GREEN OAK CHARTER TOWNSHIP
10001 SILVER LAKE ROAD, BRIGHTON, MI 48116
PHONE: 810-231-1333 • FAX 810-231-5080

AGENDA

Green Oak Charter Township
Planning Commission
Regular Meeting
Thursday, July 17, 2025
7:00 p.m.

1. Call to Order
2. The Pledge to the Flag
3. Roll Call of the Commission
4. Approval of the Agenda
5. Approval of June 19, 2025, Meeting Minutes
6. Call to the Public (Limited to agenda items only)

7. Business Items:

A. Recommend approval or denial to Township Board for Final Review for Dove Lake; a Residential Planned Unit Development located on parcel # 4716-13-200-017. The property is currently zoned RE Residential Estates 108.51 acres in size

8.Reports

A. Chairman Report
B. Township Board Representative
C. Zoning Board of Appeals Representative
D. Planning Consultant
E. Correspondence

9. Call to the Public
10. Adjournment

Posted: July 10, 2025

PLANNING COMMISSION

Cris Burkhalter, Planning Commission Chairperson
Dwayne Janke
Audrey Beyer
Lary Marshall
Doug Nale
Michael Sedlak, Twp. Board Rep.
Sarah Pearsall, Secretary

Green Oak Charter Township
Planning Commission
Regular Meeting Minutes
June 19, 2025

Approved: _____

The meeting was called to order by Mr. Marshall at 7:00 p.m.

Roll Call:	Audrey Beyer
	Dwayne Janke
	Lary Marshall
	Sarah Pearsall
	Michael Sedlak, Clerk
Absent:	Cris Burkhalter
	Doug Nale
Also Present:	Debra McKenzie, Zoning Administrator
	Michelle Marin, Carlisle Wortman
	Rick Miner, CES
	Kristina Kolb, Township Attorney
Guests:	8

APPROVAL OF AGENDA

Motion by Pearsall, second by Janke
To approve the agenda as presented.

Voice Vote: Ayes: Unanimous
Nays: None

MOTION APPROVED

APPROVAL OF MINUTES

Motion by Sedlak, second by Pearsall
To approve the May 15, 2025 minutes as presented.

Voice Vote: Ayes: Unanimous
Nays: None

MOTION APPROVED

CALL TO THE PUBLIC

Matt Rupprecht, 13799 12 Mile Road– He is opposed to the Dove Lake PUD and requested they deny final approval. He lives two doors down from the developer and It's uncomfortable to be here again speaking out against the development. As the Dove Lake community spoke out in May, the developer retaliated by blocking access to the boat ramp. The neighbors talked the developer into removing it. The developer also sent an email with veiled threats to get the residents to back down. He provided details to be placed into the minutes. Regarding the HOA that was discussed, after years of ignoring the requests, the developer strategically emailed and said it would start next week. It's imperative an HOA is turned over to the residents before this PUD is approved. It's critical that the HOA addresses their rights for a boat launch and common area. He is concerned with the proposed septic field, they would like to see any documentation and make sure it's iron clad, given the proximity to open water. For any future development he would like to see a bond developed, this would create an economic incentive to turn over the HOA so these future residents don't have to deal with the run around they have. Since the preliminary PUD, area traffic has increased dramatically and will change traffic patterns with the connection to 12 Mile. The level of service is not adequate for this. He also wants to make sure any new development has proper drainage. He was verbally promised an access road, a boat ramp, and an HOA and none of that has happened and he is counting on them to protect their investment.

Lori Fleissner, 27035 North Dixboro – She is also a resident on the lake, they still don't have the HOA turned over to them. They sent two letters to the developer from the layer she has copies of the letters from the lawyers from 2022; they have tried to get a response. They got an email Wednesday, very slandering of herself, saying that she is harassing the owners, threatening her landscaping, threatening the other homeowner's as far as things that they've done. The developer only responds to some of the homeowners via email, as a stall tactic, no true motives, she has copies of emails and texts where he has claimed he will do certain things or actually approved things, they've had to deal with this manipulation and lies for 5 years. He emailed last week and wanted to do an HOA meeting with 4 days' notice, and they don't even have by-laws to review. She thinks he filed the HOA for $50.00 and then they will have to pay the remainder for the by-laws. His emails include threats as to what will happen to them if they don't comply. She has emails stating that someone at Green Oak Township advised him that he shouldn't allow them access to the boat launch or future boat launch that they should all have to put in their own boat launches. She would like the name of the person from Green Oak that told him that. They were promised a boat launch when they bought the property, nothing was said if there was a development, and acknowledging that bait and switch on what they were originally were given on what the development should have been and what they signed, why would they spend so much money on a community boat launch if they had to put their own boat launch in.

Resident, 27203 N. Dixboro Road. He wanted to speak to the density on the other side of the lake. When he purchased his land, he stood on top of the fill dirt from the neighbors and the developer told him they were going to do a development across the lake. He was

told there would be 20-30 homes over the entire 108 acres, and since 2019 the developer has been slipping in phase 2 pictures of the phase 2 development he is trying to get passed and approved. Every single one home is a pencil size lot and adding 37 homes to a 50-acre lake is a lot. They have 12 people on the lake now, and when they have two people out there using the lake, they wave out on the dock to alert one another it's their turn next. Tripling the amount of people and boats on the lake will make the power boats useless and they may as well go to kayaks. He was told there would be 20-30 homes across the entire land and the developer wasn't forthcoming with him that there would be 37 lake access homes, that information may have changed his mind on purchasing the land, it would have been nice to know that. He was told there would be an easement on Damien's property going to the north side of the lake and an undeveloped communal area for people to enjoy and now it looks like two homes are being built there. He is concerned with the density, the sewage and waste.

Mr. Marshall closed the call to the public at 7:14 p.m. due to no further comments.

DISCUSSION ITEMS

A. Recommend approval or denial to Township Board for Final Review for Dove Lake, a Residential Planned Unit Development located on parcel # 4716-13-200-017. The property is currently zoned RE Residential Estates 108.51 acres in size

Tom Schroeder – owner
Roger Myers – legal representative for the applicant

Ms. Maren referred to the Carlisle Wortman memo dated June 16, 2025.

As set forth in Sec. 38-238(d)2, the Planning Commission shall review the final site plan and shall either approve, approve with conditions or changes, deny, or postpone action on the proposed final site plan. Any final PUD recommendation of approval should be conditioned upon the following which were also conditions of the original PUD approval to be accomplished through the PUD agreement and master deed.
1. The applicant must enter into a PUD development agreement with the Township.
2. The applicant must submit a master deed for review and approval by the Township.
3. The PUD development agreement must address the applicant's donation to the Township's Enivonrmental Trust Fund – Pathway Fund in lieu of constructing the 10-foot pathway along Twelve Mile Road.
4. The PUD development agreement must convey to the Township the necessary right-of-way easement for the construction of the future pathway along Twelve Mile Road.
5. The PUD development agreement and master deed must include a prohibition limiting obstructions between houses.

The Planning Commission can recommend additional conditions or elements that should be included in the PUD agreement. Any such conditions must be for the purpose of ensuring that public services and facilities affected by a proposed land use or activity will be capable of accommodating increased service and facility loads caused by the land use or activity, protecting the natural environment and conserving natural resources and energy, ensuring

compatibility with adjacent uses of land, and promoting the use of land in a socially and economically desirable manner.

Mr. Miner corrected himself when he said the applicant had legal access, that should only be determined by the township legal counsel. There is access off of Kensington Court and he wants to make sure that it is a legal manner. He didn't see maintenance of that stretch of private road addressed anywhere and he would like the attorney to look at that. The master deed and bylaws are still under review; he noticed the exhibit B drawings were not included and he would like those to be submitted.

Mr. Schroeder stated he was surprised and blindsided by some of his neighbors the last time. He noted Mr. Miner had said he scrutinized the plan and said they are satisfied with these plans. He didn't see how the existing homes had anything to do with this. The meets and bounds parcel on the east side of the lake, he said they wanted to try an association, he heard it for the first time 3 weeks ago. The deeds and bylaws were already done in case they wanted to start one. He booked the room for the meeting but apparently they need more notice, he never not let them have a meeting. There is no mandate for them to have an association, most of them told him that they didn't want an HOA looking over their back, so to hear this was disingenuous.

Mr. Schroeder provided signed contracts from the neighbors that shows they knew about the 37 lots that acknowledged this. The community septic was approved 4 years ago, by the County and the State of Michigan and it's closest to his own home. The solids and fluid would all go to the septic field, but then it was revised so the solids will be in the front of everyone's yard and the fluids only will be going to the field which will be much less stress on the field. As far as the density, their average is 2 acres, he has 108 divided by 37 lots is 2.9 acres per lot, the township has a cluster option and he went with that since it provides a large open space. They are the same or larger as Hidden Lake lots. His current estimates is about $100,000 more than what they paid for their lots. The new homes, even though on a smaller building envelope they will be more expensive so they should be happy they will be increasing their value. With 40 years of experience and a large investment, he had a vision of repurposing this into a lake view community, than that abandoned mining site. The boat launch, for them to say I want a new boat launch but not the new development, they've been using his own property for the launch. He provided a copy of all of this for the Planning Commissions review.

Mr. Myers, noted Mr. Schroeder felt it was important to address some of the allegations for the first time at the last meeting and additional statements made this evening. It's important to understand why we are here, we are not here to mitigate a dispute with the neighbors, the property on the other side of the lake is not part of this discussion. He thinks its important to reiterate this should not distract from why they are here tonight. The concerns that have been raised with respect to this proposed condominium and the density, the reality is the ship has already sailed, the density was approved. The plan before them is consistent with what's already been approved by the Township, it's really looking at the engineering and the specific requirements. He would like to address the status of the master deed and bylaws and exhibit B drawings, when he was retained, he reached out to Ms. Rosati and asked if the master deed and bylaws are required at this stage to be approved, if so, it wasn't in the packet, and Ms. Rosti confirmed the master deed and bylaws are not required at this junction to be reviewed, it's premature, they

have to be approved and reviewed before they are recorded. Consistent with that the reason the exhibit B drawings are not completed because they can't until the final site plan is approved. When the final site plan is approved the master deed and bylaws and exhibit B's will be submitted for review and approval and recorded.

The maintenance of the private road, there are specific requirements, and one is all of the detail on how that will be handled will be addressed in the master deed and reviewed and approved by the Township attorney. The issues will be addressed but tonight it's premature to do that.

One of the concerns is property values and to address that in a non-PUD context the lot coverage percentage is capped under 25%. In the context of a PUD, they are requesting as a deviation that the Planning Commission recommends the maximum lot coverage percentage be increased from 25 to 40%. Hidden Lake is 70 to 75% and it's appropriate for homes that are clustered around the lake and provides a proportionality that makes sense. He believed that the deviation will result in a higher quality development.

Mr. Marshall confirmed the applicant is asking to add an additional deviation to this PUD and this is the first time they have heard about this. Ms. Kolb, township attorney, stated the approximate provision was provided that allows deviations to be approved by the Planning Commission. If the Planning Commission would like more time to consider that and how that affects the coverage of the lots, that is fine, it's a pretty big number.

Mr. Marshall stated he looked through Section 18-279 land division and it states that final preliminary plan shall include those documents so he is confused by the statement that they don't need to see any of that at this point which is final plan approval. Ms. Kolb stated she has the documents and until the final approval is given and all conditions are known they can't be approved, if that is something the Commission would like to see and review before taking any action. Mr. Marshall stated it's certainly something he would like to see and review.

Ms. Beyer questioned does that change the number from 37 lots to less lots. Ms. Pearsall stated the footprint of the building on those 37 lots would change. Mr. Marshall stated it changes on how they will look at this, if the building envelope is increased, he is concerned with that.

Ms. Maren asked if the setbacks would change. Mr. Myers stated they are not requesting the setbacks be changed. He noted even 35% is acceptable. Mr. Marshall stated he would like to see mockups of how that would affect the lots.

Mr. Janke stated he was not on the Board 4 years ago and he was amazed when he looked in the archives and saw what he saw. On the construction page, the minimum width is 70' but when he looks at the layout there are 16 lots at the lakeside that are less than 70', so how is that consistent with the requested deviation having a minimum width of 70'. Mr. Schroeder explained they are pie shaped lots and they do go down, it's probably 60-70% of the lot that the house is built on, as it pies down, even though it's in the setback it won't be part of the building area. Mr. Janke stated there is a setback that was agreed to and it should never be less than 15' total, what was the inspiration for

that? Mr. Schroder stated it was Hidden Lake, all the ones on the water are 15' between homes minimum. Mr. Janke asked if Mr. Schroeder considered putting bigger lots on the water and bigger lots off the other side of the street? Mr. Schroeder stated with the cluster option, the lake lots are more valuable than the non-lake lots. Mr. Janke stated he is troubled by the density and width of the setbacks. Mr. Schroder stated it's already been approved.

Mr. Meyer stated the width at the building site in the building of regulations, to the extent it may be less at a point of the lot that's not at the building site and it could still be in conformance with the minimum of 70'.

Mr. Janke asked if Mr. Schroeder will put in a driveway cut into the cul de sac. Mr. Schroder stated that was something the neighbors wanted, for a private drive easement, to hook up to the cul de sac, no one wanted to be on a dirt road, so there is a provision for that. Mr. Marshall stated he doesn't recall seeing a connection to that cul de sac from the neighboring yards.

Mr. Janke stated he saw some inconsistencies, it appears a truck turn around, yet other drawings call it boat parking. What is it? Mr. Schroeder stated It was an idea of his to have an extra parking lot, for extra cars, thinking about it Hidden Lake doesn't have that, and it probably wouldn't be needed, but the residents may want a pickle ball court instead. Mr. Janke stated some of the drawings show a diagram of a truck, and there is an island in the truck parking area, Mr. Schroeder stated they were using that as a turn around as part of the engineering standards. Mr. Janke stated at one point there is a fire truck, several drawing show a fire truck at 42' and the new hook and ladder truck is 46'. Clerk Sedlak stated an ariel platform truck is not necessarily for height it's for reach. Mr. Janke stated is this area for boat parking or a truck turn around, there is no way a 75' trailer would use that as a truck turn around. Mr. Janke stated a semi-truck could not make that radius nor could a semi-truck make the radius at the cul de sac. Using a 42.5' old dimension of a fire truck is not appropriate for the new current fire truck, plus why is there not room for a semi-truck, the residents will be having semi-trucks delivering furniture, and delivering their new cars he didn't know why it was approved so small and tight as it is in the cul de sacs.

Mr. Miner stated they only looked at it from a standpoint of safety, and the ability for the ariel platform get in there and get out, it was mostly for maneuverability for emergency vehicles.

Mr. Janke stated in the time he has been on the board every time they look at an outside turn they use 30' turning radius and he is not sure why a 25' was approved. Mr. Miner stated he would check with Chief Gentry.

Mr. Janke stated when he first checked the plans and the septic line location was it ever considered to have that liquid line be on the opposite side of the lake, if there was a leak, it would head downhill south, down to the water, why wasn't that line put on the opposite side. Mr. Miner stated he didn't have any thoughts on that, but they can look at putting it on the opposite side of the street.

Mr. Janke stated he is very concerned about all of the infrastructure responsibility of the

homeowner's, there is a lot to take care of, everyone has holding tanks and booster pumps, it's going to be very expensive to live there. Mr. Schroeder stated there is zero maintenance, he has had none in 3 years only.

Ms. Pearsall stated she has no problem with the sewer system, but the 40% deviation has concerned her, and she would like to see some pictures, that changes it for her.

Mr. Janke asked why are they talking 40% deviation 4 years later?

Ms. Beyer stated she is in agreement with the questions that have been stated, she is also concerned with the 40%.

Clerk Sedlak stated they understand it's a separate issue with the residents, but past performance is a predictor of future performance. He asked if jet skis are allowed on the lake? Mr. Shroeder stated he is planning on having no jet skis.

Clerk Sedlak asked in the drawings that are here right now, what percentage of the available building area is covered by the homes. Mr. Meyer stated because there was no deviation requested as part of these plans it's defaulting to 25%, the homes on the plans are samples that are shown on the elevations.

Clerk Sedlak stated on the smallest lot your 25% allows you 3229 coverage, and you go up to 40% it increases it to 5166, he calculated based on what he said, on the largest lot it takes it from 7612 coverage to 12,179 coverage, that is a significant difference and they need to look at that. Mr. Schroeder brought up Hidden Lake a lot, and what happened at Hidden Lake was a result of a consent judgment, what happened at Hidden Lake shouldn't have happened and should not be considered a norm. Comparing himself to Hidden Lake there is no consent judgment here and it should be left off the table. He agreed with the septic line location; it should be looked into. Are you setting up necessary funds for the overall maintenance of the pumps as part of the HOA process or will it be up to the individual homeowner each time something happens. Mr. Schroeder stated In the PUD it's mandatory to have these set up and they are working on this. It doesn't grind anything, all solids stay in a separate tank.

Mr. Marshall stated in the last meeting he asked about a power failure at the septic system site, and he suggested an emergency power source. He didn't see any changes. In looking at the EGLE permit, references power failure and strongly recommends an alternate is provided for that cause. Also, part two talks about the transfer of ownership of the septic system so that should be covered clearly in the bylaws. He would like to see the bylaws, because he would like to see comments on fertilizers on the lawn, water softener discharge, they do not want to see that going into the lake or the septic system and that is something he will be looking for. Mr. Schroder agreed.

Mr. Marshall referenced Section 38-238 (d) (1) d. There are two phases, but they do not have a schedule for that and he will be looking for that for phase 1 and 2 and Mr. Schroeder will be committed to that schedule. Also, Section 38-240-a phasing and commencement of construction needs to be identified, he needs to see what that schedule will look like and make sure it's self sustaining. They will want to see that

schedule in detail. At the last meeting, he mentioned on page one, it states the cul de sac is greater than 750' and he requested the length should be in there, and it should say it's over 1000, he did not want to see a 2000-foot cul de sac.

There is a request for money that is being put into an environmental trust fund that would be used to complete the bike path, but then the note continues on and says when a separate plan is submitted and approved for the bike path he would withdraw those funds to pay for that path. That takes away the township's ability to make sure that path gets built, he is not in favor of how that is in note 7. The cover sheet does not agree, he is not in favor of giving that money back because the township does not have the ability to make sure it's done.

The comment states that the deed restrictions are required as part of the final site plan, their own documents say that information should be provided at this time.

Mr. Marshall explained note 15- mailboxes, they will not be able to get a postman to come up on that road, they will have to get one at the north entrance at Kensington, he would like to see that. Mr. Marshall questioned who maintains the extension of Kensington Court since it's a private road. Mr. Schroeder stated it would be part of the interior subdivision. Mr. Marshall stated that needs to be clearly identified.

Mr. Marshall stated there are several drawings that signify the Kensington Court extension is a public road and not a private road, that should be addressed on the plans. There are several drawings that have the north arrow pointing south or east. When he sees careless mistakes he has to look much harder at the drawings to find the other careless mistakes Sheet number ST-4 shows a boat ramp between lots 36 and 37 it's the only sheet that shows that, so that should be corrected. All of the ERO drawings have the lot numbers reversed and those should be consistent.

Clerk Sedlak stated they have learned over time once things are approved everything is subject to interpretation. They want him to submit the very best most accurate plan.

Mr. Marshall stated on sheet L-3 what came up is that this Kensington Court extension has no landscaping on it and there is no inclusion of what the design or what phase that will be built under, so that the whole Kensington Court extension needs to be incorporated into the construction plans and design criteria. Ms. Maren stated it does show 4 trees along that area. Mr. Marshall stated that extension of the road goes on for probably 200-300' heading up to Kensington Court. Mr. Shroeder stated it's 800 or 900 feet long, Gordon Foods landscaped their side, the road is already there, the one side is landscaped, it's an existing road. Mr. Marshall also asked how the stormwater on Kensington Court is going to be handled?

Sheet ERO3 shows the boat ramp as a future boat ramp, that needs to be clarified. Mr. Marshall explained the word "future" should be deleted. Lastly, the phase one development doesn't show an access road going to the septic plant, it appears the access road is part of phase 2. How is the maintenance going to be handled if there is no way to get to it. Mr. Schroder stated there is a gate off of 12 Mile, it' gravel with a gate on it. Mr. Marshall stated that was not on any of the drawings and it should be.

Those were his comments in looking at the current plans, and they want to see the covenant and deed restrictions, so he would like to see a resubmittal of these drawings.

Motion by Sedlak, second by Janke
To postpone Final Review for Dove Lake until the following has been submitted to the Planning Commission:

The Planning Commission has had time to review the Master Deeds and Bylaws and other documents, applicant shall provide drawings showing 35% and 40% lot coverage deviations, the applicant shall provide answers or corrections discussed at the meeting by all of the Commissioners.

Roll Call Vote: Ayes: Unanimous
Nays: None

MOTION APPROVED

REPORTS

Chairman – None
Township Board Representative – Clerk Sedlak brought the Commissioners up to date regarding the last Board meeting.
Zoning Board of Appeals Representative – Ms. Pearsall brought the Commissioners up to date regarding the last ZBA meeting.
Planning Consultant – None

Correspondence – None

CALL TO THE PUBLIC

Lori Fleissner 27035 N. Dixboro – She wanted to clarify something the attorney said about them wanting 40% of the lot being built on. She does not want that large of a home on a small lot across from the lake from her, she would rather see larger lots and smaller homes that have some kind of landscaping. The developer keeps talking about Hidden Lake and she does not want that kind of community, her lot is 2.5 acres. The developer also said they lied about signing the document, she was shocked that she signed that document, it's not the document in the package he gave them. Several homeowners can tell them that and she provided that in the packet that she gave the Commissioners. The documents she signed was a bait and switch. 10 of her neighbors did not remember signing that, and she signed it unknowingly. She also believed him about the boat launch on private property., but there will be litigation without a boat launch. They definitely don't want 35 or 40% built on.

Mr. Marshall closed the call to the public at 8:40 p.m. due to no further comments.

ADJOURNMENT

The Planning Commission meeting was adjourned at 8:40 p.m. due to no further

business.

Respectfully Submitted,

Kellie Angelosanto

Kellie Angelosanto
Recording Secretary

Powell Engineering & Associates, LLC
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Engineering a Better Michigan

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June 25, 2025

Green Oak Township Planning Commission
c/o Ms. Debora McKenzie
10001 Silver Lake Road
Brighton, MI 48116

Re: Planning Commission comments at meeting on June 19, 2025
PE Job #19-425

Dear Commissioners,

We received the comments made at the above, referenced meetings and have the following comments accordingly:

1. Percent coverage –
   A parallel plan as completed at the start of the project which showed that the site could be developed according to the ordinance with 37 lots. The zoning of Rural Estates allowed for 37 lots and therefore the PUD – planned unit development allowed a cluster of those 37 allowed lots from the parallel plan.

   Rural Estates allows a 25% lot coverage which would allow for
   (87,120 sq.ft. * 0.25 = 21,780 square feet of coverage per lot)

   If the same percentage coverage was required to be maintained for the proposed clustered lots the allowable square footage would only be approximately 3,000 square feet (garage and home). This would be a very small home allowed with a 3 car garage. Therefore, we are requesting a 40% maximum coverage as part of the PUD, which would allow for 5000 sq.ft. lot coverage.

   This still a very large reduction in proposed lot coverage of the net site area per ordinance (71 net acres = 17.75 acres lot coverage allowed per ordinance at the 25% allowable. We are requesting for 20.2 acres development at 40% which provides only 8.08 acres maximum lot coverage with the PUD cluster option. *This is less than 50% of the allowed for maximum lot coverage from the zoning ordinance.*

2. The phasing schedule will be provided on the revised drawings which will be submitted by 6/27/2025.
3. The length of the cul-de-sac from the intersection is designed at just under 1000 which is 250' more than the 750' allowed. This was a approved as part of the site plan approval – the length of the cul-de-sac has not changed since the site plan approval.
4. The master deed requires that no phosphorus fertilizer is allowed to be used within the development.
5. The boat ramp is shown on sheet COV, GR1, RD1, RD5, ST1, ST4, ST6, SAN1, ERO3, ERO4, and L-4. The boat launch has been approved by EGLE and meets all government authority for the design. A detailed design which was approved will be submitted in the full package by 6/27/2025.
6. All sheets were checked to verify that north arrows and scales are correct and updated will be submitted by 6/27/2025.
7. Detailed landscape plans were provided showing entrance landscaping – entrance landscaping for 12 Mile is on sheet L-5 and will be a great deal of landscaping with the dense existing landscaping that exists. The entrance landscaping for Kensington is shown on sheet L-4 and meets the landscaping requirements of the ordinance.
8. All storm water is designed to be picked up and stored as required by the Livingston County Drain Commission. The entrance roads and all the required storm water and design for both entrances are currently permitted through the Livingston County Drain Commission as required by the Township.
9. A gravel path is required during the first phase within the road easement provided from 12 mile road. The gravel drive will then be removed when the road is extended as part of Phase 2. The gravel drive proposed from 12 Mile is now shown on sheet SAN 4 and SEP 1.
10. Mail boxes are shown and were previously shown both a detail and their placement location on RD5. Please see RD5 for mailboxes.
11. Sump pumps are being picked up in the rear yard storm sewer and perked into the ground – this was accounted for in the storm water calculations.

In addition to the above, we have also made some very minor cleanups to the plans as requested by CES, the Green Oak Township Engineer.

If you need any further information or plans from our office, please do not hesitate to contact us.

POWELL ENGINEERING & ASSOCIATES, LLC
Consulting Engineers



Michael C. Powell, P.E.
President
19-425 dove lake development (schroder - livingston)\docs\ltr 2020-11-19 mckenzie - review response letter.docx

FINAL SITE PLANS FOR

DOVE LAKE ESTATES

GREEN OAK CHARTER TOWNSHIP, LIVINGSTON COUNTY

SITE INFORMATION:

EXISTING PROPERTY ZONING: RE - RURAL ESTATES
PROPOSED PROPERTY USE: PUD - PLANNED UNIT DEVELOPMENT
RE PARALLEL PLAN SHOWS 37 LOTS, THEREFORE
PROPOSED PUD PLAN IS REQUESTING 37 LOTS.
SITE AREA DATA:
GROSS SITE AREA = 108.05 ACRES
NET SITE AREA = 71 ACRES
DEVELOPMENT AREAS
TOTAL AREA OF DISRUPTION = 26 ACRES
TOTAL AREA OF DEVELOPMENT = 20.2 ACRES
(DEVELOPMENT IS 60' ROAD EASEMENT AND LOT AREA AND PARKING LOT)
TOTAL PROPOSED DEVELOPMENT PERCENTAGE = 28.5%
PROPOSED OPEN SPACE = 71.5%

REQUESTED DEVIATIONS AS PART OF PUD:

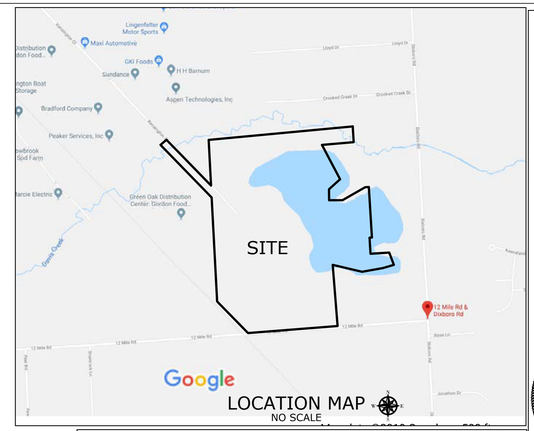
1. 60' PRIVATE ROAD RIGHT OF WAY.
2. LOTS TO BE A MINIMUM OF 12,000 SQ.FT.
3. LOTS TO HAVE A MINIMUM WIDTH OF 70'.
4. FRONT YARD SETBACK 35'.
5. SIDE YARD SETBACK 5' MINIMUM, 15' COMBINED MINIMUM.
6. CUL-DE-SAC LENGTH TO BE OVER 750' - PROPOSED LENGTH OF CUL-DE-SAC 1000 FT MAXIMUM
7. DEVELOPER TO PUT PATHWAY IN ALONG 12 MILE ROAD DURING PHASE 2 OF CONSTRUCTION.
8. LOT COVERAGE REQUESTED TO BE 40% VS 25% ORDINANCE ALLOWANCE:
2 ACRES = 21,780 SQ.FT. = 804010 SQ.FT. > 246,258 SQ.FT. MAX COVERAGE PER PUD

BENCHMARKS

1. 3/4 STEEL PIPE REROD 174' FROM SOUTH PARCEL LINE ELEV 917.50 NAVD 88
2. ⌶ STEEL PIPE SET BY BOSS ENG FOR PREVIOUS DEVELOPMENT ELEV 925.22 NAVD 88
3. 3/4 STEEL PIPE REROD 271' WEST PROP LINE 1214' FROM NORTH PROP LINE ELEV 925.00 NAVD 88
4. 3/4 STEEL PIPE REROD IN ASPHALT AT SE END OF KENSINGTON COURT ELEV 914.92 NAVD 88
5. 3/4 STEEL PIPE REROD (N:9450.9197 E:8267.1092) ELEV. 913.33 NAVD 88
6. 3/4 STEEL PIPE REROD (N:9639.7727 E:8516.3022) ELEV. 911.91 NAVD 88

LEGEND

- EXISTING PROPERTY LINE
- EXISTING CONTOURS
- EXISTING EDGE OF ROAD
- EXISTING ASPHALT ROAD HATCH
- EXISTING GRAVEL ROAD HATCH
- EXISTING LAKE
- EXISTING GRADE
- EXISTING TEST WELL LOCATION
- EXISTING BENCHMARK LOCATION
- PROPOSED EDGE OF CURBED ROAD
- PROPOSED 5' OR 8' CONCRETE WALK
- PROPOSED UNIT LINES
- PROPOSED ROAD EASEMENT
- PROPOSED WELL
- PROPOSED BUILDING SETBACK
- FEMA FLOOD PLAIN LINE
- PROPOSED CONCEPT HOUSE
- PROPOSED STORM, CATCH BASIN, MANHOLE
- PROPOSED SANITARY, MANHOLE
- PROPOSED UTILITY EASEMENT
- PROPOSED ROAD RIGHT OF WAY EASEMENT
- PROPOSED CONTOUR
- PROPOSED ROAD HATCH
- PROPOSED DRIVE HATCH
- PROPOSED FLOW DIRECTION ARROW
- PROPOSED GRADE
- PROPOSED AREA DRAINAGE DISTRICT
- PROPOSED OVERALL DRAINAGE DISTRICT
- PROPOSED LIMITS OF DISRUPTION



LOCATION MAP
NO SCALE

PHASE 1:

DOVE LAKE DRIVE PAVING AND CURB DOVE LAKE 0+00 TO 14+34.78
KENSINGTON COURT ROAD PAVING AND CURB
UNITS 1-14
STORM SEWER AND DETENTION POND IN PHASE 1 AREA
ALL SANITARY LOW PRESSURE MAIN AND SEPTIC FIELD

PHASE 2:

DOVE LAKE DRIVE PAVING AND CURB DOVE LAKE 14+34.78 TO END
DOVE LAKE BOULEVARD
ENTRANCE ONTO 12 MILE ROAD AND WALK ALONG 12 MILE ROAD
UNITS 15-37
PHASE 2 STORM SEWER AND DETENTION POND IN PHASE 2 AREA
BOAT RAMP

GENERAL NOTES:

1. ALL CONSTRUCTION TO CONFORM AND COMPLY TO THE CURRENT STANDARDS AND REQUIREMENTS SPECIFICATIONS OF THE TOWNSHIP OF GREEN OAK, LIVINGSTON COUNTY HEALTH DEPARTMENT LIVINGSTON COUNTY DRAIN COMMISSION AND ANY OTHER GOVERNMENT
2. NO LOADING/UNLOADING REQUIRED FOR THIS TYPE OF DEVELOPMENT.
3. WASTE WATER DISPOSAL TO BE GRAVITY SANITARY INTO ONSITE WASTEWATER DISPOSAL AND MUST MEET CURRENT REQUIREMENTS OF LIVINGSTON COUNTY HEALTH DEPARTMENT AND STATE OF MICHIGAN ENVIRONMENTAL HEALTH DEPARTMENT AND BE OWNED, OPERATED AND MAINTAINED BY THE PROPERTY OWNER'S ASSOCIATION CERTIFIED ONSITE DISPOSAL OPERATOR.
4. WATER SUPPLY TO BE SERVED BY INDIVIDUAL PARCEL ONSITE WELL.
5. ALL STORM SEWERS AND STORMWATER MANAGEMENT TO BE OWNED AND PROPERLY MAINTAINED BY THE PROPERTY OWNER'S ASSOCIATION.
6. TRASH DISPOSAL TO BE MUNICIPAL SINGLE FAMILY PICKUP.
7. A SOIL EROSION AND SEDIMENTATION PERMIT FROM LIVINGSTON COUNTY DRAIN COMMISSION
8. NO STREET LIGHTING PROPOSED.
9. SEE LANDSCAPE PLANS FOR ALL PROPOSED SIGN DETAILS AND LOCATIONS.
10. STORM SEWER DETENTION TO BE PROVIDED ON SITE WITH DETENTION PONDS DISCHARGING TO THE EXISTING ONSITE BODIES OF WATER.
11. ALL REQUIREMENTS BY THE FIRE DEPARTMENT PER THE INTERNATIONAL FIRE CODE WILL BE MET.
12. HOMES ARE NOT TO EXCEED 35' IN HEIGHT AND/OR 2 1/2 STORIES PER THE TOWNSHIP SCHEDULE OF REGULATIONS AND REQUIREMENTS.
13. ALL PROPOSED ROADS ARE PROPOSED TO BE PRIVATE AND BE MAINTAINED THROUGH THE MASTER DEED AND BY LAWS FOR THE PROPOSED SUBDIVISION.
14. DEED RESTRICTION AND CONDOMINIUM DOCUMENTS ARE REQUIRED AS PART OF FINAL SITE PLAN.
15. MAILBOXES TO BE IN GROUPS OF 4 CENTERED BETWEEN THE UNITS BEING SERVED. UNIT 37 WILL HAVE A SINGLE MAILBOX.
16. A PLANNED UNIT DEVELOPMENT AGREEMENT IS REQUIRED AS PART OF FINAL SITE PLAN.
17. ALL HOMES ARE REQUIRED TO HAVE A MINIMUM OF 10' UNRESTRICTED ACCESS TO LAKE SIDE OF HOME AT ALL TIMES. NO PERMANENT OR FIXED OBJECT MAY BE PLACED IN THIS AREA.
18. FUNDS FOR THE PATHWAY ALONG 12 MILE ROAD TO BE PUT INTO THE TOWNSHIP'S PARKS AND RECREATION BUDGET FOR FUTURE USE BY THE TOWNSHIP AND AN EASEMENT SHOWN ON THE PROPOSED SITE PLAN FOR A FUTURE EXTENSION OF PATHWAY.
19. THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS, THE OWNER, OWNER'S ENGINEER, LIVINGSTON COUNTY DRAIN COMMISSION, LIVINGSTON COUNTY ROAD COMMISSION, THE BOARD OF LIVINGSTON COUNTY ROAD COMMISSIONERS, THE TOWNSHIP OF GREEN OAKS, THEIR OFFICERS, AGENTS AND EMPLOYEES AND MUST BE LISTED ADDITIONALLY INSURED PARTIES WITH RESPECTS TO GENERAL LIABILITY ON THE CERTIFICATE OF INSURANCE FOR THE ENTIRETY OF THE PROJECT. ALL ABOVE SHALL NOT BE RESPONSIBLE FOR MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCES OF CONSTRUCTION, NOR SAFETY ON THE JOB SITE, NOR SHALL POWELL ENGINEERING & ASSOCIATES, LLC. OR THE ABOVE BE RESPONSIBLE FOR THE CONTRACTORS FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
20. THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS, THE OWNER AND OWNER'S ENGINEER TOWNSHIP AND COUNTY FROM ALL LIABILITIES FOR INJURY TO PERSON, OR DAMAGE TO OR LOSS OF PROPERTY, OR ANY OTHER LOSS, COST OF EXPENSE, AS A RESULT OF THE ACTIONS OF THE CONTRACTOR, HIS EMPLOYEES, AGENTS, OR SUBCONTRACTORS.
21. THE LOCATION AND ELEVATIONS OF THE EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF THE EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THIS ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLAN.

STORM SEWER TOTAL QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
8" SCHD 40 PVC	41 LF	
12" ADS N-12 PIPE	132 LF	
12" PERF ADS N-12	2780 LF	
12" C76 CL4 PIPE	461 LF	
15" C76 CL4 PIPE	756 LF	
18" C76 CL4 PIPE	733 LF	
24" C76 CL4 PIPE	818 LF	
30" C76 CL4 PIPE	811 LF	
36" C76 CL4 PIPE	33 LF	
2' INLET	11 EA	
4' CATCH BASIN	14 EA	
5' CATCH BASIN	2 EA	
6' CATCH BASIN	1 EA	
4' MANHOLE	4 EA	
5' MANHOLE	5 EA	
6' MANHOLE	3 EA	
2' YARD BASIN	2 EA	
4' YARD BASIN	17 EA	
12" END SECTION	2 EA	
24" END SECTION	3 EA	
36" END SECTION	1 EA	
4' CMP STANDPIPE	4 EA	
4' CMP OVERFLOW STRUCTURE	2 EA	
12" CMP (ENTRANCE)	150 LF	

PAVING QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
3" HIGH MOUNTABLE (30" CURB)	7,658 LF	
6" HIGH MDOT F3 CURB	130 LF	
CLASS 2 SAND	1,602 CF	
21AA CRUSHED LIMESTONE/ NATURAL STONE	66,030 CF	
MDOT 1100L HMA - 20AA LEVELING COURSE	19,396 CF	
MDOT 13A HMA - WEARING COURSE	19,396 CF	

PHASE 1 SANITARY SEWER QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
2" SDR11 HDPE PRESSURE PIPE	1340 LF	
3" SDR 11 HDPE PRESSURE PIPE	1995 LF	
4' INTERNAL FLUSHING CONNECTION AND AIR RELEASE VALVE	4 EA	
4' TERMINAL FLUSHING CONNECTION	2 EA	
4' BRANCH FLUSHING CONNECTION	1 EA	

SEPTIC SYSTEM TOTAL QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
VALVE MANHOLE	2 EA	
5000 GALLON PUMP CHAMBER	2 EA	
MICROFAST 9.0 TREATMENT PLANT	2 EA	
ORENCO V6400A HYDROTEK VALVE	2 EA	
GOULDS XYLEM 4SDX - LIFT STATION PUMPS	2 EA	
GOULDS WE07H EFFLUENT - DOSING TANK	2 EA	
GOULDS WE07H EFFLUENT-TO FIELD	2 EA	
ZOELLER M53/M55-DISCHARGE TANK	2 EA	
1" SCHD 40 PVC	2640 LF	
1.5" SCHD 40 PVC	320 LF	
2" SCHD 40 PVC	26 LF	
3" SCHD 40 PVC	198 LF	
4" SCHD 40 PVC	38 LF	
6" SCHD 40 PVC	10 LF	
3" => 1.5" REDUCER	2 EA	
BOX COVERS	48 EA	
1" SWEEPING 90° ELBOW	48 EA	
6A WASHED STONE	700± TONS	
2NS SAND	925± TONS	

SESC QUANTITY LIST

DESCRIPTION	QUANTITY
CURB & GUTTER INLET FILTER	28 EA
SILT FENCE	13085 LF
CLEAN STONE ACCESS DRIVE (20'W x 60'L)	2 EA
END SECTION RIP RAP	66,030 CF
MDOT 1100L HMA - 20AA LEVELING COURSE	8 EA
SILT FENCE GRAVEL FILTERS	25 EA

LOT SETBACKS:

	REQUIRED	PROVIDED
FRONT	50'	35'
SIDE	20'	5'/10'
WATERFRONT	50'	50'
LOT WIDTH	150'	70'
LOT SIZE	2 ACRES	12,000 SF
% COVERAGE	25% 0.5 ACRE	40% 0.11 ACRE

LOT TABLE:

LOT #	AREA SF	MAX %COV SF	LOT #	AREA SF	MAX %COV SF	LOT #	AREA SF	MAX %COV SF
1	21,958	8,783	14	17,559	7,023	27	15,566	6,226
2	19,872	7,948	15	15,755	6,302	28	15,521	6,208
3	19,908	7,963	16	15,714	6,285	29	15,255	6,102
4	18,581	7,432	17	15,186	6,074	30	14,669	5,867
5	15,532	6,212	18	16,168	6,467	31	12,917	5,166
6	13,280	5,312	19	15,397	6,158	32	14,114	5,645
7	12,298	4,919	20	15,051	6,020	33	14,140	5,656
8	13,366	5,346	21	15,252	6,100	34	14,619	5,847
9	15,916	6,366	22	17,366	6,946	35	15,906	6,362
10	14,072	5,628	23	19,684	7,873	36	23,956	9,582
11	14,223	5,689	24	21,591	8,636	37	30,448	12,179
12	14,349	5,739	25	18,887	7,554	MAX COV TOTAL		246,258
13	16,770	6,708	26	14,814	5,925			

NOTE: AREAS ARE ± DUE TO WATER LINE ELEVATION AS EACH PROPERTY LINE GOES TO EDGE OF WATER.

NOTE: * ASTERISK MEANS MODIFIED REQUESTED AS PART OF OPEN SPACE SPECIAL APPROVAL.

NOTE: TEST WELL #'S ARE BASED ON "LAKES AT FIELDSTONE FARMS"

LEGAL DESCRIPTION (16-13-200-017):

COMMENCING AT THE NORTHEAST CORNER OF SECTION 13, T1N, R6E, GREEN OAK TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN ; THENCE S84°51'26"W 600.00 FEET ALONG THE NORTH LINE OF SAID SECTION FOR A PLACE OF BEGINNING; THENCE S03°26'03"E 150.07 FEET; THENCE S84°51'26"W 200.00 FEET; THENCE S03°26'03"E 200.09 FEET; THENCE S84°51'26"W 405.66 FEET; THENCE S27°49'23"E 493.93 FEET; THENCE S47°36'04"W 190.00 FEET; THENCE S00°33'24"E 140.00 FEET; THENCE N90°00'00"E 170.00 FEET; THENCE N60°07'28"E 333.39 FEET; THENCE N86°33'57"E 47.72 FEET; THENCE S03°26'03"E 646.00 FEET; THENCE S86°33'57"W 30.00 FEET; THENCE S03°26'03"E 205.00 FEET; THENCE N86°33'57"E 239.47 FEET; THENCE S20°37'25"E 167.30 FEET; THENCE S73°43'58"W 145.47 FEET; THENCE S79°52'06"W 270.75 FEET; THENCE N76°39'55"W 384.33 FEET; THENCE S04°33'07"E 782.27 FEET TO A POINT ON THE EAST-WEST 1/4 LINE OF SAID SECTION 13 AND THE CENTER LINE OF 12 MILE ROAD; THENCE S85°26'53"W 1146.03 FEET ALONG SAID 1/4 LINE AND CENTER LINE; THENCE N44°18'12"W 564.94 FEET ALONG THE EASTERLY LINE OF THE C&O RAILROAD PROPERTY; THENCE N02°59'17"W 1327.20 FEET ALONG THE NORTH-SOUTH 1/4 LINE OF SAID SECTION 13; THENCE N44°10'54"W 936.41 FEET ALONG THE SOUTHERLY LINE OF "KENSINGTON COURT"; THENCE N49°30'11"E 100.21 FEET; THENCE S44°10'54"E 815.71 FEET ALONG THE NORTHERLY LINE OF SAID "KENSINGTON COURT"; THENCE N02°59'17"W 740.27 FEET ALONG SAID NORTH-SOUTH 1/4 LINE OF SECTION 13; THENCE N84°51'26"E 2043.92 FEET ALONG SAID NORTH LINE OF SAID SECTION 13 TO THE POINT OF BEGINNING. BEING A PART OF THE NORTHEAST 1/4 OF SECTION 13; T1N, R6E, GREEN OAK TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN CONTAINING 108.05 ACRES OF LAND, MORE OR LESS, BEING SUBJECT TO THE RIGHTS OF THE PUBLIC OVER THE SOUTHERLY 33.00 FEET THEREOF, AS IS OCCUPIED BY 12 MILE ROAD.

PROPRIETOR/DEVELOPER:

CORNERSTONE RESIDENTIAL GROUP
CONTACT: MR THOMAS SCHRODER
13757 12 MILE ROAD
SOUTH LYON, MI 48187
EMAIL: TOMCORNERSTONE@GMAIL.COM

TOPOGRAPHY INFO:

ALL TOPOGRAPHIC SURVEY IS SHOWN PER GARLOCK-SMITH LAND SURVEYING.
PHONE: 517-546-3340
EMAIL: GARLOCKSMITH@COMCAST.NET

ENGINEER SEAL

STATE OF MICHIGAN
MICHAEL C POWELL
ENGINEER
No. 6201027636
LICENSED PROFESSIONAL ENGINEER

Consulting Civil Engineers
"Engineering A Better Michigan"
Powell Engineering & Associates, LLC
4700 Cornerstone Drive, White Lake, Michigan 48383
P: 248.714-9895 info@powellengineeringllc.com

NOTE: AS AN AID TO THE CONTRACTOR, VARIOUS UTILITIES AND UNDERGROUND STRUCTURES ARE SHOWN ON THESE PLANS AND PROFILES. ALL INFORMATION CONCERNING ALL UTILITIES SHOWN ON THE PLANS WAS OBTAINED FROM RECORDS AND FIELD OBSERVATIONS AVAILABLE. HOWEVER, BUT THE OWNER AND ENGINEER DOES NOT GUARANTEE EITHER LOCATION/ELEVATION, OR THAT ADDITIONAL UNDERGROUND STRUCTURES OR UTILITIES MAY NOT BE ENCOUNTERED. IF THE CONTRACTOR DOES ENCOUNTER A DISCREPANCY BETWEEN ANY UTILITY OR STRUCTURE, OR DETERMINES THAT ANY OF THE UTILITIES / STRUCTURES SHOWN ON THESE PLANS IS INCORRECTLY LOCATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND ENGINEER FOR DIRECTION ON HOW TO PROCEED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES. NOTIFY "MISS DIG" AT 1-800-482-7171, 72 HOURS PRIOR TO THE START OF ANY CONSTRUCTION.

BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

DOVE LAKE ESTATES SITE CONDOMINIUMS

GENERAL COVER SHEET

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAK TWP, LIVINGSTON CNTY

SHEET INDEX

COV	GENERAL COVER SHEET
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GR1	PHASE 1 - GRADING (1 OF 4)
GR2	PHASE 1 - GRADING (2 OF 4)
GR3	PHASE 2 - GRADING (3 OF 4)
GR4	PHASE 2 - GRADING (4 OF 4)
RD1	PHASE 1 - DOVE LAKE DR (0+00 - 11+00)
RD2	PHASE 1 -DOVE LAKE DR (STA 11+00 - STA 14+40) AND KENSINGTON COURT
RD3	PHASE 2 - DOVE LAKE DR (STA 14+40 - STA 27+00)
RD4	PHASE 2 - DOVE LAKE DR (STA 27+00 - END) AND DOVE LAKE BLVD
RD5	SIGN PLAN AND TRUCK TURNING RADIUS DETAILS
ST 1	PHASE 1 - STORM AREA 2 (1 OF 1)
ST 2	PHASE 1 & 2 - STORM AREA 2 (2 OF 2)
ST 3	PHASE 2 - STORM AREA 1 (2 OF 2)
ST 4	PHASE 1 & 2 - STORM AREA 3 (1 OF 2)
ST 5	PHASE 2 - STORM AREA 3 (2 OF 2)
ST 6	STORM CALCS AND OVERVIEW
SAN 1	PHASE 1 - SANITARY (1 OF 4)
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SEP 1	PHASE 1 - COMMUNITY SEPTIC FIELD PLAN
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ERO1	SOIL EROSION/DRAINAGE DIST PLAN
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WET	WETLAND AND TREE SURVEY PLAN
L-1	LANDSCAPE PLAN (1 OF 5)
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L-3	LANDSCAPE PLAN (3 OF 5)
L-4	LANDSCAPE PLAN (4 OF 5)
L-5	LANDSCAPE PLAN (5 OF 5)
	STANDARD DETAIL SHEETS

ISSUE DATES

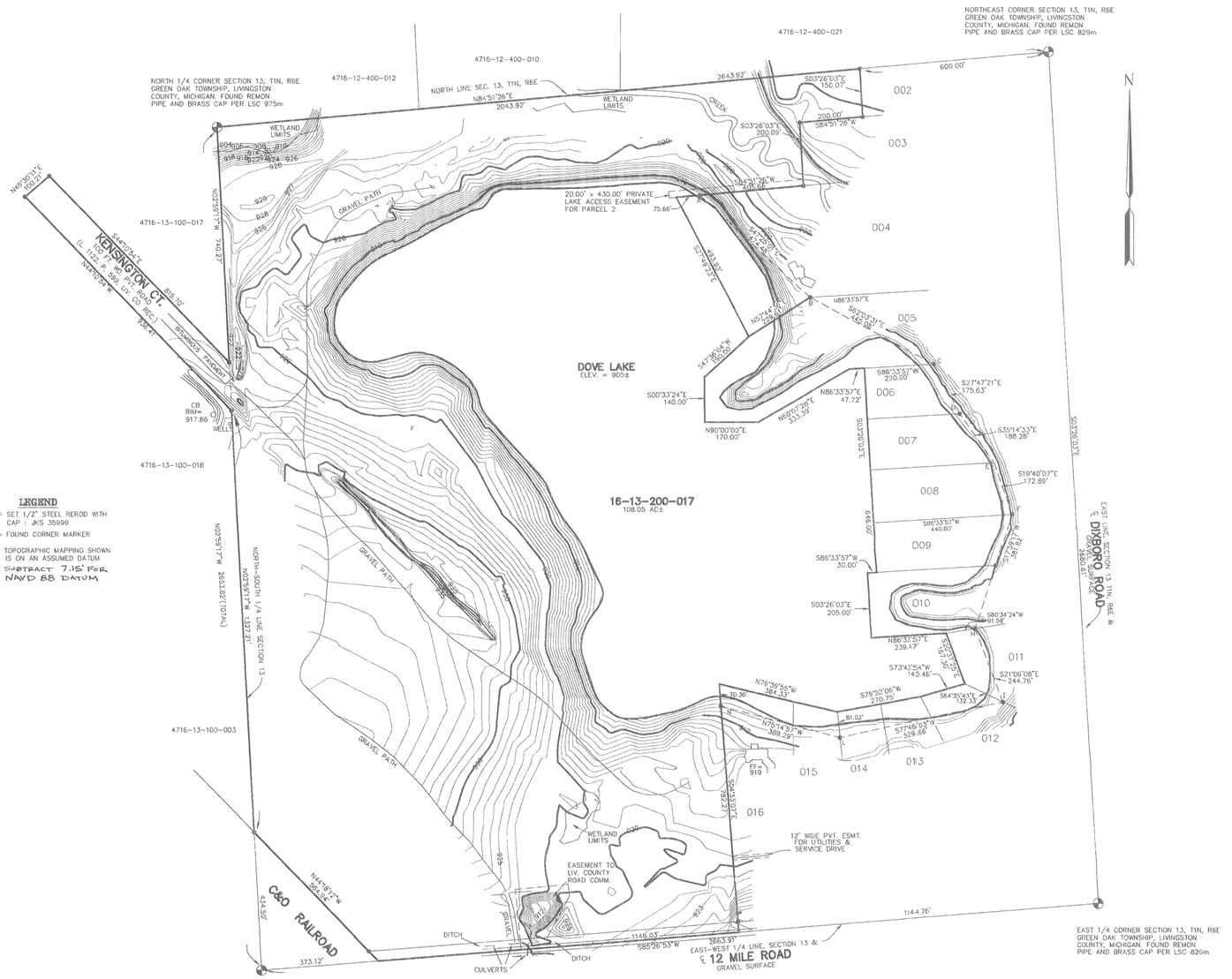
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CONSTRUCTION 9/6/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 7/5/2022
CONSTRUCTION 9/14/2022
CONSTRUCTION 5/5/2024
CONSTRUCTION 8/30/2024
CONSTRUCTION 10/31/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=150'

COV
CONSTRUCTION

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SKETCH OF EXISTING CONDITIONS



LEGEND

- ○ = SET 1/2" STEEL REROD WITH CAP : JKS 35999
- ● = FOUND CORNER MARKER

NOTE: TOPOGRAPHIC MAPPING SHOWN IS ON AN ASSUMED DATUM. SUBTRACT 7.15' FOR NAVD 88 DATUM

PARCEL 16 – 108.05 ACRES

COMMENCING AT THE NORTHEAST CORNER OF SECTION 13, T1N, R6E, GREEN OAK TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN ; THENCE S84°51'26"W 600.00 FEET ALONG THE NORTH LINE OF SAID SECTION FOR A PLACE OF BEGINNING; THENCE S03°26'03"E 150.07 FEET; THENCE S84°51'26"W 200.00 FEET; THENCE S03°26'03"E 200.09 FEET; THENCE S84°51'26"W 330.00 FEET TO POINT "A", A POINT ON A REFERENCE TRAVERSE LINE; THENCE CONTINUING S84°51'26"W 75.66 FEET; THENCE S27°49'23"E 493.93 FEET; THENCE S47°36'04"W 190.00 FEET; THENCE S00°33'24"E 140.00 FEET; THENCE N90°00'00"E 170.00 FEET; THENCE N60°07'28"E 333.39 FEET; THENCE N86°33'57"E 47.72 FEET; THENCE S03°26'03"E 646.00 FEET; THENCE S86°33'57"W 30.00 FEET; THENCE S03°26'03"E 205.00 FEET; THENCE N86°33'57"E 239.47 FEET; THENCE S20°37'25"E 167.30 FEET; THENCE S73°43'54"W 145.46 FEET; THENCE S79°52'06"W 270.75 FEET; THENCE N76°39'55"W 384.33 FEET; THENCE S04°33'07"E 70.36 FEET TO POINT "N", A POINT ON SAID REFERENCE TRAVERSE LINE THAT LIES THE FOLLOWING NINE (9) COURSES DISTANT FROM AFORESAID POINT "A": S47°25'01"E 474.48 FEET, S62°03'31"E 445.08 FEET, S27°47'21"E 175.63 FEET, S35°14'33"E 188.26 FEET, S19°40'07"E 172.89, S17°59'17"W 381.82 FEET, S21°06'08"E 244.76 FEET, S77°46'03"W 529.66 FEET AND N75°14'57"W 388.29 FEET; THENCE CONTINUING S04°33'07"E 711.91 FEET TO A POINT ON THE EAST–WEST 1/4 LINE OF SAID SECTION 13 AND THE CENTER LINE OF 12 MILE ROAD; THENCE S85°26'53"W 1146.03 FEET ALONG SAID 1/4 LINE AND CENTER LINE; THENCE N44°18'12"W 564.94 FEET ALONG THE EASTERLY LINE OF THE C&O RAILROAD PROPERTY; THENCE N02°59'17"W 1327.21 FEET ALONG THE NORTH–SOUTH 1/4 LINE OF SAID SECTION 13; THENCE N44°10'54"W 936.41 FEET ALONG THE SOUTHERLY LINE OF "KENSINGTON COURT"; THENCE N49°30'11"E 100.21 FEET; THENCE S44°10'54"E 815.70 FEET ALONG THE NORTHERLY LINE OF SAID "KENSINGTON COURT"; THENCE N02°59'17"W 740.27 FEET ALONG SAID NORTH–SOUTH 1/4 LINE TO THE NORTH 1/4 CORNER OF SAID SECTION 13; THENCE N84°51'26"E 2043.92 FEET ALONG SAID NORTH LINE OF SAID SECTION 13 TO THE PLACE OF BEGINNING; BEING A PART OF THE NORTHEAST 1/4 OF SECTION 13; T1N, R6E, GREEN OAK TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN CONTAINING 108.05 ACRES OF LAND, MORE OR LESS, BEING SUBJECT TO THE RIGHTS OF THE PUBLIC OVER THE SOUTHERLY 33.00 FEET THEREOF, AS IS OCCUPIED BY 12 MILE ROAD, ALSO BEING TOGETHER WITH THE USE OF A 12.00 FOOT WIDE PRIVATE EASEMENT FOR UTILITIES AND SERVICE DRIVE AS DESCRIBED BELOW, ALSO BEING SUBJECT TO THE USE OF A 20.00 FOOT BY 430.00 FOOT PRIVATE LAKE ACCESS EASEMENT FOR PARCEL 2 AS DESCRIBED BELOW, ALSO BEING SUBJECT TO AND TOGETHER WITH EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY.

20.00 FOOT BY 430.00 FOOT PRIVATE LAKE ACCESS EASEMENT FOR PARCEL 2:

COMMENCING AT THE NORTHEAST CORNER OF SECTION 13, T1N, R6E, GREEN OAK TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN ; THENCE S03°26'03"E 350.16 FEET ALONG THE EAST LINE OF SAID SECTION AND THE CENTER LINE OF DIXBORO ROAD; THENCE S84°51'26"W 600.00 FEET FOR A PLACE OF BEGINNING; THENCE CONTINUING S84°51'26"W 430.00 FEET; THENCE N03°26'03"W 20.00 FEET; THENCE N84°51'26"E 430.00 FEET; THENCE S03°26'03"E 20.00 FEET TO THE PLACE OF BEGINNING; BEING SUBJECT TO AND TOGETHER WITH EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY.

12.00 FOOT WIDE PRIVATE ESMT. FOR UTILITIES AND SERVICE DRIVE:

A 12.00 FOOT WIDE PRIVATE EASEMENT FOR UTILITIES AND SERVICE DRIVE BEING DESCRIBED AS FOLLOWS: COMMENCING AT THE EAST 1/4 CORNER OF SECTION 13, T1N, R6E, GREEN OAK TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN; THENCE S85°26'53"W 1144.78 FEET ALONG THE EAST–WEST 1/4 LINE OF SAID SECTION AND THE CENTER LINE OF 12 MILE ROAD; THENCE N04°33'07"W 202.41 FEET FOR A PLACE OF BEGINNING; THENCE CONTINUING N04°33'07"W 12.00 FEET; THENCE N85°26'53"E 548.34 FEET; THENCE S10°50'02"E 12.05 FEET; THENCE S85°26'53"W 549.49 FEET TO THE PLACE OF BEGINNING.

STATE OF MICHIGAN
JACK K SMITH
PROFESSIONAL SURVEYOR
No. 4001035999
LICENSED PROFESSIONAL SURVEYOR

JACK K. SMITH
PROFESSIONAL SURVEYOR No. 35999

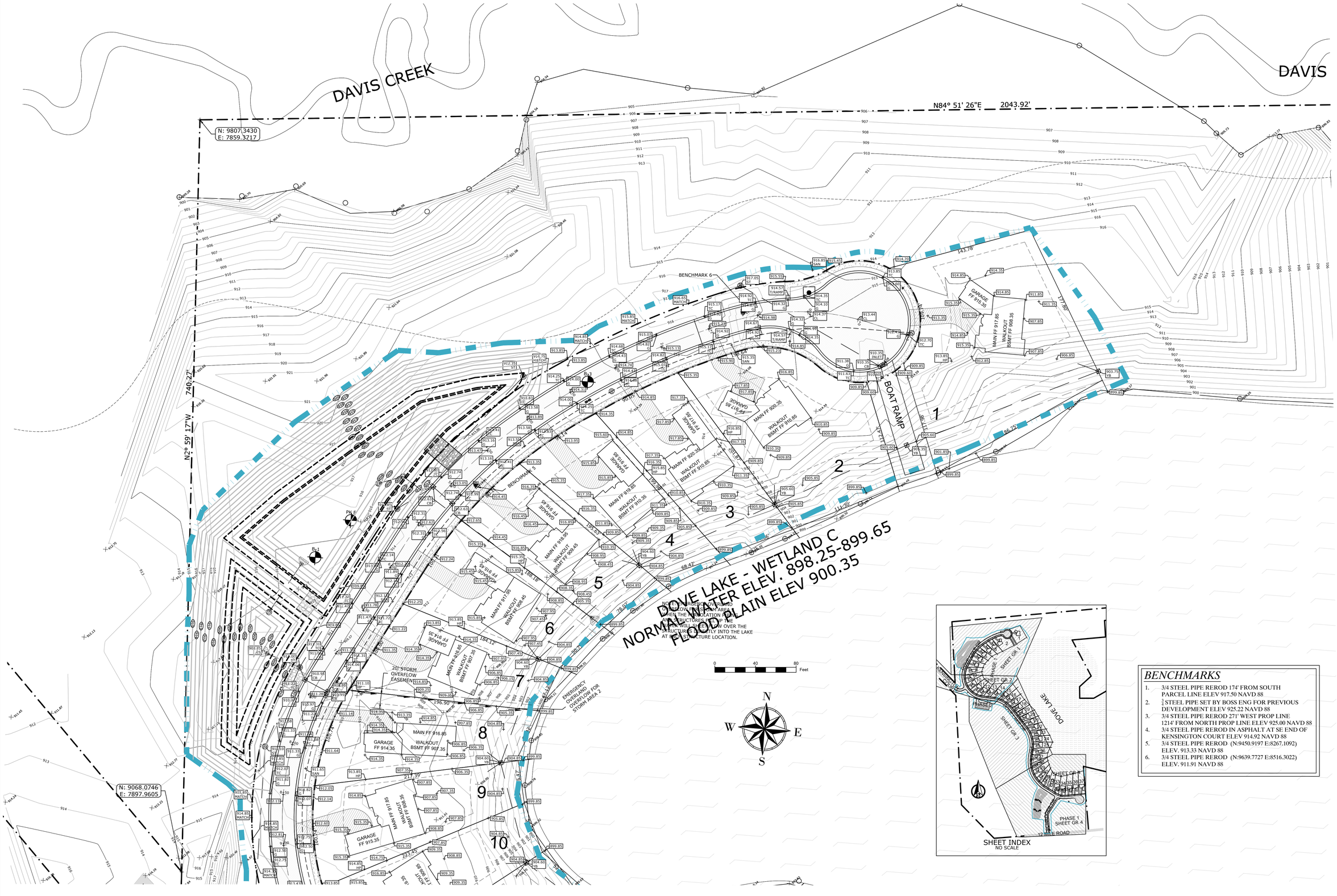
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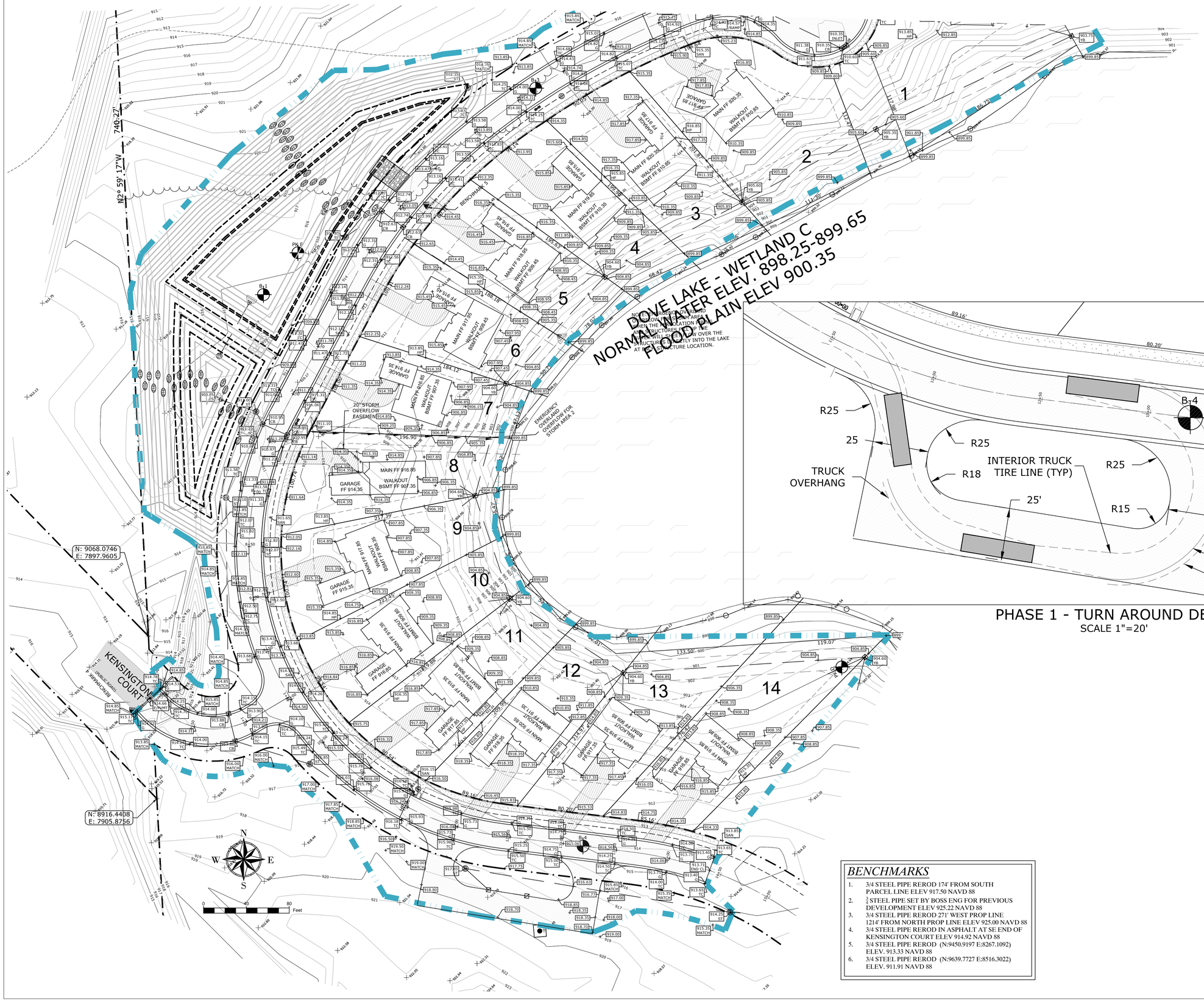
SECTION: 13 TOWN: 1 NORTH RANGE: 6 EAST

GREEN OAK TOWNSHIP
LIVINGSTON COUNTY, MICHIGAN

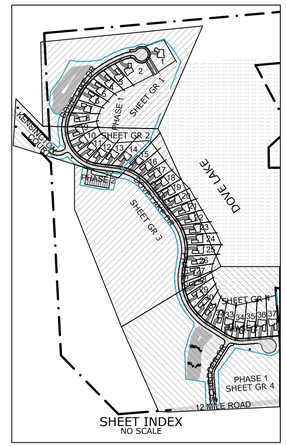
GARLOCK–SMITH
PROFESSIONAL SURVEYORS
516 EAST GRAND RIVER
HOWELL, MICHIGAN 48843
(517) 546 – 3340
FAX: (517) 546 – 2941

SCALE: 1" = 200'	
DATE: 12-22-2021	CREW: JKS/DJS
BOOK NO. 218 PG 02	COMP: JKS
REV: BK. 152 PG 01	DRAWN: JKS
SHEET 1 OF 1	


DAVIS CREEK
DAVIS
N84° 51' 26"E 2043.92'
N: 9807.3430
E: 7859.3717
N2° 59' 17"W 740.27'
BENCHMARK 6
DOVE LAKE - WETLAND C
NORMAL POOL ELEV. 898.25-899.65
FLOOD PLAIN ELEV 900.35
NOTE: EMERGENCY OVERLAND FLOW OVER THE PARKING AREA BETWEEN THE INSULATION POINT AND STRUCTURES TO KEEP THE WATER WILL SHEET FLOW OVER THE STRUCTURES DIRECTLY INTO THE LAKE AT EACH STRUCTURE LOCATION.
BOAT RAMP
20' STORM OVERFLOW EASEMENT
EMERGENCY OVERLAND OVERFLOW FOR STORM AREA 2
MAIN FF 916.85
WALKOUT BSMT FF 907.35
GARAGE FF 914.35
GARAGE FF 915.35
MAIN FF 915.35
WALKOUT BSMT FF 909.35
MAIN FF 917.85
WALKOUT BSMT FF 909.35
MAIN FF 918.85
WALKOUT BSMT FF 910.85
MAIN FF 919.85
WALKOUT BSMT FF 909.45
MAIN FF 917.85
WALKOUT BSMT FF 909.45
MAIN FF 960.35
WALKOUT BSMT FF 910.85
GARAGE FF 917.85
GARAGE FF 916.85
GARAGE FF 914.35
GARAGE FF 915.35
GARAGE FF 916.35
GARAGE FF 917.35
MAIN FF 917.85
WALKOUT BSMT FF 906.35
MAIN FF 918.85
WALKOUT BSMT FF 907.35
MAIN FF 919.85
WALKOUT BSMT FF 908.45
MAIN FF 917.85
WALKOUT BSMT FF 908.45
GARAGE FF 914.35
MAIN FF 917.85
WALKOUT BSMT FF 906.35
GARAGE FF 917.85
MAIN FF 960.35
WALKOUT BSMT FF 910.85
GARAGE FF 914.35
MAIN FF 917.85
WALKOUT BSMT FF 906.35
GARAGE FF 915.35
MAIN FF 915.35
WALKOUT BSMT FF 909.35
GARAGE FF 916.35
MAIN FF 918.85
WALKOUT BSMT FF 909.35
GARAGE FF 917.35
MAIN FF 919.85
WALKOUT BSMT FF 909.35
GARAGE FF 914.35
MAIN FF 917.85
WALKOUT BSMT FF 907.35
GARAGE FF 915.35
MAIN FF 917.85
WALKOUT BSMT FF 909.35
GARAGE FF 916.35
MAIN FF 918.85
WALKOUT BSMT FF 909.35
GARAGE FF 917.35
MAIN FF 919.85
WALKOUT BSMT FF 909.35
GARAGE FF 914.35
MAIN FF 916.85
WALKOUT BSMT FF 907.35
GARAGE FF 915.35
MAIN FF 915.35



PHASE 1 - TURN AROUND DETAIL
SCALE 1"=20'



BENCHMARKS

1. 3/4 STEEL PIPE REROD 174' FROM SOUTH PARCEL LINE ELEV 917.50 NAVD 88
2. ¾ STEEL PIPE SET BY BOSS ENG FOR PREVIOUS DEVELOPMENT ELEV 925.22 NAVD 88
3. 3/4 STEEL PIPE REROD 271' WEST PROP LINE 1214' FROM NORTH PROP LINE ELEV 925.00 NAVD 88
4. 3/4 STEEL PIPE REROD IN ASPHALT AT SE END OF KENSINGTON COURT ELEV 914.92 NAVD 88
5. 3/4 STEEL PIPE REROD (N:9450.9197 E:8267.1092) ELEV. 913.33 NAVD 88
6. 3/4 STEEL PIPE REROD (N:9639.7727 E:8516.3022) ELEV. 911.91 NAVD 88

Consulting Civil Engineers
"Engineering A Better Michigan"

Powell Engineering & Associates, LLC

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P: 248.714-9895 info@powellengineeringllc.com

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BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

DOVE LAKE ESTATES
PHASE 1 GRADING (2 OF 4)

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

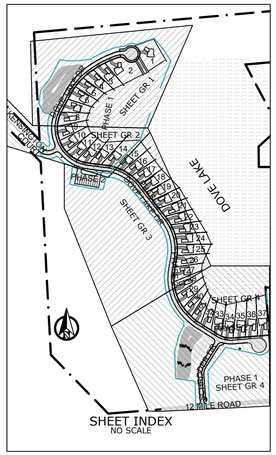
ISSUE DATES

CONSTRUCTION 5/19/2021
CONSTRUCTION 9/6/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 7/5/2022
CONSTRUCTION 5/5/2024
CONSTRUCTION 8/27/2024
CONSTRUCTION 10/31/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=40'

GR2
CONSTRUCTION

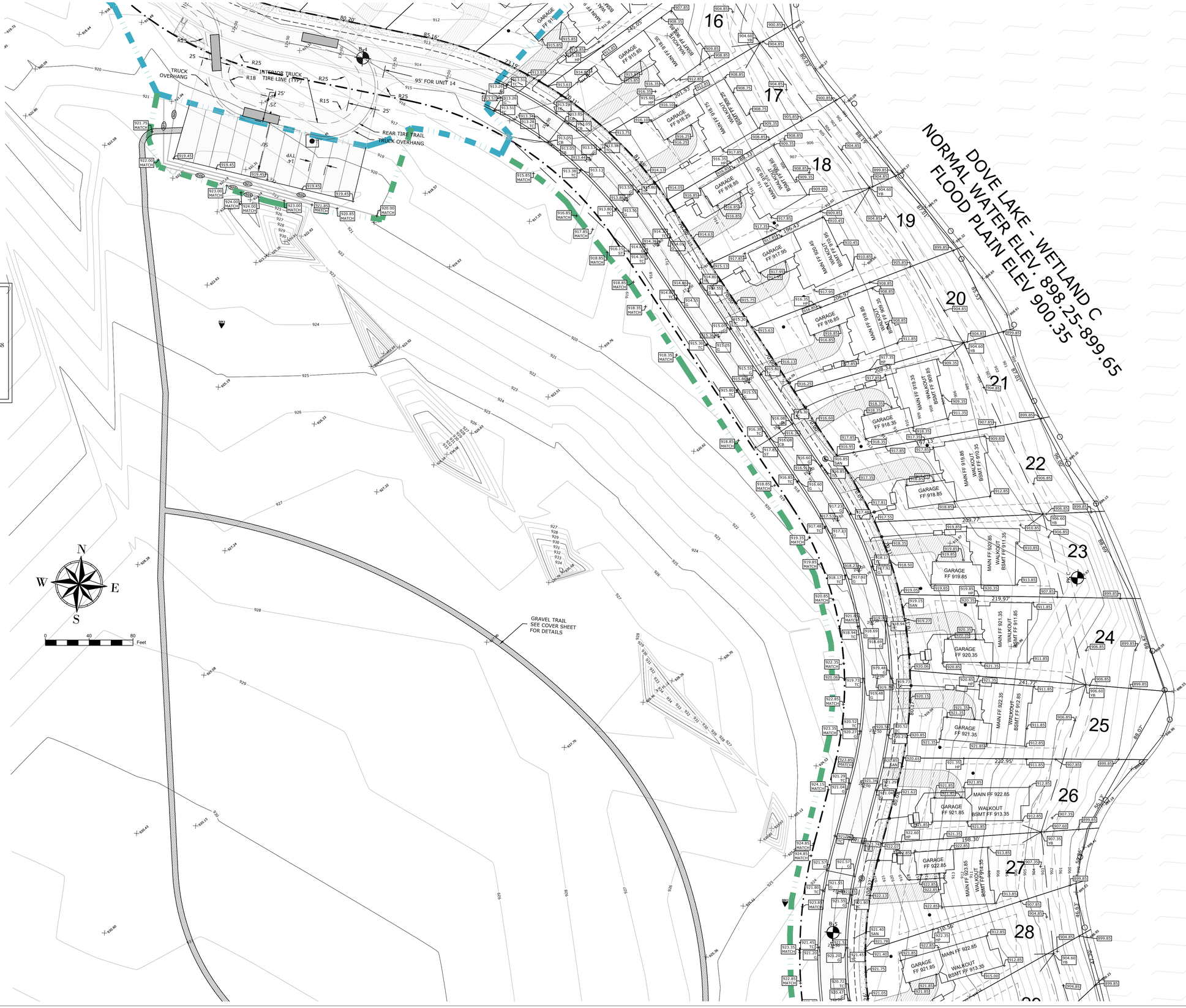
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SHEET INDEX
NO SCALE

BENCHMARKS

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BEFORE YOU DIG
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1-800-482-7171

DOVE LAKE ESTATES
PHASE 2 - GRADING (3 OF 4)

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

ISSUE DATES

CONSTRUCTION 5/19/2021
CONSTRUCTION 9/6/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 7/5/2022
CONSTRUCTION 5/5/2024
CONSTRUCTION 8/27/2024
CONSTRUCTION 10/31/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=40'

GR 3
CONSTRUCTION

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N
W
E
S
0
40
80
Feet

NOTE: EMERGENCY OVERLAND OVERFLOW FOR STORM AREA 3 WHEN THE PERCOLATION PIPING AND STRUCTURES FILL UP THE WATER WILL SHEET FLOW OVER THE STRUCTURES DIRECTLY INTO THE LAKE AT EACH STRUCTURE LOCATION.

DOVE LAKE - WETLAND C
NORMAL WATER ELEV. 898.25-899.65
FLOOD PLAIN ELEV 900.35

20' STORM WATER OVERLAND OVERFLOW EASEMENT

EMERGENCY OVERLAND OVERFLOW ROUTE FOR STORM AREA 1 WITH REQUIRED CHECK DAMS SEE ST1 FOR CHECK DAM DESIGN AND DETAILS

10' STORM EASEMENT ON PARCEL 1

10' STORM EASEMENT FOR PARCEL 15 (TYP)

EX HOUSE FF 913.85

EMERGENCY OVERLAND OVERFLOW ROUTE FOR STORM AREA 1

25' INGRESS/EGRESS EASEMENT (TYP)

10' PATHWAY EASEMENT (TYP) 8' PATHWAY

5' WIDE 4" DEEP GRAVEL PATHWAY WITH WEED BARRIER MEANDERING THROUGH EXISTING VEGETATION AS PART OF PHASE 2 (TYP)

EXISTING WETLAND NOT TO BE DISTURBED

BENCHMARK 1

10' PATHWAY EASEMENT (TYP) 8' PATHWAY TO BE CONSTRUCTED AS PART OF PHASE

PROPOSED 60' 1/2 RIGHT OF WAY LINE FOR 12 MILE ROAD

STORM RETENTION EASEMENT FOR 12 MILE ROAD DRAINAGE (L 1702, PG 839-841 L.C.R.)

EXISTING 33' 1/2 RIGHT OF WAY LINE FOR 12 MILE ROAD

EXISTING CENTERLINE 12 MILE ROAD AND SUBJECT PROPERTY SOUTHERN LINE

S85° 26' 53"W 1146.03'

S4° 33' 07"E 782.27'

N: 7277.6919
E: 9512.0617

NORTH 33' RIGHT OF WAY
12 MILE ROAD

12 MILE ROAD
(EX 66' RIGHT OF WAY)

EAST - WEST 1/4 LINE SECTION 13

BENCHMARKS

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SHEET INDEX
NO SCALE

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CALL MISS DIG
1-800-482-7171

13757 12 MILE ROAD
PARCEL I.D. #16-13-200-016
SAME OWNER AS DEVELOPER
TAX I.D. #16-13-200-016

DOVE LAKE ESTATES
PHASE 2 - GRADING (4 OF 4)

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAK TWP, LIVINGSTON CNTY

ISSUE DATES

CONSTRUCTION 5/19/2021
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CONSTRUCTION 5/5/2024
CONSTRUCTION 10/31/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=40'

GR 4
CONSTRUCTION

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SOIL BORINGS - ATV BORING LOG DONE ON 10/15/2021

B-3 (B-1 10/15/21)
0 - 7' MOIST MEDIUM BR SAND & GRAVEL
7' - 11' MOIST BROWN SANDY SILT
11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-4 (B-2 10/15/21)
0 - 5.5' MOIST SANDY BROWN CLAY W/AGGREGATE
5.5' - 7' MOIST BROWN SANDY SILT
7' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-5 (B-3 10/15/21)
0 - 13' MOIST SANDY BROWN CLAY
13 - 14' MOIST SANDY BROWN SILT
14'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

B-6 (B-4 10/15/21)
0 - 6' FILL MOIST SANDY BROWN CLAY W/ AGGREGATE
6' - 13.5' FILL - MOIST DR BROWN/GRAY SANDY CLAY W/ AGGREGATE
13.5'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

DOVE LAKE - WETLAND C
NORMAL WATER ELEV. 898.25-899.65
FLOOD PLAIN ELEV 900.35

BOAT RAMP

KENSINGTON COURT (PUBLIC ROAD)

PROPOSED LANDSCAPE PLAN (SEE SHEET L-4)

N: 8916.4408
E: 7905.8756

N: 9068.0746
E: 7897.9605

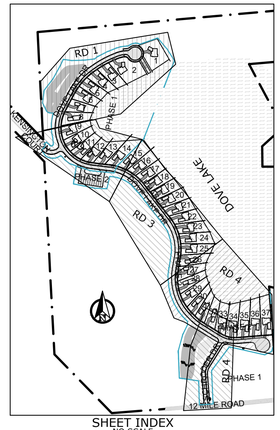
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TOTAL PAVING QUANTITY LIST

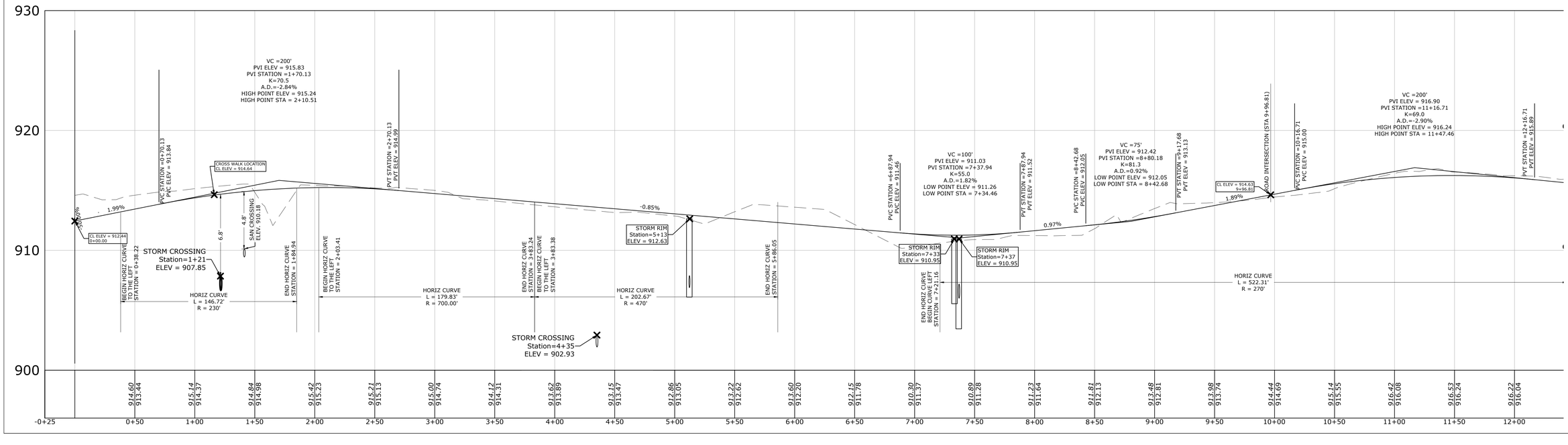
DESCRIPTION	QUANTITY	AS-BUILT
3" HIGH MOUNTABLE (30" CURB)	7,658 LF	
6" HIGH MDOT F3 CURB	130 LF	
CLASS 2 SAND	1,602 CF	
21AA CRUSHED NATURAL LIMESTONE	66,030 CF	
MDOT 1100L HMA - 20AA LEVELING COURSE	19,396 CF	
MDOT 13A HMA - WEARING COURSE	19,396 CF	

LEGEND

- EXISTING PROPERTY LINE
- EXISTING CONTOURS
- EXISTING EDGE OF ROAD
- EXISTING ASPHALT ROAD HATCH
- EXISTING GRAVEL ROAD HATCH
- EXISTING LAKE
- EXISTING GRADE
- EXISTING FEMA FLOOD PLAIN LINE
- PROPOSED EDGE OF CURBED ROAD
- PR 5' CONCRETE WALK (INTERIOR) OR 8' (ALONG 12 MILE) CONCRETE WALK
- PROPOSED UNIT LINES
- PROPOSED ROAD EASEMENT
- PROPOSED WELL
- PROPOSED BUILDING SETBACK
- PROPOSED CONCEPT HOUSE
- PROPOSED STORM, CATCH BASIN, MANHOLE
- PROPOSED SANITARY, MANHOLE
- PROPOSED UTILITY EASEMENT
- PROPOSED ROAD RIGHT OF WAY EASEMENT
- PROPOSED CONTOUR
- PROPOSED ROAD HATCH
- PROPOSED DRIVE HATCH
- PROPOSED FLOW DIRECTION ARROW
- PROPOSED GRADE
- PROPOSED LIMITS OF DISRUPTION



SHEET INDEX
NO SCALE



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DOVE LAKE ESTATES SITE CONDOMINIUMS
PHASE 1 (STA 0+00 - 11+00)

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

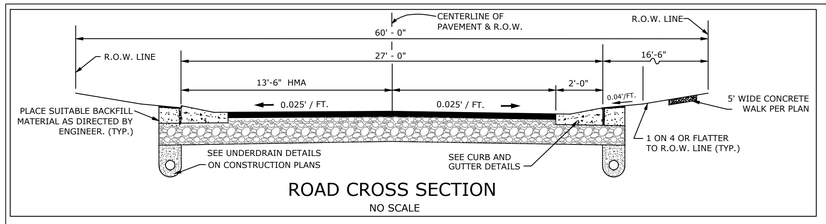
ISSUE DATES

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CONSTRUCTION 6/4/2021
CONSTRUCTION 5/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 5/5/2024
CONSTRUCTION 9/3/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	H:1"=40'V:1"=4'

RD 1
CONSTRUCTION

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ROAD CROSS SECTION

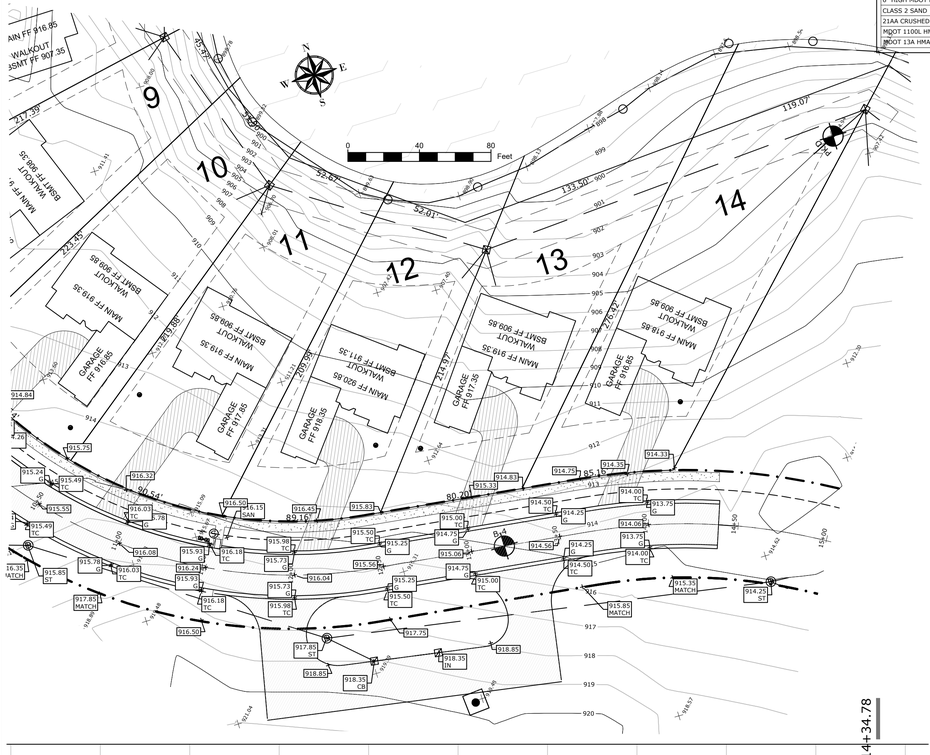
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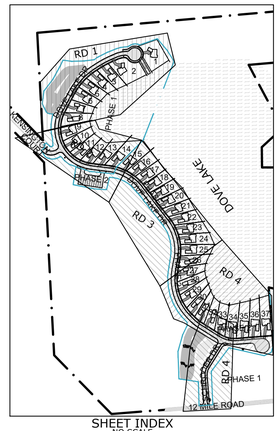
LEGEND

- EXISTING PROPERTY LINE
- EXISTING CONTOURS
- EXISTING EDGE OF ROAD
- EXISTING ASPHALT ROAD HATCH
- EXISTING GRAVEL ROAD HATCH
- EXISTING LAKE
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- PROPOSED GRADE
- PROPOSED LIMITS OF DISRUPTION

TOTAL PAVING QUANTITY LIST

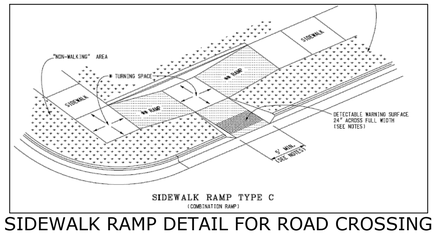
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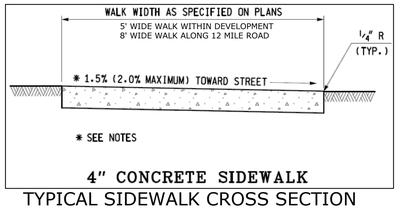
SHEET INDEX

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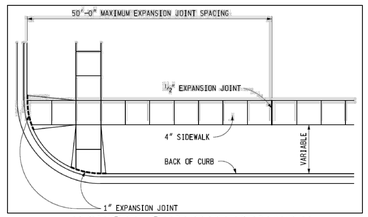


SIDEWALK RAMP TYPE C
(COMBINATION RAMP)

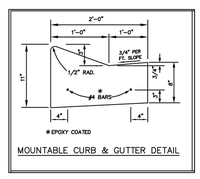
SIDEWALK RAMP DETAIL FOR ROAD CROSSING



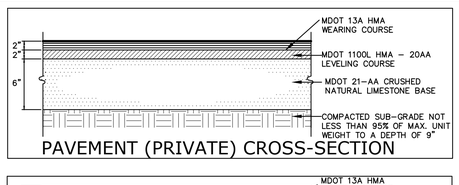
TYPICAL SIDEWALK CROSS SECTION



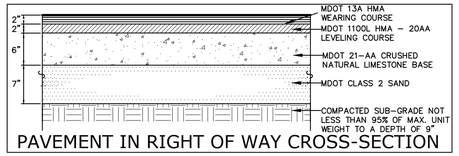
TYPICAL SIDEWALK DETAIL



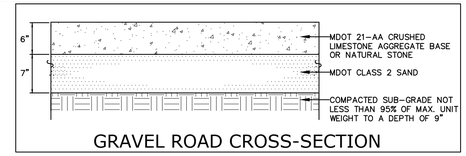
PRIVATE CURB



PAVEMENT (PRIVATE) CROSS-SECTION



PAVEMENT IN RIGHT OF WAY CROSS-SECTION



GRAVEL ROAD CROSS-SECTION

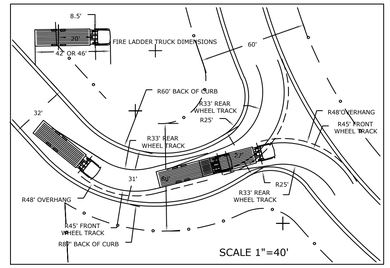
SOIL BORINGS - ATV BORING LOG DONE ON 10/15/2021

B-3 (B-3_10/15/21)
0' - 7' MOIST MEDIUM BR SAND & GRAVEL
7' - 11' MOIST BROWN SANDY SILT
11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

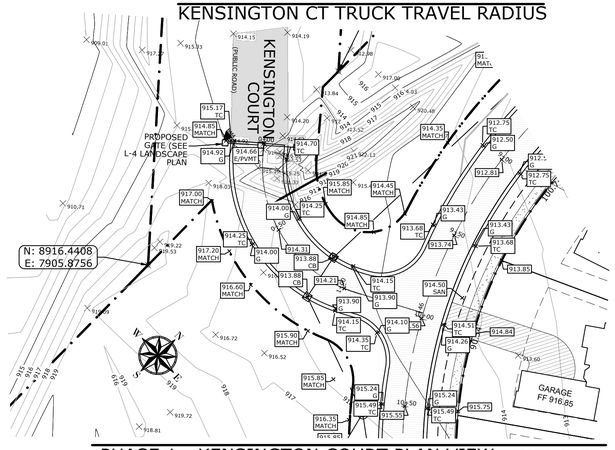
B-5 (B-3_10/15/21)
0 - 13' MOIST SANDY BROWN CLAY
13 - 14' MOIST SANDY BROWN SILT
14'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

B-4 (B-2_10/15/21)
0' – 5.5' MOIST SANDY BROWN CLAY W/AGGREGATE
5.5' - 7' MOIST BROWN SANDY SILT
7' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

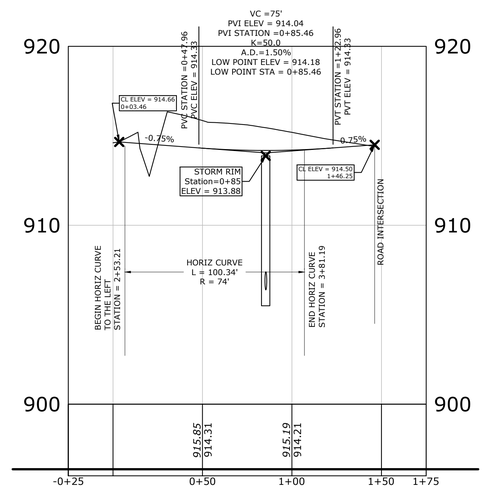
B-6 (B-4 10/15/21)
0'-6' FILL MOIST SANDY BROWN CLAY W/ AGGREGATE
6' - 13.5' FILL - MOIST DR BROWN/GRAY SANDY CLAY W/ AGGREGATE
13.5'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED



KENSINGTON CT TRUCK TRAVEL RADIUS

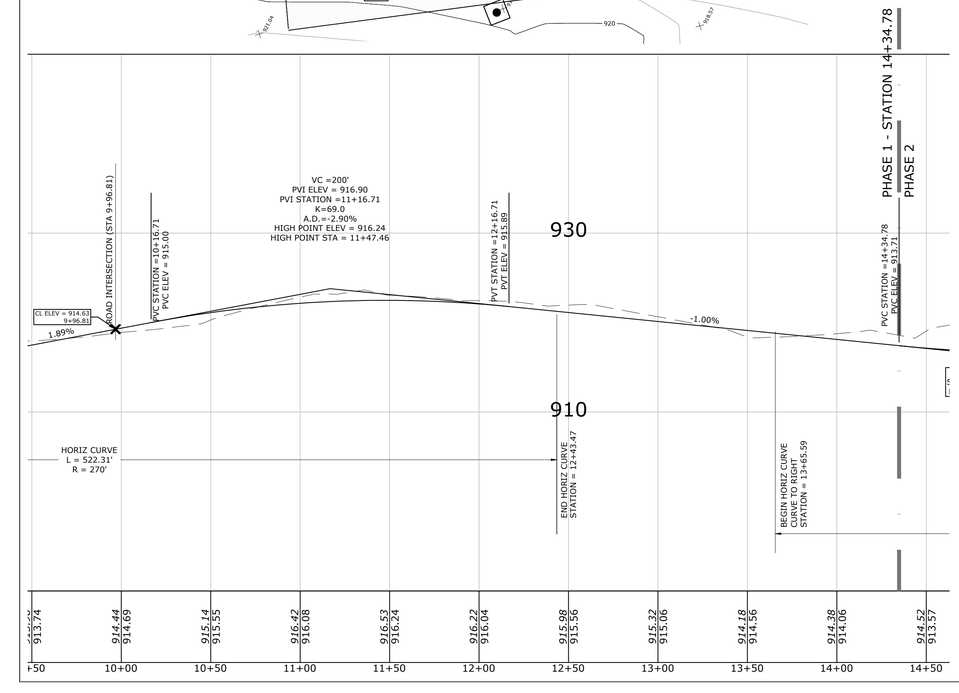


PHASE 1 - KENSINGTON COURT PLAN VIEW SCALE 1"=40'



PHASE 1 - KENSINGTON COURT PROFILE VIEW

HORIZONTAL SCALE 1"=40' VERTICAL SCALE 1"=4'



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P: 248.714-5895 info@powellengineeringllc.com

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BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

DOVE LAKE COURT
PHASE 1 (STA 7+50 - STA 14+40)

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

ISSUE DATES

CONSTRUCTION 5/19/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 5/5/2024
CONSTRUCTION 9/3/2024
CONSTRUCTION 10/31/2024
CONSTRUCTION 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	H:1"=40'V:1"=4'

RD2
CONSTRUCTION

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TOTAL PAVING QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
3" HIGH MOUNTABLE (30" CURB)	7,658 LF	
6" HIGH MDOT F3 CURB	130 LF	
CLASS 2 SAND	1,602 CF	
21AA CRUSHED NATURAL LIMESTONE	66,030 CF	
MDOT 1100L HMA - 20AA LEVELING COURSE	19,396 CF	
MDOT 13A HMA - WEARING COURSE	19,396 CF	

LEGEND

- EXISTING PROPERTY LINE
- EXISTING CONTOURS
- EXISTING EDGE OF ROAD
- EXISTING ASPHALT ROAD HATCH
- EXISTING GRAVEL ROAD HATCH
- EXISTING LAKE
- EXISTING GRADE
- EXISTING FEMA FLOOD PLAIN LINE
- PROPOSED EDGE OF CURBED ROAD
- PROPOSED UNIT LINES
- PROPOSED ROAD EASEMENT
- PROPOSED WELL
- PROPOSED BUILDING SETBACK
- PROPOSED CONCEPT HOUSE
- PROPOSED STORM, CATCH BASIN, MANHOLE
- PROPOSED SANITARY, MANHOLE
- PROPOSED UTILITY EASEMENT
- PROPOSED ROAD RIGHT OF WAY EASEMENT
- PROPOSED CONTOUR
- PROPOSED ROAD HATCH
- PROPOSED DRIVE HATCH
- PROPOSED FLOW DIRECTION ARROW
- PROPOSED GRADE
- PROPOSED LIMITS OF DISRUPTION

SOIL BORINGS - ATV BORING LOG DONE ON 10/15/2021

B-3 (B-1 10/15/21)
0' - 7' MOIST MEDIUM BR SAND & GRAVEL
7'- 11' MOIST BROWN SANDY SILT
11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-4 (B-2 10/15/21)
0' - 5.5' MOIST SANDY BROWN CLAY W/AGGREGATE
5.5' - 7' MOIST BROWN SANDY SILT
7' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-5 (B-3 10/15/21)
0' - 13' MOIST SANDY BROWN CLAY
13 - 14' MOIST SANDY BROWN SILT
14'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

B-6 (B-4 10/15/21)
0'-6' FILL MOST SANDY BROWN CLAY W/ AGGREGATE
6' - 13.5' FILL - MOST DK BROWN/GRAY SANDY CLAY W/ AGGREGATE
13.5'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

SHEET INDEX
NO SCALE

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DOVE LAKE COURT
PHASE 2 (14+40 TO 27+00)

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

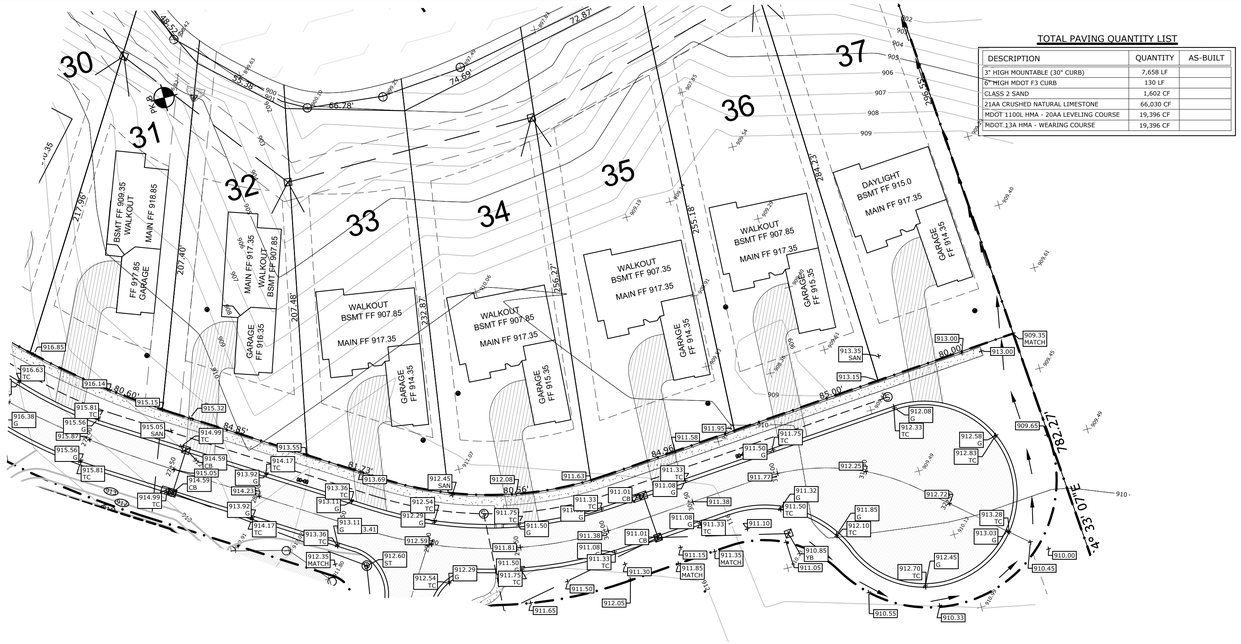
ISSUE DATES

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CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 5/5/2024
CONSTRUCTION 9/3/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=40'

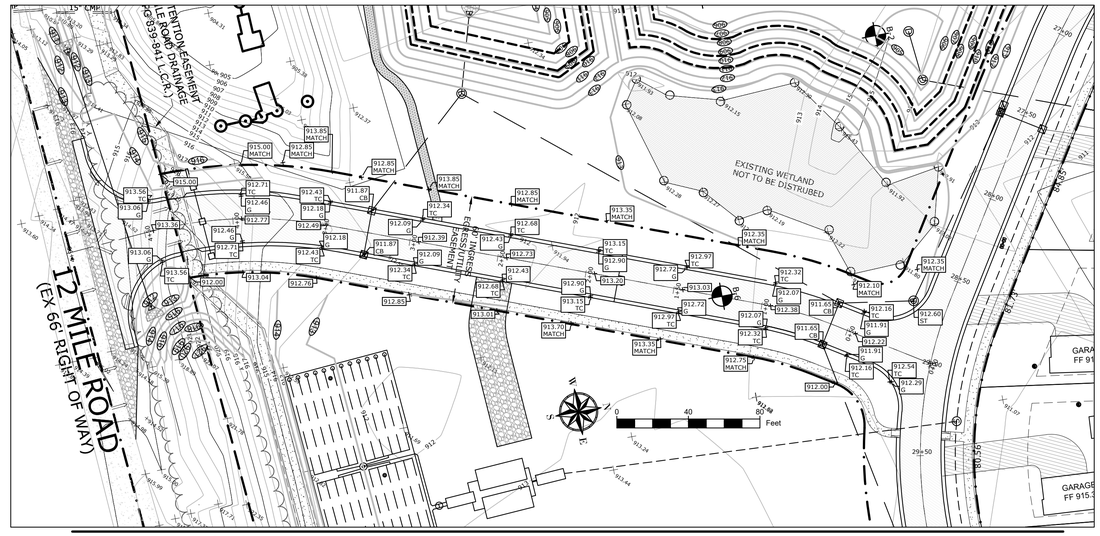
RD3
CONSTRUCTION

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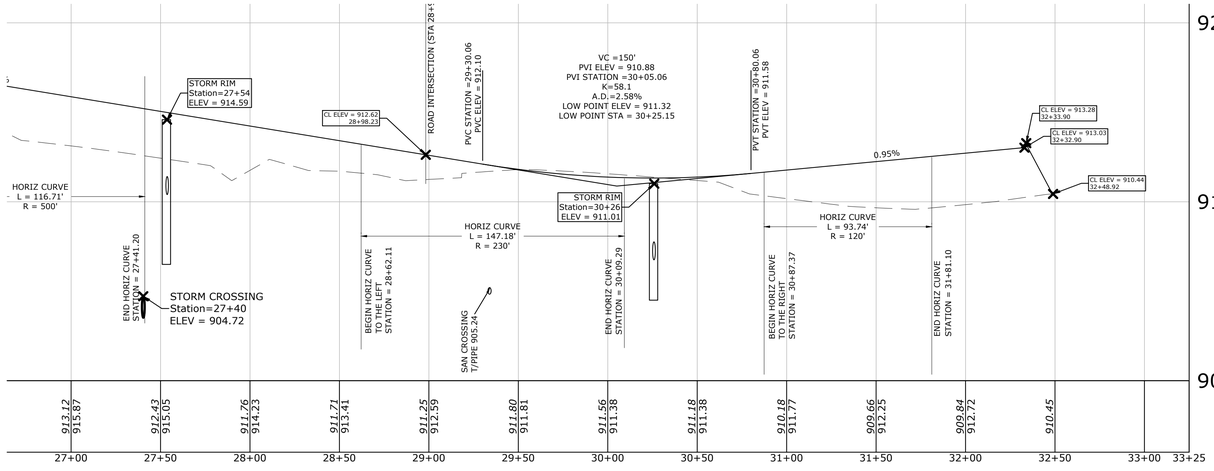


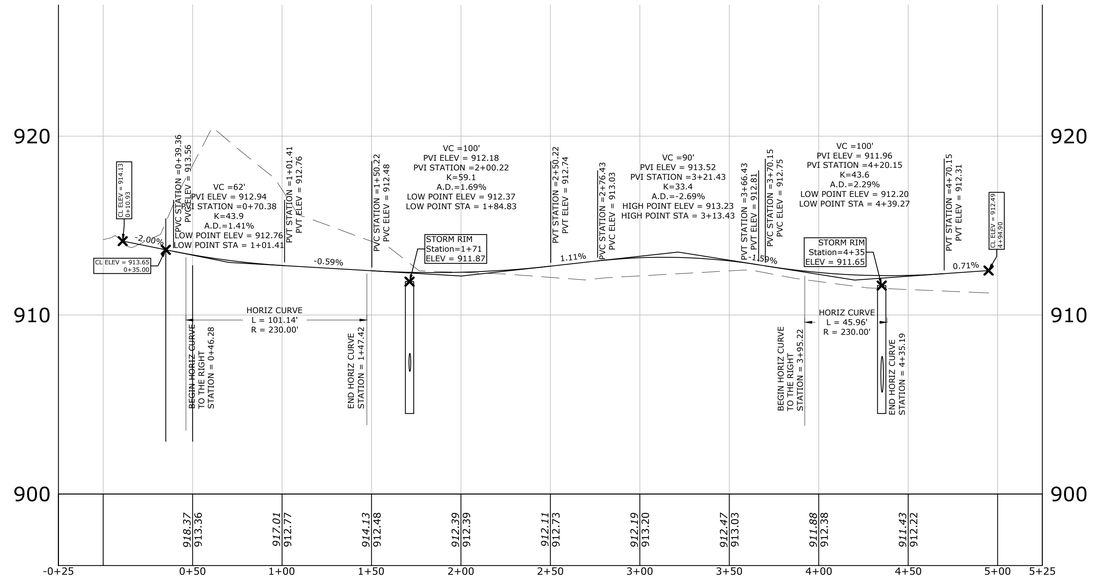
TOTAL PAVING QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
3" HIGH MOUNTABLE (30" CURB)	7,658 LF	
6" HIGH MDOT F3 CURB	130 LF	
CLASS 2 SAND	1,602 CF	
21AA CRUSHED NATURAL LIMESTONE	66,030 CF	
MDOT 1100L HMA - 20AA LEVELING COURSE	19,396 CF	
MDOT 13A HMA - WEARING COURSE	19,396 CF	

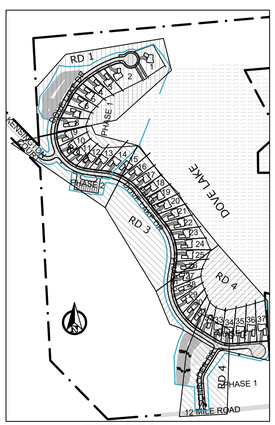


PHASE 2 - DOVE LAKE BOULEVARD PLAN VIEW SCALE 1"=40'

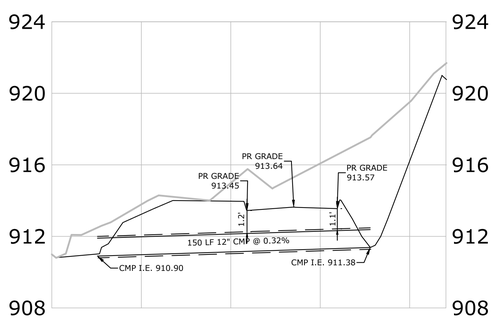




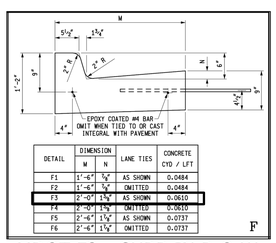
PHASE 2 - DOVE LAKE BOULEVARD PROFILE VIEW HORIZONTAL SCALE 1"=40' VERTICAL SCALE 1"=4'



SHEET INDEX
NO SCALE



PHASE 2 - CULVERT PROFILE CROSSING
SCALE HORIZ: 1"=40' VERT: 1"=4'



DETAIL	DIMENSION M	DIMENSION N	LANE TIES	CONCRETE CYD / LFT
F1	1'-6"	5"	AS SHOWN	0.0484
F2	1'-6"	5"	OMITTED	0.0484
F3	2'-0"	1'-5"	AS SHOWN	0.0610
F4	2'-0"	1'-5"	OMITTED	0.0610
F5	2'-6"	1'-5"	AS SHOWN	0.0737
F6	2'-6"	1'-5"	OMITTED	0.0737

F

MDOT F3 - CURB IN R.O.W.

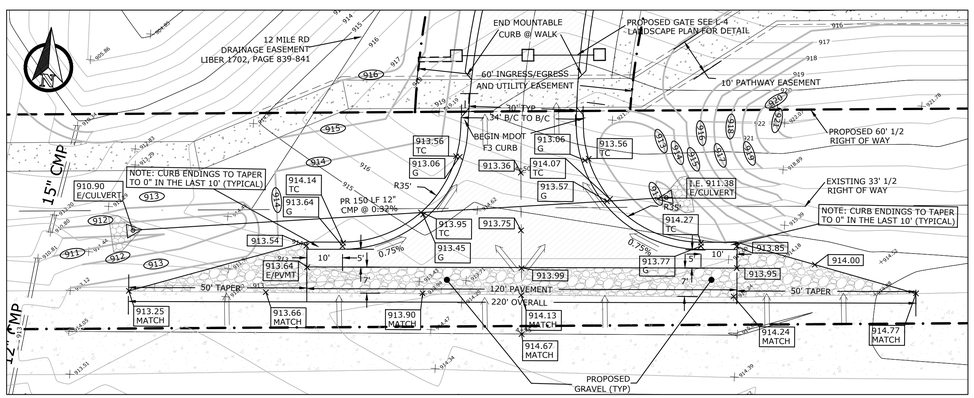
SOIL BORINGS - ATV BORING LOG DONE ON 10/15/2021

B-3 (B-1 10/15/21)
0 - 7' MOIST MEDIUM BR SAND & GRAVEL
7' - 11' MOIST BROWN SANDY SILT
11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-4 (B-2 10/15/21)
0' - 5.5' MOIST SANDY BROWN CLAY W/AGGREGATE
5.5' - 7' MOIST BROWN SANDY SILT
7' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-5 (B-3 10/15/21)
0 - 13' MOIST SANDY BROWN CLAY
13 - 14' MOIST SANDY BROWN SILT
14'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

B-6 (B-4 10/15/21)
0 - 6' FILL MOIST SANDY BROWN CLAY W/ AGGREGATE
6' - 13.5' FILL - MOIST DK BROWN/GRAY SANDY CLAY W/ AGGREGATE
13.5'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED



PHASE 2 - 12 MILE RIGHT OF WAY GRADING PLAN
SCALE 1"=20'

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DOVE LK DR (STA 27+00 TO END)
PHASE 2 DOVE LK BLVD

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

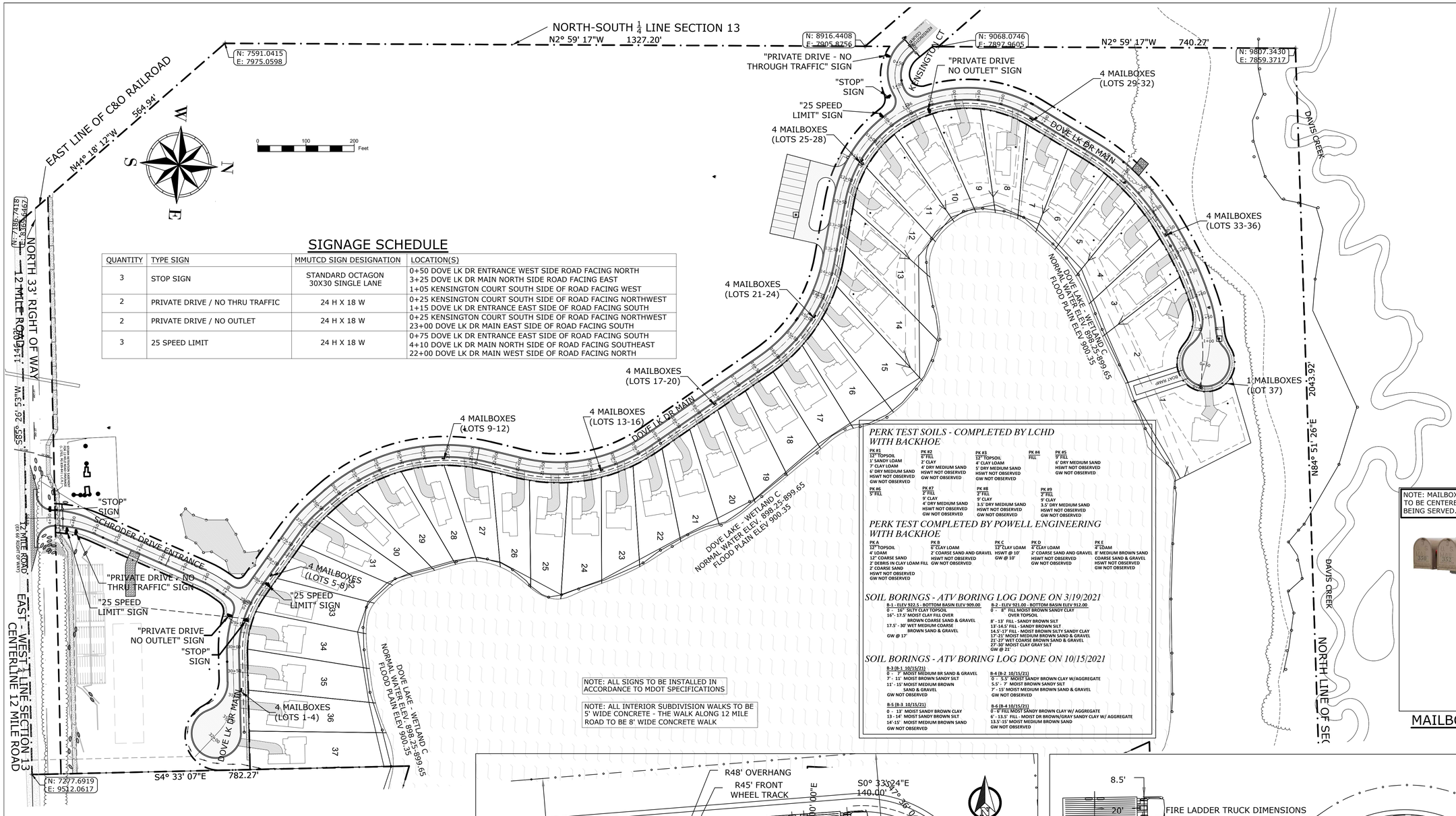
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CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
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CONSTRUCTION 9/3/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	H:1"=40'V:1"=4'

RD4
CONSTRUCTION

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SIGNAGE SCHEDULE

QUANTITY	TYPE SIGN	MMUTCD SIGN DESIGNATION	LOCATION(S)
3	STOP SIGN	STANDARD OCTAGON 30X30 SINGLE LANE	0+50 DOVE LK DR ENTRANCE WEST SIDE ROAD FACING NORTH 3+25 DOVE LK DR MAIN NORTH SIDE ROAD FACING EAST 1+05 KENSINGTON COURT SOUTH SIDE OF ROAD FACING WEST
2	PRIVATE DRIVE / NO THRU TRAFFIC	24 H X 18 W	0+25 KENSINGTON COURT SOUTH SIDE OF ROAD FACING NORTHWEST 1+15 DOVE LK DR ENTRANCE EAST SIDE OF ROAD FACING SOUTH
2	PRIVATE DRIVE / NO OUTLET	24 H X 18 W	0+25 KENSINGTON COURT SOUTH SIDE OF ROAD FACING NORTHWEST 23+00 DOVE LK DR MAIN EAST SIDE OF ROAD FACING SOUTH
3	25 SPEED LIMIT	24 H X 18 W	0+75 DOVE LK DR ENTRANCE EAST SIDE OF ROAD FACING SOUTH 4+10 DOVE LK DR MAIN NORTH SIDE OF ROAD FACING SOUTHEAST 22+00 DOVE LK DR MAIN WEST SIDE OF ROAD FACING NORTH

NOTE: ALL SIGNS TO BE INSTALLED IN ACCORDANCE TO MDOT SPECIFICATIONS

NOTE: ALL INTERIOR SUBDIVISION WALKS TO BE 5' WIDE CONCRETE - THE WALK ALONG 12 MILE ROAD TO BE 8' WIDE CONCRETE WALK

PERK TEST SOILS - COMPLETED BY LCHD WITH BACKHOE

PK #1 12" TOPSOIL 1' SANDY LOAM 7' CLAY LOAM 6' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK #2 6" FILL 2' CLAY 4' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK #3 12" TOPSOIL 4' CLAY LOAM 5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK #4 FILL	PK #5 9" FILL 6' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED
PK #6 5" FILL	PK #7 2" FILL 9' CLAY 4' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK #8 3" FILL 9' CLAY 3.5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK #9 3" FILL 9' CLAY 3.5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	

PERK TEST COMPLETED BY POWELL ENGINEERING WITH BACKHOE

PK A 12" TOPSOIL 4' LOAM 12" COARSE SAND 2' DEBRIS IN CLAY LOAM FILL 2' COARSE SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK B 6" CLAY LOAM 2' COARSE SAND AND GRAVEL HSWT NOT OBSERVED GW NOT OBSERVED	PK C 12" CLAY LOAM HSWT @ 10' GW @ 10'	PK D 4" CLAY LOAM 2' COARSE SAND AND GRAVEL HSWT NOT OBSERVED GW NOT OBSERVED	PK E 4" LOAM 8' MEDIUM BROWN SAND COARSE SAND & GRAVEL HSWT NOT OBSERVED GW NOT OBSERVED

SOIL BORINGS - ATV BORING LOG DONE ON 3/19/2021

B-1 - ELEV 922.5 - BOTTOM BASIN ELEV 909.00	B-2 - ELEV 921.00 - BOTTOM BASIN ELEV 912.00
0 - 16" SILTY CLAY TOPSOIL 16" - 17.5' MOIST CLAY FILL FIL OVER BROWN COARSE SAND & GRAVEL 17.5' - 30' WET MEDIUM COARSE BROWN SAND & GRAVEL GW @ 17'	0 - 8" FILL MOIST BROWN SANDY CLAY OVER TOPSOIL 8' - 13' FILL - SANDY BROWN SILT 13'-14.5' FILL - SANDY BROWN SILT 14.5'-17' FILL - MOIST BROWN SILTY SANDY CLAY 17'-21' MOIST MEDIUM BROWN SAND & GRAVEL 21'-27' WET COARSE BROWN SAND & GRAVEL 27'-30' MOIST CLAY GRAY SILT GW @ 21'

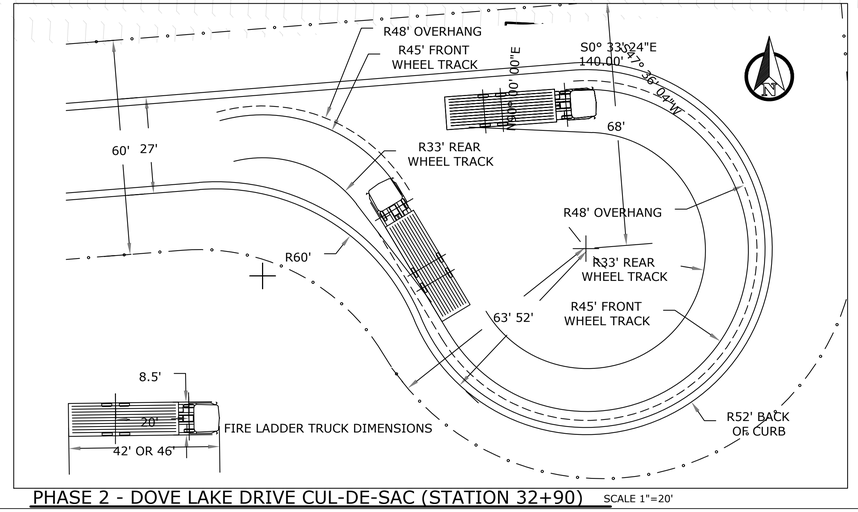
SOIL BORINGS - ATV BORING LOG DONE ON 10/15/2021

B-3 (B-1 10/15/21)	B-4 (B-2 10/15/21)
0 - 7" MOIST MEDIUM BR SAND & GRAVEL 7' - 11' MOIST BROWN SANDY SILT 11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL GW NOT OBSERVED	0 - 5.5" MOIST SANDY BROWN CLAY W/AGGREGATE 5.5" - 7' MOIST BROWN SANDY SILT 7' - 15' MOIST MEDIUM BROWN SAND & GRAVEL GW NOT OBSERVED
B-5 (B-3 10/15/21)	B-6 (B-4 10/15/21)
0 - 13" MOIST SANDY BROWN CLAY 13 - 14' MOIST SANDY BROWN SILT 14'-15' MOIST MEDIUM BROWN SAND GW NOT OBSERVED	0 - 8" FILL MOIST SANDY BROWN CLAY W/ AGGREGATE 6' - 13.5' FILL - MOIST DR BROWN/GRAY SANDY CLAY W/ AGGREGATE 13.5'-15' MOIST MEDIUM BROWN SAND GW NOT OBSERVED

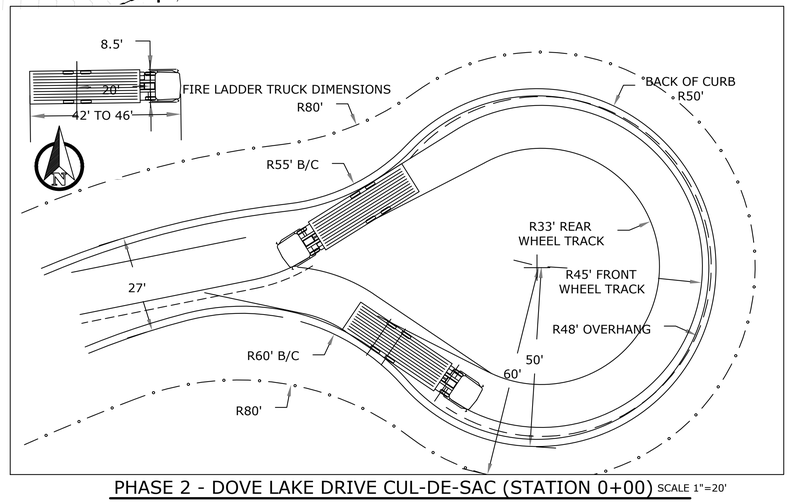
NOTE: MAILBOXES OF 4 PER GROUP TO BE CENTERED BETWEEN LOTS BEING SERVED.



MAILBOX GROUPING



PHASE 2 - DOVE LAKE DRIVE CUL-DE-SAC (STATION 32+90) SCALE 1"=20'



PHASE 2 - DOVE LAKE DRIVE CUL-DE-SAC (STATION 0+00) SCALE 1"=20'

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DOVE LAKE ESTATES SIGN PLAN

DOVE LAKE ESTATES SITE CONDOMINIUMS
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CONSTRUCTION 4/19/2022
CONSTRUCTION 5/5/2024
CONSTRUCTION 9/3/2024
STAMPING SET 6/26/2025

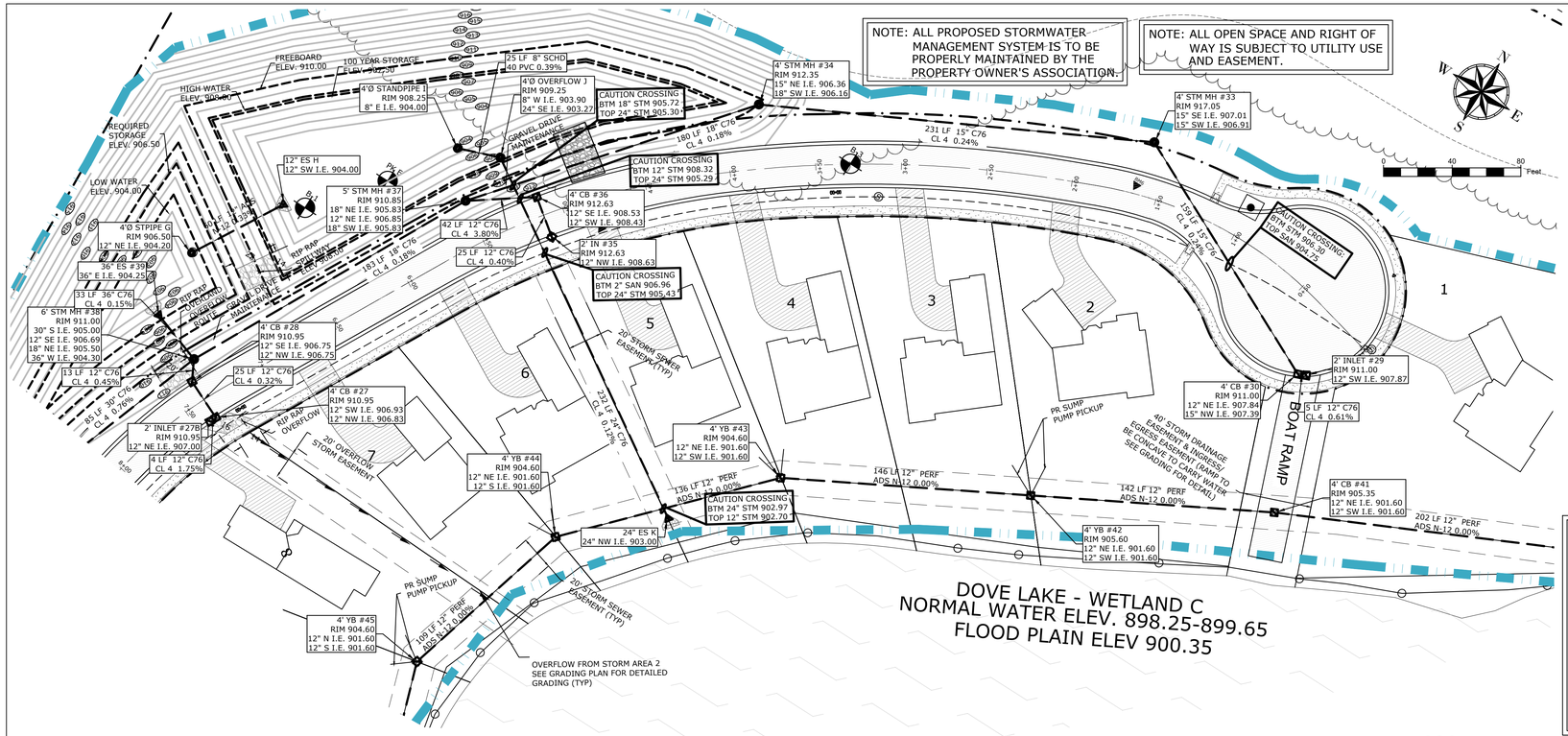
DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	H:1"=40'V:1"=4'

RD 5 CONSTRUCTION

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NOTE: ALL PROPOSED STORMWATER MANAGEMENT SYSTEM IS TO BE PROPERLY MAINTAINED BY THE PROPERTY OWNER'S ASSOCIATION.

NOTE: ALL OPEN SPACE AND RIGHT OF WAY IS SUBJECT TO UTILITY USE AND EASEMENT.



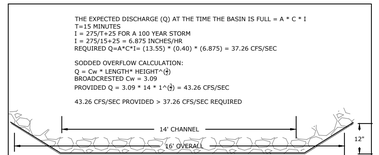
STORM SEWER PHASE 1 QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
8" SCHD 40 PVC	25 LF	
12" ADS N-12 PIPE	60 LF	
12" PERF ADS N-12	1022 LF	
12" C76 CL4 PIPE	179 LF	
15" C76 CL4 PIPE	190 LF	
18" C76 CL4 PIPE	373 LF	
24" C76 CL4 PIPE	232 LF	
30" C76 CL4 PIPE	811 LF	
36" C76 CL4 PIPE	33 LF	
2' INLET	4 EA	
4' CATCH BASIN	6 EA	
5' CATCH BASIN	2 EA	
4' MANHOLE	2 EA	
5' MANHOLE	4 EA	
6' MANHOLE	2 EA	
2' YARD BASIN	1 EA	
4' YARD BASIN	7 EA	
12" END SECTION	1 EA	
24" END SECTION	1 EA	
36" END SECTION	1 EA	
4' CMP STANDPIPE	2 EA	
4' CMP OVERFLOW STRUCTURE	1 EA	

THE EXPECTED DISCHARGE (Q) AT THE TIME THE BASIN IS FULL = A * C * I
T=15 MINUTES
I = 275/(T+25 FOR A 100 YEAR STORM
I = 275/(15+25 = 6.875 INCHES/HR
REQUIRED Q=A*C*I= (13.55) * (0.40) * (6.875) = 37.26 CFS/SEC

SODDED OVERFLOW CALCULATION:
Q = Cw * LENGTH* HEIGHT^(1/2)
BROADCRESTED Cw = 3.09
PROVIDED Q = 3.09 * 14 * 1^(1/2) = 43.26 CFS/SEC

43.26 CFS/SEC PROVIDED > 37.26 CFS/SEC REQUIRED



RIP RAP OVERLAND OVERFLOW CALCS
NO SCALE

PERK TEST SOILS - COMPLETED WITH BACKHOE

PK #1
12" TOPSOIL
1' SANDY LOAM
7' CLAY LOAM
6' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #2
6' FILL
2' CLAY
4' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #3
12" TOPSOIL
4' CLAY LOAM
5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #4
FILL

PK #5
9' FILL
6' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #6
5' FILL

PK #7
3' FILL
9' CLAY
4' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

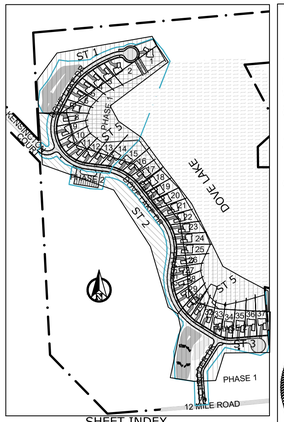
PK #8
3' FILL
9' CLAY
3.5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #9
2' FILL
9' CLAY
3.5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

SOIL BORINGS - ATV BORING LOG DONE ON 3/19/2021

B-1 - ELEV 913.35 - BOTTOM BASIN ELEV 904.00
0' – 16" SILTY CLAY TOPSOIL
16" - 17.5' MOIST CLAY FILL OVER BROWN COARSE SAND & GRAVEL
17.5' - 30' WET MEDIUM COARSE BROWN SAND & GRAVEL
GW @ 17'

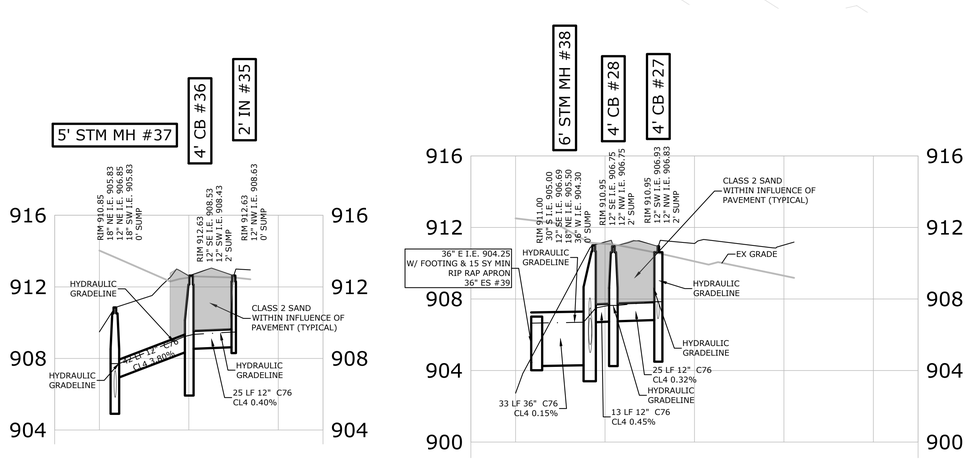
B-2 - ELEV 913.85 - BOTTOM BASIN ELEV 904.00
0' – 8" FILL MOIST BROWN SANDY CLAY OVER TOPSOIL
8' - 13' FILL - SANDY BROWN SILT
13'-14.5' FILL - SANDY BROWN SILT
14.5'-17' FILL - MOIST BROWN SILTY SANDY CLAY
17'-21' MOIST MEDIUM BROWN SAND & GRAVEL
21'-27' WET COARSE BROWN SAND & GRAVEL
27'-30' MOIST CLAY GRAY SILT
GW @ 21'

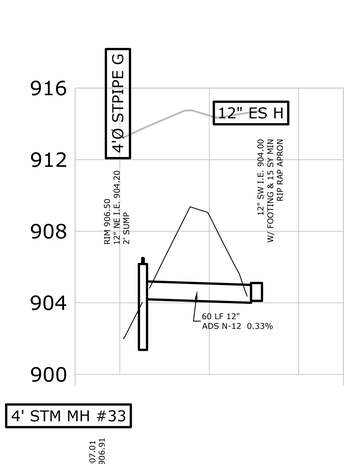


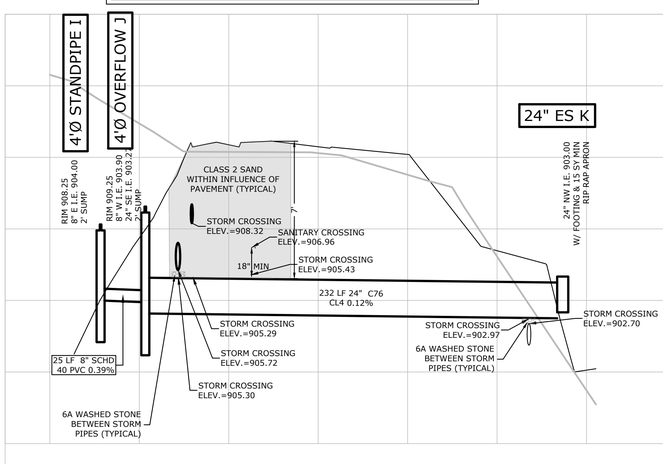
SHEET INDEX
NO SCALE

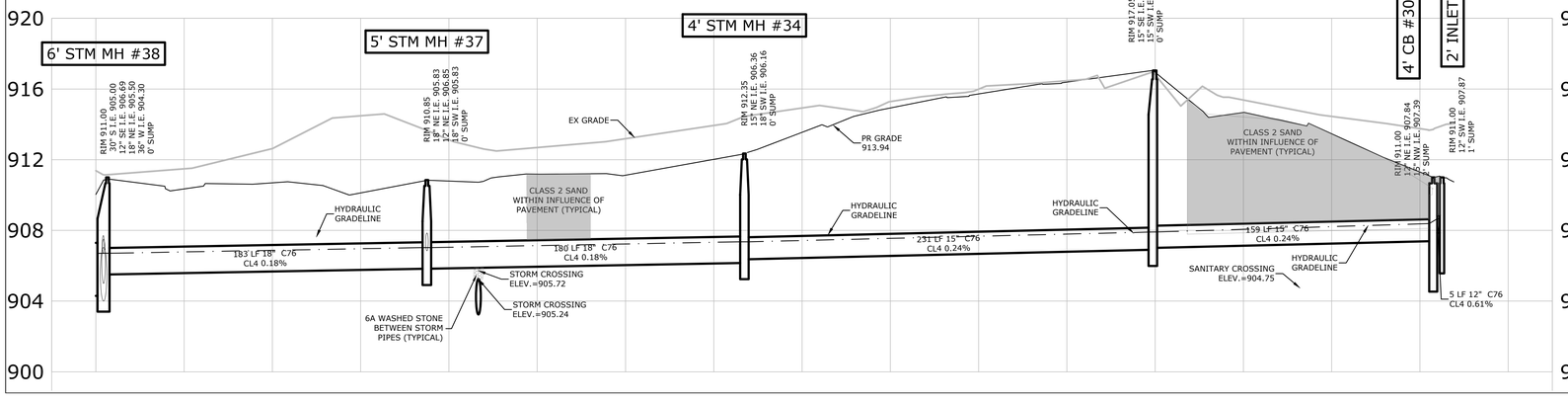
STORM STRUCTURE NORTHING/EASTING AND CASTING STORM AREA 2 - SHEET ST 2 & 3

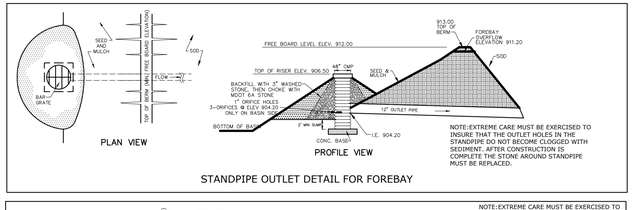
STRUCTURE	NORTHING	EASTING	CASTING
INLET #27A	9285.1741	8042.3481	EIIW 7065 W/7045 M1
CATCH BASIN #27	9280.7322	8039.9085	EIIW 7065 W/7045 M1
INLET #28A	9296.8518	8020.2431	EIIW 7065 W/7045 M1
CATCH BASIN #28	9292.2386	8017.9469	EIIW 7065 W/7045 M1
INLET #29	9618.4350	8549.3953	EIIW 7065 W/7045 M1
CATCH BASIN #30	9616.4980	8544.8834	EIIW 7065 W/7045 M1
MANHOLE #33	9685.2075	8401.6818	EIIW 1040 TYPE A
MANHOLE #34	9570.1847	8184.4398	EIIW 1040 TYPE A
INLET #35	9449.8202	8135.5946	EIIW 7065 W/7045 M1
CATCH BASIN #36	9464.7244	8115.7125	EIIW 7065 W/7045 M1
MANHOLE #37	9440.4633	8081.9429	EIIW 7065 W/7045 M1
END SECTION #39	9289.7031	7962.8503	W/BAR SCREEN, RIP-RAP AND FOUNDATION
STANDPIPE G	9329.0060	7963.8440	BAR SCREEN
END SECTION H	9381.3629	7993.5374	W/BAR SCREEN, RIP-RAP AND FOUNDATION
STANDPIPE I	9463.9008	8061.6589	BAR SCREEN
OVERFLOW J	9472.6849	8085.4774	BAR SCREEN
END SECTION L	9347.5417	8281.4639	W/BAR SCREEN, RIP-RAP AND FOUNDATION



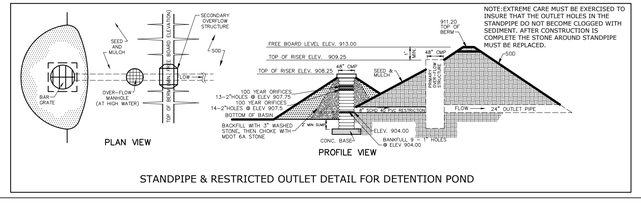








STANDPIPE OUTLET DETAIL FOR FOREBAY



STANDPIPE & RESTRICTED OUTLET DETAIL FOR DETENTION POND

Consulting Civil Engineers
"Engineering A Better Michigan"
Powell Engineering & Associates, LLC
4700 Cornerstone Drive, White Lake, Michigan 48383
P: 248.714-5895 info@powellengineeringllc.com

NOTE: AS AN AID TO THE CONTRACTOR VARIOUS UTILITIES AND UNDERGROUND STRUCTURES ARE SHOWN ON THE PLANS AND PROFILES. ALL INFORMATION CONCERNING ALL UTILITIES SHOWN ON THE PLANS AND PROFILES IS TAKEN FROM FIELD TOPO AND/OR AVAILABLE RECORDS, BUT THE OWNER AND ENGINEER ARE NOT GUARANTEE THEIR LOCATION, QUANTITY OR TYPE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY THAT ALL UTILITIES MAY NOT BE ENCOUNTERED IF THE CONTRACTOR DOES ENCOUNTER A PREVIOUSLY UNIDENTIFIED UTILITY AND OR STRUCTURE, OR DETERMINES THAT ONE OF THE UTILITIES SHOWN ON THE PLANS MAY BE RELOCATED OR ELIMINATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND ENGINEER FOR DIRECTION ON HOW TO PROCEED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES. NOTIFY "MISS DIG" AT 1-800-482-7171, 72 HOURS PRIOR TO THE START OF ANY CONSTRUCTION.

BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

DOVE LAKE ESTATES
PHASE 1-STORM AREA 2 (1 OF 2)
DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

ISSUE DATES

CONSTRUCTION 5/19/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 7/5/2022
CONSTRUCTION 9/14/2022
CONSTRUCTION 5/5/2024
CONSTRUCTION 8/27/2024
CONSTRUCTION 11/1/2024
STAMPING SET 6/26/2025

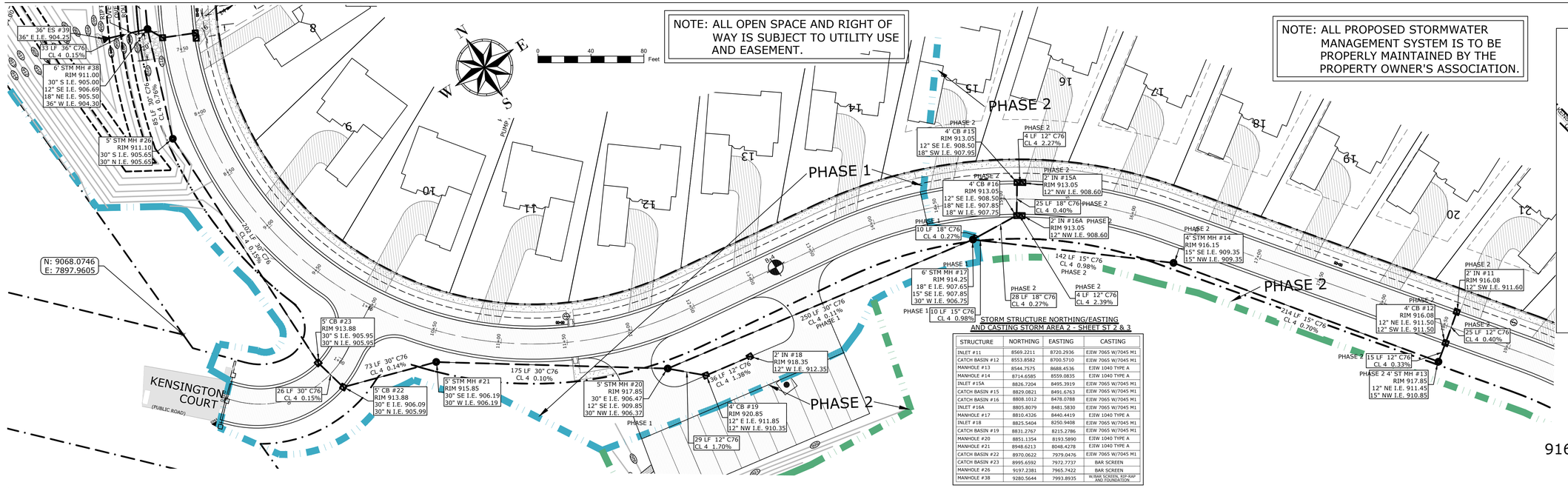
DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	H:1"=40' V:1"=4

ST 1
CONSTRUCTION

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STORM STRUCTURE NORTHING/EASTING AND CASTING STORM AREA 2 - SHEET ST 2 & 3

STRUCTURE	NORTHING	EASTING	CASTING
INLET #11	8569.2211	8720.2936	EJIW 7065 W/7045 M1
CATCH BASIN #12	8553.8582	8700.5710	EJIW 7065 W/7045 M1
MANHOLE #13	8544.7575	8688.4536	EJIW 1040 TYPE A
MANHOLE #14	8714.6585	8559.0835	EJIW 1040 TYPE A
INLET #15A	8826.7204	8495.3919	EJIW 7065 W/7045 M1
CATCH BASIN #15	8829.0821	8491.6763	EJIW 7065 W/7045 M1
CATCH BASIN #16	8808.1012	8478.0788	EJIW 7065 W/7045 M1
INLET #16A	8805.8079	8481.5830	EJIW 7065 W/7045 M1
MANHOLE #17	8810.4326	8440.4419	EJIW 1040 TYPE A
INLET #18	8825.5404	8250.9408	EJIW 7065 W/7045 M1
CATCH BASIN #19	8831.2767	8215.2786	EJIW 7065 W/7045 M1
MANHOLE #20	8851.1354	8193.5890	EJIW 1040 TYPE A
MANHOLE #21	8948.6213	8048.4278	EJIW 1040 TYPE A
CATCH BASIN #22	8970.0622	7979.0476	EJIW 7065 W/7045 M1
CATCH BASIN #23	8995.6592	7972.7737	BAR SCREEN
MANHOLE #26	9197.2381	7965.7422	BAR SCREEN
MANHOLE #38	9280.5644	7993.8935	W/BAR SCREEN, RIP-RAP AND FOUNDATION

STORM SEWER PHASE 1 QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
8" SCHD 40 PVC	25 LF	
12" ADS N-12 PIPE	60 LF	
12" PERF ADS N-12	1022 LF	
12" C76 CL4 PIPE	179 LF	
15" C76 CL4 PIPE	190 LF	
18" C76 CL4 PIPE	373 LF	
24" C76 CL4 PIPE	232 LF	
30" C76 CL4 PIPE	811 LF	
36" C76 CL4 PIPE	33 LF	
2' INLET	4 EA	
4' CATCH BASIN	6 EA	
5' CATCH BASIN	2 EA	
4' MANHOLE	2 EA	
5' MANHOLE	4 EA	
6' MANHOLE	2 EA	
2' YARD BASIN	1 EA	
4' YARD BASIN	7 EA	
12" END SECTION	1 EA	
24" END SECTION	1 EA	
36" END SECTION	1 EA	
4' CMP STANDPIPE	2 EA	
4' CMP OVERFLOW STRUCTURE	1 EA	

STORM SEWER PHASE 2 QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
8" SCHD 40 PVC	16 LF	
12" ADS N-12 PIPE	72 LF	
12" PERF ADS N-12	1758 LF	
12" C76 CL4 PIPE	282 LF	
15" C76 CL4 PIPE	566 LF	
18" C76 CL4 PIPE	360 LF	
24" C76 CL4 PIPE	586 LF	
2' INLET	7 EA	
4' CATCH BASIN	8 EA	
6' CATCH BASIN	1 EA	
4' MANHOLE	2 EA	
5' MANHOLE	1 EA	
6' MANHOLE	1 EA	
2' YARD BASIN	1 EA	
4' YARD BASIN	10 EA	
12" END SECTION	1 EA	
24" END SECTION	2 EA	
4' CMP STANDPIPE	2 EA	
4' CMP OVERFLOW STRUCTURE	1 EA	
12" CMP (ENTRANCE)	150 LF	

POWELL ENGINEERING

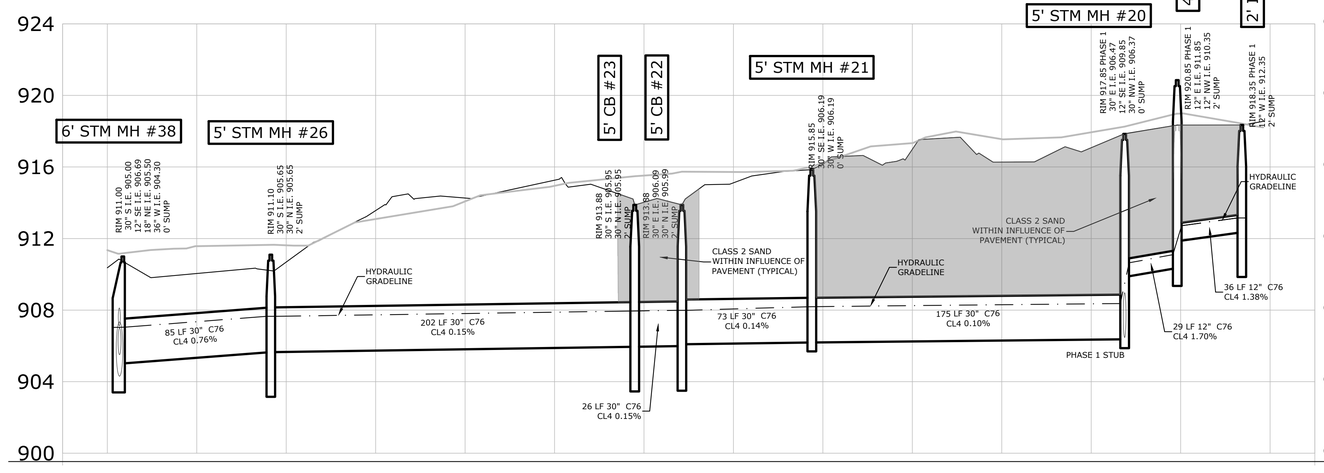
DESIGN FOR STORM SEWER SYSTEMS

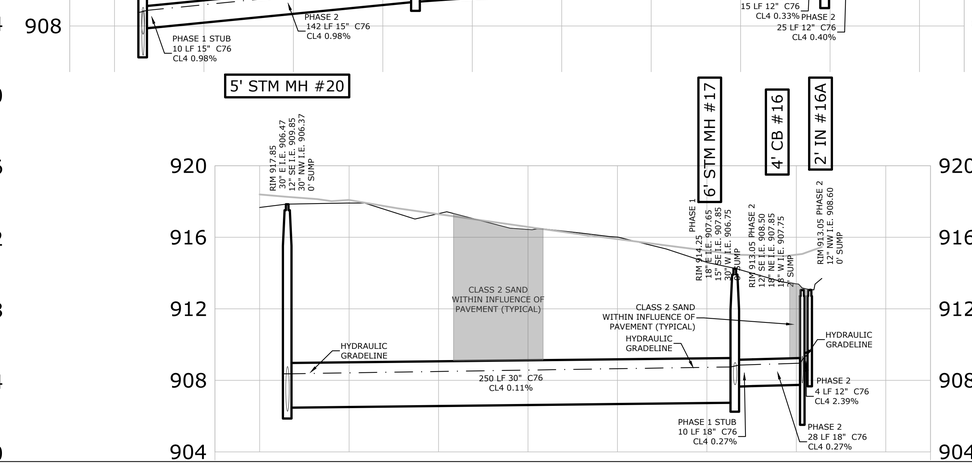
JOB NAME: DOVE LAKE - STORM AREA 2 - rev 6/30/2022
P.E. JOB # 19-425

PIPE FLOW: MANNING'S EQUATION
Q = A (1.486/n) R^2/3 S^ 1/2

n = 0.013
To = 15 = INITIAL TIME OF CONCENTRATION

FROM MH	TO MH	LAWN SF	PVMT SF	ROOF SF	TOTAL SF	INCREMENT ACRES A	TOTAL ACRES	C	EQUIV. AREA C * A	TOTAL AREA C * A	TIME MIN.	T. TIME MIN TOTAL	INCHES PER HOUR I	Q=CIA C.F.S. FLOW	ROUGH. COEFF.	CAPACITY OF SEWER C.F.S.	DIA. OF PIPE IN INCHES	LENGTH OF LINE IN FEET	TYPE OF PIPE	SLOPE OF PIPE%	SLOPE OF HG%	VELOCITY FEET PER SECOND	H.G. ELEV. UPPER END RIM	H.G. ELEV. LOWER END RIM	GRAND ELEV. UPPER END	GRAND ELEV. LOWER END	INVERT ELEV. END	INVERT ELEV. END	PIPE COVER
11	12	19642	17718	9805	47165	1.08	1.08	0.61	0.66	0.66	15.00	15.14	4.38	2.89	0.013	2.25	12	25	RCP	0.40%	0.66%	2.9	912.85	912.85	916.08	916.08	911.60	911.50	3.4
12	13	50555	5935	0	56490	1.3	2.38	0.27	0.35	1.01	15.14	15.24	4.36	4.41	0.013	2.05	12	15	RCP	0.33%	1.53%	2.6	912.68	912.68	916.08	916.08	917.85	911.50	911.45	3.5
13	14	0	0	0	0	0	2.38	0	0.00	1.01	15.24	16.05	4.35	4.4	0.013	5.4	15	214	RCP	0.70%	0.46%	4.4	911.85	917.85	916.15	910.85	909.35	5.4	
14	17	0	0	0	0	0	2.38	0	0.00	1.01	16.05	16.54	4.26	4.31	0.013	6.39	15	152	RCP	0.98%	0.45%	5.2	910.35	916.15	914.25	909.35	907.85	5	
15	16	29213	28481	13220	70914	1.63	1.63	0.61	0.99	0.99	15.00	15.11	4.38	4.36	0.013	6.64	18	25	RCP	0.40%	0.17%	3.8	909.15	913.05	913.05	907.95	907.85	3.4	
16	17	114635	12964	0	127599	2.93	4.56	0.27	0.79	1.79	15.11	15.31	4.36	7.78	0.013	5.46	18	38	RCP	0.27%	0.55%	3.1	908.96	913.05	914.25	907.75	907.65	3.6	
17	20	0	0	0	0	0	6.94	0	0.00	2.80	16.54	18.03	4.21	11.77	0.013	13.6	30	250	RCP	0.11%	0.08%	2.8	908.75	914.25	917.85	906.75	906.47	4.7	
18	19	7732	6044	0	13776	0.32	0.32	0.51	0.16	0.16	15.00	15.11	4.38	0.71	0.013	4.18	12	36	RCP	1.38%	0.04%	5.3	913.15	918.35	918.35	912.35	911.85	4.9	
19	20	7732	6044	0	13776	0.32	0.64	0.51	0.16	0.33	15.00	15.08	4.38	1.43	0.013	4.64	12	29	RCP	1.70%	0.16%	5.9	911.15	918.35	917.85	910.35	909.85	6.9	
20	21	0	0	0	0	0	7.58	0	0.00	3.12	18.03	19.15	4.07	12.71	0.013	12.97	30	175	RCP	0.10%	0.10%	2.6	908.37	917.85	915.85	906.37	906.19	6.9	
21	22	0	0	0	0	0	7.58	0	0.00	3.12	19.15	19.54	3.96	12.37	0.013	15.34	30	73	RCP	0.14%	0.09%	3.1	908.19	915.85	913.88	906.19	906.09	5	
22	23	24091	4606	0	28697	0.66	8.24	0.31	0.20	3.33	19.54	19.68	3.93	13.08	0.013	15.88	30	26	RCP	0.15%	0.10%	3.2	907.99	913.88	913.88	905.99	905.95	5.1	
23	26	2312	1823	0	4135	0.09	8.33	0.51	0.05	3.37	19.68	20.73	3.92	13.22	0.013	15.88	30	202	RCP	0.15%	0.10%	3.2	907.95	913.88	911.10	905.95	905.65	2.7	
26	38	0	0	0	0	0	8.33	0	0.00	3.37	20.73	20.92	3.83	12.92	0.013	35.75	30	85	RCP	0.76%	0.10%	7.3	907.65	911.10	911.00	905.65	905.00	2.7	
27	28	28411	20510	9600	58521	1.34	1.34	0.56	0.75	0.75	15.00	15.16	4.38	3.29	0.013	2.01	12	25	RCP	0.32%	0.85%	2.6	907.85	910.95	910.95	906.83	906.75	3	
28	38	7341	4921	0	12262	0.28	1.62	0.48	0.13	0.88	15.16	15.23	4.36	3.86	0.013	2.39	12	13	RCP	0.45%	1.17%	3	907.64	910.95	911.00	906.75	906.69	3.1	
30	33	14651	12385	2356	29392	0.67	0.67	0.55	0.37	0.37	15.00	16.02	4.38	1.61	0.013	3.16	15	159	RCP	0.24%	0.06%	2.6	908.39	911.00	917.05	907.39	907.01	2.2	
33	34	0	0	0	0	0	0.67	0	0.00	0.37	16.02	17.50	4.27	1.57	0.013	3.16	15	231	RCP	0.24%	0.06%	2.6	907.91	917.05	912.35	906.91	906.36	4.6	
34	37	0	0	0	0	0	0.67	0	0.00	0.37	17.50	18.70	4.12	1.52	0.013	4.46	18	180	RCP	0.18%	0.02%	2.5	907.36	912.35	910.85	906.16	905.83	3.3	
35	36	8585	11740	15711	36036	0.83	0.83	0.73	0.61	0.61	15.00	15.14	4.38	2.65	0.013	2.25	12	25	RCP	0.40%	0.55%	2.9	909.47	912.63	912.63	908.63	908.53	2.9	
36	37	4927	4921	0	13779	0.32	1.15	0.39	0.12	0.73	15.14	15.22	4.36	3.19	0.013	6.94	12	42	RCP	3.80%	0.80%	8.8	909.23	912.63	910.85	908.43	906.85	2.9	
37	38	0	0	0	0	0	1.82	0	0.00	1.10	18.70	19.92	4	4.4	0.013	4.46	18	183	RCP	0.18%	0.18%	2.5	907.03	910.85	911.00	905.83	905.50	3.3	
38	39	0	0	0	0	0	11.77	0	0.00	5.36	20.92	21.07	3.81	20.41	0.013	25.82	36	33	RCP	0.15%	0.09%	3.7	906.70	911.00	904.25	904.30	904.25	ES	





Consulting Civil Engineers
"Engineering A Better Michigan"
Powell Engineering & Associates, LLC
4700 Cornerstone Drive, White Lake, Michigan 48383
P: 248.714-9895 info@powellengineeringllc.com

SHEET INDEX

ST 1 - COVER SHEET
ST 2 - STORM AREA 2

NOTE, AS AN AID TO THE CONTRACTOR VARIOUS UTILITIES AND UNDERGROUND STRUCTURES ARE SHOWN ON THESE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES SHOWN ON THE PLANS AND PROFILES AS TAKEN FROM FIELD TOPO AND/OR AVAILABLE RECORDS, BUT THE OWNER AND ENGINEER DOES NOT GUARANTEE THEIR LOCATION OR THAT ADDITIONAL UNDERGROUND STRUCTURES OR UTILITIES DO NOT EXIST. IF THE CONTRACTOR DOES ENCOUNTER A PREVIOUSLY UNIDENTIFIED UTILITY AND OR STRUCTURE, OR DETERMINES THAT ONE OF THE UTILITIES / STRUCTURES SHOWN ON THESE PLANS IS INCORRECTLY LOCATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER. FAILURE TO DO SO PRIOR TO ANY ON HOW INVOKED THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES. NOTIFY "MISS DIG" AT 1-800-482-7171, 72 HOURS PRIOR TO THE START OF ANY CONSTRUCTION.

BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

DOVE LAKE ESTATES
PHASE 1&2 - STORM AREA 2

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

ISSUE DATES

CONSTRUCTION 5/19/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 7/5/2022
CONSTRUCTION 9/13/2022
CONSTRUCTION 5/5/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	H:1"=40' V:1"=4

ST 2
CONSTRUCTION

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STORM STRUCTURE NORTHING/EASTING AND CASTING STORM AREA 1

STRUCTURE	NORTHING	EASTING	CASTING
YARD BASIN #1	7651.9042	9326.4927	EJIW 1040 TYPE N
INLET #2A	7692.7763	9249.0431	EJIW 7065 W/7045 M1
CB #2	7693.0490	9253.2755	EJIW 7065 W/7045 M1
CATCH BASIN #3	7668.2002	9255.2537	EJIW 7065 W/7045 M1
INLET #4	7782.2684	9012.3770	EJIW 7065 W/7045 M1
INLET #5A	7763.5061	8995.3580	EJIW 7065 W/7045 M1
CATCH BASIN #5	7761.0314	8999.0494	EJIW 7065 W/7045 M1
MANHOLE #6	7694.1790	9093.7661	EJIW 1040 TYPE A
INLET #7	7639.7373	9108.6840	EJIW 7065 W/7045 M1
CATCH BASIN #8	7653.0271	9087.5090	EJIW 7065 W/7045 M1
INLET #9A	7396.5921	9012.9972	EJIW 7065 W/7045 M1
CATCH BASIN #9B	7405.4140	8989.5054	EJIW 7065 W/7045 M1
MANHOLE #9	7466.5088	8934.2979	EJIW 1040 TYPE A
ES #10	7478.4678	8892.1762	W/BAR SCREEN, RIP-RAP AND FOUNDATION
OUTLET A	7521.1375	8891.0002	BAR SCREEN
ES B	7593.4352	8893.4837	W/BAR SCREEN, RIP-RAP AND FOUNDATION
STANDPIPE C	7721.1436	8956.9234	BAR SCREEN
OVERFLOW D	7721.3671	8973.2760	BAR SCREEN
END SECTION F	7978.0678	9071.3886	W/BAR SCREEN, RIP-RAP AND FOUNDATION

STORM SEWER PHASE 2 QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
8" SCHD 40 PVC	16 LF	
12" ADS N-12 PIPE	72 LF	
12" PERF ADS N-12	1758 LF	
12" C76 CL4 PIPE	282 LF	
15" C76 CL4 PIPE	566 LF	
18" C76 CL4 PIPE	360 LF	
24" C76 CL4 PIPE	586 LF	
2' INLET	7 EA	
4' CATCH BASIN	8 EA	
6' CATCH BASIN	1 EA	
4' MANHOLE	2 EA	
5' MANHOLE	1 EA	
6' MANHOLE	1 EA	
2' YARD BASIN	1 EA	
4' YARD BASIN	10 EA	
12" END SECTION	1 EA	
24" END SECTION	2 EA	
4' CMP STANDPIPE	2 EA	
4' CMP OVERFLOW STRUCTURE	1 EA	
12" CMP (ENTRANCE)	150 LF	

LEGEND

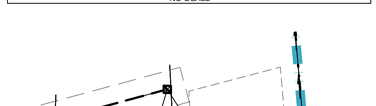
- EXISTING PROPERTY LINE
- EXISTING CONTOURS
- EXISTING EDGE OF ROAD
- EXISTING ASPHALT ROAD HATCH
- EXISTING GRAVEL ROAD HATCH
- EXISTING LAKE
- EXISTING GRADE
- EXISTING TEST WELL LOCATION
- EXISTING BENCHMARK LOCATION
- PROPOSED EDGE OF CURBED ROAD
- PROPOSED 5' OR 8' CONCRETE WALK
- PROPOSED UNIT LINES
- PROPOSED ROAD EASEMENT
- PROPOSED WELL
- PROPOSED BUILDING SETBACK
- FEMA FLOOD PLAIN LINE
- PROPOSED CONCEPT HOUSE
- PROPOSED STORM, CATCH BASIN, MANHOLE
- PROPOSED SANITARY, MANHOLE
- PROPOSED UTILITY EASEMENT
- PROPOSED ROAD RIGHT OF WAY EASEMENT
- PROPOSED CONTOUR
- PROPOSED ROAD HATCH
- PROPOSED DRIVE HATCH
- PROPOSED FLOW DIRECTION ARROW
- PROPOSED GRADE
- PROPOSED AREA DRAINAGE DISTRICT
- PROPOSED OVERALL DRAINAGE DISTRICT
- PROPOSED LIMITS OF DISRUPTION

THE TIME FOR A 100-YEAR STORM EVENT TO FILL THE 68,520 CU.FT. DETENTION BASIN IS:

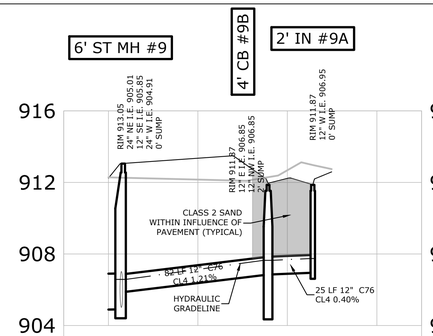
THE EXPECTED DISCHARGE (Q) AT THE TIME THE BASIN IS FULL = A * C * I
T=15 MINUTES
I = 275/T+25 FOR A 100 YEAR STORM
I = 275/15+25 = 6.875 INCHES/HR
REQUIRED Q=A*C*I= (14.15) * (0.28) * (6.875) = 27.24 CFS/SEC

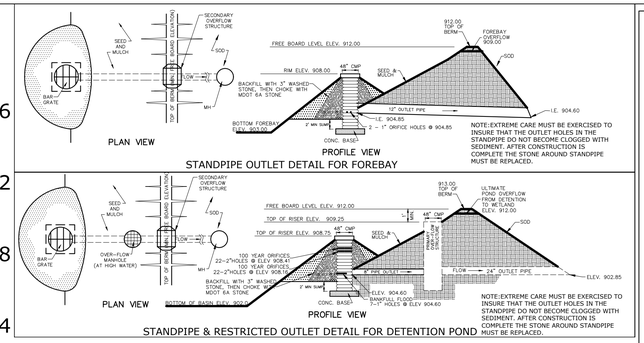
SODDED OVERFLOW CALCULATION:
Q = Cw * LENGTH* HEIGHT^(3/2)
BROADCRESTED Cw = 3.09
PROVIDED Q = 3.09 * 17 * 0.75^(3/2) = 34.12 CFS/SEC

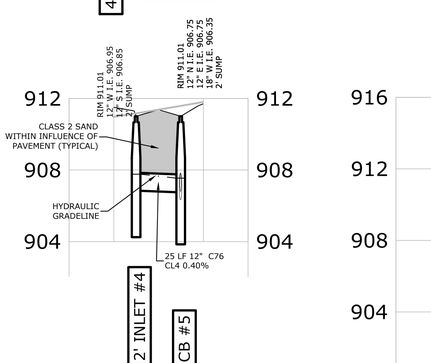
34.12 CFS/SEC PROVIDED > 27.24 CFS/SEC REQUIRED

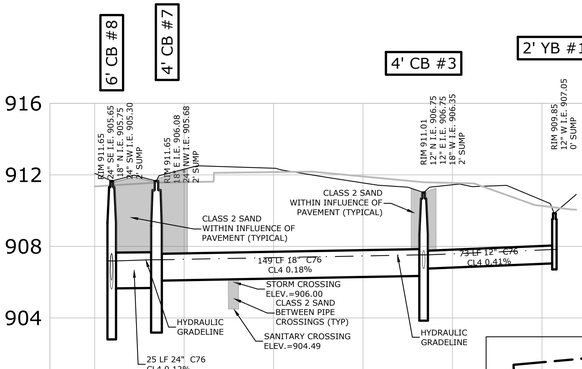


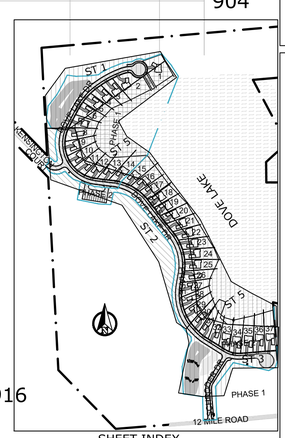
RIP RAP OVERFLOW CALCS
NO SCALE



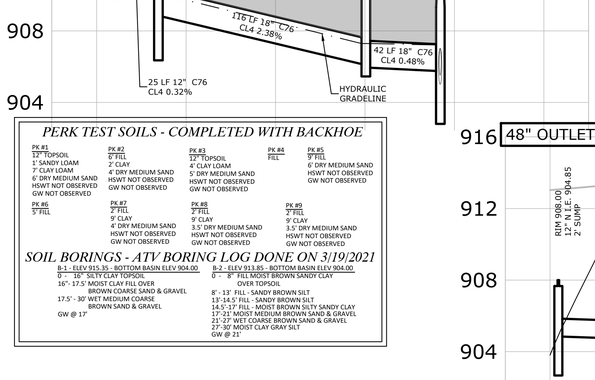


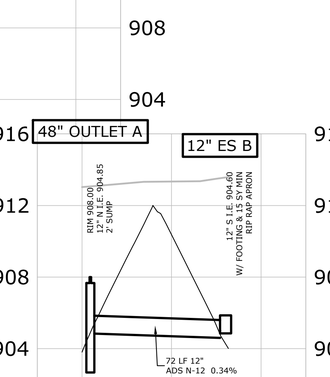






SHEET INDEX
NO SCALE





PERK TEST SOILS - COMPLETED WITH BACKHOE

PK #1 12" TOPSOIL, 1' SANDY LOAM, 7' CLAY LOAM, 6' DRY MEDIUM SAND, HSWT NOT OBSERVED, GW NOT OBSERVED

PK #2 6" FILL, 2' CLAY, 4' DRY MEDIUM SAND, HSWT NOT OBSERVED, GW NOT OBSERVED

PK #3 12" TOPSOIL, 4' CLAY LOAM, 5' DRY MEDIUM SAND, HSWT NOT OBSERVED, GW NOT OBSERVED

PK #4 FILL

PK #5 9" FILL, 6' DRY MEDIUM SAND, HSWT NOT OBSERVED, GW NOT OBSERVED

PK #6 5' FILL

PK #7 2' FILL, 9' CLAY, 4' DRY MEDIUM SAND, HSWT NOT OBSERVED, GW NOT OBSERVED

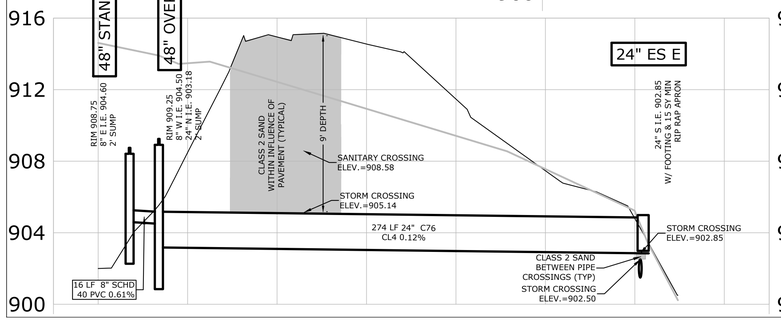
PK #8 2' FILL, 9' CLAY, 3.5' DRY MEDIUM SAND, HSWT NOT OBSERVED, GW NOT OBSERVED

PK #9 2' FILL, 9' CLAY, 3.5' DRY MEDIUM SAND, HSWT NOT OBSERVED, GW NOT OBSERVED

SOIL BORINGS - ATV BORING LOG DONE ON 3/19/2021

8-1 - ELEV 915.35 - BOTTOM BASIN ELEV 904.00
0 - 16" SILTY CLAY TOPSOIL
16" - 17.5' MOIST CLAY FILL OVER BROWN COARSE SAND & GRAVEL
17.5' - 30' WET MEDIUM COARSE BROWN SAND & GRAVEL
GW @ 17'

8-2 - ELEV 913.85 - BOTTOM BASIN ELEV 904.00
0 - 8" FILL MOIST BROWN SANDY CLAY OVER TOPSOIL
8' - 13' FILL - SANDY BROWN SILT
13'-14.5' FILL - SANDY BROWN SILT
14.5'-17' FILL - MOIST BROWN SILTY SANDY CLAY
17'-21' MOIST MEDIUM BROWN SAND & GRAVEL
21'-27' WET COARSE BROWN SAND & GRAVEL
27'-30' MOIST CLAY GRAY SILT
GW @ 21'



POWELL ENGINEERING

DESIGN FOR STORM SEWER SYSTEMS

JOB NAME: DOVE LAKE - STORM AREA 1 - revised 7/5/2022
P.E. JOB # 19-425

PIPE FLOW: MANNING'S EQUATION
Q = A (1.486/n) R^2/3 S^ 1/2

n = 0.013
To = 15 = INITIAL TIME OF CONCENTRATION

FROM MH	TO MH	LAWN SF	PVMT SF	ROOF SF	TOTAL SF	INCREMENT ACRES A	TOTAL ACRES	C	EQUIV. AREA C * A	TOTAL AREA C * A	TIME MIN	T. TIME MIN TOTAL	INCHES PER HOUR I	Q=CIA C.F.S FLOW	ROUGH. COEFF.	CAPACITY OF SEWER C.F.S.	DIA. OF PIPE IN INCHES	LENGTH OF LINE IN FEET	TYPE OF PIPE	SLOPE OF PIPE%	SLOPE OF HG%	VELOCITY FEET PER SECOND	H.G. ELEV UPPER END	GRAND ELEV. UPPER END RIM	GRAND ELEV. LOWER END RIM	INVERT ELEV. UPPER END	INVERT ELEV. LOWER END	PIPE COVER
1	3	13812	0	0	13812	0.32	0.32	0.2	0.06	0.06	15.00	15.42	4.38	0.28	0.013	2.28	12	73	RCP	0.41%	0.01%	2.9	907.85	909.85	911.01	907.05	906.75	1.7
2	3	21426	22480	9893	53799	1.24	1.24	0.62	0.77	0.77	15.00	15.14	4.38	3.37	0.013	2.25	12	25	RCP	0.40%	0.90%	2.9	907.77	911.01	911.01	906.85	906.75	3
3	7	9591	7950	0	17541	0.4	1.96	0.52	0.21	1.04	15.42	16.41	4.33	4.51	0.013	4.46	18	149	RCP	0.18%	0.18%	2.5	907.55	911.01	911.65	906.35	906.08	3
7	8	43163	2326	0	45489	1.04	3	0.24	0.25	1.29	16.41	16.58	4.23	5.46	0.013	7.83	24	25	RCP	0.12%	0.06%	2.5	907.28	911.65	911.65	905.68	905.65	3.7
4	5	16331	16911	3824	37066	0.85	0.85	0.59	0.50	0.50	15.00	15.16	4.38	2.19	0.013	2.01	12	25	RCP	0.32%	0.38%	2.6	911.22	914.59	914.59	910.40	910.32	3.1
5	6	149199	6426	0	155625	3.57	4.42	0.23	0.82	1.32	15.16	15.37	4.36	5.76	0.013	16.2	18	116	RCP	2.38%	0.30%	9.2	910.05	914.59	912.60	908.85	906.09	4.1
6	8	0	0	0	0	0	4.42	0	0.00	1.32	15.37	15.63	4.33	5.72	0.013	7.28	18	42	RCP	0.48%	0.20%	4.1	907.29	912.60	911.65	905.95	905.75	4.2
8	9	2581	4466	0	7047	0.16	7.58	0.64	0.10	2.71	16.58	18.19	4.21	11.43	0.013	7.84	24	241	RCP	0.12%	0.26%	2.5	907.21	911.65	913.05	905.30	905.01	4.1
9A	9B	30692	4389	0	35081	0.81	0.81	0.29	0.23	0.23	15.00	15.14	4.38	1.03	0.013	2.25	12	25	RCP	0.40%	0.08%	2.9	907.75	911.87	911.87	906.95	906.85	3.8
9B	9	7234	5192	0	12426	0.29	1.1	0.49	0.14	0.38	15.14	15.42	4.36	1.64	0.013	3.92	12	82	RCP	1.21%	0.21%	5	907.65	911.87	913.05	906.85	905.85	3.9
9	10	0	0	0	0	0	8.68	0	0.00	3.09	18.19	18.45	4.05	12.51	0.013	8.45	24	43	RCP	0.14%	0.31%	2.7	906.58	913.05	904.85	904.91	904.85	ES

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BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

DOVE LAKE ESTATES
PHASE 2 - STORM AREA 1

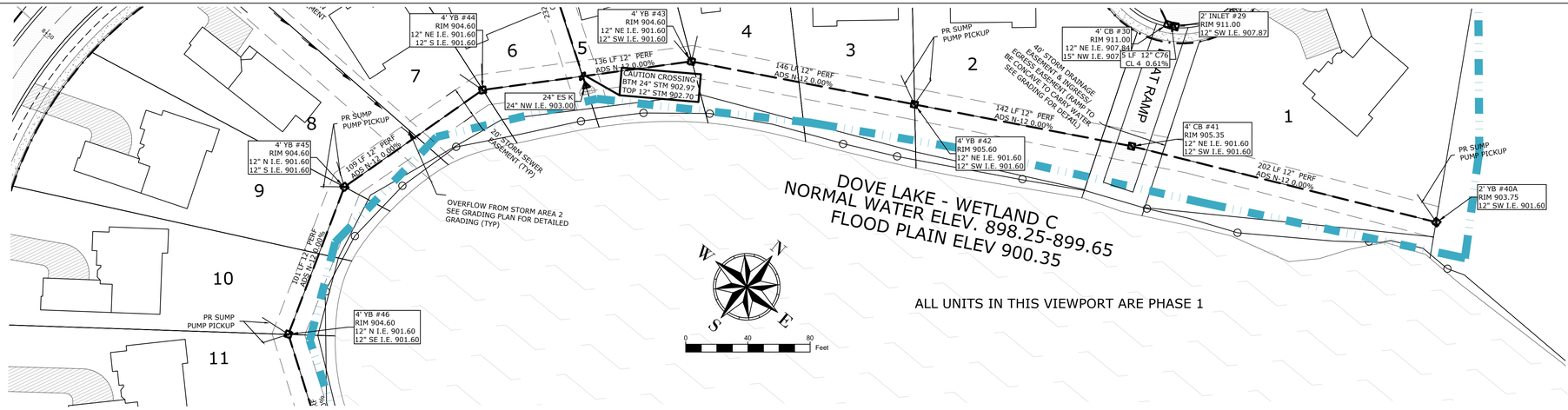
DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

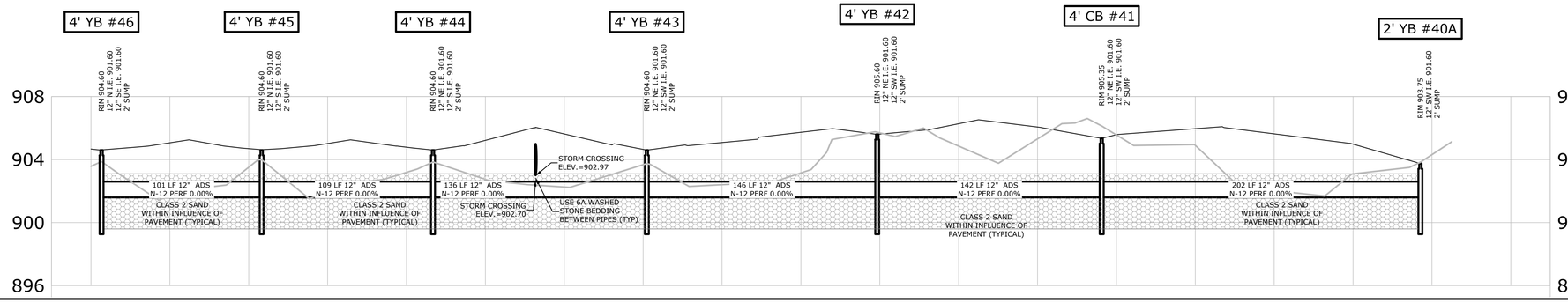
ISSUE DATES

CONSTRUCTION 5/19/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 7/5/2022
CONSTRUCTION 9/13/2022
CONSTRUCTION 5/5/2024
CONSTRUCTION 10/31/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=40'

ST 3
CONSTRUCTION





PERK TEST SOILS - COMPLETED BY LCHD WITH BACKHOE

PK #1
12" TOPSOIL
1' SANDY LOAM
7' CLAY LOAM
6' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #2
6" FILL
2' CLAY
4' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #3
12" TOPSOIL
4' CLAY LOAM
5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #4
FILL

PK #5
9" FILL
6' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #6
5" FILL

PK #7
2" FILL
9' CLAY
4' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #8
2" FILL
9' CLAY
3.5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #9
2" FILL
9' CLAY
3.5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PERK TEST COMPLETED BY POWELL ENGINEERING WITH BACKHOE

PK A
12" TOPSOIL
4' LOAM
12' COARSE SAND
2' DEBRIS IN CLAY LOAM FILL
2' COARSE SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK B
6' CLAY LOAM
2' COARSE SAND AND GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

PK C
12" CLAY LOAM
HSWT @ 10'
GW @ 10'

PK D
4" CLAY LOAM
2' COARSE SAND AND GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

PK E
4" LOAM
8' MEDIUM BROWN SAND
COARSE SAND & GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

SOIL BORINGS - ATV BORING LOG DONE ON 3/19/2021

B-1 - ELEV 915.35 - BOTTOM BASIN ELEV 904.00
0 - 16" SILTY CLAY TOPSOIL
16" - 17.5' MOIST CLAY FILL OVER BROWN COARSE SAND & GRAVEL
17.5' - 30' WET MEDIUM COARSE BROWN SAND & GRAVEL
GW @ 17'

B-2 - ELEV 913.85 - BOTTOM BASIN ELEV 904.00
0 - 8" FILL MOIST BROWN SANDY CLAY OVER TOPSOIL
8' - 13' FILL - SANDY BROWN SILT
13'-14.5' FILL - SANDY BROWN SILT
14.5' - 17' FILL - MOIST BROWN SILTY SANDY CLAY
17'-21' MOIST MEDIUM BROWN SAND & GRAVEL
21'-27' WET COARSE BROWN SAND & GRAVEL
27'-30' MOIST CLAY GRAY SILT
GW @ 21'

SOIL BORINGS - ATV BORING LOG DONE ON 10/15/2021

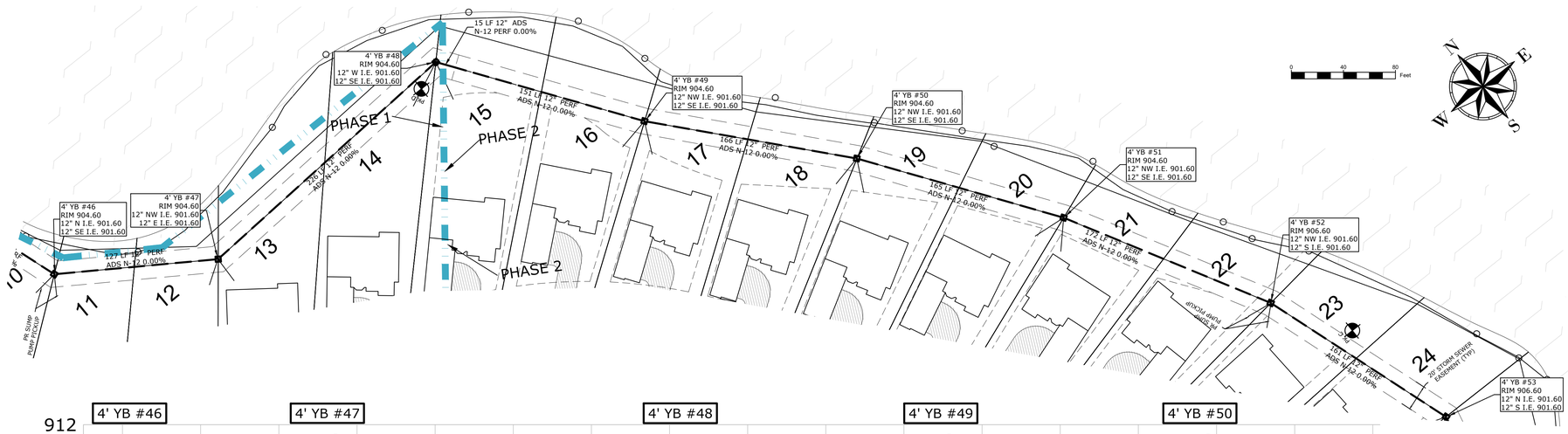
B-3 (B-1 10/15/21)
0 - 7' MOIST MEDIUM BR SAND & GRAVEL
7' - 11' MOIST BROWN SANDY SLT
11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

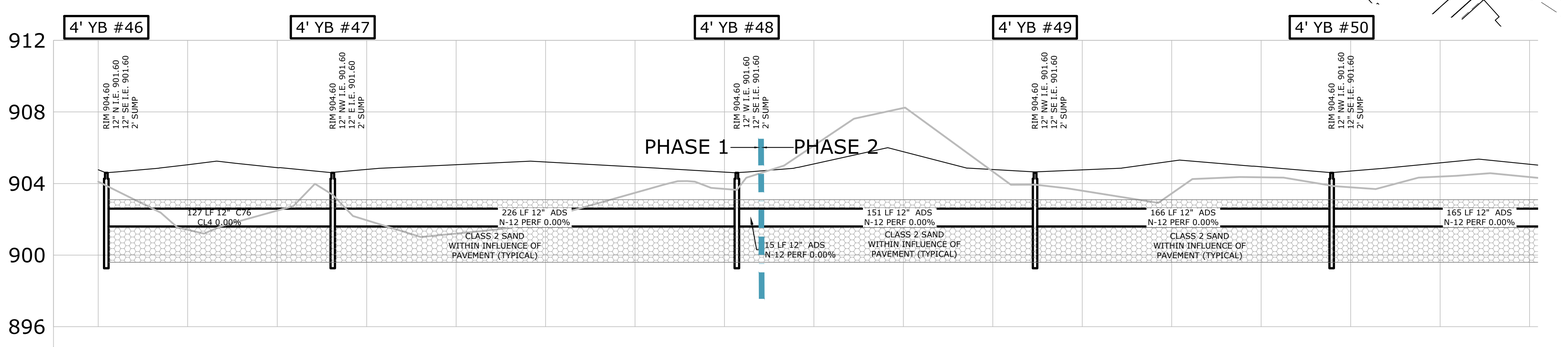
B-4 (B-2 10/15/21)
0 - 5.5' MOIST SANDY BROWN CLAY W/AGGREGATE
5.5' - 7' MOIST BROWN SANDY SLT
7' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-5 (B-3 10/15/21)
0 - 13' MOIST SANDY BROWN CLAY
13 - 14' MOIST SANDY BROWN SILT
14-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

B-6 (B-4 10/15/21)
0 - 6' FILL MOIST SANDY BROWN CLAY W/ AGGREGATE
6' - 13.5' FILL - MOIST DK BROWN/GRAY SANDY CLAY W/ AGGREGATE
13.5'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

NOTE: ALL PROPOSED STORMWATER MANAGEMENT SYSTEM IS TO BE PROPERLY MAINTAINED BY THE PROPERTY OWNER'S ASSOCIATION.



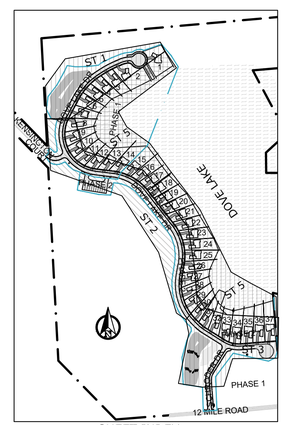


STORM SEWER AREA 3 QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
12" PERF ADS N-12 PIPE IN STONE BED	2780 LF	
2' YARD BASIN	2 EA	
4' YARD BASIN	17 EA	
4' CATCH BASIN	1 EA	

STORM STRUCTURE NORTHING/EASTING AND CASTING STORM AREA 3 - SHEET ST 4

STRUCTURE	NORTHING	EASTING	CASTING
YARD BASIN #40A	9628.0563	8759.1208	EJIW 1040 TYPE N
CATCH BASIN #41	9541.2026	8576.7205	EJIW 1040 TYPE M1
YARD BASIN #42	9473.1309	8451.7718	EJIW 1040 TYPE N
YARD BASIN #43	9403.3080	8323.4981	EJIW 1040 TYPE N
YARD BASIN #44	9303.7337	8231.5666	EJIW 1040 TYPE N
YARD BASIN #45	9199.0327	8202.6185	EJIW 1040 TYPE N
YARD BASIN #46	9102.9111	8235.1447	EJIW 1040 TYPE N
YARD BASIN #47	9033.7059	8341.1019	EJIW 1040 TYPE N
YARD BASIN #48	9048.4722	8566.4897	EJIW 1040 TYPE N
YARD BASIN #49	8913.1870	8663.8684	EJIW 1040 TYPE N
YARD BASIN #50	8789.2310	8773.9557	EJIW 1040 TYPE N
YARD BASIN #51	8654.7257	8870.2182	EJIW 1040 TYPE N



SHEET INDEX
NO SCALE

Consulting Civil Engineers
"Engineering A Better Michigan"
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4700 Cornerstone Drive, White Lake, Michigan 48383
Ph: 248.714-6935 info@powellengineeringllc.com

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DOVE LAKE ESTATES
PHASE 1 & 2 - STORM AREA 3

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

ISSUE DATES

CONSTRUCTION 5/19/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 7/5/2022
CONSTRUCTION 5/5/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	AS SHOWN

ST 4
CONSTRUCTION

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SOIL INFORMATION FOR INFILTRATION TRENCHES

DRILLING AND TESTING OBSERVATIONS

Three soil borings were completed in the area of the proposed infiltration trenches. Each of these three percolation tests were completed onsite with a backhoe open dig. In addition, to these three percolation tests, an additional ten (10) percolation tests were conducted around the site, in which each hole contained either medium sand or coarse sand and gravel. Further soils testing was done in the form of soil borings via an ATV. Six (6) soil borings were additionally completed to depths ranging from 15' to 30'. Each of these borings came back with either medium sand or medium sand and gravel. In addition to consistent soils found throughout the site, consistent elevations of groundwater were found. The groundwater follows very closely with the elevation of the existing onsite lake with elevations ranging from 892.85 to elevation 898.85 which is consistent with the lake elevations being between 897.85 to 899.35.

One of the three percolation tests soils was poor, however, no other perk test or boring was found under these conditions. Furthermore, this one perk test was further away of the 3 conducted from the trench locations and we have designated these soils as fill. Over the site, fourteen (14) percolation tests and six (6) soil borings over the site showed a consistent layer of either medium sand or sand and gravel consistently at the elevation of 900.85±.

The recorded soils in the direct vicinity of the infiltration trenches were as follows:

PK B - ELEV 906.82 AS SURVEYED IN
6' CLAY LOAM
2' COARSE SAND AND GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

PK C - ELEV 908.67 AS SURVEYED IN
12' CLAY LOAM
HSWT @ 10' - ELEV 896.67 AT TIME OF TEST
GW@ 10' - ELEV 896.67 AT TIME OF TEST
GW @ 8' 30 MINUTES AFTER TEST - ELEV 898.67

PK D - ELEV 904.94 AS SURVEYED IN
4' CLAY LOAM
2' COARSE SAND AND GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

CONCLUSIONS AND RECOMMENDATIONS

The permeability of the soils found in the percolation testing is as follows:

SOIL CLASSIFICATION	RELATIVE PERMEABILITY	COEFFICIENT OF PERMEABILITY = K
Clay Loam	Very Low Permeability	0.06 in/hr
Clay Loam w/ seams Medium sand	Very Low Permeability	0.1 in/hr
Medium Sand	High Permeability	6 in/hr
Coarse Sand & Gravel	Very High Permeability	15 in/hr

Based on the above permeability rates we recommend that the proposed percolation trench be keyed 12" into the existing coarse sand and gravel at the elevation of 899.10. The average percolation rate expected with these soils per the design is 12 in/hr. The designed rate with safety factor should be 8 in/hr.

PERK TEST SOILS - COMPLETED BY LCHD WITH BACKHOE

PK #1
12" TOPSOIL
1' SANDY LOAM
7' CLAY LOAM
6' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #2
6' FILL
2' CLAY
4' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #3
12" TOPSOIL
4' CLAY LOAM
5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #4
FILL

PK #5
9' FILL
6' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #6
5' FILL

PK #7
2' FILL
9' CLAY
4' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #8
2' FILL
9' CLAY
3.5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #9
2' FILL
9' CLAY
3.5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PERK TEST COMPLETED BY POWELL ENGINEERING WITH BACKHOE

PK A
12" TOPSOIL
4' LOAM
12" COARSE SAND
2' DEBRIS IN CLAY LOAM FILL
2' COARSE SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK B
6" CLAY LOAM
2' COARSE SAND AND GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

PK C
12" CLAY LOAM
HSWT @ 10'
GW @ 10'

PK D
4" CLAY LOAM
2' COARSE SAND AND GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

PK E
4" LOAM
8' MEDIUM BROWN SAND
COARSE SAND & GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

SOIL BORINGS - ATV BORING LOG DONE ON 3/19/2021

B-1 - ELEV 915.35 - BOTTOM BASIN ELEV 904.00
0" - 16" SILTY CLAY TOPSOIL
16"- 17.5' MOIST CLAY FILL OVER BROWN COARSE SAND & GRAVEL
17.5' - 30' WET MEDIUM COARSE BROWN SAND & GRAVEL
GW @ 17'

B-2 - ELEV 913.85 - BOTTOM BASIN ELEV 904.00
0" - 8" FILL MOIST BROWN SANDY CLAY OVER TOPSOIL
8' - 13' FILL - SANDY BROWN SILT
13'-14.5' FILL - SANDY BROWN SILT
14.5'-17' FILL - MOIST BROWN SILTY SANDY CLAY
17'-27' MOIST MEDIUM BROWN SAND & GRAVEL
27'-30' WET COARSE BROWN SAND & GRAVEL
GW @ 21'

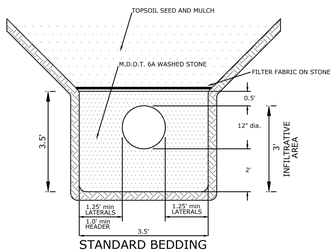
SOIL BORINGS - ATV BORING LOG DONE ON 10/15/2021

B-3 (B-1 10/15/21)
0' - 7' MOIST MEDIUM BR SAND & GRAVEL
7' - 11' MOIST BROWN SANDY SILT
11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

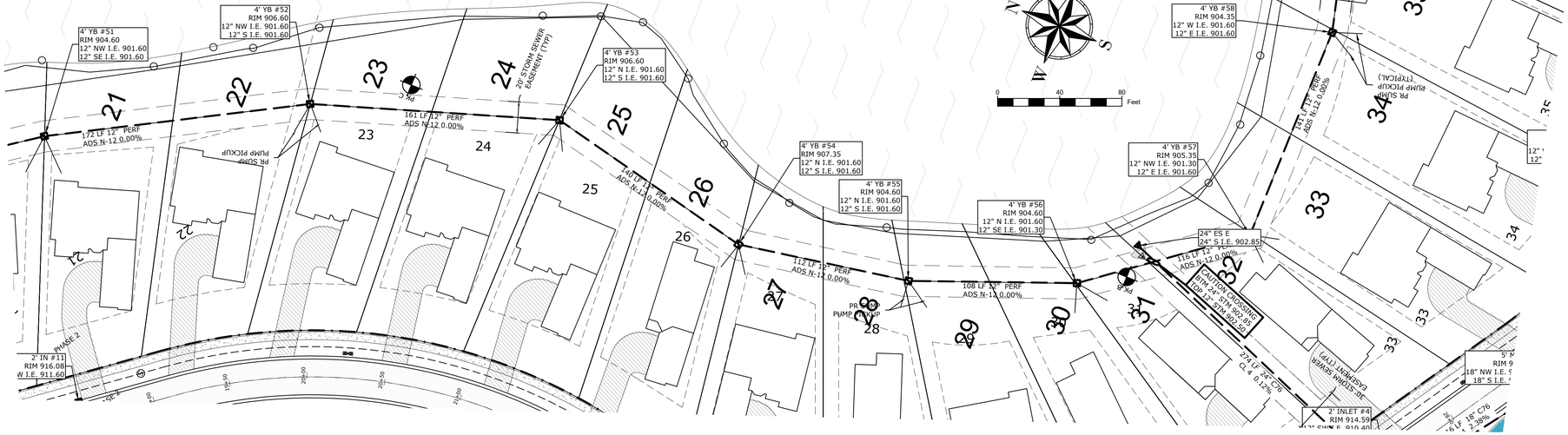
B-4 (B-2 10/15/21)
0' - 5.5' MOIST SANDY BROWN CLAY W/AGGREGATE
5.5' - 7' MOIST BROWN SANDY SILT
7' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

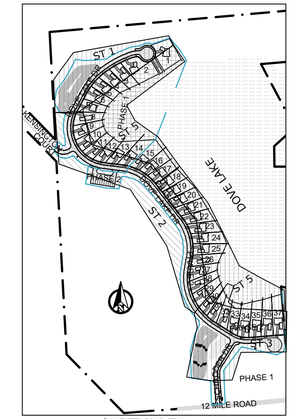
B-5 (B-3 10/15/21)
0' - 13' MOIST SANDY BROWN CLAY
13' - 14' MOIST SANDY BROWN SILT
14'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

B-6 (B-4 10/15/21)
0'- 6' FILL MOIST SANDY BROWN CLAY W/ AGGREGATE
6' - 13.5' FILL - MOIST DR BROWN/GRAY SANDY CLAY W/ AGGREGATE
13.5'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED



STANDARD BEDDING
FOR 12' DIA. PERFORATED PIPE
NO SCALE





SHEET INDEX
NO SCALE

DOVE LAKE - WETLAND C
NORMAL WATER ELEV. 898.25-899.65
FLOOD PLAIN ELEV 900.35

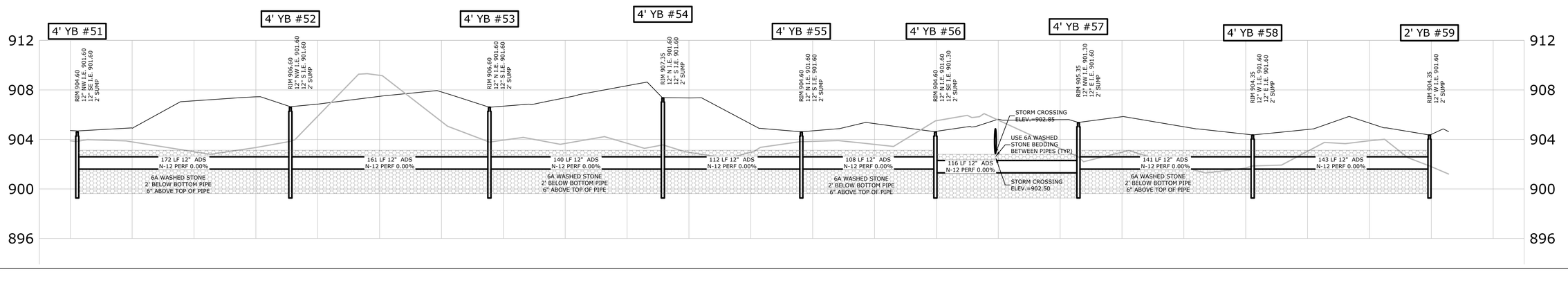
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STORM SEWER AREA 3 QUANTITY LIST

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12" PERF ADS N-12 PIPE IN STONE BED	2780 LF	
2' YARD BASIN	2 EA	
4' YARD BASIN	17 EA	
4' CATCH BASIN	1 EA	

STORM STRUCTURE NORTHING/EASTING AND CASTING STORM AREA 3 - SHEET ST 5

STRUCTURE	NORTHING	EASTING	CASTING
YARD BASIN #52	8504.3758	8954.2441	EJIW 1040 TYPE N
YARD BASIN #53	8351.8638	9005.4127	EJIW 1040 TYPE N
YARD BASIN #54	8215.0005	8974.9836	EJIW 1040 TYPE N
YARD BASIN #55	8104.8865	8994.7514	EJIW 1040 TYPE N
YARD BASIN #56	8004.0497	9034.4501	EJIW 1040 TYPE N
YARD BASIN #57	7912.7349	9105.3395	EJIW 1040 TYPE N
YARD BASIN #58	7913.1791	9246.1365	EJIW 1040 TYPE N
YARD BASIN #59	7949.5927	9384.3273	EJIW 1040 TYPE N



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DOVE LAKE ESTATES
PHASE 2 - STORM AREA 3

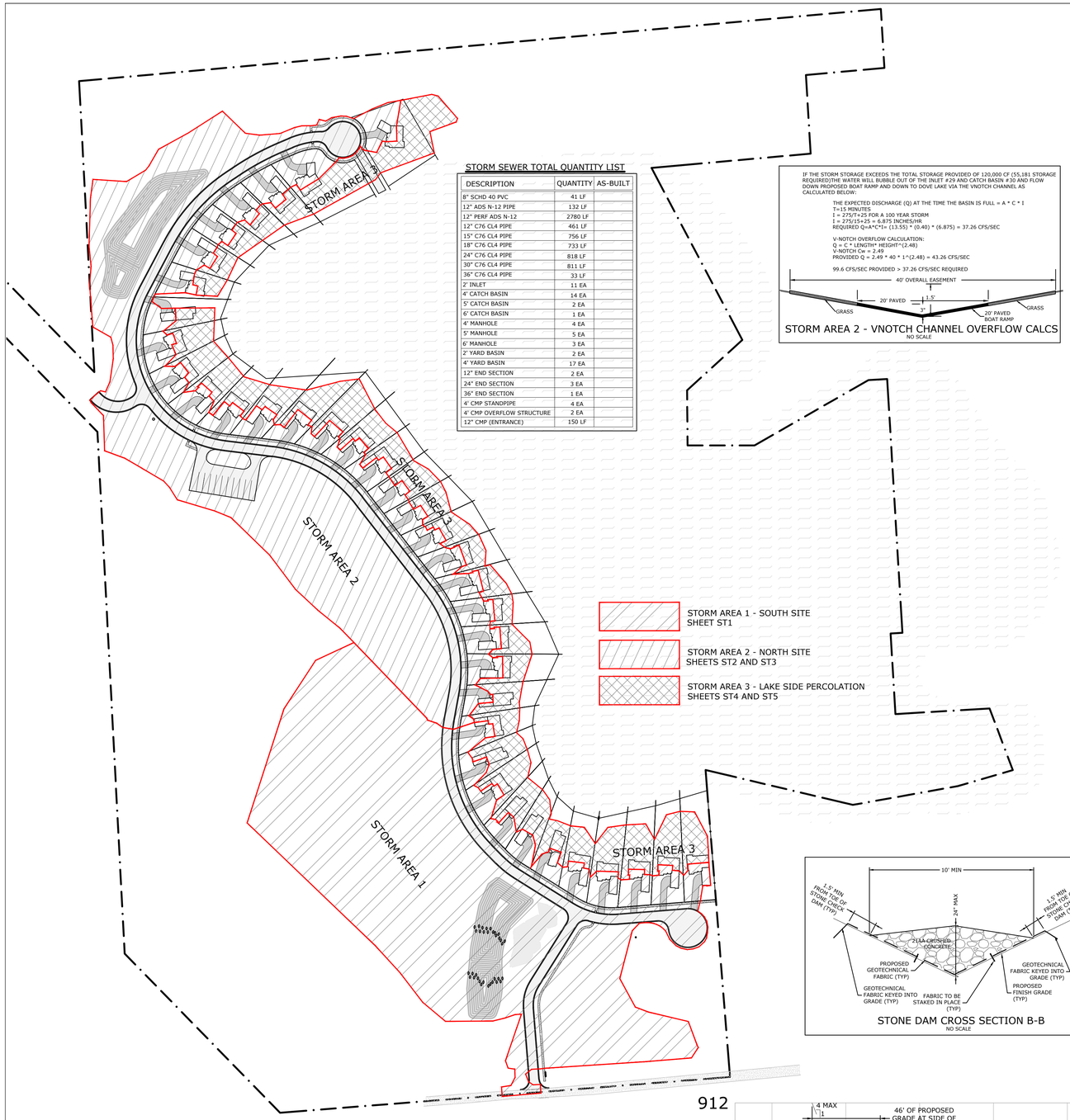
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CONSTRUCTION 5/5/2024
STAMPING SET 6/26/2025

DRAWN MCS
DESIGNED MCS
APPROVED MCP
P.E. JOB No. 19-425
SCALE AS SHOWN

ST 5
CONSTRUCTION

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STORM SEWER TOTAL QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
8" SCHD 40 PVC	41 LF	
12" ADS N-12 PIPE	132 LF	
12" PERF ADS N-12	2780 LF	
12" C76 CL4 PIPE	461 LF	
15" C76 CL4 PIPE	756 LF	
18" C76 CL4 PIPE	733 LF	
24" C76 CL4 PIPE	818 LF	
30" C76 CL4 PIPE	811 LF	
36" C76 CL4 PIPE	33 LF	
2' INLET	11 EA	
4' CATCH BASIN	14 EA	
5' CATCH BASIN	2 EA	
6' CATCH BASIN	1 EA	
4' MANHOLE	4 EA	
5' MANHOLE	5 EA	
6' MANHOLE	3 EA	
2' YARD BASIN	2 EA	
4' YARD BASIN	17 EA	
12" END SECTION	2 EA	
24" END SECTION	3 EA	
36" END SECTION	1 EA	
4' CMP STANDPIPE	4 EA	
4' CMP OVERFLOW STRUCTURE	2 EA	
12" CMP (ENTRANCE)	150 LF	

IF THE STORM STORAGE EXCEEDS THE TOTAL STORAGE PROVIDED OF 120,000 CF (55,181 STORAGE REQUIRED)THE WATER WILL BUBBLE OUT OF THE INLET #29 AND CATCH BASIN #30 AND FLOW DOWN PROPOSED BOAT RAMP AND DOWN TO DOVE LAKE VIA THE VNOTCH CHANNEL AS CALCULATED BELOW:

THE EXPECTED DISCHARGE (Q) AT THE TIME THE BASIN IS FULL = A * C * I
T=15 MINUTES
I = 275/T+25 FOR A 100 YEAR STORM
I = 275/15+25 = 6.875 INCHES/HR
REQUIRED Q=A*C*I= (13.55) * (0.40) * (6.875) = 37.26 CFS/SEC

V-NOTCH OVERFLOW CALCULATION:
Q = C * LENGTH* HEIGHT^(2.48)
V-NOTCH Cw = 2.49
PROVIDED Q = 2.49 * 40 * 1^(2.48) = 43.26 CFS/SEC

99.6 CFS/SEC PROVIDED > 37.26 CFS/SEC REQUIRED

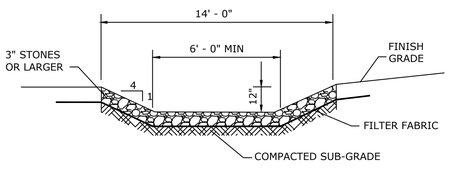
STORM AREA 2 - VNOTCH CHANNEL OVERFLOW CALCS
NO SCALE

STORM AREA 1 - SOUTH SITE SHEET ST1

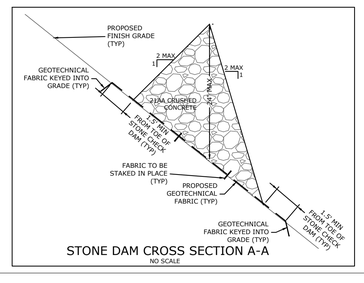
STORM AREA 2 - NORTH SITE SHEETS ST2 AND ST3

STORM AREA 3 - LAKE SIDE PERCOLATION SHEETS ST4 AND ST5

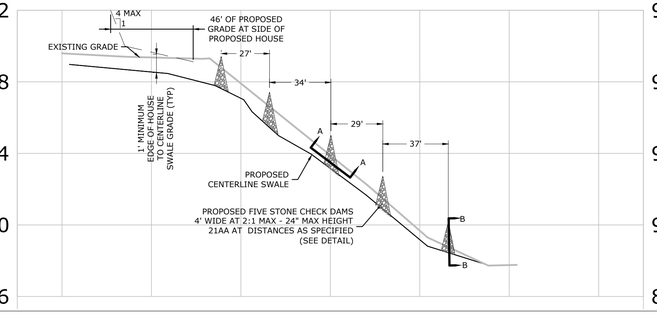
STONE DAM CROSS SECTION B-B
NO SCALE



TYPICAL FOREBAY OVERFLOW SPILLWAY DETAIL (FOREBAY TO DETENTION)
NO SCALE



STONE DAM CROSS SECTION A-A
NO SCALE



STORM WATER CALCULATIONS (AREA 1)

TRIBUTARY AREA 2 (GROSS & NET)	=	**14.15**	**ACRES**				
PAVING AREA (WALKS, DRIVES, ROAD)	=	1.26	ACRES	@	0.90	=	1.13
BUILDING AREA	=	0.25	ACRES	@	0.90	=	0.23
LAWN AREA	=	12.5	ACRES	@	0.20	=	2.51
DETENTION (LOW WATER AREA)	=	0.10	ACRES	@	1.00	=	0.10
		14.15	ACRES				3.967
C avg. = TOTAL C / TOTAL ACRES =	3.97	/	14.15	=	**0.28**		
DESIGN CONSTANT (K1) = A * C =	**3.967**						
Allowable Outflow Rate Qo = 0.2 CFS/ACRE =		**2.83 cfs**					

DURATION (MINUTES)	DURATION (SECONDS)	INTENSITY (100YR IN/HR)	COL #2 x COL #3 (INCH)	INFLOW COL 4 x K1	OUTFLOW COL 2 x Qo	STORAGE VOL (C.F.)
5	300	9.17	2750	10909	849	10060
10	600	7.86	4714	18702	1698	17004
15	900	6.88	6188	24546	2547	21999
20	1200	6.11	7333	29091	3396	25695
30	1800	5.00	9000	35703	5094	30609
60	3600	3.24	11647	46204	10188	**36016**
90	5400	2.39	12913	51226	15282	35944
120	7200	1.90	13655	54170	20376	33794
180	10800	1.34	14488	57473	30564	26909

Computed required storage = 36016

REQUIRED FOREBAY STORAGE

FIRST FLUSH = 1815 * A * C avg	=	7191	CF @	908.00	SET ORIFICES @ 908.0
BANKFULL VOLUME = 8160 * A * C	=	32371	-7207 = 25164 @	908.16	SET ORIFICES @ 908.16

PROVIDED FOREBAY STORAGE

FIRST FLUSH 7191 CU.FT. @ ELEV. 908.00

FOREBAY			
ELEV	SQ.FT.	CU.FT.	ACCUM.
903-905	2' sediment storage		
905	983	0	0
906	1826	1405	1405
907	2855	2341	3745
908	4068	3462	7207
909	5467	4768	11974
910	7048	6258	18232
911	8809	7929	26160
912	10748	9779	35939
FREEBOARD 909-910.85			

BANKFULL 25164 CU.FT. @ ELEV. 908.16
BANKFULL 28809 CU.FT. @ ELEV. 908.41

ELEV	AREA (SQ.FT.)	VOLUME (CU.FT.)	ACCUM VOLUME
902-905	PERMANMENT POOL		
905	4613	0	0
906	6664	5639	5639
907	8919	7792	13430
908	11378	10149	23579
909	14036	12707	36286
910	16880	15458	51744
911	19910	18395	70139
FREEBOARD 907.43 - 910.85			

REQUIRED DETENTION STORAGE = 28809
36016 (REQUIRED STORAGE) -7207 (FOREBAY STORAGE)CU.FT.
REQUIRED 100 YEAR STORM STORAGE OF 28809 CU.FT. @ 908.41

FOREBAY RISER & OUTLET DESIGN

FIRST FLUSH

Q(ff)=V/T(24)=7191/(24 hr)(3600 sec/hr)=	0.083	cfs @ elev 904.85
h(avg) = (2/3) * (908.00-904.85) =	2.10	FT
A = Q(ff) / 0.62* sqrt (2*32.2 * h) =	0.01	SF
USE 1" orifices =	0.0055	sf/hole
# orifices = total area/area per hole =	2	
Use 2 - 1" holes @ 904.85		
Q (ff new) = (# holes) (area/hole)* 0.62*sqrt (2 * g * h) =	0.08	cfs
Time (ff new) =V(ff)/Q(ff ne 9813 / (0.11 * 3600) =	24.00	hours

USE 2 - 1" ORIFICES @ 904.85 ELEVATION IN FOREBAY STANDPIPE - SET RISER ELEV @ 908.00

DETENTION RISER & OUTLET DESIGN

AREA 1 - 10 YEAR STORM OUTLET PIPE CALCULATION

Q(area 1) = c * I * A = 0.28 * (175/ (18+25)) * 14.15 =		16.14	cfs
USING ORIFICE CALCULATION A = Q / 0.62 * sqrt (2 * 32.2 * h)			
h(avg) = (2/3)(909-904.85) =	2.77		
A = Q(area 1)/ 0.62* sqrt (2*32.2 * h) =	1.95	SF	
DIAMETER = [SQRT (Q/π)]*2 =	18.91	inches	
2ND CHECK WITH BERNOULII EQUATION = D = ((Q^2)*n^2 * L * K/h)^(1/5.3333) =		21.12	inches

USE 24" OUTLET PIPE FROM OVERFLOW STRUCTURE

BANKFULL CALCULATIONS

Q(bf) = V/T(30) = 32371/ (30 hr) (3600 sec/hr) =	0.300	cfs
h(ave) = (2/3) (ELEV (bf) - ELEV (ff)) = (2/3) * (908.0-905.0)	2.00	ft
A = Q(*bf*) / 0.62* sqrt (2*32.2 * h) =	0.0426	sq.ft.
USE 1" orifices =	0.0055	sf/hole
# orifices = total area/area per hole =	7.74	holes
Q (bf new) = (# holes) (area/hole)* 0.62*sqrt (2 * g * h) =	0.27	cfs
T(bf new) =V(bf) /Q(bf new)=32371 / (0.29 * 3600) =	33.19	hours

USE 7 - 1" ORIFICES @ 904.60 ELEVATION

100 YEAR CALCULATIONS

Q(allow) = A * 0.2 cfs/acre = 14.15 * 0.2	2.830	cfs
Q(allow) - Q (bf new) = 2.83 - 0.27 =	2.559	cfs
h = (ELEV (100) - ELEV (bf)) = (908.5-908.16) =	0.34	ft
A = Q(100) / 0.62* sqrt (2*32.2 * h) =	0.8821	sq.ft.
USE 2" orifices =	0.02	sf/hole
# orifices = total area/area per hole =	44	holes
Q (allow)= (# holes) (area/hole)* 0.62*sqrt (2 * g * h) =	2.56	cfs
Q (bf new) =	0.27	cfs
Q (new total) =	2.83	cfs

USE 44 - 2" ORIFICES @ 908.16 AND 908.41 (SEE DETAIL)

STORM WATER CALCULATIONS (AREA 2)

TRIBUTARY AREA 2 (GROSS & NET)	=	**13.55**	**ACRES**				
PAVING AREA (WALKS, DRIVES, ROAD)	=	2.73	ACRES	@	0.90	=	2.46
BUILDING AREA	=	0.96	ACRES	@	0.90	=	0.86
LAWN AREA	=	9.7	ACRES	@	0.20	=	1.94
DETENTION (LOW WATER AREA)	=	0.15	ACRES	@	1.00	=	0.15
		13.55	ACRES				5.40653
C avg. = TOTAL C / TOTAL ACRES =	5.41	/	13.55	=	**0.40**		
DESIGN CONSTANT (K1) = A * C =	**5.41**						
Allowable Outflow Rate Qo = 0.2 CFS/ACRE	**2.71 cfs**						

DURATION (MINUTES)	DURATION (SECONDS)	INTENSITY (100YR IN/HR)	COL #2 x COL #3 (INCH)	INFLOW COL 4 x K1	OUTFLOW COL 2 x Qo	STORAGE VOL (C.F.)
5	300	9.17	2750	14868	813	14055
10	600	7.86	4714	25488	1626	23862
15	900	6.88	6188	33453	2439	31014
20	1200	6.11	7333	39648	3252	36396
30	1800	5.00	9000	48659	4878	43781
60	3600	3.24	11647	62970	9756	53214
90	5400	2.39	12913	69815	14634	**55181**
120	7200	1.90	13655	73827	19512	54315
180	10800	1.34	14488	78329	29268	49061

Computed required storage = 55181

REQUIRED FOREBAY STORAGE = 1/2" OVER ENTIRE STORM AREA

FIRST FLUSH REQUIRED = 1815 * A * C	=	9813	CF @ ELEV =	906.47	set @ 906.50
BANKFULL VOLUME CALCULATIONS = 8160*A*C	=	44117	-(9813FOREBAY STORAGE)=34303	907.48	set @ 907.50

PROVIDED FOREBAY STORAGE

FIRST FLUSH 9813 CU.FT. @ ELEV. 906.50

FOREBAY			
ELEV	SQ.FT.	CU.FT.	ACCUM.
902-904	2' SEDIMENT STORAGE		
904	1956	0	0
905	3377	2667	2667
906	5147	4262	6929
907	7157	6152	13081
908	9413	8285	21366
909	11892	10653	32018
FREEBOARD 908-910			

BANKFULL 34303 CU.FT. @ ELEV. 907.50
100 YEAR HIGH WATER ELEVATION 45368 CU.FT. @ ELEV. 908.19

ELEV	AREA (SQ.FT.)	VOLUME (CU.FT.)	ACCUM VOLUME
901-904	PERMANENT POOL		
904	5867	0	0
905	7819	6843	6843
906	9999	8909	15752
907	13025	11512	27264
908	16346	14686	41950
909	19936	18141	60091
910	23753	21845	81935
FREEBOARD	FREEBOARD 909.25 - 911		

REQUIRED STORAGE 55181 - FOREBAY STORAGE 9813
DETENTION REQUIRED STORAGE 45368
REQUIRED STORAGE OF 45368 SQ.FT. @ ELEV 908.19

FOREBAY RISER & OUTLET DESIGN

FIRST FLUSH

Q(ff)=V/T(24)=9813/(24 hr)(3600 sec/hr)=	0.114	cfs @ elev 906.5
h(avg) = (2/3) * (906.5-904.20) =	1.53	FT
A = Q(ff) / 0.62* sqrt (2*32.2 * h) =	0.02	SF
USE 1" orifices =	0.0055	sf/hole
# orifices = total area/area per hole =	3	
Use 3 - 1" holes @ 904.20		
Q (ff new) = (# holes) (area/hole)* 0.62*sqrt (2 * g * h) =	0.11	cfs
Time (ff new)= V(ff)/Q (ff new) = 9813 / (0.11*3600) =	24.00	hours

USE 3 - 1" ORIFICES @ 904.20 ELEVATION IN FOREBAY STANDPIPE - SET RISER ELEV @ 906.5

DETENTION RISER & OUTLET DESIGN

AREA 1 - 10 YEAR STORM OUTLET PIPE CALCULATION

Q(area 2) = c * I * A = 0.28 * (175/ (20.88+25)) * 13.55 =		20.62	cfs
USING ORIFICE CALCULATION A = Q / 0.62 * sqrt (2 * 32.2 * h)			
h(avg) = (2/3)[908-904) =	2.83		
A = Q(area 2)/ 0.62* sqrt (2*32.2 * h) =	2.46	SF	
DIAMETER = [SQRT (Q/π)]*2 =	21.25	inches	
2ND CHECK WITH BERNOULII EQUATION = D = ((Q^2)*n^2 * L * K/h)^(1/5.3333) =		22.20	inches

USE 24" OUTLET PIPE FROM OVERFLOW STRUCTURE

BANKFULL CALCULATIONS

Q(bf) = V/T(30) = 33815/ (30 hr) (3600 sec/hr) =	0.420	cfs
h(ave) = (2/3) (ELEV (bf) - ELEV (ff)) = (2/3) * (908.25-904.0) =	2.83	ft
A = Q(*bf*) / 0.62* sqrt (2*32.2 * h) =	0.0502	sq.ft.
USE 1" orifices =	0.0055	sf/hole
# orifices = total area/area per hole =	9.12	holes
Q (bf new) = (# holes) (area/hole)* 0.62*sqrt (2 * g * h) =	0.37	cfs
T(bf new) =V(bf) /Q(bf new)= 44117/ (0.31 * 3600) =	33.26	hours

USE 9 - 1" ORIFICES @ 904.00 ELEVATION

100 YEAR CALCULATIONS

Q(allow) = A * 0.2 cfs/acre = 13.55 * 0.2	2.710	cfs
Q(allow) - Q (bf new) = 2.71 - 0.37 =	2.342	cfs
h = (ELEV (100) - ELEV (bf)) = (908.25-907.5) =	0.75	ft
A = Q(100) / 0.62* sqrt (2*32.2 * h) =	0.5434	sq.ft.
USE 2" orifices =	0.02	sf/hole
# orifices = total area/area per hole =	27	holes
Q (allow)= (# holes) (area/hole)* 0.62*sqrt (2 * g * h) =	2.34	cfs
Q (bf new) =	0.37	cfs
Q (new total) =	2.71	cfs

USE 27 - 2" ORIFICES @ 907.5 AND 907.75 (SEE DETAIL)

STORM WATER CALCULATIONS (AREA 3) - LAKE PERCOLATION TRENCH

TRIBUTARY AREA 2 (GROSS & NET)	=	**6.07**	**ACRES**				
PAVING AREA (WALKS, DRIVES, ROAD)	=	0.05	ACRES	@	0.90	=	0.05
BUILDING AREA	=	1.38	ACRES	@	0.90	=	1.25
LAWN AREA	=	4.5	ACRES	@	0.20	=	0.91
DETENTION (LOW WATER AREA)	=	0.10	ACRES	@	1.00	=	0.10
		6.07	ACRES				2.30
C avg. = TOTAL C / TOTAL ACRES =	2.30	/	6.07	=	**0.38**		
DESIGN CONSTANT (K1) = A * C =	**2.30**						
Allowable Outflow Rate Qo = 0.2 CFS/	**1.214** cfs	*				=	**5.844**
	4.63 cfs perk rate in 2781 LF stone trench @ 9 S.F./L.F. @ 8"/hr						

DURATION (MINUTES)	DURATION (SECONDS)	INTENSITY (100YR IN/HR)	COL #2 x COL #3 (INCH)	INFLOW COL 4 x K1	OUTFLOW COL 2 x Qo	STORAGE VOL (C.F.)
5	300	9.17	2750	6321	1753	4568
10	600	7.86	4714	10836	3506	7329
15	900	6.88	6188	14222	5260	8962
20	1200	6.11	7333	16856	7013	9843
30	1800	5.00	9000	20686	10519	**10167**
60	3600	3.24	11647	26771	21038	5732
90	5400	2.39	12913	29681	31558	-1877
120	7200	1.90	13655	31386	42077	-10691
180	10800	1.34	14488	33300	63115	-29815

Computed required storage = 10167

STORAGE PROVIDED

2653 LF 12" PIPE 6A WASHED STONE TRENCHES	2653			2653	CU.FT.
3' WIDE BY 4' DEEP (3' UNDER PIPE) = 3x4 = 12 x 2653	31836	x	0.4	12734.4	CU.FT.
				15387.4	

PROVIDED STORAGE 15387.4>10167 SQ.FT. REQUIRED

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DOVE LAKE ESTATES
STORM CALCS & OVERVIEW

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

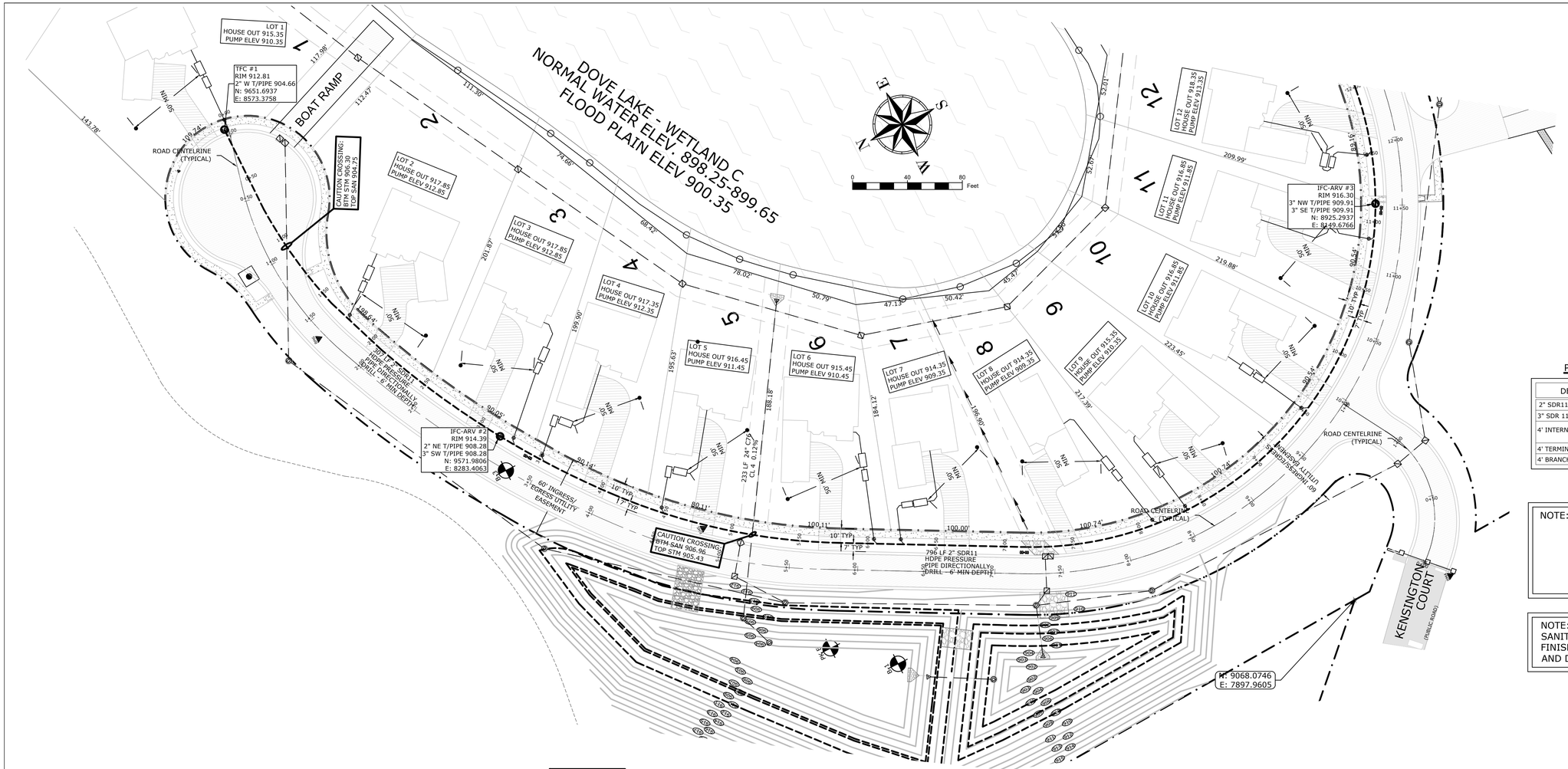
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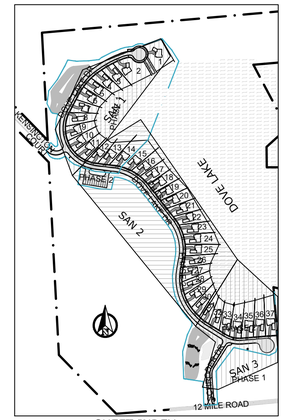
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- CONSTRUCTION 1/20/2022
- CONSTRUCTION 4/19/2022
- CONSTRUCTION 7/5/2022
- CONSTRUCTION 9/14/2022
- STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=100'

ST6
CONSTRUCTION

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SHEET INDEX
NO SCALE

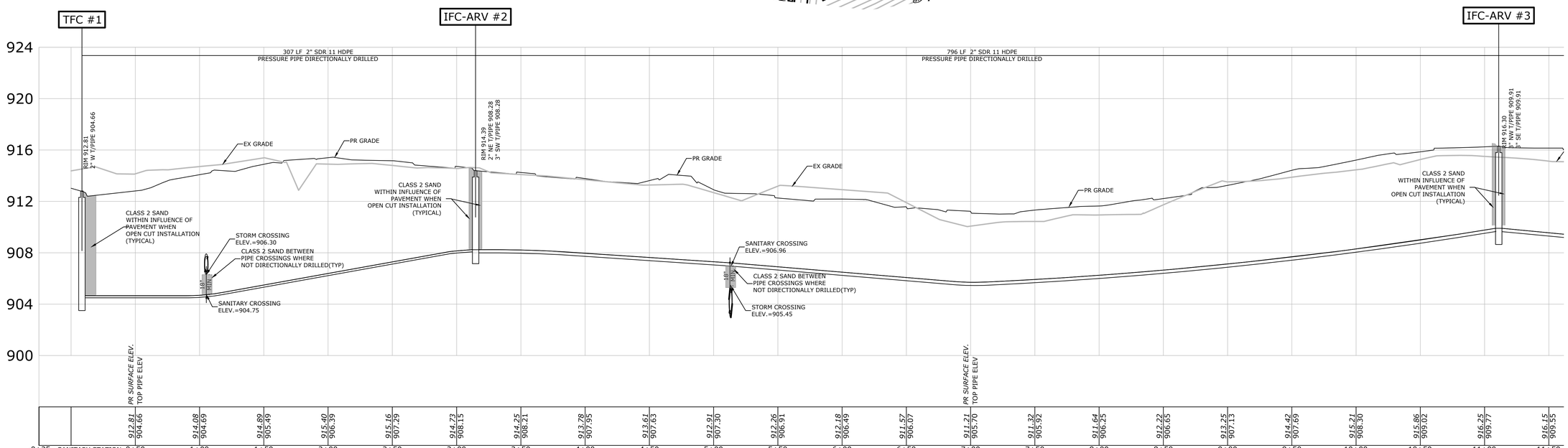
PHASE 1 SANITARY SEWER QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
2" SDR11 HDPE PRESSURE PIPE	1340 LF	
3" SDR 11 HDPE PRESSURE PIPE	1995 LF	
4' INTERNAL FLUSHING CONNECTION AND AIR RELEASE VALVE	4 EA	
4' TERMINAL FLUSHING CONNECTION	2 EA	
4' BRANCH FLUSHING CONNECTION	1 EA	

NOTE: ALL OF THE LOW PRESSURE SANITARY LINE TO BE INSTALLED WITH PHASE 1 AS WELL AS UNITS 1 - 14 TO BE INSTALLED AS PART OF PHASE 1.

PHASE 2 IS ONLY CONNECTION OF UNITS 15 - 37 TO THE FUNCTIONAL SANITARY MAIN.

NOTE: ALL HOMES TO HAVE HUNG PLUMBING - SANITARY TO COME OUT 3' BELOW FIRST FLOOR FINISH FLOOR AS REQUIRED FOR PUMP SIZING AND DEPTH OF TANKS.



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DOVE LAKE ESTATES
PHASE 1 - SANITARY (1 OF 4)
DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

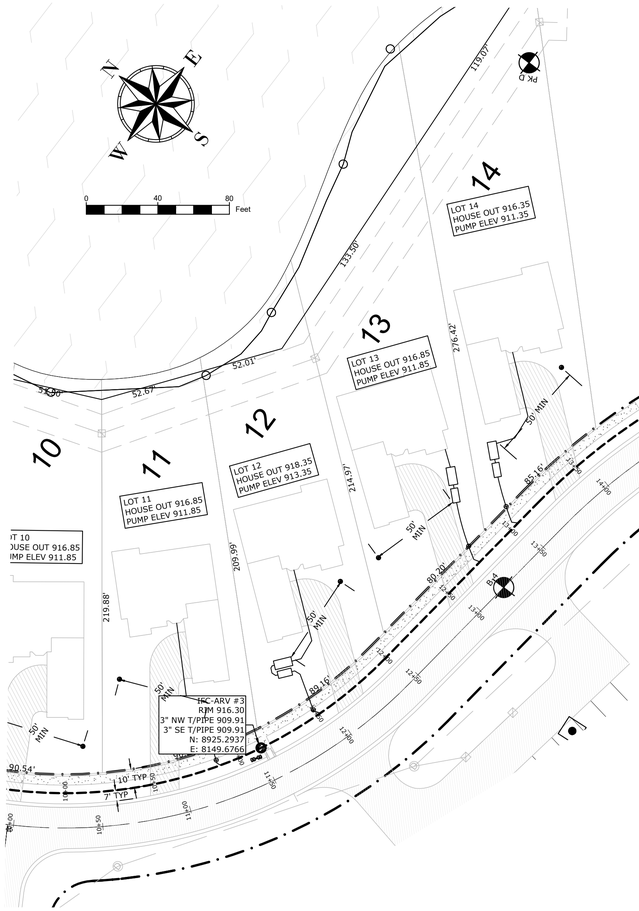
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CONSTRUCTION 8/1/2024
STAMPING SET 6/26/2025

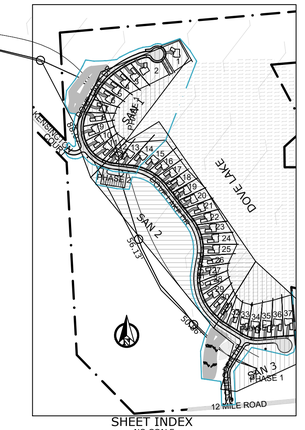
DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	H1"=40';V1"=4'

SAN 1
CONSTRUCTION

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NOTE: ALL HOMES TO HAVE HUNG PLUMBING - SANITARY TO COME OUT 3' BELOW FIRST FLOOR FINISH FLOOR AS REQUIRED FOR PUMP SIZING AND DEPTH OF TANKS.



SHEET INDEX
NO SCALE

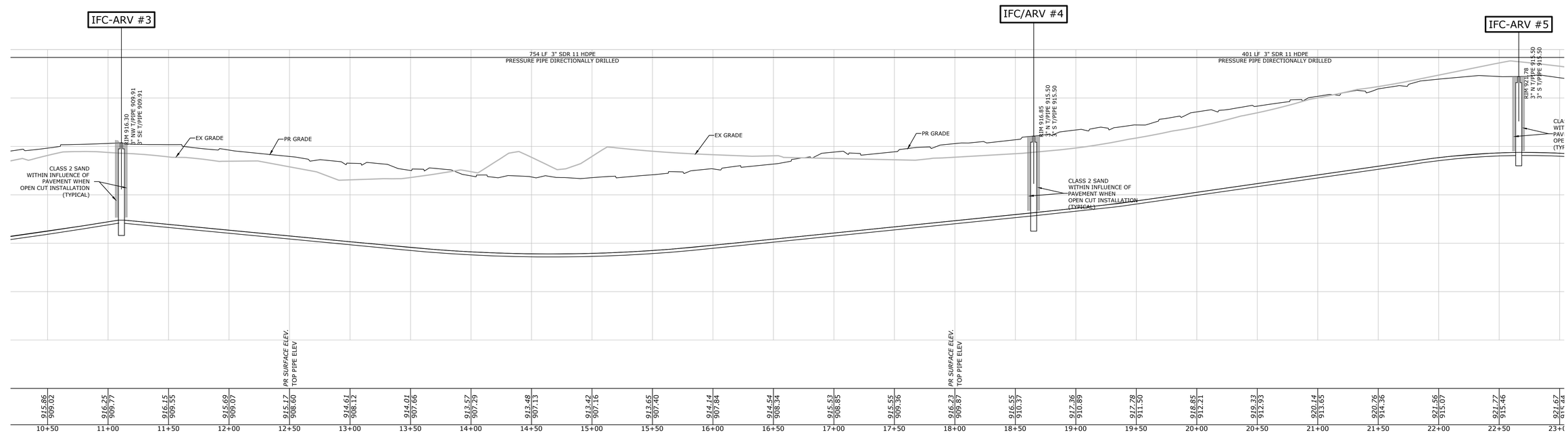
PHASE 1 SANITARY SEWER QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
2" SDR11 HDPE PRESSURE PIPE	1340 LF	
3" SDR 11 HDPE PRESSURE PIPE	1995 LF	
4' INTERNAL FLUSHING CONNECTION AND AIR RELEASE VALVE	4 EA	
4' TERMINAL FLUSHING CONNECTION	2 EA	
4' BRANCH FLUSHING CONNECTION	1 EA	

NOTE: ALL OF THE LOW PRESSURE SANITARY LINE TO BE INSTALLED WITH PHASE 1 AS WELL AS UNITS 1 - 14 TO BE INSTALLED AS PART OF PHASE 1.

PHASE 2 IS ONLY CONNECTION OF UNITS 15 - 37 TO THE UP AND FUNCTIONAL SANITARY MAIN.

By:	MCS	Date:	07/31/24	PRELIMINARY LOW PRESSURE SEWER SYSTEM PIPE SCHEDULE AND BRANCH ANALYSIS OF: DOVE LAKE SEPTIC STEP SYSTEM SEWER						AE Michelle Spencer				
Pipe:	SDR 11									Sheet No. 1 of 1				Rev.
Revised Per MDEQ		19-425												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Branch No.	# of pumps	Accum. Total	Max No. "ON"	Max Flow (gpm)	Pipe Size (in)	Max Velocity (ft/sec)	Length (ft)	Friction Loss (ft/100ft)	Friction Loss Total (ft)	H.G.L. (ft)	Max Main Elev (ft)	Min Pump Elev (ft)	Elev Diff (ft)	Max Total Head (ft)
1	2	2	2	18	2	1.947	307	1.24	3.81	967.33	915.50	910.35	5.15	56.98
2	9	11	4	36	2	3.895	796	4.47	35.62	963.53	915.50	909.35	6.15	54.18
3	10	21	5	45	3	2.241	754	1.02	7.72	927.91	915.50	910.85	4.65	17.06
4	6	27	5	45	3	2.241	401	1.02	4.11	921.63	915.50	910.85	4.65	10.78
5	6	33	6	54	3	2.689	619	1.44	8.89	920.19	911.30	909.85	1.45	10.34
6	4	4	3	27	2	2.921	237	2.63	6.22	917.52	911.30	909.85	1.45	7.67
7	0	37	6	54	3	2.689	221	1.44	3.17	911.30	911.30	909.85	1.45	1.45
HGL at the outlet into 5000 Gal pump chamber is = 911.30 FT														



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DOVE LAKE ESTATES SANITARY (2 OF 4)

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

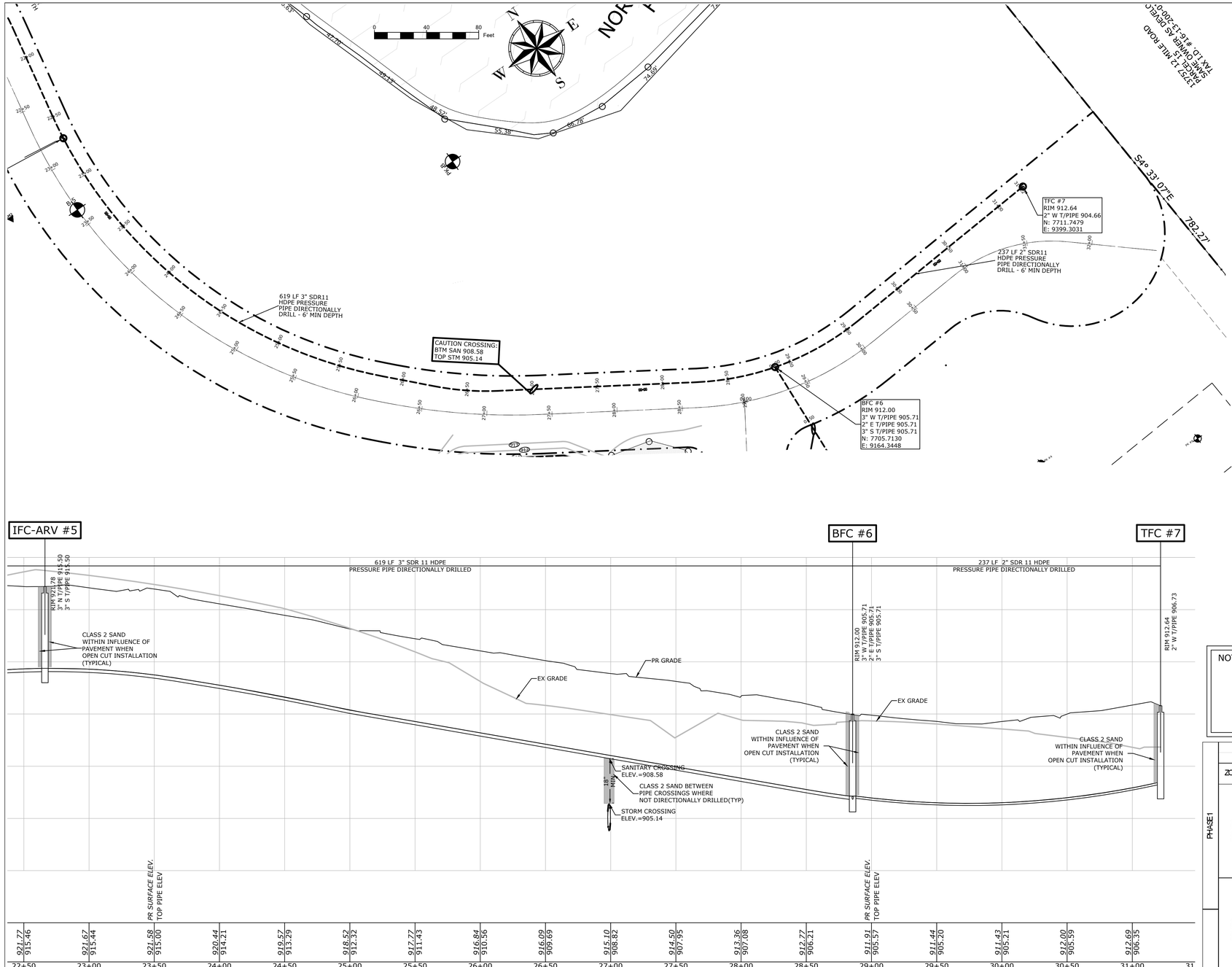
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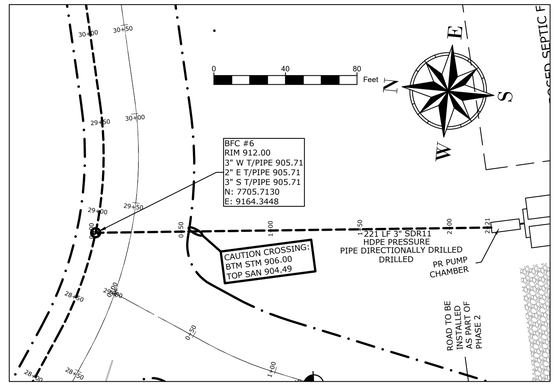
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- CONSTRUCTION 4/19/2022
- CONSTRUCTION 7/5/2022
- CONSTRUCTION 5/5/2024
- CONSTRUCTION 8/1/2024
- STAMPING SET 6/26/2025

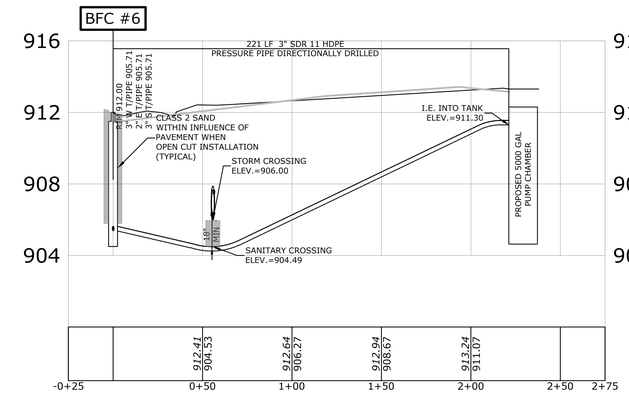
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DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=40'

SAN 2
CONSTRUCTION

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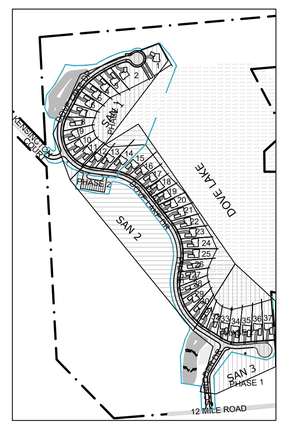
NOTE: ALL OF THE LOW PRESSURE SANITARY LINE TO BE INSTALLED WITH PHASE 1 AS WELL AS UNITS 1 - 14 TO BE INSTALLED AS PART OF PHASE 1.

PHASE 2 IS ONLY CONNECTION OF UNITS 15 - 37 TO THE UP AND FUNCTIONAL SANITARY MAIN.

		LOT#	HOUSE FF (ELEV)	PUMP ELEV	ZONE LOW POINT	MAX MAIN ELEV
PHASE1	ZONE1	1	917.85	910.35	910.35	915.5
	ZONE2	2	920.35	912.85		
		3	920.35	912.85	909.35	
		4	919.85	912.35		
		5	918.95	911.45		
		6	917.95	910.45		
		7	916.85	909.35		
		8	916.85	909.35		
		9	917.85	910.35		
		10	919.35	911.85		
		11	919.35	911.85		
	ZONE3	12	920.85	913.35	910.85	
		13	919.35	911.85		
		14	918.85	911.35		
		15	918.85	911.35		
		16	918.35	910.85		
		17	918.75	911.25		
		18	919.35	911.85		
		19	920.45	912.95		
		20	918.85	911.35		
		21	919.35	911.85		
PHASE2	ZONE4	22	919.85	912.35		
		23	920.85	913.35		
		24	921.35	913.85		
		25	922.35	914.85		
		26	922.85	915.35		
		27	923.85	916.35		
	ZONE5	28	922.85	915.35	909.85	911.3
		29	922.85	915.35		
		30	919.85	912.35		
		31	918.85	911.35		
		32	917.35	909.85		
		33	917.35	909.85		
	ZONE6	34	917.35	909.85	909.85	
		35	917.35	909.85		
		36	917.35	909.85		
		37	917.35	909.85		

PHASE 1 SANITARY SEWER QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
2" SDR11 HDPE PRESSURE PIPE	1340 LF	
3" SDR 11 HDPE PRESSURE PIPE	1995 LF	
4' INTERNAL FLUSHING CONNECTION AND AIR RELEASE VALVE	4 EA	
4' TERMINAL FLUSHING CONNECTION	2 EA	
4' BRANCH FLUSHING CONNECTION	1 EA	



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BEFORE YOU DIG
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1-800-482-7171

DOVE LAKE ESTATES
PHASE 1- SANITARY (3 OF 4)
DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

ISSUE DATES

CONSTRUCTION 5/19/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 5/5/2024
CONSTRUCTION 8/1/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=40'

SAN 3
CONSTRUCTION

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DOVE LAKE - WETLAND C
NORMAL WATER ELEV. 898.25-899.65
FLOOD PLAIN ELEV 900.35

NOTE: ALL OF THE LOW PRESSURE SANITARY LINE TO BE INSTALLED WITH PHASE 1 AS WELL AS UNITS 1 - 14 TO BE INSTALLED AS PART OF PHASE 1.

PHASE 2 IS ONLY CONNECTION OF UNITS 15 - 37 TO THE UP AND FUNCTIONAL SANITARY MAIN.

NOTE: ALL HOMES TO HAVE HUNG PLUMBING - SANITARY TO COME OUT 3' BELOW FIRST FLOOR FINISH FLOOR AS REQUIRED FOR PUMP SIZING AND DEPTH OF TANKS.

IFC/ARV #4
RIM 916.85
3" N T/PIPE 910.50
3" S T/PIPE 910.50
N: 8539.4278
E: 8752.3743

754 LF - SDR11 HDPE PRESSURE PIPE DIRECTIONALLY DRILL - 6' MIN DEPTH

IFC-ARV #5
RIM 921.78
3" N T/PIPE 910.50
3" S T/PIPE 910.50
N: 8160.0980
E: 8814.7580

619 LF 3" SDR11 HDPE PRESSURE PIPE DIRECTIONALLY DRILL - 6' MIN DEPTH

DOVE LAKE - WETLAND C
NORMAL WATER ELEV. 898.25-899
FLOOD PLAIN ELEV 900.35

BFC #6
RIM 912.00
3" W T/PIPE 905.71
2" E T/PIPE 905.71
3" S T/PIPE 905.71
N: 7705.7130
E: 9164.3448

TFC #7
RIM 912.64
2" W T/PIPE 904.66
N: 7711.7479
E: 9399.3031

237 LF 3" SDR11 HDPE PRESSURE PIPE DIRECTIONALLY DRILL - 6' MIN DEPTH

PROPOSED SEPTIC FIELD RESERVE AREA - EQUAL SIZE TO THE PROPOSED

ROAD TO BE INSTALLED AS PART OF PHASE 2

REQUIRED 20' GRAVEL ROAD FROM 3 ACRE ROAD TO DRIVE TO REMAIN ACCESSIBILITY PRIOR TO PHASE 2 COMPLETION

20' GRAVEL DRIVE PHASE 1

EX HG FF 913.

SHEET INDEX
NO SCALE

PHASE 1
PHASE 2 SAN 4
DOVE LAKE
12 MILE ROAD

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DOVE LAKE ESTATES
PHASE 2 - SANITARY (4 OF 4)
DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

ISSUE DATES

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P.E. JOB No.	19-425
SCALE	1"=40'

SAN 4
CONSTRUCTION

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CONSTRUCTION NOTES:

1. NOTIFY THIS ENGINEER 48 HOURS (2 WORKING DAYS) BEFORE STARTING CONSTRUCTION OF SEPTIC SYSTEM (248)714-9895.
2. SET SEPTIC TANKS, SURGE TANK, HIGH STRENGTH MICROFAST 9.0 SYSTEM AND PUMP CHAMBER AS SHOWN ON PLAN.
3. CUT DOWN TO MEDIUM SAND IN FIELD AREA AND SCARIFY AS SHOWN IN CROSS SECTIONS. AFTER SCARIFICATION ABSOLUTELY NO CONSTRUCTION TRAFFIC ON FIELD AREA AT ANY TIME.

NOTE: PRIOR TO ADDING SAND (STEP 4) THIS ENGINEER AND THE LIVINGSTON COUNTY HEALTH DEPARTMENT MUST INSPECT AND APPROVE SCARIFICATION. ALL TANKS MUST BE VACUUM TESTED AND CERTIFICATION OF TESTING PROVIDED TO ENGINEER PRIOR TO FINAL APPROVAL.

4. FILL PROPOSED SEPTIC FIELD AREA WITH 2NS SAND TO ELEVATION AS SHOWN ON CROSS SECTION.

NOTE: PRIOR TO ADDING STONE (STEP 5) THIS ENGINEER MUST INSPECT 2NS SAND.

5. FILL PROPOSED SEPTIC FIELD AREA WITH 8" 6A WASHED STONE AS SHOWN ON CROSS SECTION AND CONSTRUCT PIPING AS SHOWN. COVER PIPING WITH REMAINING STONE TO MAINTAIN A MINIMUM OF 12" 6A STONE.

NOTE: PRIOR TO LAYING FABRIC (STEP 6) THIS ENGINEER AND THE LIVINGSTON COUNTY HEALTH DEPARTMENT MUST INSPECT, WITNESS PRESSURE TEST AND APPROVE INSTALLATION OF SYSTEM IN ENTIRETY. FILTER FABRIC MUST BE ONSITE DURING FINAL INSPECTION.

6. COVER STONE WITH LIGHT (BREATHABLE) FILTER FABRIC AS SPECIFIED TO MINIMIZE STONE CONTAMINATION.
7. COVER FIELD AREA WITH 12"-24" SANDY LOAM & SANDY LOAM TOPSOIL AS SPECIFIED ON CROSS SECTIONS.
8. SEED AND MULCH (OR SOD) AFTER FINAL GRADING.

NOTE: IF PROPER NOTIFICATION DOES NOT OCCUR AND REQUIRED INSPECTIONS ARE NOT COMPLETED AS SPECIFIED, THIS ENGINEER RESERVES THE RIGHT TO WITHHOLD APPROVALS UNTIL SATISFACTORY INFORMATION IS PROVIDED TO THE ENGINEER REGARDING INSTALLATION. (EXCAVATION OF FIELD AREA MAY BE REQUIRED)

NOTE: IF THERE IS ANY CONFLICT BETWEEN GRADING AND THE CROSS SECTION, THE DETAILS OF THE CROSS SECTION GOVERN.

9. PRIOR TO FINAL APPROVAL OF THE INSTALLED SEPTIC SYSTEM BY THE LIVINGSTON COUNTY HEALTH DEPARTMENT. THE DESIGN ENGINEER MUST SUBMIT A LETTER CERTIFYING THAT THE SYSTEM WAS INSTALLED IN SUBSTANTIAL COMPLIANCE WITH THIS PLAN AND THE OWNER/DEVELOPER MUST HAVE CONTRACT WITH AN ONGOING MAINTENANCE PROVIDER THAT HAS TO BE PROVIDED TO THE ENGINEER AND THE COUNTY.

SEPTIC FIELD CALCULATIONS;

PROPOSED SITE CONDOMINIUM HAS 37 LOTS (9 - PROPOSED 4 BEDROOM HOUSES, 28 - PROPOSED 3 BEDROOM HOUSES)

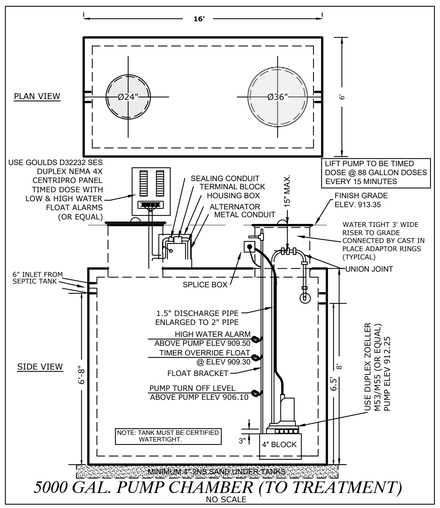
9 EA - 4 BEDROOM HOUSES @ 280 GPD/HOUSE = 2520 GPD
28 EA - 3 BEDROOM HOUSES @ 210 GPD/HOUSE = 5880 GPD
8400 GPD

PRETREATMENT DESIGNED FOR (9 HOMES @ 322 GPD+ 28 HOMES @ 252 GPD) = 9,954 DESIGNED GPD
PRE-TREATMENT PROVIDED - 2 MICROFAST 9.0 WASTEWATER TREATMENT PLANTS TREATS UP TO 18,000 GPD

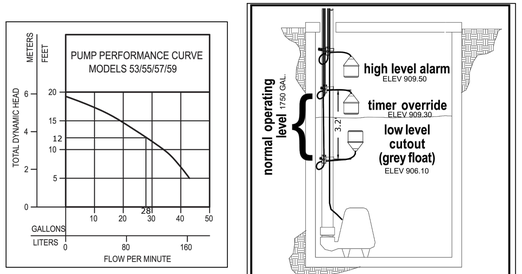
PROPOSED DISPOSAL FIELDS = 14,042 SQ.FT.

OVERALL DOSE RATE = 8400 GPD/ 14,042 SQ.FT. = 0.40 GALLONS/SQ.FT.

SOIL IS SAND; THEREFORE, STATE OF MICHIGAN ALLOWS 0.8 DOSE RATE > PROVIDED 0.60 OK.



5000 GAL. PUMP CHAMBER (TO TREATMENT)
NO SCALE

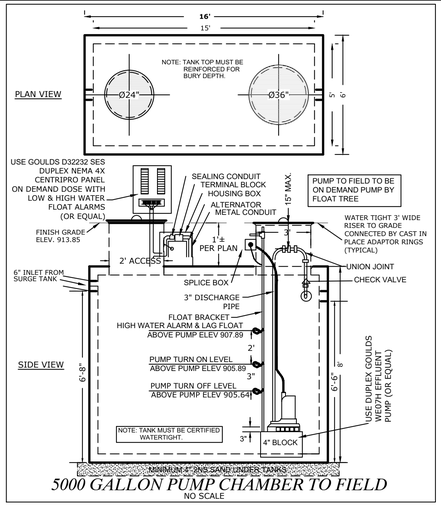


TANK TO TREATMENT FLOAT DIAGRAM

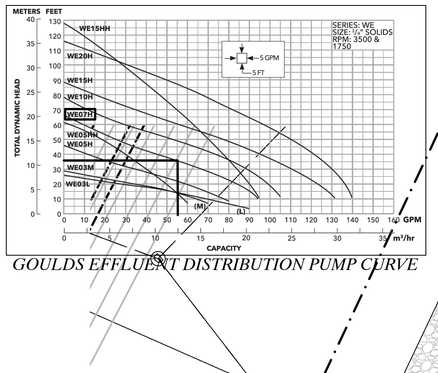
PUMP CALCULATIONS (SEPTIC TANK TO TREATMENT PLANT:

1. 8400 GPD AVERAGE FLOW
2. 96 PUMP DISCHARGE PER DAY OF 88 GAL/CYCLE (ONE PUMP DISCHARGE PER 15 MINUTES)
3. TOTAL HEADLOSS:
   STATIC HEADLOSS = 911.60 (INVERT INTO FAST 9.0) - 905.10 (PUMP ELEVATION) = 6.5 FT
   DYNAMIC HEADLOSS = 4 EA - 2" 90° BENDS + 22 LF PIPE @ 28 GPM = 5.5 FT
   TOTAL HEADLOSS = 12 FT
4. USE ZOELLER M53/M55 EFFLUENT PUMP CURVE OR EQUAL (DISCHARGE = 28 GPM)
5. PUMP CHAMBER HAS 3.2 MINUTE CYCLE TIME

PUMP IS TO BE TIMED TO RUN FOR 3.2 MINUTES TIMED TO GO OFF EVERY 15 MINUTES UNLESS THE PUMP CHAMBER EXCEEDS 1750 GALLONS - IF WATER GETS TOO HIGH - HIGH WATER ALARM AND LAG FLOAT WILL CAUSE EARLY KICK ON FOR PUMPS ALSO LOW WATER ALARM TO PROTECT THE PUMP OFF FLOAT IF WATER LEVEL GETS TOO LOW ALARM WILL SOUND AND PUMP WILL NOT DOSE TREATMENT PLANT
(SEE PUMP CHAMBER DETAIL FOR ELEVATIONS)



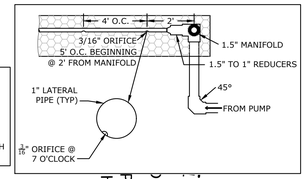
5000 GALLON PUMP CHAMBER TO FIELD
NO SCALE

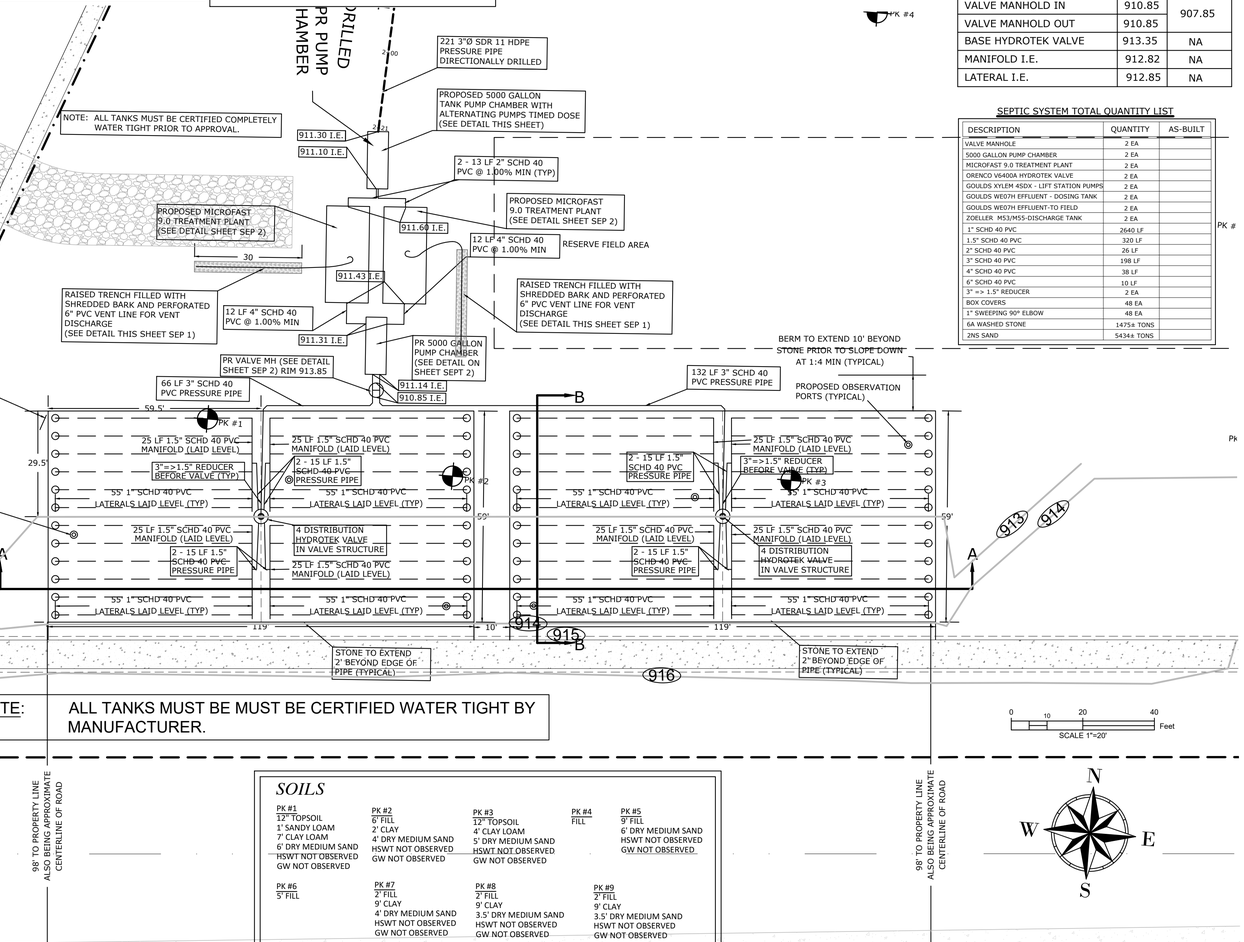


GOULDS EFFLUENT DISTRIBUTION PUMP CURVE

PUMP CHAMBER CALCULATIONS:

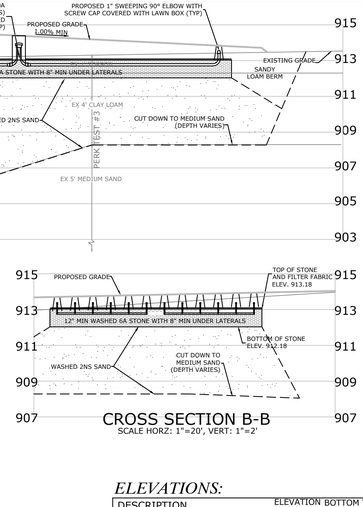
1. 8400 GPD AVERAGE FLOW
2. 24 PUMP DISCHARGE PER DAY OF 350 GAL/CYCLE (ON DEMAND DOSING)
3. HEAD LOSS SEE PRESSURE DISTRIBUTION WORKSHEET
4. USE GOULDS WE07H EFFLUENT CURVE OR EQUAL (DISCHARGE = 55 GPM)
5. PUMP CHAMBER HAS 6.4 MINUTE CYCLE TIME
6. PUMP IS TO BE CONTROLLED BY THE FLOATS AND PROTECTED WITH A HIGH WATER ALARM AND LAG FLOAT IF LEVEL GETS TOO HIGH



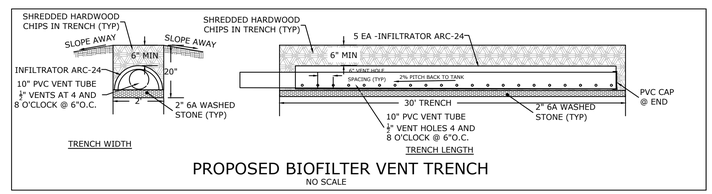


SOILS

PK #1 12" TOPSOIL 1' SANDY LOAM 7' CLAY LOAM 6' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK #2 6" FILL 2' CLAY 4' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK #3 12" TOPSOIL 4' CLAY LOAM 5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK #4 FILL	PK #5 9" FILL 6' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED
PK #6 5" FILL	PK #7 2" FILL 9" CLAY 4' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK #8 2" FILL 9' CLAY 3.5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	PK #9 2" FILL 9' CLAY 3.5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	



CROSS SECTION A-A



PROPOSED BIOFILTER VENT TRENCH
NO SCALE

CROSS SECTION B-B
SCALE HORZ: 1"=20', VERT: 1"=2'

ELEVATIONS:

DESCRIPTION	ELEVATION INVERT	BOTTOM TANK ELEVATION
5000 GAL PUMP CHAMBER IN	911.30	904.60
5000 GAL PUMP CHAMB OUT	911.10	
MICROFAST 9.0 IN	911.60	904.99
MICROFAST 9.0 OUT	911.43	
PR. PUMP CHAMBER IN	911.31	904.65
PR. PUMP CHAMBER OUT	911.14	
VALVE MANHOLD IN	910.85	907.85
VALVE MANHOLD OUT	910.85	
BASE HYDROTEK VALVE	913.35	NA
MANIFOLD I.E.	912.82	NA
LATERAL I.E.	912.85	NA

SEPTIC SYSTEM TOTAL QUANTITY LIST

DESCRIPTION	QUANTITY	AS-BUILT
VALVE MANHOLE	2 EA	
5000 GALLON PUMP CHAMBER	2 EA	
MICROFAST 9.0 TREATMENT PLANT	2 EA	
ORENCO V6400A HYDROTEK VALVE	2 EA	
GOULDS XYLEM 4SDX - LIFT STATION PUMPS	2 EA	
GOULDS WE07H EFFLUENT - DOSING TANK	2 EA	
GOULDS WE07H EFFLUENT-TO FIELD	2 EA	
ZOELLER M53/M55-DISCHARGE TANK	2 EA	
1" SCHD 40 PVC	2640 LF	
1.5" SCHD 40 PVC	320 LF	
2" SCHD 40 PVC	26 LF	
3" SCHD 40 PVC	198 LF	
4" SCHD 40 PVC	38 LF	
6" SCHD 40 PVC	10 LF	
3" => 1.5" REDUCER	2 EA	
BOX COVERS	48 EA	
1" SWEEPING 90° ELBOW	48 EA	
6A WASHED STONE	1475± TONS	
2NS SAND	5434± TONS	

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DOVE LAKE ESTATES SEPTIC FIELD

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

ISSUE DATES

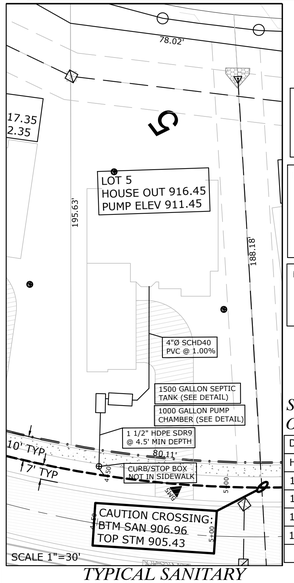
LCHD 6/3/2021
LCHD 7/8/2021
LCHD 7/30/2021
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STAMPING SET 6/28/2025

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SEP 1
CONSTRUCTION

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INDIVIDUAL UNIT SANITARY CONNECTION PLAN AND DETAILS FOR EVERY UNIT



TYPICAL SANITARY CONNECTION PLOT PLAN

NOTE: EACH PUMP CHAMBER TO BE SET TO DOSE AT A 100 GALLON/DOSE. THIS PROVIDES A STORAGE OF 480 GALLONS ABOVE THE HIGH WATER ALARM PROVIDED FOR ADDITIONAL STORAGE.

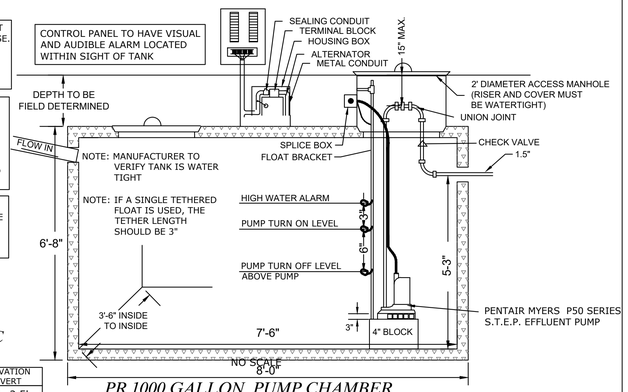
NOTE: IF THE LOCATION OF THE PUMP CHAMBER IS MOVED TO A DIFFERENT LOCATION THAN SHOWN ON PLAN AN ENGINEER WILL HAVE TO VERIFY THE DESIGNED PUMP CURVE WILL STILL WORK FOR THE PROPOSED LOW PRESSURE SEWER.

NOTE: IF SEPTIC TANKS ARE WITHIN 5' DRIVEWAY OR WITHIN 5' OF EDGE OF DRIVE THE TANKS MUST BE REINFORCED FOR TRAFFIC LOADING.

SINGLE FAMILY SEPTIC ONSITE ELEVATIONS:

DESCRIPTION	ELEVATION INVERT
HOUSE OUT	FF - 2.5'
1500 GAL. TANK IN	FF - 2.7'
1500 GAL. TANK OUT	FF - 3'
1000 GAL. PUMP IN	FF - 3.1'
1000 GAL. PUMP OUT	FF - 3.4'
TIE INTO LOW PRESSURE SEWER	

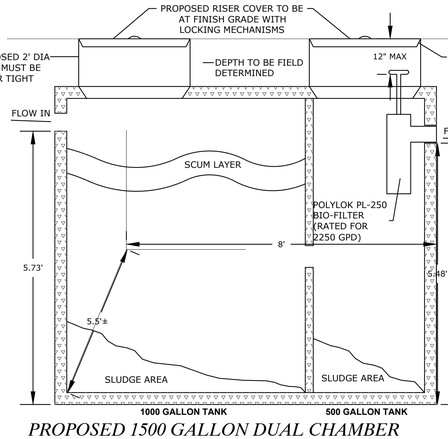
CONTROL PANEL TO HAVE VISUAL AND AUDIBLE ALARM LOCATED WITHIN SIGHT OF TANK



PR 1000 GALLON PUMP CHAMBER FOR EACH UNIT

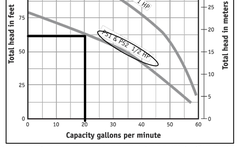
NOTE: ALL TANKS MUST BE MUST BE CERTIFIED WATER TIGHT BY MANUFACTURER.

NOTE: ALL TANKS IN DRIVEWAY OR WITHIN 5' OF DRIVEWAY MUST BE REINFORCED FOR TRAFFIC LOADING.



PROPOSED 1500 GALLON DUAL CHAMBER SEPTIC TANK FOR EACH SITE

NO SCALE



INDIVIDUAL UNIT PUMP CURVE

NO SCALE

PRESSURE DISTRIBUTION WORKSHEET

"---------- ABSORPTION SYSTEM ----------"

DESIGN FLOW = 8400 GALLONS/DAY — ABSORPTION AREA = 14042 ft²

ALLOWABLE LOADING RATE = 0.60 gpd/ft² — BED X TRENCH MOUND X

"---------- PRESSURE DISTRIBUTION NETWORK ----------"

TYPE OF MANIFOLD: END X CENTER

MANIFOLD LENGTH:	25 FT	LATERAL LENGTH:	55 FT	FORCEMAIN LENGTH:	132 FT
LATERAL SPACING:	5 FT	# OF LATERALS:	6		
PRESSURE IN LATERAL:	3 FT	DIA OF ORIFICES:	3/16 "		
ORIFICE SPACING:	4 FT	# ORIFICES/ LATERAL:	14		
FLOW/ORIFICE:	0.77 GPM	FLOW/LATERAL:	11		
REQ'D MANIFOLD DIA:	1.5 "	REQ'D LATERAL DIA:	1 "		
FORCEMAIN DIA (PRE-VALVE)	3 "	FORCEMAIN DIA (POST-VALVE)	1.5 "		

"---------- DOSING CHAMBER ----------"

VOLUME REQUIRED TO FILL LINES — PUMP CHAMBER SIZE: 5000 GALLON

FORCEMAIN PRE-VALVE:	132	FT x	38.4	GALLON/100 FEET OF PIPE =	51 GALLONS
FORCEMAIN POST-VALVE:	31	FT x	10.58	GALLON/100 FEET OF PIPE =	3 GALLONS
MANIFOLD:	25	FT x	10.58	GALLON/100 FEET OF PIPE =	3 GALLONS
LATERALS:	245	FT x	4.49	GALLON/100 FEET OF PIPE =	11 GALLONS

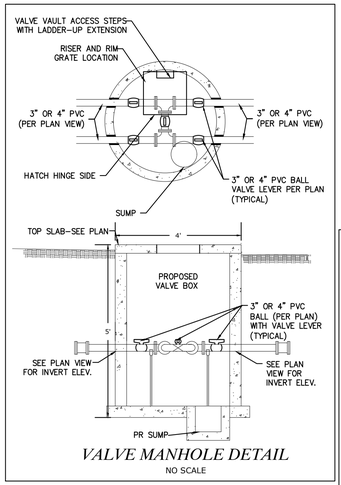
VOLUME REQUIRED TO FILL LINES	=	68 GALLONS
DESIGNED VOLUME OF DOSE	=	140 GALLONS
FLOAT DISTANCE	=	3.0 INCHES

"---------- PUMP REQUIREMENTS ----------"

MINIMUM PUMPING CAPACITY (FLOW/LATERAL) x (# LATERALS)	=	65 GPM
DESIGNED PUMPING CAPACITY	=	65 GPM

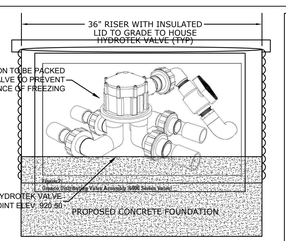
TOTAL HEADLOSS

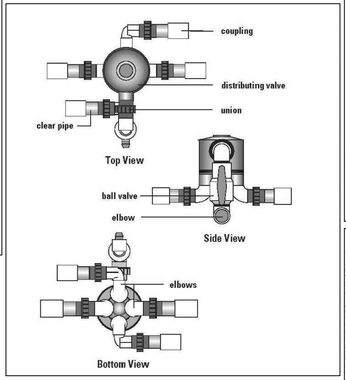
PRESSURE HEAD IN END OF LATERAL x 1.31		3.9 FT
STATIC HEAD DIFFERENCE (PUMP ELEV. TO I.E. MANIFOLD)		6.7 FT
FRICTION LOSS IN FORCEMAIN - 3" PRE VALVE		0.2 FT
FRICTION LOSSIN FORCEMAIN - 1.5" POST VALVE		2.3 FT
FRICTION LOSS IN EACH LATERAL		0.9 FT
FRICTION LOSS THROUGH HYDROTEK VALVE		22.0 FT
TOTAL HEAD LOSS=		36 FT



VALVE MANHOLE DETAIL

NO SCALE





Consulting Civil Engineers
"Engineering A Better Michigan"

Powell Engineering & Associates, LLC
4700 Cornerstone Drive, White Lake, Michigan 48383
P: 248.714-8895 info@powellengineeringllc.com

NOTE: AS AN AID TO THE CONTRACTOR VARIOUS UTILITIES AND UNDERGROUND STRUCTURES ARE SHOWN ON THESE PLANS AND PROFILES. ALL INFORMATION CONCERNING ALL UTILITIES SHOWN ON THE PLANS AND PROFILES IS TAKEN FROM FIELD TOPO AND/OR AVAILABLE RECORDS, BUT THE ENGINEER DOES NOT GUARANTEE EITHER THEIR LOCATION OR ELEVATION, OR THAT ADDITIONAL UNDERGROUND STRUCTURES OR UTILITIES MAY NOT BE ENCOUNTERED. IF THE CONTRACTOR DOES ENCOUNTER A PREVIOUSLY UNIDENTIFIED UTILITY AND OR STRUCTURE, OR DETERMINES THAT ONE OF THE UTILITIES OR STRUCTURES SHOWN ON THESE PLANS IS INCORRECTLY LOCATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND ENGINEER FOR DIRECTION ON HOW TO PROCEED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES. NOTIFY "MISS DIG" AT 800-482-7171 A MINIMUM OF 72 HRS. PRIOR TO THE START OF ANY CONSTRUCTION.

BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

PRETREATMENT ADDITIONAL NOTES:

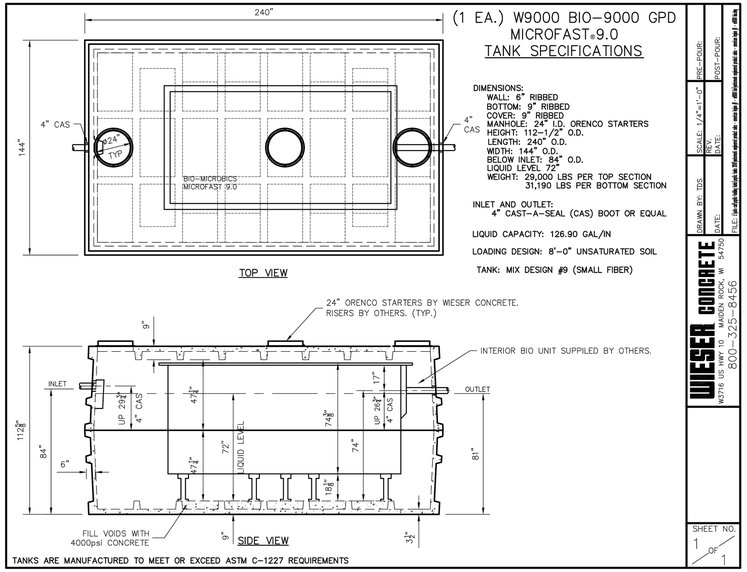
TREATMENT PLANTS WILL HAVE MORE PUMP OUT SERVICE PORTS
A 6" PVC LINE WILL BE CAST INTO THE TOP OF THE TANK FOR THE VENTING AS SHOWN ON PLAN VIEW AND DETAIL AS WELL AS RISER OPENINGS INSTALLED AT BOTH INLET AND OUTLET SIDES OF TREATMENT TANK ACCORDING TO MANUFACTURER. TANK MUST BE COMPLETED PER MANUFACTURER SPECIFICATIONS (TYP)

OPERATION & MAINTENANCE SCHEDULE:

- QUARTERLY MICROFAST 9.0 UNIT INSPECTIONS AS DESCRIBED ON THIS SHEET BY A LICENSED CONTRACTOR
- PUMP CHAMBERS ARE TO BE PUMPED ONCE EVERY TWO YEARS (OR AS NEEDED)
- AT SAME TIME OF BIOFILTER CLEANING, OBSERVATION PORTS ARE TO BE CHECKED TO VERIFY PROPER FUNCTIONING OF THE SYSTEM

REQUIREMENTS FOR MICROFAST UNIT:

1. THE MICROFAST 9.0 UNIT MUST BE CONNECTED TO A PHONE OR CABLE LINE TO CONTACT REPAIR CONTRACTOR 24 HRS/DAY IN CASE OF SYSTEM FAILURE.
2. THE MICROFAST 9.0 MAINTENANCE CONTRACT MUST BE EXTENDED TO COVER THE OPERATION OF THE TREATMENT SYSTEM IN PERPETUITY UNTIL SEWERS ARE AVAILABLE. (THIS CONTRACT IS TO HAVE THE SERVICE PROVIDER COME QUARTERLY TO PERFORM AN 100-POINT INSPECTION).
3. AN OPERATION PERMIT MUST BE OBTAINED FROM THE LCHD ANNUALLY.



(1 EA.) W9000 BIO-9000 GPD MICROFAST®9.0 TANK SPECIFICATIONS

DIMENSIONS:
WALL: 6" RIBBED
BOTTOM: 9" RIBBED
COVER: 9" RIBBED
MANHOLE: 24" I.D. ORENCO STARTERS
HEIGHT: 112=1/2" O.D.
LENGTH: 240" O.D.
WIDTH: 144" O.D.
BELOW INLET: 84" O.D.
LIQUID LEVEL: 72"
WEIGHT: 29,000 LBS PER TOP SECTION
31,190 LBS PER BOTTOM SECTION

INLET AND OUTLET:
4" CAST-A-SEAL (CAS) BOOT OR EQUAL

LIQUID CAPACITY: 126.90 GAL/IN

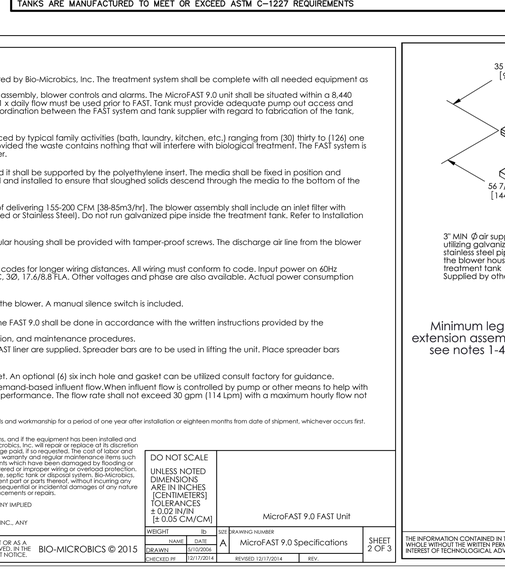
LOADING DESIGN: 8'-0" UNSATURATED SOIL

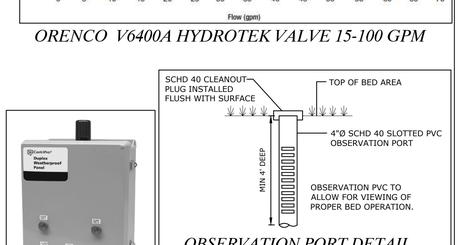
TANK: MIX DESIGN #9 (SMALL FIBER)

WIESER CONCRETE — W3716 US HWY 10 MARION ROCK, MI 54950 — 800-325-8456

SCALE: 1/4"=1'-0" — DRAWN BY: TDS — DATE: — FILE: \\pe-wl-fs\wl-fs-1\Powell projects\2019 projects\dove lake\septic\dove lake septic.dwg

SHEET NO. 1 OF 1





ORENCO V6400A HYDROTEK VALVE 15-100 GPM

PUMP CONTROL PANEL

NO SCALE

OBSERVATION PORT DETAIL

NO SCALE

DOVE LAKE ESTATES SEPTIC FIELD

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

ISSUE DATES

LCHD 6/3/2021
LCHD 7/8/2021
LCHD 7/30/2021
LCHD 5/5/2024
LCHD 8/1/2024
LCHD 9/24/2024
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=20'

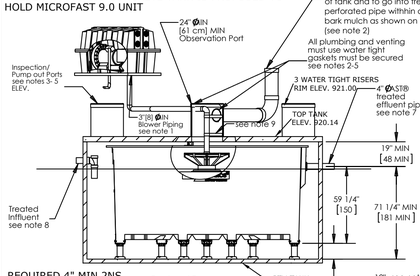
SEP 2
CONSTRUCTION

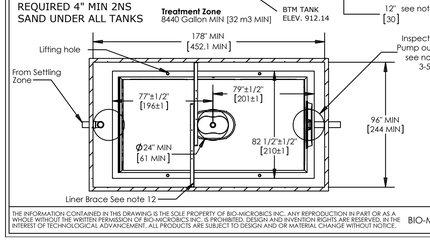
EFFLUENT S.T.E.P. PUMPS P50 & P100 SERIES

ORDERING INFORMATION

CATALOG NUMBER	HP	VOLTS	PHASE	DISCHARGE NPT	SWITCH TYPE	CORD LENGTH	APPROX. WT. LBS
P50	1/2	115	1	1-1/2"	Manual	20'	84
P50D	1/2	230	1	1-1/2"	Manual	20'	84
P52D	1/2	230	1	1-1/2"	Manual	20'	84
P102	1	230	1	1-1/2"	Manual	20'	87
P102D	1	230	1	1-1/2"	Manual	20'	87

WIESER W9000 CIO CONCRETE TANK IS PROPOSED TO HOLD MICROFAST 9.0 UNIT





NOTES

1. Airline piping to FAST® may not exceed 100 FT [30m] total length and have a maximum of 4 elbows in the piping system. For distances greater than 100 FT [30m] consult factory. Blower must be located above flood levels on a concrete base 58" X 36" X 2.5" [150 X 90X 7cm] minimum.
2. Vent to desired location and cover opening with a vent grate with at least 39 sq in.[252 sq. cm] open surface area. Secure with stainless steel screws. Vent piping must not allow condensate build up or create back pressure. Vent must be above finished grade or higher (see sheet 3 of 3).
3. All appurtenances to FAST® (e.g. tanks, access ports, electrical, etc.) must conform to all applicable country, state, province, and local plumbing and electrical codes. Pump out access shall be adequate to thoroughly clean out both zones.
4. All inspection, viewing and pump out ports must be secured to prevent accidental or unauthorized access.
5. Tank, piping, conduit, etc. are provided by others. Blower control system by Bio-Microbics, Inc. See Installation Manual.
6. If less than the specified minimums are considered necessary, consult factory for guidance.
7. All piping and ancillary equipment installed after FAST must not impede or restrict free flow of effluent.
8. The tank(s) shall be designed to prevent air passage between the settling zone/tank and the treatment zone and preventing an air lock. Examples include a baffle wall sealed to the lid or treatment zone inlet line with a pipe cap. Consult factory for guidance.
9. The air supply line into the FAST® unit must be secured to prevent vibration induced damage. The air supply line should be secured with a non-corrosive clamp every 2' min [60 cm]. See alternate air supply option on sheet 3 of 3.
10. Specialized treatment levels may require specific features to be incorporated into the design. Consult factory for guidance.
11. Refer to sheet 3 of 3 for leg extensions requirements.
12. The supplied liner braces must be installed so as to connect the liner to the side of the tank at each end of the tank as shown, thereby preventing lateral movement of the liner. Use only non-corrosive anchor bolts (provided by others).

Specifications for MicroFAST 9.0 Wastewater Treatment System

1. GENERAL
The contractor shall furnish and install (1) MicroFAST 9.0 treatment system as manufactured by Bio-Microbics, Inc. The treatment system shall be complete with all needed equipment as shown on the drawings and specified herein.
The principal items of equipment shall include FAST System insert, leg extensions, blower assembly, blower controls and alarms. The MicroFAST 9.0 unit shall be situated within a 8,440 Gallon [31900L] minimum tank, as shown on the drawing. Settling tank(s) equaling ½ to 1 x daily flow must be used prior to FAST. Tank must provide adequate pump out access and conform to local, state, and all other applicable codes. The contractor shall provide coordination between the FAST system and tank supplier with regard to fabrication of the tank, installation of the FAST unit and delivery to the job site.

2. OPERATING CONDITIONS
The MicroFAST 9.0 treatment system shall be capable of treating the wastewater produced by typical family activities (bath, laundry, kitchen, etc.) ranging from (30) thirty to (126) one hundred twenty-six persons and rated to exceed 9,000 US Gallons per day (34000 LPD) provided the waste contains nothing that will interfere with biological treatment. The FAST system is a biological treatment system not meant for non-biodegradable or industrial wastewater.

3. MEDIA
The FAST media shall be manufactured of rigid PVC, polyethylene, or polypropylene and it shall be supported by the polyethylene insert. The media shall be fixed in position and contain no moving or wearing parts and shall not corrode. The media shall be designed and installed to ensure that sloughed solids descend through the media to the bottom of the septic tank.

4. BLOWER
The MicroFAST 9.0 unit shall come equipped with a regenerative type blower capable of delivering 155-200 CFM [38-85m3/hr]. The blower assembly shall include an inlet filter with metal filter element. Blower piping to the tank shall use non-corrosive material (Galvanized or Stainless Steel). Do not run galvanized pipe inside the treatment tank. Refer to Installation Manual for further details.

5. REMOTE MOUNTED BLOWER
The blower elevation must be higher than the normal flood level. A two-piece, rectangular housing shall be provided with tamper-proof screws. The discharge air line from the blower to the MicroFAST System, shall be provided and installed by the contractor.

6. ELECTRICAL
The electrical source should be within 150 feet [45.7 meters] of the blower, consult local codes for longer wiring distances. All wiring must conform to code. Input power on 60Hz electrical systems 220/460VAC, 3Ø, 11.2/5.9 FLA, on 50 Hz electrical systems 190/380VAC, 3Ø, 17.6/8.8 FLA. Other voltages and phase are also available. Actual power consumption varies with site conditions. All conduit and wiring shall be supplied by contractor.

7. ALARMS
The alarm system shall consist of a visual and audible alarm to indicate loss of power to the blower. A manual silence switch is included.

8. INSTALLATION AND OPERATING INSTRUCTIONS
All work must be done in accordance with local codes and regulations. Installation of the FAST 9.0 shall be done in accordance with the written instructions provided by the manufacturer.
Manuals shall be furnished, which will include a description of system installation, operation, and maintenance procedures.
Treatement unit weighs approximately 2300 pounds [1044 kg]. Four holes for lifting the FAST liner are supplied. Spreader bars are to be used in lifting the unit. Place spreader bars between lifting holes.

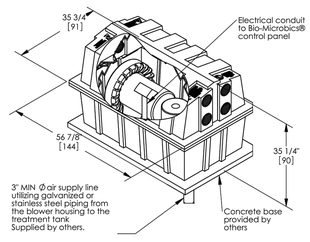
9. FLOW & PIPE SIZING
Each FAST module is provided with a standard (4) four inch effluent pipe hole and gasket. An optional (6) six inch hole and gasket can be utilized consult factory for guidance.
FAST systems have been successfully designed, tested and certified receiving gravity, demand-based influent flow.When influent flow is controlled by pump or other means to help with highly variable flow conditions, then multiple dosing events should be used to maximize performance. The flow rate shall not exceed 30 gpm (114 Lpm) with a maximum hourly flow not to exceed 10% of the design daily flow (900 gph (3400LPH)).

10. WARRANTY
Bio-Microbics, Inc. warrants all new residential FAST ® models (MicroFAST® 3.0, 4.5 and 9.0) against defects in materials and workmanship for a period of one year after installation or eighteen months from date of shipment, whichever occurs first. All are subject to the following terms and conditions below:

During the warranty period, if any part is defective or fails to perform as specified when operating at design conditions, and if the equipment has been installed and is being operated and maintained in accordance with the written instructions provided by Bio-Microbics, Inc., Bio-Microbics, Inc. will repair or replace at its discretion such defective parts free of charge. Defective parts must be returned by owner to Bio-Microbics, Inc.'s factory postage paid, if so requested. The cost of labor and all other expenses resulting from replacement of the defective parts and from installation of parts furnished under this warranty and regular maintenance items such as filters or bulbs shall be borne by the owner. This warranty does not cover general system misuse, and/or components which have been damaged by flooding or any components that have been disassembled by unauthorized persons, improperly installed or damaged due to altered or improper wiring or overload protection. Bio-Microbics, Inc. shall not be liable for damages to other property caused by any defects in the FAST system or any parts thereof. Bio-Microbics, Inc. reserves the right to revise, change or modify the construction and/or design of the FAST system, or any component part or parts thereof, without incurring any obligation to make such changes or modifications in present equipment. Bio-Microbics, Inc. is not responsible for consequential or incidental damages of any nature resulting from such things as, but not limited to, defect in design, material, or workmanship, or delays in delivery, replacements or repairs.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. BIO-MICROBICS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

NO REPRESENTATIVE OR PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR TO ASSUME FOR BIO-MICROBICS, INC., ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS. Contact your local distributor for parts and service.



DETAIL
SCALE 2 : 55

Notes
1. Secure leg extension to the FAST® unit by placing two screws on each side of the leg extension (4 screws per foot are included).
2. Cut 4" schd. 40 PVC pipe (not included) to obtain the desired height. Minimum pipe length of 11 3/4" [29.7cm], For heights greater than 18" [45.7cm] use schd. 80 PVC pipe (not included). Consult factory for extending leg beyond 36"[90 cm].
3. Anchor the leg extensions to the tank with non-corrosive hardware (not included) at the provided mounting points.
4. If less than the specified minimums are considered necessary, consult factory for guidance.
5. The air supply line into the FAST® unit must be secured to prevent vibration induced damage. The air supply line should be secured with a non-corrosive clamp every 2ft [0.6m] minimum. The unit is supplied with 3" Ø semi-flexible airline connections with stainless steel MPT fittings and sample U-shape pipe clamps.
6. Tank, anchors, liner brace, piping conduit, blower, housing pad and vents are provided by others.

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BIO-MICROBICS INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIO-MICROBICS INC. IS PROHIBITED. DESIGN AND INVENTION RIGHTS ARE RESERVED. IN THE INTEREST OF TECHNOLOGICAL ADVANCEMENT, ALL PRODUCTS ARE SUBJECT TO DESIGN AND OR MATERIAL CHANGE WITHOUT NOTICE. BIO-MICROBICS © 2015

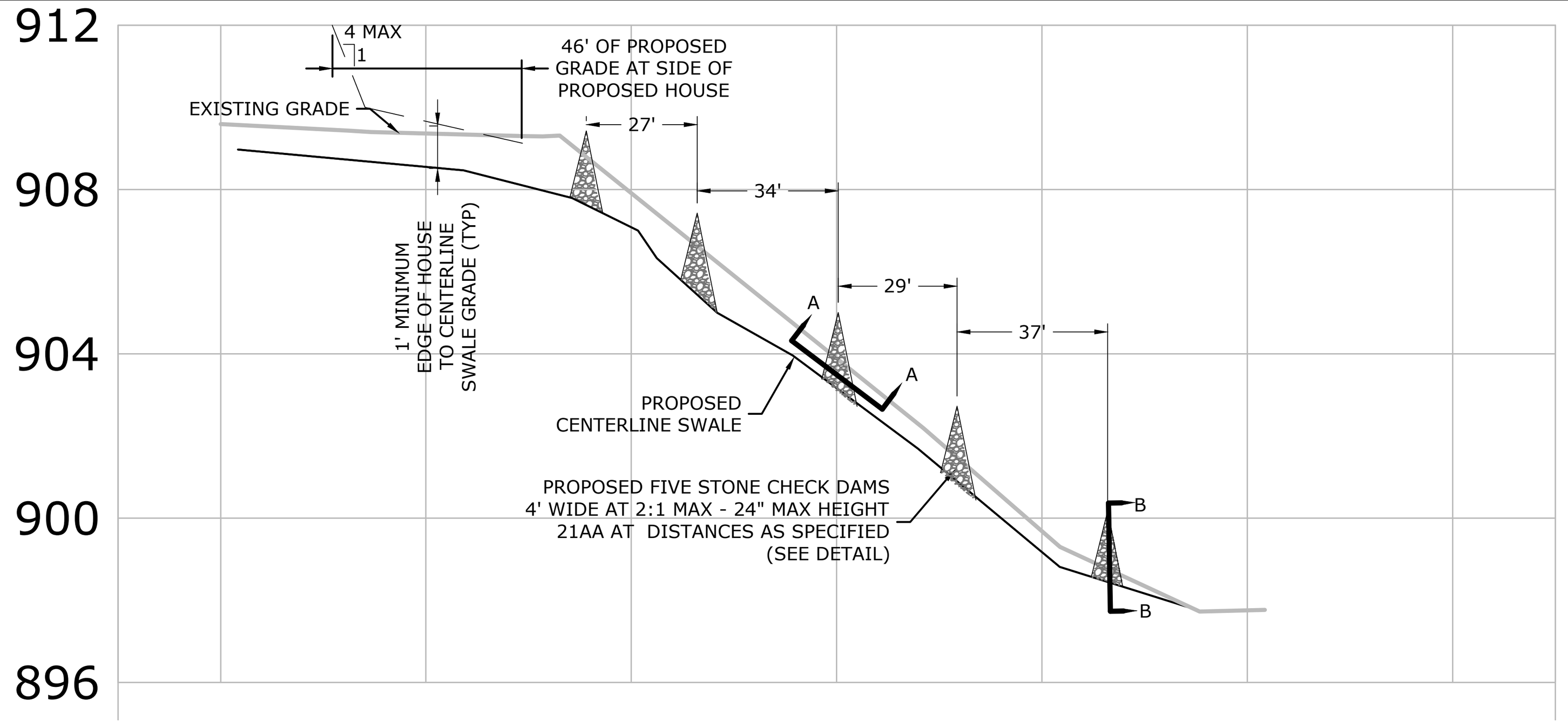
DO NOT SCALE
UNLESS NOTED DIMENSIONS ARE IN INCHES [CENTIMETERS] TOLERANCES ± 0.02 IN/IN [± 0.05 CM/CM]

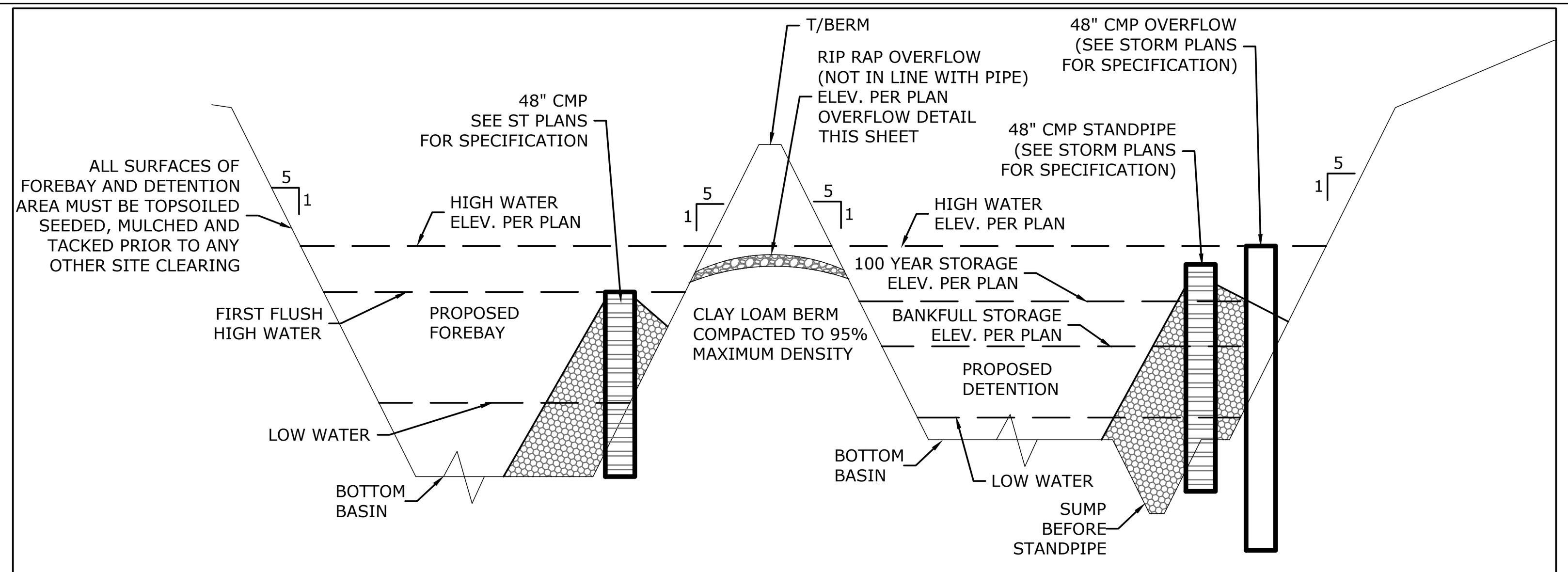
BIO MICROBICS — BETTER WATER. BETTER WORLD.

WEIGHT	lb	SIZE	DRAWING NUMBER	
		A	MicroFAST 9.0 Details	SHEET 3 OF 3

	NAME	DATE
DRAWN	CTC	5/10/2006
CHECKED	PF	12/17/2014
REVISED	12/17/2014	REV. INI-07-V

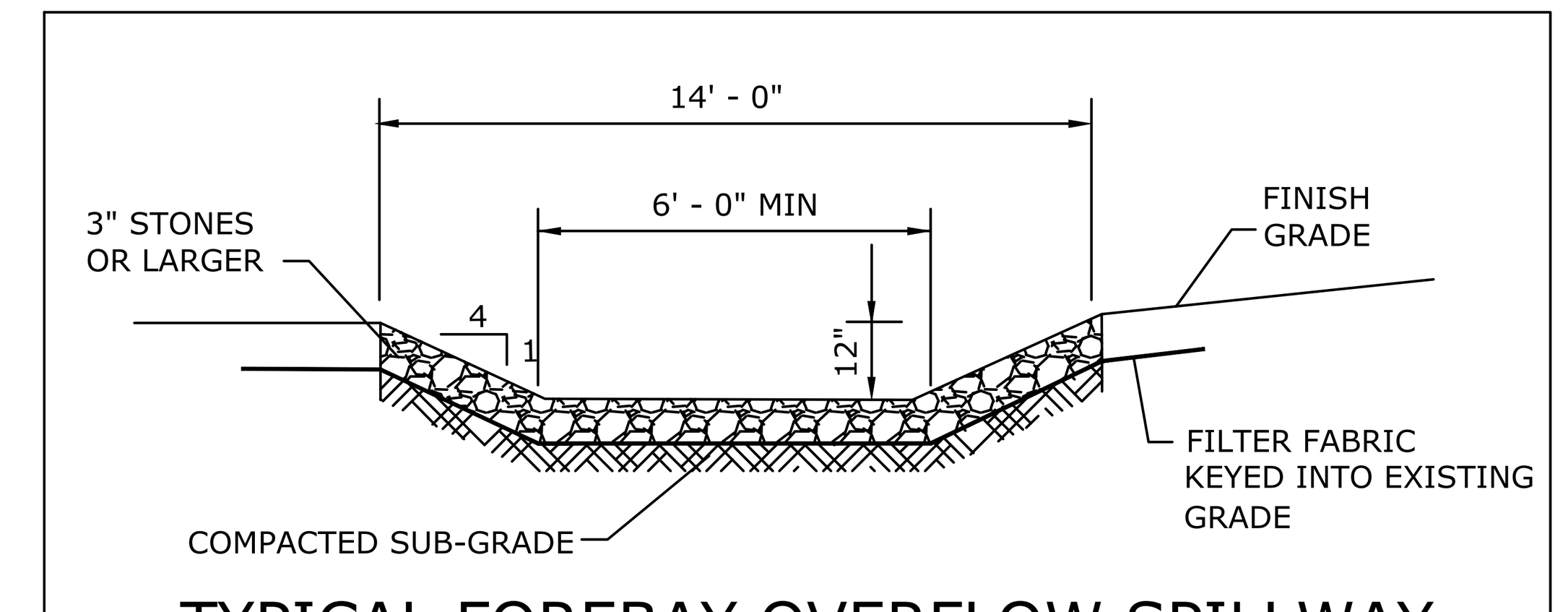
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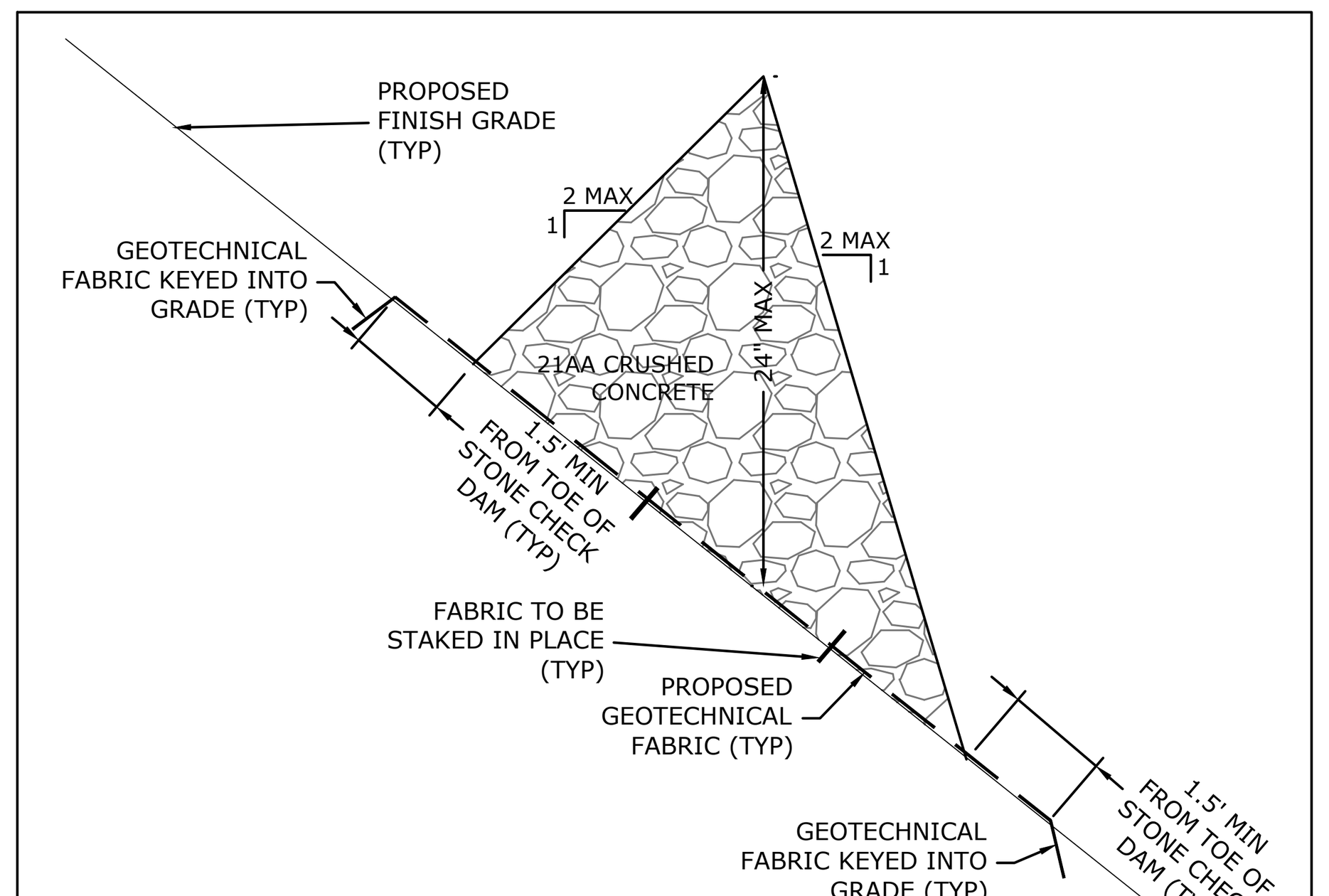


FOREBAY AND DETENTION DETAIL
HORIZ SCALE 1" = 20', VERT 1"=2.5'

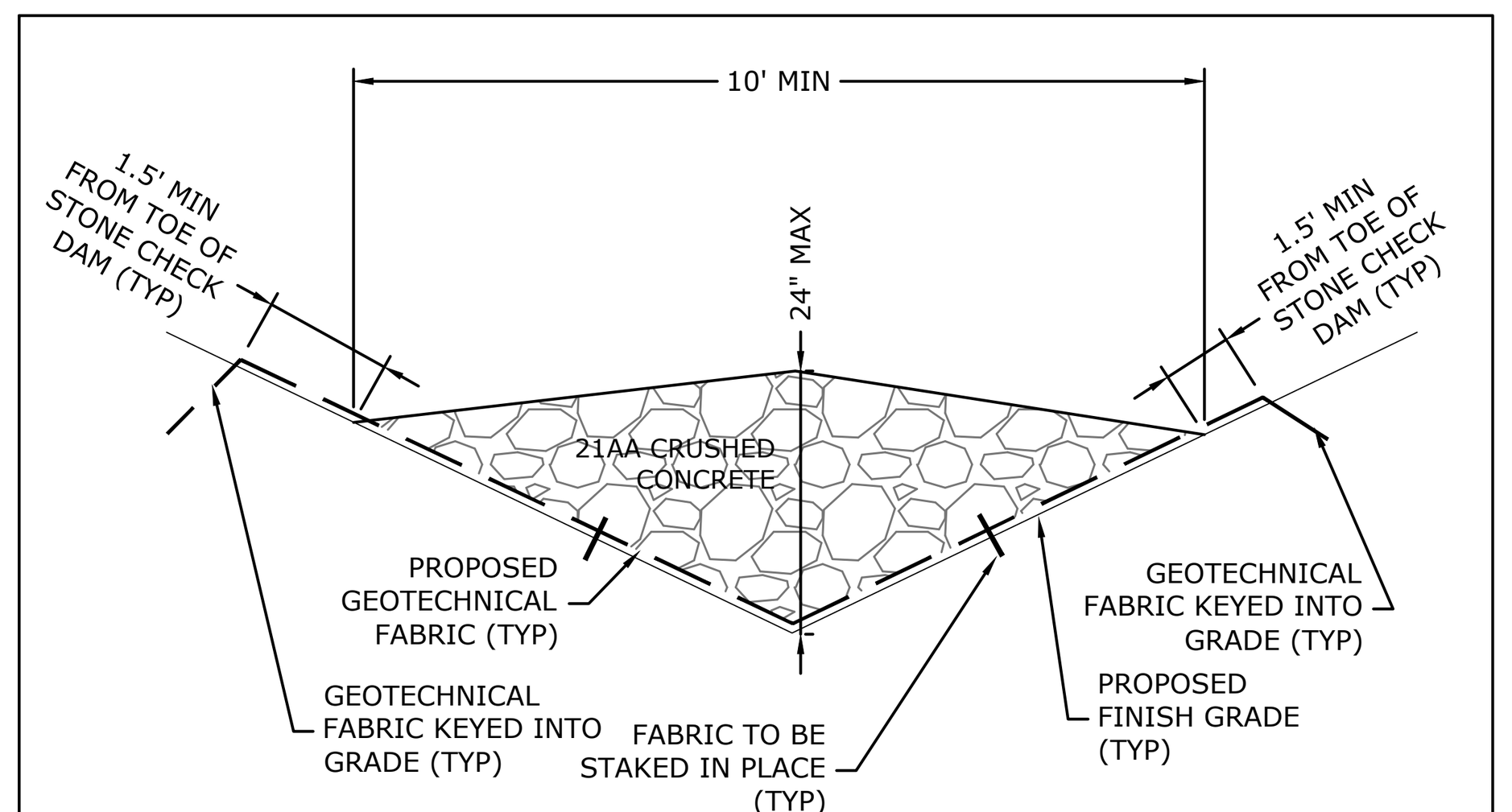
DETAIL LEGEND	QUAN (TOT)
(A) S1-4 CURB & GUTTER INLET FILTER OR S1-4A CURB & INLET FILTER (ALTERNATE A)	28 EACH
(C) SP-2 SILT FENCE	13085 LF
(D) SP-9 TEMPORARY STONE ACCESS DRIVE	2 EACH
(E) RIP RAP (SEE DETAIL ERO 4)	8 EACH
(F) SI-3A LAWN LOW POINT INLET FILTER ALT "A"	20 EACH
(G) SP-3 SILT FENCE GRAVEL FILTER	25 EACH



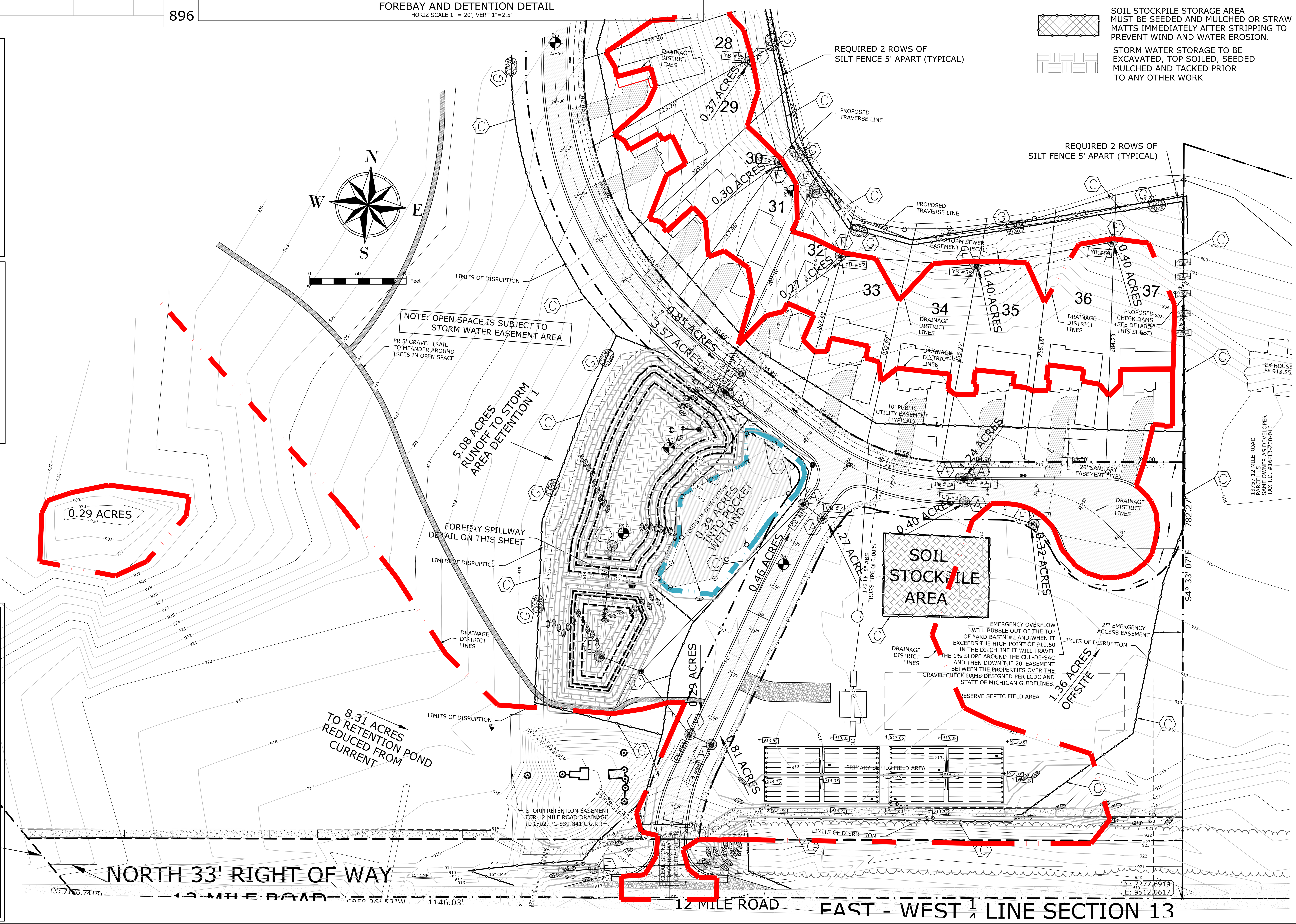
TYPICAL FOREBAY OVERFLOW SPILLWAY DETAIL (FOREBAY TO DETENTION POND)
NO SCALE



STONE DAM CROSS SECTION A-A
NO SCALE



STONE DAM CROSS SECTION B-B
NO SCALE



PK #1	PK #2	PK #3	PK #4	PK #5
12" TOPSOIL 1' SANDY LOAM 7' CLAY LOAM 6' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	6' FILL 2' CLAY 4' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	12" TOPSOIL 4' CLAY LOAM 5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	FILL	9' FILL 6' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED

PK #6	PK #7	PK #8	PK #9
5' FILL	2' FILL 9' CLAY 4' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	2' FILL 9' CLAY 3.5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	2' FILL 9' CLAY 3.5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED

PERK TEST COMPLETED BY POWELL ENGINEERING WITH BACKHOE

PK A	PK B	PK C	PK D	PK E
12" TOPSOIL 4' LOAM 12" COARSE SAND 2' DEBRIS IN CLAY LOAM FILL 2' COARSE SAND HSWT NOT OBSERVED GW NOT OBSERVED	6' CLAY LOAM 2' COARSE SAND AND GRAVEL HSWT NOT OBSERVED GW NOT OBSERVED	12' CLAY LOAM HSWT @ 10' GW @ 10'	4' CLAY LOAM 2' COARSE SAND AND GRAVEL HSWT NOT OBSERVED GW NOT OBSERVED	4' LOAM 8' MEDIUM BROWN SAND COARSE SAND & GRAVEL HSWT NOT OBSERVED GW NOT OBSERVED

SOIL BORINGS - ATV BORING LOG DONE ON 3/19/2021

B-1 - ELEV 915.35 - BOTTOM BASIN ELEV 904.00	B-2 - ELEV 913.85 - BOTTOM BASIN ELEV 904.00
0 - 16" SILTY CLAY TOPSOIL 16"- 17.5' MOIST CLAY FILL OVER BROWN COARSE SAND & GRAVEL 17.5' - 30' WET MEDIUM COARSE BROWN SAND & GRAVEL GW @ 17'	0 - 8" FILL MOIST BROWN SANDY CLAY OVER TOPSOIL 8' - 13' FILL - SANDY BROWN SILT 13'-14.5' FILL - SANDY BROWN SILT 14.5'-17' FILL - MOIST BROWN SILTY SANDY CLAY 17'-21' MOIST MEDIUM BROWN SAND & GRAVEL 21'-27' WET COARSE BROWN SAND & GRAVEL 27'-30' MOIST CLAY GRAY SILT GW @ 21'

SOIL BORINGS - ATV BORING LOG DONE ON 10/15/2021

B-3 (B-1 10/15/21)	B-4 (B-2 10/15/21)
0 - 7' MOIST MEDIUM BR SAND & GRAVEL 7' - 11' MOIST BROWN SANDY SILT 11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL GW NOT OBSERVED	0 - 5.5' MOIST SANDY BROWN CLAY W/AGGREGATE 5.5' - 7' MOIST BROWN SANDY SILT 7' - 15' MOIST MEDIUM BROWN SAND & GRAVEL GW NOT OBSERVED

B-5 (B-3 10/15/21)	B-6 (B-4 10/15/21)
0 - 13' MOIST SANDY BROWN CLAY 13 - 14' MOIST SANDY BROWN SILT 14'-15' MOIST MEDIUM BROWN SAND GW NOT OBSERVED	0 - 6' FILL MOIST SANDY BROWN CLAY W/ AGGREGATE 6' - 13.5' FILL - MOIST DR BROWN/GRAY SANDY CLAY W/ AGGREGATE 13.5'-15' MOIST MEDIUM BROWN SAND GW NOT OBSERVED

Consulting Civil Engineers
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4700 Cornerstone Drive, White Lake, Michigan 48383
P: 248.714-9895 info@powellengineeringllc.com

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BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

DOVE LAKE ESTATES
SOIL EROSION (1 OF 4)

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAK TWP, LIVINGSTON CNTY

ISSUE DATES

CONSTRUCTION 5/19/2021
CONSTRUCTION 9/6/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022
CONSTRUCTION 7/5/2022
CONSTRUCTION 9/14/2022
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=50'

ERO 1
CONSTRUCTION

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PERK TEST SOILS - COMPLETED BY LCHD WITH BACKHOE

PK #1
12" TOPSOIL
1' SANDY LOAM
7' CLAY LOAM
6' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #2
0' FILL
2' CLAY
4' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #3
12" TOPSOIL
4' CLAY LOAM
5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #4
FILL

PK #5
9' FILL
6' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #6
5' FILL

PK #7
2' FILL
9' CLAY
4' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #8
2' FILL
9' CLAY
3.5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #9
2' FILL
9' CLAY
3.5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PERK TEST COMPLETED BY POWELL ENGINEERING WITH BACKHOE

PK A
12" TOPSOIL
4' LOAM
12" COARSE SAND
2' DEBRIS IN CLAY LOAM FILL
2' COARSE SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK B
9" CLAY LOAM
2' COARSE SAND AND GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

PK C
12" CLAY LOAM
HSWT @ 10'
GW @ 10'

PK D
8" CLAY LOAM
2' COARSE SAND AND GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

PK E
8" LOAM
8' MEDIUM BROWN SAND
COARSE SAND & GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

SOIL BORINGS - ATV BORING LOG DONE ON 3/19/2021

B-1 - ELEV 915.35 - BOTTOM BASIN ELEV 904.00
0 - 16" SILTY CLAY TOPSOIL
16' - 17.5' MOIST CLAY FILL OVER BROWN COARSE SAND & GRAVEL
17.5' - 30' WET MEDIUM COARSE BROWN SAND & GRAVEL
GW @ 17'

B-2 - ELEV 913.85 - BOTTOM BASIN ELEV 904.00
0 - 8" FILL MOIST BROWN SANDY CLAY OVER TOPSOIL
8' - 13' FILL - SANDY BROWN SILT
13'-14.5' FILL - SANDY BROWN SILT
14.5'-17' FILL - MOIST BROWN SILTY SANDY CLAY
17'-21' MOIST MEDIUM BROWN SAND & GRAVEL
21'-27' WET COARSE BROWN SAND & GRAVEL
27'-30' MOIST CLAY GRAY SILT
GW @ 21'

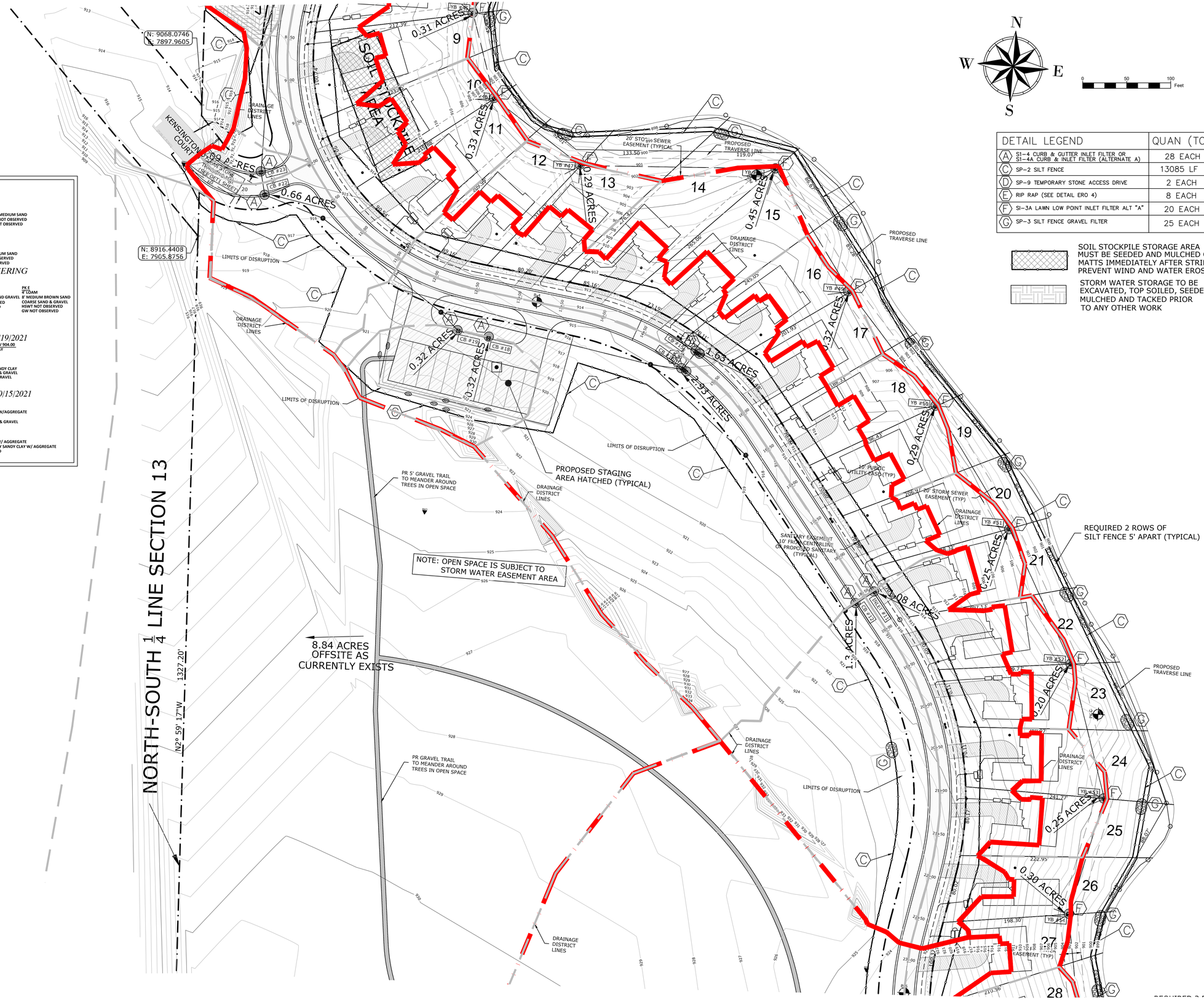
SOIL BORINGS - ATV BORING LOG DONE ON 10/15/2021

B-3 (B-1 10/15/21)
0 - 7' MOIST MEDIUM BR SAND & GRAVEL
7' - 11' MOIST BROWN SANDY SILT
11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-4 (B-2 10/15/21)
0 - 5.5' MOIST SANDY BROWN CLAY W/AGGREGATE
5.5' - 7' MOIST BROWN SANDY SILT
7' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-5 (B-3 10/15/21)
0 - 13' MOIST SANDY BROWN CLAY
13 - 14' MOIST SANDY BROWN SILT
14'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

B-6 (B-4 10/15/21)
0 - 6' FILL MOIST SANDY BROWN CLAY W/ AGGREGATE
6' - 13.5' FILL - MOIST DR BROWN/GRAY SANDY CLAY W/ AGGREGATE
13.5'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED



DETAIL LEGEND		QUAN (TOT)
(A)	SI-4 CURB & GUTTER INLET FILTER OR SI-4A CURB & INLET FILTER (ALTERNATE A)	28 EACH
(C)	SP-2 SILT FENCE	13085 LF
(D)	SP-9 TEMPORARY STONE ACCESS DRIVE	2 EACH
(E)	RIP RAP (SEE DETAIL ERO 4)	8 EACH
(F)	SI-3A LAWN LOW POINT INLET FILTER ALT "A"	20 EACH
(G)	SP-3 SILT FENCE GRAVEL FILTER	25 EACH

SOIL STOCKPILE STORAGE AREA MUST BE SEEDED AND MULCHED OR STRAW MATTS IMMEDIATELY AFTER STRIPPING TO PREVENT WIND AND WATER EROSION.

STORM WATER STORAGE TO BE EXCAVATED, TOP SOILED, SEEDED MULCHED AND TACKED PRIOR TO ANY OTHER WORK

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DOVE LAKE ESTATES
SOIL EROSION (2 OF 4)
DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAK TWP, LIVINGSTON CNTY

ISSUE DATES
CONSTRUCTION 5/19/2021
CONSTRUCTION 9/6/2021
CONSTRUCTION 1/19/2022
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STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=50'

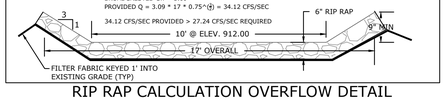
ERO 2
CONSTRUCTION

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THE TIME FOR A 100-YEAR STORM EVENT TO FILL THE 68,520 CU.FT. DETENTION BASIN IS:

THE EXPECTED DISCHARGE (Q) AT THE TIME THE BASIN IS FULL = A * C * I
T=15 MINUTES
I = 275/T+25 FOR A 100 YEAR STORM
I = 275/15+25 = 6.875 INCHES/HR
REQUIRED Q=A*C*I= (14.15) * (0.28) * (6.875) = 27.24 CFS/SEC

SODDED OVERFLOW CALCULATION:
Q = Cw * LENGTH* HEIGHT^(3/2)
BROADCRESTED Cw = 3.09
PROVIDED Q = 3.09 * 17 * 0.75^(3/2) = 34.12 CFS/SEC
34.12 CFS/SEC PROVIDED > 27.24 CFS/SEC REQUIRED



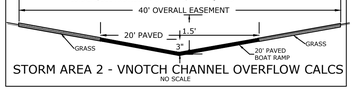
RIP RAP CALCULATION OVERFLOW DETAIL
NO SCALE

IF THE STORM STORAGE EXCEEDS THE TOTAL STORAGE PROVIDED OF 120,000 CF (55,181 STORAGE REQUIRED)THE WATER WELL BUBBLE OUT OF THE INLET #29 AND CATCH BASIN #30 AND FLOW DOWN PROPOSED BOAT RAMP AND DOWN TO DOVE LAKE VIA THE VNOTCH CHANNEL AS CALCULATED BELOW:

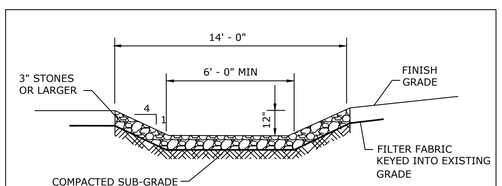
THE EXPECTED DISCHARGE (Q) AT THE TIME THE BASIN IS FULL = A * C * I
T=15 MINUTES
I = 275/T+25 FOR A 100 YEAR STORM
I = 275/15+25 = 6.875 INCHES/HR
REQUIRED Q=A*C*I= (13.55) * (0.40) * (6.875) = 37.26 CFS/SEC

V-NOTCH OVERFLOW CALCULATION:
Q = C * LENGTH* HEIGHT^(2.48)
V-NOTCH Cw = 2.49
PROVIDED Q = 2.49 * 40 * 1^(2.48) = 43.26 CFS/SEC

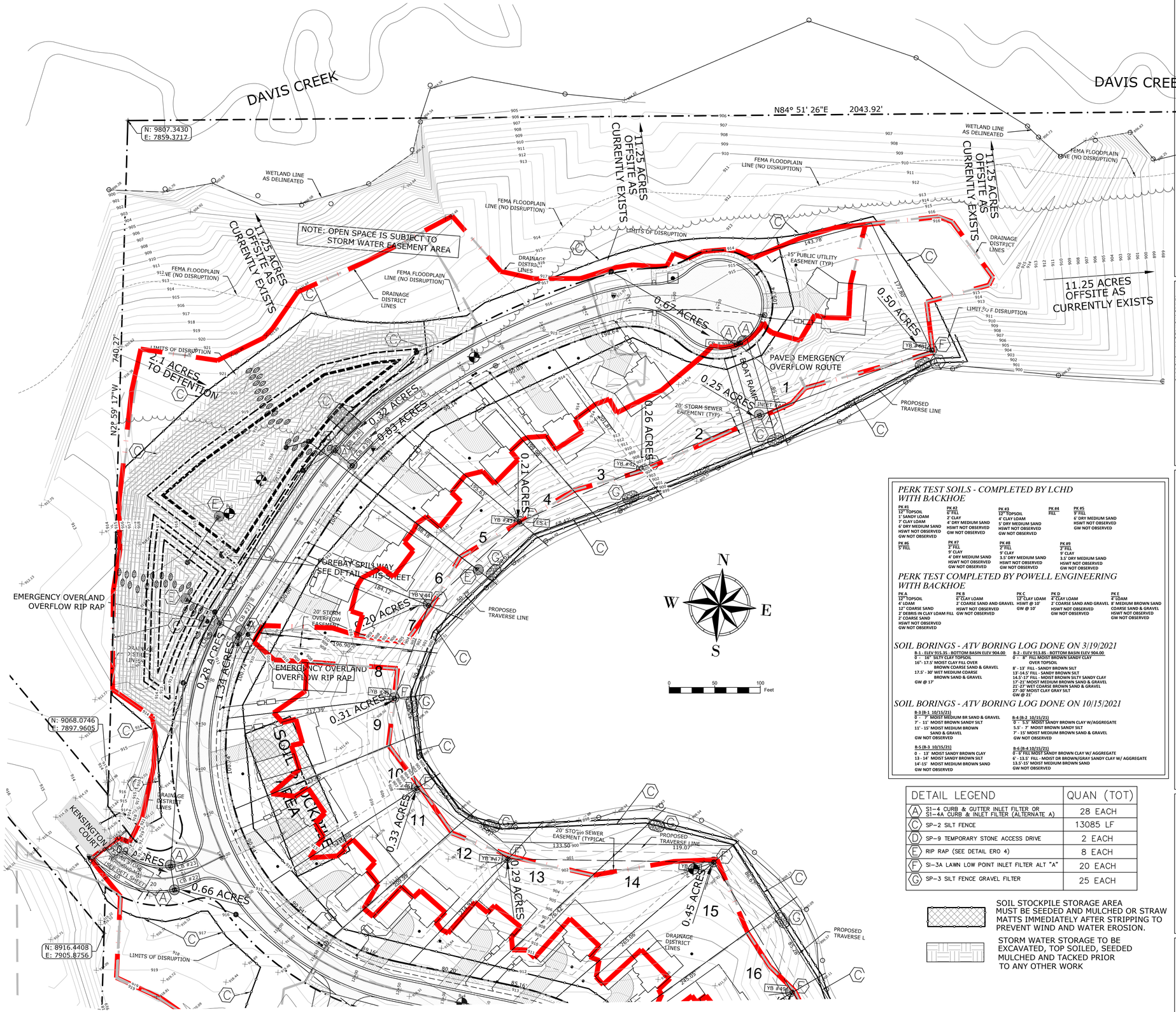
99.6 CFS/SEC PROVIDED > 37.26 CFS/SEC REQUIRED



STORM AREA 2 - VNOTCH CHANNEL OVERFLOW CALCS
NO SCALE



TYPICAL FOREBAY OVERFLOW SPILLWAY DETAIL (FOREBAY TO DETENTION POND)
NO SCALE



PERK TEST SOILS - COMPLETED BY LCHD WITH BACKHOE

PK #1 12" TOPSOIL 1' SANDY LOAM 7' CLAY LOAM 6' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	**PK #2** 8" FILL 2' CLAY 4' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	**PK #3** 12" TOPSOIL 4' CLAY LOAM 5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	**PK #4** FILL	**PK #5** 9" FILL 6' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED
PK #6 9" FILL	**PK #7** 2" FILL 9' CLAY 4' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	**PK #8** 2" FILL 9' CLAY 3.5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	**PK #9** 2" FILL 9' CLAY 3.5' DRY MEDIUM SAND HSWT NOT OBSERVED GW NOT OBSERVED	

PERK TEST COMPLETED BY POWELL ENGINEERING WITH BACKHOE

PK A 12" TOPSOIL 4' LOAM 12" COARSE SAND 2' DEBRIS IN CLAY LOAM FILL 2' COARSE SAND HSWT NOT OBSERVED GW NOT OBSERVED	**PK B** 6" CLAY LOAM 2' COARSE SAND AND GRAVEL HSWT NOT OBSERVED GW NOT OBSERVED	**PK C** 12" CLAY LOAM HSWT @ 10' GW @ 10'	**PK D** 4" CLAY LOAM 2' COARSE SAND AND GRAVEL HSWT NOT OBSERVED GW NOT OBSERVED	**PK E** 4" LOAM 8' MEDIUM BROWN SAND COARSE SAND & GRAVEL HSWT NOT OBSERVED GW NOT OBSERVED

SOIL BORINGS - ATV BORING LOG DONE ON 3/19/2021

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27'-30' MOIST CLAY GRAY SILT
GW @ 21'

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B-3 (B-1 10/15/21)
0 - 7' MOIST MEDIUM BR SAND & GRAVEL
7' - 11' MOIST BROWN SANDY SILT
11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-4 (B-2 10/15/21)
0 - 5.5' MOIST SANDY BROWN CLAY W/AGGREGATE
5.5' - 7' MOIST BROWN SANDY SILT
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GW NOT OBSERVED

B-5 (B-3 10/15/21)
0 - 13' MOIST SANDY BROWN CLAY
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14'-15' MOIST MEDIUM BROWN SAND
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0 - 6' FILL MOIST SANDY BROWN CLAY W/ AGGREGATE
6' - 13.5' FILL - MOIST DK BROWN/GRAY SANDY CLAY W/ AGGREGATE
13.5'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

DETAIL LEGEND	QUAN (TOT)
(A) S1-4 CURB & GUTTER INLET FILTER OR S1-4A CURB & INLET FILTER (ALTERNATE A)	28 EACH
(C) SP-2 SILT FENCE	13085 LF
(D) SP-9 TEMPORARY STONE ACCESS DRIVE	2 EACH
(E) RIP RAP (SEE DETAIL ERO 4)	8 EACH
(F) SI-3A LAWN LOW POINT INLET FILTER ALT "A"	20 EACH
(G) SP-3 SILT FENCE GRAVEL FILTER	25 EACH

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STORM WATER STORAGE TO BE EXCAVATED, TOP SOILED, SEEDED MULCHED AND TACKED PRIOR TO ANY OTHER WORK

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DOVE LAKE ESTATES
SOIL EROSION (3 OF 4)
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ISSUE DATES

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STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=50'

ERO 3
CONSTRUCTION

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ONGOING MAINTENANCE REQUIRED

PROGRAM PROPOSAL FOR THE CONTINUED MAINTENANCE OF ALL PERMANENT SOIL EROSION AND SEDIMENT CONTROL DEVICES

THE OWNER IS RESPONSIBLE FOR THE CONTINUED MAINTENANCE OF THE DETENTION BASIN. MAINTENANCE SHOULD BE PERFORMED FOLLOWING ANY STORM AND SHOULD INCLUDE:

1. CHECKING THE DEPTH OF SEDIMENT DEPOSIT TO ENSURE THE CAPACITY OF THE BASIN IS ADEQUATE FOR STORM WATER AND SEDIMENT DEPOSITION, AND FOR THE REMOVING OF SEDIMENT.
2. CHECKING THE BASIN FOR PIPING, SEEPAGE, OR OTHER MECHANICAL DAMAGE.
3. CHECKING FOR THE PRESENCE OF ANY SOIL CAKING, WHICH WOULD PREVENT PROPER DRAINAGE FROM THE BASIN.
4. CHECKING THE OUTFALL TO ENSURE DRAINAGE IS NOT CAUSING ANY EROSIVE VELOCITIES AND TO ENSURE THE OULET IS NOT CLOGGED.

SEDIMENT REMOVED DURING CLEANING SHOULD BE PLACED AT AN UPLAND AREA AND STABILIZED SO THAT IT DOES NOT RE-ENTER THE DRAINAGE.

THE OWNER IS RESPONSIBLE FOR THE CONTINUED MAINTENANCE OF THE SOIL EROSION CONTROL STRUCTURES THROUGHOUT THE SITE - THIS SHOULD INCLUDE:

5. CHECK THE SILT FENCE THROUGHOUT THE SITE VERIFYING TIGHT AND WORKING ONCE A WEEK AND AFTER EVERY RAIN EVENT.
6. REPLACE STRAW BALE FILTERS AS NECESSARY TO MAINTAIN EROSION CONTROL.
7. CHECK INLET FILTER IN EVERY STRUCTURE ONCE A WEEK AND AFTER EVERY RAIN EVENT.
8. DUST CONTROLLED AT ALL TIMES
9. ROADS MUST BE SWEPT DAILY TO REMOVE ANY TRACKING ONTO THE ROADS.
10. MUD REMOVED FROM TRACKING MAT DAILY.

ANY PROBLEM DISCOVERED DURING THE MAINTENANCE CHECKS SHOULD BE ADDRESSED IMMEDIATELY.

SOIL EROSION CONTROL STANDARD NOTES

1. ALL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF GREEN OAKS CHARTER TOWNSHIP AND LCDC.

NOTE: SOIL EROSION CONTROL PERMIT IS ONLY FOR THE DEVELOPMENT OF THE PROPERTY AND IS NOT APPROVED FOR EACH BUILDING SITE. EACH BUILDING SITE MUST OBTAIN THEIR SOIL EROSION CONTROL PERMIT.

2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES. ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
3. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED WITHIN THE WORK AREA AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES, PONDS AND WETLANDS.
4. THE CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS DIRECTED ON THESE PLANS AND WHERE OTHERWISE REQUIRED BY THE WORK. THE CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER CHANGES HAVE BEEN ACCOMPLISHED.
5. SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF DIRT OFF THE WORK AREA.
6. THE CONTRACTOR SHALL PRESERVE OFF-SITE NATURAL VEGETATION AS MUCH AS POSSIBLE.
7. PROTECT ALL EXISTING TREES, INCLUDING THEIR BRANCHES AND ROOTS, FROM DAMAGE DUE TO THIS WORK UNLESS SPECIFICALLY IDENTIFIED FOR REMOVAL.
8. STABILIZATION OF ALL DISTURBED AREAS SHALL BE ESTABLISHED USING THE APPROPRIATE VEGETATION WITHIN 5 DAYS OF COMPLETION OF FINAL GRADING.
9. THE CONTRACTOR SHALL SWEEP THE EXISTING STREETS SURROUNDING THE PROJECT SITE AS NEEDED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL AND SHALL PROVIDE ALL EQUIPMENT AND MATERIAL TO KEEP DUST IN CHECK AT ALL TIMES. THE CONTRACTOR SHALL RESPOND IMMEDIATELY TO ANY AND ALL COMPLAINTS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NPDES PERMIT AND ENSURING COMPLIANCE WITH ALL APPLICABLE PERMIT REGULATIONS, INCLUDING BUT NOT LIMITED TO, INSPECTION, RESTORATION AND RECORD KEEPING REQUIREMENTS. REPORTS FROM THE CERTIFIED STORM WATER OPERATOR SHALL BE MADE AVAILABLE TO THE CITY.

SOIL EROSION CONTROL REQUIREMENTS

1. TOPSOIL MUST MAINTAIN A MINIMUM OF 3" DEPTH.
2. GRASS SEED MUST MAINTAIN 210 LBS PER ACRE MINIMUM.
3. FERTILIZER MUST BE USED AT 150 LBS PER ACRE.
4. STRAW MULCH TO BE AT A MINIMUM OF 3" DEPTH - 1.5 TO 2 TONS PER ACRE AND MUST BE TIED DOWN WITH NET BINDING OR TACKIFIER.
5. HYDRO-SEEDING IS NOT PERMISSIBLE ON THIS SITE.
6. STOCKPILED TOPSOIL MUST BE SEEDED AND MULCHED OR A MULCH BLANKET MUST BE USED OVER SOIL TO PREVENT WATER AND WIND EROSION.

NOTE: A CERTIFIED STORMWATER OPERATOR IS REQUIRED TO INSPECT THE SOIL EROSION CONTROL MEASURES ON A WEEKLY BASIS AS WELL AS WITHIN 24 HOURS OF ANY RAIN/STORM EVENT.

NOTE: PRIOR TO FINAL SOIL EROSION CONTROL APPROVAL THE 6A WASHED STONE AT THE OUTLETS FOR BOTH THE FOREBAYS AND DETENTION POND MUST BE REPLACED WITH CLEAN 6A WASHED STONE.

NOTE: SOIL EROSION CONTROL FOR THE DEVELOPMENT IS ONLY FOR EARTH MOVEMENT, ROADS AND UTILITIES. PROPOSED BUILDINGS FOR EACH LOT MUST EACH HAVE THEIR OWN SOIL EROSION CONTROL PERMIT PRIOR TO ISSUANCE OF ANY BUILDING PERMIT.

NOTE: NO HYDROSEEDING IS ALLOWED ANYWHERE ON THIS SITE DUE TO THE GRADE CHANGES BEING OVER 1%. ALL AREAS MUST HAVE TOPSOIL, SEED AND MULCH THAT MUST BE TACKED OR STRAW BLANKETS AS REQUIRED BY LIVINGSTON COUNTY DRAIN COMMISSION.



PERK TEST SOILS - COMPLETED BY LCHD WITH BACKHOE

PK #1
12" TOPSOIL
1' SANDY LOAM
7' CLAY LOAM
6' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #2
6" FILL
2' CLAY
4' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #3
12" TOPSOIL
4' CLAY LOAM
5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #4
FILL

PK #5
9" FILL
6' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #6
9" FILL

PK #7
2" FILL
9" CLAY
4' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #8
2" FILL
9" CLAY
3.5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK #9
2" FILL
9" CLAY
3.5' DRY MEDIUM SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PERK TEST COMPLETED BY POWELL ENGINEERING WITH BACKHOE

PK A
12" TOPSOIL
4' LOAM
12" COARSE SAND
2' DEBRIS IN CLAY LOAM FILL
2' COARSE SAND
HSWT NOT OBSERVED
GW NOT OBSERVED

PK B
6" CLAY LOAM
2' COARSE SAND AND GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

PK C
12" CLAY LOAM
HSWT @ 10'
GW @ 10'

PK D
4' CLAY LOAM
2' COARSE SAND AND GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

PK E
4' LOAM
8' MEDIUM BROWN SAND
COARSE SAND & GRAVEL
HSWT NOT OBSERVED
GW NOT OBSERVED

SOIL BORINGS - ATV BORING LOG DONE ON 3/19/2021

B-1 - ELEV 922.5 - BOTTOM BASIN ELEV 909.00
0 - 16" SILTY CLAY TOPSOIL
16" - 17.5' MOIST CLAY FILL OVER BROWN COARSE SAND & GRAVEL
17.5' - 30' WET MEDIUM COARSE BROWN SAND & GRAVEL
GW @ 17'

B-2 - ELEV 921.00 - BOTTOM BASIN ELEV 912.00
0 - 8" FILL MOIST BROWN SANDY CLAY OVER TOPSOIL
8' - 13' FILL - SANDY BROWN SILT
13'-14.5' FILL - SANDY BROWN SILTY SANDY CLAY
14.5'-17' FILL - MOIST BROWN SILTY SANDY CLAY
17'-21' MOIST MEDIUM BROWN SAND & GRAVEL
21'-27' WET COARSE BROWN SAND & GRAVEL
27'-30' MOIST CLAY GRAY SILT
GW @ 21'

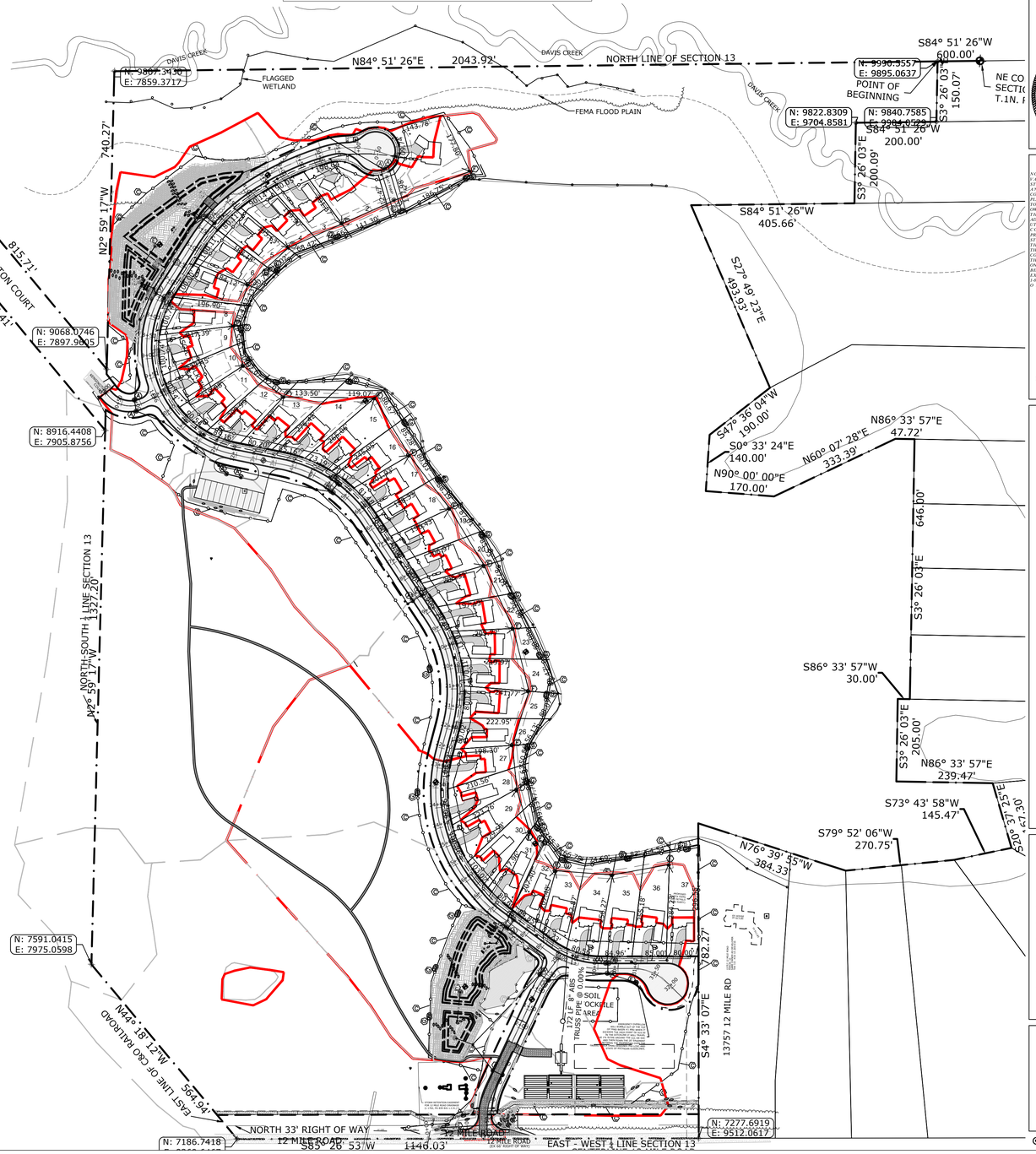
SOIL BORINGS - ATV BORING LOG DONE ON 10/15/2021

B-3 (B-1 10/15/21)
0 - 7" MOIST MEDIUM BR SAND & GRAVEL
7' - 11' MOIST BROWN SANDY SILT
11' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-4 (B-2 10/15/21)
0 - 5.5' MOIST SANDY BROWN CLAY W/AGGREGATE
5.5' - 7' MOIST BROWN SANDY SILT
7' - 15' MOIST MEDIUM BROWN SAND & GRAVEL
GW NOT OBSERVED

B-5 (B-3 10/15/21)
0 - 13' MOIST SANDY BROWN CLAY
13 - 14' MOIST SANDY BROWN SILT
14'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED

B-6 (B-4 10/15/21)
0 - 6" FILL MOIST SANDY BROWN CLAY W/ AGGREGATE
6' - 13.5' FILL - MOIST DK BROWN/GRAY SANDY CLAY W/ AGGREGATE
13.5'-15' MOIST MEDIUM BROWN SAND
GW NOT OBSERVED



SEQUENCE OF CONSTRUCTION FOR SOIL EROSION CONTROL

PHASE 1 AND PORTIONS OVERALL CONSTRUCTION

CERTIFIED STORM WATER OPERATOR _____

DATE SOIL EROSION CONTROL PERMIT RECEIVED _____

SEQUENCE	DESCRIPTION	PHASE 1	PHASE 2
1	HAVE SOIL EROSION PERMIT FROM LCDC PRIOR TO ANY WORK.	AUGUST 1-15 2025	MARCH 1-15 2027
2	INSTALL SILTATION FENCE AND STONE OUTLET FILTERS , TRACKING MAT, AND ALL SOIL EROSION PROTECTIONS PER PLAN.	AUGUST 16-30 2025	MARCH 16-31 2027
3	CONSTRUCT DETENTION BASINS AND FOREBAYS TO BE EXCAVATED, TOPSOIL, SEEDED AND MULCHED AND TACKED PRIOR TO ANY MASS GRADING	SEPTEMBER 1-15 2025	APRIL 1-15 2027
4	STRIP VEGETATION & STOCKPILE INDEPENDENT FROM EX TOPSOIL STOCK PILES	SEPTEMBER 16-30 2025	APRIL 16-30, 2027
5	SEED AND MULCH OR USE MATTED STRAW OVER STOCKPILED TOPSOIL TO PREVENT EROSION	OCTOBER 1-15 2025	MAY 1-15, 2027
6	MASS GRADE AS REQUIRED	OCTOBER 16-24 2025	MAY 16-31, 2027
7	INSTALL SANITARY SEWER (ALL PHASE 1), AND SEPTIC FIELD (ALL PHASE 1) STORM SEWER	OCTOBER 25-31 2025	JUNE 1-15, 2027
8	IMMEDIATELY INSTALL STONE FILTERS ON ALL CATCH BASINS AND INLETS. (TEMPORARY)	NOVEMBER 1-10 2025	JUNE 16-30, 2027
9	PREPARE ROAD BASE AND PAVE ROAD PHASE 1 PER PLAN AND RIGHT OF WAY WORK	NOVEMBER 11-20 2025	JULY 1-15, 2027
10	INSTALL ALL PUBLIC UTILITIES COMPLETE BOTH PHASES (GAS, ELECTRIC, TELEPHONE, AND CABLE TV).	DEC 2025-JULY 2026	JULY 16-31, 2027
11	INSTALL SILTATION FENCE ALONG PAVEMENT WHERE YARDS SLOPE TOWARD PAVEMENT, AND LAKE (TEMPORARY) - MAINTAIN THROUGH ALL CONSTRUCTION UNTIL VEG ESTABLISHED	JUNE 2026	AUGUST 1-15, 2027
12	REDISTRIBUTE TOP SOIL, AND ESTABLISH VEGETATION ON ALL DISTURBED GROUND AREAS. AREA WITHIN 25' OF LAKE MUST HAVE STAKED MULCH BLANKETS UNTIL PERMANENTLY STABILIZED.	JULY 2026	AUGUST 16-30, 2027
13	CLEAN ALL PAVEMENT AND STORM SEWERS OF ALL SEDIMENT.	AUGUST 2026	SEPTEMBER 1-15, 2027
14	REPLACE 6A WASHED STONE AROUND STANDPIPE IN FOREBAYS AND BASINS WITH CLEAN 6A STONE.		SEPTEMBER 16-30 2027
15	REMOVE TEMPORARY SOIL EROSION CONTROL MEASURES AFTER PERMANENT VEGETATION HAS BEEN ESTABLISHED.		OCTOBER 16-24 2027
	ONGOING MAINTENANCE THROUGHOUT CONSTRUCTION		OCTOBER 25-31 2027
	IT IS THE RESPONSIBILITY OF THE DEVELOPER TO INSURE THAT ALL SOIL EROSION CONTROL MEASURES ARE INSTALLED AND MAINTAINED THROUGHOUT CONSTRUCTION		
1	REPAIR AND/OR REPLACE ALL LOW POINT AND PAVEMENT CATCH BASIN FILTERS AS NEEDED. (WEEKLY AND 24 HRS POST RAIN EVENTS)		
2	DUST MUST BE CONTROLLED AT ALL TIMES.		
3	ALL MUD TRACKED ON PUBLIC ROADS AND INTERIOR ROADS SHALL BE REMOVED DAILY.		
4	SILT FENCE MUST BE CHECKED ONCE A WEEK AND AFTER EVERY RAIN EVENT.		
5	REPLACE STRAW BALE FILTERS AS NECESSARY TO MAINTAIN EROSION CONTROL.		

INDIVIDUAL BUILDING SITES FOR PHASE 1 REQUIRE THEIR OWN SOIL EROSION CONTROL PERMIT

INDIVIDUAL BUILDING SITES FOR PHASE 2 REQUIRE THEIR OWN SOIL EROSION CONTROL PERMIT

Consulting Civil Engineers "Engineering A Better Michigan"

Powell Engineering & Associates, LLC

4700 Cornerstone Drive, White Lake, Michigan 48383
P: 248.714-6095 info@powellengineeringllc.com

NOTE: AS AN AID TO THE CONTRACTOR VARIOUS UTILITIES AND UNDERGROUND STRUCTURES ARE SHOWN ON THESE PLANS AND PROFILES. ALL INFORMATION CONCERNING ALL UTILITIES SHOWN ON THE PLANS AND PROFILES HAS BEEN FIELD LOCATED BY THE RESPECTIVE PRIVATE OWNER AND ENGINEER AND/OR GOVERNMENTAL THEIR LOCATION IS APPROXIMATE, OR THAT ADDITIONAL UNDERGROUND STRUCTURES OR UTILITIES MAY NOT BE ENCOUNTERED. IF THE CONTRACTOR DOES ENCOUNTER A PREVIOUSLY UNIDENTIFIED UTILITY AND/OR THE UTILITIES DETECTED AND SHOWN ON THESE PLANS IS INCORRECTLY LOCATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND ENGINEER FOR DIRECTION ON HOW TO PROCEED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES. NOTIFY MISS DIG AT LEAST 72 HOURS BEFORE THE START OF ANY CONSTRUCTION.

BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

DOVE LAKE ESTATES
SOIL EROSION (4 OF 4)

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAK TWP, LIVINGSTON CNTY

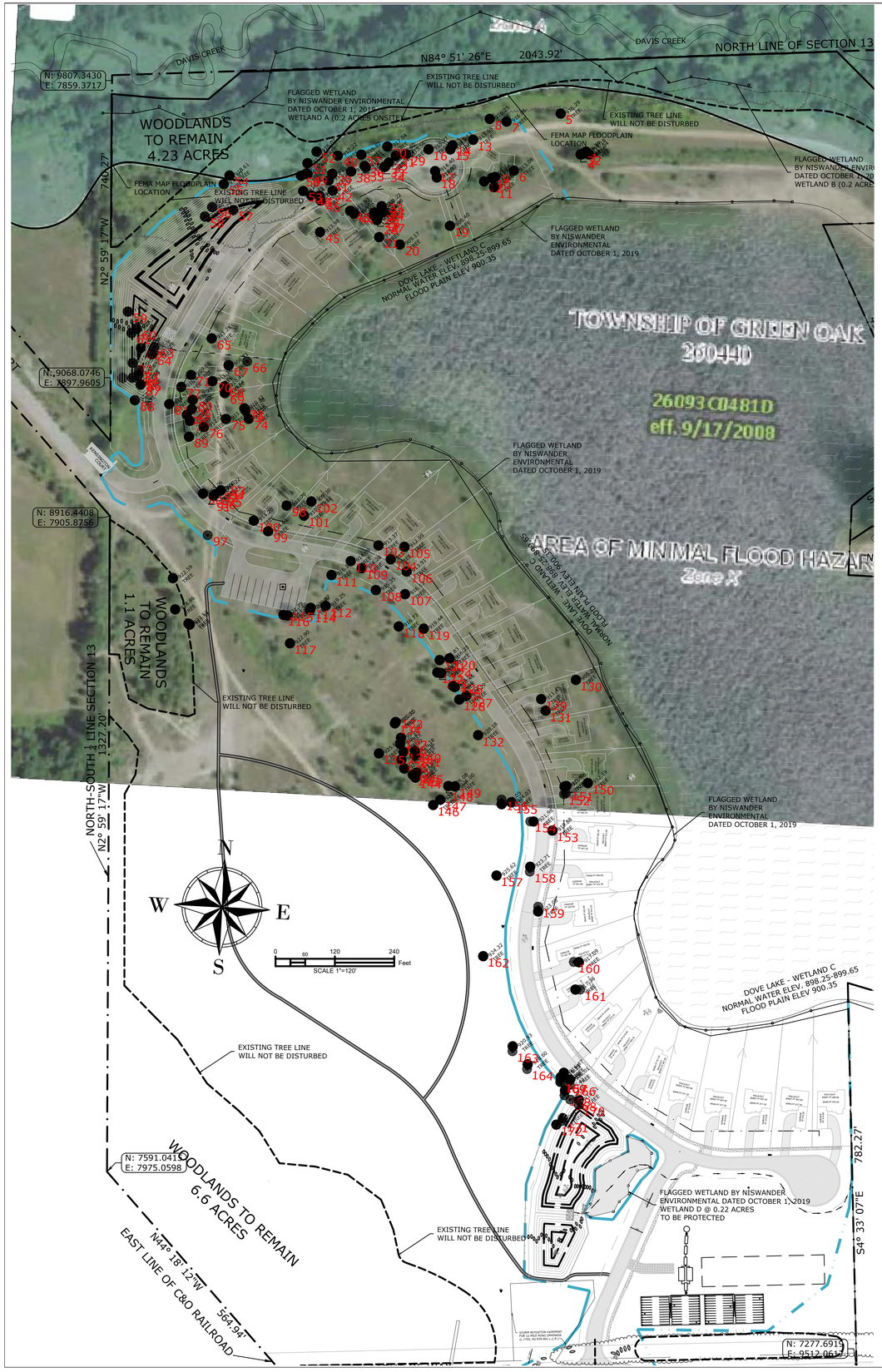
ISSUE DATES

CONSTRUCTION 4/19/2022
CONSTRUCTION 7/5/2022
CONSTRUCTION 9/14/2022
STAMPING SET 6/26/2025

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=50'

ERO 4
CONSTRUCTION

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Only trees within the limits of disruption area were tagged. Outside of the limits of disruption in the 70% of the site which is proposing no disruption there are hundreds of trees which will not be impacted by the development. These are considered woodland areas which are to remain undisturbed except in the small area near the entrance to 12 Mile Road as shown on sheet S12.

Tag #	Diameter at 4.5'	Common Name	Scientific Name	Condition Rating	removed
1	10.5	Eastern Cottonwood	Populas deltoides	Fair	remain
4	10	Eastern Cottonwood	Populas deltoides	Fair	remain
11	9	Eastern Cottonwood	Populas deltoides	Fair	remove
12	8	American Elm	Ulmus americana	Good	remove
14	10	Eastern Cottonwood	Populas Deltoides	Good	remove
15	10	Eastern Cottonwood	Populas Deltoides	Fair	remove
16	10	Eastern Cottonwood	Populas Deltoides	Fair	remove
19	16	Black Locust	Robinia pseudoacacia	Good	remain
20	9.5	Black Locust	Robinia pseudoacacia	Good	remove
21	11	Eastern Cottonwood	Populas deltoides	Fair	remove
22	8	Eastern Cottonwood	Populas deltoides	Fair	remove
23	17	Eastern Cottonwood	Populas deltoides	Poor	remove
28	9	Eastern Cottonwood	Populas deltoides	Good	remove
29	13.5	Eastern Cottonwood	Populas deltoides	Good	remove
30	13	Eastern Cottonwood	Populas deltoides	Fair	remain
31	9.5	Eastern Cottonwood	Populas deltoides	Poor	remove
37	11.5	Narrow Leaf Willow	Populas deltoides	Poor	remove
38	9.5	Eastern Cottonwood	Populas deltoides	Poor	remove
41	8	Eastern Cottonwood	Populas deltoides	Good	remove
42	8.5	Eastern Cottonwood	Populas deltoides	Fair	remove
43	10.5	Eastern Cottonwood	Populas deltoides	Fair	remove
44	10	Eastern Cottonwood	Populas deltoides	Fair	remove
45	9	Eastern Cottonwood	Populas deltoides	Fair	remove
46	8	Eastern Cottonwood	Populas deltoides	Good	remove
55	8	Eastern Cottonwood	Populas deltoides	Good	remain
56	14	Eastern Cottonwood	Populas deltoides	Poor	remove
58	14.5	Eastern Cottonwood	Populas deltoides	Poor	remove
59	10	Eastern Cottonwood	Populas deltoides	Fair	remove
60	10	Eastern Cottonwood	Populas deltoides	Fair	remove
61	9	Eastern Cottonwood	Populas deltoides	Good	remove
63	9	Narrow Leaf Willow	Salix exiqua	Poor	remove
64	8	Narrow Leaf Willow	Salix exiqua	Fair	remove
65	10	Eastern Cottonwood	Populas deltoides	Good	remove
66	14	Eastern Cottonwood	Populas deltoides	Fair	remove
67	9	Eastern Cottonwood	Populas deltoides	Poor	remove
69	15.5	Eastern Cottonwood	Populas deltoides	Poor	remove
70	9	Eastern Cottonwood	Populas deltoides	Poor	remove
71	9.5	Eastern Cottonwood	Populas deltoides	Poor	remove
72	19	Eastern Cottonwood	Populas deltoides	Poor	remove
75	13.3	Eastern Cottonwood	Populas deltoides	Good	remove
76	25	Eastern Cottonwood	Populas deltoides	Good	remove
77	15	Eastern Cottonwood	Populas deltoides	Poor	remove
78	13.5	Eastern Cottonwood	Populas deltoides	Poor	remove
79	8	Eastern Cottonwood	Populas deltoides	Fair	remove
80	18	Eastern Cottonwood	Populas deltoides	Poor	remove
81	18.5	Eastern Cottonwood	Populas deltoides	Fair	remove
85	8.5	Eastern Cottonwood	Populas deltoides	Fair	remove
86	9.5	Eastern Cottonwood	Populas deltoides	Fair	remove
87	28	Narrow Leaf Willow	Salix exiqua	Good	remove
88	15	Eastern Cottonwood	Populas deltoides	Good	remove
89	8	Eastern Cottonwood	Populas deltoides	Poor	remove
90	11.5	Eastern Cottonwood	Populas deltoides	Fair	remove
91 & 96	8	Eastern Cottonwood	Populas deltoides	Poor	remove
92 & 95	12	Eastern Cottonwood	Populas deltoides	Fair	remove
93 & 94	12	Eastern Cottonwood	Populas deltoides	Good	remove
98	8	Eastern Cottonwood	Populas deltoides	Fair	remove
99	28.5	Eastern Cottonwood	Populas deltoides	Poor	remove
101	9.5	Eastern Cottonwood	Populas deltoides	Fair	remove
102	8	Eastern Cottonwood	Populas deltoides	Good	remove
103	8	Eastern Cottonwood	Populas deltoides	Good	remove
104	9.5	Eastern Cottonwood	Populas deltoides	Fair	remove
106	18.5	Eastern Cottonwood	Populas deltoides	Good	remove
110	11	Eastern Cottonwood	Populas deltoides	Poor	remove
112	13	Eastern Cottonwood	Populas deltoides	Good	remain
113	11	Eastern Cottonwood	Populas deltoides	Fair	remain
114	13	Eastern Cottonwood	Populas deltoides	Good	remain
115	18	Eastern Cottonwood	Populas deltoides	Poor	remove
116	10	Eastern Cottonwood	Populas deltoides	Good	remove
117	11.5	Eastern Cottonwood	Populas deltoides	Fair	remain
120	10	Eastern Cottonwood	Populas deltoides	Fair	remove
123	8	Eastern Cottonwood	Populas deltoides	Fair	remain
126	8	Eastern Cottonwood	Populas deltoides	Good	remain
127	13	Eastern Cottonwood	Populas deltoides	Fair	remain
128	8	Eastern Cottonwood	Populas deltoides	Poor	remain
129	9	Eastern Cottonwood	Populas deltoides	Poor	remove
134	10	Eastern Cottonwood	Populas deltoides	Poor	remain
135	10	Eastern Cottonwood	Populas deltoides	Good	remain
138	16.5	Eastern Cottonwood	Populas deltoides	Poor	remain
139	11	Eastern Cottonwood	Populas deltoides	Poor	remain
141	8	Eastern Cottonwood	Populas deltoides	Fair	remain
142	8	Eastern Cottonwood	Populas deltoides	Fair	remain
143	18	Eastern Cottonwood	Populas deltoides	Poor	remain
145	11	Eastern Cottonwood	Populas deltoides	Poor	remain
149	14	Eastern Cottonwood	Populas deltoides	Poor	remain
150	18	Black Locust	Robinia pseudoacacia	Fair	remove
152	19	Eastern Cottonwood	Populas deltoides	Poor	remain
155	9	Eastern Cottonwood	Populas deltoides	Good	remain
156	13	Eastern Cottonwood	Populas deltoides	Poor	remain
157	22	Eastern Cottonwood	Populas deltoides	Fair	remain
159	10	Eastern Cottonwood	Populas deltoides	Good	remove
160	27.5	Eastern Cottonwood	Populas deltoides	Poor	remove
161	9	Eastern Cottonwood	Populas deltoides	Fair	remove
165	9	Eastern Cottonwood	Populas deltoides	Poor	remain
166	9	Eastern Cottonwood	Populas deltoides	Fair	remove
168	8	Eastern Cottonwood	Populas deltoides	Poor	remove
169	8	Eastern Cottonwood	Populas deltoides	Fair	remove
171	8	Eastern Cottonwood	Populas deltoides	Poor	remove

DOVE LAKE FLOOD PLAIN CALCULATIONS

AREA OF DOVE LAKE = 2,069,100 SQ.FT. = 47.5 ACRES
Cavg = 1.0
AREA OF WATERSHED = 5,800,000 SQ.FT. = 135 ACRES
AREA OF WATERSHED UPLAND = 135-47.5 = 87.5 ACRES
Cr = 0.2 ACRES

$$Cavg = \frac{47.5 \times 1.0 = 47.5}{135} + \frac{87.5 \times 0.2 = 17.5}{65} = Cavg = 0.50$$

EXPECTED VOLUME OF 100 YEAR STORM EVENT
VOL = 16,500 x A x C =
= 16,500 x 135 x 0.5 = 1,113,750 CU.FT.

RISE IN LAKE ELEVATION = $\frac{1,113,750}{2,069,100}$ = 0.53 FT

NORMAL SUMMER DOVE LAKE WATER ELEVATION = 899.85

CALCULATED 100 YEAR FLOOD PLAIN ELEVATION = 900.35

STATE OF MICHIGAN
MICHAEL C POWELL
ENGINEER
No. 6201027636
REGISTERED PROFESSIONAL ENGINEER

Consulting Civil Engineers
"Engineering A Better Michigan"
Powell Engineering & Associates, LLC
4700 Cornerstone Drive, White Lake, Michigan 48383
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DOVE LAKE ESTATES
WETLAND OVERVIEW PLAN

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

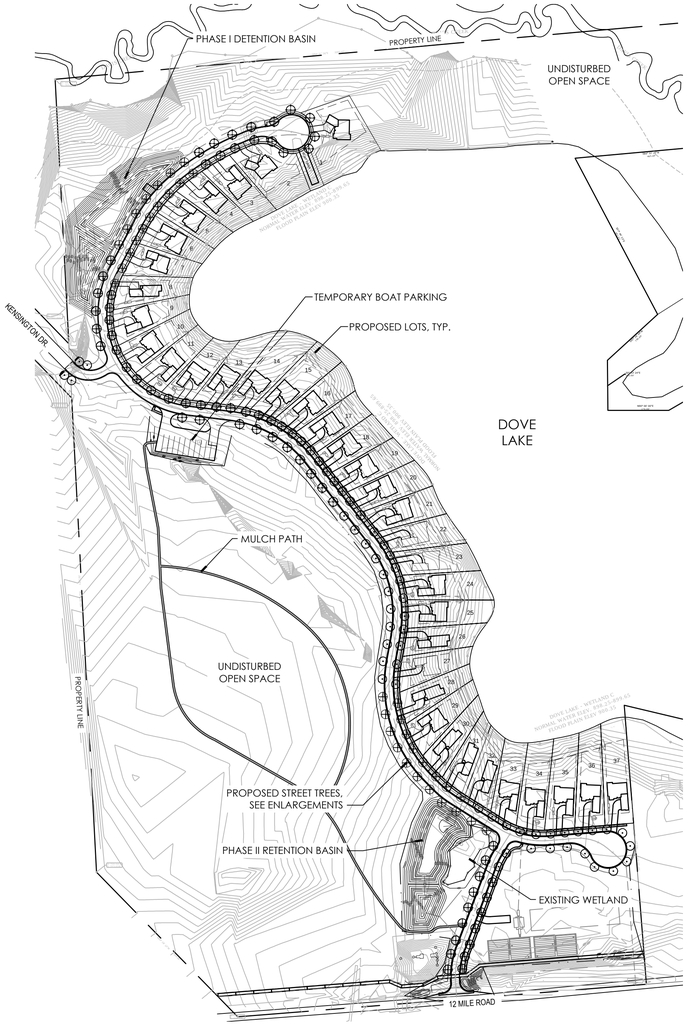
ISSUE DATES

CONSTRUCTION 5/19/2021
CONSTRUCTION 1/19/2022
CONSTRUCTION 4/19/2022

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=120'

WET CONSTRUCTION

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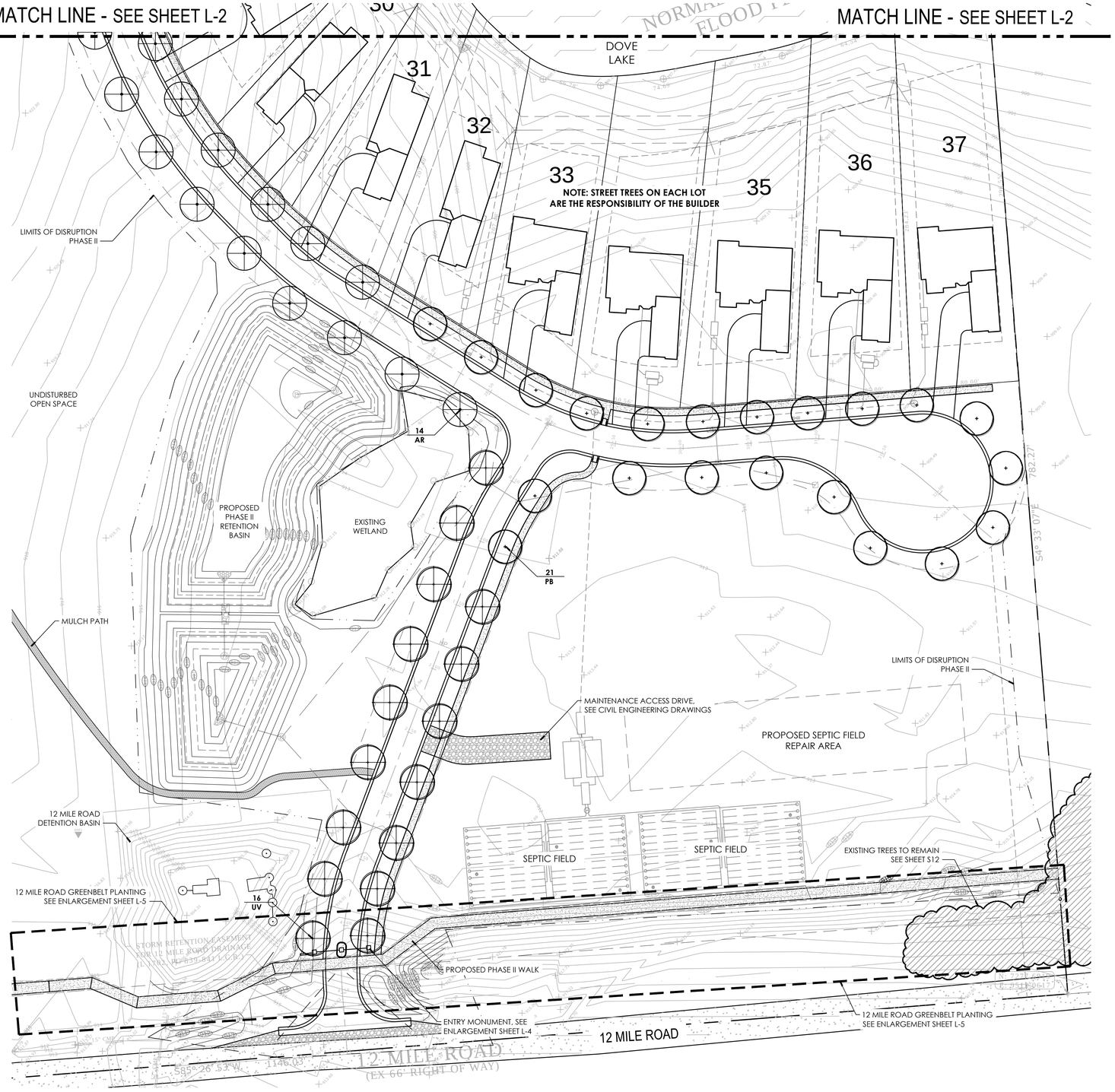
OVERALL PLAN

SCALE: 1" = 200'-0"

0 100 200 400

MATCH LINE - SEE SHEET L-2

MATCH LINE - SEE SHEET L-2



ENLARGEMENT - STREET TREE PLANTING PLAN

SCALE: 1" = 40'-0"

NOTE: SEE SHEET L-2 FOR PLANT SCHEDULE

0 20 40 80

Site Landscape Calculations:

GENERAL LANDSCAPE: (G)
Minimum of 1 Deciduous or Evergreen tree / 3,000 sf. open space
Net Site Area: 71.0 ac (3,092,760 sf)
Developed Area: 20.2 ac (879,912 sf)
Open space: 50.8 ac (2,212,848 sf)

Total Trees Required: 738 (2,212,848 / 3,000 sf)
Total Trees Provided: **738** (11.93 acres of existing woodlands are to remain - See sheet S12)

STREET TREE REQUIREMENT (Internal Roads):
2 Deciduous trees / Lot
1 Deciduous tree / 50 lf. where not adjacent to a lot

Number of lots: 37
Lf not adj. to a lot: 3,761 lf

Street Trees Required: 150 ((3,761 / 50)+74)
Street Trees Provided: **150**

TREE MITIGATION REQUIREMENT: (See sheet S12 for tree survey)
One 2" dbh deciduous tree or 6' ht. evergreen tree is required for each regulated tree removed.

Number of trees removed: 67

Replacement Trees Required: 0
Replacement Trees Provided: **0**

All trees to be removed are of a species that are exempt from protection as indicated in Sections 38-363.(l) and 38-363.(m)

LANDSCAPE ADJACENT TO ROADS (Greenbelt):
Minimum of 1 Deciduous or Evergreen tree / 30 lf.
Minimum of 1 Ornamental tree / 100 lf
Minimum of 5 Shrubs / 30 lf.

Total Road Frontage 12 Mile Road: 1,146 lf.
Total Road Frontage Kensington Dr: 101 lf.

12 Mile Road
Deciduous or Evergreen Trees Required: 39 (1,146 / 30)
Deciduous or Evergreen Trees Provided: **39**

Ornamental Trees Required: 12 (1,146 / 100)
Ornamental Trees Provided: **12**

Shrubs Required: 191 (1,146 / 30)*5
Shrubs Provided: **191**

Kensington Drive
Deciduous or Evergreen Trees Required: 4 (101 / 30)
Deciduous or Evergreen Trees Provided: **4**

Ornamental Trees Required: 1 (101 / 100)
Ornamental Trees Provided: **1**

Shrubs Required: 17 (101 / 30)*5
Shrubs Provided: **25**

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SURVEY PROVIDIED BY:

POWELL ENGINEERING, LLC
4700 Commerce Drive
White Lake, MI 48383
248.714.9895

POWELL JOB NUMBER: 19-425
DATED: 05.23.2019

NORTH

VVLA vert verde landscape architecture
734.249.3568 Plymouth, MI
james@vertverde.com

Issued For:

07.17.2020	Prelim Site Plan Review
12.16.2020	Revision
01.29.2021	Revision
03.08.2021	Revision
05.20.2021	Revision
01.25.2022	Revision
04.26.2022	Revision
08.26.2024	Revision

Project:

DOVE LAKE ESTATES
Green Oak Township, Michigan

Project Sponsor:

CORNERSTONE RESIDENTIAL GROUP
8555 Boulder Shores Drive
South Lyon, MI 48178

Sheet Name:

Landscape Plan

Seal:

STATE OF MICHIGAN · JAMES GRAY · LANDSCAPE ARCHITECT · No. 1528 · REGISTERED LANDSCAPE ARCHITECT

Drawn:	JG
Checked:	JG
Date:	05.2020
Scale:	As Noted

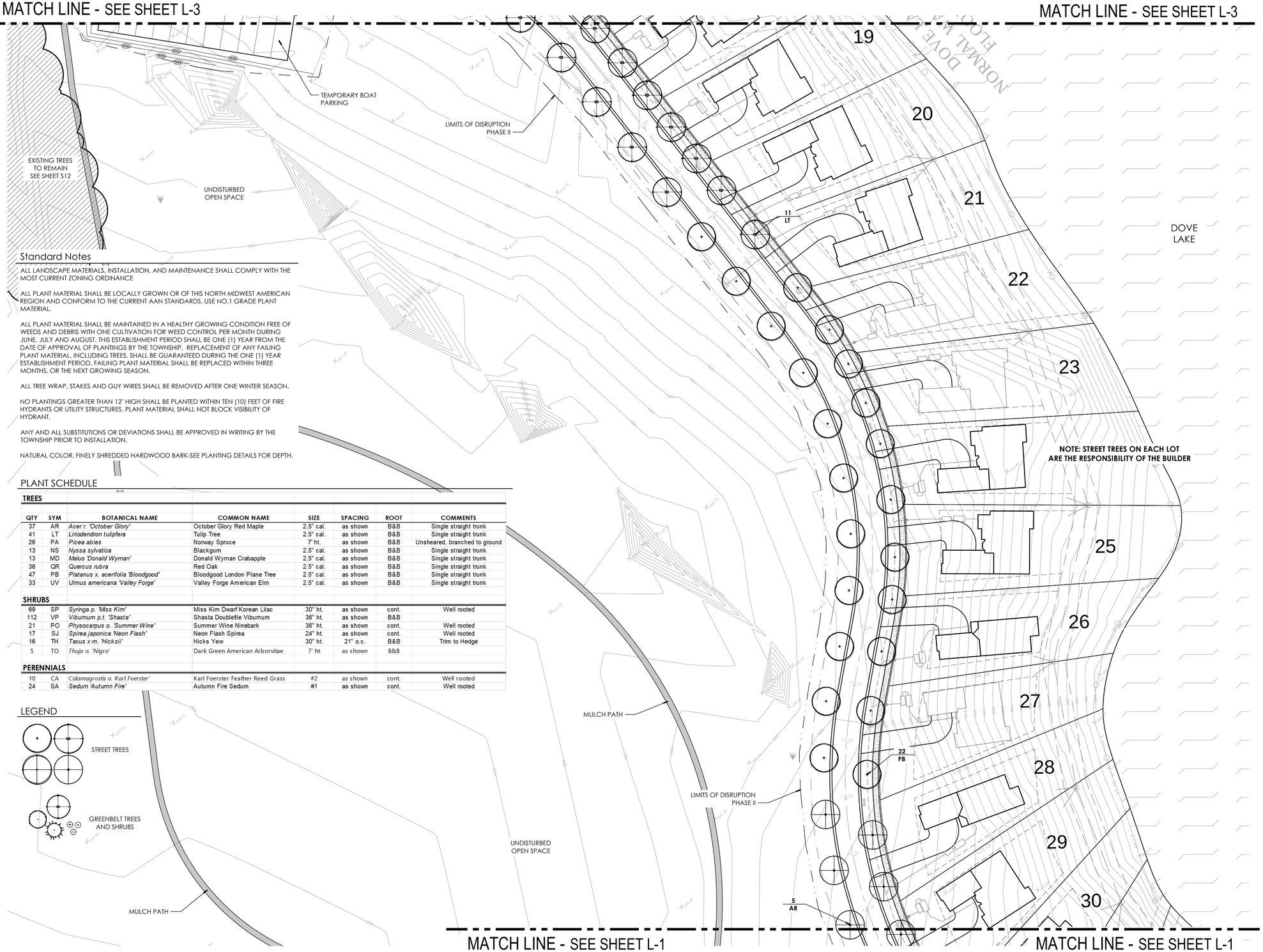
Project Number:
20.020

Sheet Number:
L-1

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MATCH LINE - SEE SHEET L-3

MATCH LINE - SEE SHEET L-3



Standard Notes

ALL LANDSCAPE MATERIALS, INSTALLATION, AND MAINTENANCE SHALL COMPLY WITH THE MOST CURRENT ZONING ORDINANCE

ALL PLANT MATERIAL SHALL BE LOCALLY GROWN OR OF THIS NORTH MIDWEST AMERICAN REGION AND CONFORM TO THE CURRENT AAN STANDARDS. USE NO.1 GRADE PLANT MATERIAL.

ALL PLANT MATERIAL SHALL BE MAINTAINED IN A HEALTHY GROWING CONDITION FREE OF WEEDS AND DEBRIS WITH ONE CULTIVATION FOR WEED CONTROL PER MONTH DURING JUNE, JULY AND AUGUST. THIS ESTABLISHMENT PERIOD SHALL BE ONE (1) YEAR FROM THE DATE OF APPROVAL OF PLANTINGS BY THE TOWNSHIP. REPLACEMENT OF ANY FAILING PLANT MATERIAL, INCLUDING TREES, SHALL BE GUARANTEED DURING THE ONE (1) YEAR ESTABLISHMENT PERIOD. FAILING PLANT MATERIAL SHALL BE REPLACED WITHIN THREE MONTHS, OR THE NEXT GROWING SEASON.

ALL TREE WRAP, STAKES AND GUY WIRES SHALL BE REMOVED AFTER ONE WINTER SEASON.

NO PLANTINGS GREATER THAN 12" HIGH SHALL BE PLANTED WITHIN TEN (10) FEET OF FIRE HYDRANTS OR UTILITY STRUCTURES. PLANT MATERIAL SHALL NOT BLOCK VISIBILITY OF HYDRANT.

ANY AND ALL SUBSTITUTIONS OR DEVIATIONS SHALL BE APPROVED IN WRITING BY THE TOWNSHIP PRIOR TO INSTALLATION.

NATURAL COLOR, FINELY SHREDDED HARDWOOD BARK-SEE PLANTING DETAILS FOR DEPTH.

PLANT SCHEDULE

QTY	SYM	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	ROOT	COMMENTS
TREES							
37	AR	*Acer r. 'October Glory'*	October Glory Red Maple	2.5" cal.	as shown	B&B	Single straight trunk
41	LT	*Liriodendron tulipfera*	Tulip Tree	2.5" cal.	as shown	B&B	Single straight trunk
26	PA	*Picea abies*	Norway Spruce	7' ht.	as shown	B&B	Unsheared, branched to ground
13	NS	*Nyssa sylvatica*	Blackgum	2.5" cal.	as shown	B&B	Single straight trunk
13	MD	*Malus 'Donald Wyman'*	Donald Wyman Crabapple	2.5" cal.	as shown	B&B	Single straight trunk
36	QR	*Quercus rubra*	Red Oak	2.5" cal.	as shown	B&B	Single straight trunk
47	PB	*Platanus x. acerifolia 'Bloodgood'*	Bloodgood London Plane Tree	2.5" cal.	as shown	B&B	Single straight trunk
33	UV	*Ulmus americana 'Valley Forge'*	Valley Forge American Elm	2.5" cal.	as shown	B&B	Single straight trunk
SHRUBS							
69	SP	*Syringa p. 'Miss Kim'*	Miss Kim Dwarf Korean Lilac	30" ht.	as shown	cont.	Well rooted
112	VP	*Viburnum p.t. 'Shasta'*	Shasta Doublefile Viburnum	36" ht.	as shown	B&B	
21	PO	*Physocarpus o. 'Summer Wine'*	Summer Wine Ninebark	36" ht.	as shown	cont.	Well rooted
17	SJ	*Spirea japonica 'Neon Flash'*	Neon Flash Spirea	24" ht.	as shown	cont.	Well rooted
16	TH	*Taxus x m. 'Hicksii'*	Hicks Yew	30" ht.	21" o.c.	B&B	Trim to Hedge
5	TO	*Thuja o. 'Nigra'*	Dark Green American Arborvitae	7' ht	as shown	B&B	
PERENNIALS							
10	CA	*Calamagrostis a. Karl Foerster'*	Karl Foerster Feather Reed Grass	#2	as shown	cont.	Well rooted
24	SA	*Sedum 'Autumn Fire'*	Autumn Fire Sedum	#1	as shown	cont.	Well rooted

LEGEND

STREET TREES

GREENBELT TREES AND SHRUBS

MULCH PATH

ENLARGEMENT - STREET TREE PLANTING PLAN

SCALE: 1" = 40'-0"

MATCH LINE - SEE SHEET L-1

MATCH LINE - SEE SHEET L-1

0 20 40 80

SCALE: 1" = 40'-0"

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734.249.3568 Plymouth, MI
james@vertverde.com

Issued For:

07.17.2020	Prelim Site Plan Review
12.16.2020	Revision
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04.26.2022	Revision

Project:

DOVE LAKE ESTATES

Green Oak Township, Michigan

Project Sponsor:

CORNERSTONE RESIDENTIAL GROUP
8555 Boulder Shores Drive
South Lyon, MI 48178

Sheet Name:

Landscape Plan

Seal:

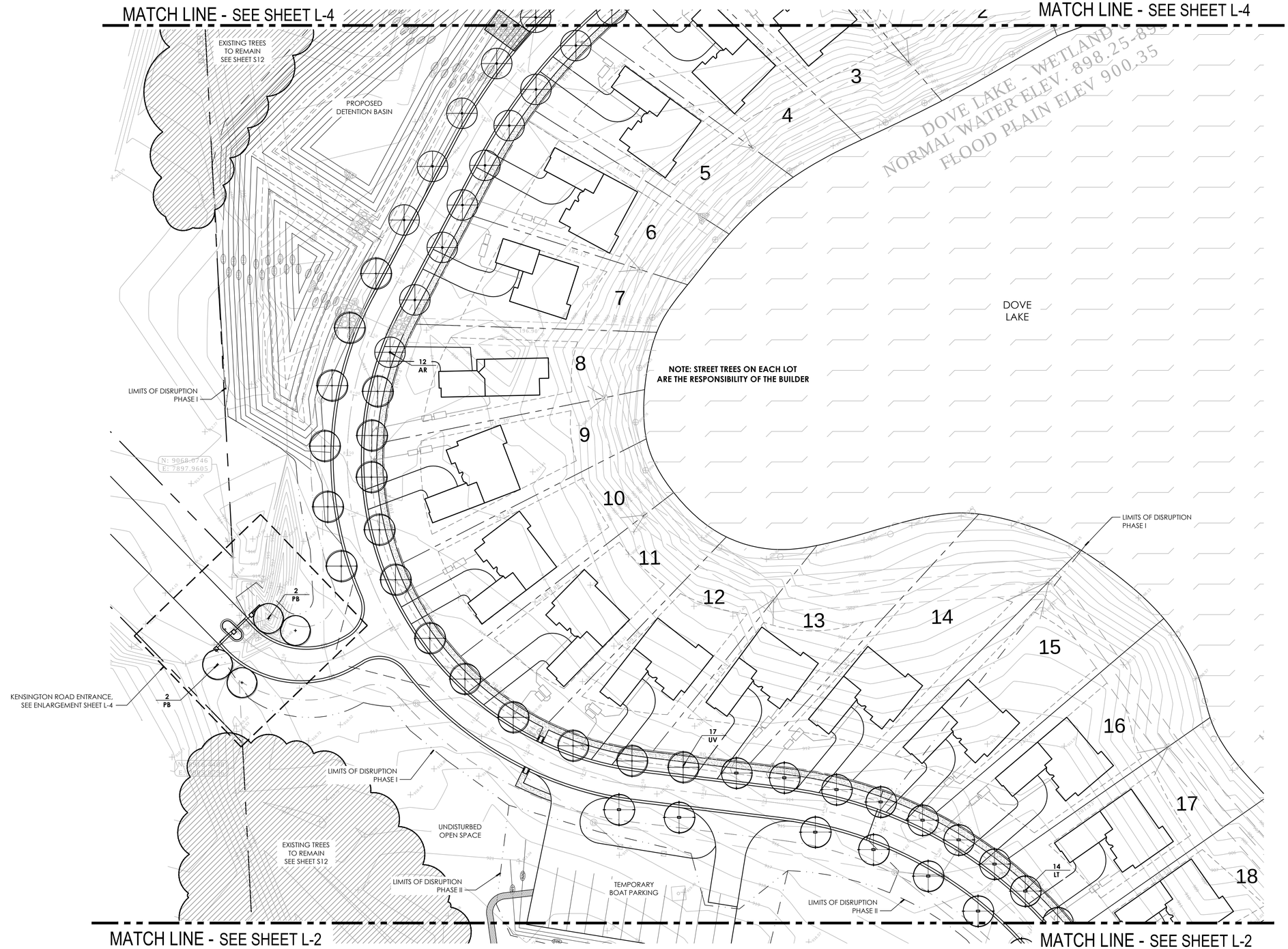
STATE OF MICHIGAN JAMES GRAY LANDSCAPE ARCHITECT No. 1528 REGISTERED LANDSCAPE ARCHITECT

Drawn:	JG
Checked:	JG
Date:	05.2020
Scale:	1" = 40'-0"

Project Number: 20.020

Sheet Number: L-2

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ENLARGEMENT - STREET TREE PLANTING PLAN

SCALE: 1" = 40'-0"

NOTE: SEE SHEET L-2 FOR PLANT SCHEDULE

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0 20 40 80

SCALE: 1" = 40'-0"

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Green Oak Township, Michigan

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Landscape Plan

Seal:

STATE OF MICHIGAN JAMES GRAY LANDSCAPE ARCHITECT No. 1528 REGISTERED LANDSCAPE ARCHITECT

Drawn:	JG
Checked:	JG
Date:	05.2020
Scale:	1" = 20'-0"

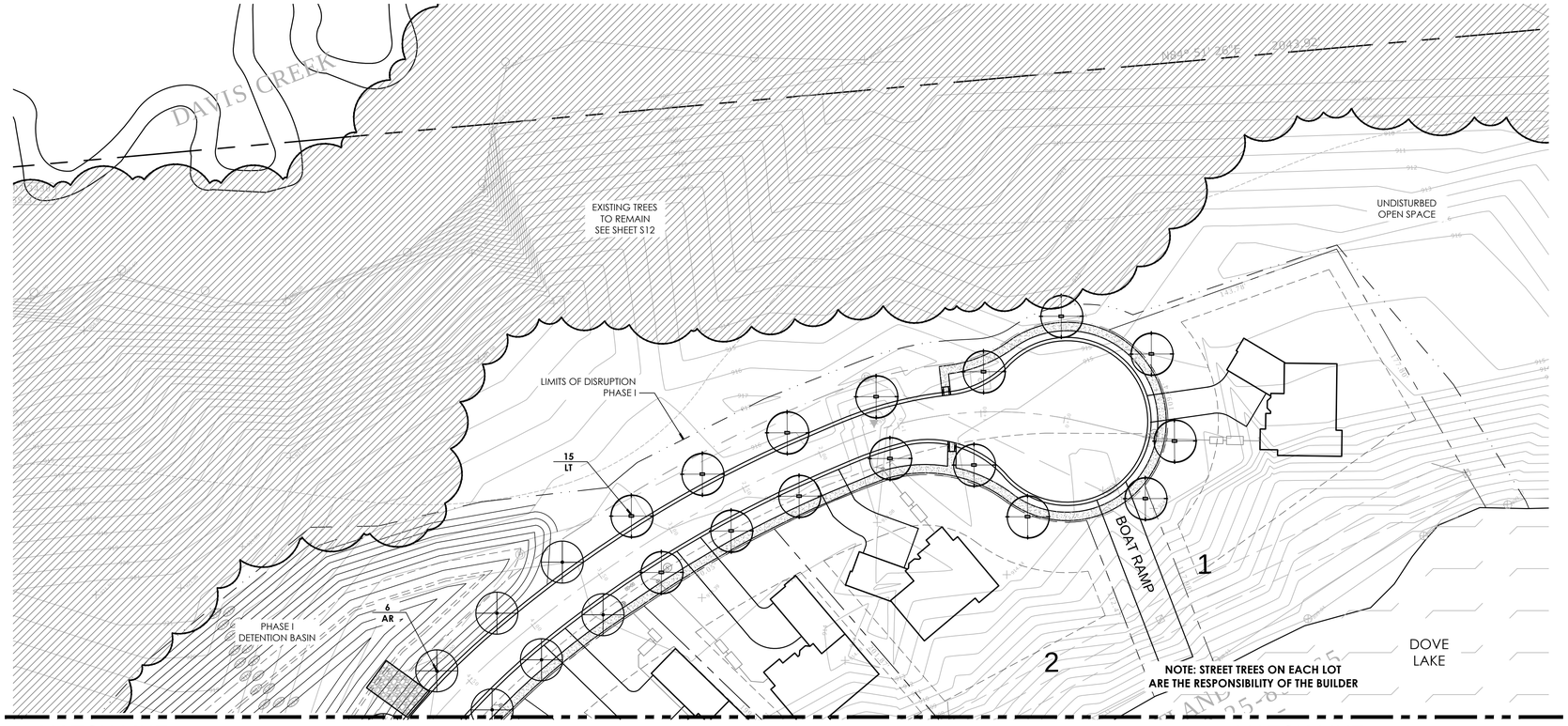
Project Number:

20.020

Sheet Number:

L-3

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ENLARGEMENT - STREET TREE PLANTING PLAN

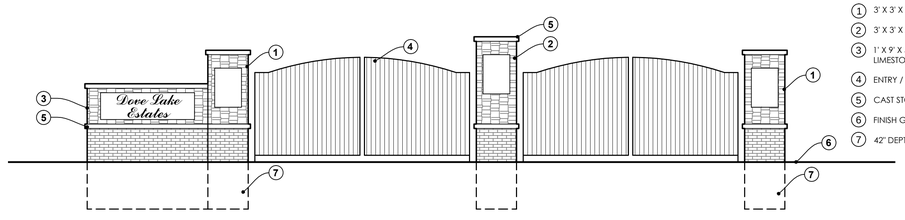
SCALE: 1" = 40'-0"

NOTE: SEE SHEET L-2 FOR PLANT SCHEDULE

0 20 40 80

GENERAL LANDSCAPE NOTES

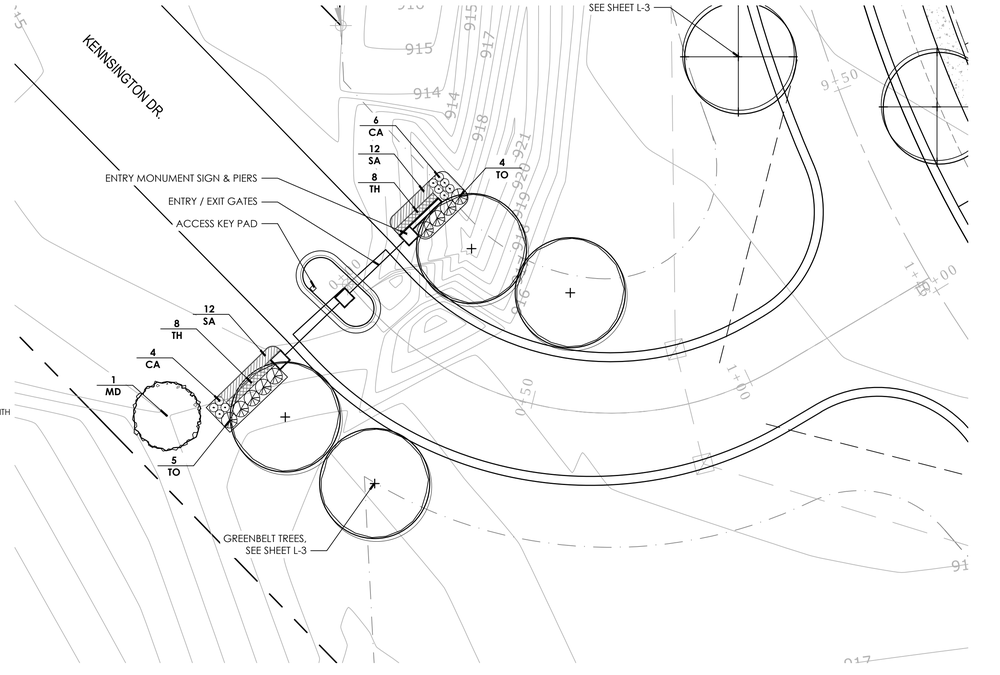
1. LANDSCAPE CONTRACTOR SHALL VISIT SITE, INSPECT EXISTING CONDITIONS AND REVIEW PROPOSED PLANTING AND RELATED WORK. IN CASE OF DISCREPANCY BETWEEN PLAN AND PLANT LIST, THE PLAN SHALL GOVERN QUANTITIES. CONTACT THE LANDSCAPE ARCHITECT WITH ANY CONCERNS.
2. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ON-SITE UTILITIES PRIOR TO BEGINNING CONSTRUCTION ON HIS/HER PHASE OF WORK. ANY DAMAGE OR INTERRUPTION OF SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE CONTRACTOR SHALL COORDINATE ALL RELATED ACTIVITIES WITH OTHER TRADES, AND SHALL REPORT ANY UNACCEPTABLE SITE CONDITIONS TO THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT.
4. PLANTS SHALL BE FULL, WELL-BRANCHED, AND IN HEALTHY VIGOROUS GROWING CONDITION.
5. PLANTS SHALL BE WATERED BEFORE AND AFTER PLANTING IS COMPLETE.
6. THE CONTRACTOR AGREES TO GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE (1) YEAR. AT THAT TIME, THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT FOR A FINAL INSPECTION. PLANT MATERIAL WITH A 25% DIEBACK OR GREATER AS DETERMINED BY THE OWNER'S REPRESENTATIVE SHALL BE REPLACED. THIS GUARANTEE INCLUDES THE FURNISHING OF NEW PLANTS, LABOR AND MATERIALS. THESE NEW PLANTS SHALL ALSO BE GUARANTEED FOR THE PERIOD OF ONE YEAR.
7. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED IN THE MOST RECENT EDITION OF THE "AMERICAN STANDARDS FOR NURSERY STOCK".
8. CONTRACTOR WILL SUPPLY FINISHED GRADE AND EXCAVATE AS NECESSARY TO SUPPLY PLANT MIX DEPTH IN ALL PLANTING BEDS AS INDICATED IN PLANT DETAILS.
9. PROVIDE CLEAN BACKFILL SOIL, USING MATERIAL STOCKPILED ON-SITE. SOIL SHALL BE SCREENED AND FREE OF DEBRIS, FOREIGN MATERIAL, AND STONE.
10. SLOW-RELEASE FERTILIZER SHALL BE ADDED TO THE PLANT PITS BEFORE BEING BACKFILLED. APPLICATION SHALL BE AT THE MANUFACTURERS RECOMMENDED RATES.
11. AMENDED PLANT MIX (PREPARED TOPSOIL) SHALL CONSIST OF 1/3 SCREENED TOPSOIL, 1/3 SAND, AND 1/3 COMPOST, MIXED WELL AND SPREAD TO A DEPTH AS INDICATED IN THE PLANTING DETAILS.
12. ALL PLANTINGS SHALL BE MULCHED WITH DOUBLE SHREDDED HARDWOOD BARK, SPREAD TO A DEPTH OF 3" FOR TREES AND SHRUBS, AND 2" ON PERENNIALS, AND GROUNDCOVER PLANTINGS. MULCH SHALL BE FREE FROM DEBRIS AND FOREIGN MATERIAL, AND PIECES OF INCONSISTENT SIZE.
13. NO SUBSTITUTIONS OR CHANGES OF LOCATION, OR PLANT TYPE SHALL BE MADE WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT OR OWNERS REPRESENTATIVE.
14. THE LANDSCAPE ARCHITECT SHALL BE NOTIFIED OF ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS PRIOR TO INSTALLATION.
15. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL PLANT MATERIAL IN A VERTICAL CONDITION THROUGHOUT THE GUARANTEED PERIOD.
16. THE LANDSCAPE ARCHITECT OR OWNERS REPRESENTATIVE SHALL HAVE THE RIGHT TO REJECT ANY WORK OR MATERIAL THAT DOES NOT MEET THE REQUIREMENTS OF THE PLANS AND/OR SPECIFICATIONS.
17. THE LANDSCAPE CONTRACTOR SHALL SEED AND MULCH OR SOD (AS INDICATED ON PLANS) ALL AREAS DESIGNATED AS SUCH ON THE PLANS, THROUGHOUT THE CONTRACT LIMITS. FURTHER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING AREAS DISTURBED DURING CONSTRUCTION, NOT IN THE CONTRACT LIMITS, TO EQUAL OR GREATER CONDITION.
18. ALL LANDSCAPE AREAS SHALL HAVE PROPER DRAINAGE THAT PREVENTS EXCESSIVE WATER FROM PONDING ON LAWN AREAS OR AROUND TREES AND SHRUBS.



1. 3' X 3' X 8' BRICK AND STONE PIER
2. 3' X 3' X 9' BRICK AND STONE PIER
3. 1' X 9' X 5'-6" BRICK AND STONE WALL WITH LIMESTONE SIGN PANEL
4. ENTRY / EXIT GATES
5. CAST STONE CAP AND SILL, TYP.
6. FINISH GRADE
7. 42" DEPTH CONCRETE FOOTING

ENTRY MONUMENT ELEVATION

Scale: 3/16" = 1'-0"



KENNSINGTON DR. ENTRANCE ENLARGEMENT

SCALE: 1/16" = 1'-0"

0 8 16 32

NORTH

811 Know what's below Call before you dig MISS DIG System, Inc. www.missdig.net

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734.249.3568 Plymouth, MI
james@vertverde.com

Issued For:

07.17.2020	Prelim Site Plan Review
12.16.2020	Revision
01.29.2021	Revision
03.08.2021	Revision
05.20.2021	Revision
01.25.2022	Revision
01.25.2022	Revision
08.26.2024	Revision

Project:

DOVE LAKE ESTATES

Green Oak Township, Michigan

Project Sponsor:

CORNERSTONE RESIDENTIAL GROUP
8555 Boulder Shores Drive
South Lyon, MI 48178

Sheet Name:

Landscape Plan

Seal:

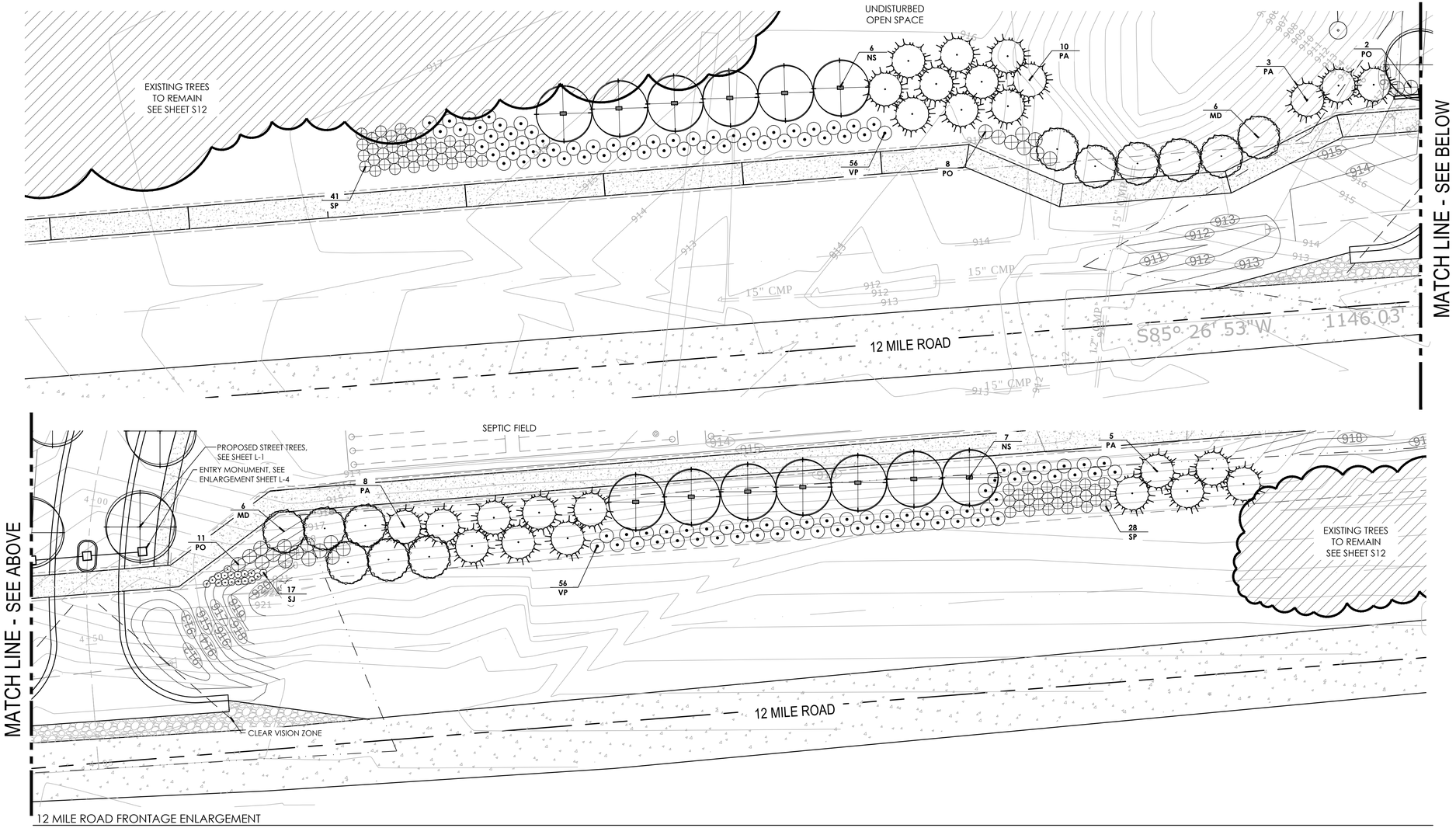
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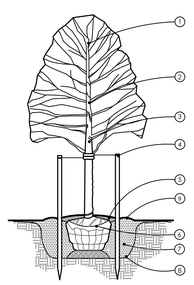
Project Number: 20.020

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12 MILE ROAD FRONTAGE ENLARGEMENT

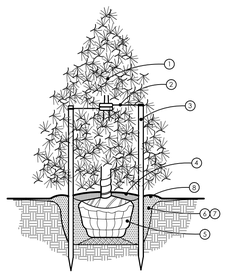


1. REMOVE SECONDARY LEADERS. DO NOT PRUNE TERMINAL LEADER OR BRANCH TOPS. PRUNE ALL DEAD AND BROKEN BRANCHES.
2. REMOVE ALL TAGS, STRINGS, PLASTICS, AND ANY OTHER MATERIALS WHICH ARE UNSIGHTLY OR COULD CAUSE GIRDLING.
3. STAKE TREES JUST BELOW FIRST BRANCH W/ 2-3" WIDE BELT-LIKE, FABRIC STRAPS ONLY. ARBOR TIE OR APPROVED EQUAL (CONNECT FROM TREE TO STAKE OPPOSITE FROM EACH OTHER, AND ALLOW FOR SOME "FLEXING") DO NOT USE WIRE OR ROPE THROUGH A HOSE. REMOVE AFTER ONE YEAR.
4. (2) 2"X2" HARDWOOD STAKES OR EQUIVALENT DRIVEN 6'-8" OUTISIDE OF ROOTBALL. REMOVE AFTER ONE YEAR.
5. COVER PLANTING W/ 3" DOUBLE SHREDDED HARDWOOD BARK MULCH. MINIMUM 6' DIA. LEAVE 3" CIRCLE OF BARE SOIL AROUND THE BASE OF THE TRUNK.
6. REMOVE ALL NON-BIODEGRADABLE MATERIALS FROM THE ROOTBALL. FOLD DOWN ALL BURLAP AND REMOVE WIRE BASKET FROM THE TOP 1/3 OF THE ROOTBALL.
7. PLANT MIX. SEE GENERAL LANDSCAPE NOTES SHEET L-3 AND SPECIFICATIONS
8. TREE PIT TO BE 3 TIMES WIDTH OF ROOTBALL
9. 4" TOPSOIL SAUCER

NOTE:
TREE SHALL BEAR SAME RELATION TO FINISH GRADE AS IT BORE ORIGINALLY OR SLIGHTLY HIGHER THAN FINISH GRADE UP TO 4" ABOVE GRADE, IF DIRECTED BY LANDSCAPE ARCHITECT FOR HEAVY CLAY SOIL AREAS.

NOTES:
1. STAKE TREES 3" - 5" CALIPER ONLY
2. GUY TREES 6" CALIPER AND OVER
3. CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION
4. SET STAKES VERTICAL AND EVENLY SPACED
5. STAYS OR GUYS TO BE SET ABOVE FIRST BRANCH

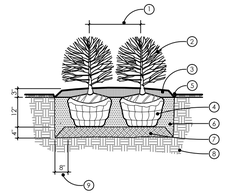
DECIDUOUS TREE PLANTING
NOT TO SCALE



1. REMOVE ALL TAGS, STRINGS, PLASTICS, AND ANY OTHER MATERIALS WHICH ARE UNSIGHTLY OR COULD CAUSE GIRDLING.
2. STAKE TREES WITH 2-3" WIDE BELT-LIKE, FABRIC STRAPS ONLY. ARBOR TIE OR APPROVED EQUAL (CONNECT FROM TREE TO STAKE OPPOSITE FROM EACH OTHER, AND ALLOW FOR SOME "FLEXING") DO NOT USE WIRE OR ROPE THROUGH A HOSE. REMOVE AFTER ONE YEAR.
3. (3) 2"X2" HARDWOOD STAKES OR EQUIVALENT DRIVEN 6-8" OUTISIDE OF ROOTBALL. REMOVE AFTER ONE YEAR.
4. COVER PLANTING W/ 3" SHREDDED HARDWOOD BARK MULCH. MINIMUM 6' DIAMETER, CONNECT EVERGREEN PLANTINGS WHERE POSSIBLE
5. REMOVE ALL NON-BIODEGRADABLE MATERIALS FROM THE ROOTBALL. FOLD DOWN ALL BURLAP AND REMOVE WIRE BASKET FROM THE TOP 1/3 OF THE ROOTBALL.
6. PLANT MIX. SEE GENERAL LANDSCAPE NOTES SHEET L-3 AND SPECIFICATIONS
7. TREE PIT TO BE 3 TIMES WIDTH OF ROOTBALL
8. 4" TOPSOIL SAUCER

NOTES:
1. STAKE EVERGREENS UNDER 12' HEIGHT
2. GUY EVERGREENS 12' HEIGHT AND OVER
3. NEVER CUT OR PRUNE CENTRAL LEADER
4. SET STAKES VERTICAL AND EVENLY SPACED
5. PRUNE ONLY TO REMOVE DEAD OR BROKEN BRANCHES

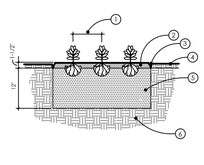
EVERGREEN TREE PLANTING
NOT TO SCALE



NOTES:
1. CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION
2. SET TOP OF ROOTBALL 2" ABOVE FINISH GRADE

1. SEE PLAN FOR SPACING
2. SHRUBS, SEE PLANT SCHEDULE
3. 3" DEPTH DOUBLE SHREDDED HARDWOOD MULCH, TYPICAL
4. REMOVE ALL NON-BIODEGRADALBE TWINE FROM ENTIRE ROOTBALL. REMOVE BURLAP FROM TOP 1/2 OF ROOTBALL.
5. SHOVEL CUT OR METAL EDGE, SEE PLAN
6. EXCAVATE EXISTING SOIL TO 12" DEPTH, REPLACE WITH PLANT MIX. SEE GENERAL LANDSCAPE NOTES SHEET L-3 AND SPECIFICATIONS
7. SCARIFY TO 4" DEPTH AND RECOMPACT
8. UNDISTURBED SUBGRADE
9. MINIMUM 8" BETWEEN ROOTBALL AND EDGE OF PLANTING PIT

SHRUB PLANTING
NOT TO SCALE



NOTES:
1. CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION

1. SEE PLANT SCHEDULE FOR SPACING
2. 2" DEPTH CANADIAN PEAT TOP DRESSING OR 2" DEPTH DOUBLE SHREDDED HARDWOOD MULCH
3. SHOVEL CUT OR METAL EDGE, SEE PLAN
4. FINISH GRADE
5. EXCAVATE EXISTING SOIL TO 12" DEPTH, REPLACE WITH PLANT MIX. SEE GENERAL LANDSCAPE NOTES SHEET L-3 AND SPECIFICATIONS
6. UNDISTURBED SUBGRADE

PERENNIAL / GROUNDCOVER PLANTING
NOT TO SCALE

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0 10 20 40
SCALE: 1" = 20'-0"

NORTH

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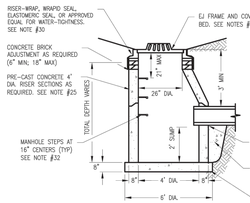
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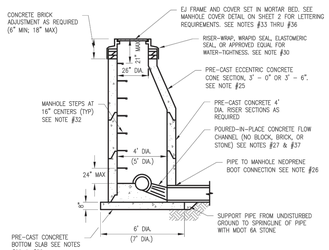
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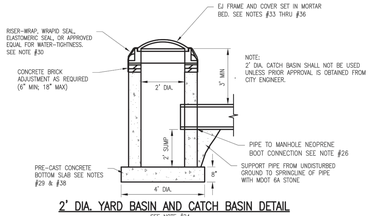
CATCH BASIN DETAIL

SEE NOTE #24



STANDARD PRECAST MANHOLE

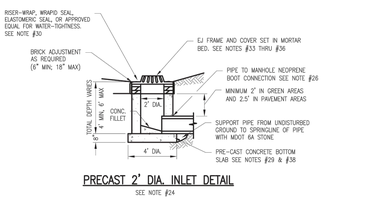
SEE NOTE #24



2' DIA. YARD BASIN AND CATCH BASIN DETAIL

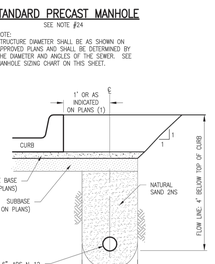
SEE NOTE #24

NOTE:
2' DIA. CATCH BASIN SHALL NOT BE USED UNLESS PRIOR APPROVAL IS OBTAINED FROM CITY ENGINEER.



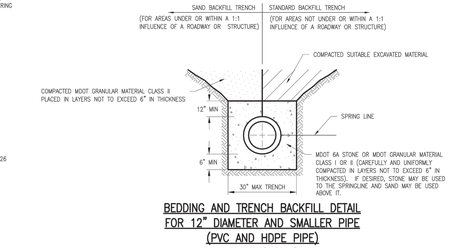
PRECAST 2' DIA. INLET DETAIL

SEE NOTE #24



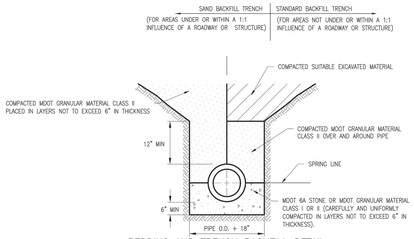
NOTES:
- A. LOCATION MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
- B. ALL UNDERDRAIN SHALL BE APPROVED PLASTIC PIPE PER MDOT SECTION 909.07. METAL PIPE SHALL NOT BE USED.
- C. ALL UNDERDRAIN SHALL OUTLET TO DRAINAGE STRUCTURE.
- D. UNDERDRAIN CONNECTIONS (AT LOW POINTS) SHALL BE MADE AS CLOSE TO THE STRUCTURE INVERT AS PRACTICAL, WITH A SPIRAL WRAP OF THE STRUCTURE USED TO MAKE THE TRANSITION FROM THE REQUIRED FLOW LINE DEPTH TO STRUCTURE INVERT.

SUBGRADE UNDERDRAIN, 6"



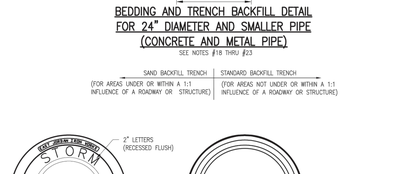
BEDDING AND TRENCH BACKFILL DETAIL FOR 12" DIAMETER AND SMALLER PIPE (PVC AND HDPE PIPE)

SEE NOTES #18 THRU #23



BEDDING AND TRENCH BACKFILL DETAIL FOR 24" DIAMETER AND SMALLER PIPE (CONCRETE AND METAL PIPE)

SEE NOTES #18 THRU #23



STORM SEWER CONSTRUCTION NOTES

GENERAL NOTES:

1. All materials and workmanship shall be in accordance with the standards and specifications of the Green Oaks Township.
2. No storm sewer is to be installed without the Township's inspector present.
3. Three (3) working days prior to construction, the Contractor shall telephone MISS DIG (811 or 1-800-482-7171) for underground facilities locations and shall also notify representative of other utilities located in the vicinity of the work.
4. Trenches that are to be left open overnight shall be enclosed with suitable fencing and lighted barricades.
5. The materials specified below may be subsituted with an approved equal as determined by the Township. It is at the sole discretion of the to determine if a material is acceptable and can be utilized. Written authorization must be obtained prior to ordering or installing the approved equal.

STORM SEWER NOTES:

6. Type and class of pipe shall be as specified on plans.

Concrete Pipe Requirements

7. All round reinforced concrete pipe (RCP) shall meet the requirements of ASTM C76 with modified tongue and groove joints with rubber gaskets manufactured to meet the requirements of ASTM C443. Catch basin sewers shall be Class IV RCP.
8. The inside joint of pipe over 36" diameter shall be pointed with mortar upon completion of backfilling operations.
9. All elliptical reinforced concrete pipe shall meet the requirements of ASTM C507 with tongue and groove joints with bituminous (DeWitt #10) joint material meeting the requirements of C443. Elliptical concrete pipe joints shall also be wrapped per ASTM C877. In addition, elliptical concrete pipe of 42" equivalent size and larger shall require inside concrete pointing.
10. Video of the interior of storm sewer 12" or greater in diameter shall be submitted to the City prior to final acceptance. Said video shall be obtained a minimum of 30 days after construction is completed. Typical items to be reviewed on the video will include pipe deflections, pipe settlement, lead connections, joints and pipe cleanliness. If the videotape review reveals unsatisfactory conditions, the Contractor shall correct the condition at his own cost and shall then re-video the affected sewer for review by the City.

Plastic Pipe Requirements

11. Per City standards, the maximum allowable pipe size for plastic storm sewer is 12" diameter. Larger diameter plastic storm sewer may be approved by the City, depending on site conditions.
12. All plastic storm sewer pipe shall have a smooth interior.
13. PVC pipe shall meet the requirements of ASTM D3034 and F949 with push-on type joints meeting the requirements of ASTM D3212 and F477.
14. ABS Truss pipe shall meet the requirements of ASTM D2680 with push-on type joints meeting the requirements of ASTM D3212 and F477.
15. HDPE pipe shall meet the requirements of AASHTO M294 and ASTM D3350 with push-on type joints meeting the requirements of ASTM D3212 and F477.
16. The completed installation of all plastic pipe shall at no point have out-of-round pipe deflections greater than 5% of normal diameter of pipe. Deflection testing shall be performed with a nine point mandrel a minimum of 30 days after installation and again 1 year after installation. Video of the interior of the storm sewer will also be required at those time intervals. A proving ring to verify the mandrel must be provided prior to testing.
17. Plastic pipe will not be permitted under roadways.

Bedding Requirements

18. Bedding shall be used as called for on the details.
19. Where unstable ground conditions are encountered, stone bedding shall be used as directed by the Engineer in order to provide a stable foundation for pipe and manholes.

Backfill Requirements

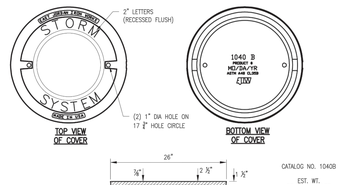
20. Backfill shall be compacted above pipe or as indicated on construction drawings. Trench backfill shall be of a suitable material and shall be free of any organic materials and rocks larger than 3" in size. Backfill shall be ramped into trench and compacted with a small dozer or other approved method.
21. Where trench is within a 1:1 influence of streets, alleys, sidewalks, driveways, parking areas and structures, sand backfill shall be used which shall consist of MDOT granular material Class II compacted in layers not to exceed 6" in thickness to a density of 95% as determined by AASHTO T99.
22. When backfilling trench of PVC pipe, manufacturer's specifications must be strictly adhered to.
23. No frozen material shall be buried more than 4' below the final elevation of the ground.

DRAINAGE STRUCTURE REQUIREMENTS:

24. Shop drawings shall be submitted to and approved by the City for each proposed structure prior to installation.
25. Precast reinforced concrete sections with modified tongue and groove joint and rubber gaskets shall conform to ASTM C-478. Cone section shall be eccentric and have stud inserts cast in place with a flush top surface.
26. All storm structures shall have Green Oaks Twp/ Livingston County Drain Commission approved flexible, watertight seals where pipes pass through walls. Flexible rubber manhole joints shall be Res-Seal, Press-Wedge, Link-Seal, Kor-N-Seal boot (with stainless steel korband), or approved equal.
27. Pipe shall be flush with the inside wall of structure and shall not protrude more than 1" into the structure. Pipe shall be pointed up with a smooth finish at its intersection with the structure wall.
28. No openings shall be made in precast units which would leave less than 12" of undisturbed precast structure wall between pipes (as measured between outside pipe walls) or would remove more than 40% of the circumference along any horizontal plane.
29. Precast riser placed on the concrete base shall be set in a full bed of mortar. All joints & liftholes shall be pointed up with mortar on the outside and inside.
30. Plaster all outside masonry surfaces with 1:2½ masonry cement (type II) 1/2" thick.
31. All manholes and catch basins shall be 4' or 5' in diameter unless otherwise indicated on construction drawings. Larger diameter drainage structures (6', 7', 8', 10', and 12' diameter) may be needed for large storm sewer pipe or for situations where the angles between entering pipes require a larger diameter structure in order to maintain at least 1' of structure wall between the pipes. 2' diameter catch basins and inlets may be used where approved by the City Engineer.
32. Structure steps are to be installed at the plant by the manufacturer of the structure. The steps are to be 16 inches on center located 90° from the centerline of the main sewer line. The steps shall be made of No. 4 deformed steel rod encased with copolymer polypropylene plastic and meet the requirements of ASTM D4101, Type II, Grade 49108 or approved equal.
33. Manhole frame and cover shall be EJ 1040, type "B" solid cover or as per construction drawings. Lettering shall be used only for public storm system. All others shall have no lettering.
34. Catch Basin and Inlet frame and cover shall be:
    - 34.1. EJ 7045, type "M1" cover and type "T1" back set (with "Dump No Waste" logo) with straight face curb and gutter.
    - 34.2. EJ 7065, type "M1" cover and 7060 "T1" back set (with "Dump No Waste" Logo) with mountable curb and gutter and integral curb and gutter.
    - 34.3. EJ 1040, type "02" cover (beehive grate) to be used on structures located in ditches, swales and rear yard catch basins. If within 8' of road, type "A" cover (oval grate) shall be used.
    - 34.4. EJ 1030, type "A" cover to be used on all 2' cleanouts and structures not located at storm water collection points. EJ 1070, type "A" cover may also be used on sump pump cleanout structures.
    - 34.5. EJ 1030, type "01" cover (beehive grate) to be used on all 2' structures located in ditches, swales and rear yard catch basins.
35. The Township reserves the right to require a change in structure covers upon final grade and walk-through inspection if deemed necessary due to site conditions.
36. Frames shall be set in full bed of mortar and the side shall be overlapped to prevent leakage.
37. A proper channel shall be constructed within the existing manhole or other structure at which the connection is to be made to direct the flow to the existing outlet in a manner that will tend to create the least amount of turbulence. The channel shall be constructed to the same size as the inside diameter of the existing pipes, and shall be built to height of 1/3 the existing pipe diameter with a minimum of 2% slope on the benches.
38. Concrete base for manhole, catch basin, and inlet shall be MDOT grade 30P, 8" thick, 3000 psi.
39. When tapping into an existing structure a brick collar shall be placed 12" thick around the pipe and extended 12" beyond the opening. If pre-cast section is tapped, bend mesh and use as reinforcement with brick collar. Taps through structure joints or cone sections are prohibited unless approved by the Township.

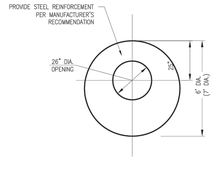
SUMP PUMP LEAD REQUIREMENTS:

42. All sump pump leads connected to a drain shall be pre-manufactured.
43. Sump pump leads shall be SCHD 40 PVC solid wall, or approved equal.
44. Sump collection system pipes shall be connected at drainage structures and shall be cored and booted. However, if approved by the engineer, taps to 12" storm sewer may be made with a Fernco EZ Tap or approved equal. Taps to other size storm sewer may be made with a Romac saddle, KOR-N-TEE lateral connector for concrete pipe, or approved equal.
45. Ends of all 6" sump pump leads shall be temporarily capped and their location staked, witnessed and recorded.
46. All sump pump leads are to be taken to the property line, easement line or as indicated on the plan.
47. Sump pump cleanouts shall be a minimum inside diameter of 2' and be constructed at changes of alignment ends of sump pump mains or as indicated on

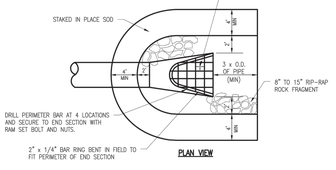


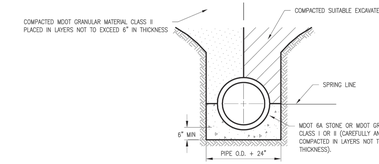
CAST IRON MANHOLE COVER

SEE NOTE #33



PRE-CAST CONCRETE TOP SLAB DETAIL, 8" THICK

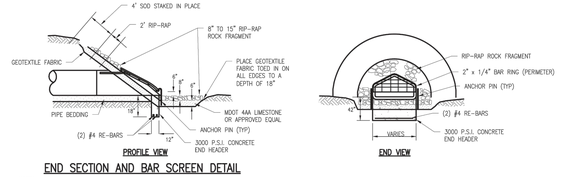




BEDDING AND TRENCH BACKFILL DETAIL FOR 27" DIAMETER AND LARGER PIPE (CONCRETE AND METAL PIPE)

SEE NOTES #18 THRU #23



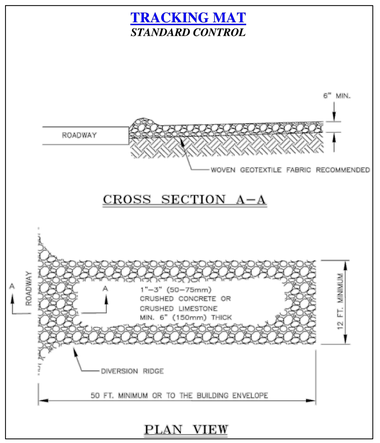


END SECTION AND BAR SCREEN DETAIL

NOTES:
- A. BAR GRATE SCREEN SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IS COMPLETE.
- B. HINGED BAR GRATES WILL BE REQUIRED FOR HEADWALLS PER OCWRC OR MDOT STANDARDS, WHICHEVER IS STRICTER.
- C. RIP-RAP MAY NOT CONTAIN ANY BROKEN CONCRETE. STANDARD RIP-RAP: 8" TO 15" ROCK; HEAVY DUTY RIP-RAP: 16" TO 24" ROCK

TRACKING MAT

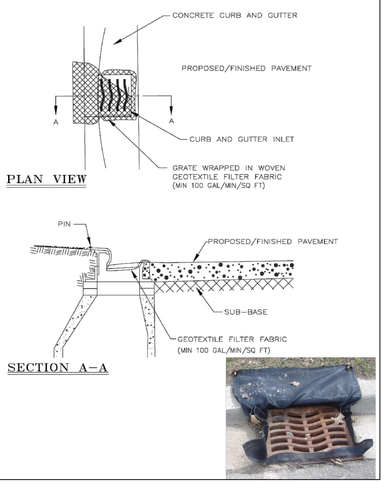
STANDARD CONTROL



GEOTEXTILE FABRIC CURB AND GUTTER INLET FILTER

STANDARD NON-WINTER USE

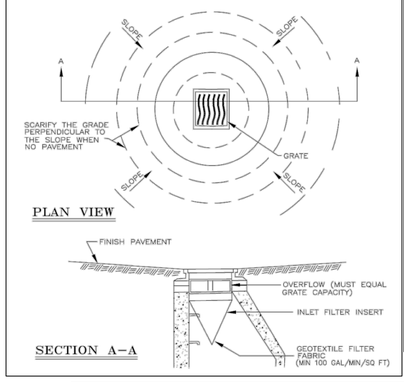
NOT FOR USE IN WINTER MONTHS OR IN AREAS THAT MAY BECOME A SAFETY HAZARD DUE T FLOODING OR FREEZING



SILT SACK OR APPROVED EQUAL LOW POINT/YARD INLET FILTER

STANDARD CONTROL YEAR ROUND OR WINTER USE

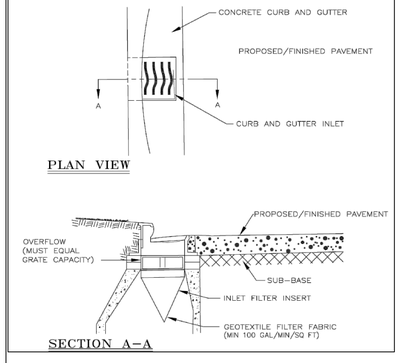
APPROVED FOR USE DURING WINTER MONTHS OR IN AREAS THAT MAY BECOME A SAFETY HAZARD DUE TO FLOODING OR FREEZING



SILT SACK OR APPROVED EQUAL CURB AND GUTTER INLET FILTER

STANDARD CONTROL YEAR ROUND OR WINTER USE

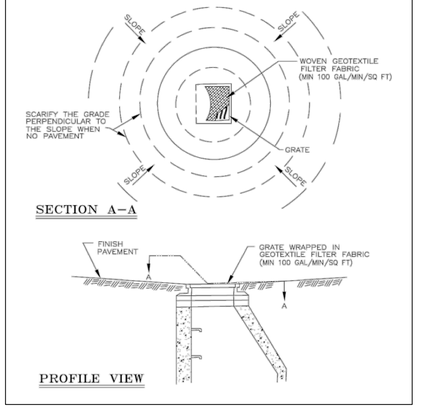
APPROVED FOR USE DURING WINTER MONTHS OR IN AREAS THAT MAY BECOME A SAFETY HAZARD DUE TO FLOODING OR FREEZING



GEOTEXTILE FABRIC LOW POINT/YARD INLET FILTER

STANDARD CONTROL NON-WINTER USE

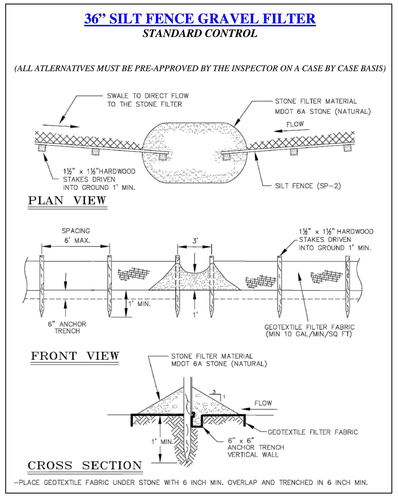
NOT FOR USE IN WINTER MONTHS OR IN AREAS THAT MAY BECOME A SAFETY HAZARD DUE TO FLOODING OR FREEZING



36" SILT FENCE GRAVEL FILTER

STANDARD CONTROL

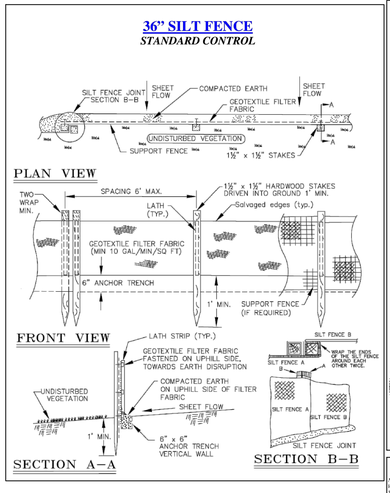
(ALL ATLERNATIVES MUST BE PRE-APPROVED BY THE INSPECTOR ON A CASE BY CASE BASIS)



-PLACE GEOTEXTILE FABRIC UNDER STONE WITH 6 INCH MIN. OVERLAP AND TRENCHED IN 6 INCH MIN.

36" SILT FENCE

STANDARD CONTROL



Consulting Civil Engineers "Engineering A Better Michigan"

Powell Engineering & Associates, LLC

4700 Cornerstone Drive, White Lake, Michigan 48383
P: 248.714-6095 info@powellengineeringllc.com

NOTE: AS AN AID TO THE CONTRACTOR VARIOUS UTILITIES AND UNDERGROUND STRUCTURES ARE SHOWN ON THESE PLANS AND PROFILES. ALL INFORMATION CONCERNING ALL UTILITIES SHOWN ON THE PLANS AND PROFILES IS TAKEN FROM FIELD OBSERVATIONS AND/OR MUNICIPAL AND OTHER UNDERGROUND ENGINEERING AND SURVEY DRAWINGS. EITHER LOCATION, ELEVATION, OR THAT ADDITIONAL UNDERGROUND STRUCTURES OR UTILITIES MAY NOT BE ENCOUNTERED. IF THE CONTRACTOR DOES ENCOUNTER A PREVIOUSLY UNDISCLOSED UTILITY AND/OR STRUCTURE NOT DESIGNATED ON THE PLANS, THE UTILITY OR STRUCTURE SHOWN ON THESE PLANS IS INCORRECTLY LOCATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND ENGINEER FOR INSTRUCTION ON HOW TO PROCEED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES. NOTIFY MISS DIG AT LEAST 72 HOURS PRIOR TO THE START OF ANY CONSTRUCTION.



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STORM DETAIL SHEET

DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

ISSUE DATES

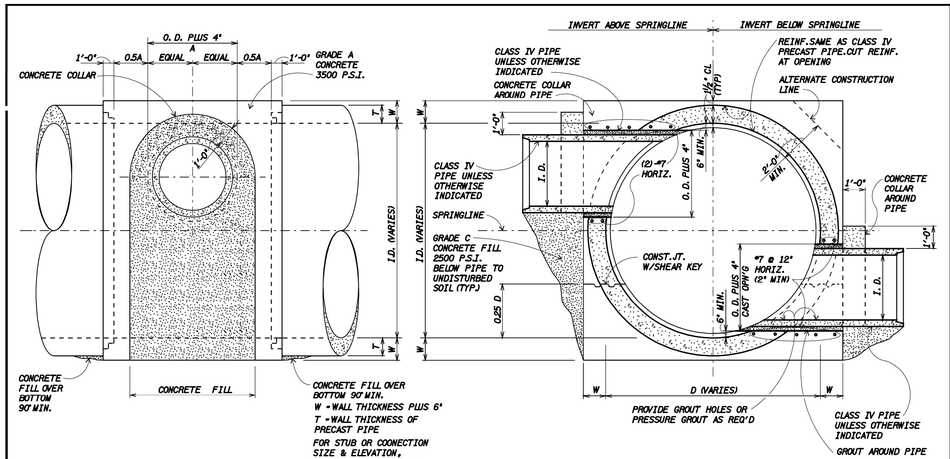
CONSTRUCTION 5/19/2021

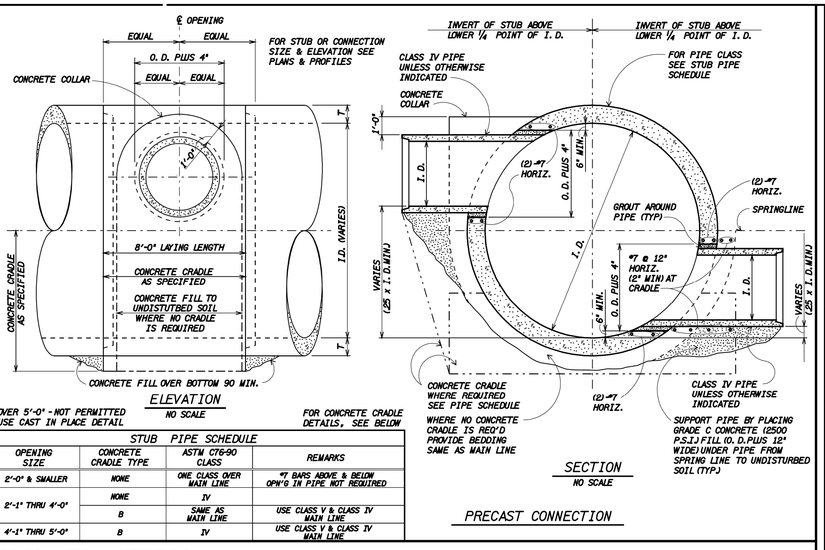
DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	NA

DET 1
CONSTRUCTION

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PLOT NAME = N/A
STROKE TIME = 25-MAY-2005 13:00
DESIGN FILE = F:\1997\1997017\1997017BS\cadd\civil\sd2.dgn
USER NAME = rose





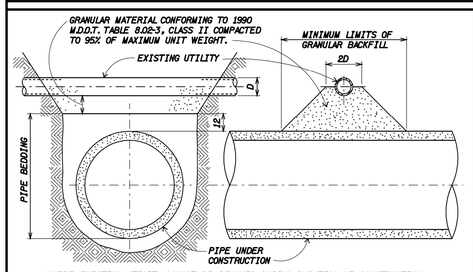
OVER 5'-0" - NOT PERMITTED USE CAST IN PLACE DETAIL

FOR CONCRETE CRADLE DETAILS, SEE BELOW

STUB PIPE SCHEDULE

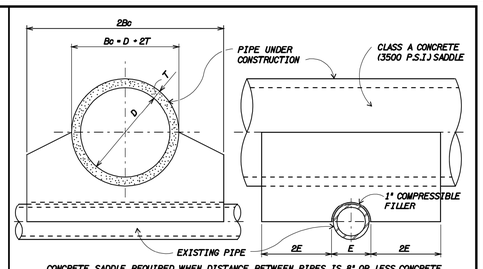
OPENING SIZE	CONCRETE CRADLE TYPE	ASTM C76-90 CLASS	REMARKS
2'-0" & SMALLER	NONE	ONE CLASS OVER MAIN LINE	#7 BARS ABOVE & BELOW OPN'G IN PIPE NOT REQUIRED
2'-1" THRU 4'-0"	NONE	IV	
	B	SAME AS MAIN LINE	USE CLASS V & CLASS IV MAIN LINE
4'-1" THRU 5'-0"	B	IV	USE CLASS V & CLASS IV MAIN LINE

STANDARD STUBS & CONECTIONS TO SEWERS



WHERE EXISTING UTILITY CANNOT BE REMOVED DURING DURATION OF CONSTRUCTION, SUPPORT AS REQUIRED AND LEAVE IN PLACE TO MAINTAIN SERVICE.

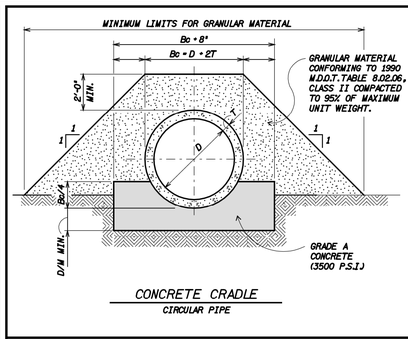
CONSTRUCTION UNDER EXISTING UTILITIES

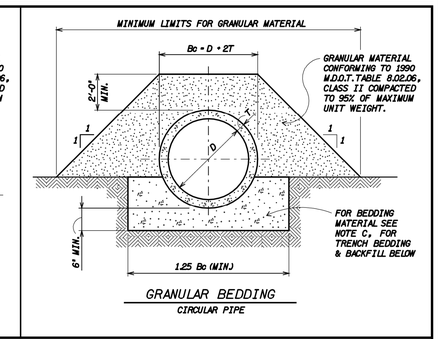


CONCRETE SADDLE REQUIRED WHEN DISTANCE BETWEEN PIPES IS 8" OR LESS.CONCRETE SADDLE NOT REQUIRED FOR SERVICE PIPES 2" OR LESS IN DIAMETER.COMPRESSIBLE FILLER SHALL BE NEOPRENE CONFORMING TO A.S.T.M. D1056-65, CLASS SB0-11 AND CS09-90.

CONSTRUCTION OVER EXISTING UTILITIES

METHOD OF CROSSING EXISTING UTILITIES WITH NEW CONSTRUCTION





EMBANKMENT BEDDING & FILL

TRENCH	TRENCH BACKFILL
TRENCH "A" (SPECIAL)	BANK RUN SAND MEETING THE REQUIREMENTS OF 1990 M.D.O.T. 8.02.06 "GRANULAR MATERIALS FOR FILL & SUBBASE". CLASS II MATERIALS SHALL BE PLACED IN ACCORDANCE WITH 1990 M.D.O.T. 2.08.10-A-1 "CONTROLLED DENSITY METHOD" WITH EACH LAYER COMPACTED TO 95 PERCENT OF MAXIMUM UNIT WEIGHT.
TRENCH "B" (STANDARD)	SUITABLE EXCAVATED MATERIAL (EXCLUDING BLUE CLAY) PLACED IN ONE FOOT LAYERS WITH EACH LAYER COMPACTED BY APPROVED MECHANICAL METHODS TO A DENSITY EQUIVALENT TO THE UNDISTURBED ADJACENT SOIL.

TRENCH BACKFILL NOTES:

SPECIAL BACKFILL FOR TRENCHES (TRENCH "A") SHALL BE USED AT ALL LOCATIONS CALLED FOR ON THE PLANS & REQUIRED IN THE SPECIFICATIONS

WHERE NOTED ON THE PLANS OR PROFILES THUS ; |TRENCH "A"| TRENCH "A" SHALL BE USED AT LOCATIONS REQUIRED BY THE SPECIFICATIONS. TRENCH "B" SHALL BE USED FOR THE BALANCE OF THE WORK.

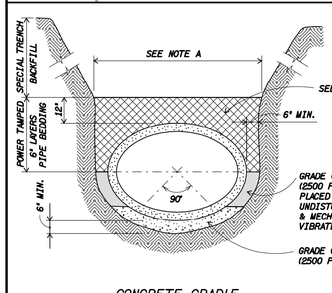
WHERE TRENCH IS IN SAND OR GRAVEL THE MAXIMUM TRENCH WIDTH AT THE TOP OF PIPE SHALL NOT EXCEED O.D. PLUS 24".

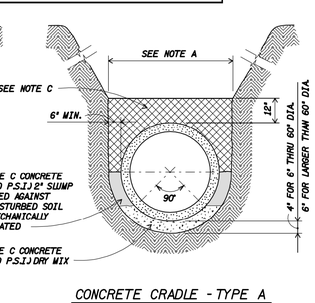
TYPES OF BEDDING

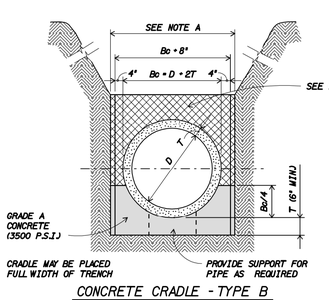
STANDARD PIPE BEDDING SHALL BE USED EXCEPT WHERE THE OTHER TYPES OF PIPE BEDDING ARE CALLED FOR ON THE PLANS & PROFILES

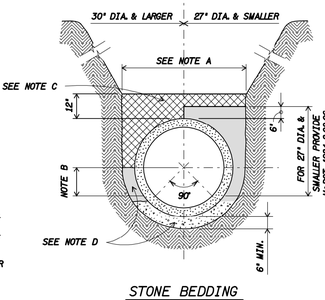
MAXIMUM TRENCH WIDTH TABLE (IN)

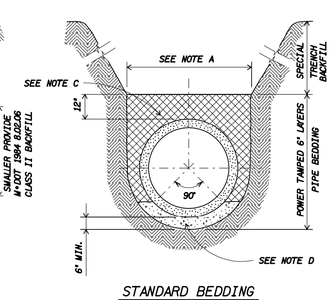
PIPE I.D.	TRENCH WIDTH
4 -12	32
15	36
18	39
21	43
24	46
27	50
30	53
36	68
42	75
48	82
54	89
60	96
66	103
72	110
78	117
84	124
90	136
96	143
102	149
108	156
114	163
120	170
132	184
144	198
156	212
168 & LARGER	O.D. PLUS 30











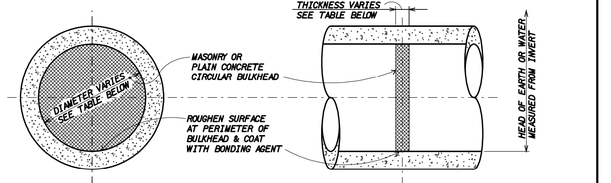
NOTE A: BELOW A POINT 12" ABOVE THE TOP OF THE PIPE, THE TRENCH WIDTH SHALL PROVIDE A CLEARANCE OF NOT LESS THAN 6" BETWEEN PIPE & TRENCH. TRENCH WIDTH SHALL NOT EXCEED THAT SHOWN IN THE MAXIMUM TRENCH WIDTH TABLE.

NOTE B: FOR 30" DIA. AND LARGER PIPE, MATERIAL SHOWN THUS [ ] SHALL BE PEASTONE.

NOTE C: PIPE BEDDING MATERIALS SHOWN THUS [ ] SHALL BE SELECTED EXCAVATED MATERIAL (EXCEPT BLUE CLAY). WHERE TRENCH "A" IS SPECIFIED, SPECIAL TRENCH "A" BACKFILL MATERIAL SHALL BE USED FOR PIPE BEDDING BACKFILL.

NOTE D: PIPE BEDDING CUSHION MATERIALS SHOWN THUS [ ] SHALL CONSIST OF MEETING THE GRADING REQUIREMENTS OF 1990 M DOT, TABLE 8.02-1, COARSE AGGREGATE 6A, BLAST FURNACE SLAG OR CRUSHED STONE CONTAINING SUFFICIENT SMALLER SIZED AGGREGATE TO PREVENT MIGRATION OF EARTH OR BACKFILL MATERIAL INTO BEDDING MATERIAL & CAREFULLY PREPARED SO THAT THE ENTIRE BOTTOM ⅛ OF THE PIPE WILL BEAR AGAINST THE CUSHION. THE TYPE & THICKNESS OF THE BEDDING SHALL BE AS REQUIRED TO MAINTAIN CORRECT ALIGNMENT & GRADE & SHALL NOT BE LESS THAN 6". (THIS BEDDING CUSHION SUPERCEDES CUSHION REQUIRED BY THE SPECIFICATIONS)

TRENCH BEDDING & BACKFILL



MASONRY BULKHEAD SHALL BE BRICK OR SOLID CONCRETE BLOCK WITH MORTAR CONSISTING OF ONE PART PORTLAND CEMENT, ¼ PART LIME & 3½ PARTS SAND.

PLAIN CONCRETE BULKHEAD SHALL BE CLASS A (3500 P.S.I.) CONCRETE.

BONDING AGENT SHALL BE GRACE PRODUCTS "DARAWELD", LARSON PRODUCTS "WELDCRETE", OR EQUAL.

CIRCULAR SECTION DIAMETER (INCHES)	ALLOWABLE HEAD OF WATER ABOVE INVERT * (FEET)												
	MASONRY BULKHEAD THICKNESS (INCHES)					PLAIN CONCRETE BULKHEAD THICKNESS (INCHES)							
	8"	12"	16"	20"	24"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
36" & SMALLER	16	35	61	95		10	22	38	58	83	113	—	—	—	—	—
42"	12	26	45	70	100	8	16	28	43	61	83	108	—	—	—	—
48"	10	20	35	54	77	7	13	22	33	48	64	83	105	—	—	—
54"	8	16	28	43	62	6	11	18	27	38	51	66	83	103	—	—
60"	7	14	23	36	50	—	9	15	22	31	42	54	68	84	101	—
66"	—	12	20	30	42	—	8	13	19	26	35	45	57	70	84	100
72"	—	11	17	26	36	—	—	11	16	23	30	39	48	59	71	84
78"	—	10	15	22	31	—	—	9	14	20	26	33	42	51	61	72
84"	—	9	14	20	27	—	—	—	13	18	23	29	36	44	53	63
90"	—	—	12	18	24	—	—	—	12	16	21	26	32	39	47	55
96"	—	—	11	16	22	—	—	—	11	14	19	23	29	35	42	49
102"	—	—	10	15	20	—	—	—	10	13	17	21	26	31	37	44
108"	—	—	—	14	18	—	—	—	—	12	16	20	24	29	34	40
114"	—	—	—	13	17	—	—	—	—	11	15	18	22	26	31	36
120"	—	—	—	12	16	—	—	—	—	—	14	17	20	24	29	33
126"	—	—	—	—	15	—	—	—	—	—	13	16	19	23	26	31
132"	—	—	—	—	14	—	—	—	—	—	—	15	18	21	25	29
144"	—	—	—	—	—	—	—	—	—	—	—	—	14	16	22	25

* CONDITIONS BEYOND TABLE VALUES REQUIRE SPECIAL BULKHEADS AS SHOWN ON PLANS

STANDARD MASONRY & PLAIN CONCRETE BULKHEADS

GENERAL CONCRETE NOTES

1. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS & MEASUREMENTS AT THE SITE & SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PROCEEDING WITH THE WORK.
2. CONCRETE SHALL BE GRADE A WITH A MINIMUM COMPRESSION STRENGTH OF 3500 P.S.I. AT 28 DAYS UNLESS OTHERWISE NOTED.
3. REINFORCEMENT STEEL SHALL BE NEW BILLET STEEL CONFORMING TO ASTM A615-90, GRADE 60, INCLUDING SUPPLEMENTARY REQU'TS S1, REINF. FOR TIES & STIRRUPS MAY BE NEW BILLET STEEL CONFORMING TO ASTM A615-90, GRADE 40.
4. REINFORCEMENT BAR DETAILING & PLACING SHALL CONFORM TO ACI 318-89 "BUILDING CODE", & TO DETAILS & DETAILING OF CONCRETE REINFORCEMENT ACI 315-80, & MANUAL OF ENGINEERING & PLACING DRAWINGS FOR REINFORCED CONC. STRUCT. ACI 315R-SP-66 (88) PLACE (2) #5 BARS, 4'-0" LONGER THAN OPENING, EACH FACE AROUND ALL OPENINGS IN WALLS & SLABS.
5. PROVIDE (1) #5 DIAGONAL x 3'-0" LONG, TOP & BOTTOM, EACH CORNER OF OPENING.
6. WALLS SHALL BE ADEQUATELY BRACED UNTIL SUPPORTING SLABS HAVE REACHED THEIR DESIGN STRENGTH.
7. PROVIDE CORNER BARS SAME SIZE & SPACING AS HORIZONTAL REINFORCEMENT ON OUTSIDE FACE OF ALL CORNERS.
8. MINIMUM COVER TO REINFORCEMENT SHALL BE AS FOLLOWS: A) 3" FOR CONCRETE POURED AGAINTS GROUND. B) WHERE FORMS ARE USED, MINIMUM COVER SHALL BE 2" FOR BARS LARGER THAN #5 & 1½" FOR BARS #5 & SMALLER.
9. MINIMUM LAP OF REINFORCEMENT SHALL BE CLASS C, AS CALLED FOR IN TABLE 20.2 OF SP-17A (78).
10. KEYWAYS SHALL BE 2"x4", UNLESS OTHERWISE NOTED.
11. PROVIDE ¾"x 45° CHAMFER AT EXPOSED EDGES UNLESS OTHERWISE NOTED.

TYPES OF PIPES & JOINTS

PIPE					JOINT	
MATERIAL	SIZE (ROUND)	SPEC.	CLASS	REMARKS	DESCRIPTION	SPEC.
PLAIN CONCRETE	4" - 24"	A.S.T.M. C14 - 90	1, 2 & 3		MODIFIED GROOVE TONGUE WITH RUBBER GASKET. INSIDE CEMENT POINTING FOR 42" & LARGER PIPE.	A.S.T.M C443 - 85A *
REINFORCED CONCRETE	12" - 144"	A.S.T.M. C76 - 90	I -V			
	12" - 144"	1990 M.D.O.T. 8.08.03	I -V	SPECIAL DESIGNS SUPPLEMENT A.S.T.M. C-76		
	156" - 204"	A.S.T.M. C76 - 90	I -V	SPECIAL DESIGN		
	EQUIVALENT ROUND 18" - 144"	A.S.T.M. C507 - 90	HE - I THRU HE - IV	ELLIPTICAL PIPE	TONGUE & GROOVE BITUMINOUS JOINT WITH INSIDE CEMENT POINTING.	
	18" - 144"	A.W.W.A. C305 - 74	C76 - 83 EQUIVALENT I -V	PRESSURE PIPE, NON-CYLINDER TYPE	STEEL RINGS & RUBBER JOINTS	A.W.W.A. C302 - 74
VITRIFIED CLAY	4" - 24"	N.C.P.I. ERM - 67	EXTRA STRENGTH		'AWWIT' 'AWWIT-A-RING' 'DEFLEC/TITE' 'LOXON' 'NOBEL' 'O-RING' 'STRE-TITE' 'TYLOX' 'UNIDC' 'WEDGELOCK'	A.S.T.M. C - 425 - 90a *

* EXCEPT AS SUCH SPECIFICATIONS RELATE TO INFILTRATION LIMITATION.

STANDARD SEWER DETAILS

BRIAN JONCKHEERE

LIVINGSTON COUNTY DRAIN COMMISSIONER

LIVINGSTON COUNTY — MICHIGAN

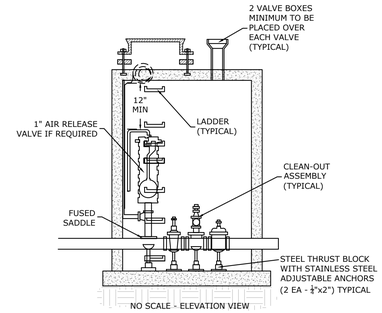
DATE	ADDITIONS AND/OR REVISIONS			
2-24-97	ISSUED FOR BIDS			
DRAWER	SCALE	DR. K.G.B.	CK. E.P.D.	APP. W.H.A.

JOB NO. 970785

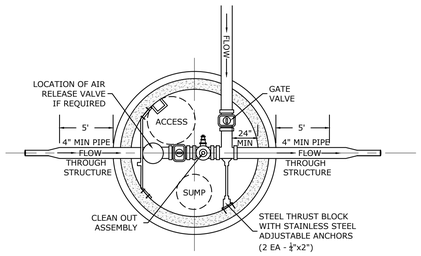
DATE

HUBBELL, ROTH & CLARK, INC.
CONSULTING ENGINEERS
555 HULET DRIVE P.O. BOX 824
BLOOMFIELD HILLS, MICH. 48303-0824

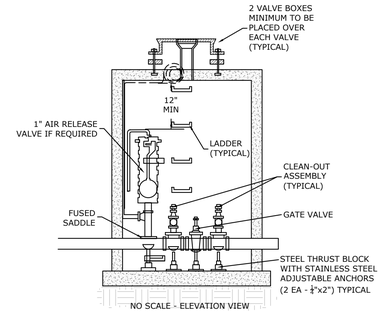
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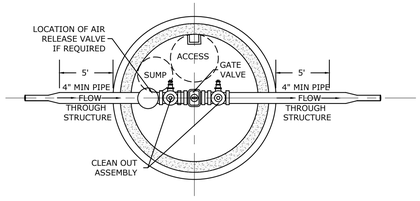
NO SCALE - ELEVATION VIEW



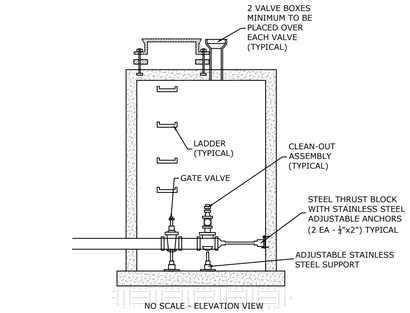
BRANCH FLUSHING CONNECTION
(BFC - THREE WAY IN WELL)
NO SCALE - PLAN VIEW



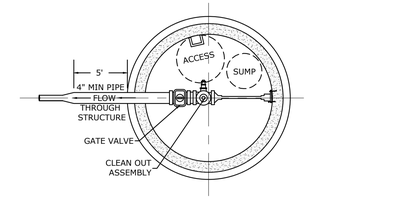
NO SCALE - ELEVATION VIEW



INTERMEDIATE FLUSHING
CONNECTION (IFC)
NO SCALE - PLAN VIEW



NO SCALE - ELEVATION VIEW



TERMINAL FLUSHING
CONNECTION (IFC)
NO SCALE - PLAN VIEW

1. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF GREEN OAK CHARTER TOWNSHIP, LIVINGSTON COUNTY HEALTH DEPARTMENT AND MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY.
2. THE CONTRACTOR SHALL NOTIFY THE TOWNSHIPS ENGINEER A MINIMUM OF 72 HOURS PRIOR TO BEGINNING OF CONSTRUCTION.
3. ALL STRUCTURES SHALL HAVE APPROVED FLEXIBLE, WATER-TIGHT SEALS WHERE PIPES PASS THROUGH THE WALLS. MANHOLES SHALL BE OF PRECAST SECTIONS WITH MODIFIED GROOVE TONGUE AND RUBBER GASKET TYPE JOINTS. PRECAST MANHOLE CONE SECTIONS SHALL BE APPROVED MODIFIED ECCENTRIC CONE TYPE. ALL MANHOLES SHALL BE PROVIDED WITH BOLTED, WATER-TIGHT COVERS. ALL JOINTS ARE REQUIRED TO HAVE AN OUTSIDE BUTYLE WRAP.
4. PER 10 STATE STANDARDS THERE IS A 18" MINIMUM VERTICAL SEPARATION AND 10' MINIMUM HORIZONTAL SEPARATION MUST BE MAINTAINED BETWEEN SANITARY SEWER AND NEARBY UTILITIES.
5. NO GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWNSPOUT DRAINAGE OR ANY OTHER TYPE OF DRAINAGE IS ALLOWED TO ENTER THE SANITARY SEWER INSTALLATION.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY AND OBTAIN INFORMATION REGARDING ANY PRESENCE OF UNDERGROUND UTILITIES WHICH MAY AFFECT THE PROJECT BEFORE CONSTRUCTION COMMENCES. CONTRACTOR SHALL CALL MISS DIG PRIOR TO ANY CONSTRUCTION TO LOCATE UNDERGROUND UTILITIES AND CABLES AS WELL AS TO NOTIFY REPRESENTATIVES OTHER OTHER UTILITIES WITHIN THE VICINITY OF THE WORK.
7. ALL OPEN CUT TRENCHES UNDER TO WITHIN A 1 ON 1 INFLUENCE OF ANY EXISTING OR PROPOSED PAVEMENT INCLUDING DRIVEWAYS OR SIDEWALKS MUST BE BACKFILLED WITH COMPACTED CLASS 2 SAND TO A 95% MAXIMUM WEIGHT DENSITY TO THE ELEVATIONS SHOWN ON THE PLANS.
8. ALL CONSTRUCTION OCCURRING FROM NOVEMBER TO MARCH MUST HAVE TEMPORARY SOIL STABILIZATION.
9. ALL PRESSURE SEWER MAINS MUST BE POLYETHYLENE PIPE (HDPE) PE3408, SDR 11 AND CONFORM TO ASTM D3350-01 STANDARD SPECIFICATION FOR POLYETHYLENE PLASTIC PIPE AND FITTINGS MATERIAL."
10. ALL VALVES SHALL HAVE ADJUSTABLE STEEL SUPPORTS.
11. AIR RELEASE VALVES SHALL BE SEWAGE COMBINATION AIR VALVES DESIGNED TO EXHAUST LARGE AMOUNTS OF AIR DURING FILLING, RELEASE SMALL AMOUNTS OF ACCUMULATED AIR DURING OPERATION, AND OPEN TO ADMIT LARGE AMOUNTS OF AIR TO PREVENT A VACUUM WHILE DRAINING.
12. THE VALVE SHALL BE FLOAT OPERATED AND BOTH THE AIR & VACUUM, AIR RELEASE FUNCTIONS SHALL BE HOUSED IN A SINGLE BODY. BODY AND COVER SHALL BE CAST IRON, CONFORMING TO ASTM A126, "STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS FOR VALVES, FLANGES AND PIPE FITTINGS" CLASS B. ALL LEVERAGE MECHANISM PARTS AND THE FLOAT SHALL BE STAINLESS STEEL. LARGE AND SMALL ORIFICE SEATS SHALL BE RENEWABLE.
13. THE COMBINATION AIR VALVE SHALL BE SUPPLIED WITH "FLUSHING ATTACHMENTS" TO ALLOW PERIODIC FLUSHING OF SEDIMENT, GREASE AND SOLIDS.
14. THE SEWAGE COMBINATION AIR VALVE SHALL BE AS MANUFACTURED BY: APCO VALVE & PRIMER CORP. OR APPROVED EQUAL.
15. AIR RELEASE STRUCTURES SHALL HAVE VENTED "C" TYPE COVERS WITH CALGON ODOR CONTROL UNITS.
16. ALL PRESSURE PIPE JOINTS SHALL BE BUTT FUSED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.
17. ALL PRESSURE TAPS TO HDPE SHALL BE DONE BY BRANCH SADDLES FUSED TO MAIN LINE PIPE.
18. MECHANICAL JOINTS MUST BE USED WITHIN VALVE WELLS AND FUSED JOINTS MUST BE USED ON OUTSIDE OF VALVE WELLS.
19. CUTTING OF PIPE LENGTHS SHALL BE PERFORMED BY THE TOOLS OR EQUPMENT THAT WILL PROVIDE A CLEAN, PERPENDICULAR CUT WITHOUT ANY DAMAGE TO THE PIPE OR FILLER MATERIAL. ALL BURRS SHALL BE REMOVED, SPIGOT ENDS ON CUT PVC PIPE SHALL BE BEVELED SIMILAR TO FACTORY BEVELING TO PREVENT GASKET DAMAGE.
20. PIPE WALLS AND JOINTS SHALL BE PROTECTED FROM ABRASION AND DAMAGE DURING HANDLING AND SHALL BE FULLY INSPECTED JUST PRIOR TO PLACING IN TRENCH.
21. BOWING OR WARPING OF PIPE CAN OCCUR WITH TEMPERATURE FLUCTUATIONS. THE CONTRACTOR SHALL STORE AND PROTECT THE PIPE TO MINIMIZE BOWING. NOMINAL PIPE LENGTHS OF 10', 12'-6", OR 20' HAVING DEVIATIONS FROM STRAIGHT GREATER THAN 1" SHALL NOT BE USED.
22. 4 TRACER WIRES SHALL BE ATTACHED TO ALL PRESSURE SEWER PIPE AT 5' INTERVALS WHEN DIRECTIONAL BORED AND 2 TRACER WIRES WHEN INSTALLED BY OPEN CUT.
23. TRACER WIRE SHALL BE 6 GAUGE SOLID COPPER WITH PLASTIC INSTULATION AND SUITABLE FOR DIRECT BURIAL.
24. ATTACHMENT TO PIPE SHALL BE MADE WITH PLASTIC CABLE TIES OR EQUIVALENT.
25. SPLICES SHALL BE SOLDERED, COPPER TO COPPER. SPLICE SHALL THEN BE ATTACHED TO PIPE WITH TIES AND SHRINK-WRAPPED IN PLACE TO REESTABLISH INSULATION ACROSS SPLICED LENGTH.
26. A MINIMUM LENGTH OF 6 FT OF WIRE SHALL BE LEFT ACCESSIBLE AT CLEANOUTS AND OTHER STRUCTURES.
27. CONTRACTOR IS RESPONSIBLE FOR TESTING CONTINUITY OF WIRE FROM STRUCTURE TO STRUCTURE. THE TOWNSHIP ENGINEER TO BE ONSITE DURING CONTINUITY TESTING.
28. ALL SANITARY SEWERS ARE TO BE OWNED AND MAINTAINED BY THE DEVELOPER UNTIL THE SITE IS BUILT OUT TO MORE THAN 50% AND THEN THE SUBDIVISION ASSOCIATION WILL TAKE OVER RESPONSIBILITY.

Consulting Civil Engineers
"Engineering A Better Michigan"
Powell Engineering & Associates, LLC
4700 Cornerstone Drive, White Lake, Michigan 48383
P: 248.714-8895 info@powellengineeringllc.com

NOTE: AS AN AID TO THE CONTRACTOR VARIOUS UTILITIES AND UNDERGROUND STRUCTURES ARE SHOWN ON THESE PLANS AND PROFILES. ALL INFORMATION CONCERNING ALL UTILITIES SHOWN ON THE PLANS AND PROFILES IS TAKEN FROM FIELD TOPO AND/OR AVAILABLE RECORDS, BUT THE CONTRACTOR SHALL NOT RELY ON THE SIZE, TYPE, OR THEIR LOCATION/ELEVATION. OR THAT ADDITIONAL UNDERGROUND STRUCTURES OR UTILITIES MAY NOT BE ENCOUNTERED. IF THE CONTRACTOR DOES ENCOUNTER A PREVIOUSLY UNIDENTIFIED UTILITY AND OR STRUCTURE, OR DETERMINES THAT ONE OF THE UTILITIES OR STRUCTURES SHOWN ON THESE PLANS IS INCORRECTLY LOCATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND ENGINEER FOR DIRECTION ON HOW TO PROCEED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES. NOTIFY "MISS DIG" AT 1-800-482-7171 (TOLL FREE) BEFORE THE START OF ANY CONSTRUCTION.

BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171

DOVE LAKE ESTATES
SANITARY DETAIL SHEET
DOVE LAKE ESTATES SITE CONDOMINIUMS
DIXBORO & 12 MILE RD, GREEN OAKS, LIVINGSTON CNTY

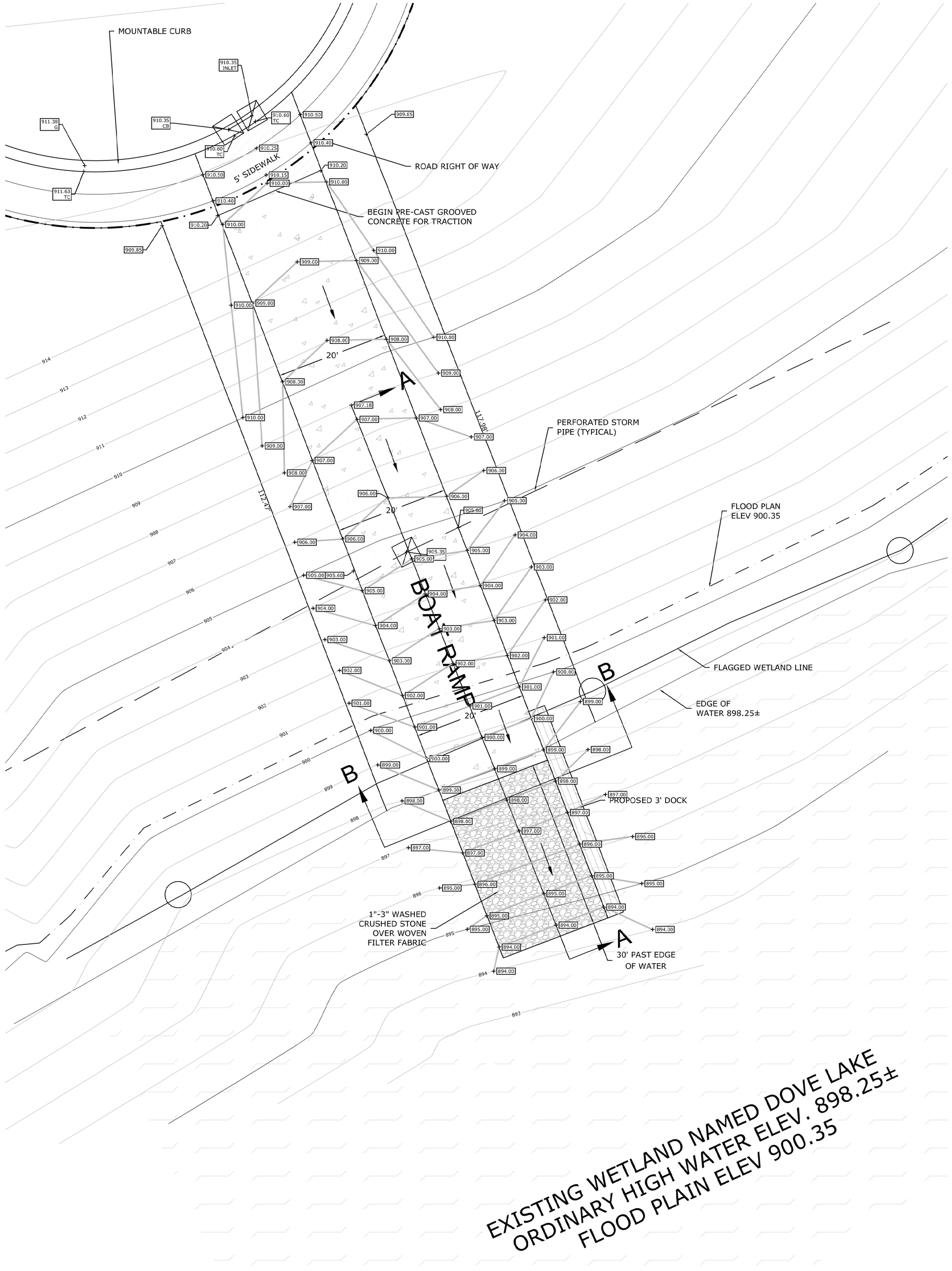
ISSUE DATES

LCHD
8/1/2024

DRAWN	MCS
DESIGNED	MCS
APPROVED	MCP
P.E. JOB No.	19-425
SCALE	1"=20'

DET 2
CONSTRUCTION

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MOUNTABLE CURB
910.35 INLET
911.38 G
910.35 CB
910.60 TC
910.60 TC
911.65 TC
910.53
910.40
910.25
910.20
910.15
910.05
910.00
910.00
910.00

Civil Engineering Solutions, Inc.
1150 Corporate Office Drive
Suite 210
Milford, MI 48381
Revise and Resubmit

COMPLETED JUL 1 0 2025
1ST Review.
CES # 2020-0036

DOVE LAKE

EXHIBIT A
BYLAWS

ARTICLE I

ASSOCIATION OF CO-OWNERS

Dove Lake, a residential Condominium Project located in Green Oak Township, Livingston County, Michigan, shall be administered by an Association of Co-owners which shall be a non-profit corporation, hereinafter called the "Association", organized under the applicable laws of the State of Michigan, and responsible for the management, maintenance, operation and administration of the Common Elements, easements and affairs of the Condominium Project in accordance with the Condominium Documents and the laws of the State of Michigan. These Bylaws shall constitute both the Bylaws referred to in the Master Deed and required by Section 3(9) of the Act and the Bylaws provided for under the Michigan Nonprofit Corporation Act. Each Co-owner shall be entitled to membership and no other person or entity shall be entitled to membership. The share of a Co-owner in the funds and assets of the Association cannot be assigned, pledged or transferred in any manner except as an appurtenance to his Unit. The Association shall keep current copies of the Master Deed, all amendments to the Master Deed, and other Condominium Documents for the Condominium Project available at reasonable hours to Co-owners, mortgagees, prospective purchasers and prospective mortgagees of Units in the Condominium Project. All Co-owners in the Condominium Project and all persons using or entering upon or acquiring any interest in any Unit therein or the Common Elements thereof shall be subject to the provisions and terms set forth in the aforesaid Condominium Documents.

ARTICLE II

ASSESSMENTS

All expenses arising from the management, administration and operation of the Association in pursuance of its authorizations and responsibilities as set forth in the Condominium Documents and the Act shall be levied by the Association against the Units and the Co-owners thereof in accordance with the following provisions:

Section 1. **Assessments for Common Elements**. All costs incurred by the Association in satisfaction of any liability arising within, caused by, or connected with the General Common Elements or the administration of the Condominium Project shall constitute expenditures affecting the administration of the Project, and all sums received as the proceeds of, or pursuant to, any policy of insurance securing the interest of the Co-owners against liabilities or losses arising within, caused by, or connected with the General Common Elements or the administration of the Condominium Project shall constitute receipts affecting the administration of the Condominium Project, within the meaning of Section 54(4) of the Act.

Section 2. **Determination of Assessments**. Assessments shall be determined in accordance with the following provisions:

(a) **Budget**. The Board of Directors of the Association shall establish an annual budget in advance for each fiscal year and such budget shall project all expenses for the forthcoming year which may be required for the proper operation, management and maintenance of the Condominium Project, including a reasonable allowance for contingencies and reserves. An adequate reserve fund for maintenance, repairs and replacement of those General Common Elements that must be repaired or replaced on a periodic basis shall be established in the budget and must be funded by regular payments as set forth in Section 3 below rather than by special assessments. At a minimum, the reserve fund shall be equal to 10% of the Association's current annual budget on a noncumulative basis. Since the minimum standard required by this subsection may prove to be inadequate for this particular project, the Association of Co-owners should carefully analyze the Condominium Project to determine if a greater amount should be set aside, or if additional reserve funds should be established for other purposes from time to time. Upon adoption of an annual budget by the Board of Directors, copies of the budget shall be delivered to each Co-owner and the assessment for said year shall be established based upon said budget, although the failure to deliver a copy of the budget to each Co-owner shall not affect or in any way diminish the liability of any Co-owner for any existing or future assessments. Should the Board of Directors at any time decide, in the sole discretion of the Board of Directors: (1) that the assessments levied are or may prove to be insufficient: (a) to pay the costs of operation and management of the Condominium, (b) to provide repairs and replacements of existing General Common Elements and improvements within Units to the extent the Association is obligated to repair and replace, (c) to provide additions to the General Common Elements not exceeding $2,000.00 annually for the entire Condominium Project, or (2) in the event of emergencies, the Board of Directors shall have the authority to increase the general assessment or to levy such additional assessment or assessments as it shall deem to be necessary. The Board of Directors also shall have the authority, without Co-owner consent, to levy assessments pursuant to the provisions of Article V, Section 3 hereof. The discretionary authority of the Board of Directors to levy assessments pursuant to this subsection shall rest solely with the Board of Directors for the benefit of the Association and the members thereof, and shall not be enforceable by any creditors of the Association or of the members thereof. The Developer may, acting on its own or through its representatives on the Association's Board of Directors, suspend the necessity for making regular assessment payments by each Co-owner (i) for a year from closing the purchase of his Unit or (ii) until the Co-owner's dwelling is completed, whichever first occurs; the purpose of this provision is to give Developer the discretionary flexibility to provide relief from payment of assessments during the transitional period of development and marketing prior to the time that a full Association expense budget becomes an operational necessity.

(b) **Special Assessments**. Special assessments, in addition to those required in subsection (a) above, may be made by the Board of Directors from time to time and approved by the Co-owners as hereinafter provided to meet other requirements of the Association, including, but not limited to: (1) assessments for additions to the

General Common Elements of a cost exceeding $2,000.00 for the entire Condominium Project per year, (2) assessments to purchase a Unit upon foreclosure of the lien for assessments described in Section 6 hereof, or (3) assessments for any other appropriate purpose not elsewhere herein described. Special assessments referred to in this subsection (b) (but not including those assessments referred to in subsection 2(a) above, which shall be levied in the sole discretion of the Board of Directors) shall not be levied without the prior approval of no less than sixty-six and two-thirds (66-2/3%) percent of the Unit Co-owners, except as hereinafter provided. The authority to levy assessments pursuant to this subsection is solely for the benefit of the Association and the members thereof and shall not be enforceable by any creditors of the Association or of the members thereof.

Section 3. **Apportionment of Assessments and Penalty for Default**. Unless otherwise provided herein or in the Master Deed, all assessments levied against the Co-owners to cover expenses of administration shall be apportioned equally among and paid by the Co-owners, without increase or decrease for the existence of any rights to the use of any Limited Common Elements appurtenant to a Unit. Annual assessments as determined in accordance with Article II, Section 2(a) above shall be payable by Co-owners in regular installments, the frequency to be determined by the Board of Directors, commencing with acceptance of a deed to or a land contract vendee's interest in a Unit, or with the acquisition of fee simple title to a Unit by any other means. The payment of an assessment shall be in default if such assessment, or any part thereof, is not paid to the Association in full on or before the due date for such payment. A late charge not exceeding $50 per installment may be assessed automatically by the Association upon each installment in default five or more days until each installment together with all applicable late charges is paid in full. The Board of Directors shall also have the right to increase the amount of the late charge upon notification to all Co-owners. The Association also may, pursuant to Article XX hereof, levy fines for late payment of assessments in addition to the late charge. Each Co-owner (whether 1 or more persons) shall be, and remain, personally liable for the payment of all assessments (including fines for late payment and costs of collection and enforcement of payment) pertinent to his Unit which may be levied while such Co-owner is the owner thereof, except a land contract purchaser from any Co-owner including Developer shall be so personally liable and such land contract seller shall not be personally liable for all such assessments levied up to and including the date upon which such land contract seller actually takes possession of the Unit following extinguishment of all rights of the land contract purchaser in the Unit. Payments on account of installments of assessments in default shall be applied as follows: first, to costs of collection and enforcement of payment, including reasonable attorney's fees; second, to any interest charges and fines for late payment on such installments; and third, to installments in default in order of their due dates. Co-owners delinquent in paying assessments shall be ineligible to serve on committees or as a Director of the Association.

Section 4. **Waiver of Use or Abandonment of Unit**. No Co-owner may exempt himself from liability for his contribution toward the expenses of administration or for payment of assessments to the Association by waiver of the use or enjoyment of any of the Common Elements or by the abandonment of his Unit.

Section 5. Liens for Unpaid Assessments. Sums assessed by the Association which remain unpaid, including but not limited to regular assessments, special assessments, fines and late charges, shall constitute a lien upon the Unit or Units in the Project owned by the Co-owner at the time of the assessment and upon the proceeds of sale thereof. Any such unpaid sum shall constitute a lien against the Unit as of the first day of the fiscal year to which the assessment, fine or late charge relates and shall be a lien prior to all claims except real property taxes and first mortgages or record. All charges which the Association may levy against any Co-owner shall be deemed to be assessments for purposes of this Section and Section 108 of the Act.

Section 6. Enforcement.

(a) Remedies. In addition to any other remedies available to the Association, the Association may enforce collection of delinquent assessments together with all applicable late charges, interest, fines, costs, advances paid by the Association to protect its lien, actual attorneys' fees (not limited to statutory fees) and other costs, by a suit at law for a money judgment or by foreclosure of the statutory lien that secures payment of assessments. In the event of default by any Co-owner in the payment of any installment of the annual assessment levied against his Unit, the Association shall have the right to declare all unpaid installments of the annual assessment for the pertinent fiscal year immediately due and payable. The Association also may discontinue the furnishing of any services to a Co-owner in default upon 7 days written notice to such Co-owner of its intention to do so. A Co-owner in default shall not be entitled to serve on committees or as a Director of the Association, to utilize any of the General Common Elements of the Project and shall not be entitled to serve on committees or as a Director of the Association, to utilize any of the General Common Elements of the Project and shall not be entitled to vote at any meeting of the Association so long as such default continues; provided, however, this provision shall not operate to deprive any Co-owner of ingress or egress to and from his Unit. In a judicial foreclosure action, a receiver may be appointed to collect a reasonable rental for the Unit from the Co-owner thereof or any persons claiming under him. The Association may also assess fines for late payment or non-payment of assessments in accordance with the provisions of Article XX of these Bylaws. All of these remedies shall be cumulative and not alternative.

(b) Foreclosure Proceedings. Each Co-owner, and every other person who from time to time has any interest in the Project, shall be deemed to have granted to the Association the unqualified right to elect to foreclose the lien securing payment of assessments either by judicial action or by advertisement. The provisions of Michigan law pertaining to foreclosure of mortgages by judicial action and by advertisement, as the same may be amended from time to time, are incorporated herein by reference for the purposes of establishing the alternative procedures to be followed in lien foreclosure actions and the rights and obligations of the parties to such actions. Further, each Co-owner and every other person who from time to time has any interest in the Project shall be deemed to have authorized and empowered the Association to sell or to cause to be sold the Unit with respect to which the assessment(s) is or are delinquent and to receive, hold and distribute the proceeds of such sale in accordance with the priorities established by applicable law. Each Co-owner of a Unit in the Project acknowledges that

at the time of acquiring title to such Unit, he was notified of the provisions of this subsection and that he voluntarily, intelligently and knowingly waived notice of any proceedings brought by the Association to foreclose by advertisement the lien for nonpayment of assessments and a hearing on the same prior to the sale of the subject Unit.

(c) **Notice of Action**. Notwithstanding the foregoing, neither a judicial foreclosure action nor a suit at law for a money judgment shall be commenced, nor shall any notice of foreclosure by advertisement be published, until the expiration of 10 days after mailing, by first class mail, postage prepaid, addressed to the delinquent Co-owner(s) at his or their last known address, a written notice that I or more installments of the annual assessment levied against the pertinent Unit is or are delinquent and that the Association may invoke any of its remedies hereunder if the default is not cured within 20 days after the date of mailing. Such written notice shall be accompanied by a written affidavit of an authorized representative of the Association that sets forth (i) the affiant's capacity to make the affidavit, (ii) the statutory and other authority for the lien, (iii) the amount outstanding (exclusive of interest, costs, attorney's fees and future assessments), (iv) the legal description of the subject Unit(s), and (v) the name(s) of the Co-owner(s) of record. Such affidavit shall be recorded in the office of the Register of Deeds in the county in which the Project is located prior to commencement of any foreclosure proceeding, but it need not have been recorded as of the date of mailing as aforesaid. If the delinquency is not cured within the 10-day period, the Association may take such remedial action as may be available to it hereunder or under Michigan law. In the event the Association elects to foreclose the lien by advertisement, the Association shall so notify the delinquent Co-owner and shall inform him that he may request a judicial hearing by bringing suit against the Association.

(d) **Expenses of Collection**. The expenses incurred in collecting unpaid assessments, including late charges, interest, fines, costs, actual attorney's fees (not limited to statutory fees), advances for taxes or other liens paid by the Association to protect its lien and other costs, shall be chargeable to the Co-owner in default and shall be secured by the lien on his Unit.

Section 7. Liability of Mortgagee. Notwithstanding any other provisions of the Condominium Documents, the holder of any first mortgage covering any Unit in the Project which comes into possession of the Unit pursuant to the remedies provided in the mortgage or by deed (or assignment) in lieu of foreclosure, or any purchaser at a foreclosure sale, shall take the property free of any claims for unpaid assessments or charges against the mortgaged Unit which accrue prior to the time such holder or purchaser acquires title to the Unit.

Section 8. Developer's Responsibility for Assessments. The Developer of the Condominium, although a member of the Association, shall not be responsible at any time for payment of the regular Association assessments. The Developer, however, shall at all times pay all expenses of maintaining the Units that it owns, including the improvements located thereon, together with a proportionate share of all current expenses of administration actually incurred by the Association from time to time, except expenses related to maintenance and use of the Units in the Project and of the improvements constructed within or appurtenant to the

Units that are not owned by Developer. For purposes of the foregoing sentence, the Developer's proportionate share of such expenses shall be based upon the ratio of all Units owned by the Developer at the time the expense is incurred to the total number of Units then in the Project. In no event shall the Developer be responsible for payment of any assessments for deferred maintenance, reserves for replacement, for capital improvements or other special assessments, except with respect to Units owned by it on which a completed and occupied residential dwelling is located. Any assessments levied by the Association against the Developer for other purposes shall be void without Developer's consent. Further, the Developer shall in no event be liable for any assessment levied in whole or in part to purchase any Unit from the Developer or to finance any litigation or other claims against the Developer, any cost of investigating and preparing such litigation or claim or any similar or related costs. During the Development and Sales Period, the Developer may (without the consent of the Association or any other Co-owner) waive the payment of assessments by any particular Co-owner during the period of time commencing as of the date upon which that Co-owner acquires fee simple interest or a land contract vendee's interest in and to a Unit and ending upon the earlier to occur of (a) two (2) years thereafter, or (b) the date upon which a completed residential dwelling is on the Unit owned by that Co-owner. A "completed residential dwelling" shall mean a dwelling with respect to which a certificate of occupancy has been issued by Green Oak Township.

Section 9. **Property Taxes and Special Assessments**. All property taxes and special assessments levied by any public taxing authority shall be assessed in accordance with Section 131 of the Act.

Section 10. **Personal Property Tax Assessment of Association Property**. The Association shall be assessed as the person or entity in possession of any tangible personal property of the Condominium owned or possessed in common by the Co-owners, and personal property taxes based thereon shall be treated as expenses of administration.

Section 11. **Construction Lien**. A construction lien otherwise arising under Act No. 497 of the Michigan Public Acts of 1980, as amended, shall be subject to Section 132 of the Act.

Section 12. **Statement as to Unpaid Assessments**. The purchaser of any Unit may request a statement of the Association as to the amount of any unpaid Association assessments, interest, late charges, fines, costs and attorney fees thereon, whether regular or special. Upon written request to the Association accompanied by a copy of the executed purchase agreement pursuant to which the purchaser holds the right to acquire a Unit, the Association shall provide a written statement of such unpaid assessments, interest, late charges, fines, costs and other fees as may exist or a statement that none exist, which statement shall be binding upon the Association for the period stated therein. Upon the payment of that sum within the period stated, the Association's lien for assessments as to such Unit shall be deemed satisfied; provided, however, that the failure of a purchaser to request such statement at least 5 days prior to the closing of the purchase of such Unit shall render any unpaid assessments against the Condominium Unit together with interest, costs, fines, late charges and attorney fees, and the lien securing the same fully enforceable against such purchaser and the Unit itself, to the extent provided by the Act. Under the Act, unpaid assessments constitute a lien upon the Unit and the proceeds of sale thereof prior to all claims except real property taxes and first mortgages of record.

ARTICLE III

ARBITRATION

Section 1. **Scope and Election**. Disputes, claims, or grievances arising out of or relating to the interpretation or the application of the Condominium Documents, or any disputes, claims or grievances arising among or between the Co-owners and the Association, upon the election and written consent of the parties to any such disputes, claims or grievances (which consent shall include an agreement of the parties that the judgment of any circuit court of the State of Michigan may be rendered upon any award pursuant to such arbitration), and upon written notice to the Association, shall be submitted to arbitration and the parties thereto shall accept the arbitrator's decision as final and binding, provided that no question affecting the claim of title of any person to any fee or life estate in real estate is involved. The Commercial Arbitration Rules of the American Arbitration Association as amended and in effect from time-to-time hereafter shall be applicable to any such arbitration.

Section 2. **Judicial Relief**. In the absence of the election and written consent of the parties pursuant to Section 1 above, no Co-owner or the Association shall be precluded from petitioning the courts to resolve any such disputes, claims or grievances.

Section 3. **Election of Remedies**. Such election and written consent by Co-owners or the Association to submit any such dispute, claim or grievance to arbitration shall preclude such parties from litigating such dispute, claim or grievance in the courts.

ARTICLE IV

INSURANCE

Section 1. **Extent of Coverage**. The Association shall, to the extent appropriate in light of the nature of the General Common Elements of the Project, carry fire and extended coverage, vandalism and malicious mischief and liability insurance (in a minimum amount to be determined by the Developer or the Association in its discretion, but in no event, less than $1,000,000 per occurrence), officers and directors liability insurance, and workmen's compensation insurance if applicable, and any other insurance the Association may deem applicable, desirable or necessary, pertinent to the ownership, use and maintenance of the General Common Elements and such insurance shall be carried and administered in accordance with the following provisions:

(a) **Responsibilities of Association**. All such insurance shall be purchased by the Association for the benefit of the Association, the Developer and the Co-owners and their mortgagees, as their interests may appear, and provision shall be made for the issuance of certificates of mortgagee endorsements to the mortgagees of Co-owners.

(b) **Insurance of Limited Common Elements**. The Association shall not be responsible, in any way, for maintaining insurance with respect to Limited Common Elements.

(c) Premium Expenses. All premiums on insurance purchased by the Association pursuant to these Bylaws shall be expenses of administration.

(d) Proceeds of Insurance Policies. Proceeds of all insurance policies owned by the Association shall be received by the Association, held in a separate account and distributed to the Association and the Co-owners and their mortgagees, as their interests may appear; provided, however, whenever repair or reconstruction of the Condominium shall be required as provided in Article V of these Bylaws, the proceeds of any insurance received by the Association as a result of any loss requiring repair or reconstruction shall be applied for such repair or reconstruction.

Section 2. Authority of Association to Settle Insurance Claims. Each Co-owner, by ownership of a Unit in the Condominium Project, shall be deemed to appoint the Association as his true and lawful attorney-in-fact to act in connection with all matters concerning the maintenance of fire and extended coverage, vandalism and malicious mischief, liability insurance and workmen's compensation insurance, if applicable, pertinent to the Condominium Project and the General Common Elements appurtenant thereto, with such insurer as may, from time to time, provide such insurance for the Condominium Project. Without limitation on the generality of the foregoing, the Association as said attorney shall have full power and authority to purchase and maintain such insurance, to collect and remit premiums therefor, to collect proceeds and to distribute the same to the Association, the Co-owners and respective mortgagees, as their interests may appear (subject always to the Condominium Documents), to execute releases of liability and to execute all documents and to do all things on behalf of such Co-owner and the Condominium as shall be necessary or convenient to the accomplishment of the foregoing. Unless the Association obtains coverage for the dwelling within the Unit pursuant to the provisions of Article IV, Section 3 below, the Association's authority shall not extend to insurance coverage on any dwelling or other improvements located within a Unit.

Section 3. Responsibilities of Co-owners. Each Co-owner shall be obligated and responsible for obtaining fire and extended coverage and vandalism and malicious mischief insurance with respect to the dwelling and all other improvements constructed or to be constructed within the perimeter of his Condominium Unit and for his personal property located therein or thereon or elsewhere on the Condominium Project. There is no responsibility on the part of the Association to insure any of such improvements whatsoever. All such insurance shall be carried by each Co-owner in an amount equal to the maximum insurable replacement value, excluding foundation and excavation costs. Each Co-owner also shall be obligated to obtain insurance coverage for his personal liability for occurrences within the perimeter of his Unit or the improvements located thereon (naming the Association and the Developer as insureds), and also for any other personal insurance coverage that the Co-owner wishes to carry. Each Co-owner shall deliver certificates of insurance to the Association from time to time, if requested by the Association, to evidence the continued existence of all insurance required to be maintained by the Co-owner hereunder. In the event of the failure of a Co-owner to obtain such insurance or to provide evidence thereof to the Association, the Association may, but is not required to, obtain such insurance on behalf of such Co-owner and the premiums therefor shall constitute a lien against the Co-owner's Unit which may be collected from the Co-owner in the

same manner that Association assessments may be collected in accordance with Article II hereof.

The Association shall under no circumstances have any obligation to obtain any of the insurance coverage described above in this Section 3 or have any liability to any person for failure to do so. The Association may elect, however, through its Board of Directors, to undertake the responsibility for obtaining the insurance described in this Section 3, or any portion thereof, exclusive of insurance covering the contents located within a Co-owner's residence, and the cost of the insurance shall be included as an expense item in the Association budget. All Co-owners shall be notified of the Board's election to obtain the insurance at least sixty (60) days prior to its effective date which notification shall include a description of the coverage and the name and address of the insurer. Each Co-owner shall also be provided a certificate of insurance as soon as it is available from the insurer. Co-owners may obtain supplementary insurance but in no event shall any such insurance coverage undertaken by a Co-owner permit a Co-owner to withhold payment of the share of the Association assessment that relates to the equivalent insurance carried by the Association. The Association also shall not reimburse Co-owners for the cost of premiums resulting from the early cancellation of an insurance policy. To the extent a Co-owner does or permits anything to be done or kept on Co-owner's Unit that will increase the rate of insurance each Co-owner shall pay to the Association, the increased cost of insurance premiums resulting from any such activity or the maintenance of any such condition shall be charged to the Co-owner responsible for such activity or condition.

Section 4. **Waiver of Right of Subrogation**. The Association and all Co-owners shall use their best efforts to cause all property and liability insurance carried by the Association or any Co-owner to contain appropriate provisions whereby the insurer waives its right of subrogation as to any claims against any Co-owner or the Association.

Section 5. **Indemnification**. Each individual Co-owner shall indemnify and hold harmless every other Co-owner, the Developer and the Association for all damages and costs, including attorneys' fees, which such other Co-owners, the Developer or the Association may suffer as a result of defending any claim arising out of an occurrence on or within such individual Co-owner's Unit and shall carry insurance to secure this indemnity if so required by the Association (or the Developer during the Development and Sales Period). This Section 5 shall not be construed to give any insurer any subrogation right or other right or claim against any individual Co-owner, however.

ARTICLE V

RECONSTRUCTION OR REPAIR

Section 1 **Co-owner's Responsibility.** Each Co-owner shall be responsible for all maintenance, repair and replacement required to improvements located within his Unit, except as may be otherwise provided as an Association obligation in Article IV, Section 3(b) of the Master Deed. If damage to or disrepair or deficient maintenance of the dwelling or other improvements constructed on a Co-owner's Unit for which the Co-owner is responsible, adversely affects the appearance of the Project, the Co-owner shall proceed with removal or replacement of the damaged property or repair or maintenance of the deficient condition without

delay. This Section shall also be applicable in the event of destruction during the course of construction of improvements on a Unit. Failure of any Co-owner to promptly and completely fulfill his responsibilities under this Section shall entitle the Association, upon reasonable notice to the Co-owner, to exercise all enforcement rights conferred upon it by the Condominium Documents including, by way of example and not limitation, all access, maintenance, decoration, repair, replacement and cost assessment rights referred to in Article X, Section 2 of the Master Deed.

Section 2. Timely Reconstruction and Repair. If damage to the General Common Elements adversely affects the appearance or utility of the Project, the Association shall proceed with replacement of the damaged property without delay.

Section 3. Association Responsibility for Repair. Immediately after the occurrence of a casualty causing damage to property for which the Association has the responsibility of maintenance, repair, reconstruction and insuring, the Association shall obtain reliable and detailed estimates of the cost to place the damaged property in a condition as good as that existing before the damage. If the proceeds of insurance are not sufficient to defray the estimated cost of reconstruction or repair required to be performed by the Association, or if at any time during such reconstruction or repair, or upon completion of such reconstruction or repair, the funds for the payment of the cost thereof are insufficient, assessment shall be made against all Co-owners for the cost of reconstruction or repair of the damaged property in sufficient amounts to provide funds to pay the estimated or actual cost of repair. This provision shall not be construed to require replacement of mature trees and vegetation with equivalent trees or vegetation.

Section 4. Timely Reconstruction and Repair. If damage to the General Common Elements adversely affects the appearance of the Project, the Association shall proceed with replacement of the damaged property without delay.

Section 5. Eminent Domain. The following provisions shall control upon any taking by eminent domain:

(a) Taking of Unit or Improvements Thereon. In the event of any taking of all or any portion of a Unit or any improvements thereon by eminent domain, the award for such taking shall be paid to the Co-owner of such Unit and the mortgagee thereof, as their interests may appear, notwithstanding any provision of the Act to the contrary. If a Co-owner's entire Unit is taken by eminent domain, such Co-owner and his mortgagee shall, after acceptance of the condemnation award therefor, be divested of all interest in the Condominium Project.

(b) Taking of General Common Elements. If there is any taking of any portion of the General Common Elements, the condemnation proceeds relative to such taking shall be paid to the Co-owners and their mortgagees in proportion to their respective interests in the Common Elements and the affirmative vote of more than 50% of the Co-owners shall determine whether to rebuild, repair or replace the portion so taken or to take such other action as they deem appropriate.

(c) **Continuation of Condominium After Taking**. In the event the Condominium Project continues after taking by eminent domain, then the remaining portion of the Condominium Project shall be resurveyed and the Master Deed amended accordingly, and, if any Unit shall have been taken, then Article V of the Master Deed shall also be amended to reflect such taking and to proportionately readjust the percentages of value of the remaining Co-owners based upon the continuing value of the Units in the Condominium totaling 100%. Such amendment may be effected by an officer of the Association duly authorized by the Board of Directors without the necessity of execution or specific approval thereof by any Co-owner.

(d) **Notification of Mortgagees**. In the event any Unit in the Condominium, or any portion thereof, or the Common Elements or any portion thereof, is made the subject matter of any condemnation or eminent domain proceeding or is otherwise sought to be acquired by a condemning authority, the Association promptly shall so notify each institutional holder of a first mortgage lien on any of the Units in the Condominium.

(e) **Applicability of the Act**. To the extent not inconsistent with the foregoing provisions, Section 133 of the Act shall control upon any taking by eminent domain.

Section 6. Priority of Mortgagee Interests. Nothing contained in the Condominium Documents shall be construed to give a Co-owner or any other party priority over any rights of first mortgagees of Condominium Units pursuant to their mortgages in the case of a distribution to Co-owners of insurance proceeds or condemnation awards for losses to or a taking of Condominium Units and/or Common Elements.

Section 7. Notification of Holders, Insurers and Guarantors of First Mortgages. In the event any first mortgage in the Condominium is held, guaranteed or insured and such holder, guarantor or insurer so requests in writing (stating its name, address and applicable mortgaged Unit number) to the Association, the Association shall give timely written notice to such requesting party of the following: (a) any condemnation or casualty loss that affects either a material portion of the Condominium or the Unit and dwelling securing such mortgage; (b) any 60-day delinquency in the payment of assessments or charges owed to the Association with respect to the Unit and dwelling securing such mortgage; (c) a lapse, cancellation, or material modification of any insurance policy maintained by the Association; and (d) any proposed action that requires the consent of a specified percentage of eligible mortgage holders.

ARTICLE VI

RESTRICTIONS

All of the Units in the Condominium shall be held, used and enjoyed subject to the following limitations and restrictions:

Section 1. Residential Use. No Unit in the Condominium shall be used for other than single-family residential purposes and the Common Elements shall be used only for

purposes consistent with single-family residential use and in accordance with the ordinances of the Green Oak Township. In home libraries and offices shall also be permissible so long as such use is consistent with the Township's ordinances.

Section 2. Leasing and Rental.

(a) Right to Lease. A Co-owner may lease the dwelling located on his Unit for the same purposes set forth in Section 1 of this Article VI; provided that written disclosure of such lease transaction is submitted to the Board of Directors of the Association in the manner specified in subsection (b) below. With the exception of a lender in possession of a Unit following a default of a first mortgage, foreclosure or deed or other arrangement in lieu of foreclosure, no Co-owner shall lease less than an entire dwelling or Unit in the Condominium and no tenant shall be permitted to occupy except under a lease the initial term of which is at least six months. The terms of all leases, occupancy agreements and occupancy arrangements shall incorporate, or be deemed to incorporate, all of the provisions of the Condominium Documents. The Developer, or its assigns, may lease any number of dwellings/Units in the Condominium in its discretion and shall not be subject to the foregoing, or the leasing procedures set forth in subsection (b) below, when leasing to individuals that hold a binding Purchase Agreement for a Unit in the Condominium and are waiting to close and move into the Unit.

(b) Leasing Procedures. The leasing of dwellings and Units in the Project shall conform to the following provisions:

(1) A Co-owner, including the Developer, desiring to rent or lease a dwelling/Unit, shall disclose that fact in writing to the Association at least 10 days before presenting a lease or otherwise agreeing to grant possession of a dwelling and Condominium Unit to a potential lessee or occupants of the dwelling and at the same time, shall supply the Association with a copy of the exact lease for its review for its compliance with the Condominium Documents. The Co-owner or Developer shall also provide the Association of Co-owners with a copy of the executed lease. If no lease is to be used, then the Co-owner or Developer shall supply the Association with the name and address of the lessees or occupants, along with the rental amount and due dates of any rental or compensation payable to a Co-owner or Developer, the due dates of that rental or compensation, and the term of the proposed arrangement.

(2) Tenants and non-owner occupants shall comply with all of the conditions of the Condominium Documents and all leases and rental agreements shall so state.

(3) If the Association determines that the tenant or non-owner occupant has failed to comply with the conditions of the Condominium Documents, the Association shall take the following action:

(i) The Association shall notify the Co-owner by certified mail advising of the alleged violation by the tenant.

(ii) The Co-owner shall have 15 days after receipt of such notice to investigate and correct the alleged breach by the tenant or advise the Association that a violation has not occurred.

(iii) If after 15 days the Association believes that the alleged breach is not cured or may be repeated, it may institute on its behalf or derivatively by the Co-owners on behalf of the Association, if it is under the control of the Developer, an action for eviction against the tenant or non-owner occupant and simultaneously for money damages in the same action against the Co-owner and tenant or non-owner occupant for breach of the conditions of the Condominium Documents. The relief provided for in this subparagraph may be by summary proceeding. The Association may hold both the tenant and the Co-owner liable for any damages to the General Common Elements caused by the Co-owner or tenant in connection with the dwelling/Unit or Condominium Project.

(4) When a Co-owner is in arrears to the Association for assessments, the Association may give written notice of the arrearage to a tenant occupying a Co-owner's dwelling/Unit under a lease or rental agreement and the tenant, after receiving the notice, shall deduct from rental payments due the Co-owner the arrearage and future assessments as they fall due and pay them to the Association. The deductions do not constitute a breach of the rental agreement or lease by the tenant. If the tenant, after being notified, fails or refuses to remit rent otherwise due the Co-owner to the Association, then the Association may do the following:

(a) Issue a statutory notice to quit for non-payment of rent to the tenant and shall have the right to enforce that notice by summary proceeding.

(b) Initiate proceedings pursuant to subsection (3)(iii).

Section 3. **Architectural Control**. All dwellings in the Condominium must be constructed by the Developer or a residential builder approved by the Developer. No building, structure or other improvement shall be constructed within a Condominium Unit or elsewhere within the Condominium Project, nor shall any exterior modification be made to any existing buildings, structure or improvement, nor any landscaping done, unless plans and specifications therefor, containing such detail as the Developer may reasonably request, have first been approved in writing by the Developer. Construction of any building or other improvements must also receive any necessary approvals from the local public authority. Developer shall have the right to refuse to approve any such plans or specifications, or grading or landscaping plans, which are not suitable or desirable in its opinion for aesthetic or other reasons; and in passing upon such plans and specifications it shall have the right to take into consideration the suitability of the proposed structure, improvement or modification, the site upon which it is proposed to be

constructed and the degree of harmony thereof with the Condominium as a whole. All residences constructed on a Unit shall contain at least the minimum square footage required at the time of construction by Green Oak Township, as well as satisfy all set back requirements of the Township.

Section 4. Alterations and Modifications of Improvements in Units and Common Elements. The written approval of the Board of Directors and, during the Development and Sales Period, also the written approval of the Developer, shall be obtained by a Co-owner prior to making alterations, modifications or changes in any of the buildings, structures, Units or Common Elements, Limited or General, including, without limitation, the erection of antennas of any sort (including antennas that are addressed in Section 15 below), lights, aerials, storm doors, awnings, newspaper holders, mailboxes, or other exterior attachments or modifications. All exterior paints and stains shall be consistent with a uniform color scheme adopted from time to time, by the Association. No Co-owner shall in any way restrict access to any utility line, or any other element that must be accessible to service the Common Elements or any element which affects an Association responsibility in any way. Developer and/or the Association shall respond to any request for approval of plans submitted under this Article VI, Section 4 within thirty (30) days after receipt of the same by Developer or the Association. If Developer or the Association fails to respond to such request within the thirty (30) day period, the request shall be deemed to be approved. If the Developer or the Association denies any such request for approval, the denial shall be in writing and shall state the reason for the denial. The foregoing notwithstanding, requests for modifications will not be considered if a Co-owner is delinquent with payment of the Co-owner's Association assessments.

Section 5. Activities. No immoral, improper, unlawful or offensive activity shall be carried on in any Unit or upon the Common Elements nor shall anything be done which may be or become an annoyance or a nuisance to the Co-owners of the Condominium. No unreasonably noisy activity shall occur in or on the Common Elements or in any Unit at any time and disputes among Co-owners, arising as a result of this provision which cannot be amicably resolved, shall be arbitrated by the Association. No Co-owner shall do or permit anything to be done or keep or permit to be kept in his Unit or on the Common Elements anything that will increase the rate of insurance on the Condominium without the written approval of the Association, and each Co-owner shall pay to the Association the increased cost of insurance premiums resulting from any such activity or the maintenance of any such condition even if approved. Activities which are deemed offensive and are expressly prohibited include, but are not limited to, the following: Any activity involving the use of firearms, air rifles, pellet guns, B-B guns, bows and arrows, or other similar dangerous weapons, projectiles or devices. Without limiting the scope or application of the foregoing, outdoor spotlights that shine into or otherwise illuminate the homes on surrounding Units shall be deemed to be nuisances, as shall outdoor horns, sirens or other noise making devises, whether attached to security systems or otherwise, which go off repeatedly or for an extended period of time. Each Unit Owner shall be responsible for their security systems with such noise making devices when the Unit Owner is not at the dwelling. No outdoor floodlights shall be permitted without the prior written approval of the Association and the prior written approval of the Developer during the Development and Sales Period.

Section 6. **Pets**. No animal may be kept or bred for any commercial purpose and shall have such care and restraint so as not to be obnoxious or offensive on account of noise, odor or unsanitary conditions. No animal may be permitted to run loose at any time upon the Common Elements and any animal shall at all times be leashed and attended by some responsible person while on the Common Elements. No savage or dangerous animal shall be kept and any Co-owner who causes any animal to be brought or kept upon the premises of the Condominium shall indemnify and hold harmless the Association for any loss, damage or liability which the Association may sustain as the result of the presence of such animal on the premises, whether or not the Association has given its permission therefor. Each Co-owner shall be responsible for collection and disposition of all fecal matter deposited by any pet maintained by such Co-owner. No dog whose barks can be heard on any frequent or continuing basis shall be kept in any Unit or on the Common Elements. The Association may charge all Co-owners maintaining animals a reasonable additional assessment to be collected in the manner provided in Article II of these Bylaws in the event that the Association determines such assessment necessary to defray the maintenance cost to the Association of accommodating animals within the Condominium. The Association shall have the right to require that any pets be registered with it and may adopt such additional reasonable rules and regulations with respect to animals as it may deem proper. In the event of any violation of this Section, the Association may assess fines for such violation in accordance with these Bylaws and in accordance with duly adopted rules and regulations of the Association.

Section 7. **Aesthetics**. The Common Elements shall not be used for storage of supplies, materials, personal property or trash or refuse of any kind, except as provided in duly adopted rules and regulations of the Association. In general, no activity shall be carried on nor condition maintained by a Co-owner, either in his Unit or upon the Common Elements, which is detrimental to the appearance of the Condominium. Without written approval by the Association and the prior written approval of the Developer during the Development and Sales Period, no Co-owner shall change in any way the exterior appearance of the residence and other improvements and appurtenances located within his Unit. Thus, in connection with any maintenance, repair, replacement, decoration or redecoration of such residence, improvements or appurtenances, no Co-owner shall modify the design, material or color of any such item including, without limitation, windows, doors, screens, roofs, siding or any other component which is visible from a Common Element or other Unit.

Section 8. **Vehicles**. No house trailers, commercial vehicles, boat trailers, boats, camping vehicles, camping trailers, motorcycles, all terrain vehicles, snowmobiles, snowmobile trailers or automobiles or vehicles other than those used primarily for general personal transportation purposes, may be parked or stored upon the Common Elements or Units unless parked inside a garage, provided that by doing so it does not require that an automobile or vehicle is parked in a driveway or road. Garage doors shall be kept closed when not in use. No inoperable vehicles of any type may be brought or stored upon the Condominium Premises either temporarily or permanently. Commercial vehicles and trucks shall not be parked in or about the Condominium (except as above provided) unless while making deliveries or pickups in the normal course of business. Overnight parking of vehicles on any street in the Condominium is prohibited except as the Association may make reasonable exceptions thereto from time to time. The Association shall have the right to place or cause to be placed adhesive windshield stickers on cars improperly parked and may also enable private towing of improperly

parked vehicles to off-premises locations, all without any liability on the part of the Association to the owners or user of any such improperly parked vehicles. The purpose of this Section is to accommodate reasonable Co-owner parking but to avoid unsightly conditions which may detract from the appearance of the Condominium as a whole. Use of motorized vehicles anywhere on the Condominium Premises, other than on the roads and driveways, is absolutely prohibited.

Section 9. Advertising. No signs or other advertising devices of any kind, including without limitation balloons and banners, shall be displayed either at the entrance to the Project or which are visible from the exterior of a Unit or on the Common Elements, including "For Sale" signs, without written permission from the Association and, during the Development and Sales Period, from the Developer.

Section 10. Rules and Regulations. It is intended that the Board of Directors of the Association may make rules and regulations from time to time to reflect the needs and desires of the majority of the Co-owners in the Condominium. Reasonable regulations consistent with the Act, the Master Deed and these Bylaws concerning the use of the Common Elements may be made and amended from time to time by any Board of Directors of the Association, including the first Board of Directors (or its successors) prior to the Transitional Control Date. Copies of all such rules, regulations and amendments thereto shall be furnished to all Co-owners.

Section 11. Right of Access of Association. The Association or its duly authorized agents shall have access to each Unit and any Limited Common Elements appurtenant thereto from time to time, during reasonable working hours, upon notice to the Co-owner thereof, as may be necessary to carry out any responsibilities imposed on the Association by the Condominium Documents. The Association or its agents shall also have access to Units and Limited Common Elements appurtenant thereto as may be necessary to respond to emergencies. The Association may gain access in such manner as may be reasonable under the circumstances and shall not be liable to such Co-owner for any necessary damage to his Unit and any Limited Common Elements appurtenant thereto caused thereby. This provision, in and of itself, shall not be construed to permit access to the interiors of dwellings or other structures.

Section 12. Driveways, Garages. All driveways shall be paved with either asphalt or concrete and shall be completed prior to occupancy unless delayed due to inclement weather or ground conditions, or other circumstances beyond the control of the Owner, in which case such work shall be completed as soon as practicable after occupancy. No gravel or unpaved driveways shall be permitted. All garages shall be attached to the dwelling located on the Unit.

Section 13. Swimming Pools, Hot Tubs, Equipment. No above ground pools shall be erected or maintained on any Unit or Common Element. In ground pools and hot tubs shall be permitted subject to the prior approval of the Association and, during the Development and Sales Period, the Developer. The hot tub and all mechanical and electrical equipment and other equipment associated with the hot tub, shall be enclosed or screened so as not to be visible from the outside of any building or structure in the Condominium. The appearance and materials of such enclosure or screening shall be in harmony with and compatible with the rest of the building or structure on the Unit.

Section 14. Fences. No fence, wall or hedge of any kind, including without limitation invisible fences, shall be erected or maintained on any Unit or Common Element without the prior approval of the Association and the Developer during the Development and Sales Period.

Section 15. Antennae, Satellite Dishes. No outside television antenna or other antenna, or aerial saucer, dish or similar device shall be placed, constructed, altered or maintained for a Unit on a General Common Element, unless the Association and the Developer during the Development and Sales Period, determine that the absence of an outside antenna within a General Common Element causes substantial hardship with respect to a particular Unit. Notwithstanding the foregoing, over the air reception devices (e.g. television antenna or satellite communications dishes not exceeding one meter in diameter) may be installed within a Unit subject to the reasonable requirements of Developer during the Development and Sales Period and the Association as set forth in the rule and regulations, and provided that the Co-owner is responsible for any damages or expense to the Common Elements or to the Association resulting from such installation.

Section 16. Dog Kennels. No dog kennels or runs or other enclosed shelters for animals shall be permitted.

Section 17. No Temporary Structures. No mobile home, trailer, house or camping trailer, tent, shack, tool storage shed, barn, tree house or other similar outbuilding or structure shall be utilized for residence purposes on any Unit at any time, either temporarily or permanently. Outside storage units used for storage purpose shall be permitted subject to the prior written approval of the Association and, during the Development and Sales Period, the Developer. Outside storage shall be screened with a privacy fence that conforms with the standards set forth in Sections 7 and 14 above, be comprised of an exterior finish material that is of the same type and quality of, and is in architectural harmony with, the residence located on the Unit and satisfies the Township's set back requirements. Outside storage units shall not exceed a perimeter of eight (8) feet by ten (10) feet or be more than nine (9) feet in height, shall be constructed on a concrete slab, and shall be located in the rear yards of Units but not within the side yard set back and not closer than ten (10) feet from the rear Unit line. All requisite Township permits shall be obtained after approved by the Association and, if required, approved by the Developer.

Section 18. Co-owner Maintenance. Each Co-owner shall maintain his Unit, dwelling located thereon and any Limited Common Elements appurtenant thereto for which he has maintenance responsibility in a safe, clean and sanitary condition. Each Co-owner shall also use due care to avoid damaging any of the Common Elements including, but not limited to, the telephone, water, gas, plumbing, electrical or other utility conduits and systems and any other Common Elements which are appurtenant to, or which may affect any other Unit. The painted surface of the exterior of all buildings in the Project shall be repainted not less than every seven years. The roof on all buildings shall also be reshingled as recommended by the manufacturer. Further, each Co-owner shall be responsible for damages or costs to the Association resulting from negligent damage to or misuse of any of the Common Elements by him, or his family, guests, agents or invitees, unless such damages or costs are covered by insurance carried by the Association (in which case there shall be no such responsibility, unless reimbursement to the Association is limited by virtue of a deductible provision, in which case the

responsible Co-owner shall bear the expense to the extent of the deductible amount). Each individual Co-owner shall indemnify the Association and all other Co-owners against such damages and costs, including attorneys fees, and all such costs or damages to the Association may be assessed to and collected from the responsible Co-owner in the manner provided in Article II hereof. Developer reserves for itself and the Association the right to enter upon any Unit not owned by Developer for the purpose of mowing, removing, clearing, cutting or pruning underbrush, weeds or other unsightly growth, or to abate any nuisance which in the opinion of Developer or the Association detracts from the overall beauty, setting, safety and enjoyment of the Project. Such entrance for the purpose of mowing, cutting, clearing or pruning shall not be deemed a trespass. Developer or the Association and its agents may likewise enter upon a Unit to remove any trash which has collected on such Unit without such entrance and removal being deemed a trespass. The provisions of this paragraph shall not be construed as an obligation on the part of Developer or the Association to mow, clear, cut or prune any Unit nor to provide garbage or trash removal services nor to abate any nuisance. All costs associated with the foregoing work shall be reimbursed pursuant to Section 20 below. The foregoing notwithstanding, except in the case of emergencies or extended absence or vacation of the Unit Owners, neither the Developer nor the Association shall take any action to abate a nuisance without first providing the Unit Owner with notice and reasonable opportunity to cure or remove such nuisance.

Section 19 Basketball Backboards and Flag Poles. All basketball backboards shall be properly maintained. No flagpoles shall be permitted within Units, on any of the improvements located within the Units, or on any of the General Common Elements, except that in accordance with Section 56a of the Act, a Co-owner is permitted to display a single United States flag of a size not greater than three feet by five feet anywhere on the exterior of the Co-owner's residence or Unit.

Section 20. Failure of Co-owner to Perform Maintenance Responsibilities. In the event a Co-owner fails to maintain, decorate, repair or replace any items for which it is responsible either to the standard established from time to time by the Association or in accordance with any of the restrictions set forth in the Condominium Documents, the Association (and/or the Developer during the Development and Sales Period) shall have the right, but not the obligation, to take whatever action or actions it deems desirable to so maintain, decorate, repair or replace any such improvements within a Unit, all at the expense of the Co-owner of the Unit. Such right shall be conditioned upon 10 days advance written notice to the Co-owner of the intention to take such action. Failure of the Association (or the Developer) to take any such action shall not be deemed a waiver of the Association's (or the Developer's) right to take any such action at a future time nor shall the Developer or the Association be liable to any Co-owner or any other person for failure to take any such action. The Developer and the Association shall have easements in furtherance of the rights accorded them hereunder as set forth in Article X, Section 2 of the Master Deed and no exercise of such rights shall be deemed to be a trespass or other infringement of the rights of any Co-owner, lessee or other person and shall not render the Developer or the Association liable to any person whatsoever on account of such exercise. All costs incurred by the Association or the Developer in performing any responsibilities under the Condominium Documents which are required in the first instance to be borne by any Co-owner shall be assessed against such Co-owner and shall be due and payable with his regular assessment installment next falling due; further, the lien for non-payment shall

attach as in all cases of regular assessments and such assessments may be enforced by the use of all means available to the Association under the Condominium Documents and by law for the collection of regular assessments including, without limitation, legal action, foreclosure of the lien securing payment and imposition of fines. Any costs becoming assessable hereunder shall include not only the direct costs of such maintenance, repair or replacement but shall also include such reasonable indirect costs as are determined, in the discretion of the assessing party, to have been incurred by it in taking such action.

Section 21. Reserved Rights of Developer.

(a) Prior Approval by Developer. During the Development and Sales Period, no buildings, fences, walls, retaining walls, drives, walks or other structures or improvements shall be commenced, erected, maintained, nor shall any addition to, or change or alteration to any structure be made (including in color or design), nor shall any hedges, trees or substantial plantings or landscaping modifications be made, until plans and specifications, acceptable to the Developer, showing the nature, kind, shape, height, materials, color scheme, location and approximate cost of such structure or improvement and the grading or landscaping plan of the area to be affected shall have been submitted to and approved in writing by Developer, its successors or assigns, and a copy of said plans and specifications, as finally approved, lodged permanently with the Developer. The Developer shall have the right to refuse to approve any such plan or specifications, or grading or landscaping plans which are not suitable or desirable in its opinion for aesthetic or other reasons; and in passing upon such plans, specifications, grading or landscaping, it shall have the right to take into consideration the suitability of the proposed structure, improvement or modification, the site upon which it is proposed to effect the same, and the degree of harmony thereof with the Condominium as a whole. The purpose of this Section is to assure that drainage patterns established by Developer are not altered by the Co-owner or his landscape architect, and to assure the continued maintenance of the Condominium as a beautiful and harmonious residential development and shall be binding upon both the Association and upon all Co-owners.

(b) Developer's Rights in Furtherance of Development and Sales. None of the restrictions contained in this Article VI shall apply to the commercial activities or signs or billboards, if any, of the Developer during the Development and Sales Period or of the Association in furtherance of its powers and purposes set forth herein and in its Articles of Incorporation, as the same may be amended from time to time. Notwithstanding anything to the contrary elsewhere herein contained, Developer shall have the right to maintain a sales office, at least two (2) trailers for either marketing or construction purposes, model units, advertising display signs, storage areas and reasonable parking incident to the foregoing, storage are for maintaining construction equipment in a part of the General Common Element area for new construction purposes and for maintenance of the Project, and such access to, from and over the Project as may be reasonable to enable development and sale of the entire Project by the Developer. It may continue to do so during the entire Development and Sales Period and may continue to do so even after the conclusion of the Development and Sales Period for so long as Developer continues to construct or owns or holds title or an option or other enforceable interest in land for development as condominiums within two

miles from the perimeter of the Condominium Project. Developer shall also have the right to maintain or conduct on the Condominium Premises any type of promotional activity it desires, including the erection of any and all kinds of temporary facilities relative to the marketing and promotion of the Project.

(c) **Enforcement of Bylaws**. The Condominium Project shall at all times be maintained in a manner consistent with the highest standards of a beautiful, serene, private, residential community for the benefit of the Co-owners and all persons interested in the Condominium. The Developer shall have the right to enforce these Bylaws throughout the Development and Sales Period which right of enforcement shall include (without limitation) an action to restrain the Association or any Co-owner from any activity prohibited by these Bylaws.

Section 22. General. The purpose of this Article VI is to assure the continued maintenance of the Condominium as a beautiful and harmonious residential development and shall be binding upon all Co-owners. The Developer may, in its sole discretion, waive any part of the restrictions set forth in this Article VI due to unusual topographic, natural or aesthetic considerations or other circumstances which the Developer deems compelling. Any such waiver must be in writing and shall be limited to the Unit to which it pertains and shall not constitute a waiver as to enforcement of the restrictions as to any other Unit. Developer's rights under this Article VI may, in Developer's discretion, be assigned to the Association or other successor to Developer. Developer may construct any improvements upon the Condominium Premises that it may, in its sole discretion, elect to make without the necessity of prior consent from the Association or any other person or entity, subject only to the express limitations contained in the Condominium Documents.

Section 23. Department of Veterans Affairs Financing. To the extent that any provision set forth in the Master Deed or these Bylaws regarding leasing or a right of first refusal is inconsistent with the requirement(s) of guaranteed or direct loan programs of the United States Department of Veterans Affairs, as set forth in chapter 37 of title 38, United States Code, or part 36 of title 38, Code of Federal Regulations ("DVA Financing"), such provision shall not apply to any Unit that is:

(i) encumbered by DVA Financing or,
(ii) owned by the Department of Veterans Affairs.

Section 24. Livingston County Health Department Requirements.

a. All wells must be owned and maintained by individual Co-owners.

b. There shall be no future subdividing of any Units, which would utilize individual water supply systems and the community sewage treatment system.

c. The wells and septic mains shall be in the exact area as indicated on the preliminary site plan. There shall be no deviations to these locations due to the potential of making neighboring Units within this development un-buildable. In the future and ensuring the approvals included in this letter; if for any reason modifications to the originally approved

community septic area, including septic mains are considered necessary a written request along with an application for soil evaluation and the associated fees shall be submitted to Livingston County Health Department for review and approvals.

d. All wells shall be drilled by a Michigan licensed well driller and be drilled to a depth that will penetrate a minimum of a 10 ft. impervious clay layer and/or shall maintain a minimum of 50 ft. from the static water level to the bottom of the casing or top of the screen in an unconfined formation.

e. The water softener and/or water conditioning discharge waters shall not be connected or discharged into the onsite sewage disposal system.

f. Units 1- 37 will be serviced by a community septic system. The community system has been designed to accommodate the wastewater flows from these residences.

g. Occupancy of any homes being constructed on Units 1 - 37 shall not be approved until the central septic system and sanitary lines have been constructed and approved in accordance with engineer design specifications.

h. The central septic system must be installed in accordance with the design engineer specifications and certification must be given that the system was installed in accordance with the approved plans prior to the issuance of any permits on Units 1 - 37.

i. Units 1-37 as part of the community septic will have individual septic tanks, pump chambers, pumps and controls. Both the septic tank and pump chamber shall be certified watertight by the manufacturer once set in place.

j. The individual Unit Co-owners shall be responsible for the maintenance and repair of their individual potable water supply.

k. The reserve septic location as designated on the preliminary plan on file at the Livingston County Health Department must be maintained vacant and accessible for future sewage disposal uses.

l.. There shall be no underground utility lines located within the areas designated as active and reserve septic system areas.

m. There shall be no activity within the regulated wetlands unless permits have been obtained from EGLE.

The above restrictions set forth in this Section 24 run in perpetuity and may only be waived by the Livingston County Health Department

ARTICLE VII

MORTGAGES

Section 1. **Notice to Association.** Any Co-owner who mortgages his Unit shall notify the Association of the name and address of the mortgagee, and the Association shall maintain such information in a book entitled "Mortgages of Units". The Association may, at the written request of a mortgagee of any such Unit, report any unpaid assessments due from the Co-owner of such Unit. The Association shall give to the holder of any first mortgage covering any Unit in the Project written notification of any default in the performance of the obligations of the Co-owner of such Unit that is not cured within 60 days.

Section 2. **Insurance.** The Association, if required by the mortgagee, shall notify each mortgagee appearing in the book entitled "Mortgagees of Units", of the name of each company insuring the Condominium against fire, perils covered by extended coverage, and vandalism and malicious mischief and the amounts of such coverage. In addition, the Association shall give each mortgagee, mortgage insurer and the guarantor of any mortgage on any Unit in the Condominium a timely written notice of any lapse, cancellation or material modification of any insurance policy maintained by the Association.

Section 3. **Notification of Meetings.** Upon request submitted to the Association, any institutional holder of a first mortgage lien on any Unit in the Condominium shall be entitled to receive written notification of every meeting of the members of the Association and to designate a representative to attend such meeting.

Section 4. **Notification of Foreclosure.** The mortgagee of a first mortgage on a Unit shall give notice of foreclosure to the Association pursuant to Section 108(9) of the Act.

ARTICLE VIII

VOTING

Section 1. **Vote**. Except as limited in these Bylaws, each Co-owner shall be entitled to one vote for each Condominium Unit owned. In the event of a tie vote, the President of the Association shall be entitled to cast the tie breaking vote.

Section 2. **Eligibility to Vote**. No Co-owner, other than the Developer, shall be entitled to vote at any meeting of the Association until he has presented evidence of ownership of a Unit in the Condominium Project to the Association. Except as provided in Article XI, Section 2 of these Bylaws, no Co-owner, other than the Developer, shall be entitled to vote prior to the date of the First Annual Meeting of members held in accordance with Section 2 of Article IX. The vote of each Co-owner may be cast only by the individual representative designated by such Co-owner in the notice required in Section 3 of this Article VIII below or by a proxy given by such individual representative. The Developer shall be the only person entitled to vote at a meeting of the Association until the First Annual Meeting of members and shall be entitled to vote during such period notwithstanding the fact that the Developer may own no Units at some time or from time to time during such period. At and after the First Annual Meeting the Developer shall be entitled to one vote for each Unit which it owns.

Section 3. **Designation of Voting Representative**. Each Co-owner shall file a written notice with the Association designating the individual representative who shall vote at

meetings of the Association and receive all notices and other communications from the Association on behalf of such Co-owner. Such notice shall state the name and address of the individual representative designated, the number or numbers of the Condominium Unit or Units owned by the Co-owner, and the name and address of each person, firm, corporation, partnership, association, trust or other entity who is the Co-owner. Such notice shall be signed and dated by the Co-owner. The individual representative designated may be changed by the Co-owner at any time by filing a new notice in the manner herein provided. The Association shall maintain a certified list of all designated voting representatives listed by Unit numbers. Further, the Association shall produce the list of designated voting representatives at all meetings; post the list during meetings, including posting by electronic means if the meeting is conducted solely by remote communication.

Section 4. **Quorum**. The presence in person or by proxy of thirty-five (35) percent of Unit Co-owners qualified to vote shall constitute a quorum for holding a meeting of the members of the Association, except for voting on questions specifically required by the Condominium Documents to require a greater quorum. The written vote and the electronic vote of any person furnished at or prior to any duly called meeting at which meeting said person is not otherwise present in person or by proxy shall be counted in determining the presence of a quorum with respect to the question upon which the vote is cast. All Co-owners participating by remote communication shall be counted towards quorum.

Section 5. **Voting**. Votes may be cast only in person or by a writing duly signed by the designated voting representative not present at a given meeting in person or by proxy. Proxies and any written votes must be filed with the Secretary of the Association at or before the appointed time of each meeting of the members of the Association. Cumulative voting shall not be permitted. Proxies must be in writing signed by the designated voting representative and any written votes, intention to participate remotely and any electronic votes, must be filed with the secretary of the Association at or before the appointed time of each meeting of the members of the Association.
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Section 6. **Majority**. A majority, except where otherwise provided herein, shall consist of more than fifty percent (50%) of those qualified to vote and present in person or by proxy (or written vote, if applicable) or by electronic vote at a given meeting of the members of the Association. Whenever provided specifically herein, a majority may be required to exceed the simple majority hereinabove set forth of designated voting representatives.

ARTICLE IX

MEETINGS

Section 1. **Place of Meeting**. Meetings of the Association shall be held at the principal office of the Association or at such other suitable place convenient to the Co-owners as may be designated by the Board of Directors. Meetings of the Association shall be conducted in accordance with Sturgis' Code of Parliamentary Procedure, Roberts Rules of Order or some other generally recognized manual of parliamentary procedure, when not otherwise in conflict with the Condominium Documents (as defined in the Master Deed) or the laws of the State of Michigan.

Section 2. **First Annual Meeting**. The First Annual Meeting of members of the Association may be convened only by the Developer and may be called at any time after more than 50% of the Units that may be created in Dove Lake have been conveyed and the purchasers thereof qualified as members of the Association. In no event, however, shall such meeting be called later than 120 days after the conveyance of legal or equitable title to non-developer Co-owners of 75% of all Units that may be created or 54 months after the first conveyance of legal or equitable title to a non-developer Co-owner of a Unit in the Project, whichever first occurs. Developer may call meetings of members for informative or other appropriate purposes prior to the First Annual Meeting of members and no such meeting shall be construed as the First Annual Meeting of members. The date, time and place of such meeting shall be set by the Board of Directors, and at least 10 days' written notice thereof shall be given to each Co-owner. The phrase "Units that may be created" as used in this paragraph and elsewhere in the Condominium Documents refers to the maximum number of Units which the Developer is permitted under the Condominium Documents to include in the Condominium.

Section 3. **Annual Meetings**. Annual meetings of members of the Association shall be held in the month of October, or as otherwise determined by the Board of Directors, at such time and place as shall be determined by the Board of Directors; provided, however, that the second annual meeting shall not be held sooner than 8 months after the date of the First Annual Meeting. At such meetings there shall be elected by ballot of the Co-owners a Board of Directors in accordance with the requirements of Article XI of these Bylaws. The Co-owners may also transact at annual meetings such other business of the Association as may properly come before them.

Section 4. **Special Meetings**. It shall be the duty of the President to call a special meeting of the Co-owners as directed by resolution of the Board of Directors or upon a petition signed by not less than 1/3 of the Co-owners presented to the Secretary of the Association. Notice of any special meeting shall state the time and place of such meeting and the purposes thereof. No business shall be transacted at a special meeting except as stated in the notice.

Section 5. **Notice of Meetings**. It shall be the duty of the Secretary (or other Association officer in the Secretary's absence) to serve a notice of each annual or special meeting, stating the purpose thereof as well as the time and place where it is to be held, upon each Co-owner of record, at least 10 days but not more than 60 days prior to such meeting. The mailing, postage prepaid or by electronic transmission, of a notice to the representative of each Co-owner at the address shown in the notice required to be filed with the Association by Article VIII, Section 3 of these Bylaws shall be deemed notice served. Any member may, by written waiver of notice signed by such member, waive such notice, and such waiver, when filed in the records of the Association, shall be deemed due notice.

Section 6. **Adjournment**. If any meeting of Co-owners cannot be held because a quorum is not in attendance, the Co-owners who are present may adjourn the meeting to a time not less than 48 hours from the time the original meeting was called.

Section 7. **Order of Business**. The order of business at all meetings of the members shall be as follows: (a) roll call to determine the voting power represented at the meeting; (b) proof of notice of meeting or waiver of notice; (c) reading of minutes of preceding meeting; (d) reports of officers; (e) reports of committees; (f) appointment of inspectors of election (at annual meetings or special meetings held for the purpose of electing Directors or

officers); (g) election of Directors (at annual meeting or special meetings held for such purpose); (h) unfinished business; and (i) new business meetings of members shall be chaired by the most senior officer of the Association present at such meeting. For purposes of this Section, the order of seniority of officers shall be President, Vice President, Secretary and Treasurer.

Section 8. **Action Without Meeting**. Any action which may be taken at a meeting of the members (except for the election or removal of Directors) may be taken without a meeting by written ballot of the members. Ballots shall be solicited in the same manner as provided in Section 5 for the giving of notice of meetings of members. Such solicitations shall specify (a) the number of responses needed to meet the quorum requirements; (b) the percentage of approvals necessary to approve the action; and (c) the time by which ballots must be received in order to be counted. The form of written ballot shall afford an opportunity to specify a choice between approval and disapproval of each matter and shall provide that, where the member specifies a choice, the vote shall be cast in accordance therewith. Approval by written ballot shall be constituted by receipt, within the time period specified in the solicitation, of (i) a number of ballots which equals or exceeds the quorum which would be required if the action were taken at a meeting; and (ii) a number of approvals which equals or exceeds the number of votes which would be required for approval if the action were taken at a meeting at which the total number of votes cast was the same as the total number of ballots cast.

Section 9. **Consent of Absentees**. The transactions at any meeting of members, either annual or special, however called and noticed, shall be as valid as though made at a meeting duly held after regular call and notice, if a quorum is present either in person or by proxy; and if, either before or after the meeting, each of the members not present in person or by proxy, signs a written waiver of notice, or a consent to the holding of such meeting, or an approval of the minutes thereof. All such waivers, consents or approvals shall be filed with the corporate records or made a part of the minutes of the meeting.

Section 10. **Minutes; Presumption of Notice**. Minutes or a similar record of the proceedings of meetings of members, when signed by the President or Secretary, shall be presumed truthfully to evidence the matters set forth therein. A recitation in the minutes of any such meeting that notice of the meeting was properly given shall be prima facie evidence that such notice was given.

Section 11. **Remote Communications.** Co-owners may participate in meetings of members of the Association by telephone conferencing or other remote communication provided that all members present at the meeting are advised of the means of remote communication and the following are met:

(a) the identity of the person communicating remotely can be verified.

(b) measures are in place so that the remote caller is able to participate in and hear the proceedings.

(c) votes or action by means of remote communication are recorded.

If the person participating remotely could have voted at the original meeting, then voting remotely at any adjourned meeting is also possible.

Section 12. Electronic Voting. Electronic voting is permitted.

ARTICLE X

ADVISORY COMMITTEE

Within 1 year after conveyance of legal or equitable title to the first Unit in the Condominium to a purchaser or within 120 days after conveyance to purchasers of 1/3 of the Units that may be created, whichever first occurs, the Developer shall cause to be established an Advisory Committee consisting of at least 3 non-developer Co-owners. The Committee shall be established and perpetuated in any manner the Developer deems advisable, except that if more than 50% of the non-developer Co-owners petition the Board of Directors for an election to select the Advisory Committee, then an election for such purpose shall be held. The purpose of the Advisory Committee shall be to facilitate communications between the temporary Board of Directors and the other Co-owners and to aid in the transition of control of the Association from the Developer to purchaser Co-owners. A chairman of the committee shall be selected by the members. The Advisory Committee shall cease to exist automatically when the non-developer Co-owners have the voting strength to elect a majority of the Board of Directors of the Association. The Developer may remove and replace at its discretion at any time any member of the Advisory Committee who has not been elected thereto by the Co-owners.

ARTICLE XI

BOARD OF DIRECTORS

Section 1. Number and Qualification of Directors, The Board of Directors shall be comprised of three members. All Directors must be members of the Association or officers, partners, trustees, employees or agents of members of the Association, except for the first Board of Directors. Directors shall serve without compensation.

Section 2. Election of Directors.

(a) First Board of Directors. The first Board of Directors, or its successors as selected by the Developer, shall manage the affairs of the Association until the appointment of the first non-developer Co-owners to the Board. Thereafter elections for non-developer Co-owner Directors shall be held as provided in subsections (b) and (c) below. The terms of office shall be two years. The Directors shall hold office until their successors are elected and hold their first meeting.

(b) Appointment of Non-developer Co-owners to Board Prior to First Annual Meeting. Not later than 120 days after conveyance of legal or equitable title to non-developer Co-owners of 25% of the Units that may be created, one of the Directors shall be selected by non-developer Co-owners. When the required percentage level of

conveyance has been reached, the Developer shall notify the non-developer Co-owners so that the Co-owners may elect the required Director. If the Board is enlarged to five members, then not later than 120 days after conveyance of legal or equitable title to non-developer Co-owners of 50% in number of the Units that may be created, two of the five directors shall be elected by non-developer Co-owners. When the required percentage level of conveyance has been reached, the Developer shall notify the non-developer Co-owners so that the Co-owners may elect the required Director. Upon certification by the Co-owners to the Developer of the Director so selected, the Developer shall then immediately appoint such Director to the Board to serve until the First Annual Meeting of members unless he is removed pursuant to Section 7 of this Article or he resigns or becomes incapacitated. Additional non-developer Co-owners may also be elected to the Board or removed therefrom at the Developer's pleasure.

(c) Election of Directors at and After First Annual Meeting.

(i) Not later than 120 days after conveyance of legal or equitable title to non-developer Co-owners of seventy-five (75%) percent of the Units that may be created, the non-developer Co-owners shall elect all Directors on the Board, except that the Developer shall have the right to designate at least one Director as long as it owns at least ten (10%) percent of the Units in the Project. Such Developer designee, if any, shall be one of the total number of Directors referred to in Section 1 above and shall serve a one-year term pursuant to subsection (iv) below. Whenever the required conveyance level is achieved, a meeting of Co-owners shall be promptly convened to effectuate this provision, even if the First Annual Meeting has already occurred.

(ii) Regardless of the percentage of Units which have been conveyed, upon the expiration of 54 months after the first conveyance of legal or equitable title to a non-developer Co-owner of a Unit in the Project, the non-developer Co-owners have the right to elect a number of members of the Board of Directors equal to the percentage of Units they own, and the Developer has the right to elect a number of members of the Board of Directors equal to the percentage of Units which are owned by the Developer and for which all assessments are payable by the Developer. This election may increase, but shall not reduce, the minimum election and designation rights otherwise established in subsection (i). Application of this subsection does not require a change in the size of the Board of Directors.

(iii) If the calculation of the percentage of members of the Board of Directors that the non-developer Co-owners have the right to elect under subparagraph (ii), or if the product of the number of members of the Board of Directors multiplied by the percentage of Units held by the non-developer Co-owners under subsection (b) results in a right of non-developer Co-owners to elect a fractional number of members of the Board of Directors, then a fractional election right of 0.5 or greater shall be rounded up to the nearest whole number, which number shall be the number of members of the Board of Directors that the non-developer Co-owners have the right to elect. After application of this formula the Developer shall have the right to elect the remaining members of the Board

of Directors. Application of this subsection shall not eliminate the right of the Developer to designate 1 Director as provided in subparagraph (i).

(iv) At the First Annual Meeting two Directors shall be elected for a term of two years and one Director shall be elected for a term of one year (depending on the total number of Directors on the Board). At such meeting all nominees shall stand for election as one slate and the two persons receiving the highest number of votes shall be elected for a term of two years and the one person receiving the next highest number of votes shall be elected for a term of one year. At each annual meeting held thereafter, one, two or three Directors shall be elected depending upon the number of Directors whose terms expire. After the First Annual Meeting, the term of office, (except for either one (or two) of the Directors elected at the First Annual Meeting, of each Director shall be two years. The Directors shall hold office until their successors have been elected and hold their first meeting.

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(v) Once the Co-owners have acquired the right hereunder to elect a majority of the Board of Directors, annual meetings of Co-owners to elect Directors and conduct other business shall be held in accordance with the provisions of Article IX, Section 3 hereof.

Section 3. **Powers and Duties**. The Board of Directors shall have the powers and duties necessary for the administration of the affairs of the Association and may do all acts and things as are not prohibited by the Condominium Documents or required thereby to be exercised and done by the Co-owners.

Section 4. **Other Duties**. In addition to the foregoing duties imposed by these Bylaws or any further duties which may be imposed by resolution of the members of the Association, the Board of Directors shall be responsible specifically for the following:

(a) To manage and administer the affairs of and to maintain the Condominium Project and the General Common Elements thereof.

(b) To levy and collect assessments from the members of the Association and to use the proceeds thereof for the purposes of the Association.

(c) To carry insurance and collect and allocate the proceeds thereof.

(d) To rebuild improvements after casualty.

(e) To contract for and employ persons, firms, corporations or other agents to assist in the management, operation, maintenance and administration of the Condominium Project.

(f) To acquire, maintain and improve; and to buy, operate, manage, sell, convey, assign, mortgage or lease any real or personal property (including any Unit in the Condominium and easements, rights-of-way and licenses) on behalf of the Association in furtherance of any of the purposes of the Association.

(g) To borrow money and issue evidences of indebtedness in furtherance of any or all of the purposes of the Association, and to secure the same by mortgage, pledge, or other lien on property owned by the Association; provided, however, that any such action shall also be approved by affirmative vote of 75% of all of the members of the Association qualified to vote.

(h) To make rules and regulations in accordance with Article VI, Section 10 of these Bylaws.

(i) To establish such committees as it deems necessary, convenient or desirable and to appoint persons thereto for the purpose of implementing the administration of the Condominium and to delegate to such committees any functions or responsibilities which are not by law, or the Condominium Documents required to be performed by the Board.

(j) To enforce the provisions of the Condominium Documents.

Section 5. **Management Agent**. The Board of Directors may employ for the Association a professional management agent (which may include the Developer or any person or entity related thereto) at reasonable compensation established by the Board to perform such duties and services as the Board shall authorize, including, but not limited to, the duties listed in Sections 3 and 4 of this Article, and the Board may delegate to such management agent any other duties or powers which are not by law or by the Condominium Documents required to be performed by or have the approval of the Board of Directors or the members of the Association. In no event shall the Board be authorized to enter into any contract with a professional management agent, or any other contract providing for services by the Developer, sponsor or builder, in which the maximum term is greater than 3 years or which is not terminable by the Association upon 90 days written notice thereof to the other party and no such contract shall violate the provisions of Section 55 of the Act.

Section 6. **Vacancies**. Vacancies in the Board of Directors which occur after the Transitional Control Date caused by any reason other than the removal of a Director by a vote of the members of the Association shall be filled by vote of the majority of the remaining Directors, even though they may constitute less than a quorum, except that the Developer shall be solely entitled to fill the vacancy of any Director whom it is permitted in the first instance to designate. Each person so elected shall be a Director until a successor is elected at the next annual meeting of the members of the Association. Vacancies among non-developer Co-owner elected Directors which occur prior to the Transitional Control Date may be filled only through election by non-developer Co-owners and shall be filled in the manner specified in Section 2(b) of this Article.

Section 7. **Removal**. At any regular or special meeting of the Association duly called with due notice of the removal action proposed to be taken, any one or more of the Directors may be removed with or without cause by the affirmative vote of more than 50% of all of the Co-owners qualified to vote and a successor may then and there be elected to fill any vacancy thus created. The quorum requirement for the purpose of filling such vacancy shall be the normal 35% requirement set forth in Article VIII, Section 4 and shall not be reduced. Any Director whose removal has been proposed by the Co-owners shall be given an opportunity to

be heard at the meeting. The Developer may remove and replace any or all of the Directors selected by it at any time or from time to time in its sole discretion. Likewise, any Director selected by the non-developer Co-owners to serve before the First Annual Meeting may be removed before the First Annual Meeting in the same manner set forth in this paragraph for removal of Directors generally.

Section 8. **First Meeting**. The first meeting of a newly elected Board of Directors shall be held within 10 days of election at such place as shall be fixed by the Directors at the meeting at which such Directors were elected, and no notice shall be necessary to the newly elected Directors in order legally to constitute such meeting, providing a majority of the whole Board shall be present.

Section 9. **Regular Meetings**. Regular meetings of the Board of Directors may be held at such times and places as shall be determined from time to time by a majority of the Directors, but at least two such meetings shall be held during each fiscal year. Notice of regular meetings of the Board of Directors shall be given to each Director personally, by mail, telephone or telegraph, at least 10 days prior to the date named for such meeting.

Section 10. **Special Meetings**. Special meetings of the Board of Directors may be called by the President on 3 days notice to each Director given personally, by mail, telephone or telegraph, which notice shall state the time, place and purpose of the meeting. Special meetings of the Board of Directors shall be called by the President or Secretary in like manner and on like notice on the written request of two Directors.

Section 11. **Waiver of Notice**. Before or at any meeting of the Board of Directors, any Director may, in writing, waive notice of such meeting and such waiver shall be deemed equivalent to the giving of such notice. Attendance by a Director at any meetings of the Board shall be deemed a waiver of notice by him of the time and place thereof. If all the Directors are present at any meeting of the Board, no notice shall be required and any business may be transacted at such meeting.

Section 12. **Quorum**. At all meetings of the Board of Directors, a majority of the Directors shall constitute a quorum for the transaction of business, and the acts of the majority of the Directors present at a meeting at which a quorum is present shall be the acts of the Board of Directors. If, at any meeting of the Board of Directors, there be less than a quorum present, the majority of those present may adjourn the meeting to a subsequent time upon 24 hours prior written notice delivered to all Directors not present. At any such adjourned meeting, any business which might have been transacted at the meeting as originally called may be transacted without further notice. The joinder of a Director in the action of a meeting by signing and concurring in the minutes thereof, shall constitute the presence of such Director for purposes of determining a quorum. All Directors participating by remote communications shall be counted towards the quorum.

Section 13. **First Board of Directors**. The actions of the first Board of Directors of the Association or any successors thereto selected or elected before the Transitional Control Date shall be binding upon the Association so long as such actions are within the scope of the powers and duties which may be exercised generally by the Board of Directors as provided in the Condominium Documents.

Section 14. **Fidelity Bonds**. The Board of Directors shall require that all officers and employees of the Association handling or responsible for Association funds shall furnish adequate fidelity bonds. The premiums on such bonds shall be expenses of administration.

Section 15. **Civil Actions**. The Association has the authority to commence civil actions on behalf of the Co-owners subject to the prior approval of no less than a 60 percent (60%) of the Unit Owners; provided, however, the Board of Directors of the Association shall be permitted, acting upon a majority vote of the Board, to bring a civil action to enforce the following: (i) provisions of the Condominium Master Deed and Bylaws and (ii) payment of assessments against and from the Co-owners. All civil actions requiring the approval of the Co-owners shall first be reviewed by the Board of Directors to evaluate its merit. A special meeting of the Co-owners shall be held for the purpose of voting on whether or not to proceed with the litigation. A special assessment to fund any such litigation will also require the approval of no less than a Majority of the Unit Owners. Each member of the Association shall have the right to enforce the provisions of this Section 15.

Section 16. **Remote Communications.** Board of directors may participate in meetings of directors by telephone conferencing or other remote communication provided that all directors present at the meeting are advised of the means of remote communication and the following are met:

(1) the identity of the person communicating remotely can be verified.

(2) measures are in place so that the remote caller is able to participate in and hear the proceedings.

(3) votes or action by means of remote communication are recorded.

If the person participating remotely could have voted at the original meeting, then voting remotely at any adjourned meeting is also possible.

Section 17. **Electronic Voting.** Electronic voting is permitted.

ARTICLE XII

OFFICERS

Section 1. **Officers**. The principal officers of the Association shall be a President, who shall be a member of the Board of Directors, a Vice President, a Secretary and a Treasurer. The Directors may appoint an Assistant Treasurer, and an Assistant Secretary, and such other officers as in their judgment may be necessary. Any two offices except that of President and Vice President may be held by one person.

(a) **President**. The President shall be the chief executive officer of the Association. He shall preside at all meetings of the Association and of the Board of Directors. He shall have all of the general powers and duties which are usually vested in the office of the President of an association, including, but not limited to, the power to appoint committees from among the members of the Association from time to time as he may in his discretion deem appropriate to assist in the conduct of the affairs of the Association.

(b) Vice President. The Vice President shall take the place of the President and perform his duties whenever the President shall be absent or unable to act. If neither the President nor the Vice President is able to act, the Board of Directors shall appoint some other member of the Board to so do on an interim basis. The Vice President shall also perform such other duties as shall from time to time be imposed upon him by the Board of Directors.

(c) Secretary. The Secretary shall keep the minutes of all meetings of the Board of Directors and the minutes of all meetings of the members of the Association; he shall have charge of the corporate seal, if any, and of such books and papers as the Board of Directors may direct; and he shall, in general, perform all duties incident to the office of the Secretary.

(d) Treasurer. The Treasurer shall have responsibility for the Association's funds and securities and shall be responsible for keeping full and accurate accounts of all receipts and disbursements in books belonging to the Association. He shall be responsible for the deposit of all monies and other valuable effects in the name and to the credit of the Association, and in such depositories as may, from time to time, be designated by the Board of Directors.

Section 2. Election. The officers of the Association shall be elected annually by the Board of Directors at the organizational meeting of each new Board and shall hold office at the pleasure of the Board.

Section 3. Removal. Upon affirmative vote of a majority of the members of the Board of Directors, any officer may be removed either with or without cause, and his successor elected at any regular meeting of the Board of Directors, or at any special meeting of the Board called for such purpose. No such removal action may be taken, however, unless the matter shall have been included in the notice of such meeting. The officer who is proposed to be removed shall be given an opportunity to be heard at the meeting.

Section 4. Duties. The officers shall have such other duties, powers and responsibilities as shall, from time to time, be authorized by the Board of Directors.

ARTICLE XIII

SEAL

The Association may (but need not) have a seal. If the Board determines that the Association shall have a seal, then it shall have inscribed thereon the name of the Association, the words "corporate seal", and "Michigan".

ARTICLE XIV

FINANCE

Section 1. **Records**. The Association shall keep detailed books of account showing all expenditures and receipts of administration which shall specify the maintenance and repair expenses of the General Common Elements and any other expenses incurred by or on behalf of the Association and the Co-owners. Such accounts and all other Association records shall be open for inspection by the Co-owners and their mortgagees during reasonable working hours. The Association shall prepare and distribute to each Co-owner at least once a year a financial statement, the contents of which shall be defined by the Association. Except if opted out, as permitted by the Act, by a majority of the Co-owners on an annual basis by vote conducted in the manner provided in Article VIII above, the books, records, and financial statements shall be independently audited or reviewed by a certified public accountant, as defined in Section 720 of the Occupational Code, 1980 PA 299, as amended from time to time. Any institutional holder of a first mortgage lien on any Unit in the Condominium shall be entitled to receive a copy of such annual audited financial statement within 90 days following the end of the Association's fiscal year upon request therefor. The costs of any audit and accounting expenses shall be expenses of administration.

Section 2. **Fiscal Year**. The fiscal year of the Association shall be an annual period commencing on such date as may be initially determined by the Directors. The commencement date of the fiscal year shall be subject to change by the Directors for accounting reasons or other good cause.

Section 3. **Bank**. Funds of the Association shall be initially deposited in such bank or savings association as may be designated by the Directors and shall be withdrawn only upon the check or order of such officers, employees or agents as are designated by resolution of the Board of Directors from time to time. The funds may be invested from time to time in accounts or deposit certificates of such bank or savings association as are insured by the applicable federal deposit insurer and may also be invested in interest bearing obligations of the United States Government.

ARTICLE XV

LIMITATION AND ASSUMPTION OF LIABILITY OF VOLUNTEERS; INDEMNIFICATION

Section 1. **Limitation of Liability of Volunteers.** No Director or officer of the Association who is a volunteer Director or volunteer officer (as these terms are defined in the Michigan Non-Profit Corporation Act) of the Association shall be personally liable to the Association or its members for monetary damages for any action taken or any failure to take any action as a volunteer Director or officer except for liability arising from: (a) The amount of a financial benefit received by a director or volunteer officer to which he or she is not entitled; (b) Intentional infliction of harm on the corporation, its shareholders, or members; (c) A violation of section 551 of the Michigan Non-Profit Corporation Act; (d) An intentional criminal act; and, (e) A liability imposed under section 497(a) of the Michigan Non-Profit Corporation Act. If the Michigan Non-Profit Corporation Act hereafter is amended to authorize the further elimination or limitation of the liability of directors or officers, then the liability of a director or officer of the corporation, in addition to the limitation on personal liability contained herein, shall be limited to the fullest extent permitted by the amended Michigan Non-Profit Corporation Act. No amendment or repeal of this Section 1 shall apply to or have any effect on the liability of any

director or officer of the corporation for or with respect to any acts or omissions of such director or officer occurring prior to such amendment or repeal.

Section 2. **Assumption of Liability of Volunteers.** The Association further assumes liability for all acts or omissions of a volunteer Director, volunteer officer or other volunteer if all of the following are met: (a) the volunteer was acting or reasonably believed he or she was acting within the scope of his or her authority; (b) the volunteer was acting in good faith; (c) the volunteer's conduct did not amount to gross negligence or willful and wanton misconduct; (d) the volunteer's conduct was not an intentional tort; and (e) the volunteer's conduct was not a tort arising out of the ownership, maintenance, or use of a motor vehicle for which tort liability may be imposed as provided in Section 3135 of the Insurance Code of 1956, Act No. 218 of Michigan Public Acts of 1956.

Section 3. **Indemnification of Volunteers.** The Association shall also indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending, or completed action, suit, or proceeding, whether civil, criminal, administrative, or investigative, and whether formal or informal, other than an action by or in the right of the Association, by reason of the fact that the person is or was a volunteer Director, volunteer officer, or nondirector volunteer of the Association, against all expenses including attorney's fees, judgments, penalties, fines, and amounts paid in settlement actually and reasonably incurred by the person in connection with the action, suit, or proceeding if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the Association or its members, and with respect to any criminal action or proceeding, if the person had no reasonable cause to believe that the conduct was unlawful. In the event of any claim for indemnification hereunder based upon a settlement by the volunteer Director, volunteer officer, or nondirector volunteer seeking such indemnification, the indemnification herein shall apply only if the Board of Directors (with any Director seeking indemnification abstaining) approves such settlement and indemnification as being in the best interest of the corporation. The indemnification and advancement of expenses provided by or granted pursuant to this Article shall not be deemed exclusive of any other rights to which those seeking indemnification or advancement or expenses may be entitled under the Articles of Incorporation, the Bylaws, contractual agreement, or otherwise by law and shall continue as to a person who has ceased to be a volunteer Director or volunteer officer or nondirector volunteer of the corporation and shall inure to the benefit of the heirs, executors, and administrators of such person. At least ten (10) days prior to payment of any indemnification which it has approved, the Board of Directors shall notify all members thereof. The Association shall maintain insurance coverage to cover indemnification payments made pursuant to this Article XV to the extent such insurance coverage is available.

ARTICLE XVI

AMENDMENTS

Section 1. **Proposal**. Amendments to these Bylaws may be proposed by the Board of Directors of the Association acting upon the vote of the majority of the Directors or may be proposed by one third (1/3) or more of the Unit Co-owners by instrument in writing signed by them.

Section 2. **Meeting**. Upon any such amendment being proposed, a meeting for consideration of the same shall be duly called in accordance with the provisions of these Bylaws.

Section 3. **Voting**. These Bylaws may be amended by the Co-owners at any regular annual meeting or a special meeting called for such purpose by an affirmative vote of not less than 66 2/3 % of all Unit Co-owners. No consent of mortgagees shall be required to amend these Bylaws except as otherwise provided in Section 90a of the Act. No amendment to these Bylaws prior to expiration of the Development and Sales Period may be adopted or implemented without the written consent of the Developer.

Section 4. **By Developer**. Prior to expiration of the Development and Sales Period, these Bylaws may be unilaterally amended by the Developer without approval from any other person so long as any such amendment does not materially alter or change the right of a Co-owner or mortgagee

Section 5. **When Effective**. Any amendment to these Bylaws shall become effective upon recording of such amendment in the office of the Livingston County Register of Deeds.

Section 6. **Binding**. A copy of each amendment to the Bylaws shall be furnished to every member of the Association after adoption; provided, however, that any amendment to these Bylaws that is adopted in accordance with this Article shall be binding upon all persons who have an interest in the Project irrespective of whether such persons actually receive a copy of the amendment.

ARTICLE XVII

DEFINITIONS

All terms used herein shall have the same meaning as set forth in the Master Deed to which these Bylaws are attached as an Exhibit or as set forth in the Act.

ARTICLE XVIII

COMPLIANCE

The Association and all present or future Co-owners, tenants, future tenants, or any other persons acquiring an interest in or using the Project in any manner are subject to and shall comply with the Act, as amended, and the mere acquisition, occupancy or rental of any Unit or an interest therein or the utilization of or entry upon the Condominium Premises shall signify that the Condominium Documents are accepted and ratified. In the event the Condominium Documents conflict with the provisions of the Act, the Act shall govern.

ARTICLE XIX

REMEDIES FOR DEFAULT

Any default by a Co-owner shall entitle the Association or another Co-owner or Co-owners to the following relief:

Section 1. **Legal Action**. Failure to comply with any of the terms or provisions of the Condominium Documents shall be grounds for relief, which may include, without intending to limit the same, an action to recover sums due for damages, injunctive relief, foreclosure of lien (if default in payment of assessment) or any combination thereof, and such relief may be sought by the Association or, if appropriate, by an aggrieved Co-owner or Co-owners.

Section 2. **Recovery of Costs**. In any proceeding arising because of an alleged default by any Co-owner, the Association, if successful, shall be entitled to recover the costs of the proceeding and such reasonable attorney's fees (not limited to statutory fees) as may be determined by the court, but in no event shall any Co-owner be entitled to recover such attorney's fees.

Section 3. **Removal and Abatement**. The violation of any of the provisions of the Condominium Documents shall also give the Association or its duly authorized agents the right, in addition to the rights set forth above, to enter upon the Common Elements or into any Unit (but not into any dwelling or related garage), where reasonably necessary, and summarily remove and abate, at the expense of the Co-owner in violation, any structure, thing or condition existing or maintained contrary to the provisions of the Condominium Documents. The Association shall have no liability to any Co-owner arising out of the exercise of its removal and abatement power authorized herein.

Section 4. **Assessment of Fines**. The violation of any of the provisions of the Condominium Documents by any Co-owner shall be grounds for assessment by the Association, acting through its duly constituted Board of Directors, of monetary fines for such violations. No fine may be assessed unless in accordance with the provisions of Article XX hereof.

Section 5. **Non-waiver of Right**. The failure of the Association or of any Co-owner to enforce any right, provision, covenant or condition which may be granted by the Condominium Documents shall not constitute a waiver of the right of the Association or of any such Co-owner to enforce such right, provision, covenant or condition in the future.

Section 6. **Cumulative Rights, Remedies and Privileges**. All rights, remedies and privileges granted to the Association or any Co-owner or Co-owners pursuant to any terms, provisions, covenants or conditions of the aforesaid Condominium Documents shall be deemed to be cumulative and the exercise of any one or more shall not be deemed to constitute an election of remedies, nor shall it preclude the party thus exercising the same from exercising such other and additional rights, remedies or privileges as may be available to such party at law or in equity.

Section 7. **Enforcement of Provisions of Condominium Documents**. A Co-owner may maintain an action against the Association and its officers and Directors to compel such persons to enforce the terms and provisions of the Condominium Documents. In such a proceeding, the Association, if successful, shall recover the costs of the proceeding and

reasonable attorney fees, as determined by the court. A Co-owner may maintain an action against any other Co-owner for injunctive relief or for damages or any combination thereof for noncompliance with the terms and provisions of the Condominium Documents or the Act.

ARTICLE XX

ASSESSMENT OF FINES

Section 1. **General**. The violation by any Co-owner, occupant or guest of any provisions of the Condominium Documents including any duly adopted rules and regulations shall be grounds for assessment by the Association, acting through its duly constituted Board of Directors, of monetary fines against the involved Co-owner. Such Co-owner shall be deemed responsible for such violations whether they occur as a result of his personal actions or the actions of his family, guests, tenants or any other person admitted through such Co-owner to the Condominium Premises.

Section 2. **Procedures**. Upon any such violation being alleged by the Board, the following procedures will be followed:

(a) **Notice**. Notice of the violation, including the Condominium Document provision violated, together with a description of the factual nature of the alleged offense set forth with such reasonable specificity as will place the Co-owner on notice as to the violation, shall be sent by first class mail, postage prepaid, or personally delivered to the representative of said Co-owner at the address as shown in the Notice required to be filed with the Association pursuant to Article VIII, Section 3 of these Bylaws. The Co-owner shall have fourteen (14) days from delivery of the notice to correct the violation.

(b) **Opportunity to Defend**. The offending Co-owner shall have an opportunity to appear before the Board and offer evidence in defense of the alleged violation. The appearance before the Board shall be at its next scheduled meeting but in no event shall the Co-owner be required to appear less than l0 days from the date of the Notice. The offending Co-owner may, at his option, elect to forego the appearance as provided herein by delivery of a written response to the Board.

(c) **Default**. Failure to respond to the Notice of Violation constitutes a default.

(d) **Hearing and Decision**. Upon appearance by the Co-owner before the Board and presentation of evidence of defense, or, in the event of the Co-owner's default, the Board shall, by majority vote of a quorum of the Board, decide whether a violation has occurred and shall notify the Co-owner within ten (10) days of its decision. The Board's decision is final.

(e) **Subsequent Notices.** If a violation exists fourteen (14) days following the prior notice, then an additional notice requesting compliance within fourteen (14) days shall be delivered to the Co-owner in the same manner set forth in sub-paragraph (a) above.

Section 3. **Amounts**. Upon violation of any of the provisions of the Condominium Documents or after occurrence of the same violation within three (3) months of notice of the same violation, the following fines shall be levied:

(a) **First Violation**. No fine shall be levied.

(b) **Second Violation**. Fifty Dollars ($50.00) fine.

(c) **Third Violation**. One Hundred Fifty Dollars ($150.00) fine.

(d) **Fourth Violation and Subsequent Violations**. Two Hundred Dollars ($200.00) fine.

Section 4. **Collection**. The fines levied pursuant to Section 3 above shall be assessed against the Co-owner and shall be due and payable together with the regular Condominium assessment on the first of the next following month. Failure to pay the fine will subject the Co-owner to all liabilities set forth in the Condominium Documents including, without limitation, those described in Article II and Article XIX of the Bylaws.

Section 5. **Developer Exempt from Fines.** The Association shall not be entitled to assess fines against the Developer during the Development and Sales Period for any alleged violations of the Condominium Documents but shall be remitted solely to its other legal remedies for redress of such alleged violations.

ARTICLE XXI

RIGHTS RESERVED TO DEVELOPER

Any or all of the rights and powers granted or reserved to the Developer in the Condominium Documents or by law, including the right and power to approve or disapprove any act, use, or proposed action or any other matter or thing, may be assigned by it to any other entity or to the Association. Any such assignment or transfer shall be made by appropriate instrument in writing in which the assignee or transferee shall join for the purpose of evidencing its consent to the acceptance of such powers and rights and such assignee or transferee shall thereupon have the same rights and powers as herein given and reserved to the Developer. Any rights and powers reserved or retained by Developer, or its successors shall expire and terminate, if not sooner assigned to the Association, at the conclusion of the Development and Sales Period as defined in Article III of the Master Deed. The immediately preceding sentence dealing with the expiration and termination of certain rights and powers granted or reserved to the Developer is intended to apply, insofar as the Developer is concerned, only to the Developer's rights to approve and control the administration of the Condominium and shall not, under any circumstances, be construed to apply to or cause the termination and expiration of any real property rights granted or reserved to the Developer or its successors and assigns in the Master Deed or elsewhere (including, but not limited to, access easements, utility easements and all other easements created and reserved in such documents which shall not be terminable in any manner hereunder and which shall be governed only in accordance with the terms of their creation or reservation and not hereby).

ARTICLE XXII

SEVERABILITY

In the event that any of the terms, provisions or covenants of these Bylaws or the Condominium Documents are held to be partially or wholly invalid or unenforceable for any reason whatsoever, such holding shall not affect, alter, modify or impair in any manner whatsoever any of the other terms, provisions or covenants of such documents or the remaining portions of any terms, provisions or covenants held to be partially invalid or unenforceable.

CES
CIVIL ENGINEERING SOLUTIONS, Inc.

July 10, 2025

Green Oak Charter Township
10001 Silver Lake Road
Brighton, MI 48116

ATTN: Ms. Debra McKenzie, Planning & Zoning Administrator

RE: Dove Lake PUD – 1st Condo Doc Review – Revise & Resubmit
CES #2020-0036

Dear Ms. McKenzie,

Civil Engineering Solutions, Inc. has completed the 1st Condo Doc Review for the above-referenced project. The documents were received by our office via email on June 26, 2025. We note the following items.

Master Deed

1. Article II: The legal description needs to be inserted.
2. Article IV: Section 1j – The heading of this section should read 21AA Gravel Trail.
3. Article IV: Section 1m – Private Road: Exhibit B shall be provided.
4. Article IV: Section 3a (iii) – It is suggested that additional language is included that discharge of ground water and connection of sump pump discharges to the sanitary sewer system is prohibited.
5. Article IX: Section 8 – Easement for safety path: The following language should be added: A separate easement document on Township Standard form shall be provided. The easement shall also be depicted on exhibit B drawings.
6. Article IX: Section 9 – Easement for Boat Ramp: Exhibit C shall be provided.
7. Article X: Section 3a – Roads: The Township Attorney should evaluate this section to determine if future maintenance is adequately addressed.

Bylaws

1. Article VI: Section 18 – It is suggested that additional language is included that discharge of ground water and connection of sump pump discharges to the sanitary sewer system is prohibited.

Exhibit B

1. Exhibit B drawings were not included but shall be provided.

Revised documents should be provided for review.

1150 Corporate Office Drive, Suite 210, Milford, MI 48381 o: 248.264.6906 f: 810-448-5903

CES
CIVIL ENGINEERING SOLUTIONS, Inc.

Please contact us with any questions or concerns. We may be reached at (248) 264-6906.

Sincerely,
CIVIL ENGINEERING SOLUTIONS, INC.

Rick Miner, P.E.
Project Manager

encl: stamped condo docs

cc: Mark St. Charles, Township Supervisor, via email
Kevin Gentry, Fire Chief, via email
Paul Montagno and Michelle Marin, Carlisle-Wortman, via email
Kristen Kolb & Matt Zalewski, Township Attorneys, via email
Mike Powell, P.E., Powell Engineering & Associates, via email
Thomas Schroder, Cornerstone Residential Group, via email

1150 Corporate Office Drive, Suite 210, Milford, MI 48381 o: 248.264.6906 f: 810-448-5903

PRIVATE ROAD EASEMENT AND MAINTENANCE AGREEMENT

This Private Road Easement and Maintenance Agreement ("Agreement"), made the 25th day of January, 2025, by and between [LIST ALL HOMEOWNERS AND ADDRESSES/PARCEL I.D. NUMBERS/UNIT NUMBERS] (collectively "Parcel Owners"):

RECITALS

A. The Parcel Owners constitute all of the persons having an interest as title holders of the parcels of land described on the attached Exhibit A ("Subject Property"). Exhibit B ("private easment")

B. All of the above Subject Property borders upon and is serviced by the improved private roadway(s) known as Dove Lake Drive and Schroder Drive ("Private Road).

C. The Parcel Owners desire to provide for improvement, maintenance, and repair of the Private Road and the Easement, and to make such provisions binding upon themselves and upon all subsequent owners of the Subject Property.

D. The Private Road and the Easement is located in Green Oak Charter Township , Livingston County, State of Michigan, and is more particularly described on the attached Exhibit B.

NOW, THEREFORE, in consideration of the mutual obligations, promises and covenants set forth in this Agreement, the Parcel Owners agree as follows:

1. Ingress and egress to and from the Subject Property shall be by means of the Private Road as described herein and said ingress and egress shall be in common. None of the Parcel Owners may disassociate a particular parcel's right to use the Private Road by separate conveyance.

2. This Agreement shall prohibit any individual with any interest in any individual parcel from restricting or interfering with the normal ingress and egress of other property owners, their families, guests, invitees, tradespeople, and other traveling to or leaving any of the properties served by the Private Road.

3. The Private Road and Easement shall be maintained, repaired, and improved by the Parcel Owners in the manner and proportions set forth below. For purposes of this Agreement, maintenance, repairs, and improvements shall include, but are not limited to:

8. The Private Road and Easement described in this Agreement shall at all times be maintained, repaired, replaced, and resurfaced as necessary so as to allow satisfactory, unrestricted access by emergency vehicles, as determined by Green Oak Charter Township in its sole discretion. If the Parcel Owners or their successors and/or assigns, fail to maintain, repair, replace, or resurface the Private Road or Easement as required by this Agreement, the Township may serve written notice of such failure upon them. The notice shall be sent to the Parcel Owners at the last address shown on the property tax assessment records of the Township. Such written notice shall contain a demand that the deficiencies of maintenance, repair, replacement, or resurfacing be cured within a stated period of time. If such deficiencies are not cured, the Township is authorized to enter onto any of the property described in Exhibit A and undertake such maintenance, repair, replacements, or resurfacing. The cost thereof, plus an administrative fee of 25% of the cost thereof, shall be due and owing from the Parcel Owners or their successors and/or assigns, within thirty (30) days of billing. If these amounts are not paid, then the Township shall have a lien against the lot owners of Exhibit A in the amount of the costs described in this paragraph, which lien may be enforced in the manner provided by Michigan law for foreclosure of mortgages by advertisement or collected as a special assessment on the next annual Township tax roll, or by a separate suit for collection, or any combination of these remedies, at the discretion of the Township.

9. Notwithstanding any other provision contained in this Agreement, the foregoing easements, licenses, rights and privileges are granted to the Township and its officers, employees, and agents with respect to the Private Road. These easements, licenses, rights, and privileges shall not be modified or rescinded without the express written permission of the Township.

10. To the fullest extent permitted by law, the Parcel Owners and their heirs, representatives and assigns agree to defend, pay on behalf of, indemnify and hold harmless Green Oak Charter Township, its elected and appointed officials, employees and others working on behalf of the Township (herein collectively "Township") against any and all claims, demands, suits or loss, including all costs connected therewith, actual attorney fees and any damages which may be asserted, claimed or recovered against or from the Township by reason of personal injury, including bodily injury or death and/or property damage which arises out of, or is in any way connected or associated with, the road, except for any acts of the Township, its employees, contractors or agents that may be deemed to be intentional misconduct or gross negligence.

11. The obligation to maintain the Private Road and Easement shall be an obligation running with the land to be served by the Private Road and Easement, binding on owner(s) of such land and their heirs, successors, and assigns. All existing and future property owners served by the road shall be required to endorse this Agreement, thereby acknowledging that the road surface and easement are privately owned and that all construction and maintenance within the easement shall be contracted and paid for by said property owners.

12. This Agreement shall be recorded at the office of the Livingston County Register of Deeds.

13. This Agreement may be executed in one or more counterparts.

14. This Agreement will be governed by the laws of the State of Michigan.

This Agreement has been executed on the date underneath the respective signatures.

(Signatures to follow)

PARCEL OWNER:

TNS – DOVE LAKE ESTATES LLC.

By: THOMAS N SCHRODER
Its: MANGER
Dated: 1-13-25

ACKNOWLEDGMENT

STATE OF MICHIGAN)
) ss
COUNTY OF OAKLAND)

On this 13 day of January, 2025, Thomas Schroder appeared before me and did acknowledge that he/she signed this Private Road Agreement for Parcel ID: 16-13-200-017

Joseph Scanlon, Notary Public
Livingston County, Michigan
Acting in Oakland County, Michigan
My Commission Expires: 01-04-2031

Joseph Scanlon
Notary Public, State of Michigan
County of Livingston
My Commission Expires 01/04/2031
Acting in the County of Oakland

PARCEL OWNER:

DOVE LAKE ESTATES LLC.

By: THOMAS N SCHRODER
Its: MANGER
Dated: 1-13-25

ACKNOWLEDGMENT

STATE OF MICHIGAN)
) ss
COUNTY OF)

On this ____ day of _____, 20___, _____ appeared before me and did acknowledge that he/she signed this Private Road Agreement for Parcel ID: _____

_____

, Notary Public
_____ County, Michigan
Acting in _____ County, Michigan
My Commission Expires: _____

ADD SIGNATURES AND NOTARIES FOR ALL PROPERTY OWNERS

Drafted by/Return to:

Leslie Zawada, P.E.
Civil Engineering Solutions, Inc.
1150 Corporate Office Drive
Suite 210
Milford, MI 48381

a. Surface grading and resurfacing at regular intervals.

b. Snow and ice removal.

c. Repair of potholes.

d. Maintenance of road drainage systems.

e. Maintenance of unobstructed vision at any intersection with another private road or with a public road.

f. Regular cutting of weeds and grass within the easement.

g. Annual dust control.

h. Other improvements necessary to maintain driver and pedestrian safety and to keep the road in good physical condition at all times.

4. The Parcel Owners shall be responsible for and pay the proportionate cost of maintaining the road with each parcel described on Exhibit A bearing an equal share. New users shall be charged for a proportionate share of the cost of maintenance and improvements, whether the new users are a result of: (1) extension of the private road beyond its initial length, or (2) connection to another road, or (3) providing access to existing abutting properties. The apportionment of costs shall be based on the principle that each property having access to the road derives equal benefit from the road.

5. Each Parcel Owner shall bear at his/her own expense any cost of repairing the roadway caused by "Extraordinary Use" related to their parcel. "Extraordinary Use" includes, but is not limited to, construction equipment, grading of property that impacts drainage, moving vans, or increased usage not associated with normal residential or vehicular traffic.

6. At all times, the obligations and rights under this Agreement shall run with the land and shall bind the Parcel Owners, their successors, personal representatives, and assigns.

7. An easement for ingress and egress is hereby created over the Private Road in favor of Green Oak Charter Township and any other public agency for the purpose of: (a) providing police, fire, rescue, emergencies, and other lawful governmental services; (b) ingress, egress, inspection for public purposes, and access to utility easements, including, but not limited to, water, sanitary sewer, storm water sewer, electric, gas and communications easements; (c) construction, extension, relocation, maintenance, repair, replacement and removal of utilities, including, but not limited to, water, sanitary sewer, storm water sewer, electric, gas and communications utilities; and (d) to install, maintain, repair, replace, or remove machinery or equipment connected to the public sewer system or public water system, including, but not limited to, water main lines, grinder pumps, and valves.

Exhibit B

"Be Sure of Your Ground"

Garlock-Smith

PROFESSIONAL SURVEYORS
4655 OAK GROVE ROAD
HOWELL, MI 48855
GARLOCKSMITH@COMCAST.NET
(517) 546-3340

"MISSING" PIECE OF ROADWAY

COMMENCING AT THE NORTH 1/4 CORNER OF SECTION 13, T1N, R6E, GREEN OAK TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN; THENCE S02°59'17"E 740.27 FEET ALONG THE NORTH-SOUTH 1/4 LINE OF SAID SECTION 13 AS PREVIOUSLY SURVEYED AND MONUMENTED; THENCE N44°10'54"W 815.70 FEET ALONG THE NORTHEASTERLY LINE OF "KENSINGTON COURT", A 100.00 FOOT WIDE PRIVATE ROAD EASEMENT AS RECORDED IN LIBER 1122 OF DEEDS ON PAGE 599 IN THE OFFICE OF THE REGISTER OF DEEDS FOR LIVINGSTON COUNTY, MICHIGAN FOR A PLACE OF BEGINNING; THENCE S49°30'11"W 100.21 FEET; THENCE N44°10'54"W 459.87 FEET ALONG THE SOUTHWESTERLY LINE OF SAID "KENSINGTON COURT" TO THE SOUTHWESTERLY CORNER OF SAID "KENSINGTON COURT" AS SHOW ON THE PLAT OF "KENSINGTON PINES INDUSTRIAL PARK" AS RECORDED IN LIBER 30 OF PLATS ON PAGES 6-11 IN THE OFFICE OF THE REGISTER OF DEEDS FOR LIVINGSTON COUNTY, MICHIGAN; THENCE N45°49'06"E 100.00 FEET ALONG THE SOUTHEASTERLY LINE OF SAID "KENSINGTON COURT" AS DEPICTED ON SAID PLAT; THENCE S44°10'54"E 466.31 FEET ALONG THE NORTHEASTERLY LINE OF SAID "KENSINGTON COURT" TO THE PLACE OF BEGINNING. CONTAINING 1.06 ACRES OF LAND, MORE OR LESS AND BEING SUBJECT TO AND TOGETHER WITH THE USE OF EASEMENTS AND RESTRICTIONS AS PREVIOUSLY RECORDED.

Civil Engineering Solutions, Inc.
1150 Corporate Office Drive
Suite 210
Milford, MI 48381
Revise and Resubmit

COMPLETED JUL 1 0 2025
1ST Review.
CES #2020-0036

DOVE LAKE

MASTER DEED

This Master Deed is made and executed on this ____ day of ____, 2025, by Dove Lake, LLC, a Michigan limited liability company, hereinafter referred to as the "Developer", whose post office address is 13757 12 Mile Rd., South Lyon, Michigan 48178, in pursuance of the provisions of the Michigan Condominium Act (being Act 59 of the Public Acts of 1978, as amended).

WHEREAS, the Developer desires by recording this Master Deed, together with the Bylaws attached hereto as Exhibit A and the Condominium Subdivision Plan attached hereto as Exhibit B (both of which are hereby incorporated herein by reference and made a part hereof), to establish the real property described in Article II below, together with the improvements located and to be located thereon, and the appurtenances thereto, as a residential Condominium Project under the provisions of the Act.

NOW, THEREFORE, the Developer does, upon the recording hereof, establish Dove Lake as a residential Condominium Project under the Act and does declare that Dove Lake shall, after such establishment, be held, conveyed, hypothecated, encumbered, leased, rented, occupied, improved, or in any other manner utilized, subject to the provisions of the Act, and to the covenants, conditions, restrictions, uses, limitations and affirmative obligations set forth in this Master Deed, the Bylaws and the Condominium Subdivision Plan, all of which shall be deemed to run with the land and shall be a burden and a benefit to the Developer and any persons acquiring or owning an interest in the Condominium Premises and their respective successors and assigns. In furtherance of the establishment of the Condominium Project, it is provided as follows:

ARTICLE I

TITLE AND NATURE

The Condominium Project shall be known as Dove Lake, Livingston County Condominium Subdivision Plan No._____. The Condominium Project is established in

accordance with the Act. The Units contained in the Condominium, including the number, boundaries, dimensions and area of each Unit therein, are set forth completely in the Condominium Subdivision Plan attached as Exhibit B hereto. Each Unit is a separate building site, designed to contain a single residence and other improvements for dwelling purposes and each Unit is capable of individual utilization on account of having its own entrance from and exit to either a General Common Element of the Condominium Project or a public right of way. Each Co-owner in the Condominium Project shall have an exclusive right to his Unit and shall have undivided and inseparable rights to share with other Co-owners the Common Elements of the Condominium Project.

ARTICLE II

LEGAL DESCRIPTION

The land which is submitted to the Condominium Project established by this Master Deed is described as follows:

Land located in Green Oak Township, Livingston County, Michigan described as:

[PHASE 1 LEGAL DESCRIPTION IS NEEDED]

Together with and subject to all easements and restrictions of record and governmental limitations. Developer further reserves herein the right to extract minerals, oil, gas, timber, water, and/or other natural occurring resources under the surface of the land described in this Article II, or portions thereof.

ARTICLE III

DEFINITIONS

Certain terms are utilized not only in this Master Deed and Exhibits A and B hereto, but are or may be used in various other instruments such as, by way of example and not limitation, the Articles of Incorporation and rules and regulations of Dove Lake Association, a Michigan non-profit corporation, and deeds, mortgages, liens, land contracts, easements and other instruments affecting the establishment of, or transfer of, interests in Dove Lake as a condominium. Wherever used in such documents or any other pertinent instruments, the terms set forth below shall be defined as follows:

Section 1. Act. The "Act" means the Michigan Condominium Act, being Act 59 of the Public Acts of 1978, as amended.

Section 2. Association. "Association" means Dove Lake Association, which is the non-profit corporation organized under Michigan law of which all Co-owners shall be members, which corporation shall administer, operate, manage and maintain the Condominium.

Section 3. Bylaws. "Bylaws" means Exhibit A hereto, being the Bylaws setting forth

the substantive rights and obligations of the Co-owners and required by Section 3(9) of the Act to be recorded as part of the Master Deed. The Bylaws shall also constitute the corporate bylaws of the Association as provided for under the Michigan Nonprofit Corporation Act.

Section 4. Common Elements. "Common Elements", where used without modification, means both the General and Limited Common Elements described in Article IV hereof.

Section 5. Condominium Documents. "Condominium Documents" means and includes this Master Deed and Exhibits A and B hereto, and the Articles of Incorporation and rules and regulations, if any, of the Association, as all of the same may be amended from time to time.

Section 6. Condominium Premises. "Condominium Premises" means and includes the land described in Article II above, all improvements and structures thereon, and all easements, rights and appurtenances belonging to Dove Lake as described above.

Section 7. Condominium Project, Condominium or Project. "Condominium Project", "Condominium" or "Project" each mean Dove Lake as a Condominium Project established in conformity with the Act.

Section 8. Condominium Subdivision Plan. "Condominium Subdivision Plan" means Exhibit B hereto.

Section 9. Co-owner or Owner. "Co-owner" means a person, firm, corporation, partnership, association, trust or other legal entity or any combination thereof who or which owns one or more Units in the Condominium Project. The term "Owner", wherever used, shall be synonymous with the term "Co-owner".

Section 10. Consolidating Master Deed. "Consolidating Master Deed" means the final amended Master Deed which shall describe Dove Lake as a completed Condominium Project and shall reflect the entire land area in the Condominium that may be added to the Condominium from time to time under Article VII hereof, and all Units and Common Elements therein, and which shall express percentages of value pertinent to each Unit as finally readjusted. Such Consolidating Master Deed, if and when recorded in the office of the Livingston County Register of Deeds, shall supersede the previously recorded Master Deed for the Condominium and all amendments thereto. In the event the Units and Common Elements in the Condominium are established in substantial conformance with the proposed Condominium Subdivision Plan attached as Exhibit B to the Master Deed, the Developer shall be able to satisfy the foregoing obligation by the filing of a certificate in the office of the Livingston County Register of Deeds confirming that the Units and Common Elements "as built" are in substantial conformity with the proposed Condominium Subdivision Plan and no Consolidating Master Deed need be recorded.

Section 11. Developer. "Developer" means Dove Lake, LLC, a Michigan limited liability company, which has made and executed this Master Deed, and its successors and assigns. Both successors and assigns shall always be deemed to be included within the term "Developer" whenever, however and wherever such term is used in the Condominium Documents. Developer as used herein shall not, however, include the term "Successor Developer" as defined in Section 135 of the Act.

Section 12. Development and Sales Period. "Development and Sales Period", for

the purposes of the Condominium Documents and the rights reserved to the Developer thereunder, means the period commencing with the recording of the Master Deed and continuing as long as the Developer (i) owns any Unit which it offers for sale, (ii) there remains any residence to be constructed on Units that it owns, or (iii) it owns or holds an option or other enforceable purchase interest in land for residential development within a five (5) mile radius of the Condominium Premises, whichever last occurs.

Section 13. First Annual Meeting. "First Annual Meeting" means the initial meeting at which non-developer Co-owners are permitted to vote for the election of all Directors and upon all other matters which properly may be brought before the meeting. Such meeting is to be held (a) in the Developer's sole discretion after 50% of the Units which may be created are sold, or (b) mandatorily within (i) 54 months from the date of the first Unit conveyance, or (ii) 120 days after 75% of all Units which may be created are sold, whichever first occurs.

Section 14. Sewer Agency. "Sewer Agency" means Dove Lake Wastewater Treatment Authority, LLC, a Michigan limited liability company, or its successors and assigns, which is the entity that owns and is responsible for the community septic system serving the Project.

Section 15. Township. "Township" shall mean Green Oak Charter Township, a Michigan charter township.

Section 16. Transitional Control Date. "Transitional Control Date" means the date on which a Board of Directors of the Association takes office pursuant to an election in which the votes which may be cast by eligible Co-owners unaffiliated with the Developer exceed the votes which may be cast by the Developer.

Section 17. Unit or Condominium Unit. "Unit" or "Condominium Unit" each mean the space constituting a complete single Unit in Dove Lake, as the same is described in Article V, Section 1 hereof and on Exhibit B hereto, and shall have the same meaning as the term "Condominium Unit" as defined in the Act. All structures and improvements now or hereafter located within the boundaries of a Unit shall be owned in their entirety by the Co-owner of the Unit within which they are located and shall not, unless otherwise expressly provided in the Condominium Documents, constitute Common Elements.

Whenever any reference herein is made to one gender, the same shall include a reference to any and all genders where the same would be appropriate; similarly, whenever a reference is made herein to the singular, a reference to the plural shall also be included where the same would be appropriate and vice versa.

ARTICLE IV

COMMON ELEMENTS

The Common Elements of the Project and the respective responsibilities for maintenance, decoration, repair or replacement thereof, are as follows:

Section 1. General Common Elements. The General Common Elements are:

(a) **Land.** The land described in Article II hereof, other than that portion thereof identified either as Units or Limited Common Elements.

(b) **Electrical.** The electrical transmission mains throughout the Project up to the point of lateral connection for Unit service, together with common lighting for the Project, if any is installed.

(c) **Telephone.** The telephone system throughout the Project up to the ancillary connection for Unit service.

(d) **Gas.** The gas distribution mains throughout the Project up to the point of lateral connection for Unit service.

(e) **Community Septic System.** The community septic system throughout the Project up to the point of lateral connection to a Unit.

(f) **Telecommunications/Fiber Optic Service.** The telecommunications system and/or fiber optic service throughout the Project, if and when it may be installed, up to the point of the ancillary connection for Unit service.

(g) **Storm Water Management System.** The storm water management system throughout the project, which includes all areas containing drainage facilities and the detention and retention ponds, and infiltration trenches within the Project.

(h) **Entrance Area.** The entrance area, including the entry-way sign for the Project.

(i) **Dove Lake**. That portion of Dove Lake depicted on Exhibit B as General Common Element.

(j) **Gravel Trail**. The meandering trail throughout the Condominium.

(k) **Short Term Boat Parking Lot**. The boat parking lot meant for short term boat and trailer parking.

(l) **Boat Ramp**. The boat ramp located between Units 1 and 2 in the Condominium to provide boat for access to Dove Lake.

(m) **Private Road**. The private road depicted on Exhibit B attached._

(n) **Other.** Such other elements of the Project not herein designated as General or Limited Common Elements which are not enclosed within the boundaries of a Unit, and which are intended for common use or are necessary to the existence, upkeep and safety of the Project.

Section 2. Limited Common Elements. Limited Common Elements shall be subject to the exclusive use and enjoyment of the Owner or Owners of the Unit to which the Limited Common Elements are assigned. The Limited Common Elements are as follows:

(a) **Utilities.** The leads for the gas distribution system, the electrical

transmission, telephone, cable, telecommunications, sanitary sewer system, and storm sewer servicing an individual Unit, are each Limited Common Elements, limited in use to the Unit served thereby.

(b) Wells. The on-site well installed to serve each individual Unit is a Limited Common Element, limited in use to the Unit served thereby.

Section 3. Responsibilities. The respective responsibilities for the maintenance, decoration, repair and replacement of the Common Elements are as follows:

(a) Co-owner Responsibilities

(i) Units and Limited Common Elements. It is anticipated that separate residential dwellings will be constructed within the Units depicted on Exhibit B. Except as otherwise expressly provided, the responsibility for, and the costs of maintenance, decoration, repair and replacement of any dwelling and appurtenance to each shall be borne by the Co-owner of the Unit which is served thereby; provided, however, that the exterior appearance of such dwellings and Units, to the extent visible from any other Unit or Common Element in the Project, as well as the use and appearance of all yard areas, shall be subject at all times to the prior approval of the Association and, further, that all exterior maintenance shall be subject to and in accordance with Article VI, Section 18 of the Bylaws. In connection with any amendment made by the Developer pursuant to Article VI hereof, Developer may designate Limited Common Elements that are to be maintained, decorated, repaired and replaced at Co-owner expense or, in proper cases, at Association expense. Each Co-owner shall also be responsible for maintenance of any areas lying between either the street curb or edge of the road and each Co-owner's Unit, including any and all sidewalks.

(ii) Utility Services. It shall be the responsibility of each Co-owner to install, maintain, repair and replace the well that serves the Co-owner's Unit. All costs of electricity, telephone, cable television, natural gas, sanitary sewer, telecommunications, fiber optics, and any other utility services shall be borne by the Owner of the Unit to which such services are furnished. All utility laterals and leads shall be maintained, repaired and replaced at the expense of the Co-owner whose Unit they service, except to the extent that such expenses are borne by a utility company or a public authority and the Association shall have no responsibility therefor.

(iii) Community Septic System. The Co-owner of each Unit on which a residence has been constructed shall be responsible for payment of all appropriate charges or fees made by the Sewer Agency for the use of the community septic system and payment of appropriate charges or assessments to be made into the perpetual escrow fund, as required by the Michigan Department of Environmental Quality. In addition, each Unit Owner shall be responsible for the costs of maintenance, repair and replacement of sewer leads to each respective Unit and for the sanitary sewage pumping or treatment facility appurtenant to each Unit, together with an obligation to pay all fees and assessments levied by the Sewer Agency. All Owners acknowledge, by their purchase of a Unit in the Project, that the Sewer Agency has the authority to assess a use fee to the Owner of each Unit and to develop a reserve account within which to build up an escrow fund to be used exclusively for maintenance, repair and replacement of the utility system. By such usage, each Owner grants the Sewer Agency the right and

authority to disconnect such sewer service to a Unit in the event of a delinquency in the payment for such usage fee and to record a lien for such delinquency against the interest of the Owner of said Unit with the Livingston County Register of Deeds that will be junior in security only to real property taxes and any prior first mortgage of record. The Agency shall have the same right to foreclose said liens as are granted to first mortgagees by the statutes of the State of Michigan. Upon completion of construction of the Condominium and all dwellings therein, it is contemplated that the rights, obligations, requirements and responsibilities of the Sewer Agency, and all other matters related to operation and maintenance of the waste water treatment system, as well as the ownership of improvements constituting the waste water treatment system, will transfer to the Association and upon such event, the Association shall bear all responsibilities for operating the waste water sewer system. The operations and improvements constituting the waste water system, but not including laterals that serve an individual Unit which are an Owner's responsibility, shall be transferred to the Association by way of a quit claim deed and shall be transferred in their then "as-is" and "where-is" condition. Each Unit Co-owner as a part of the Community Septic System will have individual septic tanks, pump chambers, pumps and controls that will are to be installed, maintained and replaced by the individual Co-owners.

(b) Association Responsibilities.

(i) Units. The Association shall not be responsible for performing any maintenance, repair or replacement with respect to Units, the dwellings and their appurtenances located within the Condominium Units. In order to provide for flexibility in administering the Condominium, the Association, acting through its Board of Directors, may undertake such regularly recurring, reasonably uniform, periodic exterior maintenance functions with respect to dwellings constructed within any Unit boundaries and their appurtenances as it may deem appropriate (including, without limitation, exterior painting and staining, and lawn mowing). Nothing herein contained, however, shall compel the Association to undertake such responsibilities. Any such responsibilities undertaken by the Association shall be charged to any affected Co-owner on a reasonably uniform basis and collected in accordance with the assessment procedures established under Article II of the Bylaws. The Developer, in the initial maintenance budget for the Association, shall be entitled to determine the nature and extent of such services and reasonable rules and regulations may be promulgated in connection therewith.

(ii) General Common Elements, Storm Water Drainage and Detention Basin. The cost of maintenance, repair and replacement of all General Common Elements (including all landscaping therein and any signage that may be located on the General Common Elements), the storm water drainage system (including the detention basin if located within the Project), all fences, if any, installed by the Developer, as they may be replaced from time to time, and all other improvements installed within the General Common Elements, shall be borne by the Association.

Section 4. Utility Systems. Some or all of the utility lines, systems (including mains and service leads) and equipment and the telecommunications system, described above may be owned by the local public authority or by the company that is providing the pertinent service. Accordingly, such utility lines, systems and equipment, and the telecommunications system, shall be General Common Elements only to the extent of the Co-owners' interest therein, if any,

and Developer makes no warranty whatsoever with respect to the nature or extent of such interest, if any.

Section 5. Use of Units and Common Elements. No Co-owner shall use his Unit or the Common Elements in any manner inconsistent with the purposes of the Project or in any manner which will interfere with or impair the rights of any other Co-owner in the use and enjoyment of his Unit or the Common Elements.

ARTICLE V

UNIT DESCRIPTION AND PERCENTAGE OF VALUE

Section 1. Description of Units. Each Unit in the Condominium Project is described in this paragraph with reference to the Condominium Subdivision Plan of Dove Lake as prepared by Powell Engineering & Associates, LLC and attached as Exhibit B hereto. Each Unit is designated as a separate residential building site to contain a dwelling and related appurtenances and shall consist of the area contained within the Unit boundaries as shown in Exhibit B hereto and delineated with heavy outlines.

Section 2. Percentage of Value. The percentage of value assigned to each Unit in Dove Lake shall be equal. The determination that percentages of value should be equal was made after reviewing the comparative characteristics of each Unit in the Project and concluding that there are not material differences among the Units insofar as the allocation of percentages of value is concerned. The percentage of value assigned to each Unit shall determine each Co-owner's respective share of the Common Elements of the Condominium Project, the proportionate share of each respective Co-owner in the proceeds and the expenses of administration and the value of such Co-owner's vote at meetings of the Association (which voting shall be in accordance with Article VIII, Section 1 of the Bylaws.) The total value of the Project is 100%.

ARTICLE VI

CONVERTIBLE AREAS

Section 1. Designation of Convertible Areas. The Units and Common Elements are hereby designated as Convertible Areas within which the Units and Common Elements may be modified as provided herein.

Section 2. The Developer's Right to Modify Units and Common Elements. The Developer reserves the right, in its sole discretion, during a period ending six years from the date of recording this Master Deed, to enlarge, extend, diminish and modify the size or location of Units and/or Common Elements appurtenant or geographically proximate to such Units, so long as such modifications do not unreasonably impair or diminish the appearance of the Project or the view, privacy or other significant attribute or amenity of any Unit which adjoins or is proximate to the modified Unit or Common Element and in accordance with all appropriate governmental requirements. Any and all modifications must comply with the regulations and ordinances of the Township.

Section 3. Compatibility of Improvements. All improvements constructed within the Convertible Areas described above shall be reasonably compatible with the structures on other portions of the Condominium Project. No improvements, other than as above indicated, may be created on the Convertible Areas.

Section 4. Amendment of Master Deed and Modification of Percentages of Value. Such conversion of this Condominium Project shall be given effect by appropriate amendments to this Master Deed in the manner provided by law, which amendments shall be prepared by and at the discretion of the Developer and in which the percentages of value set forth in Article V hereof shall be proportionately readjusted when applicable in order to preserve a total value of 100% for the entire Project resulting from such amendments to this Master Deed. The precise determination of the readjustments in percentages of value shall be made within the sole judgment of the Developer. Such readjustments, however, shall reflect a continuing reasonable relationship among percentages of value based upon the original method of determining percentages of value for the Project.

Section 5. Redefinition of Common Elements. Such amendments to the Master Deed shall also contain such further definitions and redefinitions of General or Limited Common Elements as may be necessary to adequately describe, serve and provide access to the additional parcel or parcels being added to the Project by such amendments. In connection with any such amendments, the Developer shall have the right to change the nature of any Common Element previously included in the Project for any purpose reasonably necessary to achieve the purposes of this Article, including, but not limited to, the connection of roadways and sidewalks in the Project to any roadways and sidewalks that may be located on, or planned for the area of future development area, as the case may be, and to provide access to any Unit that is located on, or planned for the area of future development area from the roadways and sidewalks located in the Project.

Section 6. Consolidating Master Deed. A Consolidating Master Deed shall be recorded pursuant to the Act when the Project is finally concluded as determined by the Developer in order to incorporate into one set of instruments all successive stages of development. The Consolidating Master Deed, when recorded, shall supersede the previously recorded Master Deed and all amendments thereto.

Section 7. Consent of Interested Persons. All of the Co-owners and mortgagees of Units and other persons interested or to become interested in the Project from time to time shall be deemed to have irrevocably and unanimously consented to such amendments to this Master Deed as may be proposed by the Developer to effectuate the purposes of this Article VI and to any proportionate reallocation of percentages of value of existing Units which the Developer may determine necessary in conjunction with such amendments. All such interested persons irrevocably appoint the Developer as agent and attorney for the purpose of execution of such amendments to the Master Deed and all other documents necessary to effectuate the foregoing. Such amendments may be effected without the necessity of rerecording the entire Master Deed or the Exhibits hereto and may incorporate by reference all or any pertinent portions of this Master Deed and the Exhibits hereto.

ARTICLE VII

SUBDIVISION, CONSOLIDATION AND OTHER MODIFICATIONS OF UNITS

Notwithstanding any other provision of the Master Deed or the Bylaws, Units in the Condominium may be subdivided, consolidated, modified and the boundaries relocated, in accordance with Sections 48 and 49 of the Act and this Article and all appropriate governmental requirements; such changes in the affected Unit or Units shall be promptly reflected in a duly recorded amendment or amendments to this Master Deed.

Section 1. By Developer. Developer reserves the sole right during the Development and Sales Period and without the consent of any other Co-owner or any mortgagee of any Unit to take the following action:

(a) Subdivide Units; Consolidate Units; Relocate Units. Subdivide or resubdivide any Units which it owns, consolidate under single ownership two or more Units which are located adjacent to one another, and relocate any boundaries between Units. Such subdivision or resubdivision of Units, consolidation of Units and relocation of boundaries of Units shall be given effect by an appropriate amendment or amendments to this Master Deed in the manner provided by law, which amendment or amendments shall be prepared by and at the sole discretion of Developer, its successors or assigns.

(b) Amend to Effectuate Modifications. In any amendment or amendments resulting from the exercise of the rights reserved to Developer above, each portion of the Unit or Units resulting from such subdivision, consolidation or relocation of boundaries shall be separately identified by number and the percentage of value as set forth in Article V hereof for the Unit or Units subdivided, consolidated or as to which boundaries are relocated shall be proportionately allocated to the resultant new Condominium Units in order to preserve a total value of 100% for the entire Project resulting from such amendment or amendments to this Master Deed. The precise determination of the readjustments in percentage of value shall be within the sole judgment of Developer. Such amendment or amendments to the Master Deed shall also contain such further definitions of General or Limited Common Elements as may be necessary to adequately describe the Units in the Condominium Project as so modified. All of the Co-owners and mortgagees of Units and other persons interested or to become interested in the Project from time to time shall be deemed to have irrevocably and unanimously consented to such amendment or amendments of this Master Deed to effectuate the foregoing and to any proportionate reallocation of percentages of value of Units which Developer or its successors may determine necessary in conjunction with such amendment or amendments. All such interested persons irrevocably appoint Developer or its successors as agent and attorney for the purpose of execution of such amendment or amendments to the Master Deed and all other documents necessary to effectuate the foregoing. Such amendments may be effected without the necessity of rerecording an entire Master Deed or the Exhibits hereto.

Section 2. By Co-owners. One or more Co-owners may undertake:

(a) **Subdivision of Units.** The Co-owner of a Unit may subdivide his Unit upon request to the Association in accordance with Section 49 of the Act. Upon receipt of such request, the president of the Association shall cause to be prepared an amendment to the Master Deed, duly subdividing the Unit, separately identifying the resulting Units by number or other designation, designating only the Limited or General Common Elements in connection therewith, and reallocating the percentages of value in accordance with the Co-owner's request. The Co-owner requesting such subdivision shall bear all costs of such amendment. Such subdivision shall not become effective, however, until the amendment to the Master Deed, duly executed by the Association, has been recorded in the office of the Livingston County Register of Deeds.

(b) **Consolidation of Units; Relocation of Boundaries.** Co-owners of Units may relocate boundaries between their Units or eliminate boundaries between two or more Units upon written request to the Association in accordance with Section 48 of the Act. Upon receipt of such request, the president of the Association shall cause to be prepared an amendment to the Master Deed duly relocating the boundaries, identifying the Units involved, reallocating percentages of value and providing for conveyancing between or among the Co-owners involved in relocation of boundaries. The Co-owners requesting relocation of boundaries shall bear all costs of such amendment. Such relocation or elimination of boundaries shall not become effective, however, until the amendment to the Master Deed has been recorded in the office of the Livingston County Register of Deeds.

Section 3. Limited Common Elements. Limited Common Elements shall be subject to assignment and reassignment in accordance with Section 39 of the Act and in furtherance of the rights to subdivide, consolidate or relocate boundaries described in this Article.

Section 4. Livingston County Health Department Restriction. No subdividing of Units to create new Units that would utilize individual water supply systems and/or the community septic system shall be permitted.

ARTICLE VIII

DOVE LAKE USE RESTRICTIONS

Section 1. Michigan Law. All Michigan boating laws must be adhered to and these laws govern the lake.

Section 2. Spotter. A spotter must be used when a boat is pulling a water skier, tuber, etc. The driver of the boat cannot act as a spotter. A skier (person being towed) must be a minimum of 100 feet from shore, dock, marked swimming area or other boats.

Section 3. Traffic. Traffic on the lake is counter-clockwise. Boats shall turn to the right when meeting another boat; turn left when overtaking another boat. Boats approaching each other at right angles shall give right-of-way to the boat on the right. Motor powered boats shall at all times give the right-of-way to non-motorized boats.

Section 4. Speed Limit. Boating speed is limited to 50 miles per hour. Boaters must comply with all applicable State of Michigan inland water ordinances and any other governing

agency having jurisdiction over this body of water.

Section 5. **Boat Cleanliness**. Boat exterior cleanliness is required. Co-owners are required to thoroughly wash their boats prior to entering the lake. Contamination from other water ways can adversely affect the lake, therefore the Association shall have the right to deny access until the boat is properly washed.

Section 6. **Boat Restrictions**. Boat restrictions for the lake are as follows: Unit owners at Dove Lake are allowed one (1) motorized boat; only boats registered to a Unit Co-owner are permitted; and, rules restricting the number of non-motorized boats may be adopted from time to time. No jet skies, wake boards, wakesurfing, and wakeboard boats are permitted.

Section 7. **Music**. Music is permitted from boats; however, the sound level must be kept at a reasonable volume level (based on Township ordinances) and shall be kept free from any offensive language.

Section 8. **Use**. Access to the lake is allowed by any Co-owner (including vacant Units) provided that they are paying the Association dues for that Unit. No picnics or swimming or like activities are allowed at any vacant Unit that has not paid Association dues.

Section 9. **Lake Level.** Storm water that flows into the lake, both currently and when adjacent land is developed, will impact the lake level, with the lake level to rise as the rate of flow of storm water increases in the lake. Further, the lake is spring fed which also impacts the lake level at any given time. Water cannot be pumped or otherwise drawn from the lake for sprinkling of lawns.

Section 10. **Natural Beauty.** The lake is a natural attraction and as such, each Co-owner is responsible and liable for the safety and quiet enjoyment of the lake by the Co-owner, Co-owner's family and Co-owner's guests and invitees.

Section 11. **Boat Ramp**. The boat ramp located between Units 1 and 2 in the Condominium is solely to provide boat access to Dove Lake. For the safety of all unloading and loading boats, there shall be no sunbathing at or swimming allowed off the boat ramp (other than what would be ancillary to launching a boat) or picnicking at the boat ramp.

Section 12. Landscaping fertilizers. Fertilizers are limited to organic types only. Fertilizers with phorphorous are prohibited. It is the homeowners responsibility to notify thier subcontractor regarding fertilizer restrictions.

Section13. Water softner use. Water softner discharge is not to be discharged into storm or sanitaty sewer.

ARTICLE IX

(PHASE 2 LEGAL DESCRIPTION IS NEEDED)

EXPANSION OF CONDOMINIUM

Section 1. **Right to Expand.** As of the date this Master Deed is recorded, the Developer intends to establish a Condominium Project consisting of 14 Units on the land described in Article II hereof all as shown on the Condominium Subdivision Plan. Developer reserves the right, however, to establish a Condominium Project consisting of more Units than described above by adding to the Condominium all or any portion of the land described as follows:

Therefore, any other provisions of this Master Deed to the contrary notwithstanding, the number of Units in this Condominium Project may, at the option of the Developer, from time to time, within a period ending no later than six years from the date of recording this Master Deed or longer as permitted by the Act, be expanded to any number determined by the Developer in its sole judgment, but in no event shall the number of Units be more than 37.

Section 2. Addition of Land. In connection with such expansion, the Developer unconditionally reserves the right to add to the Condominium Project such portion or portions of the land described in this Article IX. There is no obligation on the part of the Developer to add to the Condominium Project all or any portion of the expansion area described above, nor is there any obligation to add portions thereof in any particular order.

Section 3. Compatibility of Improvements. All improvements constructed within the expansion are described above shall be reasonably compatible with the structures on other portions of the Condominium Project.

Section 4. Amendment of Master Deed and Modification of Percentages of Value. Such expansion of this Condominium Project shall be given effect by appropriate amendments to this Master Deed in the manner provided by law, which amendments shall be prepared by and at the discretion of the Developer and in which the percentages of value set forth in Article V hereof shall be proportionately readjusted when applicable in order to preserve a total value of 100% for the entire Project resulting from such amendments to this Master Deed. The precise determination of the readjustments in percentages of value shall be made within the sole judgment of the Developer. Such readjustments, however, shall reflect a continuing reasonable relationship among percentages of value based upon the original method of determining percentages of value for the Project.

Section 5. Redefinition of Common Elements. Such amendments to the Master Deed shall also contain such further definitions and redefinitions of General or Limited Common Elements as may be necessary to adequately describe, serve and provide access to the additional parcel or parcels being added to the Project by such amendments. In connection with any such amendments, the Developer shall have the right to change the nature of any Common Element previously included in the Project for any purpose reasonably necessary to achieve the purposes of this Article, including, but not limited to, the connection of roadways and sidewalks in the Project to any roadways and sidewalks that may be located on, or planned for the area of future development area, as the case may be, and to provide access to any Unit that is located on, or planned for the area of future development area from the roadways and sidewalks located in the Project.

Section 6. Consolidating Master Deed. A Consolidating Master Deed shall be recorded pursuant to the Act when the Project is finally concluded as determined by the Developer in order to incorporate into one set of instruments all successive stages of development. The Consolidating Master Deed, when recorded, shall supersede the previously recorded Master Deed and all amendments thereto.

Section 7. Consent of Interested Persons. All of the Co-owners and mortgagees of Units and other persons interested or to become interested in the Project from time to time shall be deemed to have irrevocably and unanimously consented to such amendments to this Master Deed as may be proposed by the Developer to effectuate the purposes of this Article VI and to any

proportionate reallocation of percentages of value of existing Units which the Developer may determine necessary in conjunction with such amendments. All such interested persons irrevocably appoint the Developer as agent and attorney for the purpose of execution of such amendments to the Master Deed and all other documents necessary to effectuate the foregoing. Such amendments may be effected without the necessity of rerecording the entire Master Deed or the Exhibits hereto and may incorporate by reference all or any pertinent portions of this Master Deed and the Exhibits hereto.

ARTICLE X

EASEMENTS

Section 1. Easement for Maintenance of Encroachments and Utilities. There shall be easements to, through and over the entire Project (including all Units) for the continuing maintenance, repair, replacement and enlargement of any General Common Element utilities in the Condominium. In the event any portion of a structure located within a Unit encroaches upon a Common Element or another Unit due to shifting, settling or moving of a building, or due to survey errors or construction deviations or change in ground elevations, reciprocal easements shall exist for the maintenance of such encroachment for so long as such encroachment exists, and for maintenance thereof after rebuilding in the event of destruction, however, subject to and limited by Section 40 of the Act which requires the consent of the Co-owner of the Unit that is proposed to be burdened by an encroachment or easement, whether the easement is by reason of any deviation from the plans in the construction, repair, renovation, restoration, or replacement of any improvement, or by reason of the settling or shifting of any land or improvement.

Section 2. Easement for Maintenance of Dwelling Exteriors, Limited Common Element Areas, Etc. There shall be easements to and in favor of the Association, and its officers, Directors, agents and designees, in, on and over all Units in the Project, for access to the Units and the exterior of each of the residential dwellings constructed within the Project to permit the maintenance, decoration, repair and replacement thereof in accordance with provisions of Article IV, Section 3(b) hereof, and in accordance with the terms hereinafter set forth.

Section 3. Roads and Utilities Easements.

(a) Roads. Developer reserves for the benefit of itself, its successors and assigns, and all future owners of the land described in Article IX, easements for the unrestricted use of all roads, walkways and other General Common Elements in the Condominium for the purpose of further development and construction (on or off the Condominium Premises) by it or its successors and assigns. In order to achieve the purposes of this Article and of Article IX of this Master Deed, Developer shall have the right to alter any General Common Element areas existing between said road and any portion of the land described in Article II by installation of curb cuts, paving, drives, walks and roadway connections at such locations on and over the General Common Elements as Developer may elect from time to time. Developer shall also have the right, in furtherance of its construction, development and sales activities on the Condominium, to go over and across, and to permit its agents, contractors, subcontractors and employees to go over and

across, any portion of the General Common Elements from time to time as Developer may deem necessary for such purposes. In the event Developer disturbs any area of the Condominium Premises adjoining such curb cuts, paving, drives, walks or roadway connections or other General Common Elements upon installation thereof or in connection with its construction, development and sales activities, Developer shall, at its expense, restore such disturbed areas to substantially their condition existing immediately prior to such disturbance. All continuing expenses of maintenance, repair, replacement and resurfacing of any road used for perpetual access purposes referred to in this Section shall be perpetually shared by this Condominium and any developed portions of the land described in Article IX whose closest means of access to a public road is over such road or roads. The Co-owners in this Condominium shall be responsible from time to time for payment of a proportionate share of said expenses which share shall be determined by multiplying such expenses times a fraction, the numerator of which is the number of completed dwelling Units in this Condominium, and the denominator of which is comprised of the number of such Units plus all other Units on which are located completed dwellings on the land described in Article IX not lying within the Condominium whose closest means of access to a public road is over such road. Developer may, by a subsequent instrument prepared and recorded in its discretion without consent from any interested party, specifically define by legal description the easements of access reserved hereby, if Developer deems it necessary or desirable to do so. Developer further reserves the right during the Development and Sales Period to install temporary construction roadways and accesses over the General Common Elements in order to gain access from the Project to a public road.

The Developer reserves the right at any time until the elapse of two (2) years after the expiration of the Development and Sales Period, and the Association shall have the right thereafter, to dedicate to the public a right-of-way (of such width as may be required by the local public authority) over any or all of the roadways in the Condominium shown as General Common Elements on Exhibit B. Any such right-of-way dedication may be made by the Developer without the consent of any Co-owner, mortgagee or other person and shall be evidenced by an appropriate amendment to this Master Deed and to Exhibit B hereto, recorded in the Livingston County Records. All of the Co-owners and mortgagees of Units and other persons interested or to become interested in the Project from time to time shall be deemed to have irrevocably and unanimously consented to such amendment or amendments of this Master Deed to effectuate the foregoing right-of-way dedication.

(b) Utility Easements. Developer also hereby reserves for the benefit of itself, its successors and assigns and all future owners of the land described in Article IX not located in the Condominium or any portion or portions thereof, perpetual easements to utilize, tap, tie into, extend and enlarge all utility mains located in the Condominium Premises, including, but not limited to, water, gas, telephone, electrical, cable television, storm and sanitary sewer mains and to connect to transformer(s) located on the Condominium Premises. In the event Developer, its successors or assigns, utilizes, taps, ties into, extends or enlarges any utilities located on the Condominium Premises, it shall be obligated to pay all of the expenses reasonably necessary to restore the Condominium Premises to their state immediately prior to such utilization, tapping, tying-in, extension or enlargement. All expenses of maintenance, repair and replacement of any utility mains referred to in this Section shall be shared by this Condominium and any developed portions of the land described in Article IX which are served by such utility mains. The Co-owners

of this Condominium shall be responsible from time to time for payment of a proportionate share of said expenses which share shall be determined by multiplying such expenses times a fraction, the numerator of which is the number of dwelling Units in this Condominium, and the denominator of which is comprised of the numerator plus all other dwelling Units in the land described in Article IX not located within the Condominium which benefit from such mains. Provided, however, that the foregoing expenses are to be paid and shared only if such expenses are not borne by a public utility or a governmental agency. Provided, further, that the expense sharing shall be applicable only to utility mains and all expenses of maintenance, upkeep, repair and replacement of utility leads or laterals shall be borne by the Co-owner whose Unit they service, except to the extent that such expenses are borne by a utility company or a public authority, and the Association shall have no responsibility therefor.

The Developer reserves the right at any time until the elapse of two (2) years after the expiration of the Development and Sales Period, and the Association shall have the right thereafter to grant easements for utilities over, under and across the Condominium to appropriate governmental agencies or public utility companies and to transfer title of utilities to governmental agencies or to utility companies. Any such grants of easement or transfers of title may be made by the Developer without the consent of any Co-owner, mortgagee or other person and shall be evidenced by an appropriate amendment to this Master Deed and to Exhibit B hereto, recorded in the Livingston County Records. All of the Co-owners and mortgagees of Units and other persons interested or to become interested in the Project from time to time shall be deemed to have irrevocably and unanimously consented to such amendment or amendments of this Master Deed as may be required to effectuate any of the foregoing grants of easement or transfers of title.

Section 4. Grant of Easements by Association. The Association, acting through its lawfully constituted Board of Directors (including any Board of Directors acting prior to the Transitional Control Date) shall be empowered and obligated to grant such easements, licenses, rights-of-entry and rights-of-way over, under and across the Condominium Premises for utility purposes, access purposes or other lawful purposes as may be necessary for the benefit of the Condominium; subject, however, to the approval of the Developer so long as the Development and Sales Period has not expired. No easements created under the Condominium Documents may be modified, or obligations with respect thereto varied, without the consent of each person benefited thereby.

Section 5. Easements for Maintenance, Repair and Replacement. The Developer, the Association, public entities or agencies, and all public or private utilities shall have such easements as may be necessary over the Condominium Premises, including all Units and Common Elements to fulfill any responsibilities of maintenance, repair, decoration or replacement which they or any of them are required or permitted to perform under the Condominium Documents. These easements include, without any implication of limitation, the right of the Association to obtain access during reasonable hours and upon reasonable notice for purposes of inspection of improvements within any Unit to ascertain that the same has been designed and constructed in conformity with standards imposed and/or specific approvals granted by the Association.

Section 6. Storm Water and Surface Drainage. The Developer hereby reserves on behalf of itself, its successors and assigns, the Co-owners, and for the benefit of the public

agencies, including without limitation the Township, a perpetual easement to use the storm sewer and detention basin, if in the Condominium, for the purposes of storm water drainage and detention as well as Storm Water Maintenance Agreement shall be provided to the Township.

Section 7. Telecommunications Agreements and Fiber Optic Service.

(a) The Association, acting through its duly constituted Board of Directors and subject to the Developer's approval during the Development and Sales Period, shall have the power to grant such easements, licenses and other rights-of-entry, use and access and to enter into any contract or agreement, including wiring agreements, right-of-way agreements, access agreements and multi-unit agreements and, to the extent allowed by law, contracts for sharing of any installation or periodic subscriber service fees as may be necessary, convenient or desirable to provide for telecommunications, video text, broad band cable, fiber optics, satellite dish, earth antenna and similar services (collectively "Telecommunications") to the Project or any Unit therein. Notwithstanding the foregoing, in no event shall the Board of Directors enter into any contract or agreement or grant any easement, license or right of entry or do any other act or thing which will violate any provision of any federal, state or local law or ordinance. Any and all sums paid by any Telecommunications or other company or entity in connection with such service, including fees, if any, for the privilege of installing same or sharing periodic subscriber service fees, shall be receipts affecting the administration of the Condominium Project within the meaning of the Act and shall be paid over to and shall be the property of the Association, unless the company is operated by the Developer as reserved in sub-paragraph (b) below, upon such event they shall be paid over to and shall be the property of the Developer.

(b) The Developer may provide fiber optic service in the Project but has no obligation to do so. In such event, the fiber optic cables, and related equipment ("Fiber Optic Improvements") located throughout the Project, up to the point of entry to each residence, would be owned by the Developer. At all times the Developer provides fiber optic service in the Project, the fiber optic cable and related equipment will be installed, maintained, repaired and replaced by the Developer, at the Developer's sole cost and expense. The Developer hereby reserves an easement throughout the Project for the purpose of installing, maintaining, repairing and replacing the Fiber Optic Improvements, in the event the Fiber Optic Improvements are installed. The rights reserved in this paragraph can be assigned by the Developer or transferred to its successor, assign or designee.

Section 8. Easement for Safety Path. Developer shall convey to the Township the necessary right-of-way easement for the construction of a safety pathway along Twelve Mile Road, on Twp. std. form

Section 9. License for Boat Ramp. The Developer hereby reserves for the benefit of the neighboring parcels described in Exhibit C attached (hereafter, each is referred to as a "Parcel"), a license to use the boat ramp located in the Condominium provided that the restrictions set forth below are strictly adhered to by the owner of the Parcel using the boat ramp: & shown on Exh B

a. Parcel owners can only use the boat ramp for boats that are registered to the owner of the Parcel.

b. The Parcel owner using the boat ramp will be required to contribute proportionately

towards the cost of construction and maintenance of the boat ramp.

The forgoing right to use the boat ramp is conditioned on the Parcel owners who use the ramp adhering to all use restrictions that apply to the boat ramp and lake rules.

Section 10. Other Community Easements. The Developer and the Association shall have the right to grant such further easements over or with respect to General Common Elements of the Condominium as may be necessary or desirable in furtherance of development, community usage, coordinated maintenance and operation of Dove Lake, as well as the neighboring developments. The foregoing reservation of right shall include, without limitation, the right for the Developer to grant either to governmental or to private entities, an easement as may be needed to provide for wireless communication throughout Dove Lake, and the neighboring developments.

ARTICLE XI

AMENDMENT

This Master Deed and the Condominium Subdivision Plan may be amended with the consent of sixty-six and 2/3 (66-2/3%) percent of the Unit Co-owners, except as hereinafter set forth:

Section 1. Modification of Units or Common Elements. No Unit dimension may be modified in any material way without the consent of the Co-owner and mortgagee of such Unit nor may the nature or extent of Limited Common Elements or the responsibility for maintenance, repair or replacement thereof be modified in any material way without the written consent of the Co-owner and first mortgagee of any Unit to which the same are appurtenant, except as otherwise expressly provided in this Master Deed or in the Bylaws to the contrary.

Section 2. Mortgagee Consent. Amendments shall require the approval of first mortgagees only in accordance with Section 90a of the Act. The notice is to be mailed to first mortgagees under Section 90a of the Act shall be sent to first mortgagees via certified mail, return receipt requested.

Section 3. By Developer. Pursuant to Section 90(1) of the Act, the Developer hereby reserves the right, on behalf of itself and on behalf of the Association, to amend this Master Deed and the other Condominium Documents without approval of any Co-owner or mortgagee for the purposes of correcting survey or other errors and for any other purpose as do not materially affect any rights of a Co-owner or mortgagee in the Project, in which event Co-owner and mortgagee consent shall be required as provided above

Section 4. Change in Percentage of Value. The value of the vote of any Co-owner and the corresponding proportion of common expenses assessed against such Co-owner shall not be modified without the written consent of such Co-owner and his first mortgagee, nor shall the percentage of value assigned to any Unit be modified without like consent, except as provided in this Master Deed or Bylaws.

Section 5. Termination, Vacation, Revocation or Abandonment. The Condominium Project may not be terminated, vacated, revoked or abandoned without the written consent of

the Developer and of 80% of all non-developer Co-owners and, in accordance with Section 90a of the Act, their mortgagees.

Section 6. Developer Approval. During the Development and Sales Period, this Master Deed shall not be amended, nor shall the provisions thereof be modified by any other amendment to this Master Deed without the written consent of the Developer.

ARTICLE XII
ASSIGNMENT

Any or all of the rights and powers granted or reserved to the Developer in the Condominium Documents or by law, including the power to approve or disapprove any act, use or proposed action or any other matter or thing, may be assigned by it to any other entity or to the Association. Any such assignment or transfer shall be made by appropriate instrument in writing duly recorded in the office of the Livingston County Register of Deeds.

[BALANCE OF THIS PAGE INTENTIONALLY LEFT BLANK. SIGNATURE AND ACKNOWLEDGMENT APPEAR ON THE FOLLOWING PAGE]

DOVE LAKE, LLC, a Michigan limited liability company

By: _____
Thomas N. Schroder, Manager

STATE OF MICHIGAN)
) SS.
COUNTY OF LIVINGSTON)

On this_____day of_____, 2025 the foregoing Master Deed was acknowledged before me in Livingston County, Michigan by Thomas N. Schroder, Manager of Dove Lake, LLC, a Michigan limited liability company, on behalf of the company.

_____

Notary Public,_____County, Michigan
My commission expires: _____
Acting in the County of Livingston

Master Deed drafted by:
C. Kim Shierk, of
Williams Williams Rattner & Plunkett,
P.C. 380 North Old Woodward Avenue
Birmingham, Michigan 48009
When recorded, return to drafter

Digital EGLE/USACE Joint Permit Application (JPA) for Inland Lakes and Streams, Great Lakes, Wetlands, Floodplains, Dams, Environmental Areas, High Risk Erosion Areas and Critical Dune Areas

version 1.43

(Submission #: HQ6-Q2GS-91CK9, version 3)

Details

Submission ID	HQ6-Q2GS-91CK9
Status	In Process

Fees

Fee	$50.00
Payments/Adjustments	($2,000.00)
Balance Due	($1,950.00) (Paid)

Form Input

Instructions

Click hereto down a copy or print these instructions (recommended).

Contact Information

Applicant Information (Usually the property owner)

First Name	Last Name
jim	witkowski

Organization Name
cornerstone building

Phone Type	Number	Extension
Mobile	2485050635	

Email
jimgwit@gmail.com

Address

3111 PINCKNEY RD

HOWELL

HOWELL, MI 48843

Is the Applicant the fee simple property owner? (Does the applicant have full and permanent ownership of the parcel, as well as any buildings on that parcel?)
Yes

Has the applicant hired an agent or cooperating agency (agency or firm assisting applicant) to complete the application process?
No

Are there additional property owners or other contacts you would like to add to the application?
Yes

Additional Contact Information (1 of 1)

Contact Role(s)
NONE PROVIDED

Contact Information

Prefix
NONE PROVIDED

First Name	Last Name
jim	witkowski

Title
NONE PROVIDED

Organization Name
cornerstone building

Phone Type	Number	Extension
Business	2485050635	

Email
jimgwit@gmail.com

Address

3111 PINCKNEY RD

HOWELL

HOWELL, MI 48843

Project Location

EGLE Site Reference Number (Pre-Populated)
6417652654446234651

Project Location
42.48781049008037,-83.67574993557076

Project Location Address

[NO STREET ADDRESS SPECIFIED]

[NO CITY SPECIFIED], *[NO STATE SPECIFIED][NO ZIP CODE SPECIFIED]*

County
Livingston

Is there a Property Tax ID Number(s) for the project area?
Yes
Please enter the Tax ID Number(s) for the project location
16-13-200-017

Is there Subdivision/Plat and Lot Number(s)?
No

Is this project within Indian Lands?
No

Local Unit of Government (LUG)
Green Oak Township

Directions to Project Site
south off the end of Kensington court

Background Information

Has the Michigan Department of Environment, Great Lakes, and Energy (EGLE) and/or United States Army Corps of Engineers (USACE) conducted a pre-application meeting/inspection for this project?
No

Has the EGLE completed a Wetland Identification Program (WIP) assessment for this site?
No

Environmental Area Number (if known):
NONE PROVIDED

Has the United States Army Corps of Engineers (USACE) completed either an approved or preliminary jurisdictional determination for this site?
No

Were any regulated activities previously completed on this site under an EGLE and/or USACE permit?
No

Have any activities commenced on this project?
No

Is this an after-the-fact application?
No

Are you aware of any unresolved violations of environmental law or litigation involving the property?
No

Is there a conservation easement or other easement, deed restriction, lease, or other encumbrance upon the property?
No

Are there any other federal, interstate, state, or local agency authorizations associated with this project?
No

Permit Application Category and Public Notice Information

Indicate the type of permit being applied for.
General Permit for wetlands, lakes, streams, or Great Lakes

If you are applying for a general permit, which project type(s) is being proposed?
NO GP CATEGORY (MP Category only)

Project Description

Project Use: (select all that apply - Private, Commercial, Public/Government/Tribal, Receiving Federal/State Transportation Funds, Non-profit, or Other)
Private

Project Type (select all that apply):
Development-Condominium/Subdivision-Residential

Project Summary (Purpose and Use): Provide a summary of all proposed activities including the intended use and reason for the proposed project.
install new boat launch for 14 homes on private dove lake

Project Construction Sequence, Methods, and Equipment: Describe how the proposed project timing, methods, and equipment will minimize disturbance from the project construction, including but not limited to soil erosion and sedimentation control measures.
draw down lake - put sand bags around area of new boat launch - dredge out 23 cu yds to create boat ramp - put in 7 preformed concrete pads, remove sand bags and restore shoreline to match undisturbed

Project Alternatives: Describe all options considered as alternatives to the proposed project, and describe how impacts to state and federal regulated waters will be avoided and minimized. This may include other locations, materials, etc.
minimal possible design provided to keep environmental impact to minimum

Project Compensation: Describe how the proposed impacts to state and federal regulated waters will be compensated, OR explain why compensatory mitigation should not be required for the proposed impacts. Include amount, location, and method of compensation (i.e., bank, on-site, preservation, etc.)
minor temporary impact to lake

Upload any additional information as needed to provide information applicable to your project regarding project purpose sequence, methods, alternatives, or compensation.

> dove lake egle revised plans 12_26_24.pdf - 12/27/2024 02:34 PM
> **Comment**
> *NONE PROVIDED*

Resource and Activity Type

SELECT THE ACTIVITIES from the list below that are proposed in your project (check ALL that apply). If you don't see your project type listed, select "Other Project Type". These activities listed require additional information to be gathered later in the application.
Boat Ramp

The Proposed Project will involve the following resources (check ALL that apply).
Pond (open water less than 5 acres in size)

Pond Information

What is the surface area of the pond? (acres)
4.35

Identify all resources impacted by the proposed pond.
Neither of the above options

Major Project Fee Calculation Questions

Is filling of 10,000 cubic yards or more proposed (cumulatively) within wetlands, streams, lakes, or Great Lakes?
No

Is dredging of 10,000 cubic yards (cumulatively) or more proposed within streams, lakes, or Great Lakes? (wetlands not included)
No

Is new dredging or adjacent upland excavation in suspected contamination areas proposed by this application?
No

Is a subdivision, condominium, or new golf course proposed?
No

CORRECTION REQUEST *(CORRECTED)*

Major Project

Are additional impacts proposed as a part of the construction of the subdivision, condominium, or golf course? If so, please provide additional information on the impacts in the project summary section and your site plans. Otherwise, you may select 'no' to this question and will receive a refund for the difference in fees.
Created on 10/8/2024 12:19 PM by **Matthew Rogers**

2 COMMENTS

jim witkowski (jimgwit@gmail.com) (12/27/2024 2:39 PM)
This was changed to no because no other part of this proposed subdivision impacts any part of any wetland

jim witkowski (jimgwit@gmail.com) (10/8/2024 2:34 PM)

There is a subdivision associated with this but no additional impact to the lake for this project.

Boat Ramp Project

Please select the type of boat ramp project.
New boat ramp

Type of construction material:
Concrete

How many skid piers will the boat ramp have?
7

Proposed skid pier dimensions

Length (feet)	Width (feet)
6	12

Distance from the proposed project to the adjacent property lines.

Left (feet)	Right (feet)
9	9

Upload of Proposed Site Plans

Does your project include any one or more of the following: impacts to one or more acres of wetland, new construction of a breakwater or seawall with a total length more than 1,000 feet, a stream enclosure of greater than 300 feet in one or more segments, or relocation or channelization of a stream more than 1,000 feet in one or more segments? Also select "YES" for any other project that requires federal coordination.
No

If you have obtained a letter resulting from the USFWS Michigan Determination Key (DKey) tool for endangered species, please attach the letter below.

USFWS Information and Planning and Consultation (IPaC) system can be found online at https://ipac.ecosphere.fws.gov/.

USFWS Michigan Determination Key (DKey) Tool

Upload the Michigan DKey Output Letter

Screenshot_17-9-2024_9428_.jpeg - 09/17/2024 09:43 AM

Comment

NONE PROVIDED

Required on all Site Plan uploads. Please identify that all of the following items are included on your plans that you upload with this application.

Site Plan Features	Existing and Proposed Plan Set
Scale, Compass North, and Property Lines	Yes
Fill and Excavation areas with associated amounts in cubic yards	Yes
Any rivers, lakes, or ponds and associated Ordinary High Water Mark (OHWM)	Yes
Exterior dimensions of Structures, Fill and Excavation areas associated with the proposed project	Yes
Dimensions to other Structures and Lot Lines associated with the project	Yes
Topographic Contour Lines from licensed surveyor or engineer when applicable	Yes

Upload Site Plans and Cross Section Drawings for your Proposed Project

19-425_MP- rev 4-1-2024 - PHASING General (1).pdf - 12/27/2024 02:23 PM

dove lake egle revised plans 12_26_24.pdf - 12/27/2024 02:23 PM

DOVE LAKE CONSTRUCTION - FULL SET - rev 8-27-2024.pdf - 12/27/2024 02:26 PM

Comment

NONE PROVIDED

CORRECTION REQUEST *(CORRECTED)*

Project Plans

Please revise your plans to more accurately represent the project. Provide all relevant dimensions (length, width, height) and edit your cross section plans to show the existing grade relative to the proposed grade. Also, please provide a more zoomed out overhead plan showing the location of the project relative to nearby landmarks. It is difficult to discern the location of the project with the available information.

If a condominium, neighborhood, or golf course are proposed that impact water resources, please provide project plans.

Created on 10/8/2024 12:33 PM by **Matthew Rogers**

3 COMMENTS

jim witkowski (jimgwit@gmail.com) (12/27/2024 2:40 PM)

We have provided a site specific layout for the boat launch

Matthew Rogers (rogersm17@michigan.gov) (11/12/2024 1:52 PM)

A typical boat ramp cross section is not sufficient for review. Please provide a site specific cross section showing dimensions, existing versus proposed grade, proposed

fill, etc. Also, please provide an overhead plan that shows dimensions of the boat ramp and total impacts.

jim witkowski (jimgwit@gmail.com) (10/8/2024 2:30 PM)
completed

Additional Required and Supplementary Documents

NONE PROVIDED

Comment

NONE PROVIDED

Fees

General Permit Fee:
+$50.00

Total Fee Amount:
$50.00

Is the applicant or landowner a State of Michigan Agency?
Yes

Will the State of Michigan Agency identified as the applicant or land owner be paying by an Internal Exchange Transaction (IET, previously known as IAB) in SIGMA?
No

Attachments

Date	Attachment Name	Context	User
12/27/2024 2:34 PM	dove lake egle revised plans 12_26_24.pdf	Attachment	jim witkowski
12/27/2024 2:26 PM	DOVE LAKE CONSTRUCTION - FULL SET - rev 8-27-2024.pdf	Attachment	jim witkowski
12/27/2024 2:23 PM	dove lake egle revised plans 12_26_24.pdf	Attachment	jim witkowski
12/27/2024 2:23 PM	19-425_MP- rev 4-1-2024 - PHASING General (1).pdf	Attachment	jim witkowski
9/17/2024 9:43 AM	Screenshot_17-9-2024_9428_.jpeg	Attachment	jim witkowski

Status History

	User	Processing Status
12/19/2024 8:50:08 AM	jim witkowski	Draft
12/27/2024 2:40:28 PM	jim witkowski	Submitting
12/27/2024 2:40:38 PM	jim witkowski	Submitted
12/27/2024 2:40:42 PM	jim witkowski	In Process

Revisions

Revision	Revision Date	Revision By
Revision 1	9/17/2024 8:28 AM	jim witkowski
Revision 2	10/8/2024 1:10 PM	jim witkowski
Revision 3	12/19/2024 8:50 AM	jim witkowski

Submission Complete

Digital EGLE/USACE Joint Permit Application (JPA) for Inland Lakes and Streams, Great Lakes, Wetlands, Floodplains, Dams, Environmental Areas, High Risk Erosion Areas and Critical Dune Areas

HotKey: LW Submission HQ6-Q2GS-91CK9 Revision 3 Form Version 1.43

Payment Complete

Submission Fees

Fee	$50.00
Amount Paid Online	-$2,000.00
Total Due	**-$1,950.00**