 to 861.3 ft. Note that the average groundwater level observed during drilling and the longer-term groundwater readings in Borings 13, 16 and 17 correspond fairly well with ground surface elevations in the lowland area south of the railroad tracks. Water levels can be expected to fluctuate based on seasonal variations in precipitation, infiltration, evapotranspiration, the levels in nearby waterbodies, as well as other factors. A more detailed description of the site soil and groundwater conditions is presented on the boring logs attached in Appendix B, which also contain the laboratory test results (including Particle Size Distribution Test Report), and on the WDSPS Soil and Site Evaluation – Storm form contained in Appendix F.

According to the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS) *Web Soil Survey*, eight soil series are identified within the development area. Two major soil series, which constitute about three-quarters of the site, are Kegonsa silt loam (KeB; approximately 42% of area) and Plano silt loam (PoB; approximately 33% of area). Minor soils include Dodge silt loam (DnB) in the north and northeast, Grays silt loam (GsB) in the east, Kidder soils (KrD2) in the north-central portions (near the high point), Sable silty clay loam (SaA) and Elburn silty loam (EgA) in the south to southwest as well as Colwood silt loam (Co) in an isolated area at the eastern perimeter of the development area.

The vast majority of the site's soils (Kegonsa, Plano, Dodge and Kidder) are described as well-drained soils that formed from loess over loamy and/or gravelly/sandy outwash on outwash plains, or from glacial till or loess over loamy till on drumlins and moraines. A typical profile involves finer-grained soils, such as clay loam, silty clay loam, sandy clay loam, silt loam and loam, followed by coarser-grained soils like sandy loam, gravelly sandy loam, stratified gravelly sand and gravelly coarse sand. As an exception, the soil series Grays silt loam, formed from silty alluvium over stratified silt and fine sand lacustrine deposits on lake plains, typically involves silt loam and silty clay loam over very fine sandy loam to silt loam. In areas mapped as Kegonsa silt loam, Plano silt loam, Dodge silt loam, Grays silt loam and Kidder soils, the seasonally high groundwater table is expected to remain more than 80 in. below the ground surface.

In contrast to the soils described in the previous paragraph, the soil series Sable silty clay loam, Elburn silt loam and Colwood silt loam, mapped in small southern to southwestern and eastern sections of the site, are described as somewhat poorly-drained to poorly-drained soils that formed from loess on swales, loess over sandy and gravelly outwash on till plains, and from loamy glaciolacustrine deposits over stratified silt and fine sand glaciolacustrine deposits on lakebeds. Fairly deep finer-grained deposits (silty clay loam and silt loam) are common in areas mapped as Sable silty clay loam, with silty clay loam, sandy clay loam and silt loam over stratified very fine sand to silt, sandy loam and very gravelly coarse sand typically encountered in areas mapped as Elburn silt loam and Colwood silt loam. Where Sable silty clay loam, Elburn silt loam and Colwood silt loam are present, the seasonally high groundwater table should generally be expected within 0 to 12 in. of the ground surface, and frequent ponding may occur in areas mapped as Sable silty clay loam and Colwood silt loam.

The Soil Map for this site, which was generated by the USDA-NRCS *Web Soil Survey*, is attached in Appendix B. The soil profiles in the borings were in general agreement with the profiles from the soil mapping.

## DISCUSSION AND RECOMMENDATIONS

Subject to the limitations discussed below and based on the subsurface exploration program, it is our opinion that this site is generally suitable for construction. However, some excavation below subgrade (EBS or undercutting/replacement) will likely be required during site grading and roadway construction, based on the presence of near-surface clay soils. In addition, some undercutting/replacement of marginal clay and/or clayey sand may be required below residential floor slabs and foundations, as well as utility inverts/structures in some portions of the site depending on structure and utility grades. Furthermore, bedrock excavation could potentially also be required during utility construction and building excavations in isolated portions of the site depending on utility and structure grades. Additionally, shallow groundwater and/or perched zones may impact utility and basement excavations in portions of the site, and groundwater levels should be considered when establishing basement grades.

Our recommendations for site preparation, roadway and utility design/construction are presented in the following subsections, along with preliminary stormwater infiltration and residential building design and construction considerations. Additional information regarding the conclusions and recommendations presented in this report is discussed in Appendix C.

## 1. Site Preparation

We recommend that topsoil and vegetation be stripped at least 10 ft beyond the construction limits in areas to receive fill and where building and roadway construction is planned. The topsoil can be stockpiled on-site and later re-used as fill in landscape areas. Topsoil thicknesses typically ranged between 12 and 36 in. in the borings, but variable topsoil thicknesses should be expected between and beyond boring locations due to past agricultural activities. Trees and root zones should be removed in conjunction with topsoil stripping.

After topsoil removal, the exposed soils are generally expected to consist of stiff to very stiff clay. Granular soils exposed in areas at-grade or requiring fill (if any) should be recompacted with a vibratory smooth-drum roller, and cohesive/fine-grained subgrade soils should be statically compacted (without vibration) and then proof-rolled with a piece of heavy rubber-tire construction equipment, such as a loaded scraper or tri-axle dump truck, to check for soft/yielding areas. If soft/unstable clay soils are encountered, an attempt could be made to dry/recompact the cohesive soils to develop a stable subgrade, which will likely be the most economical alternative to improve marginal subgrade soils, but this approach will likely require more time than other alternatives and is also highly weather dependent. Several cycles of discing, drying and recompaction may be required during extended periods of favorable weather (i.e., dry, warm and windy conditions) before a firm subgrade is developed. If drying/recompaction is not effective or the construction schedule or weather does not allow for drying/recompaction, the unsuitable soils can be undercut and replaced with suitable backfill compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557). As an alternative, soft subgrade soils could be stabilized using coarse aggregate (e.g., 3-in. dense graded base, select crushed material, etc.) that is compacted into the subgrade until deflection ceases. Similarly, loose sands that do not improve with compaction should be undercut and replaced with suitable granular backfill. Note that some of the shallow clay soils encountered in the borings exhibited fairly high natural moisture contents, and zones of lower- to moderate strength clay and clayey sand were also encountered, so we anticipate that some undercutting/stabilization or discing/recompacting will be required, which could be fairly widespread depending on the time of the year when grading occurs. *We therefore recommend that the project budget include a generous contingency for undercutting/stabilization or discing/recompacting during site preparation (or roadway subgrade preparation if not addressed earlier in the project).*

After a stable subgrade has been developed, fill placement to establish site grades may then proceed. To the extent practical, we recommend using granular soils (i.e., sand and/or gravel, including on-site materials if selectively excavated and stockpiled) as fill in building areas, as well as within the upper several feet of roadways as these soils are generally easier to place and compact compared to cohesive/fine-grained soils, particularly in adverse weather conditions. It is our opinion that clay and silt soils excavated on-site are best used in landscaping, or potentially in lower portions of roadway embankments assuming that moisture conditioning will be completed to facilitate proper compaction. Moisture conditioning (drying) may require several cycles of discing and recompaction in order to develop adequate compaction, which could delay construction progress. Fill/backfill should be placed in accordance with the Recommended Compacted Fill Specifications presented in Appendix D. *Where placement of several feet of fill will be required to establish site grades (i.e., more than about 5 ft above existing), a time delay between fill placement and beginning roadway and/or residential construction should be considered to allow the slightly to moderately compressible cohesive and fine-grained soils generally encountered on this site to consolidate and settle under the weight of the new fill, with a delay time of about one to three months typically being adequate.* We can provide additional details once the grading plan is developed, if needed.

As discussed above, possible/probable bedrock was encountered in isolated borings, and the depth and consistency of bedrock should be expected to vary across the site. As a general "rule of thumb", it has been our experience that excavation to the level of auger refusal in soil borings can typically be accomplished using conventional earthwork equipment and techniques, including a narrow bucket and ripping tooth. Excavations that extend below the level of auger refusal typically require special bedrock removal techniques, such as chiseling with an excavator-mounted rock chipper, blasting, etc. Rock excavation considerations are contained in Appendix E. *We recommend that a unit rate for rock excavation be established in the bidding documents. Note that rock excavation should be clearly defined in the project specifications.* It should also be noted that mass excavation with scrapers may not be able to extend into weathered bedrock to the same extent as using a large excavator (with appropriate bucket) and haul trucks. *Supplemental test pits are recommended to further explore the depth and consistency of the bedrock where deeper cuts are anticipated and the soil borings indicate the presence of bedrock.*

## 2. Roadway Pavement Design

The shallow cohesive soils encountered across the site are expected to control the pavement design, as we anticipate that the pavement subgrades (near existing site grades) will generally consist of stiff to very stiff clay soils, which could potentially also be used to raised site grades in some areas. Standard earthwork-related techniques that should be used during roadway construction after topsoil stripping include proof-rolling, undercutting/stabilization (excavation below subgrade – EBS) and compaction control of fill/backfill, as discussed in the Site Preparation section of this report.

Based on the borings, the shallow soil conditions in the borings generally appear suitable for pavement support. *However, because of the potential for shallow marginal clays (to clayey sands) at or below existing site grades/pavement subgrade levels, especially in southern, lower portions of the site, we recommend including a generous contingency for undercutting and stabilization with 3-in. dense graded base (or other coarse aggregate) in the project budget.* If long, continuous sections of soft/unstable soils are encountered, biaxial geogrid (e.g., Tensar Type 1 (BX 1100) or equivalent) or woven geotextile fabric (e.g., Mirafi 600X or equivalent) can be used to reduce the undercut depth and provide additional stabilization. It has been our experience that clay or silt soils with pocket penetrometer readings of less than about 1.5 tsf will likely require undercutting after proof-rolling, as described above. If roadway grades will be raised above existing grade, and well-compacted fill is placed above a firm subgrade during general site grading, the need for undercutting/stabilization will likely be reduced.

Based on the soil conditions encountered in the borings and assuming that on-site clays may be used to raise grade in some roadway areas, the pavement design will be controlled by the cohesive soils, and the following parameters should be used to develop the design pavement sections, which are based on a firm or adequately stabilized subgrade being developed:

| | |
|---|---|
| USCS Soil Classification | CL |
| AASTHO Classification | A-6 |
| Frost Group Index | F-3 |
| Design Group Index | 12 |
| Soil Support Value | 4.2 |
| Subgrade Modulus, k (pci) | 150 |

These design parameters are based on the following assumptions:

1. The subgrade has been closely monitored.
2. The subgrade has been thoroughly and adequately compacted.
3. Wet zones have been dried, drained or removed.
4. Pockets of dissimilar material have been removed, replaced or mixed to achieve a homogeneous subgrade.
5. Adequate subgrade drainage has been achieved.

(Reference: WisDOT *Geotechnical Manual)*

Assuming traffic volumes of up to 100 cars and less than 5 trucks per day per design lane (i.e., Traffic Class II according to Wisconsin Asphalt Pavement Association (WAPA) recommendations for low-volume roadways and subdivision streets), a typical pavement section per WDOT Standard Specifications and following WAPA recommendations is 3.5 to 4.0 in. of asphalt pavement over 8 to 12 in. of compacted aggregate base course. Alternative pavement designs for different traffic count data (e.g., if high truck traffic loads are expected) are also acceptable provided they are based on the given design parameters. *Note that if the upper (surface) asphalt layer will not be installed immediately after the lower (binder) asphalt layer and construction traffic will travel on only the lower layer, consideration should be given to increasing the lower asphalt layer thickness to improve the durability of the lower layer.*

**3. <u>Utility Construction</u>**

Based on the available soil and groundwater information, it appears that utility construction can proceed using traditional open-cut methods. Dewatering may be required in some portions of the site, especially where shallow groundwater was encountered in the borings (predominantly southern, lower parts of the site) and the soil mapping indicates that the seasonal high water table may be within 1 ft of the ground surface during wet periods (southern/southwestern and eastern areas). Rock excavation may potentially also be required in some areas, depending on utility locations and depths. It is expected that excavation sidewalls will be sloped back for relatively shallow installations (i.e., less than 4 ft in depth) and that a trench shield and/or internal bracing will be used for deeper excavations. The following are our recommendations regarding trench excavation, dewatering, and backfilling:

- <u>Excavation</u>: Open cuts should be sloped and/or braced in accordance with OSHA guidelines. The softer clays, sand and gravel with low "fines" content (denoted as SP/SP-SM and GP/GP-GM on the boring logs), as well as loose sands with higher silt content (SM and SC) are generally classified as OSHA "Type C" soils, and slopes of 1.5H:1V or flatter are expected to be at least temporarily stable. At least medium stiff clays and denser silty to clayey sand soils above the water table are generally classified as OSHA "Type B" soils where slopes of 1H:1V are expected to be temporarily stable. Note that flatter side slopes may also be required where perched water is present that destabilizes the side slopes. *The appropriate utility trench excavation side slopes should be determined by a competent person completing the earthwork in accordance with OSHA slope guidelines.* Due to the presence of weak and marginal clays, clayey to silty sand and sand strata in some of the borings, a stone stabilization layer consisting of 6 to 12 in. of compacted crushed stone may be required below the bedding layer in some areas to adequately support utility piping, depending on utility grades.

- <u>Dewatering</u>: Groundwater was encountered at depths between about 2 and 13 ft below existing site grades. In addition, the soil mapping indicates that seasonally elevated groundwater may be within 1 ft of the ground surface in some portions of the site. Therefore, depending on the location and depth of the utility, as well as the time of year construction occurs, some dewatering may be required. In general, groundwater drawdowns of less than about 1 to 2 ft can typically be achieved using submersible pumps operating from filtered sump pits, which can also be used to remove seepage or precipitation. If groundwater drawdowns exceed about 2 ft, dewatering with vacuum well points or deep wells may be required. Dewatering means and methods are the responsibility of the utility contractor.

- <u>Rock Removal</u>: Possible/probable bedrock was encountered in isolated borings, as previously discussed. The depth to bedrock should be expected to vary across the site. Although rock excavation considerations were included in the Site Preparation section of this report, bedrock removal in narrow utility trenches will likely be more difficult than in mass cut areas, as it may be more difficult to locate and exploit fractures and weak zones in the bedrock. Rock excavation considerations are contained in Appendix E, and we recommend that a unit rate for rock excavation be established in the bidding documents for utility excavations. Supplemental test pits are recommended to further explore the depth and consistency of the bedrock along proposed utility alignments where possible/probable bedrock was encountered in the soil borings.

- Backfilling: Excavation backfilling may proceed using the following guidelines:

  - Although clayey and silty excavation spoils may be used to backfill the utility trenches above the pipe and associated granular bedding material, to the extent possible, we recommend that granular soils be used as backfill below paved areas because sand/gravel soils are relatively easy to place and compact in most weather conditions compared to cohesive soils. Silt and clay soils will likely require moisture conditioning prior to placement and compaction, which could delay construction progress. Granular soils containing cobbles and boulders should not be used in direct contact with utility lines.

  - Backfill material should be placed in accordance with Appendix D guidelines or applicable municipal requirements.

  - Compaction recommendations:

    - Within 10 ft of buildings: 95% modified Proctor (ASTM D1557);
    - Depths greater than 3 ft below grade in pavement areas: 90% modified Proctor;
    - Final 3 ft in pavement areas: 95% modified Proctor; and
    - Landscape areas: 85% modified Proctor.

## 4. Preliminary Stormwater Infiltration Potential

We understand that stormwater management areas are currently being considered in southern portions of the site near Borings 13, 16 and 17.

The subsurface conditions encountered in the southernmost Borings B-16 and B-17 were fairly consistent and included about 12 in. of topsoil, followed by lower-permeability clay loam and sandy clay loam strata, which were underlain, below a depth of about 6.5 ft, by more permeable fine sand and sand layers. However, groundwater was encountered during drilling at the bottom of the lower-permeability soils, and the shallow clay soils generally exhibited redoximorphic features (redox or mottling) and low-chroma/high-value (gray) dominant color, indicating the level of past saturation from perched water, periodically infiltrating surface water or seasonally elevated groundwater. About one day after the completion of Borings B-16 and B-17, the groundwater had stabilized at about 2.0 to 2.5 ft below current site grades in these boreholes. Therefore, it is our opinion that the area near Borings B-16 and B-17 is not suitable for infiltrating significant quantities of stormwater.

In Boring B-13, performed slightly further north and at a higher elevation, the shallow topsoil was underlain by lower-permeability sandy clay loam to a depth of about 3 ft, followed by more permeable granular strata to the maximum depth explored. Groundwater in this boring was encountered at a depth of about 8 ft during drilling and about 6 ft below the ground surface upon the completion of drilling. Provided the bottom of the infiltration system near B-13 extends through the lower-permeability soils (or lower-permeability soils are undercut below the bottom of the infiltration system and replaced with appropriate sandier soils) and adequate separation from groundwater can be achieved, it is our opinion that some stormwater infiltration in this area may potentially be feasible.

A gradation performed on a representative sand sample obtained above the apparent groundwater table in Boring B-13 showed a P200 content of 3.5%, and the particle size distribution test report is included in Appendix B. Per NR151, it may be necessary to include at least a 3-ft soil layer with a minimum of 20% fines or a 5-ft thick layer with a minimum of 10% fines below the bottom of the infiltration system to act as a filtering layer before the infiltrating stormwater reaches the groundwater table. *The inclusion of a filtering layer with higher fines content may control the infiltration rate of the infiltration system.*

*As the soil conditions vary across the site, the Boring Logs and WDSPS Soil and Site Evaluation – Storm form attached in Appendices B and F, respectively, should be consulted for a description of the soil conditions at each boring location. Variability in the soil conditions should be expected across the site and within stormwater basins that could result in a wide range of undercut depths to reach soil suitable for the design infiltration rate.*

**Infiltration Potential:** The following is a *preliminary* summary of the estimated infiltration rates for the soils encountered in Borings B-13, B-16 and B-17, per Table 2 of the WDNR Conservation Practice Standard 1002, *Site Evaluation for Storm Water Infiltration*. The estimated infiltration rates are as follows:

- Clay loam (CL) 0.03 in./hr
- Silty clay loam (SiCL) 0.04 in./hr
- Sandy clay loam (SCL) 0.11 in./hr
- Silt loam (SiL) 0.13 in./hr
- Fine sandy loam (FSL) 0.50 in./hr
- Gravelly sandy loam (GRSL) 0.50 in./hr
- Fine sand (FS) 0.50 in./hr
- Sand (S) 3.60 in./hr
- Extremely gravelly sand (XGRS) 3.60 in./hr

Note that the infiltration rates should be considered very approximate since they are merely based on soil texture and do not account for in-place soil density and other factors, which will affect the infiltration rate. We recommend that the soils at and several feet below the bottom of stormwater management systems be checked by a geotechnical engineer or certified soil tester *in conjunction with the basin designer* to document that the soils are appropriate for the design infiltration rate or recommend remedial measures, if necessary. The Wisconsin Department of Safety and Professional Services Soil and Site Evaluation – Storm form for Borings B-13, B-16 and B-17 is contained in Appendix F.

It must be cautioned that the results of the soil borings have limitations with regard to the evaluation of the on-site stormwater infiltration potential as actual soil horizon transitions may vary from those shown on the boring logs and infiltration form. The reviewing agency may require test pits be excavated at a later date prior to finalizing the stormwater design. *The results of the test pits may require revisions to the stormwater management design if the design has been based solely on the soil borings.*

**Groundwater:** Groundwater was encountered in the southernmost Stormwater Borings B-16 and B-17, about one day after the completion of drilling, at about 2.0 to 2.5 ft. In addition, the soil mapping indicates that the seasonally high groundwater table may be within 1 ft of the ground surface in southern to southwestern (and isolated eastern) portions of the site. Furthermore, redoximorphic features and low-chroma/high-value dominant color, which are indicative of the level of previous saturation from perched water, periodically infiltrating surface water or seasonally elevated groundwater, were generally noted in the cohesive soils. Slightly deeper groundwater levels were observed in Boring B-13, performed further north and at a higher ground surface elevation compared to B-16 and B-17. At the completion of B-13, the groundwater level was observed at about 6 ft below the ground surface.

**Bedrock:** Apparent bedrock was not encountered in the Stormwater Borings B-13 and B-16, but the soils below a depth of about 13 ft in B-17 were classified as possible highly weathered bedrock, and possible/probable bedrock was also encountered in isolated other borings performed on this site. The depth of bedrock should therefore be expected to vary across the site.

During construction, appropriate erosion control should be provided to prevent eroded soil from contaminating the stormwater management areas. Where appropriate, the stormwater system design should include pretreatment to remove fine-grained soils (silt/clay) and clogging materials (oils/greases) from stormwater prior to entering the infiltration areas. Additionally, a regular maintenance plan should be developed to remove silt/clay soils and clogging materials that may accumulate in the bottom of the stormwater management area over time. Failure to adequately control fine-grained soils and clogging materials from entering the infiltration area or failure to regularly remove fine-grained soils and clogging materials that accumulate at the base of the stormwater infiltration system will likely cause the stormwater management system to fail.

Additionally, it is important that the soils in the bottom of the infiltration systems do not become compacted during construction or measures are taken to mitigate soils that are compacted during construction. Refer to WDNR Conservation Practice Standards 1002, 1003 and 1004, as well as NR151 for additional information.

## 5. Preliminary Foundation Design

Depending on building elevations, a combination of cohesive, fine-grained and granular soils could be encountered at foundation grades. If site grades are raised, footings may also bear on compacted granular fill, in which case it is important that the existing soils be carefully checked (including shallow test pits) to document the existing soils are suitable for building support prior to new fill placement. Bedrock excavation may potentially also be required for footing and basement excavations in isolated locations, depending on building grades.

It is our opinion that residential structures can generally be supported on conventional spread footing foundations bearing on suitable natural soils and engineered fill. Based on the range of soil conditions encountered, a bearing pressure in the range of 1,000 psf to 3,000 psf appears to be applicable over most of the site. However, depending on building locations and grades, some undercutting below footings (and floor slabs) due to lower-strength and marginal soils should generally be expected. The soil conditions in southern portions of the site generally appear to be the weakest and most compressible, which may potentially be problematic for building support, but fairly shallow undercutting will likely also be required in other portions of the site to develop suitable foundation and floor slab subgrades. There were also areas where denser sand/silt and harder clay were encountered, and higher bearing pressures could potentially be used.

Since residential structure loads are generally light, for preliminary design purposes, we recommend assuming an allowable bearing pressure of 1,500 psf, with the understanding that undercutting below footings could be required in various locations, depending on building and foundation grades. *Note that dewatering may potentially be required during basement, undercutting and backfilling operations, depending on building location and elevations, as well as the time of year construction occurs. We recommend that careful consideration be given to establishing basement grades where groundwater was encountered. Longer-term water level readings in monitoring wells may prove helpful in this determination. To the extent possible, we recommend establishing basement grade several feet above the seasonal high groundwater level to reduce the potential for dewatering being required below basements.*

The following parameters should be used for *preliminary* foundation design:

- Maximum net allowable bearing pressure: 1,500 psf

- Minimum foundation widths:
  - Continuous wall footings: 18 in.

- Column pad footings: 30 in.

- Minimum footing depths:
  - Exterior/perimeter footings: 4 ft
  - Interior footings: no minimum requirement

Undercutting below footing grade will be required where loose or disturbed sand/silt soils or clay with $q_P$-readings of less than 0.75 tsf are encountered at or slightly below footing grade. As discussed above, some undercutting below footing grade should be expected, and an allowance for this operation should be included in the project budget. *Where medium stiff clays (i.e., pocket penetrometer readings of less than 1 tsf) are encountered that are especially susceptible to disturbance from construction traffic or weather, we recommend placing a 6-in. layer of clear stone below the footings immediately after excavation to act as a working platform.* Where undercutting is required, the base of the undercut excavation should be widened beyond the footing edges at least 0.5 ft in each direction for each foot of undercut depth for stress distribution purposes. Foundation grades above the water table can be restored with granular backfill compacted to at least 95% compaction (modified Proctor – ASTM D1557) or 3-in. dense graded base that is placed in maximum loose lifts of 12 in. and thoroughly compacted with a large vibratory compactor until deflection ceases. Below the water table, undercut excavations should be backfilled with crushed clear stone that is placed in loose lifts of 12 in. or less, which are subsequently compacted with a large vibratory plate compactor or excavator-mounted hoe-pack until deflection ceases. Where the total clear stone layer thickness exceeds 12 in., the clear stone should be wrapped in non-woven geotextile fabric (e.g. Mirafi 160N or equivalent) to prevent migration of fines into the void spaces of the clear stone.

Since the subsurface conditions vary across the site, CGC should be present during footing excavations to check whether subgrades are satisfactory for the design bearing pressure and to advise on corrective measures, where necessary. We recommend using a smooth-edged backhoe bucket for footing and undercut excavations in soil. A bucket with teeth is acceptable where excavation occurs in weathered bedrock, provided loosened rock is removed from the bottom of the excavation. Additionally, granular soils exposed at footing grade that are above the water table and not susceptible to disturbance from vibrations should be recompacted with a large vibratory plate compactor or an excavator-mounted hoe-pack prior to formwork/concrete placement to densify soils loosened during the excavation process. Soils potentially susceptible to disturbance from compaction (e.g., silty or clayey soils or granular soils close to or below the water table) should be hand trimmed and/or stabilized with clear stone, as appropriate. Provided the foundation design/construction recommendations discussed above are followed, we estimate that total and differential settlements should be on the order of 1.0 and 0.5 in., respectively.

Based on groundwater observations in the soil borings and indications in the soil mapping that shallow groundwater may be encountered in some portions of the site, a sub-floor dewatering system with sump pump may potentially be required for some residential structures to prevent groundwater from entering the lower level depending on the location and elevation. Depending on basement grades, seasonal dewatering could be fairly significant, and we recommend that careful consideration be given to establishing basement grades where groundwater was encountered. To the extent possible, we recommend establishing basement grade several feet above the seasonal high groundwater level to reduce the potential for dewatering being required below basements. Longer-term water level readings in monitoring wells may prove helpful in determining seasonally high groundwater levels, and we can provide additional information and recommendations if needed.

## CONSTRUCTION CONSIDERATIONS

Due to variations in weather, construction methods and other factors, specific construction problems are difficult to predict. Soil related difficulties that could be encountered on the site are discussed below:

- Earthwork construction during the late fall through early spring could be complicated as a result of wet weather and freezing temperatures. During cold weather, exposed subgrades should be protected from freezing before and after footing construction. Fill should never be placed while frozen or on frozen ground.

- If the construction schedule requires that construction proceed during adverse weather, typically encountered during fall through spring, the contingency for undercutting disturbed soils should be increased.

- To the extent practical, traffic should be avoided on prepared subgrades to minimize further disturbance.

- Excavations extending greater than 4 ft in depth below the existing ground surface should be sloped or braced in accordance with current OSHA standards.

- Based on the soil mapping and water observations in the soil borings, groundwater infiltration into some utility, basement and footing excavations may occur, especially during wet seasons. Dewatering using submersible pumps operating from filtered sump pits, vacuum well points or deep wells may be required for groundwater control, as previously discussed, which should be evaluated by the contractor.

- The depth to bedrock is expected to vary across the site. In addition to potential bedrock removal during building excavations, some bedrock excavation may be required during utility construction. Supplemental test pits can be excavated to better determine if bedrock excavation may be required. See the Site Preparation and Utility Construction sections of the report, as well as Appendix E for additional information regarding rock excavation.

## RECOMMENDED CONSTRUCTION MONITORING

The quality of the residential building pads and pavement subgrades will largely be determined by the level of care exercised during site development. To check that earthwork and foundation construction proceeds in accordance with our recommendations, the following operations should be monitored by CGC:

- Topsoil stripping/removal and subgrade proof-rolling;
- Fill/backfill placement and compaction;
- Foundation excavation and subgrade preparation; and
- Concrete placement.

## FOLLOW-UP EXPLORATION PROGRAMS

The exploration program described in this report is preliminary in nature and is not intended to provide sufficient detail on subsurface conditions for each individual lot or stormwater management area. Due to the variability in soil and bedrock conditions, especially the potential for undercutting of soft/loose soils below footing grade of some residential structures, shallow groundwater as well as possible bedrock excavation during utility and residential building construction, follow-up exploration by test pits or borings is recommended to provide lot-specific geotechnical recommendations. *Note that stormwater infiltration potential estimations based on soil borings are considered preliminary, and test pits will likely need to be performed in proposed stormwater management areas to develop final design infiltration rates. If the stormwater design is based on the soil borings performed during the subsurface exploration program summarized in this report, revisions to the design may be required depending on the findings in the test pits.* We can provide specific recommendations and a proposal for the additional geotechnical work at the appropriate time.

* * * * *

CGC, Inc.



It has been a pleasure to serve you on this project. If you have any questions or need additional consultation, please contact us.

Sincerely,

**CGC, Inc.**

Tim F. Gassenheimer, EIT, CST
Staff Engineer

Ryan J. Portman, PE, CST
Consulting Professional

Encl: Appendix A - Field Exploration
Appendix B - Soil Boring Location Exhibit
Logs of Test Borings (17)
Particle Size Distribution Test Report (1)
Log of Test Boring-General Notes
Unified Soil Classification System
Web Soil Survey Map and Legend (3 Pages)
Appendix C - Document Qualifications
Appendix D - Recommended Compacted Fill Specifications
Appendix E - Rock Excavation Considerations
Appendix F - WDSPS Soil and Site Evaluation – Storm Forms (3 Borings)

Cc: Mr. Dan Day, D'Onofrio Kottke and Associates

# APPENDIX A

# FIELD EXPLORATION

## APPENDIX A

### FIELD EXPLORATION

Subsurface conditions for this study were explored by drilling 17 Standard Penetration Test (SPT) soil borings to planned depths between 15 and 20 ft below current site grades at locations selected and field-staked by D'Onofrio Kottke personnel, who also surveyed the ground surface elevations at the boring locations. The borings were conducted on December 11 and 12, 2019 by GeoServe (under subcontract to CGC), using a track-mounted (ATV) Geoprobe 7822DT rotary drill rig equipped with hollow stem augers and an automatic SPT hammer. Note that auger and split-spoon refusal occurred in Boring 15 at about 12.5 ft below the ground surface on apparent bedrock.

Soil samples were generally obtained at 2.5-foot intervals to a depth of 10 ft and at 5-ft intervals thereafter. As an exception, the borings located in or near proposed stormwater management areas were sampled at 2.5-foot intervals to the final depth. The soil samples were obtained in general accordance with specifications for standard penetration testing, ASTM D 1586. The specific procedures used for drilling and sampling are described below.

1. Boring Procedures between Samples

   The boring is extended downward, between samples, by a hollow stem auger.

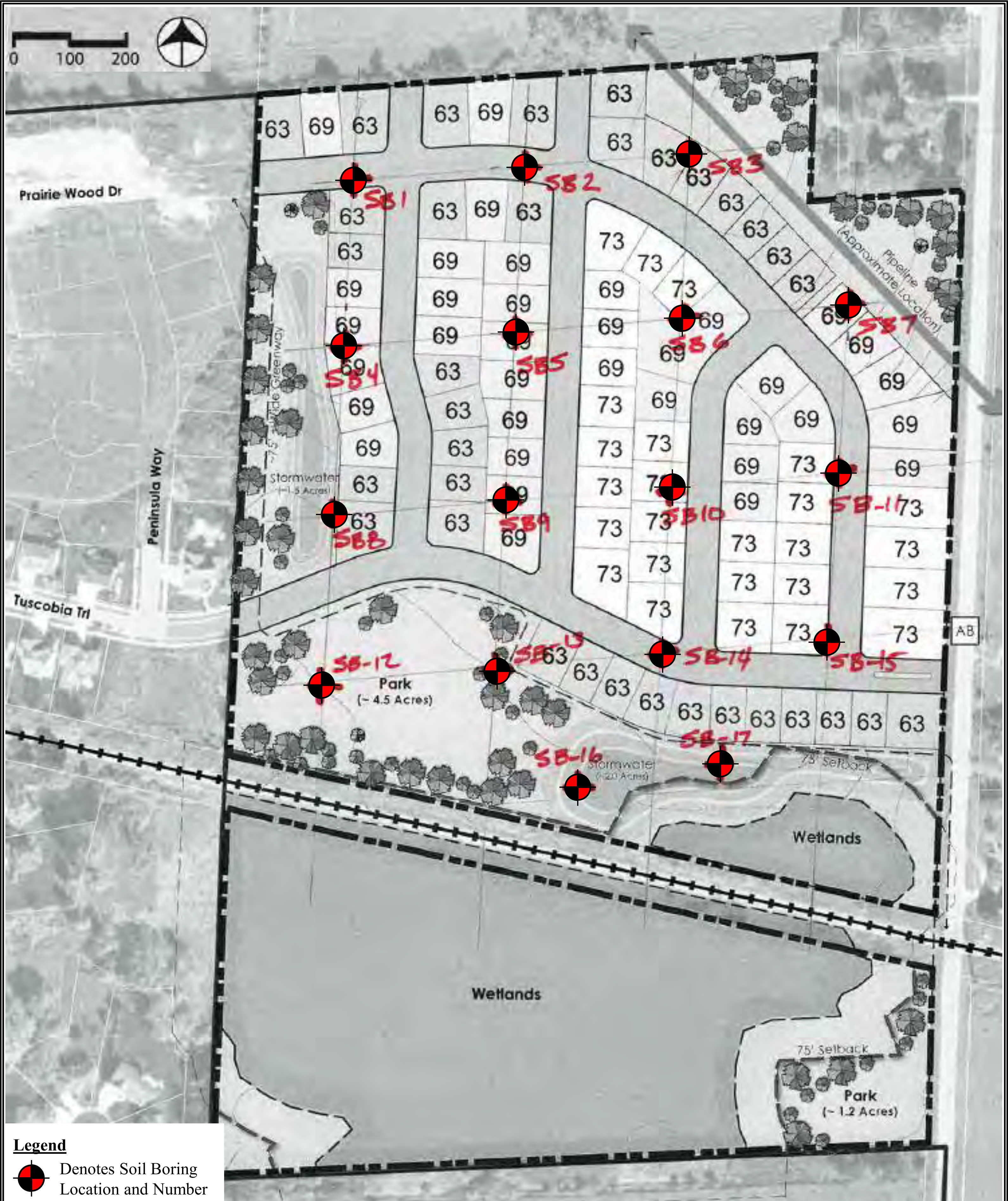
2. Standard Penetration Test and Split-Barrel Sampling of Soils
   (ASTM Designation: D 1586)

   This method consists of driving a 2-inch outside diameter split-barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the log of borings and is known as the Standard Penetration Resistance. Recovered samples are first classified as to texture by the driller.

During the field exploration, the driller visually classified the soil and prepared a field log. *Field screening of the soil samples for possible environmental contaminants was not conducted by the driller, as environmental site assessment activities is beyond CGC's work scope*. Water level observations were made in each boring during and after drilling and are shown at the bottom of each boring log. Upon completion of drilling, the boreholes were backfilled in accordance with WDNR regulations, and the soil samples were delivered to our laboratory for visual classification and laboratory testing. The soils were visually classified by a geotechnical engineer using the Unified Soil Classification System. The final logs prepared by the engineer, including the laboratory test results, along with a Soil Boring Location Exhibit and a description of the Unified Soil Classification System are presented in Appendix B.

# APPENDIX B

## SOIL BORING LOCATION EXHIBIT
## LOGS OF TEST BORINGS (17)
## PARTICLE SIZE DISTRIBUTION TEST REPORT (1)
## LOG OF TEST BORING-GENERAL NOTES
## UNIFIED SOIL CLASSIFICATION SYSTEM
## WEB SOIL SURVEY MAP AND LEGEND (3 PAGES)




**Legend**

Denotes Soil Boring Location and Number

**Notes**

1. Borings were drilled by GeoServe on December 11 and 12, 2019.
2. Boring locations are approximate.
3. Base map was prepared by D'Onofrio Kottke and Associates.

| Job No.: C19482 | CGC, Inc. | SOIL BORING LOCATION EXHIBIT<br>Proposed Residential Development<br>Utterback Property – CTH AB<br>Town of Dunn, Dane County, Wisconsin |
|---|---|---|
| Date: 12/2019 | | |

# LOG OF TEST BORING

CGC Inc.

| | |
|---|---|
| Project | Proposed Residential Development Utterback Property - CTH AB |
| Location | Town of Dunn, Dane County, Wisconsin |
| Boring No. | 1 |
| Surface Elevation (ft) | 872.72 |
| Job No. | C19482 |
| Sheet | 1 of 1 |

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | VISUAL CLASSIFICATION and Remarks | qu (qa) (tsf) | W | LL | PL | LI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 18 | M | 7 | | Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL) | (2.5-3.25) | 24.3 | | | |
| | | | | | | Stiff, Brown Lean CLAY, Trace Sand (CL) | | | | | |
| 2 | | 18 | M | 4 | | | (1.0-1.75) | 29.8 | | | |
| | | | | | 5 | Medium Dense to Very Dense, Tan Fine to Coarse SAND and GRAVEL, Trace to Little Silt, Scattered Cobbles/Boulders (SP/SP-SM/GP/GP-GM) | | | | | |
| 3 | | 18 | M | 29 | | | | | | | |
| 4 | | 18 | M | 60 | | Possible Cobble/Boulder near 9 ft | | | | | |
| | | | | | 10 | | | | | | |
| | | | | | | Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM) | | | | | |
| 5 | | 8 | W | 16 | | | | | | | |
| | | | | | 15 | End of Boring at 15 ft<br><br>Borehole Backfilled with Bentonite Chips | | | | | |
| | | | | | 20 | | | | | | |

## WATER LEVEL OBSERVATIONS

| | | | | |
|---|---|---|---|---|
| While Drilling | ∇ 13.0' | Upon Completion of Drilling | | |
| Time After Drilling | | | | 10 mins. |
| Depth to Water | | | | NW |
| Depth to Cave in | | | | 11.0' |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

| | | | | | |
|---|---|---|---|---|---|
| Start | 12/12/19 | End | 12/12/19 | | |
| Driller | GeoServe | Chief | Eddie | Rig | Geoprobe 7822DT |
| Logger | Matt | Editor | TFG | | |
| Drill Method | 2.25" HSA; Autohammer | | | | |

# LOG OF TEST BORING

CGC Inc.

Project: Proposed Residential Development
Utterback Property - CTH AB
Location: Town of Dunn, Dane County, Wisconsin

Boring No. 2
Surface Elevation (ft) 881.14
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | VISUAL CLASSIFICATION and Remarks | qu (qa) (tsf) | W | LL | PL | LI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 18 | M | 8 | | Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL) | (2.5-4.0) | 25.8 | | | |
| | | | | | | Very Stiff, Brown Lean CLAY, Trace Sand (CL) | | | | | |
| 2 | | 4 | M | 10 | | | (2.5) | | | | |
| | | | | | 5 | Medium Dense, Tan Fine to Coarse SAND and GRAVEL, Trace to Little Silt, Scattered Cobbles/Boulders (SP/SP-SM/GP/GP-GM) | | | | | |
| 3 | | 18 | M | 12 | | Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM) | | | | | |
| 4 | | 4 | M | 24 | | | | | | | |
| | | | | | 10 | | | | | | |
| | | | | | | Medium Dense to Very Dense, Tan Fine to Medium SAND, Little to Some Gravel, Little Silt, Scattered Cobbles/Boulders (SP-SM) | | | | | |
| 5 | | 18 | M | 27 | | | | | | | |
| | | | | | 15 | | | | | | |
| 6 | | 12 | M | 102 | | | | | | | |
| | | | | | 20 | End of Boring at 20 ft<br><br>Borehole Backfilled with Bentonite Chips | | | | | |

## WATER LEVEL OBSERVATIONS

While Drilling ∇ NW    Upon Completion of Drilling ____
Time After Drilling: 10 mins.
Depth to Water: NW
Depth to Cave in: 17.0'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/12/19 End 12/12/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

# LOG OF TEST BORING

CGC Inc.

Project: Proposed Residential Development, Utterback Property - CTH AB

Location: Town of Dunn, Dane County, Wisconsin

Boring No. 3
Surface Elevation (ft) 869.74
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | VISUAL CLASSIFICATION and Remarks | qu (qa) (tsf) | W | LL | PL | LI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 18 | M | 10 | | Very Stiff, Brown/Gray (Lightly Mottled) Lean CLAY, Trace Sand (CL) | (3.0-3.25) | 25.7 | | | |
| | | | | | | Medium Stiff, Brown Sandy Lean CLAY, Trace Gravel (CL) | | | | | |
| 2 | | 18 | M | 6 | | | (0.75-1.0) | 18.2 | | | |
| | | | | | 5 | | | | | | |
| 3 | | 12 | M/W | 7 | ∇ | Loose to Medium Dense, Tan Fine to Coarse SAND and GRAVEL, Trace to Little Silt, Scattered Cobbles/Boulders (SP/SP-SM/GP/GP-GM) | | | | | |
| | | | | | ▼ | | | | | | |
| 4 | | 16 | W | 28 | | | | | | | |
| | | | | | 10 | | | | | | |
| 5 | | 10 | W | 13 | | | | | | | |
| | | | | | 15 | End of Boring at 15 ft<br><br>Borehole Backfilled with Bentonite Chips | | | | | |
| | | | | | 20 | | | | | | |

## WATER LEVEL OBSERVATIONS

While Drilling ∇ 6.5'    Upon Completion of Drilling ______
Time After Drilling: 10 mins.
Depth to Water: 8.0' ▼
Depth to Cave in: 9.0'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/12/19 End 12/12/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

# LOG OF TEST BORING

CGC Inc.

| | |
|---|---|
| Project | Proposed Residential Development Utterback Property - CTH AB |
| Location | Town of Dunn, Dane County, Wisconsin |
| Boring No. | 4 |
| Surface Elevation (ft) | 867.88 |
| Job No. | C19482 |
| Sheet | 1 of 1 |

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE | | | | | | VISUAL CLASSIFICATION and Remarks | SOIL PROPERTIES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | | qu (qa) (tsf) | W | LL | PL | LI |
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 16 | M | 6 | | Very Stiff, Brown Lean CLAY, Trace Sand (CL) | (2.5-2.75) | 24.4 | | | |
| 2 | | 18 | M | 20 | | | | | | | |
| | | | | | 5 | Medium Dense, Tan Fine to Coarse SAND and GRAVEL, Trace to Little Silt, Scattered Cobbles/Boulders (SP/SP-SM/GP/GP-GM) | | | | | |
| 3 | | 18 | W | 22 | ∇ | Medium Dense, Tan Fine to Coarse SAND, Little Gravel, Trace Silt (SP) | | | | | |
| | | | | | ▼ | Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM) | | | | | |
| 4 | | 12 | W | 18 | 10 | | | | | | |
| | | | | | | Medium Dense, Tan/Reddish Brown (Laminated) Silty Fine SAND to Sandy SILT (SM/ML) | | | | | |
| 5 | | 16 | W | 16 | 15 | | | | | | |
| | | | | | | End of Boring at 15 ft | | | | | |
| | | | | | | Borehole Backfilled with Bentonite Chips | | | | | |
| | | | | | 20 | | | | | | |

## WATER LEVEL OBSERVATIONS

| | | | | | |
|---|---|---|---|---|---|
| While Drilling | ∇ 6.5' | Upon Completion of Drilling | | | |
| Time After Drilling | | | | 10 mins. | |
| Depth to Water | | | | 8.0' | ▼ |
| Depth to Cave in | | | | 8.0' | |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/12/19 End 12/12/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

CGC Inc.

# LOG OF TEST BORING

Project: Proposed Residential Development
Utterback Property - CTH AB
Location: Town of Dunn, Dane County, Wisconsin

Boring No. 5
Surface Elevation (ft) 871.59
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | VISUAL CLASSIFICATION and Remarks | qu (qa) (tsf) | W | LL | PL | LI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 18 | M | 7 | | Very Stiff, Brown Lean CLAY, Trace Sand (CL) | (2.5-2.75) | 23.3 | | | |
| 2 | | 18 | M | 6 | | Stiff, Brown Sandy Lean CLAY, Little Gravel (CL) | (1.0-2.0) | | | | |
| | | | | | 5 | Loose, Brown Fine to Medium SAND, Little to Some Silt, Trace Gravel (SP-SM/SM) | | | | | |
| 3 | | 12 | M | 24 | | Medium Dense, Tan Fine to Coarse SAND and GRAVEL, Trace to Little Silt, Scattered Cobbles/Boulders (SP/SP-SM/GP/GP-GM) | | | | | |
| 4 | | 12 | W | 7 | ▽ | Loose to Very Dense, Brown Fine to Medium SAND, Some Silt, Little to Some Gravel, Scattered Cobbles/Boulders (SM) | | | | | |
| | | | | | 10 | | | | | | |
| | | | | | ▼ | | | | | | |
| 5 | | 16 | W | 81 | | Probable Cobble/Boulder near 14 ft | | | | | |
| | | | | | 15 | | | | | | |
| | | | | | | Medium Dense to Very Dense, Tan Fine SAND, Trace to Little Silt (SP/SP-SM) | | | | | |
| 6 | | 18 | W | 95 | | Very Stiff, Reddish Brown Lean to Silty CLAY, Trace Gravel (CL/CL-ML - Possible Highly Weathered/Decomposed Bedrock) | (2.75-3.5) | | | | |
| | | | | | 20 | End of Boring at 20 ft | | | | | |
| | | | | | | Borehole Backfilled with Bentonite Chips | | | | | |

## WATER LEVEL OBSERVATIONS

While Drilling ▽ 8.5' Upon Completion of Drilling ______

| | | | | |
|---|---|---|---|---|
| Time After Drilling | | | | 10 mins. |
| Depth to Water | | | | 11.0' ▼ |
| Depth to Cave in | | | | 14.0' |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/12/19 End 12/12/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

# LOG OF TEST BORING

CGC Inc.

Project: Proposed Residential Development
Utterback Property - CTH AB
Location: Town of Dunn, Dane County, Wisconsin

Boring No. 6
Surface Elevation (ft) 866.29
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE | | | | | | VISUAL CLASSIFICATION and Remarks | SOIL PROPERTIES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | | qu (qa) (tsf) | W | LL | PL | LI |
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 12 | M | 6 | | Very Stiff, Brown Lean CLAY, Trace Sand (CL) | (2.0-2.5) | 23.0 | | | |
| 2 | | 16 | M/W | 3 | | Very Loose, Brown Fine to Medium SAND, Some Silt, Trace Gravel (SM) | | | | | |
| | | | | | 5 | | | | | | |
| 3 | | 18 | W | 12 | | Medium Dense, Tan Fine to Coarse SAND, Little Gravel, Trace Silt (SP) | | | | | |
| 4 | | 18 | W | 6 | | Loose, Brown Fine to Medium SAND, Trace Silt and Gravel (SP) | | | | | |
| | | | | | 10 | | | | | | |
| | | | | | | Medium Dense, Grayish Brown Fine to Coarse SAND, Little Gravel, Trace Silt (SP) | | | | | |
| 5 | | 18 | W | 12 | | | | | | | |
| | | | | | 15 | End of Boring at 15 ft | | | | | |
| | | | | | | Borehole Backfilled with Bentonite Chips | | | | | |
| | | | | | 20 | | | | | | |

## WATER LEVEL OBSERVATIONS

| | | | | | |
|---|---|---|---|---|---|
| While Drilling | ∇ 6.5' | Upon Completion of Drilling | | | |
| Time After Drilling | | | | 10 mins. | |
| Depth to Water | | | | 6.0' | ▼ |
| Depth to Cave in | | | | 7.0' | |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/12/19 End 12/12/19
Driller GeoServe Chief Eddie Rig Geoprobe
Logger Matt Editor TFG 7822DT
Drill Method 2.25" HSA; Autohammer

# LOG OF TEST BORING

CGC Inc.

Project: Proposed Residential Development
Utterback Property - CTH AB
Location: Town of Dunn, Dane County, Wisconsin

Boring No. 7
Surface Elevation (ft) 866.34
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | VISUAL CLASSIFICATION and Remarks | qu (qa) (tsf) | W | LL | PL | LI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 16 | M | 6 | | Very Stiff, Brown Lean CLAY, Trace Sand (CL) | (2.25-2.5) | 24.0 | | | |
| | | | | | | Soft, Brown Sandy Lean CLAY, Trace Gravel (CL) | | | | | |
| 2 | | 10 | M/W | 4 | 5 | | (0.25-0.5) | 17.5 | | | |
| 3 | | 12 | W | 3 | | Very Loose, Brown Fine to Medium SAND, Little Silt, Trace Gravel (SP-SM) | | | | | |
| 4 | | 12 | W | 5 | 10 | Loose, Tan Fine SAND, Little to Some Silt (SP-SM/SM) | | | | | |
| | | | | | | Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM) | | | | | |
| 5 | | 12 | W | 24 | 15 | | | | | | |
| | | | | | 20 | End of Boring at 15 ft<br><br>Borehole Backfilled with Bentonite Chips | | | | | |

## WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.5'   Upon Completion of Drilling ____
Time After Drilling: 10 mins.
Depth to Water: 6.0' ▼
Depth to Cave in: 7.0'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/11/19 End 12/11/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

# LOG OF TEST BORING

CGC Inc.

Project: Proposed Residential Development, Utterback Property - CTH AB
Location: Town of Dunn, Dane County, Wisconsin

Boring No. 8
Surface Elevation (ft) 865.92
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE | | | | | | VISUAL CLASSIFICATION and Remarks | SOIL PROPERTIES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | | qu (qa) (tsf) | W | LL | PL | LI |
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 12 | M | 4 | | Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL) | (2.0) | 25.9 | | | |
| 2 | | 16 | M | 5 | 5 | Stiff to Very Stiff, Gray/Brown (Mottled) Lean CLAY, Trace Sand (CL) | (1.75-3.0) | 26.7 | | | |
| 3 | | 12 | W | 20 | | Medium Dense, Tan Gravelly Fine to Coarse SAND, Trace Silt, Scattered Cobbles/Boulders (SP) | | | | | |
| 4 | | 12 | W | 15 | 10 | Medium Dense, Tan Fine to Medium SAND, Some Gravel, Trace to Little Silt (SP/SP-SM) | | | | | |
| | | | | | | Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM) | | | | | |
| 5 | | 16 | W | 12 | 15 | | | | | | |
| | | | | | 20 | End of Boring at 15 ft<br><br>Borehole Backfilled with Bentonite Chips | | | | | |

## WATER LEVEL OBSERVATIONS

| | | | | | |
|---|---|---|---|---|---|
| While Drilling | ∇ 6.5' | Upon Completion of Drilling | | | |
| Time After Drilling | | | | 10 mins. | |
| Depth to Water | | | | 6.0' | ▼ |
| Depth to Cave in | | | | 7.0' | |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/12/19 End 12/12/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

CGC Inc.

# LOG OF TEST BORING

Project: Proposed Residential Development
Utterback Property - CTH AB
Location: Town of Dunn, Dane County, Wisconsin

Boring No. 9
Surface Elevation (ft) 870.51
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | VISUAL CLASSIFICATION and Remarks | qu (qa) (tsf) | W | LL | PL | LI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 16 | M | 7 | | Very Stiff, Brown Lean CLAY, Trace Sand (CL) | (3.25-3.5) | 23.4 | | | |
| 2 | | 18 | M | 18 | 5 | Medium Dense, Tan Fine to Coarse SAND, Some Gravel, Trace Silt, Scattered Cobbles/Boulders (SP) | | | | | |
| 3 | | 18 | M | 90 | | Dense to Very Dense, Tan Fine to Coarse SAND and GRAVEL, Trace to Little Silt, Scattered to Numerous Cobbles/Boulders (SP/SP-SM/GP/GP-GM)<br>Probable Cobble/Boulder near 6.5 ft | | | | | |
| 4 | | 0 | M | 34 | 10 | No Recovery from 8.5 to 10 ft (Sample 4) - Sample Collected from Drill Cuttings | | | | | |
| 5 | | 12 | W | 10 | 15 | Medium Dense to Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM) | | | | | |
| 6 | | 18 | W | 45 | 20 | Possible Cobble/Boulder near 19 ft | | | | | |
| | | | | | | End of Boring at 20 ft<br><br>Borehole Backfilled with Bentonite Chips | | | | | |

## WATER LEVEL OBSERVATIONS

While Drilling ▽ 13.0'    Upon Completion of Drilling ______
Time After Drilling: 10 mins.
Depth to Water: 11.0' ▼
Depth to Cave in: 11.0'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/12/19 End 12/12/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

CGC Inc.

# LOG OF TEST BORING

Project: Proposed Residential Development
Utterback Property - CTH AB
Location: Town of Dunn, Dane County, Wisconsin

Boring No. 10
Surface Elevation (ft) 868.32
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | VISUAL CLASSIFICATION and Remarks | qu (qa) (tsf) | W | LL | PL | LI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 18 | M | 8 | | Very Stiff, Brown Lean CLAY, Trace Sand (CL) | (2.75-3.0) | 23.7 | | | |
| 2 | | 18 | M | 9 | | Loose, Tan Fine to Coarse SAND, Some Gravel, Trace Silt, Scattered Cobbles/Boulders (SP) | | | | | |
| | | | | | 5 | | | | | | |
| 3 | | 18 | M | 40 | | Medium Dense to Dense, Tan Fine to Coarse SAND and GRAVEL, Trace to Little Silt, Scattered Cobbles/Boulders (SP/SP-SM/GP/GP-GM) Possible Cobble/Boulder near 6.5 ft | | | | | |
| 4 | | 18 | W | 18 | | | | | | | |
| | | | | | 10 | | | | | | |
| | | | | | | Loose to Medium Dense, Tan Fine to Coarse SAND, Trace Silt and Gravel (SP) | | | | | |
| 5 | | 12 | W | 10 | | | | | | | |
| | | | | | 15 | End of Boring at 15 ft | | | | | |
| | | | | | | Borehole Backfilled with Bentonite Chips | | | | | |
| | | | | | 20 | | | | | | |

## WATER LEVEL OBSERVATIONS

While Drilling ▽ 8.0'    Upon Completion of Drilling ______
Time After Drilling: 10 mins.
Depth to Water: 8.0' ▼
Depth to Cave in: 8.0'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/12/19 End 12/12/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

# LOG OF TEST BORING

CGC Inc.

| | |
|---|---|
| Project | Proposed Residential Development Utterback Property - CTH AB |
| Location | Town of Dunn, Dane County, Wisconsin |
| Boring No. | 11 |
| Surface Elevation (ft) | 862.88 |
| Job No. | C19482 |
| Sheet | 1 of 1 |

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE | | | | | | VISUAL CLASSIFICATION and Remarks | SOIL PROPERTIES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | | qu (qa) (tsf) | W | LL | PL | LI |
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 6 | M | 6 | | Stiff, Brown/Gray (Lightly Mottled) Sandy Lean CLAY (CL) | (1.75-2.0) | 12.0 | | | |
| | | | | | | Loose to Medium Dense, Brown Clayey Fine to Medium SAND (SC) | | | | | |
| 2 | | 12 | M/W | 18 | | Medium Dense, Tan Fine to Coarse SAND, Little Gravel, Trace Silt (SP) | | | | | |
| | | | | | 5 | | | | | | |
| 3 | | 16 | W | 17 | | Medium Dense, Grayish Brown Gravelly Fine to Coarse SAND, Trace to Little Silt, Scattered Cobbles/Boulders (SP/SP-SM) | | | | | |
| 4 | | 10 | W | 10 | | Loose, Gray to Brown Fine to Coarse SAND, Little Gravel, Trace Silt (SP) | | | | | |
| | | | | | 10 | | | | | | |
| 5 | | 18 | W | 9 | | | | | | | |
| | | | | | 15 | End of Boring at 15 ft<br>Borehole Backfilled with Bentonite Chips | | | | | |
| | | | | | 20 | | | | | | |

## WATER LEVEL OBSERVATIONS

| | | | | |
|---|---|---|---|---|
| While Drilling | ∇ 6.0' | Upon Completion of Drilling | | |
| Time After Drilling | | | | 10 mins. |
| Depth to Water | | | | 6.0' ▼ |
| Depth to Cave in | | | | 6.0' |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/11/19 End 12/11/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

# LOG OF TEST BORING

CGC Inc.

Project: Proposed Residential Development, Utterback Property - CTH AB
Location: Town of Dunn, Dane County, Wisconsin

Boring No. 12
Surface Elevation (ft) 863.41
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | VISUAL CLASSIFICATION and Remarks | qu (qa) (tsf) | W | LL | PL | LI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 18± in. TOPSOIL (OL) | | | | | |
| 1 | | 18 | M | 5 | | Stiff, Gray/Brown (Lightly Mottled) Lean CLAY, Trace to Little Sand (CL) | (1.0-1.25) | 28.2 | | | |
| 2 | | 18 | M | 7 | | Stiff, Light Gray/Brown (Mottled) Lean CLAY, Little Sand (CL) | (1.25-1.75) | | | | |
| | | | | | 5 | | | | | | |
| 3 | | 18 | W | 4 | | Loose, Brown Fine to Medium SAND, Trace Silt and Gravel (SP) | | | | | |
| 4 | | 18 | W | 36 | | Dense, Grayish Brown Gravelly Fine to Coarse SAND, Little Silt, Scattered Cobbles/Boulders (SP-SM) | | | | | |
| | | | | | 10 | | | | | | |
| | | | | | | Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM) | | | | | |
| 5 | | 12 | W | 19 | | | | | | | |
| | | | | | 15 | End of Boring at 15 ft<br>Borehole Backfilled with Bentonite Chips | | | | | |
| | | | | | 20 | | | | | | |

## WATER LEVEL OBSERVATIONS

| | | | | | |
|---|---|---|---|---|---|
| While Drilling | ▽ 6.5' | Upon Completion of Drilling | | | |
| Time After Drilling | | | | 10 mins. | |
| Depth to Water | | | | 4.0' | ▼ |
| Depth to Cave in | | | | 8.0' | |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/11/19 End 12/11/19
Driller GeoServe Chief Eddie Rig Geoprobe
Logger Matt Editor TFG 7822DT
Drill Method 2.25" HSA; Autohammer

# LOG OF TEST BORING

CGC Inc.

Project: Proposed Residential Development, Utterback Property - CTH AB
Location: Town of Dunn, Dane County, Wisconsin

Boring No. 13
Surface Elevation (ft) 867.25
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE No. | Type | Rec (in.) | Moist | N | Depth (ft) | VISUAL CLASSIFICATION and Remarks | qu (qa) (tsf) | W | LL | PL | LI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 12 | M | 5 | | Stiff/Loose, Brown to Yellowish Brown Sandy Lean CLAY to Clayey Fine SAND, Trace Gravel (CL/SC) *USDA: 10YR 5/3, 5/4 Sandy Clay Loam* | (1.0-1.5) | 14.7 | | | |
| 2 | | 16 | M | 12 | 5 | Medium Dense, Very Pale Brown Fine to Medium SAND, Trace Silt and Gravel (SP) *USDA: 10YR 7/3 Fine Sand* P200 (Sample 2 - 3.5 to 5 ft): 3.5% | | 4.5 | | | |
| 3 | | 18 | M/W | 19 | | Medium Dense, Pale Brown Sandy Fine to Coarse GRAVEL, Trace Silt, Scattered Cobbles/Boulders (GP) *USDA: 10YR 6/3 Extremely Gravelly Sand* | | | | | |
| 4 | | 16 | W | 4 | 10 | Very Loose to Loose, Pale Brown Fine to Medium SAND, Little Gravel, Trace Silt (SP) *USDA: 10YR 6/3 Sand* | | | | | |
| 5 | | 18 | W | 11 | | Medium Dense, Pale Brown Silty Fine SAND, Trace Gravel (SM) *USDA: 10YR 6/3 Fine Sandy Loam* | | | | | |
| 6 | | 18 | W | 15 | 15 | Medium Dense, Pale Brown Fine Sand, Trace Silt and Gravel, Scattered Silt Seams (SP) *USDA: 10YR 6/3 Fine Sand, Silt Loam Seams* | | | | | |
| | | | | | 20 | End of Boring at 15 ft<br>Borehole Backfilled with Bentonite Chips | | | | | |

## WATER LEVEL OBSERVATIONS

| | | | | |
|---|---|---|---|---|
| While Drilling | ∇ 8.0' | Upon Completion of Drilling | | |
| Time After Drilling | | | 1 Day | 10 mins. |
| Depth to Water | | | NW | 6.0' ▼ |
| Depth to Cave in | | | 6.0' | 6.0' |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/11/19 End 12/11/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

# LOG OF TEST BORING

CGC Inc.

Project: **Proposed Residential Development**
**Utterback Property - CTH AB**
Location: **Town of Dunn, Dane County, Wisconsin**

Boring No. **14**
Surface Elevation (ft) **866.81**
Job No. **C19482**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE | | | | | | VISUAL CLASSIFICATION and Remarks | SOIL PROPERTIES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | | qu (qa) (tsf) | W | LL | PL | LI |
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 14 | M | 7 | | Very Stiff, Brown Lean CLAY, Trace Sand (CL) | (2.75-3.0) | 24.0 | | | |
| 2 | | 18 | M/W | 3 | | | | | | | |
| | | | | | 5 | Very Loose, Brown Fine to Medium SAND, Little to Some Silt, Trace Gravel (SP-SM/SM) | | | | | |
| 3 | | 12 | W | 5 | | Loose, Grayish Brown Gravelly Fine to Coarse SAND, Little Silt, Scattered Cobbles/Boulders (SP-SM) | | | | | |
| 4 | | 12 | W | 3 | | Very Loose, Brown Fine to Medium SAND, Trace Silt and Gravel (SP) | | | | | |
| | | | | | 10 | | | | | | |
| | | | | | | Loose to Medium Dense, Tan Silty Fine SAND, Scattered Lean Clay Seams (SM) | | | | | |
| 5 | | 18 | W | 10 | | | | | | | |
| | | | | | 15 | End of Boring at 15 ft<br><br>Borehole Backfilled with Bentonite Chips | | | | | |
| | | | | | 20 | | | | | | |

## WATER LEVEL OBSERVATIONS

| | | | | |
|---|---|---|---|---|
| While Drilling | ∇ 7.0' | Upon Completion of Drilling | | |
| Time After Drilling | | | | 10 mins. |
| Depth to Water | | | | 6.0' ▼ |
| Depth to Cave in | | | | 6.0' |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start **12/11/19** End **12/11/19**
Driller **GeoServe** Chief **Eddie** Rig **Geoprobe 7822DT**
Logger **Matt** Editor **TFG**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

# LOG OF TEST BORING

Project: **Proposed Residential Development**
**Utterback Property - CTH AB**
Location: **Town of Dunn, Dane County, Wisconsin**

Boring No. **15**
Surface Elevation (ft) **864.13**
Job No. **C19482**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE | | | | | | VISUAL CLASSIFICATION and Remarks | SOIL PROPERTIES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | | qu (qa) (tsf) | W | LL | PL | LI |
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 18 | M | 6 | | Stiff, Brown Lean CLAY, Trace Sand (CL) | (1.75-2.0) | 25.6 | | | |
| 2 | | 12 | M | 4 | 5 | Soft, Gray/Brown (Mottled) Lean CLAY to Sandy Lean CLAY, Trace Gravel (CL) | (0.25-0.5) | 22.9 | | | |
| 3 | | 18 | M/W | 23 | | Medium Dense, Tan Fine to Medium SAND, Little Gravel, Trace Silt, Scattered Organic Seams (SP) | | | | | |
| 4 | | 18 | W | 5 | 10 | Loose, Brown SILT to Clayey SILT, Trace to Little Sand (ML) | (0.5-1.5) | 21.3 | 17 | 16 | |
| 5 | | 4 | W | 99/4" | | Very Dense, Brown to Gray Clayey to Silty Fine to Coarse SAND, Some Gravel (SC/SM - Probable Highly Weathered to Weathered Sandy Dolomite Bedrock) | | | | | |
| 6 | | 0 | - | 99/0" | | End of Boring/Auger and Split-Spoon Refusal on Apparent Sandy Dolomite Bedrock at 12.5 ft | | | | | |
| | | | | | 15 | Borehole Backfilled with Bentonite Chips | | | | | |
| | | | | | 20 | | | | | | |

## WATER LEVEL OBSERVATIONS

While Drilling ▽ **7.0'** Upon Completion of Drilling ______

| | | | | |
|---|---|---|---|---|
| Time After Drilling | | | | **10 mins.** |
| Depth to Water | | | | **6.0'** ▼ |
| Depth to Cave in | | | | **6.0'** |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start **12/11/19** End **12/11/19**
Driller **GeoServe** Chief **Eddie** Rig **Geoprobe**
Logger **Matt** Editor **TFG** **7822DT**
Drill Method **2.25" HSA; Autohammer**

# LOG OF TEST BORING

CGC Inc.

| | |
|---|---|
| Project | Proposed Residential Development Utterback Property - CTH AB |
| Location | Town of Dunn, Dane County, Wisconsin |
| Boring No. | 16 |
| Surface Elevation (ft) | 861.45 |
| Job No. | C19482 |
| Sheet | 1 of 1 |

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | VISUAL CLASSIFICATION and Remarks | qu (qa) (tsf) | W | LL | PL | LI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 12 | M/W | 3 | | Medium Stiff to Stiff, Black to Very Dark Grayish Brown Organic to Silty CLAY, Little to Some Sand (OL/CL-ML - Probable Lower Horizon Topsoil in Upper Part of Layer) *USDA: 10YR 2/1 to 3/2 Clay Loam* | (0.75-1.25) | | | | |
| 2 | | 18 | M | 6 | 5 | Stiff, Gray/Light Olive Brown (Mottled) Sandy Lean CLAY, Trace Gravel (CL) *USDA: 2.5Y 5/1 (Redox: c2d 2.5Y 5/3) Sandy Clay Loam* | (1.5-1.75) | | | | |
| 3 | | 18 | W | 12 | | Medium Dense, Pale Brown Fine to Medium SAND, Little Gravel, Trace Silt (SP) *USDA: 10YR 6/3 Sand* | | | | | |
| 4 | | 18 | W | 18 | 10 | Medium Dense, Pale Brown Fine Sand, Trace Silt and Gravel (SP) *USDA: 10YR 6/3 Fine Sand* | | | | | |
| 5 | | 18 | W | 11 | | Medium Dense, Fine Layers of Light Yellowish Brown Silty Fine SAND, Light Brown SILT and Brown Lean CLAY (SM/ML/CL) *USDA: Stratified 10YR 6/4 Fine Sandy Loam, 7.5YR 6/3 Silt Loam and 7.5YR 5/4 Silty Clay Loam* | | | | | |
| 6 | | 18 | W | 11 | 15 | Medium Stiff to Very Stiff, Light Brown Lean to Silty CLAY, Trace Sand (CL/CL-ML) *USDA: 7.5YR 6/3 Silty Clay Loam* | (0.75-2.5) | | | | |
| | | | | | 20 | End of Boring at 15 ft<br>Borehole Backfilled with Bentonite Chips | | | | | |

## WATER LEVEL OBSERVATIONS

| | | | | |
|---|---|---|---|---|
| While Drilling | ▽ 6.5' | Upon Completion of Drilling | | |
| Time After Drilling | | | 1 Day | 10 mins. |
| Depth to Water | | | 2.0' | 6.0' ▼ |
| Depth to Cave in | | | 4.0' | 6.0' |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

| | |
|---|---|
| Start | 12/11/19 |
| End | 12/11/19 |
| Driller | GeoServe |
| Chief | Eddie |
| Rig | Geoprobe 7822DT |
| Logger | Matt |
| Editor | TFG |
| Drill Method | 2.25" HSA; Autohammer |

CGC Inc.

# LOG OF TEST BORING

Project: Proposed Residential Development
Utterback Property - CTH AB
Location: Town of Dunn, Dane County, Wisconsin

Boring No. 17
Surface Elevation (ft) 861.70
Job No. C19482
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

| SAMPLE | | | | | | VISUAL CLASSIFICATION and Remarks | SOIL PROPERTIES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | TYPE | Rec (in.) | Moist | N | Depth (ft) | | qu (qa) (tsf) | W | LL | PL | LI |
| | | | | | | 12± in. TOPSOIL (OL) | | | | | |
| 1 | | 18 | M | 5 | | Stiff, Gray/Brown (Lightly Mottled) Sandy Lean CLAY, Trace Gravel (CL) *USDA: 10YR 5/1 (Redox: c1f 10YR 5/3) Sandy Clay Loam* | (1.25-1.5) | | | | |
| 2 | | 18 | M | 4 | 5 | Medium Stiff to Stiff, Gray/Yellowish Brown (Mottled) Lean CLAY, Trace to Little Sand (CL) *USDA: 5Y 6/1 (Redox: c2d 10YR 5/4) Clay Loam* | (0.75-1.5) | | | | |
| 3 | | 18 | W | 11 | | Medium Dense, Pale Brown Fine Sand, Trace Silt and Gravel, Scattered Silt and Organic to Silty Clay Seams (SP) *USDA: 10YR 6/3 Fine Sand, Silt Loam and Silty Clay Loam Seams* | | | | | |
| 4 | | 18 | W | 17 | 10 | | | | | | |
| 5 | | 18 | W | 5 | | Stiff to Very Stiff, Light Brown/Brown (Laminated) Lean to Silty CLAY, Trace Sand (CL/CL-ML) *USDA: 7.5YR 6/3, 5/4 Silty Clay Loam* | (1.25-2.5) | | | | |
| 6 | | 8 | W | 50/2" | 15 | Very Dense, Gray Clayey to Silty Fine to Coarse SAND, Some Gravel, Scattered Cobbles/Boulders (SC/SM - Possible Highly Weathered Bedrock) *USDA: 7.5YR 6/1 Gravelly Sandy Loam* Probable Cobble/Boulder near 14 ft | | | | | |
| | | | | | | End of Boring at 15 ft | | | | | |
| | | | | | | Borehole Backfilled with Bentonite Chips | | | | | |
| | | | | | 20 | | | | | | |

## WATER LEVEL OBSERVATIONS

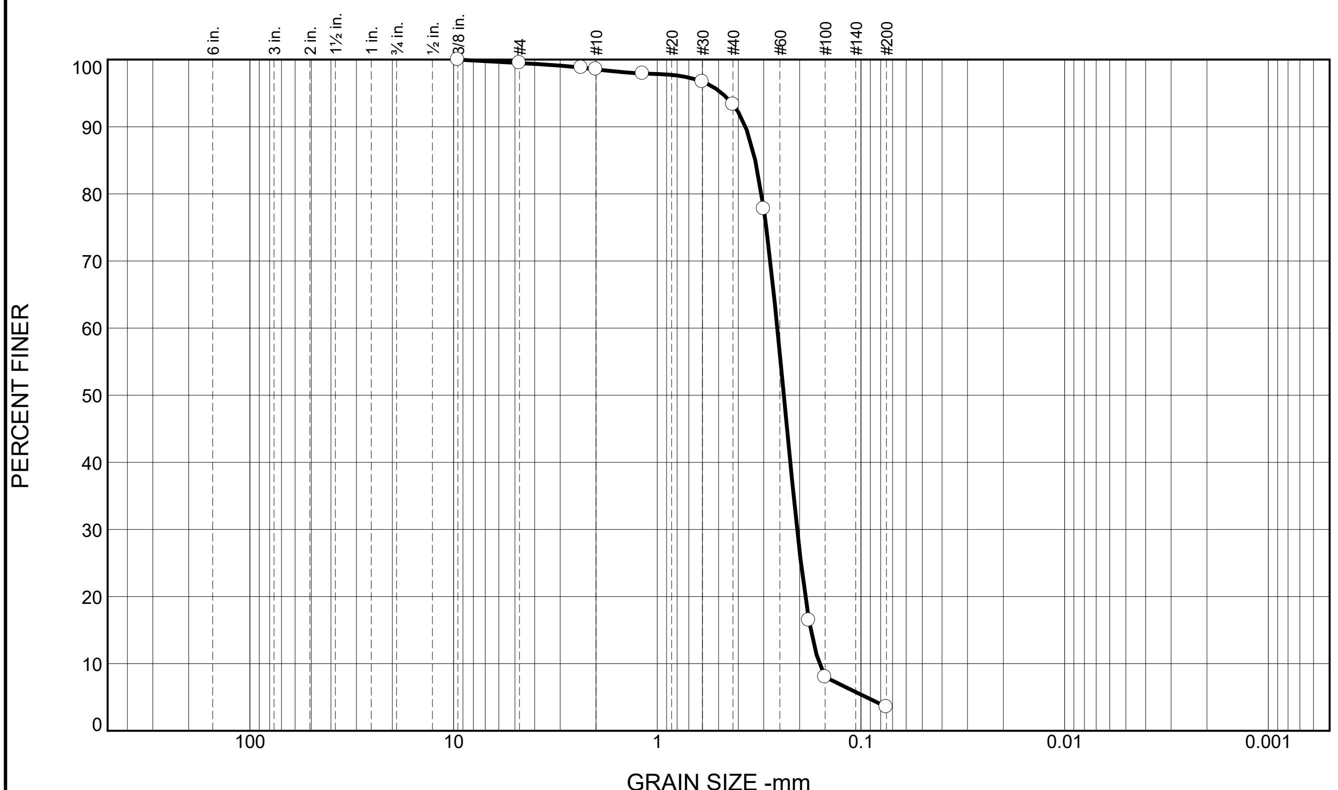
| | | | | |
|---|---|---|---|---|
| While Drilling | ∇ 6.5' | Upon Completion of Drilling | | |
| Time After Drilling | | | 1 Day | 10 mins. |
| Depth to Water | | | 2.5' | 6.0' |
| Depth to Cave in | | | 5.0' | 7.0' |

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

## GENERAL NOTES

Start 12/11/19 End 12/11/19
Driller GeoServe Chief Eddie Rig Geoprobe 7822DT
Logger Matt Editor TFG
Drill Method 2.25" HSA; Autohammer

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 0.5 | 0.9 | 5.3 | 89.8 | 3.5 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8 | 100.0 | | |
| #4 | 99.5 | | |
| #8 | 98.8 | | |
| #10 | 98.6 | | |
| #16 | 97.9 | | |
| #30 | 96.7 | | |
| #40 | 93.3 | | |
| #50 | 77.8 | | |
| #80 | 16.4 | | |
| #100 | 8.0 | | |
| #200 | 3.5 | | |

* (no specification provided)

**Material Description**

Brown Fine to Medium Sand, Trace Silt and Gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 0.3687 $D_{85}$= 0.3303 $D_{60}$= 0.2573
$D_{50}$= 0.2391 $D_{30}$= 0.2057 $D_{15}$= 0.1764
$D_{10}$= 0.1599 $C_u$= 1.61 $C_c$= 1.03

**Classification**

USCS= SP AASHTO=

**Remarks**

USDA: Fine Sand

**Sample Number:** Boring 13 **Depth:** 3.5 to 5 ft

**Date:** 12/27/19

CGC,Inc.

**Client:** VH Acquisitions, LLC
**Project:** Utterback Property Residential Devlopment

**Project No:** C19482 **Figure**

**Tested By:** DRW **Checked By:** TFG

CGC, Inc.

# LOG OF TEST BORING

*General Notes*

## DESCRIPTIVE SOIL CLASSIFICATION

### Grain Size Terminology

| Soil Fraction | Particle Size | U.S. Standard Sieve Size |
|---|---|---|
| Boulders | Larger than 12” | Larger than 12” |
| Cobbles | 3” to 12” | 3” to 12” |
| Gravel: Coarse | ¾” to 3” | ¾” to 3” |
| Fine | 4.76 mm to ¾” | #4 to ¾” |
| Sand: Coarse | 2.00 mm to 4.76 mm | #10 to #4 |
| Medium | 0.42 to mm to 2.00 mm | #40 to #10 |
| Fine | 0.074 mm to 0.42 mm | #200 to #40 |
| Silt | 0.005 mm to 0.074 mm | Smaller than #200 |
| Clay | Smaller than 0.005 mm | Smaller than #200 |

Plasticity characteristics differentiate between silt and clay.

### General Terminology

**Physical Characteristics**
Color, moisture, grain shape, fineness, etc.
**Major Constituents**
Clay, silt, sand, gravel
**Structure**
Laminated, varved, fibrous, stratified, cemented, fissured, etc.
**Geologic Origin**
Glacial, alluvial, eolian, residual, etc.

### Relative Density

| Term | “N” Value |
|---|---|
| Very Loose | 0 - 4 |
| Loose | 4 - 10 |
| Medium Dense | 10 - 30 |
| Dense | 30 - 50 |
| Very Dense | Over 50 |

### Relative Proportions Of Cohesionless Soils

| Proportional Term | Defining Range by Percentage of Weight |
|---|---|
| Trace | 0% - 5% |
| Little | 5% - 12% |
| Some | 12% - 35% |
| And | 35% - 50% |

### Consistency

| Term | $q_u$-tons/sq. ft |
|---|---|
| Very Soft | 0.0 to 0.25 |
| Soft | 0.25 to 0.50 |
| Medium | 0.50 to 1.0 |
| Stiff | 1.0 to 2.0 |
| Very Stiff | 2.0 to 4.0 |
| Hard | Over 4.0 |

### Organic Content by Combustion Method

| Soil Description | Loss on Ignition |
|---|---|
| Non Organic | Less than 4% |
| Organic Silt/Clay | 4 – 12% |
| Sedimentary Peat | 12% - 50% |
| Fibrous and Woody Peat | More than 50% |

### Plasticity

| Term | Plastic Index |
|---|---|
| None to Slight | 0 - 4 |
| Slight | 5 - 7 |
| Medium | 8 - 22 |
| High to Very High | Over 22 |

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6” penetrations of the 2” split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30” and is seated to a depth of 6” before commencing the standard penetration test.

## SYMBOLS

### Drilling and Sampling

CS – Continuous Sampling
RC – Rock Coring: Size AW, BW, NW, 2”W
RQD – Rock Quality Designation
RB – Rock Bit/Roller Bit
FT – Fish Tail
DC – Drove Casing
C – Casing: Size 2 ½”, NW, 4”, HW
CW – Clear Water
DM – Drilling Mud
HSA – Hollow Stem Auger
FA – Flight Auger
HA – Hand Auger
COA – Clean-Out Auger
SS - 2” Dia. Split-Barrel Sample
2ST – 2” Dia. Thin-Walled Tube Sample
3ST – 3” Dia. Thin-Walled Tube Sample
PT – 3” Dia. Piston Tube Sample
AS – Auger Sample
WS – Wash Sample
PTS – Peat Sample
PS – Pitcher Sample
NR – No Recovery
S – Sounding
PMT – Borehole Pressuremeter Test
VS – Vane Shear Test
WPT – Water Pressure Test

### Laboratory Tests

$q_a$ – Penetrometer Reading, tons/sq ft
$q_a$ – Unconfined Strength, tons/sq ft
W – Moisture Content, %
LL – Liquid Limit, %
PL – Plastic Limit, %
SL – Shrinkage Limit, %
LI – Loss on Ignition
D – Dry Unit Weight, lbs/cu ft
pH – Measure of Soil Alkalinity or Acidity
FS – Free Swell, %

### Water Level Measurement

▽- Water Level at Time Shown
NW – No Water Encountered
WD – While Drilling
BCR – Before Casing Removal
ACR – After Casing Removal
CW – Cave and Wet
CM – Caved and Moist

**Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.**

CGC, Inc.

Madison - Milwaukee

# Unified Soil Classification System

## UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

| | | |
|---|---|---|
| **COARSE-GRAINED SOILS** (more than 50% of material is larger than No. 200 sieve size) | | |
| | Clean Gravels (Less than 5% fines) | |
| **GRAVELS** More than 50% of coarse fraction larger than No. 4 sieve size | GW | Well-graded gravels, gravel-sand mixtures, little or no fines |
| | GP | Poorly-graded gravels, gravel-sand mixtures, little or no fines |
| | Gravels with fines (More than 12% fines) | |
| | GM | Silty gravels, gravel-sand-silt mixtures |
| | GC | Clayey gravels, gravel-sand-clay mixtures |
| | Clean Sands (Less than 5% fines) | |
| **SANDS** 50% or more of coarse fraction smaller than No. 4 sieve size | SW | Well-graded sands, gravelly sands, little or no fines |
| | SP | Poorly graded sands, gravelly sands, little or no fines |
| | Sands with fines (More than 12% fines) | |
| | SM | Silty sands, sand-silt mixtures |
| | SC | Clayey sands, sand-clay mixtures |
| **FINE-GRAINED SOILS** (50% or more of material is smaller than No. 200 sieve size.) | | |
| **SILTS AND CLAYS** Liquid limit less than 50% | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity |
| | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays |
| | OL | Organic silts and organic silty clays of low plasticity |
| **SILTS AND CLAYS** Liquid limit 50% or greater | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts |
| | CH | Inorganic clays of high plasticity, fat clays |
| | OH | Organic clays of medium to high plasticity, organic silts |
| **HIGHLY ORGANIC SOILS** | PT | Peat and other highly organic soils |

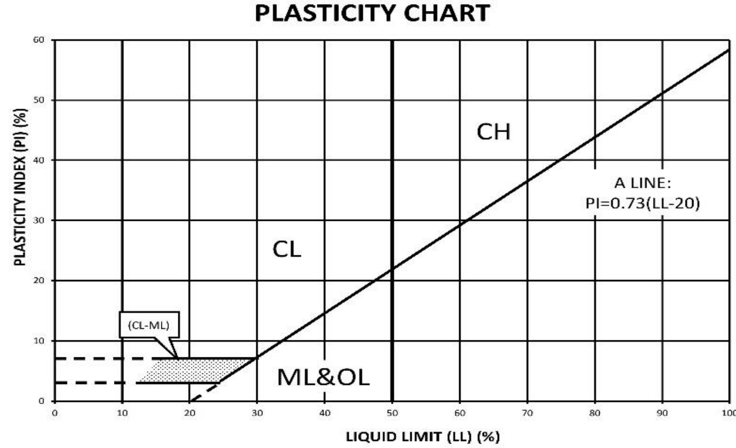
## LABORATORY CLASSIFICATION CRITERIA

| | | |
|---|---|---|
| GW | $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3 | |
| GP | Not meeting all gradation requirements for GW | |
| GM | Atterberg limts below "A" line or P.I. less than 4 | Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols |
| GC | Atterberg limts above "A" line or P.I. greater than 7 | |
| SW | $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3 | |
| SP | Not meeting all gradation requirements for GW | |
| SM | Atterberg limits below "A" line or P.I. less than 4 | Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols |
| SC | Atterberg limits above "A" line with P.I. greater than 7 | |

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ………………………………………….. GW, GP, SW, SP
More than 12 percent …………………………….………… GM, GC, SM, SC
5 to 12 percent ……………….…..... Borderline cases requiring dual symbols

**PLASTICITY CHART**



Soil Map—Dane County, Wisconsin
(Utterback Property)


Map Scale: 1:3,110 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 45, 90, 180, 270

Feet: 0, 150, 300, 600, 900

N

Map projection: Web Mercator  Corner coordinates: WGS84  Edge tics: UTM Zone 16N WGS84

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dane County, Wisconsin
Survey Area Data: Version 18, Sep 10, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| Co | Colwood silt loam, 0 to 2 percent slopes | 0.1 | 0.2% |
| DnB | Dodge silt loam, 2 to 6 percent slopes | 4.4 | 11.3% |
| EgA | Elburn silt loam, gravelly substratum, 0 to 3 percent slopes | 0.3 | 0.9% |
| GsB | Grays silt loam, 2 to 6 percent slopes | 3.4 | 8.7% |
| KeB | Kegonsa silt loam, 2 to 6 percent slopes | 16.7 | 42.3% |
| KrD2 | Kidder soils, 10 to 20 percent slopes, eroded | 0.8 | 2.0% |
| PoB | Plano silt loam, gravelly substratum, 2 to 6 percent slopes | 13.0 | 33.1% |
| SaA | Sable silty clay loam, 0 to 2 percent slopes | 0.6 | 1.6% |
| **Totals for Area of Interest** | | **39.4** | **100.0%** |

# APPENDIX C

# DOCUMENT QUALIFICATIONS

# APPENDIX C
# DOCUMENT QUALIFICATIONS

## I. GENERAL RECOMMENDATIONS/LIMITATIONS

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

## II. IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes. While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

### READ THE FULL REPORT

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

### A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not informed.*

### SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

### MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINION

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgement to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ - sometimes significantly - from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

**A REPORT'S RECOMMENDATIONS ARE NOT FINAL**

Do not over-rely on the confirmation-dependent recommendations included in your report. *Those confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgement and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's confirmation-dependent recommendations if we do not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

**A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION**

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical engineering report. Confront that risk by having CGC participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

**DO NOT REDRAW THE ENGINEER'S LOGS**

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

**GIVE CONSTRUCTORS A COMPLETE REPORT AND GUIDANCE**

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

**READ RESPONSIBILITY PROVISIONS CLOSELY**

Some clients, design professionals, and constructors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineer's responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

**ENVIRONMENTAL CONCERNS ARE NOT COVERED**

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

**OBTAIN PROFESSIONAL ASSISTANCE TO DEAL WITH MOLD**

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

**RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE**

Membership in the Geotechnical Business Council (GBC) of Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of GBC, for more information.

Modified and reprinted with permission from:

Geotechnical Business Council
of the Geoprofessional Business Association
8811 Colesville Road, Suite G 106
Silver Spring, MD 20910

# APPENDIX D

# RECOMMENDED COMPACTED FILL SPECIFICATIONS

# APPENDIX D

# CGC, INC.

# RECOMMENDED COMPACTED FILL SPECIFICATIONS

## General Fill Materials

Proposed fill shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non-soil material which by decomposition might cause settlement. Also, fill shall never be placed while frozen or on frozen surfaces. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft of the building area. Fill used greater than 10 ft beyond the building limits shall not contain rock, boulders or concrete pieces greater than a 2 sq ft area and shall not be placed within the final 2 ft of finish subgrade or in designated utility construction areas. Fill containing rock, boulders or concrete pieces should include sufficient finer material to fill voids among the larger fragments.

## Special Fill Materials

In certain cases, special fill materials may be required for specific purposes, such as stabilizing subgrades, backfilling undercut excavations or filling behind retaining walls. For reference, WisDOT gradation specifications for various types of granular fill are attached in Table 1.

## Placement Method

The approved fill shall be placed, spread and leveled in layers generally not exceeding 10 in. in thickness before compaction. The fill shall be placed at moisture content capable of achieving the desired compaction level. For clay soils or granular soils containing an appreciable amount of cohesive fines, moisture conditioning will likely be required.

It is the Contractor's responsibility to provide all necessary compaction equipment and other grading equipment that may be required to attain the specified compaction. Hand-guided vibratory or tamping compactors will be required whenever fill is placed adjacent to walls, footings, columns or in confined areas.

## Compaction Specifications

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 2. Note that these compaction guidelines would generally not apply to coarse gravel/stone fill. Instead, a method specification would apply (e.g., compact in thin lifts with a vibratory compactor until no further consolidation is evident).

## Testing Procedures

Representative samples of proposed fill shall be submitted to CGC, Inc. for optimum moisture-maximum density determination (ASTM D1557) prior to the start of fill placement. The sample size should be approximately 50 lb.

CGC, Inc. shall be retained to perform field density tests to determine the level of compaction being achieved in the fill. The tests shall generally be conducted on each lift at the beginning of fill placement and at a frequency mutually agreed upon by the project team for the remainder of the project.

**Table 1**
**Gradation of Special Fill Materials**

| Material | WisDOT Section 311 | WisDOT Section 312 | WisDOT Section 305 | | | WisDOT Section 209 | | WisDOT Section 210 |
|---|---|---|---|---|---|---|---|---|
| | Breaker Run | Select Crushed Material | 3-in. Dense Graded Base | 1 1/4-in. Dense Graded Base | 3/4-in. Dense Graded Base | Grade 1 Granular Backfill | Grade 2 Granular Backfill | Structure Backfill |
| Sieve Size | Percent Passing by Weight | | | | | | | |
| 6 in. | 100 | | | | | | | |
| 5 in. | | 90-100 | | | | | | |
| 3 in. | | | 90-100 | | | | | 100 |
| 1 1/2 in. | | 20-50 | 60-85 | | | | | |
| 1 1/4 in. | | | | 95-100 | | | | |
| 1 in. | | | | | 100 | | | |
| 3/4 in. | | | 40-65 | 70-93 | 95-100 | | | |
| 3/8 in. | | | | 42-80 | 50-90 | | | |
| No. 4 | | | 15-40 | 25-63 | 35-70 | 100 (2) | 100 (2) | 25-100 |
| No. 10 | | 0-10 | 10-30 | 16-48 | 15-55 | | | |
| No. 40 | | | 5-20 | 8-28 | 10-35 | 75 (2) | | |
| No. 100 | | | | | | 15 (2) | 30 (2) | |
| No. 200 | | | 2-12 | 2-12 | 5-15 | 8 (2) | 15 (2) | 15 (2) |

***Notes:***
1. Reference: Wisconsin Department of Transportation *Standard Specifications for Highway and Structure Construction.*
2. Percentage applies to the material passing the No. 4 sieve, not the entire sample.
3. Per WisDOT specifications, both breaker run and select crushed material can include concrete that is 'substantially free of steel, building materials and other deleterious material'.

**Table 2**
**Compaction Guidelines**

| Area | Percent Compaction (1) Clay/Silt | Percent Compaction (1) Sand/Gravel |
|---|---|---|
| **Within 10 ft of building lines** | | |
| Footing bearing soils | 93 - 95 | 95 |
| Under floors, steps and walks | | |
| - Lightly loaded floor slab | 90 | 90 |
| - Heavily loaded floor slab and thicker fill zones | 92 | 95 |
| **Beyond 10 ft of building lines** | | |
| Under walks and pavements | | |
| - Less than 2 ft below subgrade | 92 | 95 |
| - Greater than 2 ft below subgrade | 90 | 90 |
| Landscaping | 85 | 90 |

***Notes:***
1. Based on Modified Proctor Dry Density (ASTM D 1557)

# APPENDIX E

# ROCK EXCAVATION CONSIDERATIONS

## APPENDIX E

## ROCK EXCAVATION CONSIDERATIONS

In order to minimize probable "rock" excavation expenses during construction, we suggest that project specifications incorporate the following:

A. It is assumed that all excavations to levels and dimensions required by the Contract Documents are earth excavation. Earth excavation includes removal and disposal of all materials encountered except rock/sound bedrock which is defined as natural materials which:

   1. Cannot be excavated with a minimum 3/4 cubic yard capacity backhoe without drilling and blasting;

   2. Cannot be economically removed with a one-tooth ripper on a D8 cat (or equivalent);

   3. Requires the use of special equipment such as a pneumatic hammer;

   4. Requires the use of explosives (after obtaining written permission of the owner).

B. Examples of material classified as rock are boulders 1/2 cubic yard or more in volume, bedrock, rock in ledges, and rock-hard cementitious aggregate deposits.

C. Do not proceed with rock excavation work until architect, engineer and/or testing firm (i.e., CGC) has taken the necessary measures to determine quantity of rock excavation required to complete the work. Measurements will be taken after properly stripped of earth by the contractor. Contractor will be paid the difference between the cost of rock and earth excavation based on an agreed upon unit price established prior to starting rock excavation.

A statement should also be included in the specifications to the effect that: "Stated models of earth excavation equipment are merely for purposes of defining the various excavation categories and are not intended to indicate the brand or type of equipment that is to be used.”

## APPENDIX F

## WISCONSIN DEPARTMENT OF SAFETY & PROFESSIONAL SERVICES
## SOIL AND SITE EVALUATION – STORM FORM (3 BORINGS)

Division of Industry Services
P.O. Box 2658
Madison, Wisconsin 53701
Scott Walker, Governor
Laura Gutierrez, Secretary



# Attachment 2:

## SOIL AND SITE EVALUATION - STORM

In accordance with SPS 382.365, 385, Wis. Adm. Code, and WDNR Standard 1002

Attach a complete site plan on paper not less than 8 ½ x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent of slope, scale or dimensions, north arrow, and BM referenced to nearest road

***Please print all information***

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1)(m)]

County: Dane
Parcel I.D.: 028/0610-024-8070-0
Reviewed by:
Date:

Property Owner: Utterback LTD Partnership c/o Wayne Utterback
Property Location: Govt. Lot NE ¼ SE ¼ S 02 T N 06 R 10 E
Property Owner's Mail Address: 4627 Prairie Fire Ct.
Lot #: Block#: Subd. Name or CSM #:
City: DeForest State: WI Zip Code: 53532 Phone Number:
☐ City ☐ Village ☒ Town: Dunn
Nearest Road: CTH AB

Drainage area ______ ☐ sq ft ☐ acres

Test site suitable for (check all that apply): ☐ Site not suitable;
☐ Bioretention; ☐ Subsurface Disperal System;
☐ Reuse; ☐ Irrigation; ☐ Other ______

Hydraulic Application Test Method
☒ Morphological Evaluation
☐ Double Ring Infiltrometer
☐ Other: (specify) ______

Soil Moisture
Date of soil borings: ______
USDA-NRCS WETS Value:
☐ Dry = 1;
☐ Normal = 2;
☐ Wet = 3.

B-13 #OBS. ☐ Pit ☒ Boring Ground surface elevation 867.3 ft. Elevation of limiting factor 861.3 ft. (Groundwater)

| Horizon | Depth in. | Dominant Color Munsell | Redox Description Qu. Sz. Cont. Color | Texture | Structure Gr. Sz. Sh. | Consistence | Boundary | % Rock Frags. | % Fines | Hydraulic App Rate Inches/Hr |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0-12 | Topsoil (not sampled) | | | | | | | | |
| 2 | 12-36 | 10YR 5/3, 5/4 | none | SCL | 2mabk | mfi | | <5 | | 0.11 |
| 3 | 36-66 | 10YR 7/3 | none | FS | 0sg | ml | | 1 | 4 | 0.50 |
| 4 | 66-96 | 10YR 6/3 | none | XGRS | 0sg | ml | | 65-75 | | 3.60 |
| 5 | 96-126 | 10YR 6/3 | none | S | 0sg | ml | | <10 | | 3.60 |
| 6 | 126-156 | 10YR 6/3 | none | FSL | 2msbk | mfr | | <5 | | 0.50 |
| 7 | 156-180 | 10YR 6/3 | none | FS, SiL | 0sg | ml | | <5 | | 0.13-0.50 |

Comments: Groundwater was encountered at about 8 ft during drilling and at about 6 ft shortly after the completion of drilling. About one day after the completion of drilling, the borehole had caved-in at about 6 ft, with no groundwater present above this depth.
Infiltration potential appears limited based on fairly shallow groundwater.

B-16 #OBS. ☐ Pit ☒ Boring Ground surface elevation 861.5 ft. Elevation of limiting factor 859.5 ft. (Groundwater)

| Horizon | Depth in. | Dominant Color Munsell | Redox Description Qu. Sz. Cont. Color | Texture | Structure Gr. Sz. Sh. | Consistence | Boundary | % Rock Frags. | % Fines | Hydraulic App Rate Inches/Hr |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0-12 | Topsoil (not sampled) | | | | | | | | |
| 2 | 12-36 | 10YR 2/1 to 3/2 | none | CL | 0m | mfi | | <5 | | 0.03 |
| 3 | 36-78 | 2.5Y 5/1 | c2d 2.5Y 5/3 | SCL | 0m | mfi | | <5 | | 0.11 |
| 4 | 78-102 | 10YR 6/3 | none | S | 0sg | ml | | <10 | | 3.60 |
| 5 | 102-126 | 10YR 6/3 | none | FS | 0sg | ml | | <5 | | 0.50 |
| 6 | 126-156 | 10YR 6/4, 7.5YR 6/3, 7.5YR 5/4 | none | Strat. FSL, SiL, SiCL | variable | | | <5 | | 0.04 |
| 7 | 156-180 | 7.5YR 6/3 | none | SiCL | 0m | mvfi | | <5 | | 0.04 |

Comments: Groundwater was encountered at about 6.5 ft during drilling and at about 6 ft shortly after the completion of drilling. About one day after the completion of drilling, the borehole had caved-in at about 4 ft, with groundwater observed at about 2 ft.
Infiltration potential appears very limited based on shallow groundwater.

Name (Please Print): Tim F. Gassenheimer
Signature: Gassenheimer
Credential Number: SP-011900004
Address: 129 Milky Way, Madison, WI 53718
Date Evaluation Conducted: December 11, 2019
Telephone Number: (608) 288-4100

B-17 #OBS. ☐ Pit ☒ Boring Ground surface elevation 861.7 ft. Elevation of limiting factor 860.7 ft. (Redox)
859.2 ft. (Groundwater)

| Horizon | Depth in. | Dominant Color Munsell | Redox Description Qu. Sz. Cont. Color | Texture | Structure Gr. Sz. Sh. | Consistence | Boundary | % Rock Frags. | % Fines | Hydraulic App Rate Inches/Hr |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0-12 | Topsoil (not sampled) | | | | | | | | |
| 2 | 12-36 | 10YR 5/1 | c1f 10YR 5/3 | SCL | 0m | mfi | | <5 | | 0.11 |
| 3 | 36-78 | 5Y 6/1 | c2d 10YR 5/4 | CL | 0m | mfi | | <5 | | 0.03 |
| 4 | 78-126 | 10YR 6/3 | none | FS, SiL/SiCL | 0sg | ml | | <5 | | 0.04-0.50 |
| 5 | 126-156 | 7.5YR 6/3, 5/4 | none | SiCL | 0m | mvfi | | <5 | | 0.04 |
| 6 | 156-180 | 7.5YR 6/1 | none | GRSL (1) | 1cabk | mfr | | 20-30 | | 0.50 |

Comments: Groundwater was encountered at about 6.5 ft during drilling and at about 6 ft shortly after the completion of drilling. About one day after the completion of drilling, the borehole had caved-in at about 5 ft, with groundwater observed at about 2.5 ft.
Infiltration potential appears very limited based on shallow low-chroma/high-value dominant color and redox, as well as groundwater.
(1) Horizon 6 was classified as possible bedrock.

Overall Site Comments: See Comments above and Stormwater Infiltration Potential section in Geotechnical Exploration Report.

# APPENDIX F

## WETLAND REPORT

# APPENDIX G

## DRAFT MAINTENANCE AGREEMENT

**Maintenance provisions:**

Detention Basin

Visual inspection of the detention basin and outlet structure shall be performed, at a minimum annually. The inspections shall include checking for potential problems such as: subsidence, erosion, tree growth in and around the embankment and outfall structure, sediment accumulation, clogging of outfall structure, and damage to the emergency spillway. Problems identified by the inspections shall be repaired as soon as practicable.

Sediment accumulations shall be removed by dredging when two (2) foot of siltation has occurred or as directed by the Village of Waunakee. The dredged material shall be removed and disposed of in accordance with NR 347.

The detention basin shall be mowed a minimum of twice per year. Mowing shall maintain a minimum grass height of 6 to 8 inches. Areas of sparse vegetation shall be reseeded. Additional fertilizer shall be applied as needed, per the results of a soil test.

Separate and distinct records shall be maintained by the owner to record the specific activities and costs thereof for the maintenance plan implementation. The records shall include the dates of maintenance visits and the specific work performed. Records shall be kept as required by local, state or federal law.

Infiltration Basin

Visual Inspection of the Infiltration Basin shall be performed, at a minimum, annually.

Maintenance shall be required when system shows standing water beyond 24 hours of rain event. Cleaning shall consist of removal of sediment, two (2) foot undercut, undercut replacement with material consisting of 15-30% compost and 70-85% sand and restoration in-kind.

Restoration of plant material shall be with native plugs or seed mixture tolerant of fluctuating water conditions. If a seed mixture is used steps shall be taken to assure vegetation establishes

# ROSEWOOD FIELDS
# VILLAGE OF MCFARLAND
# DANE COUNTY, WISCONSIN

# STORM SEWER SIZING REPORT

**PREPARED BY**
**D'Onofrio, Kottke & Associates, Inc.**
**7530 Westward Way**
**Madison, Wisconsin 53717**
**608.833.7530**

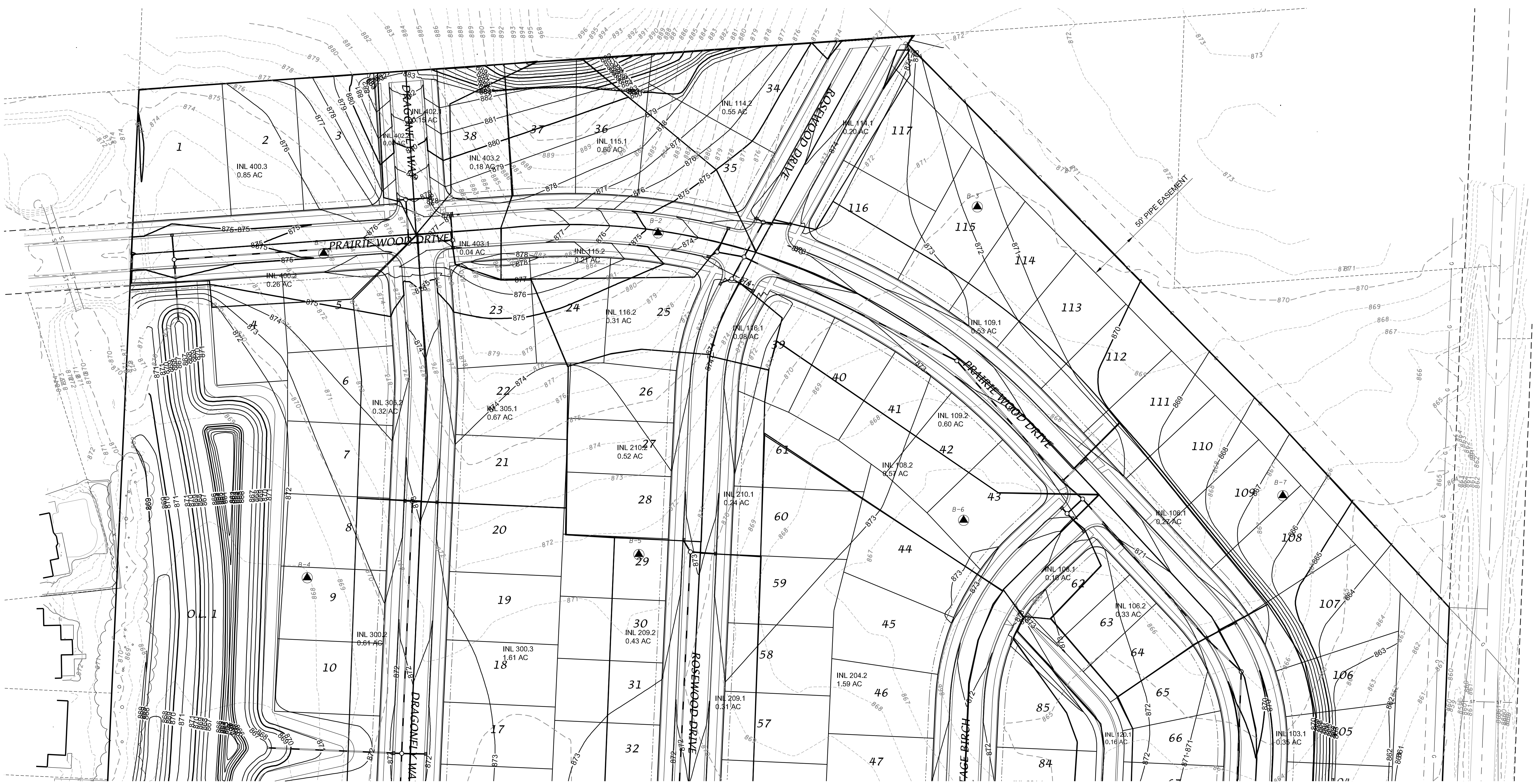
**August 25, 2020**

Storm sewer design calculations for Rosewood Fields were performed using the Hydraflow Storm Sewer Extensions software. Rainfall data was obtained from the NOAA Atlas 14 precipitations intensity data set. Drainage areas for each inlet are depicted in the attached storm sewer sizing maps.

Storm sewer pipes were designed to accommodate the 10-year storm event. The storm sewer network was modeled to keep the hydraulic grade line within the pipes for this event. The 100-year event is conveyed to the stormwater management ponds via the storm sewer system, roadway ROWs, and stormwater easements. Hydraflow output for storm sewer sizing using the 10-year storm event is attached.

Inlet and catch basin spacing was designed to meet the following criteria: For the 5-year storm event, maintain drive lanes in the center of the roadway. For the 25-year event, prevent stormwater from crossing the center line of the roadway. For the 100-year storm, contain the stormwater in the public ROW. Hydraflow outputs for inlet spread calculations for the 5-year, 25-year, and 100-year storms are attached.

The storm sewer system for Juniper Ridge is designed to meet the guidelines of the Village of McFarland. The attached calculations and exhibits support the storm sewer design.




D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

STORM SEWER SIZING

# ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

SCALE: 1"= 100'
(PAGE SIZE: 11x17)
0 50

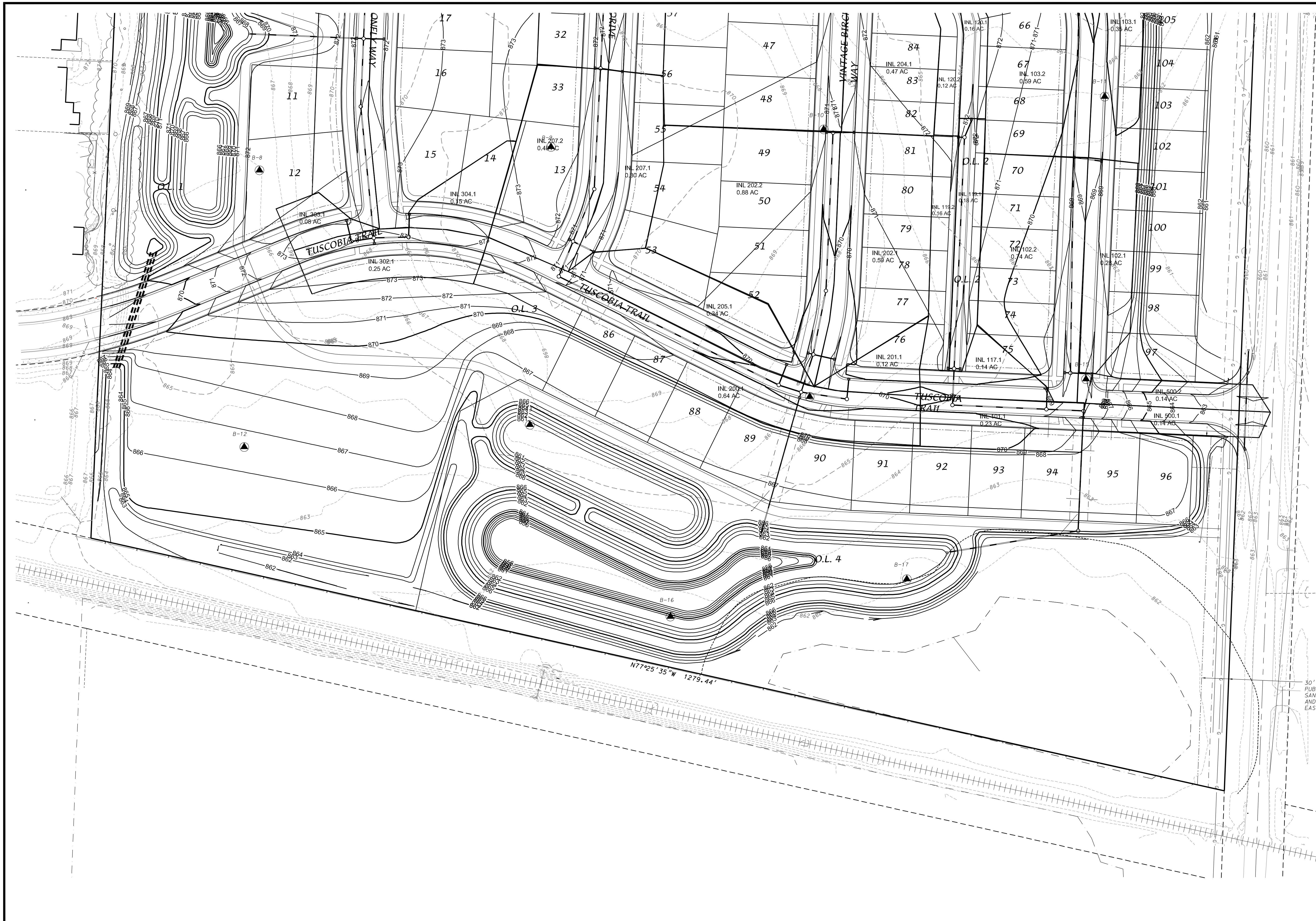
DATE: 08-25-20
REVISED:

DRAWN BY: KWB

FN: 20-05-132

Sheet Number:
1 OF 2

File: U:\User\2005132\Drawings\Storm Sewer.dwg Storm Sewer Plotted: Aug 25, 2020 - 4:01pm




D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

STORM SEWER SIZING

# ROSEWOOD FIELDS

VILLAGE OF MCFARLAND, DANE COUNTY, WISCONSIN

SCALE: 1"= 100'
(PAGE SIZE: 11x17)

DATE: 08-25-20
REVISED:

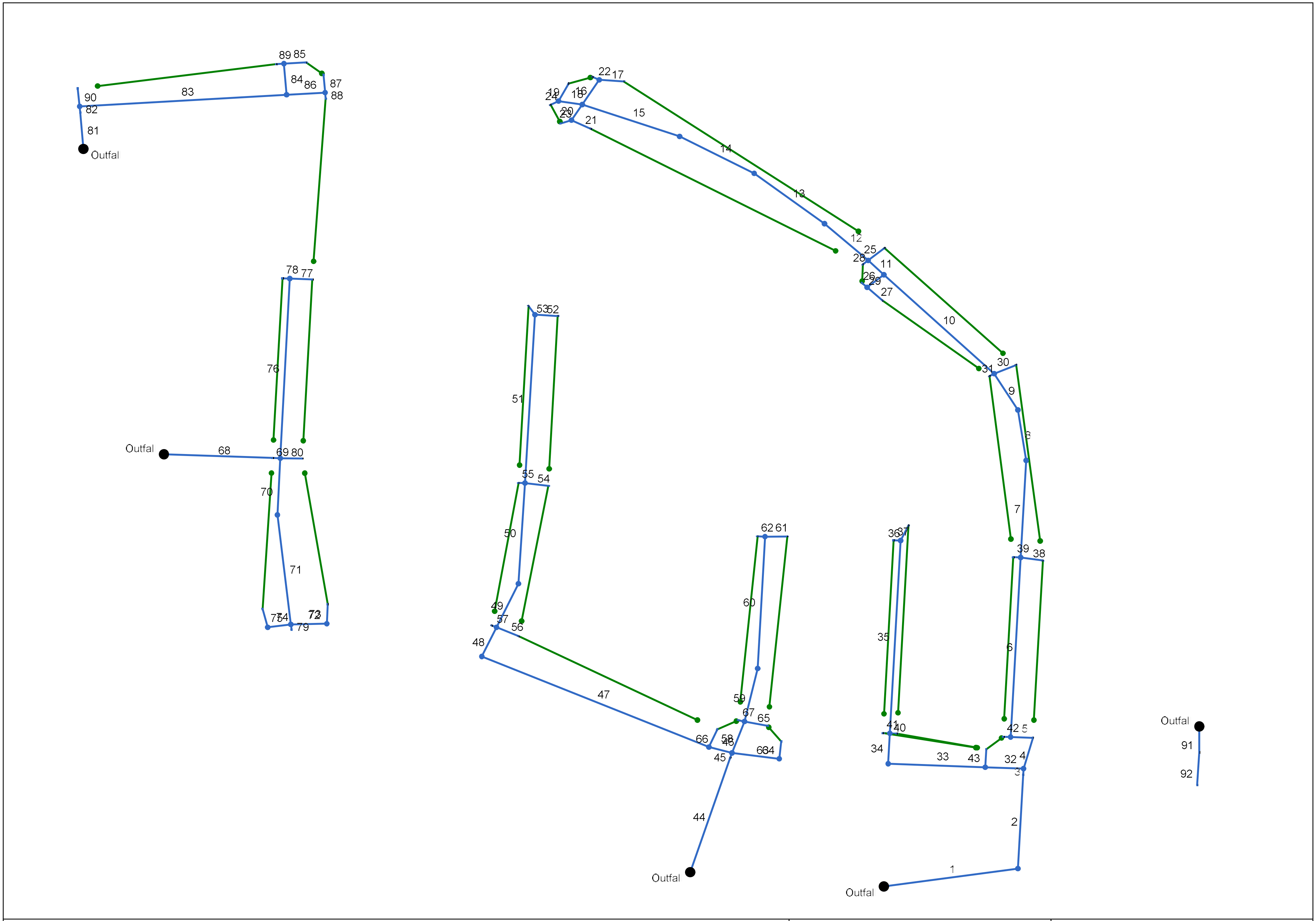
DRAWN BY: KWB

FN: 20-05-132

Sheet Number:
2 OF 2

File: U:\User\2005132\Drawings\Storm Sewer.dwg Storm Sewer 2 Plotted: Aug 25, 2020 - 3:57pm

# Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan




| Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Date: 8/25/2020 |
| --- | --- | --- |

# Structure Report



| Struct No. | Structure ID | Junction Type | Rim Elev (ft) | Structure | | | Line Out | | | Line In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Shape | Length (ft) | Width (ft) | Size (in) | Shape | Invert (ft) | Size (in) | Shape | Invert (ft) |
| 1 | CB 100 | Manhole | 866.75 | Cir | 4.00 | 4.00 | 27 | Cir | 862.58 | 27 | Cir | 862.58 |
| 2 | INL 101.1 | Combination | 869.01 | Rect | 3.00 | 2.00 | 27 | Cir | 863.08 | 24 | Cir | 863.33 |
| 3 | CB 101 | Manhole | 870.42 | Cir | 4.00 | 4.00 | 24 | Cir | 863.38 | 24 | Cir | 863.38 |
| | | | | | | | | | | 12 | Cir | 864.38 |
| 4 | INL 102.1 | Combination | 869.50 | Rect | 3.00 | 2.00 | 24 | Cir | 863.57 | 24 | Cir | 863.57 |
| 5 | CB 102 | Manhole | 868.74 | Cir | 4.00 | 4.00 | 24 | Cir | 863.68 | 24 | Cir | 863.68 |
| | | | | | | | | | | 12 | Cir | 864.68 |
| 6 | CB 103 | Manhole | 870.05 | Cir | 4.00 | 4.00 | 24 | Cir | 864.63 | 24 | Cir | 864.63 |
| | | | | | | | | | | 12 | Cir | 865.63 |
| | | | | | | | | | | 12 | Cir | 865.63 |
| 7 | CB 104 | Manhole | 871.34 | Cir | 4.00 | 4.00 | 24 | Cir | 865.21 | 24 | Cir | 865.21 |
| 8 | CB 105 | Manhole | 872.02 | Cir | 4.00 | 4.00 | 24 | Cir | 865.52 | 24 | Cir | 865.52 |
| 9 | CB 106 | Manhole | 872.57 | Cir | 4.00 | 4.00 | 24 | Cir | 865.76 | 21 | Cir | 866.01 |
| | | | | | | | | | | 12 | Cir | 866.76 |
| | | | | | | | | | | 12 | Cir | 866.76 |
| 10 | CB 107 | Manhole | 874.34 | Cir | 4.00 | 4.00 | 21 | Cir | 866.81 | 21 | Cir | 866.81 |
| | | | | | | | | | | 12 | Cir | 867.56 |
| 11 | CB 109 | Manhole | 874.59 | Cir | 4.00 | 4.00 | 21 | Cir | 866.93 | 18 | Cir | 867.18 |
| | | | | | | | | | | 12 | Cir | 867.68 |
| | | | | | | | | | | 12 | Cir | 867.68 |
| 12 | CB 110 | Manhole | 875.28 | Cir | 4.00 | 4.00 | 18 | Cir | 867.49 | 18 | Cir | 867.49 |
| 13 | CB 111 | Manhole | 875.75 | Cir | 4.00 | 4.00 | 18 | Cir | 867.94 | 18 | Cir | 867.94 |
| 14 | CB 112 | Manhole | 876.69 | Cir | 4.00 | 4.00 | 18 | Cir | 868.41 | 18 | Cir | 868.41 |
| 15 | CB 113 | Manhole | 877.82 | Cir | 4.00 | 4.00 | 18 | Cir | 868.97 | 12 | Cir | 869.47 |
| | | | | | | | | | | 12 | Cir | 869.47 |
| | | | | | | | | | | 12 | Cir | 869.47 |
| 16 | CB 114 | Manhole | 878.19 | Cir | 4.00 | 4.00 | 12 | Cir | 869.66 | 12 | Cir | 869.66 |
| | | | | | | | | | | 12 | Cir | 869.66 |
| 17 | INL 114.1 | Combination | 879.46 | Rect | 3.00 | 2.00 | 12 | Cir | 869.79 | | | |

| Project File: Rosewood Storm Sewer.stm | Number of Structures: 92 | Run Date: 8/25/2020 |
|---|---|---|

# Structure Report



| Struct No. | Structure ID | Junction Type | Rim Elev (ft) | Structure Shape | Structure Length (ft) | Structure Width (ft) | Line Out Size (in) | Line Out Shape | Line Out Invert (ft) | Line In Size (in) | Line In Shape | Line In Invert (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | CB 115 | Manhole | 878.08 | Cir | 4.00 | 4.00 | 12 | Cir | 869.62 | 12<br>12 | Cir<br>Cir | 869.62<br>869.62 |
| 19 | INL 115.1 | Combination | 879.33 | Rect | 3.00 | 2.00 | 12 | Cir | 869.75 | | | |
| 20 | CB 116 | Manhole | 878.05 | Cir | 4.00 | 4.00 | 12 | Cir | 869.59 | 12<br>12 | Cir<br>Cir | 869.59<br>869.59 |
| 21 | INL 116.1 | Combination | 879.30 | Rect | 3.00 | 2.00 | 12 | Cir | 869.71 | | | |
| 22 | INL 114.2 | Combination | 879.44 | Rect | 3.00 | 2.00 | 12 | Cir | 869.70 | | | |
| 23 | INL 116.2 | Combination | 879.18 | Rect | 3.00 | 2.00 | 12 | Cir | 869.65 | | | |
| 24 | INL 115.2 | Combination | 879.18 | Rect | 3.00 | 2.00 | 12 | Cir | 869.67 | | | |
| 25 | INL 109.1 | Combination | 875.30 | Rect | 3.00 | 2.00 | 12 | Cir | 867.92 | | | |
| 26 | CB 108 | Manhole | 874.04 | Cir | 4.00 | 4.00 | 12 | Cir | 867.81 | 12<br>12 | Cir<br>Cir | 867.81<br>867.81 |
| 27 | INL 108.1 | Combination | 875.29 | Rect | 3.00 | 2.00 | 12 | Cir | 868.05 | | | |
| 28 | INL 109.2 | Combination | 875.13 | Rect | 3.00 | 2.00 | 12 | Cir | 867.76 | | | |
| 29 | INL 108.2 | Combination | 875.13 | Rect | 3.00 | 2.00 | 12 | Cir | 867.89 | | | |
| 30 | INL 106.1 | Combination | 873.29 | Rect | 3.00 | 2.00 | 12 | Cir | 867.02 | | | |
| 31 | INL 106.2 | Combination | 873.09 | Rect | 3.00 | 2.00 | 12 | Cir | 866.82 | | | |
| 32 | CB 117 | Manhole | 869.19 | Cir | 4.00 | 4.00 | 12 | Cir | 864.79 | 12<br>12 | Cir<br>Cir | 864.79<br>864.79 |
| 33 | CB 118 | Manhole | 869.87 | Cir | 4.00 | 4.00 | 12 | Cir | 865.83 | 12 | Cir | 865.83 |
| 34 | CB 119 | Manhole | 870.48 | Cir | 4.00 | 4.00 | 12 | Cir | 866.24 | 12<br>12<br>12 | Cir<br>Cir<br>Cir | 866.24<br>866.24<br>866.24 |
| 35 | CB 120 | Manhole | 871.19 | Cir | 4.00 | 4.00 | 12 | Cir | 867.53 | 12<br>12 | Cir<br>Cir | 867.53<br>867.53 |
| 36 | INL 120.1 | Combination | 872.10 | Rect | 3.00 | 2.00 | 12 | Cir | 867.64 | | | |

| Project File: Rosewood Storm Sewer.stm | Number of Structures: 92 | Run Date: 8/25/2020 |
|---|---|---|

Storm Sewers v12.00

# Structure Report



| Struct No. | Structure ID | Junction Type | Rim Elev | Structure | | | Line Out | | | Line In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (ft) | Shape | Length (ft) | Width (ft) | Size (in) | Shape | Invert (ft) | Size (in) | Shape | Invert (ft) |
| 37 | INL 120.2 | Combination | 871.96 | Rect | 3.00 | 3.00 | 12 | Cir | 867.57 | | | |
| 38 | INL 103.1 | Combination | 870.75 | Rect | 3.00 | 2.00 | 12 | Cir | 865.87 | | | |
| 39 | INL 103.2 | Combination | 870.59 | Rect | 3.00 | 2.00 | 12 | Cir | 865.71 | | | |
| 40 | INL 119.1 | Combination | 870.36 | Rect | 3.00 | 2.00 | 12 | Cir | 866.31 | | | |
| 41 | INL 119.2 | Combination | 870.60 | Rect | 3.00 | 2.00 | 12 | Cir | 866.32 | | | |
| 42 | INL 102.2 | Combination | 869.82 | Rect | 3.00 | 2.00 | 12 | Cir | 864.76 | | | |
| 43 | INL 117.1 | Combination | 869.35 | Rect | 3.00 | 2.00 | 12 | Cir | 865.03 | | | |
| 44 | INL 200.1 | Combination | 869.79 | Rect | 3.00 | 2.00 | 24 | Cir | 863.17 | 24 | Cir | 863.17 |
| 45 | CB 200 | Manhole | 869.51 | Cir | 4.00 | 4.00 | 24 | Cir | 863.24 | 18<br>18<br>12 | Cir<br>Cir<br>Cir | 863.74<br>863.74<br>864.24 |
| 46 | CB 205 | Manhole | 869.64 | Cir | 4.00 | 4.00 | 18 | Cir | 863.88 | 15<br>12 | Cir<br>Cir | 864.13<br>864.48 |
| 47 | CB 206 | Manhole | 871.21 | Cir | 4.00 | 4.00 | 15 | Cir | 866.69 | 15 | Cir | 866.69 |
| 48 | CB 207 | Manhole | 870.74 | Cir | 4.00 | 4.00 | 15 | Cir | 867.10 | 15<br>12<br>12 | Cir<br>Cir<br>Cir | 867.10<br>867.35<br>867.35 |
| 49 | CB 208 | Manhole | 871.12 | Cir | 4.00 | 4.00 | 15 | Cir | 867.41 | 15 | Cir | 867.41 |
| 50 | CB 209 | Manhole | 871.79 | Cir | 4.00 | 4.00 | 15 | Cir | 868.08 | 12<br>12<br>12 | Cir<br>Cir<br>Cir | 868.33<br>868.33<br>868.33 |
| 51 | CB 210 | Manhole | 872.95 | Cir | 4.00 | 4.00 | 12 | Cir | 869.45 | 12<br>12 | Cir<br>Cir | 869.45<br>869.45 |
| 52 | INL 210.1 | Combination | 874.20 | Rect | 3.00 | 2.00 | 12 | Cir | 869.60 | | | |
| 53 | INL 210.2 | Combination | 874.09 | Rect | 3.00 | 2.00 | 12 | Cir | 869.52 | | | |
| 54 | INL 209.1 | Combination | 872.06 | Rect | 3.00 | 2.00 | 12 | Cir | 868.58 | | | |
| 55 | INL 209.2 | Combination | 872.08 | Rect | 3.00 | 2.00 | 12 | Cir | 868.40 | | | |

| Project File: Rosewood Storm Sewer.stm | Number of Structures: 92 | Run Date: 8/25/2020 |
|---|---|---|

# Structure Report

| Struct No. | Structure ID | Junction Type | Rim Elev (ft) | Structure Shape | Structure Length (ft) | Structure Width (ft) | Line Out Size (in) | Line Out Shape | Line Out Invert (ft) | Line In Size (in) | Line In Shape | Line In Invert (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56 | INL 207.1 | Combination | 871.06 | Rect | 3.00 | 2.00 | 12 | Cir | 867.62 | | | |
| 57 | INL 207.2 | Combination | 871.06 | Rect | 3.00 | 2.00 | 12 | Cir | 867.40 | | | |
| 58 | CB 202 | Manhole | 869.03 | Cir | 4.00 | 4.00 | 18 | Cir | 864.29 | 18<br>12<br>12 | Cir<br>Cir<br>Cir | 864.29<br>865.18<br>865.18 |
| 59 | CB 203 | Manhole | 869.47 | Cir | 4.00 | 4.00 | 18 | Cir | 864.80 | 18 | Cir | 864.80 |
| 60 | CB 204 | Manhole | 870.48 | Cir | 4.00 | 4.00 | 18 | Cir | 865.68 | 12<br>15 | Cir<br>Cir | 866.18<br>865.93 |
| 61 | INL 204.1 | Combination | 870.75 | Rect | 3.00 | 2.00 | 12 | Cir | 866.42 | | | |
| 62 | INL 204.2 | Combination | 869.50 | Rect | 3.00 | 2.00 | 15 | Cir | 866.01 | | | |
| 63 | CB 201 | Manhole | 869.66 | Cir | 4.00 | 4.00 | 12 | Cir | 865.27 | 12 | Cir | 865.27 |
| 64 | INL 201.1 | Combination | 869.91 | Rect | 3.00 | 2.00 | 12 | Cir | 865.73 | | | |
| 65 | INL 202.1 | Combination | 869.32 | Rect | 3.00 | 2.00 | 12 | Cir | 865.43 | | | |
| 66 | INL 205.1 | Combination | 869.93 | Rect | 3.00 | 2.00 | 12 | Cir | 864.73 | | | |
| 67 | INL 202.2 | Combination | 869.32 | Rect | 3.00 | 2.00 | 12 | Cir | 865.25 | | | |
| 68 | INL 300.2 | Combination | 871.38 | Rect | 3.00 | 2.00 | 18 | Cir | 867.93 | 18 | Cir | 867.93 |
| 69 | CB 300 | Manhole | 870.46 | Cir | 4.00 | 4.00 | 18 | Cir | 868.00 | 12<br>15<br>15 | Cir<br>Cir<br>Cir | 868.50<br>868.25<br>868.25 |
| 70 | CB 301 | Manhole | 871.22 | Cir | 4.00 | 4.00 | 12 | Cir | 868.88 | 12 | Cir | 868.88 |
| 71 | CB 302 | Manhole | 872.15 | Cir | 4.00 | 4.00 | 12 | Cir | 869.62 | 12<br>12<br>12 | Cir<br>Cir<br>Cir | 869.62<br>869.62<br>869.62 |
| 72 | CB 304 | Manhole | 875.41 | Cir | 4.00 | 4.00 | 12 | Cir | 869.82 | 12 | Cir | 869.82 |
| 73 | INL 304.1 | Combination | 874.34 | Rect | 3.00 | 2.00 | 12 | Cir | 870.08 | | | |
| 74 | CB 303 | Manhole | 872.40 | Cir | 4.00 | 4.00 | 12 | Cir | 869.75 | 12 | Cir | 869.75 |

| Project File: Rosewood Storm Sewer.stm | Number of Structures: 92 | Run Date: 8/25/2020 |
|---|---|---|

# Structure Report



| Struct No. | Structure ID | Junction Type | Rim Elev (ft) | Structure | | | Line Out | | | Line In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Shape | Length (ft) | Width (ft) | Size (in) | Shape | Invert (ft) | Size (in) | Shape | Invert (ft) |
| 75 | INL 303.1 | Combination | 873.65 | Rect | 3.00 | 2.00 | 12 | Cir | 869.88 | | | |
| 76 | CB 305 | Manhole | 872.31 | Cir | 4.00 | 4.00 | 15 | Cir | 869.46 | 12 | Cir | 869.71 |
| | | | | | | | | | | 12 | Cir | 869.71 |
| 77 | INL 305.1 | Combination | 873.56 | Rect | 3.00 | 2.00 | 12 | Cir | 869.95 | | | |
| 78 | INL 305.2 | Combination | 873.39 | Rect | 3.00 | 2.00 | 12 | Cir | 869.79 | | | |
| 79 | INL 302.1 | Combination | 873.22 | Rect | 3.00 | 2.00 | 12 | Cir | 869.69 | | | |
| 80 | INL 300.3 | Combination | 871.15 | Rect | 3.00 | 2.00 | 15 | Cir | 868.43 | | | |
| 81 | INL 400.2 | Combination | 874.72 | Rect | 3.00 | 2.00 | 12 | Cir | 869.92 | 12 | Cir | 869.92 |
| 82 | CB 400 | Manhole | 874.46 | Cir | 4.00 | 4.00 | 12 | Cir | 870.00 | 12 | Cir | 870.00 |
| | | | | | | | | | | 12 | Cir | 870.00 |
| 83 | CB 401 | Manhole | 876.49 | Cir | 4.00 | 4.00 | 12 | Cir | 872.80 | 12 | Cir | 872.80 |
| | | | | | | | | | | 12 | Cir | 872.80 |
| 84 | CB 402 | Manhole | 877.95 | Cir | 4.00 | 4.00 | 12 | Cir | 874.30 | 12 | Cir | 874.30 |
| | | | | | | | | | | 12 | Cir | 874.30 |
| 85 | INL 402.1 | Combination | 878.22 | Rect | 3.00 | 2.00 | 12 | Cir | 874.54 | | | |
| 86 | CB 403 | Manhole | 877.13 | Cir | 4.00 | 4.00 | 12 | Cir | 873.20 | 12 | Cir | 873.20 |
| | | | | | | | | | | 12 | Cir | 873.20 |
| 87 | INL 403.2 | Combination | 877.40 | Rect | 3.00 | 2.00 | 12 | Cir | 873.44 | | | |
| 88 | INL 403.1 | Combination | 877.40 | Rect | 3.00 | 2.00 | 12 | Cir | 873.28 | | | |
| 89 | INL 402.2 | Combination | 878.22 | Rect | 3.00 | 2.00 | 12 | Cir | 874.38 | | | |
| 90 | INL 400.3 | Combination | 874.73 | Rect | 3.00 | 2.00 | 12 | Cir | 870.24 | | | |
| 91 | STRUCT-(139) | Combination | 862.50 | Rect | 3.00 | 2.00 | 12 | Cir | 870.25 | 12 | Cir | 870.25 |
| 92 | STRUCT-(138) | Combination | 862.50 | Rect | 3.00 | 2.00 | 12 | Cir | 870.50 | | | |

| Project File: Rosewood Storm Sewer.stm | Number of Structures: 92 | Run Date: 8/25/2020 |
|---|---|---|

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 1 | CB 100 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 2 | INL 101.1 | 0.74 | 0.00 | 0.70 | 0.03 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.034 | 2.00 | 0.050 | 0.020 | 0.013 | 0.13 | 3.58 | 0.04 | 0.84 | 0.0 | Off |
| 3 | CB 101 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 4 | INL 102.1 | 0.89 | 0.40 | 1.29 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.21 | 7.29 | 0.21 | 7.29 | 0.0 | Off |
| 5 | CB 102 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 6 | CB 103 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 7 | CB 104 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 8 | CB 105 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 9 | CB 106 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 10 | CB 107 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 11 | CB 109 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 12 | CB 110 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 13 | CB 111 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 14 | CB 112 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 15 | CB 113 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 16 | CB 114 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 17 | INL 114.1 | 0.64 | 0.00 | 0.56 | 0.08 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.60 | 0.08 | 1.69 | 0.0 | 25 |
| 18 | CB 115 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 19 | INL 115.1 | 1.92 | 0.00 | 1.32 | 0.60 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.24 | 9.17 | 0.17 | 5.43 | 0.0 | 22 |
| 20 | CB 116 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 21 | INL 116.1 | 0.26 | 0.00 | 0.25 | 0.01 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.13 | 3.37 | 0.03 | 0.61 | 0.0 | 28 |
| 22 | INL 114.2 | 1.76 | 0.60 | 2.36 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.28 | 11.14 | 0.28 | 11.14 | 0.0 | Off |
| 23 | INL 116.2 | 0.99 | 0.09 | 1.08 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.19 | 6.43 | 0.19 | 6.43 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 22.59 / (Inlet time + 3.70) ^ 0.58; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report

| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 24 | INL 115.2 | 0.67 | 0.00 | 0.58 | 0.09 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.74 | 0.09 | 1.76 | 0.0 | 23 |
| 25 | INL 109.1 | 1.69 | 0.08 | 1.25 | 0.53 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.24 | 8.88 | 0.16 | 5.11 | 0.0 | 30 |
| 26 | CB 108 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 27 | INL 108.1 | 0.32 | 0.00 | 0.31 | 0.01 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.14 | 3.87 | 0.04 | 0.84 | 0.0 | 31 |
| 28 | INL 109.2 | 1.92 | 0.01 | 1.32 | 0.60 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.24 | 9.18 | 0.17 | 5.44 | 0.0 | 29 |
| 29 | INL 108.2 | 1.82 | 0.60 | 2.42 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.29 | 11.36 | 0.29 | 11.36 | 0.0 | Off |
| 30 | INL 106.1 | 0.86 | 0.53 | 1.04 | 0.36 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.22 | 8.01 | 0.14 | 4.14 | 0.0 | 38 |
| 31 | INL 106.2 | 1.05 | 0.01 | 0.84 | 0.23 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.20 | 7.12 | 0.12 | 3.11 | 0.0 | 39 |
| 32 | CB 117 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 33 | CB 118 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 34 | CB 119 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 35 | CB 120 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 36 | INL 120.1 | 0.51 | 0.00 | 0.46 | 0.05 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 5.01 | 0.07 | 1.39 | 0.0 | 40 |
| 37 | INL 120.2 | 0.38 | 0.00 | 0.36 | 0.02 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.30 | 0.05 | 1.05 | 0.0 | 41 |
| 38 | INL 103.1 | 1.12 | 0.36 | 1.08 | 0.40 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.22 | 8.21 | 0.15 | 4.37 | 0.0 | 4 |
| 39 | INL 103.2 | 1.89 | 0.23 | 1.42 | 0.70 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.25 | 9.54 | 0.18 | 5.84 | 0.0 | 42 |
| 40 | INL 119.1 | 0.58 | 0.05 | 0.55 | 0.08 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.54 | 0.08 | 1.66 | 0.0 | 43 |
| 41 | INL 119.2 | 0.51 | 0.02 | 0.48 | 0.06 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 5.13 | 0.07 | 1.45 | 0.0 | 43 |
| 42 | INL 102.2 | 2.36 | 0.75 | 3.11 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.33 | 13.50 | 0.33 | 13.50 | 0.0 | Off |
| 43 | INL 117.1 | 0.45 | 0.14 | 0.53 | 0.05 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.010 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.47 | 0.06 | 1.23 | 0.0 | 42 |
| 44 | INL 200.1 | 2.05 | 0.00 | 2.05 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.26 | 10.09 | 0.26 | 10.09 | 0.0 | Off |
| 45 | CB 200 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 46 | CB 205 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 22.59 / (Inlet time + 3.70) ^ 0.58; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 47 | CB 206 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 48 | CB 207 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 49 | CB 208 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 50 | CB 209 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 51 | CB 210 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 52 | INL 210.1 | 0.77 | 0.00 | 0.65 | 0.12 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.18 | 6.12 | 0.10 | 1.94 | 0.0 | 54 |
| 53 | INL 210.2 | 1.66 | 0.00 | 1.18 | 0.48 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.23 | 8.63 | 0.16 | 4.84 | 0.0 | 55 |
| 54 | INL 209.1 | 0.99 | 0.12 | 0.87 | 0.24 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.20 | 7.25 | 0.13 | 3.27 | 0.0 | 56 |
| 55 | INL 209.2 | 1.37 | 0.48 | 1.29 | 0.57 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.24 | 9.04 | 0.17 | 5.28 | 0.0 | 57 |
| 56 | INL 207.1 | 0.96 | 0.24 | 0.92 | 0.28 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.21 | 7.50 | 0.13 | 3.57 | 0.0 | 66 |
| 57 | INL 207.2 | 1.53 | 0.57 | 2.10 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.27 | 10.28 | 0.27 | 10.28 | 0.0 | Off |
| 58 | CB 202 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 59 | CB 203 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 60 | CB 204 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 61 | INL 204.1 | 1.50 | 0.00 | 1.10 | 0.40 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.006 | 2.00 | 0.050 | 0.020 | 0.013 | 0.22 | 7.95 | 0.14 | 4.19 | 0.0 | 65 |
| 62 | INL 204.2 | 5.08 | 0.00 | 2.66 | 2.42 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.006 | 2.00 | 0.050 | 0.020 | 0.013 | 0.32 | 13.12 | 0.25 | 9.72 | 0.0 | 67 |
| 63 | CB 201 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 64 | INL 201.1 | 0.38 | 0.00 | 0.36 | 0.02 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.30 | 0.05 | 1.05 | 0.0 | 65 |
| 65 | INL 202.1 | 1.89 | 0.43 | 2.31 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.28 | 10.99 | 0.28 | 10.99 | 0.0 | Off |
| 66 | INL 205.1 | 1.09 | 0.28 | 1.02 | 0.35 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.22 | 7.93 | 0.14 | 4.07 | 0.0 | 67 |
| 67 | INL 202.2 | 2.81 | 2.77 | 5.58 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.46 | 19.97 | 0.46 | 19.97 | 0.0 | Off |
| 68 | INL 300.2 | 1.95 | 0.19 | 2.14 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.27 | 10.40 | 0.27 | 10.40 | 0.0 | Off |
| 69 | CB 300 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 22.59 / (Inlet time + 3.70) ^ 0.58; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 70 | CB 301 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 71 | CB 302 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 72 | CB 304 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 73 | INL 304.1 | 0.48 | 0.00 | 0.44 | 0.04 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 4.85 | 0.07 | 1.31 | 0.0 | 80 |
| 74 | CB 303 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 75 | INL 303.1 | 0.26 | 0.00 | 0.25 | 0.01 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.13 | 3.37 | 0.03 | 0.61 | 0.0 | 68 |
| 76 | CB 305 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 77 | INL 305.1 | 2.14 | 0.00 | 1.47 | 0.68 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.011 | 2.00 | 0.050 | 0.020 | 0.013 | 0.22 | 8.12 | 0.15 | 4.72 | 0.0 | 80 |
| 78 | INL 305.2 | 1.02 | 0.00 | 0.84 | 0.18 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.011 | 2.00 | 0.050 | 0.020 | 0.013 | 0.18 | 5.81 | 0.10 | 1.94 | 0.0 | 68 |
| 79 | INL 302.1 | 0.80 | 0.00 | 0.80 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.16 | 5.16 | 0.16 | 5.16 | 0.0 | Off |
| 80 | INL 300.3 | 5.15 | 0.72 | 5.86 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.46 | 19.97 | 0.46 | 19.97 | 0.0 | Off |
| 81 | INL 400.2 | 0.83 | 0.00 | 0.83 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.17 | 5.31 | 0.17 | 5.31 | 0.0 | Off |
| 82 | CB 400 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 83 | CB 401 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 84 | CB 402 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 85 | INL 402.1 | 0.48 | 0.00 | 0.48 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.040 | 2.00 | 0.050 | 0.020 | 0.013 | 0.11 | 2.50 | 0.01 | 0.24 | 0.0 | 87 |
| 86 | CB 403 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 87 | INL 403.2 | 0.58 | 0.00 | 0.58 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.14 | 4.06 | 0.14 | 4.06 | 0.0 | Off |
| 88 | INL 403.1 | 0.13 | 0.00 | 0.13 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.015 | 2.00 | 0.050 | 0.020 | 0.013 | 0.08 | 1.61 | 0.00 | 0.00 | 0.0 | 77 |
| 89 | INL 402.2 | 0.26 | 0.00 | 0.26 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.040 | 2.00 | 0.050 | 0.020 | 0.013 | 0.09 | 1.74 | 0.00 | 0.00 | 0.0 | 90 |
| 90 | INL 400.3 | 2.72 | 0.00 | 2.72 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.31 | 12.29 | 0.31 | 12.29 | 0.0 | Off |
| 91 | STRUCT-(139) | 0.45 | 0.00 | 0.41 | 0.04 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.67 | 0.06 | 1.23 | 0.0 | Off |
| 92 | STRUCT-(138) | 0.45 | 0.00 | 0.41 | 0.04 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.67 | 0.06 | 1.23 | 0.0 | Off |

| Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020 |
|---|---|---|

NOTES: Inlet N-Values = 0.016; Intensity = 22.59 / (Inlet time + 3.70) ^ 0.58; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Pipes



| Line No. | Line ID | Drng Area (ac) | i Inlet (in/hr) | Flow Rate (cfs) | Capac Full (cfs) | Line Length (ft) | Line Slope (%) | Invert Dn (ft) | Invert Up (ft) | HGL Dn (ft) | HGL Up (ft) | Line Size (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CB 100 TO AE 100.1 | 0.00 | 0.00 | 16.46 | 19.50 | 146.188 | 0.40 | 862.00 | 862.58 | 863.46 | 864.21 | 27 |
| 2 | INL 101.1 TO CB 100 | 0.23 | 6.39 | 16.77 | 19.56 | 125.345 | 0.40 | 862.58 | 863.08 | 864.65 | 864.93 | 27 |
| 3 | CB 101 TO INL 101.1 | 0.00 | 0.00 | 16.26 | 17.91 | 7.971 | 0.63 | 863.33 | 863.38 | 865.11 | 865.14 | 24 |
| 4 | INL 102.1 TO CB 101 | 0.28 | 6.39 | 14.60 | 15.16 | 42.294 | 0.45 | 863.38 | 863.57 | 865.62 | 865.79 | 24 |
| 5 | CB 102 TO INL 102.1 | 0.00 | 0.00 | 14.00 | 15.31 | 24.000 | 0.46 | 863.57 | 863.68 | 866.30 | 866.39 | 24 |
| 6 | CB 103 TO CB 102 | 0.00 | 0.00 | 12.76 | 14.24 | 239.500 | 0.40 | 863.68 | 864.63 | 866.70 | 867.46 | 24 |
| 7 | CB 104 TO CB 103 | 0.00 | 0.00 | 10.77 | 15.14 | 129.364 | 0.45 | 864.63 | 865.21 | 867.72 | 868.01 | 24 |
| 8 | CB 105 TO CB 104 | 0.00 | 0.00 | 10.92 | 15.29 | 67.855 | 0.46 | 865.21 | 865.52 | 868.05 | 868.21 | 24 |
| 9 | CB 106 TO CB 105 | 0.00 | 0.00 | 11.05 | 14.98 | 54.693 | 0.44 | 865.52 | 865.76 | 868.28 | 868.41 | 24 |
| 10 | CB 107 TO CB 106 | 0.00 | 0.00 | 9.83 | 10.64 | 177.385 | 0.45 | 866.01 | 866.81 | 868.61 | 869.29 | 21 |
| 11 | CB 109 TO CB 107 | 0.00 | 0.00 | 8.12 | 10.86 | 25.510 | 0.47 | 866.81 | 866.93 | 869.55 | 869.62 | 21 |
| 12 | CB 110 TO CB 109 | 0.00 | 0.00 | 5.24 | 7.10 | 67.780 | 0.46 | 867.18 | 867.49 | 869.79 | 869.96 | 18 |
| 13 | CB 111 TO CB 110 | 0.00 | 0.00 | 5.38 | 7.01 | 101.047 | 0.45 | 867.49 | 867.94 | 869.98 | 870.25 | 18 |
| 14 | CB 112 TO CB 111 | 0.00 | 0.00 | 5.51 | 7.42 | 94.114 | 0.50 | 867.94 | 868.41 | 870.28 | 870.54 | 18 |
| 15 | CB 113 TO CB 112 | 0.00 | 0.00 | 5.69 | 7.39 | 113.097 | 0.50 | 868.41 | 868.97 | 870.57 | 870.90 | 18 |
| 16 | CB 114 TO CB 113 | 0.00 | 0.00 | 2.31 | 2.53 | 37.697 | 0.50 | 869.47 | 869.66 | 871.06 | 871.22 | 12 |
| 17 | INL 114.1 TO CB 114 | 0.20 | 6.39 | 0.64 | 2.50 | 26.394 | 0.49 | 869.66 | 869.79 | 871.36 | 871.36 | 12 |
| 18 | CB 115 TO CB 113 | 0.00 | 0.00 | 2.56 | 2.71 | 25.906 | 0.58 | 869.47 | 869.62 | 871.06 | 871.19 | 12 |
| 19 | INL 115.1 TO CB 115 | 0.60 | 6.39 | 1.92 | 2.53 | 25.665 | 0.51 | 869.62 | 869.75 | 871.36 | 871.43 | 12 |
| 20 | CB 116 TO CB 113 | 0.00 | 0.00 | 1.15 | 2.53 | 23.787 | 0.50 | 869.47 | 869.59 | 871.06 | 871.09 | 12 |
| 21 | INL 116.1 TO CB 116 | 0.08 | 6.39 | 0.26 | 2.52 | 24.016 | 0.50 | 869.59 | 869.71 | 871.12 | 871.12 | 12 |
| 22 | INL 114.2 TO CB 114 | 0.55 | 6.39 | 1.76 | 2.52 | 8.000 | 0.50 | 869.66 | 869.70 | 871.36 | 871.37 | 12 |
| 23 | INL 116.2 TO CB 116 | 0.31 | 6.39 | 0.99 | 2.49 | 12.285 | 0.49 | 869.59 | 869.65 | 871.12 | 871.13 | 12 |

| Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Date: 8/25/2020 |
|---|---|---|

NOTES: Intensity = 22.59 / (Inlet time + 3.70) ^ 0.58 -- Return period = 10 Yrs. ; ** Critical depth

# Pipes



| Line No. | Line ID | Drng Area (ac) | i Inlet (in/hr) | Flow Rate (cfs) | Capac Full (cfs) | Line Length (ft) | Line Slope (%) | Invert Dn (ft) | Invert Up (ft) | HGL Dn (ft) | HGL Up (ft) | Line Size (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | INL 115.2 TO CB 115 | 0.21 | 6.39 | 0.67 | 2.53 | 9.903 | 0.50 | 869.62 | 869.67 | 871.36 | 871.36 | 12 |
| 25 | INL 109.1 TO CB 109 | 0.53 | 6.39 | 1.69 | 3.55 | 24.188 | 0.99 | 867.68 | 867.92 | 869.79 | 869.85 | 12 |
| 26 | CB 108 TO CB 107 | 0.00 | 0.00 | 2.01 | 3.59 | 24.543 | 1.02 | 867.56 | 867.81 | 869.55 | 869.63 | 12 |
| 27 | INL 108.1 TO CB 108 | 0.10 | 6.39 | 0.32 | 3.56 | 24.000 | 1.00 | 867.81 | 868.05 | 869.73 | 869.73 | 12 |
| 28 | INL 109.2 TO CB 109 | 0.60 | 6.39 | 1.92 | 3.60 | 7.812 | 1.02 | 867.68 | 867.76 | 869.79 | 869.82 | 12 |
| 29 | INL 108.2 TO CB 108 | 0.57 | 6.39 | 1.82 | 3.56 | 8.000 | 1.00 | 867.81 | 867.89 | 869.73 | 869.75 | 12 |
| 30 | INL 106.1 TO CB 106 | 0.27 | 6.39 | 0.86 | 3.54 | 26.311 | 0.99 | 866.76 | 867.02 | 868.61 | 868.62 | 12 |
| 31 | INL 106.2 TO CB 106 | 0.33 | 6.39 | 1.05 | 3.59 | 5.904 | 1.02 | 866.76 | 866.82 | 868.61 | 868.61 | 12 |
| 32 | CB 117 TO CB 101 | 0.00 | 0.00 | 1.83 | 3.55 | 41.308 | 0.99 | 864.38 | 864.79 | 865.62 | 865.71 | 12 |
| 33 | CB 118 TO CB 117 | 0.00 | 0.00 | 1.54 | 3.55 | 104.464 | 1.00 | 864.79 | 865.83 | 865.80 | 866.36 j | 12 |
| 34 | CB 119 TO CB 118 | 0.00 | 0.00 | 1.56 | 3.58 | 40.554 | 1.01 | 865.83 | 866.24 | 866.36 | 866.77 | 12 |
| 35 | CB 120 TO CB 119 | 0.00 | 0.00 | 0.86 | 2.52 | 257.148 | 0.50 | 866.24 | 867.53 | 866.77 | 867.92 | 12 |
| 36 | INL 120.1 TO CB 120 | 0.16 | 6.39 | 0.51 | 2.54 | 21.690 | 0.51 | 867.53 | 867.64 | 867.92 | 867.95 | 12 |
| 37 | INL 120.2 TO CB 120 | 0.12 | 6.39 | 0.38 | 2.60 | 7.500 | 0.53 | 867.53 | 867.57 | 867.92 | 867.92 | 12 |
| 38 | INL 103.1 TO CB 103 | 0.35 | 6.39 | 1.12 | 3.55 | 24.187 | 0.99 | 865.63 | 865.87 | 867.72 | 867.74 | 12 |
| 39 | INL 103.2 TO CB 103 | 0.59 | 6.39 | 1.89 | 3.56 | 8.000 | 1.00 | 865.63 | 865.71 | 867.72 | 867.74 | 12 |
| 40 | INL 119.1 TO CB 119 | 0.18 | 6.39 | 0.58 | 3.44 | 7.500 | 0.93 | 866.24 | 866.31 | 866.77 | 866.62 | 12 |
| 41 | INL 119.2 TO CB 119 | 0.16 | 6.39 | 0.51 | 3.68 | 7.500 | 1.07 | 866.24 | 866.32 | 866.77 | 866.62 | 12 |
| 42 | INL 102.2 TO CB 102 | 0.74 | 6.39 | 2.36 | 3.56 | 8.000 | 1.00 | 864.68 | 864.76 | 866.70 | 866.73 | 12 |
| 43 | INL 117.1 TO CB 117 | 0.14 | 6.39 | 0.45 | 3.56 | 24.000 | 1.00 | 864.79 | 865.03 | 865.80 | 865.81 | 12 |
| 44 | INL 200.1 TO AE 200.2 | 0.64 | 6.39 | 17.92 | 19.46 | 157.969 | 0.74 | 862.00 | 863.17 | 863.52 | 864.69 | 24 |
| 45 | CB 200 TO INL 200.1 | 0.00 | 0.00 | 16.28 | 22.39 | 7.142 | 0.98 | 863.17 | 863.24 | 864.69 | 864.69 j | 24 |
| 46 | CB 205 TO CB 200 | 0.00 | 0.00 | 6.84 | 7.69 | 26.090 | 0.54 | 863.74 | 863.88 | 864.84 | 864.98 | 18 |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Date: 8/25/2020

NOTES: Intensity = 22.59 / (Inlet time + 3.70) ^ 0.58 -- Return period = 10 Yrs. ; ** Critical depth

# Pipes



| Line No. | Line ID | Drng Area (ac) | i Inlet (in/hr) | Flow Rate (cfs) | Capac Full (cfs) | Line Length (ft) | Line Slope (%) | Invert Dn (ft) | Invert Up (ft) | HGL Dn (ft) | HGL Up (ft) | Line Size (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 | CB 206 TO CB 205 | 0.00 | 0.00 | 6.22 | 6.26 | 272.386 | 0.94 | 864.13 | 866.69 | 865.36 | 867.70 j | 15 |
| 48 | CB 207 TO CB 206 | 0.00 | 0.00 | 6.27 | 6.38 | 42.042 | 0.98 | 866.69 | 867.10 | 868.23 | 868.63 | 15 |
| 49 | CB 208 TO CB 207 | 0.00 | 0.00 | 4.19 | 4.54 | 62.733 | 0.49 | 867.10 | 867.41 | 869.03 | 869.30 | 15 |
| 50 | CB 209 TO CB 208 | 0.00 | 0.00 | 4.33 | 4.56 | 134.287 | 0.50 | 867.41 | 868.08 | 869.37 | 869.97 | 15 |
| 51 | CB 210 TO CB 209 | 0.00 | 0.00 | 2.36 | 2.51 | 224.640 | 0.50 | 868.33 | 869.45 | 870.17 | 871.16 | 12 |
| 52 | INL 210.1 TO CB 210 | 0.24 | 6.39 | 0.77 | 2.78 | 24.568 | 0.61 | 869.45 | 869.60 | 871.30 | 871.31 | 12 |
| 53 | INL 210.2 TO CB 210 | 0.52 | 6.39 | 1.66 | 2.58 | 13.329 | 0.53 | 869.45 | 869.52 | 871.30 | 871.33 | 12 |
| 54 | INL 209.1 TO CB 209 | 0.31 | 6.39 | 0.99 | 3.54 | 25.263 | 0.99 | 868.33 | 868.58 | 870.17 | 870.19 | 12 |
| 55 | INL 209.2 TO CB 209 | 0.43 | 6.39 | 1.37 | 3.59 | 6.901 | 1.01 | 868.33 | 868.40 | 870.17 | 870.18 | 12 |
| 56 | INL 207.1 TO CB 207 | 0.30 | 6.39 | 0.96 | 3.59 | 26.533 | 1.02 | 867.35 | 867.62 | 869.03 | 869.05 | 12 |
| 57 | INL 207.2 TO CB 207 | 0.48 | 6.39 | 1.53 | 3.41 | 5.467 | 0.92 | 867.35 | 867.40 | 869.03 | 869.04 | 12 |
| 58 | CB 202 TO CB 200 | 0.00 | 0.00 | 10.37 | 11.74 | 44.015 | 1.25 | 863.74 | 864.29 | 864.84 | 865.53 | 18 |
| 59 | CB 203 TO CB 202 | 0.00 | 0.00 | 6.18 | 8.84 | 72.040 | 0.71 | 864.29 | 864.80 | 865.53 | 865.76 j | 18 |
| 60 | CB 204 TO CB 203 | 0.00 | 0.00 | 6.49 | 7.43 | 175.860 | 0.50 | 864.80 | 865.68 | 865.89 | 866.77 | 18 |
| 61 | INL 204.1 TO CB 204 | 0.47 | 6.39 | 1.50 | 3.56 | 24.076 | 1.00 | 866.18 | 866.42 | 867.11 | 866.94 | 12 |
| 62 | INL 204.2 TO CB 204 | 1.59 | 6.39 | 5.08 | 6.47 | 7.965 | 1.00 | 865.93 | 866.01 | 867.11 | 866.92 | 15 |
| 63 | CB 201 TO CB 200 | 0.00 | 0.00 | 0.36 | 5.04 | 51.435 | 2.00 | 864.24 | 865.27 | 864.69 | 865.52 j | 12 |
| 64 | INL 201.1 TO CB 201 | 0.12 | 6.39 | 0.38 | 5.03 | 23.075 | 1.99 | 865.27 | 865.73 | 865.52 | 865.99 | 12 |
| 65 | INL 202.1 TO CB 202 | 0.59 | 6.39 | 1.89 | 3.54 | 25.256 | 0.99 | 865.18 | 865.43 | 865.70 | 866.01 | 12 |
| 66 | INL 205.1 TO CB 205 | 0.34 | 6.39 | 1.09 | 3.54 | 25.246 | 0.99 | 864.48 | 864.73 | 865.36 | 865.17 | 12 |
| 67 | INL 202.2 TO CB 202 | 0.88 | 6.39 | 2.81 | 3.63 | 6.747 | 1.04 | 865.18 | 865.25 | 865.84 | 865.97 | 12 |
| 68 | INL 300.2 TO AE 300.1 | 0.61 | 6.39 | 9.21 | 9.37 | 116.877 | 0.80 | 867.00 | 867.93 | 868.17 | 869.17 | 18 |
| 69 | CB 300 TO INL 300.2 | 0.00 | 0.00 | 7.70 | 9.56 | 8.446 | 0.83 | 867.93 | 868.00 | 869.44 | 869.48 | 18 |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Date: 8/25/2020

NOTES: Intensity = 22.59 / (Inlet time + 3.70) ^ 0.58 -- Return period = 10 Yrs. ; ** Critical depth

# Pipes

| Line No. | Line ID | Drng Area (ac) | i Inlet (in/hr) | Flow Rate (cfs) | Capac Full (cfs) | Line Length (ft) | Line Slope (%) | Invert Dn (ft) | Invert Up (ft) | HGL Dn (ft) | HGL Up (ft) | Line Size (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70 | CB 301 TO CB 300 | 0.00 | 0.00 | 1.24 | 2.53 | 75.538 | 0.50 | 868.50 | 868.88 | 869.78 | 869.86 | 12 |
| 71 | CB 302 TO CB 301 | 0.00 | 0.00 | 1.32 | 2.53 | 146.689 | 0.50 | 868.88 | 869.62 | 869.87 | 870.17 | 12 |
| 72 | CB 304 TO CB 302 | 0.00 | 0.00 | 0.46 | 2.56 | 38.646 | 0.52 | 869.62 | 869.82 | 870.31 | 870.31 | 12 |
| 73 | INL 304.1 TO CB 304 | 0.15 | 6.39 | 0.48 | 3.55 | 26.198 | 0.99 | 869.82 | 870.08 | 870.33 | 870.37 j | 12 |
| 74 | CB 303 TO CB 302 | 0.00 | 0.00 | 0.24 | 2.56 | 25.184 | 0.52 | 869.62 | 869.75 | 870.31 | 870.31 | 12 |
| 75 | INL 303.1 TO CB 303 | 0.08 | 6.39 | 0.26 | 2.57 | 24.911 | 0.52 | 869.75 | 869.88 | 870.31 | 870.31 | 12 |
| 76 | CB 305 TO CB 300 | 0.00 | 0.00 | 3.13 | 4.59 | 239.625 | 0.50 | 868.25 | 869.46 | 869.78 | 870.36 | 15 |
| 77 | INL 305.1 TO CB 305 | 0.67 | 6.39 | 2.14 | 3.55 | 24.191 | 0.99 | 869.71 | 869.95 | 870.53 | 870.57 j | 12 |
| 78 | INL 305.2 TO CB 305 | 0.32 | 6.39 | 1.02 | 3.60 | 7.809 | 1.02 | 869.71 | 869.79 | 870.53 | 870.21 | 12 |
| 79 | INL 302.1 TO CB 302 | 0.25 | 6.39 | 0.80 | 3.54 | 7.069 | 0.99 | 869.62 | 869.69 | 870.31 | 870.06 | 12 |
| 80 | INL 300.3 TO CB 300 | 1.61 | 6.39 | 5.15 | 5.64 | 23.560 | 0.76 | 868.25 | 868.43 | 869.78 | 869.93 | 15 |
| 81 | INL 400.2 TO AE 400.1 | 0.26 | 6.39 | 4.05 | 8.71 | 48.815 | 5.98 | 867.00 | 869.92 | 867.81 | 870.77 | 12 |
| 82 | CB 400 TO INL 400.2 | 0.00 | 0.00 | 3.38 | 3.56 | 8.000 | 1.00 | 869.92 | 870.00 | 870.77 | 870.79 | 12 |
| 83 | CB 401 TO CB 400 | 0.00 | 0.00 | 1.30 | 3.99 | 223.129 | 1.25 | 870.00 | 872.80 | 870.79 | 873.28 j | 12 |
| 84 | CB 402 TO CB 401 | 0.00 | 0.00 | 0.70 | 6.77 | 41.500 | 3.61 | 872.80 | 874.30 | 873.28 | 874.65 j | 12 |
| 85 | INL 402.1 TO CB 402 | 0.15 | 6.39 | 0.48 | 3.56 | 24.000 | 1.00 | 874.30 | 874.54 | 874.65 | 874.83 j | 12 |
| 86 | CB 403 TO CB 401 | 0.00 | 0.00 | 0.67 | 3.50 | 41.500 | 0.96 | 872.80 | 873.20 | 873.28 | 873.54 j | 12 |
| 87 | INL 403.2 TO CB 403 | 0.18 | 6.39 | 0.58 | 3.56 | 24.000 | 1.00 | 873.20 | 873.44 | 873.54 | 873.75 j | 12 |
| 88 | INL 403.1 TO CB 403 | 0.04 | 6.39 | 0.13 | 3.56 | 8.000 | 1.00 | 873.20 | 873.28 | 873.54 | 873.43 | 12 |
| 89 | INL 402.2 TO CB 402 | 0.08 | 6.39 | 0.26 | 3.56 | 8.000 | 1.00 | 874.30 | 874.38 | 874.65 | 874.59 | 12 |
| 90 | INL 400.3 TO CB 400 | 0.85 | 6.39 | 2.72 | 3.56 | 24.004 | 1.00 | 870.00 | 870.24 | 870.79 | 870.95 j | 12 |
| 91 | CTH AB - 1 | 0.14 | 6.39 | 0.83 | 3.02 | 34.794 | 0.72 | 870.00 | 870.25 | 870.38 | 870.63 | 12 |
| 92 | CTH AB - 2 | 0.14 | 6.39 | 0.45 | 2.70 | 43.358 | 0.58 | 870.25 | 870.50 | 870.63 | 870.78 | 12 |

| Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Date: 8/25/2020 |
|---|---|---|

NOTES: Intensity = 22.59 / (Inlet time + 3.70) ^ 0.58 -- Return period = 10 Yrs. ; ** Critical depth

# Inlet Report

| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet Ht (in) | Curb Inlet L (ft) | Grate Inlet Area (sqft) | Grate Inlet L (ft) | Grate Inlet W (ft) | Gutter So (ft/ft) | Gutter W (ft) | Gutter Sw (ft/ft) | Gutter Sx (ft/ft) | Gutter n | Gutter Depth (ft) | Gutter Spread (ft) | Inlet Depth (ft) | Inlet Spread (ft) | Inlet Depr (in) | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CB 100 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 2 | INL 101.1 | 0.62 | 0.00 | 0.60 | 0.02 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.034 | 2.00 | 0.050 | 0.020 | 0.013 | 0.12 | 3.21 | 0.03 | 0.65 | 0.0 | Off |
| 3 | CB 101 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 4 | INL 102.1 | 0.76 | 0.28 | 1.03 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.18 | 6.21 | 0.18 | 6.21 | 0.0 | Off |
| 5 | CB 102 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 6 | CB 103 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 7 | CB 104 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 8 | CB 105 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 9 | CB 106 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 10 | CB 107 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 11 | CB 109 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 12 | CB 110 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 13 | CB 111 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 14 | CB 112 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 15 | CB 113 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 16 | CB 114 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 17 | INL 114.1 | 0.54 | 0.00 | 0.48 | 0.06 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 5.15 | 0.07 | 1.46 | 0.0 | 25 |
| 18 | CB 115 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 19 | INL 115.1 | 1.62 | 0.00 | 1.16 | 0.46 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.23 | 8.53 | 0.15 | 4.73 | 0.0 | 22 |
| 20 | CB 116 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 21 | INL 116.1 | 0.22 | 0.00 | 0.21 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.12 | 3.00 | 0.02 | 0.43 | 0.0 | 28 |
| 22 | INL 114.2 | 1.48 | 0.46 | 1.94 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.25 | 9.73 | 0.25 | 9.73 | 0.0 | Off |
| 23 | INL 116.2 | 0.84 | 0.06 | 0.90 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.17 | 5.63 | 0.17 | 5.63 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 45.68 / (Inlet time + 10.90) ^ 0.77; Return period = 5 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 24 | INL 115.2 | 0.57 | 0.00 | 0.50 | 0.06 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.28 | 0.08 | 1.53 | 0.0 | 23 |
| 25 | INL 109.1 | 1.43 | 0.06 | 1.09 | 0.40 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.22 | 8.23 | 0.15 | 4.39 | 0.0 | 30 |
| 26 | CB 108 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 27 | INL 108.1 | 0.27 | 0.00 | 0.26 | 0.01 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.13 | 3.48 | 0.03 | 0.67 | 0.0 | 31 |
| 28 | INL 109.2 | 1.62 | 0.00 | 1.16 | 0.46 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.23 | 8.54 | 0.15 | 4.74 | 0.0 | 29 |
| 29 | INL 108.2 | 1.54 | 0.46 | 2.00 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.26 | 9.92 | 0.26 | 9.92 | 0.0 | Off |
| 30 | INL 106.1 | 0.73 | 0.40 | 0.88 | 0.25 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.21 | 7.29 | 0.13 | 3.32 | 0.0 | 38 |
| 31 | INL 106.2 | 0.89 | 0.01 | 0.73 | 0.16 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.19 | 6.58 | 0.11 | 2.45 | 0.0 | 39 |
| 32 | CB 117 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 33 | CB 118 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 34 | CB 119 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 35 | CB 120 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 36 | INL 120.1 | 0.43 | 0.00 | 0.40 | 0.03 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.58 | 0.06 | 1.19 | 0.0 | 40 |
| 37 | INL 120.2 | 0.32 | 0.00 | 0.31 | 0.01 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.14 | 3.90 | 0.04 | 0.86 | 0.0 | 41 |
| 38 | INL 103.1 | 0.94 | 0.25 | 0.92 | 0.28 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.21 | 7.48 | 0.13 | 3.54 | 0.0 | 4 |
| 39 | INL 103.2 | 1.59 | 0.16 | 1.23 | 0.52 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.24 | 8.83 | 0.16 | 5.06 | 0.0 | 42 |
| 40 | INL 119.1 | 0.49 | 0.03 | 0.47 | 0.05 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 5.04 | 0.07 | 1.41 | 0.0 | 43 |
| 41 | INL 119.2 | 0.43 | 0.01 | 0.41 | 0.04 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.66 | 0.06 | 1.22 | 0.0 | 43 |
| 42 | INL 102.2 | 2.00 | 0.55 | 2.54 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.29 | 11.74 | 0.29 | 11.74 | 0.0 | Off |
| 43 | INL 117.1 | 0.38 | 0.09 | 0.44 | 0.03 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.010 | 2.00 | 0.050 | 0.020 | 0.013 | 0.14 | 3.93 | 0.05 | 0.95 | 0.0 | 42 |
| 44 | INL 200.1 | 1.73 | 0.00 | 1.73 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.24 | 8.96 | 0.24 | 8.96 | 0.0 | Off |
| 45 | CB 200 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 46 | CB 205 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |

| Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020 |
|---|---|---|

NOTES: Inlet N-Values = 0.016; Intensity = 45.68 / (Inlet time + 10.90) ^ 0.77; Return period = 5 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 47 | CB 206 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 48 | CB 207 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 49 | CB 208 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 50 | CB 209 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 51 | CB 210 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 52 | INL 210.1 | 0.65 | 0.00 | 0.56 | 0.09 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.64 | 0.09 | 1.71 | 0.0 | 54 |
| 53 | INL 210.2 | 1.40 | 0.00 | 1.04 | 0.36 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.22 | 8.02 | 0.14 | 4.17 | 0.0 | 55 |
| 54 | INL 209.1 | 0.84 | 0.09 | 0.75 | 0.17 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.19 | 6.66 | 0.11 | 2.55 | 0.0 | 56 |
| 55 | INL 209.2 | 1.16 | 0.36 | 1.11 | 0.42 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.23 | 8.31 | 0.15 | 4.49 | 0.0 | 57 |
| 56 | INL 207.1 | 0.81 | 0.17 | 0.79 | 0.19 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.20 | 6.86 | 0.12 | 2.79 | 0.0 | 66 |
| 57 | INL 207.2 | 1.29 | 0.42 | 1.71 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.24 | 8.90 | 0.24 | 8.90 | 0.0 | Off |
| 58 | CB 202 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 59 | CB 203 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 60 | CB 204 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 61 | INL 204.1 | 1.27 | 0.00 | 0.97 | 0.30 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.006 | 2.00 | 0.050 | 0.020 | 0.013 | 0.21 | 7.38 | 0.13 | 3.53 | 0.0 | 65 |
| 62 | INL 204.2 | 4.29 | 0.00 | 2.36 | 1.92 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.006 | 2.00 | 0.050 | 0.020 | 0.013 | 0.31 | 12.26 | 0.24 | 8.83 | 0.0 | 67 |
| 63 | CB 201 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 64 | INL 201.1 | 0.32 | 0.00 | 0.31 | 0.01 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.14 | 3.90 | 0.04 | 0.86 | 0.0 | 65 |
| 65 | INL 202.1 | 1.59 | 0.32 | 1.91 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.25 | 9.61 | 0.25 | 9.61 | 0.0 | Off |
| 66 | INL 205.1 | 0.92 | 0.19 | 0.87 | 0.24 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.20 | 7.25 | 0.13 | 3.26 | 0.0 | 67 |
| 67 | INL 202.2 | 2.37 | 2.17 | 4.54 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.41 | 17.51 | 0.41 | 17.51 | 0.0 | Off |
| 68 | INL 300.2 | 1.65 | 0.13 | 1.77 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.24 | 9.13 | 0.24 | 9.13 | 0.0 | Off |
| 69 | CB 300 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 45.68 / (Inlet time + 10.90) ^ 0.77; Return period = 5 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report

| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet Ht (in) | Curb Inlet L (ft) | Grate Inlet Area (sqft) | Grate Inlet L (ft) | Grate Inlet W (ft) | Gutter So (ft/ft) | Gutter W (ft) | Gutter Sw (ft/ft) | Gutter Sx (ft/ft) | Gutter n | Gutter Depth (ft) | Gutter Spread (ft) | Inlet Depth (ft) | Inlet Spread (ft) | Inlet Depr (in) | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70 | CB 301 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 71 | CB 302 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 72 | CB 304 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 73 | INL 304.1 | 0.40 | 0.00 | 0.38 | 0.03 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.43 | 0.06 | 1.11 | 0.0 | 80 |
| 74 | CB 303 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 75 | INL 303.1 | 0.22 | 0.00 | 0.21 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.12 | 3.00 | 0.02 | 0.43 | 0.0 | 68 |
| 76 | CB 305 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 77 | INL 305.1 | 1.81 | 0.00 | 1.30 | 0.51 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.011 | 2.00 | 0.050 | 0.020 | 0.013 | 0.21 | 7.55 | 0.14 | 4.04 | 0.0 | 80 |
| 78 | INL 305.2 | 0.86 | 0.00 | 0.74 | 0.13 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.011 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.35 | 0.09 | 1.70 | 0.0 | 68 |
| 79 | INL 302.1 | 0.67 | 0.00 | 0.67 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.15 | 4.56 | 0.15 | 4.56 | 0.0 | Off |
| 80 | INL 300.3 | 4.34 | 0.54 | 4.88 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.43 | 18.40 | 0.43 | 18.40 | 0.0 | Off |
| 81 | INL 400.2 | 0.70 | 0.00 | 0.70 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.15 | 4.69 | 0.15 | 4.69 | 0.0 | Off |
| 82 | CB 400 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 83 | CB 401 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 84 | CB 402 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 85 | INL 402.1 | 0.40 | 0.00 | 0.40 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.040 | 2.00 | 0.050 | 0.020 | 0.013 | 0.10 | 2.17 | 0.00 | 0.00 | 0.0 | 87 |
| 86 | CB 403 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 87 | INL 403.2 | 0.49 | 0.00 | 0.49 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.13 | 3.56 | 0.13 | 3.56 | 0.0 | Off |
| 88 | INL 403.1 | 0.11 | 0.00 | 0.11 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.015 | 2.00 | 0.050 | 0.020 | 0.013 | 0.08 | 1.51 | 0.00 | 0.00 | 0.0 | 77 |
| 89 | INL 402.2 | 0.22 | 0.00 | 0.22 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.040 | 2.00 | 0.050 | 0.020 | 0.013 | 0.08 | 1.63 | 0.00 | 0.00 | 0.0 | 90 |
| 90 | INL 400.3 | 2.29 | 0.00 | 2.29 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.28 | 10.92 | 0.28 | 10.92 | 0.0 | Off |
| 91 | STRUCT-(139) | 0.38 | 0.00 | 0.36 | 0.02 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.26 | 0.05 | 1.03 | 0.0 | Off |
| 92 | STRUCT-(138) | 0.38 | 0.00 | 0.36 | 0.02 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.26 | 0.05 | 1.03 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 45.68 / (Inlet time + 10.90) ^ 0.77; Return period = 5 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report

| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet Ht (in) | Curb Inlet L (ft) | Grate Inlet Area (sqft) | Grate Inlet L (ft) | Grate Inlet W (ft) | Gutter So (ft/ft) | Gutter W (ft) | Gutter Sw (ft/ft) | Gutter Sx (ft/ft) | Gutter n | Gutter Depth (ft) | Gutter Spread (ft) | Inlet Depth (ft) | Inlet Spread (ft) | Inlet Depr (in) | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CB 100 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 2 | INL 101.1 | 0.89 | 0.00 | 0.82 | 0.07 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.034 | 2.00 | 0.050 | 0.020 | 0.013 | 0.14 | 4.01 | 0.05 | 1.07 | 0.0 | Off |
| 3 | CB 101 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 4 | INL 102.1 | 1.08 | 0.58 | 1.65 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.23 | 8.69 | 0.23 | 8.69 | 0.0 | Off |
| 5 | CB 102 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 6 | CB 103 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 7 | CB 104 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 8 | CB 105 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 9 | CB 106 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 10 | CB 107 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 11 | CB 109 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 12 | CB 110 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 13 | CB 111 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 14 | CB 112 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 15 | CB 113 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 16 | CB 114 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 17 | INL 114.1 | 0.77 | 0.00 | 0.65 | 0.12 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.18 | 6.13 | 0.10 | 1.95 | 0.0 | 25 |
| 18 | CB 115 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 19 | INL 115.1 | 2.31 | 0.00 | 1.51 | 0.79 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.26 | 9.90 | 0.18 | 6.22 | 0.0 | 22 |
| 20 | CB 116 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 21 | INL 116.1 | 0.31 | 0.00 | 0.30 | 0.01 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.14 | 3.78 | 0.04 | 0.80 | 0.0 | 28 |
| 22 | INL 114.2 | 2.12 | 0.79 | 2.91 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.32 | 12.90 | 0.32 | 12.90 | 0.0 | Off |
| 23 | INL 116.2 | 1.19 | 0.13 | 1.33 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.21 | 7.44 | 0.21 | 7.44 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 24.25 / (Inlet time + 2.80) ^ 0.56; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 24 | INL 115.2 | 0.81 | 0.00 | 0.67 | 0.13 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.19 | 6.27 | 0.10 | 2.06 | 0.0 | 23 |
| 25 | INL 109.1 | 2.04 | 0.12 | 1.44 | 0.72 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.25 | 9.64 | 0.18 | 5.93 | 0.0 | 30 |
| 26 | CB 108 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 27 | INL 108.1 | 0.38 | 0.00 | 0.36 | 0.02 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.30 | 0.05 | 1.05 | 0.0 | 31 |
| 28 | INL 109.2 | 2.31 | 0.01 | 1.52 | 0.80 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.26 | 9.92 | 0.18 | 6.24 | 0.0 | 29 |
| 29 | INL 108.2 | 2.19 | 0.80 | 2.99 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.32 | 13.15 | 0.32 | 13.15 | 0.0 | Off |
| 30 | INL 106.1 | 1.04 | 0.72 | 1.24 | 0.52 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.24 | 8.84 | 0.16 | 5.07 | 0.0 | 38 |
| 31 | INL 106.2 | 1.27 | 0.02 | 0.98 | 0.32 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.21 | 7.75 | 0.14 | 3.85 | 0.0 | 39 |
| 32 | CB 117 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 33 | CB 118 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 34 | CB 119 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 35 | CB 120 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 36 | INL 120.1 | 0.62 | 0.00 | 0.54 | 0.08 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.50 | 0.08 | 1.64 | 0.0 | 40 |
| 37 | INL 120.2 | 0.46 | 0.00 | 0.42 | 0.04 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 4.75 | 0.06 | 1.27 | 0.0 | 41 |
| 38 | INL 103.1 | 1.35 | 0.52 | 1.29 | 0.58 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.24 | 9.07 | 0.17 | 5.32 | 0.0 | 4 |
| 39 | INL 103.2 | 2.27 | 0.32 | 1.65 | 0.94 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.27 | 10.38 | 0.19 | 6.72 | 0.0 | 42 |
| 40 | INL 119.1 | 0.69 | 0.08 | 0.65 | 0.12 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.18 | 6.13 | 0.10 | 1.95 | 0.0 | 43 |
| 41 | INL 119.2 | 0.62 | 0.04 | 0.57 | 0.09 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.67 | 0.09 | 1.72 | 0.0 | 43 |
| 42 | INL 102.2 | 2.85 | 1.04 | 3.88 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.37 | 15.73 | 0.37 | 15.73 | 0.0 | Off |
| 43 | INL 117.1 | 0.54 | 0.21 | 0.65 | 0.09 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.010 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 5.10 | 0.08 | 1.55 | 0.0 | 42 |
| 44 | INL 200.1 | 2.46 | 0.00 | 2.46 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.29 | 11.49 | 0.29 | 11.49 | 0.0 | Off |
| 45 | CB 200 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 46 | CB 205 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |

| Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020 |
|---|---|---|

NOTES: Inlet N-Values = 0.016; Intensity = 24.25 / (Inlet time + 2.80) ^ 0.56; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 47 | CB 206 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 48 | CB 207 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 49 | CB 208 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 50 | CB 209 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 51 | CB 210 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 52 | INL 210.1 | 0.92 | 0.00 | 0.75 | 0.17 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.19 | 6.67 | 0.11 | 2.56 | 0.0 | 54 |
| 53 | INL 210.2 | 2.00 | 0.00 | 1.36 | 0.64 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.25 | 9.33 | 0.17 | 5.61 | 0.0 | 55 |
| 54 | INL 209.1 | 1.19 | 0.17 | 1.02 | 0.35 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.22 | 7.94 | 0.14 | 4.06 | 0.0 | 56 |
| 55 | INL 209.2 | 1.65 | 0.64 | 1.51 | 0.79 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.26 | 9.88 | 0.18 | 6.19 | 0.0 | 57 |
| 56 | INL 207.1 | 1.15 | 0.35 | 1.10 | 0.41 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.23 | 8.26 | 0.15 | 4.44 | 0.0 | 66 |
| 57 | INL 207.2 | 1.85 | 0.79 | 2.63 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.30 | 12.03 | 0.30 | 12.03 | 0.0 | Off |
| 58 | CB 202 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 59 | CB 203 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 60 | CB 204 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 61 | INL 204.1 | 1.81 | 0.00 | 1.26 | 0.54 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.006 | 2.00 | 0.050 | 0.020 | 0.013 | 0.23 | 8.61 | 0.16 | 4.94 | 0.0 | 65 |
| 62 | INL 204.2 | 6.12 | 0.00 | 3.03 | 3.09 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.006 | 2.00 | 0.050 | 0.020 | 0.013 | 0.34 | 14.12 | 0.28 | 10.75 | 0.0 | 67 |
| 63 | CB 201 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 64 | INL 201.1 | 0.46 | 0.00 | 0.42 | 0.04 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 4.75 | 0.06 | 1.27 | 0.0 | 65 |
| 65 | INL 202.1 | 2.27 | 0.58 | 2.85 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.31 | 12.72 | 0.31 | 12.72 | 0.0 | Off |
| 66 | INL 205.1 | 1.31 | 0.41 | 1.21 | 0.50 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.23 | 8.75 | 0.16 | 4.97 | 0.0 | 67 |
| 67 | INL 202.2 | 3.39 | 3.59 | 6.98 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.46 | 19.97 | 0.46 | 19.97 | 0.0 | Off |
| 68 | INL 300.2 | 2.35 | 0.27 | 2.62 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.30 | 11.98 | 0.30 | 11.98 | 0.0 | Off |
| 69 | CB 300 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 24.25 / (Inlet time + 2.80) ^ 0.56; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 70 | CB 301 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 71 | CB 302 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 72 | CB 304 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 73 | INL 304.1 | 0.58 | 0.00 | 0.51 | 0.07 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.33 | 0.08 | 1.55 | 0.0 | 80 |
| 74 | CB 303 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 75 | INL 303.1 | 0.31 | 0.00 | 0.30 | 0.01 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.14 | 3.78 | 0.04 | 0.80 | 0.0 | 68 |
| 76 | CB 305 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 77 | INL 305.1 | 2.58 | 0.00 | 1.68 | 0.90 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.011 | 2.00 | 0.050 | 0.020 | 0.013 | 0.24 | 8.80 | 0.17 | 5.47 | 0.0 | 80 |
| 78 | INL 305.2 | 1.23 | 0.00 | 0.97 | 0.26 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.011 | 2.00 | 0.050 | 0.020 | 0.013 | 0.19 | 6.35 | 0.11 | 2.57 | 0.0 | 68 |
| 79 | INL 302.1 | 0.96 | 0.00 | 0.96 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.18 | 5.91 | 0.18 | 5.91 | 0.0 | Off |
| 80 | INL 300.3 | 6.20 | 0.97 | 7.17 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.46 | 19.97 | 0.46 | 19.97 | 0.0 | Off |
| 81 | INL 400.2 | 1.00 | 0.00 | 1.00 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.18 | 6.08 | 0.18 | 6.08 | 0.0 | Off |
| 82 | CB 400 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 83 | CB 401 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 84 | CB 402 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 85 | INL 402.1 | 0.58 | 0.00 | 0.57 | 0.01 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.040 | 2.00 | 0.050 | 0.020 | 0.013 | 0.12 | 2.88 | 0.02 | 0.47 | 0.0 | 87 |
| 86 | CB 403 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 87 | INL 403.2 | 0.69 | 0.01 | 0.70 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.15 | 4.69 | 0.15 | 4.69 | 0.0 | Off |
| 88 | INL 403.1 | 0.15 | 0.00 | 0.15 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.015 | 2.00 | 0.050 | 0.020 | 0.013 | 0.09 | 1.73 | 0.00 | 0.00 | 0.0 | 77 |
| 89 | INL 402.2 | 0.31 | 0.00 | 0.31 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.040 | 2.00 | 0.050 | 0.020 | 0.013 | 0.09 | 1.87 | 0.00 | 0.00 | 0.0 | 90 |
| 90 | INL 400.3 | 3.27 | 0.00 | 3.27 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.34 | 13.98 | 0.34 | 13.98 | 0.0 | Off |
| 91 | STRUCT-(139) | 0.54 | 0.00 | 0.48 | 0.06 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 5.15 | 0.07 | 1.46 | 0.0 | Off |
| 92 | STRUCT-(138) | 0.54 | 0.00 | 0.48 | 0.06 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 5.15 | 0.07 | 1.46 | 0.0 | Off |

| Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020 |
|---|---|---|

NOTES: Inlet N-Values = 0.016; Intensity = 24.25 / (Inlet time + 2.80) ^ 0.56; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet Ht (in) | Curb Inlet L (ft) | Grate Inlet Area (sqft) | Grate Inlet L (ft) | Grate Inlet W (ft) | Gutter So (ft/ft) | Gutter W (ft) | Gutter Sw (ft/ft) | Gutter Sx (ft/ft) | Gutter n | Gutter Depth (ft) | Gutter Spread (ft) | Inlet Depth (ft) | Inlet Spread (ft) | Inlet Depr (in) | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CB 100 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 2 | INL 101.1 | 1.11 | 0.00 | 0.99 | 0.12 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.034 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.56 | 0.07 | 1.37 | 0.0 | Off |
| 3 | CB 101 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 4 | INL 102.1 | 1.35 | 0.90 | 2.25 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.28 | 10.78 | 0.28 | 10.78 | 0.0 | Off |
| 5 | CB 102 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 6 | CB 103 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 7 | CB 104 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 8 | CB 105 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 9 | CB 106 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 10 | CB 107 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 11 | CB 109 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 12 | CB 110 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 13 | CB 111 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 14 | CB 112 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 15 | CB 113 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 16 | CB 114 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 17 | INL 114.1 | 0.97 | 0.00 | 0.78 | 0.19 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.20 | 6.81 | 0.11 | 2.74 | 0.0 | 25 |
| 18 | CB 115 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 19 | INL 115.1 | 2.90 | 0.00 | 1.79 | 1.11 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.28 | 10.88 | 0.20 | 7.25 | 0.0 | 22 |
| 20 | CB 116 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 21 | INL 116.1 | 0.39 | 0.00 | 0.36 | 0.02 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.32 | 0.05 | 1.06 | 0.0 | 28 |
| 22 | INL 114.2 | 2.66 | 1.11 | 3.77 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.37 | 15.42 | 0.37 | 15.42 | 0.0 | Off |
| 23 | INL 116.2 | 1.50 | 0.21 | 1.71 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.24 | 8.89 | 0.24 | 8.89 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 29.05 / (Inlet time + 2.40) ^ 0.55; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet Ht (in) | Curb Inlet L (ft) | Grate Inlet Area (sqft) | Grate Inlet L (ft) | Grate Inlet W (ft) | Gutter So (ft/ft) | Gutter W (ft) | Gutter Sw (ft/ft) | Gutter Sx (ft/ft) | Gutter n | Gutter Depth (ft) | Gutter Spread (ft) | Inlet Depth (ft) | Inlet Spread (ft) | Inlet Depr (in) | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | INL 115.2 | 1.02 | 0.00 | 0.81 | 0.21 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.20 | 6.96 | 0.12 | 2.92 | 0.0 | 23 |
| 25 | INL 109.1 | 2.56 | 0.19 | 1.72 | 1.03 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.27 | 10.65 | 0.20 | 7.00 | 0.0 | 30 |
| 26 | CB 108 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 27 | INL 108.1 | 0.48 | 0.00 | 0.44 | 0.04 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.16 | 4.87 | 0.07 | 1.33 | 0.0 | 31 |
| 28 | INL 109.2 | 2.90 | 0.02 | 1.80 | 1.12 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.28 | 10.91 | 0.21 | 7.28 | 0.0 | 29 |
| 29 | INL 108.2 | 2.76 | 1.12 | 3.88 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.37 | 15.73 | 0.37 | 15.73 | 0.0 | Off |
| 30 | INL 106.1 | 1.31 | 1.03 | 1.53 | 0.81 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.26 | 9.95 | 0.19 | 6.27 | 0.0 | 38 |
| 31 | INL 106.2 | 1.60 | 0.04 | 1.17 | 0.47 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.23 | 8.58 | 0.16 | 4.79 | 0.0 | 39 |
| 32 | CB 117 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 33 | CB 118 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 34 | CB 119 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 35 | CB 120 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 36 | INL 120.1 | 0.77 | 0.00 | 0.65 | 0.12 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.18 | 6.14 | 0.10 | 1.96 | 0.0 | 40 |
| 37 | INL 120.2 | 0.58 | 0.00 | 0.51 | 0.07 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.34 | 0.08 | 1.56 | 0.0 | 41 |
| 38 | INL 103.1 | 1.69 | 0.81 | 1.61 | 0.90 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.26 | 10.23 | 0.19 | 6.57 | 0.0 | 4 |
| 39 | INL 103.2 | 2.85 | 0.47 | 1.98 | 1.35 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.29 | 11.48 | 0.22 | 7.88 | 0.0 | 42 |
| 40 | INL 119.1 | 0.87 | 0.12 | 0.80 | 0.20 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.20 | 6.90 | 0.12 | 2.84 | 0.0 | 43 |
| 41 | INL 119.2 | 0.77 | 0.07 | 0.70 | 0.15 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.19 | 6.39 | 0.10 | 2.21 | 0.0 | 43 |
| 42 | INL 102.2 | 3.58 | 1.53 | 5.11 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.44 | 19.00 | 0.44 | 19.00 | 0.0 | Off |
| 43 | INL 117.1 | 0.68 | 0.35 | 0.84 | 0.19 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.010 | 2.00 | 0.050 | 0.020 | 0.013 | 0.18 | 5.95 | 0.10 | 2.00 | 0.0 | 42 |
| 44 | INL 200.1 | 3.10 | 0.00 | 3.10 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.33 | 13.46 | 0.33 | 13.46 | 0.0 | Off |
| 45 | CB 200 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 46 | CB 205 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 29.05 / (Inlet time + 2.40) ^ 0.55; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report



| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 47 | CB 206 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 48 | CB 207 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 49 | CB 208 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 50 | CB 209 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 51 | CB 210 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 52 | INL 210.1 | 1.16 | 0.00 | 0.90 | 0.26 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.21 | 7.39 | 0.13 | 3.43 | 0.0 | 54 |
| 53 | INL 210.2 | 2.52 | 0.00 | 1.61 | 0.90 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.27 | 10.26 | 0.19 | 6.60 | 0.0 | 55 |
| 54 | INL 209.1 | 1.50 | 0.26 | 1.24 | 0.53 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.24 | 8.85 | 0.16 | 5.08 | 0.0 | 56 |
| 55 | INL 209.2 | 2.08 | 0.90 | 1.83 | 1.16 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.28 | 10.99 | 0.21 | 7.37 | 0.0 | 57 |
| 56 | INL 207.1 | 1.45 | 0.53 | 1.35 | 0.63 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.25 | 9.28 | 0.17 | 5.56 | 0.0 | 66 |
| 57 | INL 207.2 | 2.32 | 1.16 | 3.48 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.35 | 14.58 | 0.35 | 14.58 | 0.0 | Off |
| 58 | CB 202 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 59 | CB 203 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 60 | CB 204 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 61 | INL 204.1 | 2.27 | 0.00 | 1.50 | 0.78 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.006 | 2.00 | 0.050 | 0.020 | 0.013 | 0.25 | 9.48 | 0.18 | 5.89 | 0.0 | 65 |
| 62 | INL 204.2 | 7.69 | 0.00 | 3.55 | 4.15 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.006 | 2.00 | 0.050 | 0.020 | 0.013 | 0.37 | 15.45 | 0.30 | 12.10 | 0.0 | 67 |
| 63 | CB 201 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 64 | INL 201.1 | 0.58 | 0.00 | 0.51 | 0.07 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.17 | 5.34 | 0.08 | 1.56 | 0.0 | 65 |
| 65 | INL 202.1 | 2.85 | 0.84 | 3.70 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.36 | 15.21 | 0.36 | 15.21 | 0.0 | Off |
| 66 | INL 205.1 | 1.65 | 0.63 | 1.50 | 0.78 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.26 | 9.84 | 0.18 | 6.15 | 0.0 | 67 |
| 67 | INL 202.2 | 4.26 | 4.92 | 9.18 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.49 | 21.69 | 0.49 | 21.69 | 0.0 | Off |
| 68 | INL 300.2 | 2.95 | 0.42 | 3.37 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.35 | 14.26 | 0.35 | 14.26 | 0.0 | Off |
| 69 | CB 300 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |

Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020

NOTES: Inlet N-Values = 0.016; Intensity = 29.05 / (Inlet time + 2.40) ^ 0.55; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

# Inlet Report

| Line No | Inlet ID | Q = CIA (cfs) | Q carry (cfs) | Q capt (cfs) | Q Byp (cfs) | Junc Type | Curb Inlet | | Grate Inlet | | | Gutter | | | | | | | Inlet | | | Byp Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ht (in) | L (ft) | Area (sqft) | L (ft) | W (ft) | So (ft/ft) | W (ft) | Sw (ft/ft) | Sx (ft/ft) | n | Depth (ft) | Spread (ft) | Depth (ft) | Spread (ft) | Depr (in) | |
| 70 | CB 301 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 71 | CB 302 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 72 | CB 304 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 73 | INL 304.1 | 0.73 | 0.00 | 0.62 | 0.11 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.18 | 5.96 | 0.09 | 1.87 | 0.0 | 80 |
| 74 | CB 303 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 75 | INL 303.1 | 0.39 | 0.00 | 0.36 | 0.02 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.15 | 4.32 | 0.05 | 1.06 | 0.0 | 68 |
| 76 | CB 305 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 77 | INL 305.1 | 3.24 | 0.00 | 1.97 | 1.27 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.011 | 2.00 | 0.050 | 0.020 | 0.013 | 0.25 | 9.68 | 0.19 | 6.44 | 0.0 | 80 |
| 78 | INL 305.2 | 1.55 | 0.00 | 1.16 | 0.39 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.011 | 2.00 | 0.050 | 0.020 | 0.013 | 0.20 | 7.05 | 0.13 | 3.44 | 0.0 | 68 |
| 79 | INL 302.1 | 1.21 | 0.00 | 1.21 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.20 | 6.96 | 0.20 | 6.96 | 0.0 | Off |
| 80 | INL 300.3 | 7.79 | 1.38 | 9.17 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.49 | 21.63 | 0.49 | 21.63 | 0.0 | Off |
| 81 | INL 400.2 | 1.26 | 0.00 | 1.26 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.20 | 7.16 | 0.20 | 7.16 | 0.0 | Off |
| 82 | CB 400 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 83 | CB 401 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 84 | CB 402 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 85 | INL 402.1 | 0.73 | 0.00 | 0.70 | 0.02 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.040 | 2.00 | 0.050 | 0.020 | 0.013 | 0.13 | 3.38 | 0.04 | 0.73 | 0.0 | 87 |
| 86 | CB 403 | 0.00 | 0.00 | 0.00 | 0.00 | MH | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | Sag | 0.00 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | Off |
| 87 | INL 403.2 | 0.87 | 0.02 | 0.90 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.17 | 5.61 | 0.17 | 5.61 | 0.0 | Off |
| 88 | INL 403.1 | 0.19 | 0.00 | 0.19 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.015 | 2.00 | 0.050 | 0.020 | 0.013 | 0.09 | 1.88 | 0.00 | 0.00 | 0.0 | 77 |
| 89 | INL 402.2 | 0.39 | 0.00 | 0.39 | 0.00 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.040 | 2.00 | 0.050 | 0.020 | 0.013 | 0.10 | 2.08 | 0.00 | 0.00 | 0.0 | 90 |
| 90 | INL 400.3 | 4.11 | 0.00 | 4.11 | 0.00 | Comb | 4.0 | 3.00 | 1.60 | 3.00 | 2.00 | Sag | 2.00 | 0.050 | 0.020 | 0.000 | 0.39 | 16.36 | 0.39 | 16.36 | 0.0 | Off |
| 91 | STRUCT-(139) | 0.68 | 0.00 | 0.58 | 0.09 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.18 | 5.76 | 0.09 | 1.77 | 0.0 | Off |
| 92 | STRUCT-(138) | 0.68 | 0.00 | 0.58 | 0.09 | Comb | 4.0 | 3.00 | 0.00 | 3.00 | 2.00 | 0.005 | 2.00 | 0.050 | 0.020 | 0.013 | 0.18 | 5.76 | 0.09 | 1.77 | 0.0 | Off |

| | | |
|---|---|---|
| Project File: Rosewood Storm Sewer.stm | Number of lines: 92 | Run Date: 8/25/2020 |

NOTES: Inlet N-Values = 0.016; Intensity = 29.05 / (Inlet time + 2.40) ^ 0.55; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

VILLAGE OF
McFarland

## VILLAGE BOARD SUMMARY SHEET

**MEETING DATE:** **Tuesday, September 15, 2020**

**SECTION:** **Business**

**DEPARTMENT:** **Public Works**

**CONTACT:** **Matt Schuenke, Village Administrator, Jim Hessling, Public Works Director**

**AGENDA ITEM:** **Discussion and action to make a recommendation to the Village Board regarding the final design and authorize the Eastside Interceptor project for bidding.**

**PREVIOUS ACTION:**
The Public Works Committee reviewed the 60% design plans at their meeting on August 13th.

An online forum was held to present these plans to the public on August 31st. There were about 17 people in attendance form the public.

**ISSUE SUMMARY:**
The Eastside Sanitary Sewer Interceptor Project will enable the Village to handle future development in the approximate area of including undeveloped property south of CTH MN, west of CTH AB, and north of Elvehjem Road. An interceptor sewer is a large pipe that receives wastewater flow from smaller local sewers and directs it to a lift station or a wastewater treatment plant. As part of our work on this project, a final decision needs to be accepted by the Committee and then direction provided to go to bid for the project as a recommendation to the Village Board. The Village Board will then take final action as part of the next step to advance the project that is desired for implementation early in 2021.

An online forum was held for the projec ton Monday, August 31st to present the project to the public and gather input. The comments received in that meeting are provided in your packet as background.

The entire design is included in your packet for consideration as listed on the agenda. This included the installation of the pipe, associated trail, and access points from Devil's Lake Way up to CTH MN. However, Staff is recommending that we break the project up into two phases with the first phase terminating at the north end of the proposed Rosewood Fields Subdivision. The need for the pipe north of this point is purely dependent on pace of development. South of this point a preliminary plat has been approved with a final plat pending followed by additional conceptual plans for other property associated with the pipe. Everything to the north is purely conceptual visioning that likely does not come to fruitiion within the next few years. The

VILLAGE OF
McFarland

amount of work and what is needed to get the project ready for construction can be completed timely for installation in the Winter of 2021 as planned. Please consider the following schedule:

- September 15, 2020 - Committee: Discuss project phasing and determine the extent of the project. Staff is requesting action at this meeting given the time constraints noted and that we need to decide to move forward either in whole or in part as part of this meeting.
- September 28, 2020 - Village Board - Board would consider the recommendation of the Committee to accept the final design and send the project to bid as presented.
- November 2020 - Bid the Project
- December 2020 - Committee/Board consideration of bids.
- January 2021 - Project Commencement

This schedule is very tight but in order to line up winter construction as is desired then we need to follow it to meet our deadlines. Less of a project due to phasing will give us more flexibility though if that is desired.

**FINANCIAL/BUDGET IMPACT:**
Enclosed is the revised cost estimate from the Engineer on shortening the project. The total estiamted using a slightly larger pipe is $776,393. We will talk more in the meeting about how this number was calculated as well as the impact of the added path.

Included in your packet is an email from the Auditor regarding cash flow if the utility is to expend the capital funds early in the fiscal year but not be reimbursed via borrowing until more the middle portion of the year. There is no concern on the part of the Audtitor what Staff is proposing as they support this approach to advance the project. Our reserves provided for over 16 months of operations if we took in no additional money whereas its recommended we have at least 3 months on hand. The costs for the project would be carried for about 4 to 6 months, and be reimbursed as is an acceptable/common practice.

**VILLAGE PLAN REFERENCE:**
2018 McFarland East Basin Utility Service Study - Project as proposed here was studied and recommended as a result of this work.

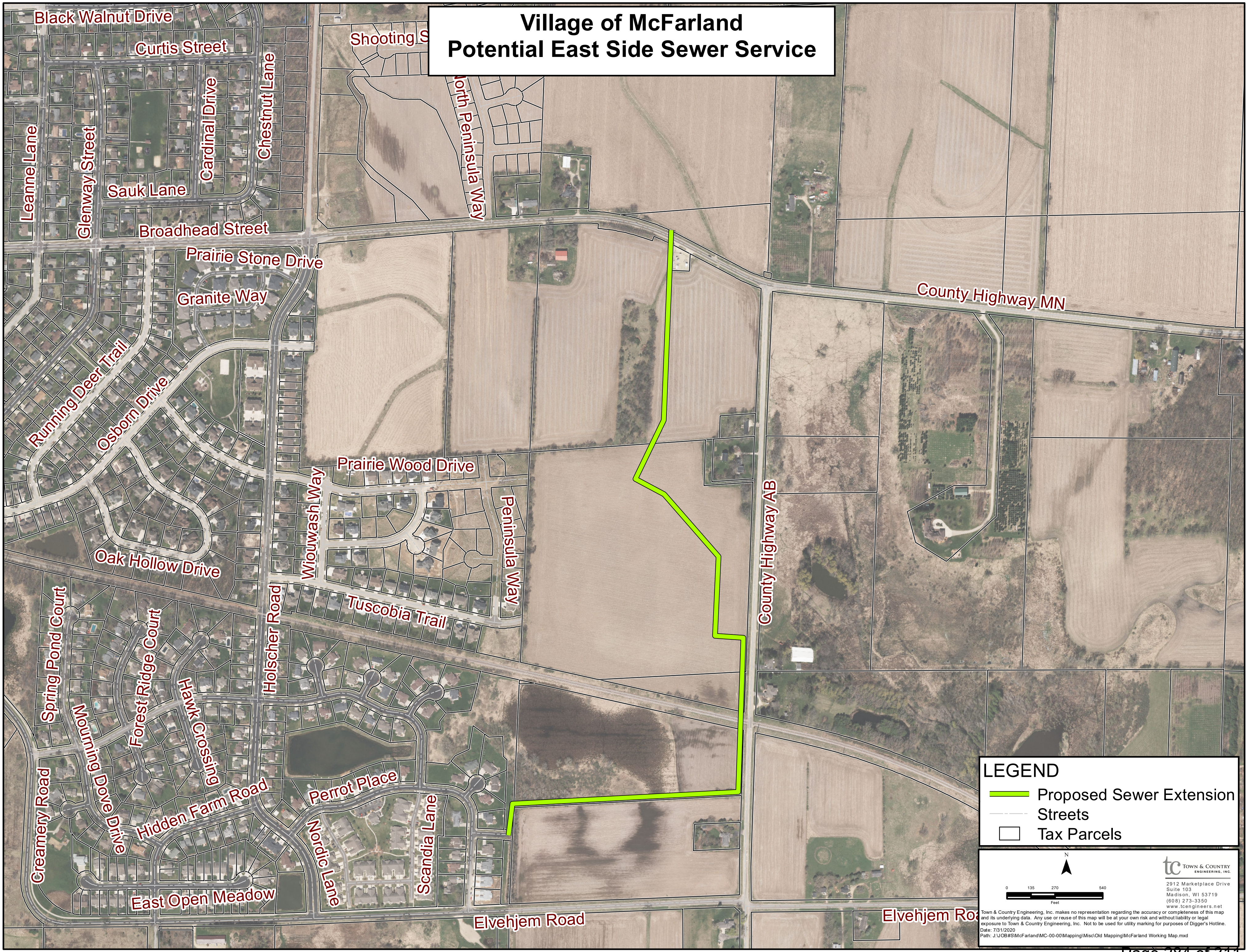
**ORDINANCE REFERENCE:**
None.

**BOARD, COMMISSION OR COMMITTEE RECOMMENDATION:**
Presented in order for the Committee to make a recommendation to the Village Board to accept the final design and send the project to bidding.

**ATTACHMENTS:**

VILLAGE OF
McFarland

1. Route Overview
2. MC 168 CURRENT SET
3. Estimated Eastside Interceptor Cost 09102020 UPDATED
4. Public Input Session 8.31.2020 Eastside Interceptor
5. Response from Auditor on Cash Flow 09082020


Village of McFarland
Potential East Side Sewer Service
Black Walnut Drive
Curtis Street
Shooting S
North Peninsula Way
Leanne Lane
Glenway Street
Cardinal Drive
Chestnut Lane
Sauk Lane
Broadhead Street
Prairie Stone Drive
Granite Way
County Highway MN
Running Deer Trail
Osborn Drive
Prairie Wood Drive
Wiouwash Way
Peninsula Way
County Highway AB
Oak Hollow Drive
Tuscobia Trail
Spring Pond Court
Forest Ridge Court
Holscher Road
Hawk Crossing
Mourning Dove Drive
Creamery Road
Hidden Farm Road
Perrot Place
Nordic Lane
Scandia Lane
East Open Meadow
Elvehjem Road
Elvehjem Roa
LEGEND
Proposed Sewer Extension
Streets
Tax Parcels
N
0 135 270 540
Feet
TOWN & COUNTRY ENGINEERING, INC.
2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net
Town & Country Engineering, Inc. makes no representation regarding the accuracy or completeness of this map and its underlying data. Any use or reuse of this map will be at your own risk and without liability or legal exposure to Town & Country Engineering, Inc. Not to be used for utility marking for purposes of Digger's Hotline.
Date: 7/31/2020
Path: J:\JOB#S\McFarland\MC-00-00\Mapping\Misc\Old Mapping\McFarland Working Map.mxd

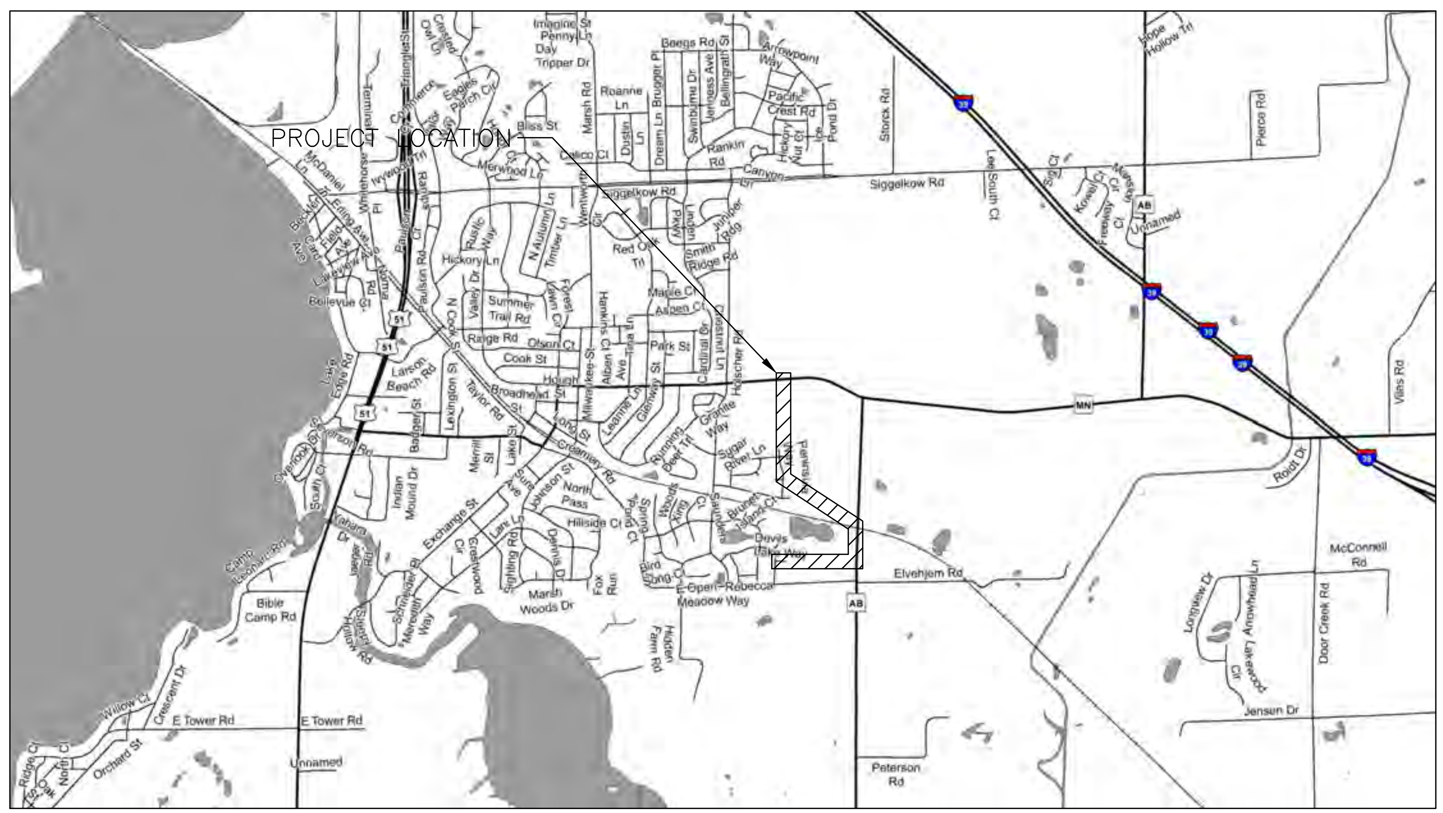
# 2020 STREET AND UTILITY IMPROVEMENTS

## EAST SIDE SEWER EXTENSION

### Village of McFarland, Wisconsin

## SHEET INDEX

| SHEET NO. | SHEET DESCRIPTION |
|---|---|
| 1 | EROSION CONTROL PLAN AND GENERAL NOTES |
| 2 | EROSION CONTROL – STANDARD CONSTRUCTION DETAILS |
| | SANITARY SEWER, WATER MAIN, AND STORM SEWER |
| A1 | PLAN & PROFILE – XXXXX STREET STATION 98+20 TO STATION 104+20 |
| A2 | PLAN & PROFILE – XXXXX STREET STATION 103+80 TO STATION 109+80 |
| A3 | PLAN & PROFILE – XXXXX STREET STATION 109+40 TO STATION 115+40 |
| A4 | PLAN & PROFILE – XXXXX STREET STATION 115+00 TO STATION 121+00 |
| A5 | PLAN & PROFILE – XXXXX STREET STATION 120+60 TO STATION 126+60 |
| A6 | PLAN & PROFILE – XXXXX STREET STATION 124+80 TO STATION 130+80 |
| A7 | PLAN & PROFILE – XXXXX STREET STATION 130+40 TO STATION 136+40 |
| A8 | PLAN & PROFILE – XXXXX STREET STATION 136+00 TO STATION 142+00 |
| A9 | PLAN & PROFILE – XXXXX STREET STATION 141+60 TO STATION 147+60 |
| A10 | PLAN & PROFILE – XXXXX STREET STATION 147+20 TO STATION 153+20 |
| A11 | SANITARY SEWER – STANDARD CONSTRUCTION DETAILS |




NO SCALE

MEMBER
ONE CALL SYSTEMS INTERNATIONAL

TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN

CALL DIGGERS HOTLINE
1-800-242-8511
TOLL FREE

WIS. STATUTE 182.0175 (1974) REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE.

## LEGEND

UNDERGROUND TELE. — UT
UNDERGROUND CATV. — UCATV
UNDERGROUND ELEC. — UE
OVERHEAD — OH
EXISTING GAS — G
PROPERTY LINE
EXISTING WATER MAIN — WM
EXISTING SANITARY SEWER — SAN
EXISTING STORM SEWER — STM
EXISTING FENCE LINE — X
SAWCUT — XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
NEW STORM SEWER
NEW WATER MAIN
NEW SANITARY SEWER

NEW ITEMS:
WATER VALVE, CURB STOP, HYDRANT, MANHOLE, CURB INLET, ENDWALL, CAUTION GAS WARNING

EXISTING ITEMS:
FLAG POLE, MAILBOX, POWER POLE, LIGHT POLE, LAMP POST, PULL BOX
WATER VALVE, CURB STOP, HYDRANT, WELL, MONITORING WELL, TRACER WIRE
SANITARY MANHOLE, SANITARY VALVE, CLEANOUT, STORM MANHOLE, CURB INLET, CIRCULAR INLET
SQUARE INLET, ENDWALL, STUMP, DECID. TREE, EVERGREEN (RELATIVE SIZE SHOWN), SHRUB OR HEDGE, SIGN
CATV. PED., TELE. PED., ELEC. PED., GAS VALVE, STREET SIGN, IRON PIPE, IRON ROD

NOTES: 1.) EXISTING FEATURES AND LABELS ARE SHOWN WITH SCREENED, LIGHTER LINES.
2.) NEW CONCRETE IS SHOWN SHADED IN PLAN VIEWS
3.) CONCRETE REMOVALS ARE SHOWN BY CROSS-HATCHING

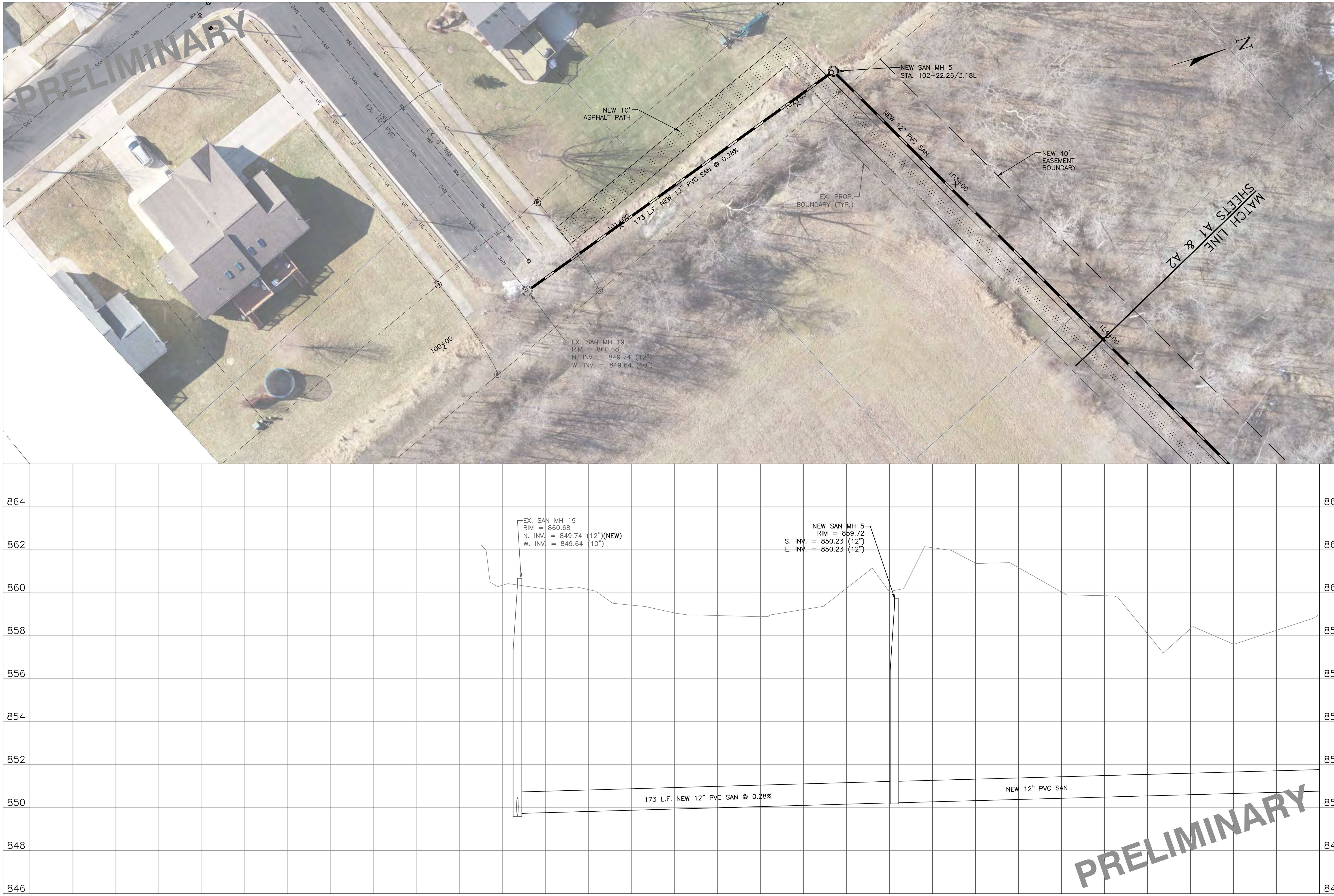

2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net
TOWN & COUNTRY ENGINEERING, INC.


DATE | BY | REVISIONS

SHEET

2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin

PROJECT NO.: MC 168
DRAWING FILE: MC 168 DETAILS.DWG
DATE: 7-17-20
DRAWN BY: X.X.X.
CHECKED BY: X.X.X.
REV. DATE:




2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net

TOWN & COUNTRY ENGINEERING, INC.

PLAN & PROFILE
Station 98+20 To Station 104+20

2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin

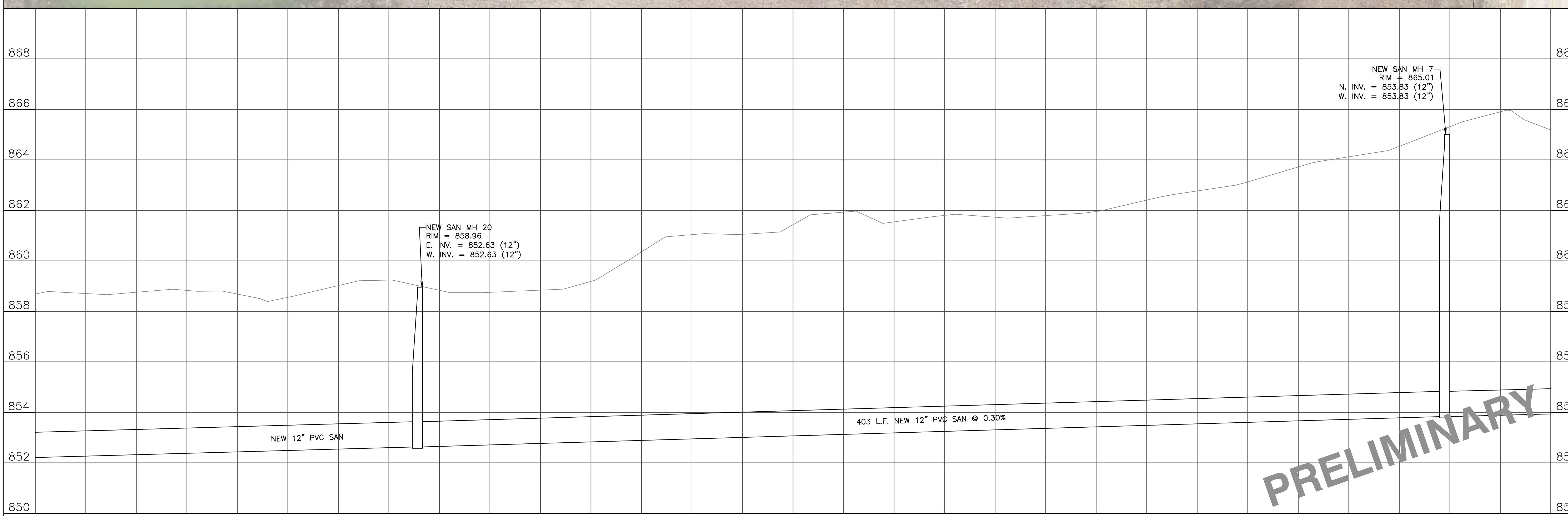
PROJECT NO.: MC 168
DRAWING FILE: MC 168 SHEETS.DWG
DRAWN BY: J.R.K.
CHECKED BY: T.J.S.
DATE: 7-24-20
REVISIONS:
SCALE: HORIZONTAL 0 5 10 20
VERTICAL 0 1 2
SHEET: A1


TOWN & COUNTRY ENGINEERING, INC.
2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net

PLAN & PROFILE
Station 103+80 To Station 109+80

2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin

PROJECT NO.: MC 168
DRAWING FILE: MC 168 SHEETS.DWG
DRAWN BY: J.R.K.
CHECKED BY: T.J.S.
DATE: 7-24-20
REVISIONS:
SCALE: HORIZONTAL 0 5 10 20
VERTICAL 0 1 2
SHEET: A2


2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net

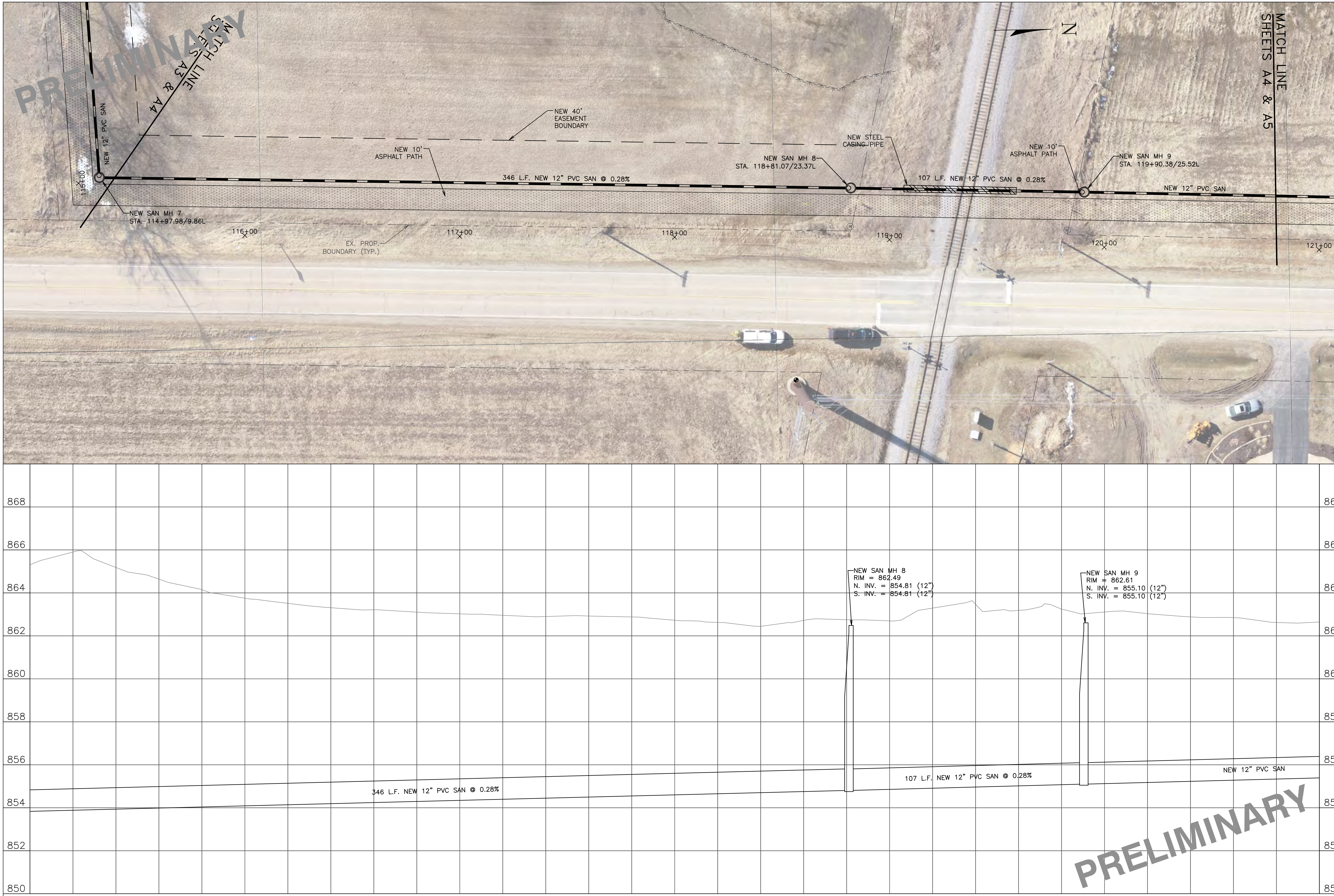
tc TOWN & COUNTRY ENGINEERING, INC.

PLAN & PROFILE

Station 109+40 To Station 115+40

2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin

PROJECT NO.: MC 168
DRAWING FILE: MC 168 SHEETS.DWG
DRAWN BY: J.R.K.
CHECKED BY: T.J.S.
DATE: 7-24-20
REVISIONS:
SCALE: HORIZONTAL 0 5 10 20
VERTICAL 0 1 2
SHEET: A3




TOWN & COUNTRY ENGINEERING, INC.
2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net

PLAN & PROFILE

Station 115+00 To Station 120+00

2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin

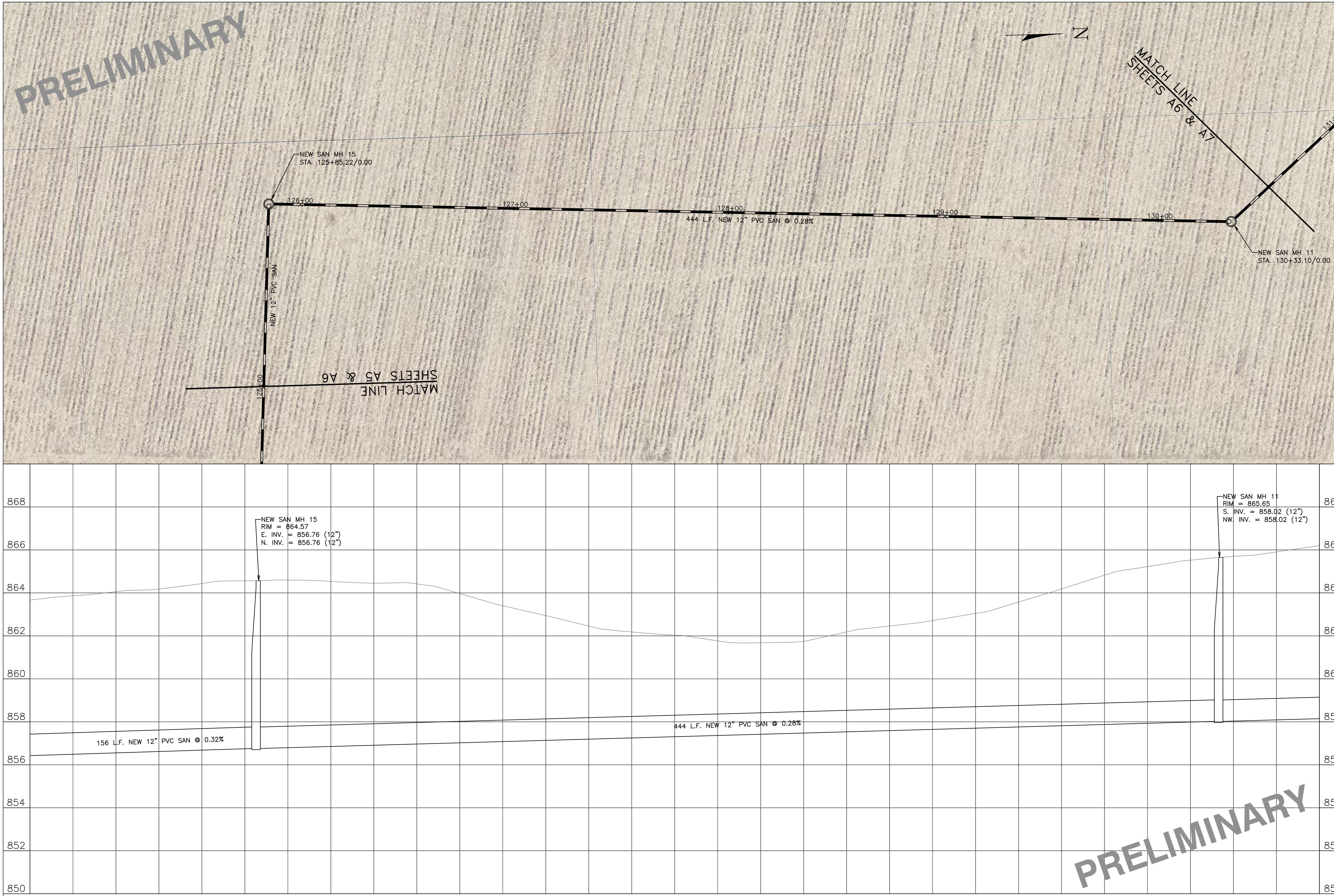
PROJECT NO.: MC 168
DRAWING FILE: MC 168 SHEETS.DWG
DRAWN BY: J.R.K.
CHECKED BY: T.J.S.
DATE: 7-24-20
REVISIONS:
SCALE: HORIZONTAL 0 5 10 20
VERTICAL 1 2
SHEET: A4


TOWN & COUNTRY ENGINEERING, INC.
2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net

PLAN & PROFILE
Station 120+60 To Station 126+60

2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin

PROJECT NO.: MC 168
DRAWING FILE: SHEETS.DWG
DRAWN BY: J.R.K.
CHECKED BY: T.J.S.
DATE: 7-24-20
REVISIONS:
SCALE: HORIZONTAL 0 5 10 20
VERTICAL 1 2
SHEET: A5



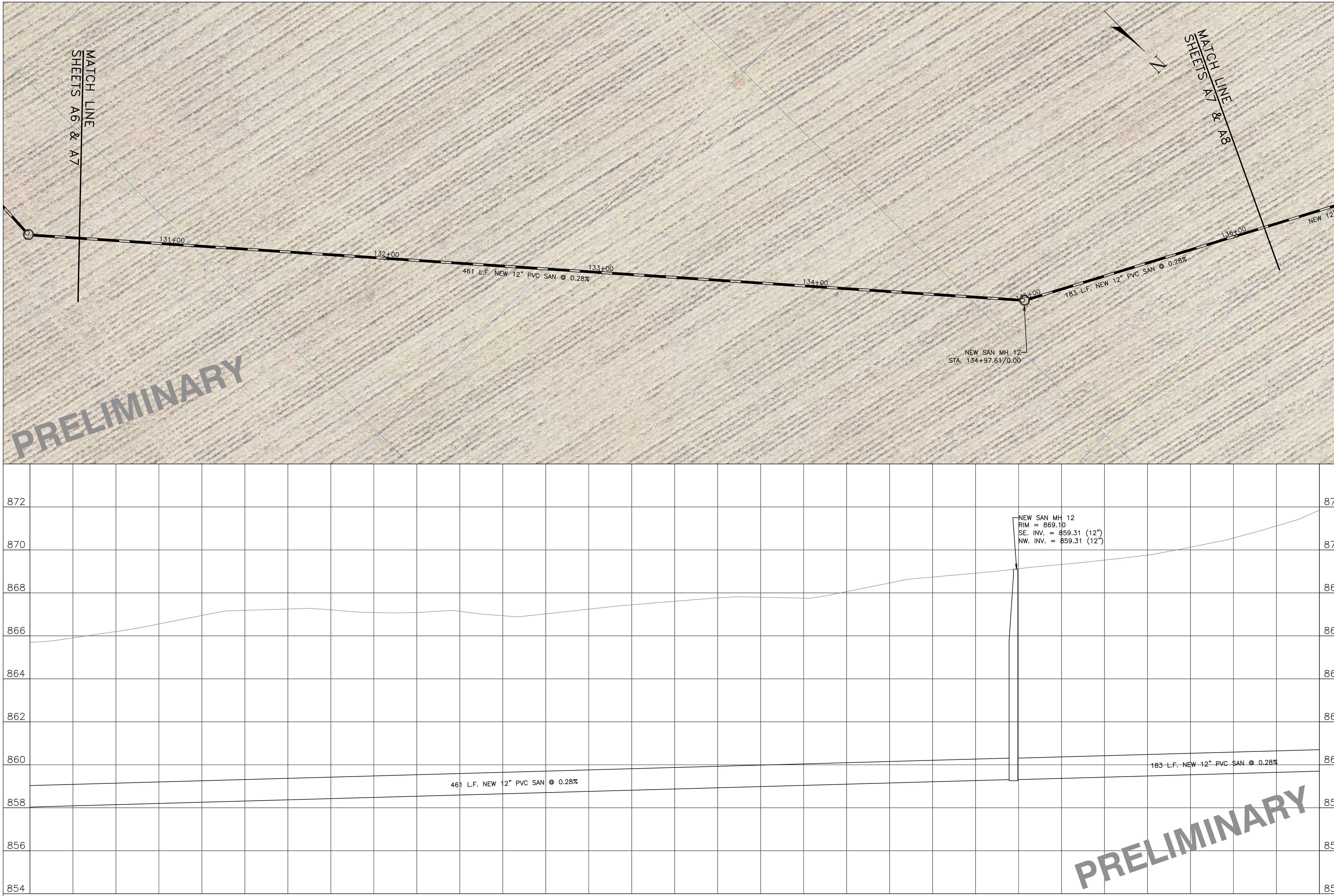

TOWN & COUNTRY ENGINEERING, INC.

2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net

PLAN & PROFILE
STREET NAME
Station 124+80 To Station 130+80

2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin

PROJECT NO.: MC 168
DRAWING FILE: MC 168 SHEETS.DWG
DRAWN BY: J.R.K.
CHECKED BY: T.J.S.
DATE: 7-24-20
REVISIONS:
SCALE: HORIZONTAL 0 5 10 20
VERTICAL 0 1 2
SHEET: A6




TOWN & COUNTRY ENGINEERING, INC.
2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net

PLAN & PROFILE
Station 130+40 To Station 136+40

2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin

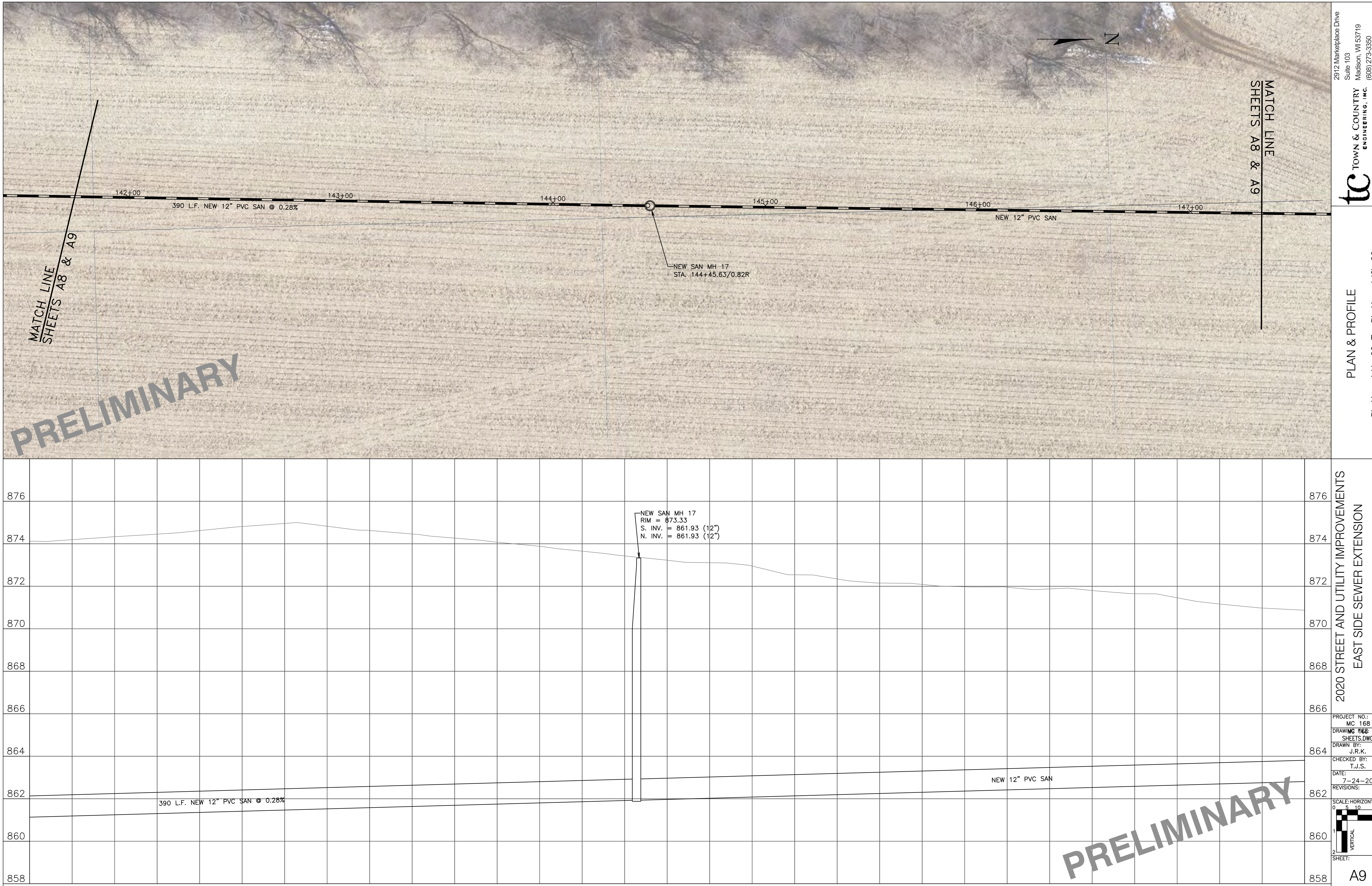
PROJECT NO.: MC 168
DRAWING FILE: MC 168 SHEETS.DWG
DRAWN BY: J.R.K.
CHECKED BY: T.J.S.
DATE: 7-24-20
REVISIONS:
SCALE: HORIZONTAL 0 5 10 20
VERTICAL 0 1 2
SHEET: A7

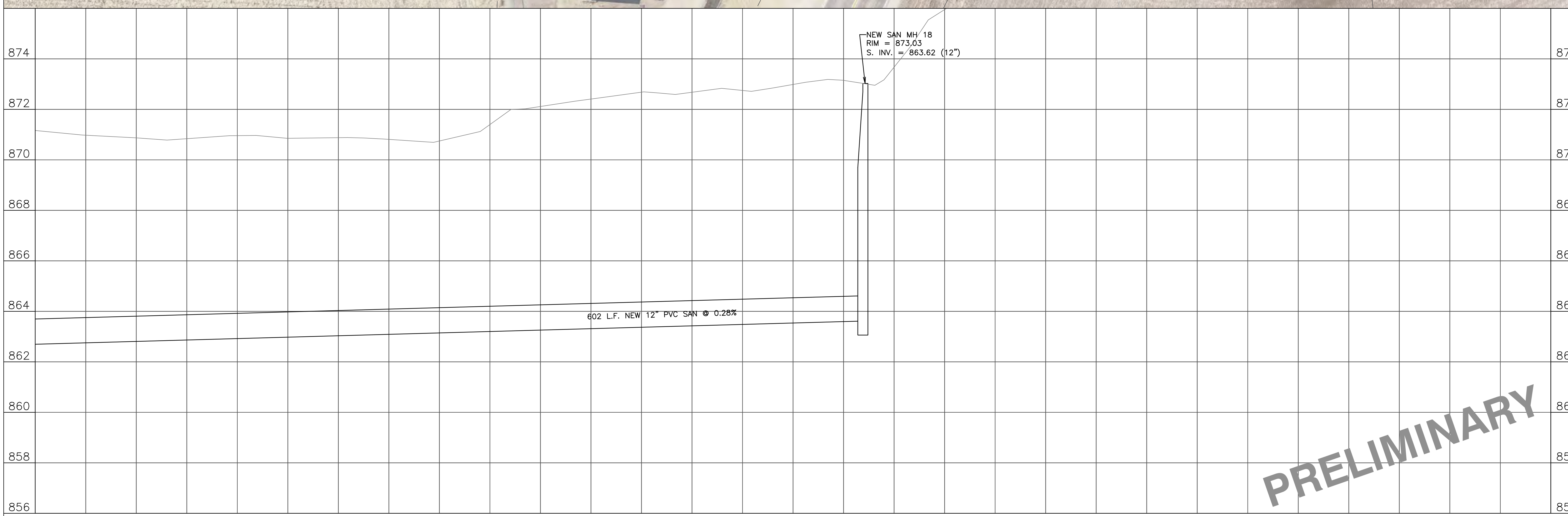

tc TOWN & COUNTRY ENGINEERING, INC.
2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net

PLAN & PROFILE
Station 136+00 To Station 142+00

2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin

PROJECT NO.: MC 168
DRAWING FILE: MC 168 SHEETS.DWG
DRAWN BY: J.R.K.
CHECKED BY: T.J.S.
DATE: 7-24-20
REVISIONS:
SCALE: HORIZONTAL 0 5 10 20; VERTICAL 1 2
SHEET: A8


MATCH LINE SHEETS A8 & A9
142+00
143+00
144+00
145+00
146+00
147+00
390 L.F. NEW 12" PVC SAN @ 0.28%
NEW 12" PVC SAN
NEW SAN MH 17
STA. 144+45.63/0.82R
MATCH LINE SHEETS A8 & A9
PRELIMINARY
NEW SAN MH 17
RIM = 873.33
S. INV. = 861.93 (12")
N. INV. = 861.93 (12")
390 L.F. NEW 12" PVC SAN @ 0.28%
NEW 12" PVC SAN
876
874
872
870
868
866
864
862
860
858
PRELIMINARY
2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net
TOWN & COUNTRY ENGINEERING, INC.
PLAN & PROFILE
Station 141+60 To Station 147+60
2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin
PROJECT NO.: MC 168
DRAWING FILE: MC 168 SHEETS.DWG
DRAWN BY: J.R.K.
CHECKED BY: T.J.S.
DATE: 7-24-20
REVISIONS:
SCALE: HORIZONTAL 0 5 10 20
VERTICAL 1 2
SHEET: A9


tc TOWN & COUNTRY ENGINEERING, INC.
2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net

PLAN & PROFILE
Station 147+20 To Station 153+20

2020 STREET AND UTILITY IMPROVEMENTS
EAST SIDE SEWER EXTENSION
Village of McFarland, Wisconsin

| | |
|---|---|
| PROJECT NO.: | MC 168 |
| DRAWING FILE: | MC 168 SHEETS.DWG |
| DRAWN BY: | J.R.K. |
| CHECKED BY: | T.J.S. |
| DATE: | 7-24-20 |
| REVISIONS: | |
| SCALE: HORIZONTAL | 0 5 10 20 |
| VERTICAL | 1 2 |
| SHEET: | A10 |

| | |
|---|---|
| CLIENT NAME: | Village of McFarland |
| PROJECT NAME: | **Countrywood Interceptor** |
| | **Extension from Devil's Lake Way to northern edge of RR corridor** |
| DATE OF ESTIMATE: | September 10, 2020 |

**PHYSICAL ASSUMPTIONS:**

| | |
|---|---|
| Pipeline Subject to Dewatering, Feet: | 1938 |
| Pipeline Subject to Rock Excavation, Feet: | |
| Expected Average Depth of Rock, Feet: | |
| Pipeline Subject to Pavement Restoration, Feet: | 1938 |
| Depth of Pipeline, Feet: | 9 |
| Pipeline Subject to Grass Restoration, Feet: | 1938 |
| Crushed Aggregrate Restoration Thickness, Inches: | 18 |
| Asphalt Pavement Restoration Thickness, Inches: | 3 |
| Average Pavement Width Left of Sewer, Feet: | 10 |
| Average Pavement Width Right of Sewer, Feet: | 10 |
| Average Grass Width Left of Sewer, Feet: | 15 |
| Average Grass Width Right of Sewer, Feet: | 15 |
| Assumed Trench Sideslope,Vert. to Horiz., __ to 1: | 1 |

**COST ASSUMPTIONS FOR CALCULATIONS:**

| | |
|---|---|
| Crushed Aggregate Cost, Per Ton: | $15.00 |
| Asphalt Pavement Cost, Per Ton: | $95.00 |

**Assumes that utility work is done concurrently with street work (no mobilization cost, only temp. gravel restoration above trench)

**COST ESTIMATE:**

| Description: | Units | | Unit Price | | Estimated Cost |
|---|---|---|---|---|---|
| Mobilization/Demobilization | 1 | lump sum | | lump sum | $0 |
| 12" Dia. PVC Sanitary Sewer, Basic Cost | 1938 | lin. ft. | $90 | /lin. ft. | $174,420 |
| 8" Dia. PVC Sanitary Sewer, Basic Cost | | lin. ft. | $65 | /lin. ft. | $0 |
| 24" Dia. Steel Casing | 100 | lin. ft. | $500 | /lin. ft. | $50,000 |
| Sanitary Manhole Castings | 7 | each | $475 | each | $3,325 |
| Sanitary Manhole Masonry | 105 | vert. ft. | $400 | /vert. ft. | $42,000 |
| 4" Sanitary Wyes | 0 | each | $300 | each | $0 |
| 4" Risers | 0 | vert. ft. | $60 | /vert. ft. | $0 |
| 4" PVC Sanitary Service Laterals | 0 | lin. ft. | $60 | /lin. ft. | $0 |
| Service Lateral Reconnections | 0 | each | $350 | each | $0 |
| Tree & Other Obstacle Removal | 1 | lump sum | | lump sum | $0 |
| Dewatering Allowance | 1938 | lin. ft. | $4 | /lin. ft. | $7,752 |
| Pavement Restoration Allowance | 1938 | lin. ft. | $64 | /lin. ft. | $124,032 |
| Topsoil Restoration, Seeding, Fertilizing | 3876 | sq. yd. | $4 | /sq. yd. | $15,504 |
| & Mulching Allowance | | | | | $0 |
| Allowance for Pulling Trench Box | 0 | lin. ft. | $2 | /lin. ft. | $0 |
| Maintenance/Recreational Path | 1938 | lin. ft. | $100 | /lin. ft. | $193,800 |
| Other Erosion Control | 1 | l.s. | $500 | l.s. | $500 |
| **CONSTRUCTION SUBTOTAL** | | | | | $611,333 |
| Engineering/Const Admin/Observation | @ 17 | % | | | $103,927 |
| Contingency | @ 10 | % | | | $61,133 |
| **TOTAL PROJECT COSTS** | | | | | **$776,393** |
| Cost if using 8-inch pipe | | | | | **$714,861** |
| Upsizing costs | | | | | **$61,532** |

**Public Input Session—Eastside Interceptor**

August 31, 2020 at 6:00 p.m. via Zoom webinar

Attendee comments and questions:

- Bill Stoneman, 5905 Oak Hollow Drive, McFarland WI
    - Has there been any resistance of the current landowners?
    - Also, what is the estimated financial gain of each impacted parcel owner? Payment for easement? Please detail—this is public record, correct?
    - A question came to mind. At what point in the future do we anticipate a need to expand capacity or our connection to Metro?
- Chris Fredrick
    - Do you want to expand on the potential staging options. It was mentioned but not elaborated on
- Jane Licht
    - When do you anticipate this project to start
- Wes Licht, 2964 Highway AB
    - What mount of wetlands will be destroyed? How will they be restored? Or replaced? Will the 30 foot easement include the bike path?
    - If AB is improved due to the housing projects south of the tracks and the 100 plus homes in the Veridian development on the Utterback property, will the placement of the pipeline be a problem as it seems very close to the roadway as it crosses the RR tracks?

**From:** Dobson, Jodi
**To:** Matt Schuenke
**Subject:** RE: Sewer Interceptor
**Date:** Tuesday, September 8, 2020 10:23:52 AM
**Attachments:** image003.png
image004.png
image005.png
image006.png
image007.png
image008.png

---

Matt,

Thanks for reaching out to discuss the sewer interceptor project along with timing and financing. As we discussed today on the phone, the village has worked over the years to put the water and sewer utility fund into a strong financial position. As such, at the end of 2019 the fund had $3,095,892 in unrestricted cash and investments. This represents roughly 16.5 months of operations available, compared to the GFOA recommended minimum of 3 months. This level of reserves allows the utility flexibility in financing capital projects and therefore the utility has the ability to fund the project discussed in the short term until being reimbursed with borrowed funds on the village's normal borrowing timeline. In addition, you noted you have a process in place to ensure you have the proper intent to reimburse documentation that your bond representatives will require. I don't see a concern with this plan or the short term decrease in reserves as you have a plan in place to reimburse them within the same fiscal year.

If you have any further questions let me know.

Jodi

**Jodi Dobson, CPA**
**Partner**

bakertilly

Baker Tilly US, LLP
T: +1 (608) 240 2469 | M: +1 (608) 332 4276
Ten Terrace Ct, PO Box 7398, Madison, WI, 53707-7398 USA
jodi.dobson@bakertilly.com | bakertilly.com

**From:** Matt Schuenke <Matt.Schuenke@mcfarland.wi.us>
**Sent:** Thursday, September 03, 2020 8:57 AM
**To:** Dobson, Jodi <Jodi.Dobson@bakertilly.com>
**Subject:** Sewer Interceptor



Jodi,

We are working on a sanitary sewer interceptor project that we want to construct this Winter. As part of our review at Committee, concern has been raised that we will be expending capital funds months before the borrowing is received that is meant to cover the cost. I want to talk about how we could potentially alleviate that concern as it centers around cash flow between when we expend the funds and when the borrowing is received. Do you have some time on Friday or in the morning of Tuesday and Wednesday next week?

Thanks,
Matt

VILLAGE OF
McFarland

# VILLAGE BOARD SUMMARY SHEET

**MEETING DATE:** **Tuesday, September 15, 2020**

**SECTION:** **Business**

**DEPARTMENT:** **Administration**

**CONTACT:**

**AGENDA ITEM:** **Discussion regarding special assessments and cost recovery method(s) for the Eastside Interceptor project.**

**PREVIOUS ACTION:**

**ISSUE SUMMARY:**
Enclosed is an intial draft of an assessment method prepared by the Village Engineer for the interceptor project. This does presently include 100% of the costs of the path associated with it; however, this point remains to be discussed. The VIllage Engineer will walk through initial assumptions as we talk through our options to be reimbursed for the construction of this pipe to support future development.

Action is not needed on this item as we are beginning our discussion on this item with the Committee.

**FINANCIAL/BUDGET IMPACT:**

**VILLAGE PLAN REFERENCE:**

**ORDINANCE REFERENCE:**

**BOARD, COMMISSION OR COMMITTEE RECOMMENDATION:**

**ATTACHMENTS:**
1. Estimated Eastside Interceptor Special Assessment 09102020 DRAFT

Potential Lift Station 2 Sewer Interceptor Extension (Countrywood Interceptor)
**Village of McFarland**
Estimated Cost Sharing Arrangement
**9/10/2020**

Notes:
1. Incremental oversizing is to a 12-inch sanitary sewer from 8-inch sanitary sewer
2. Dwelling unit count is assumed at 0.38 ac/dwelling unit.
3. It is estimated that half of the area within these parcels will be served by the 2021 east side sewer extension. The remaining portion is anticipated to be served by a parallel village utility to the west.
4. 25% of the remaining subbasins of E and F because that is estimated to be the amount developed in the next 25 years.
5. This is based on the Phase 1 East Side Sewer Extension Estimate as detailed in the attached estimate = $ 714,861
6. There is a significant amount of wetland area within these parcels. It is anticipated that wetland area within this parcel will not be developable or served by sewer. As a result, the sewer service area for this parcel shown is the estimated acreage outside of the WDNR Wetland Inventory layer.
5. MMSD sewer charges are NOT included in these figures.
6. Village impact fees for Library and Water System are NOT included in these figures.

| | Potential Users | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Total Base Cost (without oversizing) | Sperle & Teppo | Utterback Limited Partnership (South of RR Corridor)[6] | Utterback Limited Partnership (North of RR Corridor)[3] | Utter[3] | Vennevoll | Elvehjem Acres[6] | 25% of the Remainder of Subbasin E[4] | 25% of the Remainder of Subbasin F[4] | Village (incremental oversizing)[1] |
| Approx. Sewer Service Area | 18.00 | 4.01 | 18.24 | 23.62 | 35.87 | 18.39 | 25.09 | 36.66 | |
| Service Area, % | 10.0% | 2.2% | 10.1% | 13.1% | 19.9% | 10.2% | 13.9% | 20.4% | |
| **Estimated Charges[5]** | **$71,536** | **$15,954** | **$72,470** | **$93,851** | **$142,555** | **$73,097** | **$99,693** | **$145,705** | **$61,532** |
| Estimated Dwelling Unit Count[2] | 47 | 11 | 48 | 62 | 94 | 48 | 66 | 96 | |
| **Per Dwelling Unit Costs** | **$1,522.04** | **$1,450.40** | **$1,509.79** | **$1,513.73** | **$1,516.54** | **$1,522.86** | **$1,510.50** | **$1,517.76** | |

VILLAGE OF
McFarland

## VILLAGE BOARD SUMMARY SHEET

**MEETING DATE:** **Tuesday, September 15, 2020**

**SECTION:** **Business**

**DEPARTMENT:** **Community Development**

**CONTACT:** **Andrew Bremer, Comm & Eco Dev Director**

**AGENDA ITEM:** **Discussion and action to make a recommendation to the Village Board regarding a request for a private septic and well for a new single family residence located on Lot 2 CSM #14495, 3365 Siggelkow Road.**

**PREVIOUS ACTION:**
3.20.2017, CSM #14495 approved by the Village Plan Commission.
6.26.2017, Ordinance 2017-16 annexation of property to the Village.
1.22.2018, Ordinance 2018-02 creation of the Rural Homes District.
1.22.2018, Ordinance 2018-03 rezoning 3365 Siggelkow Road to the RH-1 District.
3.26.2018, Ordinance 2018-01 establishing standards for RH-1 properties.
9.14.2020, Village Board considered the original request.

**ISSUE SUMMARY:**
The owners of 3365 Siggelkow Road have submitted a building permit for the construction of a new single family home. The property is zoned Rural Homes, RH-1; single family homes are a permitted use in the RH-1 District. The home would be located on Lot #2 of CSM #14495, with a new driveway in the area marked 66' wide future driveway easement area on the CSM. There is an existing residence on Lot #1 of CSM #14495. The proposed home would be on a private septic and well.

On March 20, 2017, the Village Plan Commission approved CSM #14495 as part of it's extraterritorial plat review jurisdiction. The minutes from that meeting note that the former property owner was seeking the CSM for the construction of a single family home on Lot #2. On June 26, 2017 the Village Board approved Ordinance 2017-16 annexing several properties, including 3365 Siggelkow Road to the Village. In January and March of 2018, the Village Board then approved Ordinances 2018-01 through 2018-03 which created the Rural Homes District, amended several municipal codes as a result of the new district, and rezoned several properties, including 3365 Siggelkow Road, to the RH-1 District.

Ordinance 2018-01, specifically revised Section 8-52(a) of the Building Code to read:

- Residential buildings. Unless an exception is granted by the Village Board, no building permit shall be issued for the construction of any residential building until public sewer and water are installed in the streets necessary to service the property for which the permit is required.

Public water and sewer utilities are currently not available at this location. The nearest public utilities are located in Juniper Ridge, approximately 3/4-mile from the property. The Village's current Capital Improvement Plan does not include extension of public sewer and water down Siggelkow Road to serve properties in this area and it may be decades before this project is completed based on market conditions and Village capital improvement planning.

There are portions of Chapter 47 Public Utilities that address future well and septic abandonment and mandatory connections to public water and sewer utilities when services become available to a property. The costs of abandonment of private utilities and connections to public utilities are the responsibility of the property owner. In addition, septic systems and wells require permits from Dane County and the WDNR. Therefore, Village staff recommend the following conditions of approval with the building permit:

1. Applicant obtaining both a Sanitary Permit and Well Location Permit from Dane County.
2. Applicant obtaining a Well Construction Permit from the WDNR.
3. Mandatory connections to public water wells and public sewers upon their construction in streets adjacent to the property in accordance with Sec. 47.44 and Sec. 47-105 of the Village Municipal Code of Ordinances.
4. Installation of at least a 16" culvert along with apron end walls for the proposed driveway along Siggelkow Road servicing the new residence

**FINANCIAL/BUDGET IMPACT:**

**VILLAGE PLAN REFERENCE:**
The property is planned for future Industrial use in the Village's Comprehensive Plan. The property is also identified for future Office and Light Industrial development in the Village's East Side Neighborhood Growth Plan. When the Plan Commission considered the approval of CSM #14495 in 2017, the minutes reflect in opinion that as 7-acre lots they could transition into commercial uses in the future.

**ORDINANCE REFERENCE:**
Sec. 8-52(a), Utilities Required for Residential Buildings
Sec. 47-44, Private Water Wells
Sec. 47-105, Mandatory Connections to Public Sewers

**BOARD, COMMISSION OR COMMITTEE RECOMMENDATION:**

Code prescribes that the Village Board considers the exception to whether or not private well/septic could be provided in this circumstance. It is scheduled for their consideration at their meeting on Monday, September 14th. If they agree to grant the exception, then the Committee will not need to weigh in on this. If they defer to the Committee, then we will need to discuss the matter. Staff wanted to give the item a chance to fit within this months meetings if the board did not take action versus waiting a month to do so.

**ATTACHMENTS:**

1. CSM 14495

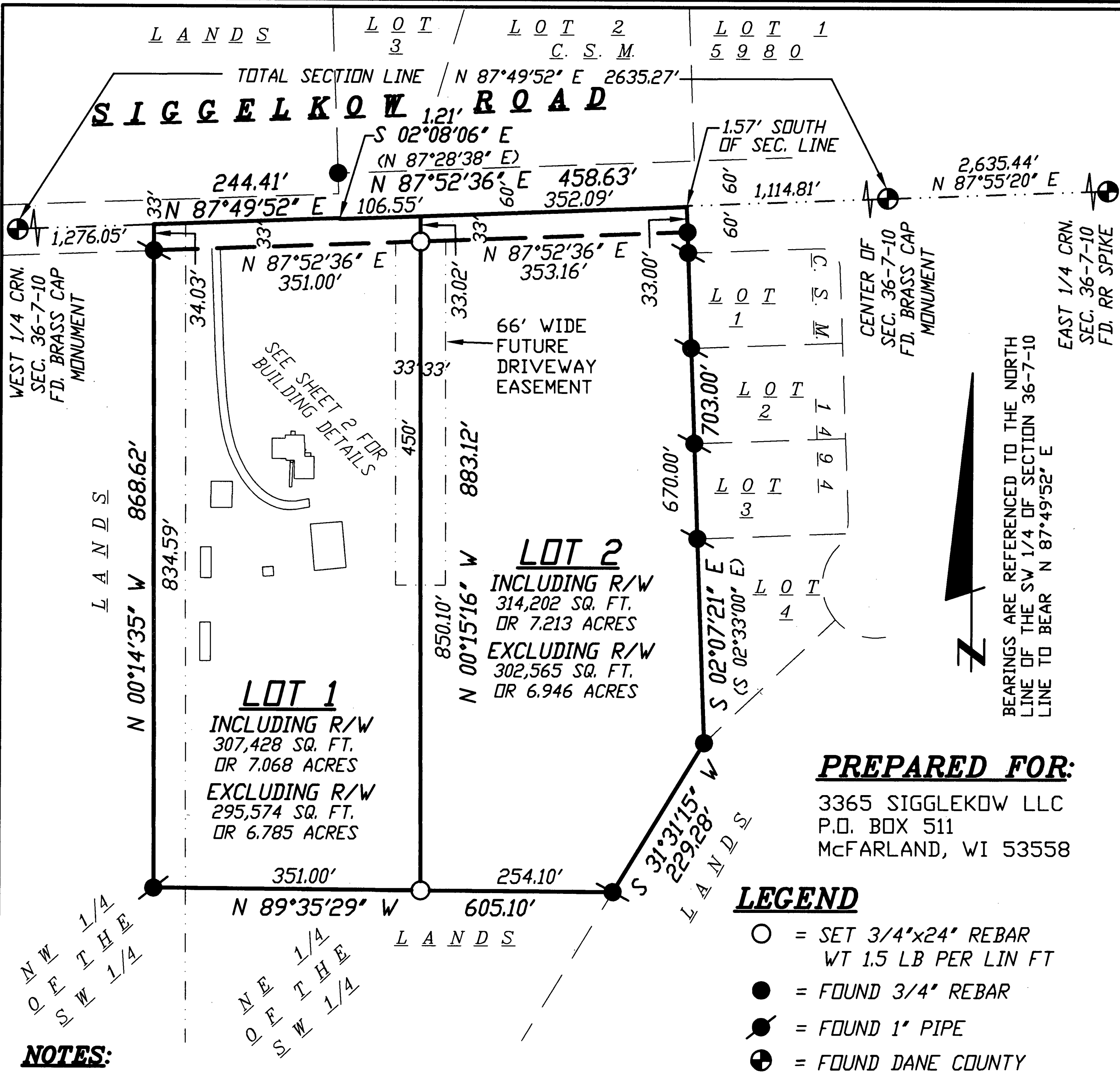
# CERTIFIED SURVEY MAP

**WILLIAMSON SURVEYING AND ASSOCIATES, LLC**

NOA T. PRIEVE & CHRIS W. ADAMS, PROFESSIONAL LAND SURVEYORS

104 A WEST MAIN STREET, WAUNAKEE, WISCONSIN, 53597 PHONE: 608-255-5705

Located in part of the NW 1/4 of the SW 1/4 and part of the NE 1/4 of the SW 1/4 of Section 36, T7N, R10E, Town of Blooming Grove, Dane County, Wisconsin.




**PREPARED FOR:**

3365 SIGGLEKOW LLC
P.O. BOX 511
McFARLAND, WI 53558

**LEGEND**

- ○ = SET 3/4"x24" REBAR WT 1.5 LB PER LIN FT
- ● = FOUND 3/4" REBAR
- = FOUND 1" PIPE
- = FOUND DANE COUNTY SECTION CORNER (AS NOTED)
- ( ## ) = RECORDED AS

**NOTES:**

1.) THIS SURVEY WAS PREPARED WITHOUT BENEFIT OF A TITLE REPORT FOR THE SUBJECT TRACT OR ADJOINERS AND IS THEREFORE SUBJECT TO ANY EASEMENTS, AGREEMENTS, RESTRICTIONS AND STATEMENT OF FACTS REVEALED BY EXAMINATION OF SUCH DOCUMENTS.

2.) WETLANDS AND FLOOD PLAIN, IF PRESENT, HAVE NOT BEEN DELINEATED OR SHOWN.

3.) SEE SHEET 2 FOR BUILDING DETAIL.

SCALE 1" = 200'

0' 100' 200' 400' 600'

DOCUMENT NO. 5319370

CERTIFIED SURVEY MAP NO. 14495

Sheet 1 of 4

**SURVEYORS SEAL**

WISCONSIN
NOA PRIEVE
S-2499
LODI, WI
LAND SURVEYOR

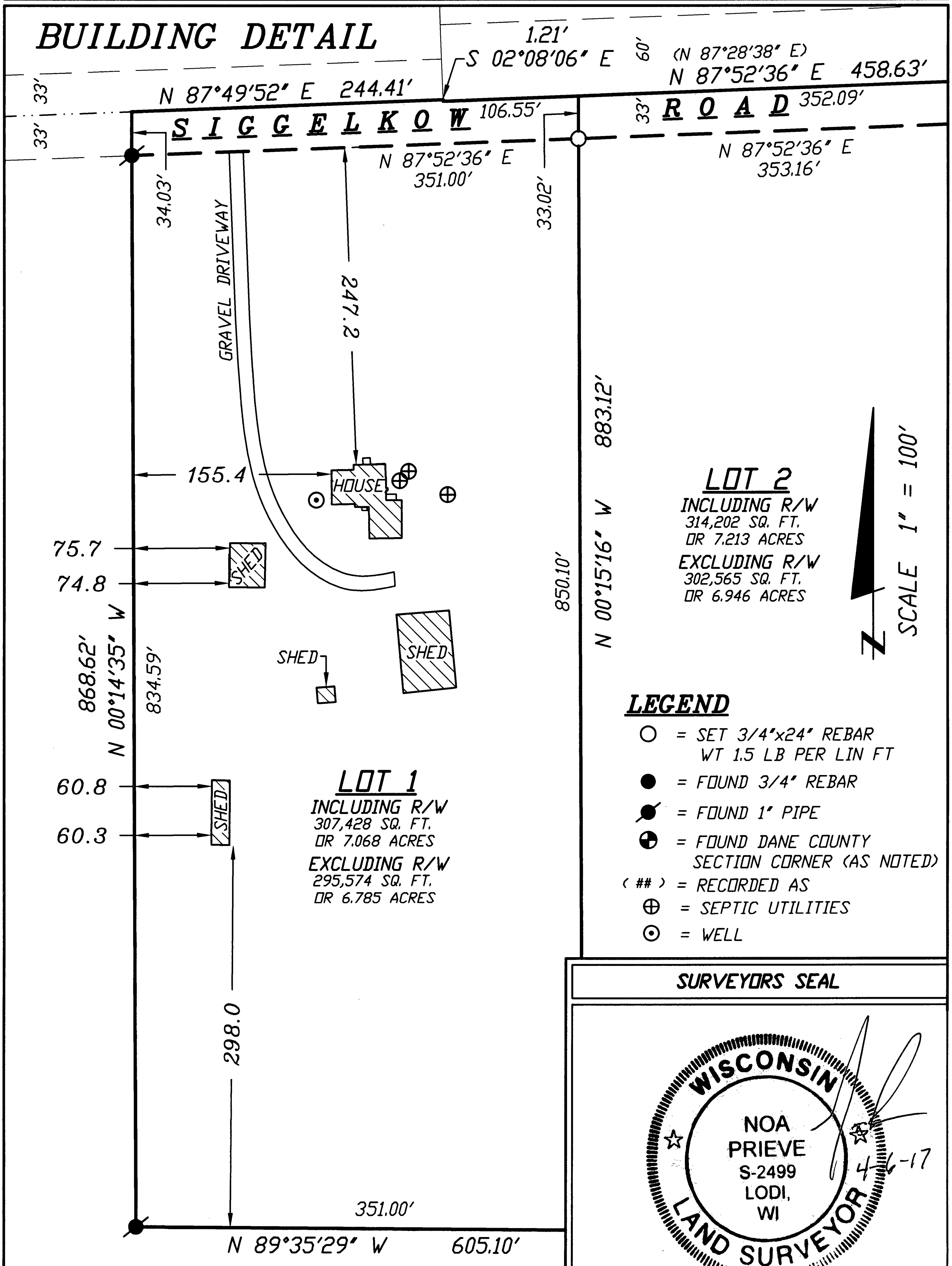
4/6/17

16W-464

# CERTIFIED SURVEY MAP

WILLIAMSON SURVEYING AND ASSOCIATES, LLC
NOA T. PRIEVE & CHRIS W. ADAMS, PROFESSIONAL LAND SURVEYORS
104 A WEST MAIN STREET, WAUNAKEE, WISCONSIN, 53597 PHONE: 608-255-5705

Located in part of the NW 1/4 of the SW 1/4 and part of the NE 1/4 of the SW 1/4 of Section 36, T7N, R10E, Town of Blooming Grove, Dane County, Wisconsin.




Sheet 2 of 4

16W-464

# CERTIFIED SURVEY MAP

**WILLIAMSON SURVEYING AND ASSOCIATES, LLC**
*NOA T. PRIEVE & CHRIS W. ADAMS, PROFESSIONAL LAND SURVEYORS*
*104 A WEST MAIN STREET, WAUNAKEE, WISCONSIN, 53597 PHONE: 608-255-5705*

Located in part of the NW 1/4 of the SW 1/4 and part of the NE 1/4 of the SW 1/4 of Section 36, T7N, R10E, Town of Blooming Grove, Dane County, Wisconsin.

## SURVEYOR'S CERTIFICATE

I, Noa T. Prieve, Professional Land Surveyor hereby certify that in full compliance with the provisions of Chapter 236.34 Wisconsin Statutes, the subdivision regulations of Dane County, and by the direction of the owners listed below, I have surveyed, divided, and mapped a correct representation of the exterior boundaries of the land surveyed and the division of that land, being part of the NW 1/4 of the SW 1/4 and part of the NE 1/4 of the SW 1/4 of Section 36, T7N, R10E, Town of Blooming Grove, Dane County, Wisconsin, being more particularly described as follows:

Commencing at the West 1/4 corner of said Section 36; thence N 87°49'52" E along the North line of the SW 1/4, 1276.05 feet to the point of beginning.

Thence continue N 87°49'52" E, 244.41 feet; thence S 02°08'06" E, 1.21 feet; thence N 87°52'36" E, 458.63 feet; thence S 02°07'21" E, 703.00 feet; thence S 31°31'15" W, 229.28 feet; thence N 89°35'29" W, 605.10 feet; thence N 00°14'35" W, 868.62 feet to the point of beginning. This parcel contains 621,630 sq. ft. or 14.27 acres and is subject to a road right of way of 33.00 feet over the most northerly part thereof.

Williamson Surveying and Associates, LLC
by Noa T. Prieve & Chris W. Adams

*Date* April 6, 2017

*Noa T. Prieve S-2499*
*Professional Land Surveyor*

## OWNERS' CERTIFICATE:

3365 Sigglekow LLC, a limited liability company duly organized and existing under and by virtue of the laws of the State of Wisconsin, as owner of the described land, does hereby consent to the surveying, dividing and mapping of the land described on this certified survey map. I ALSO CERTIFY THAT THIS CERTIFIED SURVEY MAP IS REQUIRED BY S. 7517(1)(A), DANE COUNTY CODE OF ORDINANCES, *
IN WITNESS WHEREOF, the said 3365 Sigglekow LLC, has caused these presents to be signed by its authorized member listed below at Blooming Grove Wisconsin and its signature hereunto affixed on this 18 day of April, 2017.

* TO BE SUBMITTED TO THE DANE COUNTY ZONING AND LAND REGULATION COMMITTEE FOR APPROVAL.

*3365 Sigglekow LLC*
*Randall Aschbrenner*

STATE OF WISCONSIN)
DANE COUNTY)

Personally came before me this 18th day of April, 2017, Randall Aschbrenner, authorized member of the above named limited liability company, to me known to be the person who executed the foregoing instrument and to me known to be such officer of said company, and acknowledge that they executed the foregoing instrument as such officer as the deed of said corporation, by its authority.

Dane *County, Wisconsin.*

*My commission expires* 2/4/18

Martha L Prestegard
*Notary Public*

Martha L Prestegard
*Print Name*

**SURVEYORS SEAL**

WISCONSIN
NOA PRIEVE
S-2499
LODI, WI
LAND SURVEYOR
4-6-17

*Sheet 3 of 4*

*16W-464*

# CERTIFIED SURVEY MAP


## WILLIAMSON SURVEYING AND ASSOCIATES, LLC

NOA T. PRIEVE & CHRIS W. ADAMS, PROFESSIONAL LAND SURVEYORS

104 A WEST MAIN STREET, WAUNAKEE, WISCONSIN, 53597 PHONE: 608-255-5705


Located in part of the NW 1/4 of the SW 1/4 and part of the NE 1/4 of the SW 1/4 of Section 36, T7N, R10E, Town of Blooming Grove, Dane County, Wisconsin.

**TOWN BOARD RESOLUTION**

Resolved that this certified survey map is hereby acknowledged and approved by the Town of Blooming Grove on this 18 day of April, 2017.

Michael Wolf

Michael Wolf
Town Clerk

**VILLAGE OF MCFARLAND APPROVAL**

Resolved that this certified survey map in the Town of Blooming Grove is hereby acknowledged and approved by the Village of McFarland on this 20th day of March, 2017

Village Clerk

**NOTE:**

REFER TO BUILDING SITE INFORMATION CONTAINED IN THE DANE COUNTY SOIL SURVEY.

**DANE COUNTY APPROVAL:**

Approved for recording per Dane County Zoning and Land Regulation Committee action on April 18, 2017.

Daniel Everson

Daniel Everson #9976
Assistant Zoning Administrator

**REGISTER OF DEEDS:**

Received for recording this 18 day of April, 2017 at 3:27 o'clock P.M. and recorded in Volume 100 of Dane County Certified Surveys on pages 19 through 22.

Received 4/18/17 2:48pm

Kristi Chlebowski by Shelly Sechafer, deputy

Kristi Chlebowski
Register of Deeds

**SURVEYORS SEAL**

WISCONSIN
NOA PRIEVE
S-2499
LODI, WI
LAND SURVEYOR

4-6-17

DOCUMENT NO. 5319370

CERTIFIED SURVEY MAP NO. 14495

Sheet 4 of 4

16W-464

VILLAGE OF
McFarland

# VILLAGE BOARD SUMMARY SHEET

**MEETING DATE:** **Tuesday, September 15, 2020**

**SECTION:** **Business**

**DEPARTMENT:** **Public Works**

**CONTACT:** **Jim Hessling, Public Works Director**

**AGENDA ITEM:** **Presentation of the Public Works Monthly Report from the Director.**

**PREVIOUS ACTION:**

**ISSUE SUMMARY:**
Director's monthly report including the August Impact Fee report.

**FINANCIAL/BUDGET IMPACT:**

**VILLAGE PLAN REFERENCE:**

**ORDINANCE REFERENCE:**

**BOARD, COMMISSION OR COMMITTEE RECOMMENDATION:**

**ATTACHMENTS:**
1. August 2020 Public Works Directors report

**PUBLIC WORKS COMMITTEE**
**September 8, 2020**

**PUBLIC UTILITIES COMMITTEE**
**September 15, 2020**

# Public Works Directors Report for August 2020

The following is information concerning events and activities of the Public Works Department along with the Water and Sewer Utilities for the previous month. This information is provided in brief to provide an overview of the highlights.

**PW Complex**

Construction activities at the public works building are currently on going. The void under the concrete has been repaired. Work is progressing on the mezzanine, and the mechanic's shop floor. Outside yard work has started with the removal of the asphalt and the partial installation of the concrete flume.

**Road Construction Projects**

This year's street projects, Burma Road, Autumn and North Autumn Lanes along with the sump pump header project are moving along. Binder pavement has been laid in some places.

**Lead and Copper Testing**

The department has been working with the DNR on site selection for our 2020 Lead and Copper Testing requirements. All sites now have to be re-approved by the DNR before samples are collected.

**Painting**

Painting of various cross walks and curb lines continued in August.

**Meetings/Training/Seminars**

All meetings were held by electronic means this month.

- Jim Hessling participated in:
  - APWA monthly board meeting

# 2020 WATER SYSTEM IMPACT FEES

| Collected in Month | 2020 Fees | 2019 Fees | 2020 Impact Fee Distribution | | |
|---|---|---|---|---|---|
| | | | Tower | Main | Well |
| January | 1,950.00 | 2,600.00 | 1,099.44 | 312.00 | 538.56 |
| February | 4,550.00 | 6,500.00 | 2,565.36 | 728.00 | 1,256.64 |
| March | 4,550.00 | 1,950.00 | 2,565.36 | 728.00 | 1,256.64 |
| **1st Quarter Total** | **11,050.00** | **11,050.00** | **6,230.16** | **1,768.00** | **3,051.84** |
| April | 10,402.00 | 10,400.00 | 5,864.76 | 1,664.32 | 2,872.92 |
| May | 1,950.00 | 1,950.00 | 1,099.44 | 312.00 | 538.56 |
| June | 3,250.00 | 9,100.00 | 1,832.40 | 520.00 | 897.60 |
| **2nd Quarter Total** | **15,602.00** | **21,450.00** | **8,796.60** | **2,496.32** | **4,309.08** |
| July | 3,900.00 | 1,950.00 | 2,198.88 | 624.00 | 1,077.12 |
| August | 2,600.00 | 650.00 | 1,465.92 | 416.00 | 718.08 |
| September | - | 1,300.00 | - | - | - |
| **3rd Quarter Total** | **6,500.00** | **3,900.00** | **3,664.80** | **1,040.00** | **1,795.20** |
| October | - | 7,151.00 | - | - | - |
| November | - | 6,500.00 | - | - | - |
| December | - | 7,150.00 | - | - | - |
| **4th Quarter Total** | **-** | **20,801.00** | **-** | **-** | **-** |

## HISTORICAL WATER IMPACT FEE TOTALS

| | | | | | |
|---|---|---|---|---|---|
| **2020 Total** | 33,152.00 | | 18,691.56 | 5,304.32 | 9,156.12 |
| **2019 Total** | 57,201.00 | | 32,250.79 | 9,152.16 | 15,798.05 |
| **2018 Total** | 71,501.00 | | 40,313.34 | 11,440.16 | 19,747.50 |
| **2017 Total** | 60,801.20 | | 34,281.17 | 9,728.00 | 16,792.03 |
| **2016 Total** | 38,026.00 | | 23,708.24 | 5,252.00 | 9,065.76 |
| **2015 Total** | 5,851.00 | | 3,298.92 | 936.00 | 1,616.08 |
| **2014 Total** | 7,150.00 | | 4,031.28 | 1,144.00 | 1,974.72 |
| **2013 Total** | 21,125.00 | | 11,910.59 | 3,380.00 | 5,834.41 |
| **2012 Total** | 13,650.00 | | 7,696.08 | 2,184.00 | 3,769.92 |
| **2011 Total** | 12,350.00 | | 6,963.12 | 1,976.00 | 3,410.88 |
| **2010 Total** | 5,200.00 | | 2,931.84 | 832.00 | 1,436.16 |
| **2009 Total** | 7,150.00 | | 4,031.26 | 1,144.00 | 1,974.74 |
| **2008 Total** | 10,400.00 | | 5,863.62 | 1,664.00 | 2,872.38 |
| **2007 Total** | 34,451.00 | | 19,423.88 | 5,512.16 | 9,514.96 |
| **2006 Total** | 28,927.00 | | 16,309.33 | 4,628.32 | 7,989.35 |
| **2005 Total** | 52,326.00 | | 29,501.92 | 8,372.16 | 14,451.92 |
| **2004 Total** | 77,679.00 | | 43,796.20 | 12,428.64 | 21,454.16 |
| **2003 Total** | 59,802.00 | | 33,716.97 | 9,568.32 | 16,516.71 |
| **2002 Total** | 69,625.00 | | 39,255.27 | 11,140.00 | 19,229.73 |
| **2001 Total** | 55,271.50 | | 31,162.62 | 8,843.44 | 15,265.44 |
| **2000 Total** | 56,701.00 | | 31,968.59 | 9,072.16 | 15,660.25 |
| **1999 Total** | 55,388.00 | | 31,228.31 | 8,862.08 | 15,297.61 |
| **1998 Total** | 14,581.73 | | 8,221.33 | 2,333.08 | 4,027.32 |
| **Grand Total** | **$ 815,157.43** | **$ -** | **$ 461,864.67** | **$ 129,592.68** | **$ 223,700.08** |

| | | | |
|---|---|---|---|
| $650= | $366.48 | $104.00 | $179.52 |
| $1300 | $732.96 | $208.00 | $359.04 |

Tower= .56381, Main=.16, Well=.27619