



State of Michigan
Department of Environmental Quality
Water Resources Division - Lansing
Transportation and Flood Hazard Unit
P.O. Box 30458
Lansing, MI 48909

Site Name: 81 Nixon Road / Dhu Varren Road / Green Road Intersection reconstruction
Application Number: 2HP-3JVY-E06V **Date:** December 19, 2016

PUBLIC NOTICE

The City of Ann Arbor - Public Services Area, 301 E. Huron Street, P.O. Box 8647, Ann Arbor, Michigan 48107-8647, has applied to this office for a permit under authority of Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). The applicant proposes to impact a total of 0.31 acres of wetland in three locations (0.026 acres, 0.006 acres, and 0.278 acres, respectively) for the reconstruction of the Nixon Road, Dhu Varren Road and Green Road intersection. The project will include removal of an existing wetland single equalization culvert beneath Dhu Varren Road and construction of two 86 foot long, 1.5 foot diameter corrugated metal culverts, as replacement. They propose to mitigate for wetland impacts by purchasing credits in the Huron River Wetland Mitigation Bank. The project is located in T02S, R06E, Sections 10 and 15, City of Ann Arbor, Washtenaw County, Michigan, in accordance with plans attached to this notice.

THIS NOTICE IS NOT A PERMIT

The proposed project may also be regulated by one or more additional parts of the NREPA that are administered by the Michigan Department of Environmental Quality (MDEQ), Water Resources Division (WRD). The requirements of all applicable parts are considered in determining if a permit can be issued. When a permit application is received requesting authorization to work in or over the inland waters of the State of Michigan, pursuant to Part 303 of the NREPA, the NREPA provides that the MDEQ submit copies for review to the department of public health; the city, village, or township and county where the project is to be located; the local soil conservation district; and any local watershed council organized under Part 311, Local River Management, of the NREPA. Additional notification is provided to certain persons as required by statute or determined by the MDEQ.

Those persons wanting to make comments on the proposed project shall furnish this office with their written comments no later than 20 days from the date of this notice. Written comments will be made part of the record and should reference the above application number. Objections must be factual, specific, and fully describe the reasons upon which any objection is founded. Unless a written request is filed with the MDEQ within the 20-day public comment period, the MDEQ may make a decision on the application without a public hearing. The determination as to whether a permit will be issued or a public hearing held will be based on an evaluation of all relevant factors, including the public comments received and the effect of the proposed work on the public trust or interest, including navigation, fish, wildlife, and pollution. The specific permit decision criteria can be found in the parts of the NREPA applicable to this application and listed above. Copies of these parts of the NREPA are available at:

<http://www.michigan.gov/jointpermit>.

Public comments received will also be considered.

The entire copy of the public notice package may be viewed at the MDEQ, WRD's District Office listed on the top of this public notice or online at:

<https://miwaters.deq.state.mi.us/miwaters/#!/external/publicnotice/search>.

To access the public notice page online, search for the public notice by location or applicant name, and view by clicking on the "Documents" tab. Comments may be sent electronically by clicking on the "Add Comment" tab. A hard copy of the public notice may be requested by calling the above number.

cc: City of Ann Arbor, Applicant
Tim Payne, MDNR, Wildlife Division
Sara Thomas, MDNR, Fisheries Division
Washtenaw County Clerk
Washtenaw County Drain Commissioner
Washtenaw County Health Department
Washtenaw County Conservation District
Washtenaw CEA
John Katers, OHM Advisors, Agent

Dean Anderson, MSHDA
John Skubinna, MDEQ, WRD
Tiffany Myers, MDEQ, WRD
Matt Konieczki, MDEQ, WRD
Luke Golden, MDEQ, WRD
William Larsen, MDEQ, WRD
Adjoining Property Owners
Local Postmaster



**STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY**

Water Resources Division - Lansing
Transportation and Flood Hazard Unit
P.O. Box 30458 Lansing, MI 48909
517-256-1469

NOTICE OF PUBLIC HEARING

TAKE NOTICE that the Michigan Department of Environmental Quality (MDEQ) Water Resources Division (WRD) will hold a public hearing at the Ann Arbor District Library Traverwood Branch located at 3333 Traverwood Drive, Ann Arbor, Michigan 48105 on Thursday, January 12, 2017, at 7:00 pm.

The purpose of this hearing is to secure the views of interested persons concerning the following application for permit:

Application for Permit 2HP-3JVY-E06V under Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), by City of Ann Arbor - Public Services Area, 301 E Huron Street, P.O. Box 8647, Ann Arbor, Michigan 48107-8647.

The applicant proposes to impact a total of 0.31 acres of wetland in three locations (0.026 acres, 1.6 acres, and 0.278 acres, respectively) for the reconstruction of the Nixon Road, Dhu Varren Road and Green Road intersection. The project will include removal of an existing wetland single equalization culvert beneath Dhu Varren Road and construction of two 86 foot long, 1.5 foot diameter corrugated metal culverts, as replacement. They propose to mitigate for wetland impacts by purchasing credits in the Huron River Wetland Mitigation Bank.

The project is located in T02S, R06E, Sections 10 and 15, City of Ann Arbor, Washtenaw County, Michigan, in accordance with plans attached to this notice.

Please visit <https://miwaters.deq.state.mi.us/miwaters/#/external/home> and search for the public notice if you would like to view the project plans, or at the MDEQ, WRD, Transportation and Flood Hazard Unit, 525 West Allegan Street, Lansing, Michigan, 48909, or by calling 517-256-1469. The public hearing record will remain open for ten days after the public hearing date. Any written comments to be submitted for the public hearing record must be received at this address on or before the close of the record.

The hearing will be held pursuant to Section 324.30307 of Part 303, Wetlands Protection, of the NREPA. The hearing will not be a legal proceeding, witnesses will not be sworn, and there will be no cross examination. Public hearings are primarily informational and are held to encourage the expression of views and presentation of facts.

The MDEQ will, upon written request, provide a copy of the MDEQ's decision on this application.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
Water Resources Division

Date: December 19, 2016

NOTE: Persons with disabilities needing accommodations for effective participation in this meeting should call the telephone number listed above one week in advance to request mobility, visual, hearing, or other assistance.



AGENCY USE	Previous USACE File Number	Date Received	DEQ File Number
	USACE File Number		Fee received \$

Validate that all parts of this checklist are submitted with the application package. Fill out application and additional pages as needed.

All items in Sections 1 through 9 are completed.

Project-specific Sections 10 through 20 are completed.

Dimensions, volumes, and calculations are provided for all impact areas.

All information contained in the headings for the appropriate Sections (1-20) are addressed, and identified attachments (➔) are included.

Map, site plan(s), cross sections; one set must be black and white on 8 ½ by 11 inch paper; photographs.

Application fee is attached.

1 Project Location Information For Latitude, Longitude, and TRS info anywhere in Michigan see www.mcqi.state.mi.us/wetlands/

Project Address (road, if no street address) <i>Nixon / Green / Dhu Varren Intersection</i>	Zip Code <i>48105</i>	Municipality (Township/Village/City) <i>City of Ann Arbor</i>	County <i>Washtenaw</i>
Property Tax Identification Number(s)	Latitude <i>42.3172 N</i>	Township/Range/Section (TRS) T <i>02S</i> N or S; R <i>06E</i> E or W;	
Subdivision/Plat and Lot Number	Longitude <i>- 83 7077 W</i>	Sec <i>10&15</i> OR Private Claim # _____	

2 Applicant and Agent Information

Owner/Applicant (individual or corporate name) <i>Igor Kotlyar - City of Ann Arbor</i>	Agent/Contractor (firm name and contact person) <i>John Katers - OHM Advisors</i>
Mailing Address <i>301 E Huron St PO Box 8647</i>	Mailing Address <i>34000 Plymouth Road</i>
City <i>Ann Arbor</i> State <i>MI</i> Zip Code <i>48107</i>	City <i>Livonia</i> State <i>MI</i> Zip Code <i>48150</i>
Contact Phone Number Fax <i>734-794-6410 ext 43634</i>	Contact Phone Number Fax <i>734-466-4448</i>
Email <i>IKotlyar@a2gov.org</i>	E-mail <i>john.katers@ohm-advisors.com</i>
<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Is the applicant the sole owner of all property on which this project is to be constructed and all property involved or impacted by this project? ➔ If no, attach letter(s) of authorization from all property owners including the owner of the disposal site.	
Property Owner's Name (If different from applicant)	Mailing Address
Contact Phone Number	City State Zip Code

3 Project Description

Project Name <i>Nixon / Green / Dhu Varren Roundabout</i>	Preapplication File Number <i>2GQ - B8DN - STAA-P</i>
Name of Water body <i>N/A</i>	Date project staked/flagged <i>7/15/2014</i>

The proposed project is on, within, or involves (check all that apply) <input type="checkbox"/> an inland lake (5 acres or more) <input type="checkbox"/> a Great Lake or Section 10 Waters <input type="checkbox"/> a pond (less than 5 acres) <input checked="" type="checkbox"/> a wetland <input type="checkbox"/> a stream, river, ditch or drain <input type="checkbox"/> a 100-year floodplain <input type="checkbox"/> a legally established County Drain <input type="checkbox"/> a dam Date Drain was established <input type="checkbox"/> a designated high risk erosion area <input type="checkbox"/> a channel/canal <input type="checkbox"/> a designated critical dune area <input checked="" type="checkbox"/> 500 feet of an existing water body <input type="checkbox"/> a designated environmental area	Project Use <input type="checkbox"/> private <input type="checkbox"/> commercial <input checked="" type="checkbox"/> public/government <input checked="" type="checkbox"/> project is receiving federal/state transportation funds <input type="checkbox"/> Wetland Restoration <input type="checkbox"/> other
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Indicate the type of permit being applied for: General Permit Minor Project Individual (All other projects.) ➔ See Appendix C.

Written Summary of All Proposed Activities *For the Nixon / Green / Dhu Varren Roundabout, the project proposes to: place fill in wetlands F, J, and Z (0.026 acres & 47 cyd, 0.006 acres & 5 cyd, and 0.278 acres & 1,833 cyd, respectively), place two 12" dia outlet pipes (with riprap) which will outlet to wetland J and Z, place two hydrodynamic separator structures to treat the stormwater before outletting to wetlands, and replacing the existing 12" equalization culvert between wetlands J and Z with 2-18" equalization culverts.*

A total of 0.310 acres of wetland impacts and 1,885 cyd of wetland fill will be placed as a part of this project.

Construction Sequence and Methods *Temporary sheet piling is necessary in Wetland Z to build a cofferdam to allow for the construction of Dhu Varren Road. Temporary silt fencing will be installed around the wetlands, and filter bags installed in existing catch basins prior to construction. Storm sewer will be installed, and filter bags installed in new catch basins. A stone reservoir will be constructed*



under the road on the north, south, and east legs of the roundabout to provide underground storage for stormwater. Additionally, surface storage will be provided on the north and south side of Dhu Varren Road, on the north side of Green Road, and in the center island of the roundabout. The existing intersection will be reconstructed as a modern roundabout beginning with a sand subbase, followed by an aggregate base, and HMA pavement to create the road surface. The equalization culvert between Wetlands J & Z will be replaced while maintaining flow between the wetlands.

4 Project Purpose, Use and Alternatives *Attach additional sheets as necessary.*

Describe the purpose of the project and its intended use; include any new development or expansion of an existing land use.

The purpose of this project is to reconstruct the intersection of Nixon / Green / Dhu Varren Roads as a modern roundabout to improve safety, and better accommodate the traffic along the corridor. Currently, the intersection is a four-way stop-controlled intersection, Nixon Road running north-south, Dhu Varren Road to the west, and Green Road to the east. Dhu Varren Road and Green Road are offset from each other by approximately 90 feet, forming two T-intersections with Nixon Road. This existing intersection configuration is not adequate for current and future traffic volumes.

The northeast and southeast quadrants of the intersection are attached to residential condominiums. The northwest and southwest quadrants of the intersection are currently being developed into 400-500 residential units (Nixon Farms). There is also a proposed 235-300 unit project under review (Woodbury Club Apartments) located approximately ¼ mile north of the intersection on the east side of Nixon Road. These new developments will contribute traffic to the corridor, and improvements to the intersection must be made in order to safely accommodate current and future traffic flow.

Building a roundabout at this intersection will improve capacity and operational efficiency while also:

- Improving pedestrian, bicycle, and vehicular safety;*
- Creating a pedestrian-friendly environment by adding sidewalks, streetlights, shorter crossings;*
- Accommodating bicycle traffic by adding bike lanes;*
- Providing accessibility for the disabled in accordance with ADA requirements;*
- Minimizing environmental impacts to wetlands and other natural features*

Describe the alternatives considered to avoid or minimize resource impacts. Include factors such as, but not limited to, alternative locations, project layout and design, and construction technologies. For utility crossings include alternative routes and construction methods.

The following is a detailed description of the progression of the design and alternatives considered as part of this progression:

1. Intersection Study (October 2013 to March 2015)

The City of Ann Arbor hired Opus International to study the intersection of Nixon / Green / Dhu Varren Roads in October 2013 to identify an intersection configuration that would improve capacity and operational efficiency while also:

- Improving pedestrian, bicycle, and vehicular safety;*
- Creating a pedestrian-friendly environment;*
- Accommodating bicycle traffic;*
- Providing accessibility for the disabled in accordance with ADA requirements;*
- Minimizing environmental impacts to wetlands and other natural features*

The roundabout option with bypass lane (Exhibit 2) was considered one of two acceptable improvement options, however, their top recommendation was for realigning and widening Dhu Varren Road and lane widening on Nixon and Green Road for the installation of a traffic signal (Exhibit 1).

These two options had similar level of service (LOS), and the City of Ann Arbor ultimately selected the roundabout as the preferred option for the following reasons:

- A proven safety record. Signalized intersections that were converted to roundabouts experienced a 78% reduction in severe injury collisions and a 44% reduction in total crashes (National Cooperative Highway Research Program Report No. 572 (2007), Transportation Research Board, National Academy of Sciences and Engineering).*
- Roundabouts, when designed correctly, have low approach and entry speeds that are pedestrian friendly. There are fewer conflict points between pedestrians and vehicles at roundabouts. The splitter islands for each roundabout approach simplify and greatly shorten the crossing distance for pedestrians, as the islands are refuges for pedestrians.*
- The conceptual design for the signal option prepared by Opus (Exhibit 1) depicted the Dhu Varren approach to the signal in a horizontal curve and intersecting Nixon with a pronounced skew angle. These features can have the potential for safety concerns, as the curvature would limit visibility at the signalized intersection for left turning vehicles (potential head-on left turn crashes) that opposes potentially high-speed oncoming traffic. Plus, the skew angle results in substandard view angles of the cross road (potential angle and right turn rear end crashes).*

2. Preliminary Design Phase (March 2016 to July 2016)

- OHM Advisors was awarded the contract to prepare detailed design plans for a modern roundabout at the intersection of Nixon / Green / Dhu Varren Roads in March 2016.*
- As a prelude to designing intersections, OHM Advisors usually prefers to reassess the selection of a roundabout to ensure that the design is appropriate and will be sufficiently robust to safely handle traffic out to the planned horizon year for the community. We collected new traffic and non-motorized counts for this reassessment, accounting for the planned residential developments within the City along the Nixon Road corridor, and expanding the volume data out to the forecast year of 2035. When comparing this new travel data to that used by Opus, we see some minor differences. However, the two data sets are of the same order of magnitude, so we would anticipate that the analysis results for alternatives would be comparable.*
- We use RODEL as our preferred analysis tool for evaluating roundabout capacity for both conceptual and detailed design. The operational analysis showed us that Opus was correct in recommending a single-lane roundabout. However, in our more detailed exploration of operations, we conclude that a full bypass lane in the southwest quadrant, handling east bound to south bound movements, is not needed for opening day volumes. Further, it is questionable if it would be needed for the horizon year. Given the uncertainty of forecasting traffic volumes out 20 and more years, we conclude that planning for a future bypass lane should occur now with our design. However, we recommend that it not be constructed at this time. This is because national safety reviews of roundabouts indicate that over-building capacity, especially in the context of additional lanes, introduces a more complex situation*



than is initially needed, which has the potential to increase the risk of crashes.

- The city agreed with our recommendation of a single lane roundabout, without bypass lane, and directed us to begin preliminary design on this concept. We prepared 3 options for the public's review and comment (Exhibits 3, 4, and 5) at the public meeting in June, 2016. The public overwhelmingly supported the option shown in Exhibit 4, which showed shifting the alignment of Dhu Varren to the south to have the least impacts to Wetland J on the north side of Dhu Varren Road.
 - We then further developed the design based on Exhibit 4, and arrived at Exhibit 6, in July 2016. The exclusion of the bypass lane helped reduce impacts to wetland Z from 0.388 acres in Exhibit 2 to 0.313 acres in Exhibit 6, as shown in Table A. Although impacts to wetland Z were decreased, impacts to Wetland J on the north side of Dhu Varren Road were deemed to be too high.
3. Final Design Phase (July 2016 to October 2016)
- In an effort to further reduce wetland impacts, changes to the road geometry and grading were made:
 - On Dhu Varren Road, the horizontal alignment was meticulously placed to minimize impacts to wetlands.
 - The width of the proposed splitter island on Dhu Varren Road was reduced in order to pull the sidewalk on the north side of Dhu Varren Road further south, to eliminate impacts to Wetland J along Dhu Varren Road.
 - On the north leg of the roundabout, the project limits were extended in order to shift the road east to almost completely eliminate impacts to Wetland J along Nixon Road (0.006 acres, see Table A and Exhibit 7)
 - Slopes between the proposed sidewalk and existing wetland areas were increase to a 1 on 2 (whereas 1 on 4 is preferred) to reduce impacts to all wetlands.
 - With the incorporation of all these design changes, the total project wetland impacts were reduced from 0.500 acres in Exhibit 6 to 0.310 acres in Exhibit 7, as shown in Table A.

In addition to the reduction in wetland impacts, other minimizations to resource impacts due to horizontal geometry and grading changes during final design are as follows:

- Avoided a culvert extension on the north leg of the roundabout (as shown in Exhibit 7).
- Avoided impacts to the landmark Bur Oak tree at the northwest corner of the roundabout.
- Using a low height, ramped curb ("turtle curb") in lieu of full height, vertical face curb, to the west of the splitter island on Dhu Varren Road, to make it easier for turtles to cross the road from Wetland J to Wetland Z.
- Roundabouts have been proven to reduce idling and greenhouse gas emissions.
- Provided surface and underground stormwater storage.

All of these minimizations to resource impacts were achieved while keeping a strong focus on speed control and safety of the intersection, which is of utmost importance to the public per the feedback received in the June and July public meetings. The geometric flexibility (i.e. the use of approach and entry curvature) that is inherent with roundabouts resulted in lower-speed and a less impactful design to the environment compared to a signal.

5 Locating Your Project Site Attach a legible black and white map with a North arrow.

Names of roads of closest intersection **Nixon / Green / Dhu Varren Roads**

Directions from main intersection to the project site, with distances from the best and nearest visible landmark and water body

Description of buildings on the site (color; 1 or 2 story, other)

Description of adjacent landmarks or buildings (address; color; etc)

How can your site be identified if there is no visible address?

6 Easements and Other Permits

- No Yes Is there a conservation easement or other easement, deed restriction, lease, or other encumbrance upon the property?
 ➔ If yes, attach a copy. Provide copies of court orders and legal lake levels if applicable.

List all other federal, interstate, state, or local agency authorizations including required assurances for Critical Dune Area projects.

Agency	Type of Approval	Number	Date Applied	Date approved /denied	Reason for denial
WCRC	Traffic control	NA	not yet applied	NA	NA
AA - wetlands	wetland impacts	NA	not yet applied	NA	NA
AA - Planning and Development Svc	ROW permit	NA	not yet applied	NA	NA
AA - SESC	Soil Erosion	NA	not yet applied	NA	NA
AA - LANE/ROAD CLOSURE	Traffic control	NA	not yet applied	NA	NA

7 Compliance

If a permit is issued, when will the activity begin? (M/D/Y) **5/2017**

Proposed completion date (M/D/Y) **6/2018**

- No Yes Has any construction activity commenced or been completed in a regulated area?
 ➔ If Yes, identify the portion(s) underway or completed on drawings or attach project specifications and give completion date(s).
 No Yes Were the regulated activities conducted under a DEQ and/or USACE permit?
 ➔ If Yes, list the permit numbers

No Yes Are you aware of any unresolved violations of environmental law or litigation involving the property?
 → If Yes, attach explanation.

8 Adjoining Property Owners *Provide current mailing addresses. Attach additional sheets/labels for long lists.*

<input type="checkbox"/> Established Lake Board	Contact Person	Mailing Address	City	State and Zip Code
<input type="checkbox"/> Lake Association				

List all adjoining property owners.

If you own the adjoining lot, provide the requested information for the first adjoining parcel that is not owned by you.

Property Owner's Name	Mailing Address	City	State and Zip Code
<i>Toll MI VI Limited Partnership (Toll Brothers)</i>	<i>50420 Tamarack Trail</i>	<i>Northville</i>	<i>MI, 48168</i>

9 Applicant's Certification *Read carefully before signing.*

I am applying for a permit(s) to authorize the activities described herein. I certify that I am familiar with the information contained in this application; that it is true and accurate; and, to the best of my knowledge, that it is in compliance with the State Coastal Zone Management Program. I understand that there are penalties for submitting false information and that any permit issued pursuant to this application may be revoked if information on this application is untrue. I certify that I have the authority to undertake the activities proposed in this application. By signing this application, I agree to allow representatives of the DEQ, USACE, and/or their agents or contractors to enter upon said property in order to inspect the proposed activity site before and during construction and after the completion of the project. I understand that I must obtain all other necessary local, county, state, or federal permits and that the granting of other permits by local, county, state, or federal agencies does not release me from the requirements of obtaining the permit requested herein before commencing the activity. I understand that the payment of the application fee does not guarantee the issuance of a permit.

<input type="checkbox"/> Property Owner <input type="checkbox"/> Agent/Contractor <input checked="" type="checkbox"/> Corp. or Public Agency / Title	Printed Name <i>Igor Kotlyar</i> <i>Project Engineer - Project Management Services Unit - City of Ann Arbor</i>	Signature 	Date <i>10/12/2016</i>
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10 Projects Impacting Inland Lakes, Streams, Great Lakes, Wetlands or Floodplains

- Complete only those sections A through M applicable to your project.
- If your project impacts wetlands also complete Section 12. If your project impacts regulated floodplains also complete Section 13.
- To calculate volume in cubic yards (cu yd), multiply the average length in feet (ft) times the average width (ft) times the average depth (ft) and divide by 27. Example: (25 ft long x 10 ft wide x 2 feet deep) / 27 = 18.5 cubic yards
- Some projects on the Great Lakes require an application for conveyance prior to Joint Permit Application completeness.
 - ➔ Provide a black and white overall site plan, with cross-section and profile drawings. Show existing lakes, streams, wetlands, and other water features; existing structures; and the location of all proposed structures, land change activities and soil erosion and sedimentation control measures. Review Appendix B and EZ Guides for aid in providing complete site-specific drawings.
 - ➔ Provide tables for multiple impact areas or multiple activities such as multiple fill areas or multiple culverts. Include your calculations.

Water Level Elevation

On inland waters NGVD 29 NAVD 88 other Observed water elevation (ft) *see table* date of observation (M/D/Y)
 On a Great Lake IGLD 85 surveyed converted from observed still water elevation.

A. PROJECTS REQUIRING FILL (See All Sample Drawings)

- ➔ Attach a site plan and cross-section views to scale showing maximum and average fill dimensions with calculations.
- ➔ For multiple impact areas on a site provide a table with location, dimensions and volumes for each fill area.

Purpose bioengineered shore protection boat ramp boat well bridge or culvert crib dock
 riprap seawall swim area other *roundabout construction*

Dimensions of fill (ft) Length Width <i>see table</i> Maximum Depth	Total volume (cubic yards) <i>see table</i>	Volume below OHWM (cubic yards) <i>see table</i>
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Maximum water depth in fill area (ft) <i>see table</i>	Area filled (sq ft) <i>see table</i>	Will filter fabric be used under proposed fill? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (If Yes, type)
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Fill will extend *see table* feet into the water from the shoreline and upland feet out of the water.

Type of clean fill peastone % sand % gravel % other *Engineered backfill*

Source of clean fill commercial on-site ➔ If on-site, show location on site plan.
 other ➔ If other, attach description of location.

B. PROJECTS REQUIRING DREDGING OR EXCAVATION (See Sample Drawings)

- Refer to www.mi.gov/jointpermit for spoils disposal and authorization requirements.
- ➔ Attach a site plan and cross-section views to scale showing maximum and average dredge or excavation dimensions with calculations.
- ➔ For multiple impact areas on a site provide a table with location, dimensions and volumes for each dredge/excavation area.

Purpose boat ramp boat well bridge or culvert maintenance dredge
 navigation pond/basin other

Dimensions (ft) Length Width Maximum Depth	Total volume (cu yds) <i>no dredging</i>	Volume below OHWM (cu yds) <i>no dredging</i>
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Has this same area been previously dredged? No Yes If Yes, provide date and permit number:

Will the previously dredged area be enlarged? No Yes If Yes, when and how much?

Is long-term maintenance dredging planned? No Yes If Yes, how often?

Dredge or Excavation Method Hydraulic Mechanical other

Spoils Disposal	Dredged or excavated spoils will be placed <input type="checkbox"/> on-site <input type="checkbox"/> landfill <input type="checkbox"/> USACE confined disposal facility <input type="checkbox"/> other upland off-site For disposal, provide a ➔ Detailed spoils disposal area location map and site plan with property lines. ➔ Letter of authorization from property owner of spoils disposal site, if disposed off-site.
	For volumes less than 5,000 cu yards, has proposed dredge material been tested for contaminants within the past 10 years? <input type="checkbox"/> No <input type="checkbox"/> Yes ➔ If Yes, provide test results with a map of sampling locations.

C. PROJECTS REQUIRING RIPRAP (See Sample Drawings 2, 3, 8, 12, 14, 22, and 23)

Riprap water ward of the ordinary high water mark: dimensions (ft) length width depth <i>see table</i>	Volume(cu yd) <i>see table</i>
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Riprap landward of the ordinary high water mark: dimensions (ft) length width depth <i>see table</i>	Volume(cu yd) <i>see table</i>
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Type and size of riprap (inches)
 field stone angular rock *d50=6", dmax=9"* other

Will filter fabric or pea stone be used under proposed riprap?
 No Yes, Type *Geotextile fabric*

<input type="checkbox"/> D. SHORE PROTECTION PROJECTS (See EZ Guides and Sample Drawings 2, 3, and 17. Complete Sections 10A, B, and/or C.) For bioengineering projects include the list of native plants/seeds, if available.			
Type and length (ft)	<input type="checkbox"/> bioengineering (ft)	<input type="checkbox"/> revetment (ft)	<input type="checkbox"/> riprap (ft) <input type="checkbox"/> seawall/bulkhead (ft)
Structure is	<input type="checkbox"/> new <input type="checkbox"/> repair <input type="checkbox"/> replacement of an existing structure	Will the existing structure be removed? <input type="checkbox"/> No <input type="checkbox"/> Yes	
Proposed Toe Stone (linear feet)		Distance of project from adjacent property lines (ft)	
Distance of project from an obvious fixed structure (example - 50 ft from SW corner of house)			
For bioengineering projects indicate the structure type <input type="checkbox"/> brush bundles <input type="checkbox"/> coir log <input type="checkbox"/> live stakes <input type="checkbox"/> tree revetment <input type="checkbox"/> other			
<input type="checkbox"/> E. DOCK - PIER – MOORING PILINGS (See Sample Drawing 10) ♦ Attach a copy of the property legal description, mortgage survey, or a property boundary survey report.			
Dock Type <input type="checkbox"/> open pile <input type="checkbox"/> filled <input type="checkbox"/> crib <input type="checkbox"/> floating <input type="checkbox"/> cantilevered <input type="checkbox"/> spring piles <input type="checkbox"/> piling clusters <input type="checkbox"/> other			
Is the structure within the applicant's riparian area interest area? <input type="checkbox"/> No <input type="checkbox"/> Yes ♦ Show parcel property lines on the site plan.			
Proposed structure dimensions (ft) length width		Use <input type="checkbox"/> private <input type="checkbox"/> public <input type="checkbox"/> commercial	
Dimensions of nearest adjacent structures (ft) length width		Distance of dock from adjacent property lines (ft)	
<input type="checkbox"/> F. BOAT WELL (See EZ Guide. Complete Sections 10A and 10B)			
Dimensions (ft) length width depth		Number of boats	
Type of sidewall stabilization <input type="checkbox"/> concrete <input type="checkbox"/> riprap <input type="checkbox"/> steel <input type="checkbox"/> vinyl <input type="checkbox"/> wood <input type="checkbox"/> other			
Volume of backfill behind sidewall stabilization (cu yd)		Distance of boat well from adjacent property lines (ft)	
<input type="checkbox"/> G. BOAT RAMP (See EZ Guide. Complete sections 10A, 10B, and 10C for mattress and pavement fill, dredge, and riprap)			
Type <input type="checkbox"/> new <input type="checkbox"/> existing <input type="checkbox"/> maintenance/improvement		Use <input type="checkbox"/> private <input type="checkbox"/> public <input type="checkbox"/> commercial	
Existing overall boat ramp dimensions (ft) length width depth		Type of construction material <input type="checkbox"/> concrete <input type="checkbox"/> wood <input type="checkbox"/> stone <input type="checkbox"/> other	
Proposed overall ramp dimensions (ft) length width depth		Proposed ramp dimensions (ft) below ordinary high water mark length width depth	
Number of proposed skid piers	Proposed skid pier dimensions (ft) length width		Distance of ramp from adjacent property lines (ft)
<input type="checkbox"/> H. BOAT HOIST – ROOFS (See EZ Guide)			
Type <input type="checkbox"/> cradle <input type="checkbox"/> side lifter <input type="checkbox"/> other		Located on <input type="checkbox"/> seawall <input type="checkbox"/> dock <input type="checkbox"/> bottomlands	
Hoist dimensions, including catwalks (ft) length width			
Area occupied, including catwalks (sq ft)		Distance of hoist from adjacent property lines (ft)	
Permanent Roof <input type="checkbox"/> No <input type="checkbox"/> Yes ♦ If Yes, how is the roof supported?		Maximum Roof Dimensions (ft): length width height	
<input type="checkbox"/> I. BOARDWALKS and DECKS in WETLANDS or FLOODPLAINS (See Sample Drawings 5 and 6. Complete Sections 12 and/or 13) ♦ Provide a table for multiple boardwalks and decks proposed in one project; include locations and dimensions.			
Wetlands		Floodplains	
Boardwalk <input type="checkbox"/> on pilings <input type="checkbox"/> on fill	Deck <input type="checkbox"/> on pilings <input type="checkbox"/> on fill	Boardwalk <input type="checkbox"/> on pilings <input type="checkbox"/> on fill	Deck <input type="checkbox"/> on pilings <input type="checkbox"/> on fill
Dimensions (ft) length width	Dimensions (ft) length width	Dimensions (ft) length width	Dimensions (ft) length width
<input checked="" type="checkbox"/> J. INTAKE PIPES (See Sample Drawing 16) or OUTLET PIPES (See Sample Drawing 22)			
If outlet pipe, discharge is to <input type="checkbox"/> inland lake <input type="checkbox"/> stream, drain or river <input type="checkbox"/> overland flow <input type="checkbox"/> Great Lake <input checked="" type="checkbox"/> wetland <input type="checkbox"/> other			
Number of pipes <i>see table</i>	Pipe diameters and invert elevations <i>see table</i>	Does pipe discharge below the OHWM?	<input type="checkbox"/> No <input type="checkbox"/> Yes
		Is the water treated before discharge?	<input type="checkbox"/> No <input type="checkbox"/> Yes
Type <input type="checkbox"/> headwall <input checked="" type="checkbox"/> end section <input type="checkbox"/> other <i>see table</i>		Dimensions of headwall OR end section (ft) length <i>see table</i> width height	



12 Activities That May Impact Wetlands (See Sample Drawings 8 & 9). Complete other Sections as applicable.																				
<ul style="list-style-type: none"> • Locate your site and wetland information with the DEQ Wetlands Map Viewer at www.mcgi.state.mi.us/wetlands/ • For information on the DEQ's Wetland Identification Program (WIP) visit www.mi.gov/wetlands. <ul style="list-style-type: none"> ➔ Provide a detailed site plan with labeled property lines, upland and wetland areas, and dimensions and volumes of wetland impacts. ➔ Complete the wetland dredge and wetland fill dimension information below for each impacted wetland area. ➔ Attach tables for multiple impact areas or activities. ➔ Attach at least one cross-section for each wetland dredge and/or fill area; show wetland and upland boundaries on the cross-section. 																				
Has the DEQ conducted a wetland assessment for this parcel?		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	➔ If Yes, provide a copy or WIP number:																	
Has a professional wetland delineation been conducted for this parcel?		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	➔ If Yes, provide a copy with data sheets																	
Is there a recorded DEQ easement on the property?		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	➔ If Yes, provide the easement number																	
Did the applicant purchase the property before October 1, 1980?		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	➔ If Yes, provide documentation.																	
Is any grading or mechanized land clearing proposed?		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	➔ If Yes, label the locations on the site plan.																	
Has any of the proposed grading or mechanized land clearing been completed?		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	➔ If Yes, label the locations on the site plan																	
<table style="width:100%; border: none;"> <tr> <td style="width: 33%; border: none;">Proposed Activity</td> <td style="width: 33%; border: none;"><input type="checkbox"/> boardwalk or deck (Section 10I)</td> <td style="width: 33%; border: none;"><input checked="" type="checkbox"/> bridges and culverts (Section 14)</td> <td style="width: 33%; border: none;"><input type="checkbox"/> designated environmental area</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;"><input checked="" type="checkbox"/> dewatering</td> <td style="border: none;"><input checked="" type="checkbox"/> draining surface water</td> <td style="border: none;"><input checked="" type="checkbox"/> driveway / road</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;"><input type="checkbox"/> fences (Section 10L)</td> <td style="border: none;"><input checked="" type="checkbox"/> fill or dredge</td> <td style="border: none;"><input checked="" type="checkbox"/> restoration</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;"><input type="checkbox"/> septic system</td> <td style="border: none;"><input checked="" type="checkbox"/> stormwater discharge (Section 10J)</td> <td style="border: none;"><input checked="" type="checkbox"/> other road & sidewalk construction</td> </tr> </table>					Proposed Activity	<input type="checkbox"/> boardwalk or deck (Section 10I)	<input checked="" type="checkbox"/> bridges and culverts (Section 14)	<input type="checkbox"/> designated environmental area		<input checked="" type="checkbox"/> dewatering	<input checked="" type="checkbox"/> draining surface water	<input checked="" type="checkbox"/> driveway / road		<input type="checkbox"/> fences (Section 10L)	<input checked="" type="checkbox"/> fill or dredge	<input checked="" type="checkbox"/> restoration		<input type="checkbox"/> septic system	<input checked="" type="checkbox"/> stormwater discharge (Section 10J)	<input checked="" type="checkbox"/> other road & sidewalk construction
Proposed Activity	<input type="checkbox"/> boardwalk or deck (Section 10I)	<input checked="" type="checkbox"/> bridges and culverts (Section 14)	<input type="checkbox"/> designated environmental area																	
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	<input type="checkbox"/> septic system	<input checked="" type="checkbox"/> stormwater discharge (Section 10J)	<input checked="" type="checkbox"/> other road & sidewalk construction																	
FILL	Dimensions maximum length (ft) <i>see table</i> maximum width (ft)	Area <input checked="" type="checkbox"/> acres <input type="checkbox"/> sq ft <i>see table</i>	Average depth (ft) <i>see table</i>	Volume (cu yd) <i>see table</i>																
DREDGE	Dimensions maximum length (ft) <i>0</i> maximum width (ft) <i>0</i>	Area <input checked="" type="checkbox"/> acres <input type="checkbox"/> sq ft <i>0</i>	Average depth (ft) <i>0</i>	Volume (cu yd) <i>0</i>																
Spoils Disposal	Dredged or excavated spoils will be placed <input type="checkbox"/> on-site <input type="checkbox"/> landfill <input type="checkbox"/> USACE confined disposal facility <input type="checkbox"/> other upland off-site For disposal, provide a ➔ Detailed spoils disposal area location map and site plan with property lines. ➔ Letter of authorization from property owner of spoils disposal site, if disposed off-site.																			
Septic System	The proposed project will be serviced by: <input type="checkbox"/> public sewer <input type="checkbox"/> private septic system ➔ Show system on plans.																			
If a private septic system is proposed, has an application for a permit been made to the County Health Department? <input type="checkbox"/> No <input type="checkbox"/> Yes If Yes, has a permit been issued? <input type="checkbox"/> No <input type="checkbox"/> Yes ➔ Provide a copy of the permit.																				
Describe the wetland impacts, the proposed use or development, and the alternatives considered: <ul style="list-style-type: none"> • <i>The project proposes to impact wetlands at 3 locations as a part of the reconstruction of the intersection of Nixon / Green / Dhu Varren Roads. Approximately 0.310 acres of wetland will be impacted by the project: 0.026 acres of fill in Wetland F, 0.006 acres of fill in Wetland J, and 0.278 acres of fill in wetland Z.</i> • <i>This is a public transportation project that involves building a roundabout at the intersection of Nixon / Green / Dhu Varren Roads to improve traffic safety and flow. Detailed discussion on the project purpose and the alternatives considered can be found in section 4.</i> • <i>The proposed roadway improvements will help make the intersection safer while minimizing the wetland impacts to the greatest extent possible.</i> Please see permit number 14-81-0040-P for a copy of the wetland delineation with data sheets.																				
Does the project impact more than 1/3 acre of wetland? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes ➔ If Yes, submit a Mitigation Plan with the type and amount of mitigation proposed. For more information go to www.mi.gov/wetlands																				
Describe how impacts to waters of the United States will be avoided and minimized: <i>The impacts to waters of the United States are being avoided when possible, and minimized to the greatest extent when impacts are unavoidable. The location of the roundabout was chosen (as detailed in section 4) with the intent of having the least impacts practical to the wetlands. Slopes behind the sidewalk will be 1 on 2 to minimize grading at the wetlands. Sidewalk alignments were shifted to avoid wetlands whenever possible. Sidewalk and road alignment shifts resulted in avoiding a culvert extension that was required by a previous iteration of the design.</i>																				

Soil erosion and sedimentation control (SESC) measures will be utilized to minimize impacts to the waters of the United States. SESC measures used on this project include: silt fence, catch basin filter bags, rip rap, and manufactured stormwater treatment devices (hydrodynamic separator).

Also, approximately 40,000 CF of stormwater storage (surface and underground) will be constructed as a part of this project, which will be beneficial to the waters of the United States due to the detaining of stormwater before entering the wetlands.

Describe how the impact to waters of the United States will be compensated. OR Explain why compensatory mitigation should not be required for the proposed impacts.

Total wetland impacts within the project are approximately 0.310 acres. The city of Ann Arbor proposes to mitigate these impacts by purchasing 0.310 acres of wetland credits at the bank located in the Huron River Mitigation Banking Watershed and the Ann Arbor Moraines Ecoregion.

The bank expects to receive certification by 10/1/2017 from MDEQ releasing the credits offered for sale. Please see the two attached documents detailing the purchasing of wetland credits.



14 Bridges and Culverts Including Foot and Cart Bridges. (See EZ Guides and Sample Drawings 5, 14A, 14B, 14C, 14D.)

- Complete other applicable Sections, including 10A-C.
- A hydraulic analysis or hydrologic analysis may be required to fully assess impacts. ➔ Attach hydraulic calculations.
- High Water Elevation - describe reference point and highest known water level above or below reference point and date of observation.
 - ➔ Attach additional sheets for multiple bridges and/or culverts.
 - ➔ Provide detailed site-specific drawings of existing and proposed Plan and Elevation View at a scale adequate for detailed review.
 - ➔ Provide all information in the boxes below; do not write in a reference to plan sheets. Show reference datum used on plans.

Stream Information	The site has a high water elevation (ft) <input type="checkbox"/> above or <input type="checkbox"/> below the Reference Point of _____ Date observed _____		
	Reference datum used <input type="checkbox"/> NGVD 29 <input type="checkbox"/> NAVD 88 <input type="checkbox"/> IGLD 85 (Great Lakes coastal areas) <input type="checkbox"/> other _____		
	Average stream width (ft) at the ordinary high water mark (OHWM) outside the influence of any ponding or scour holes around the structure	Upstream _____ Downstream _____	
	Cross-sectional area of primary channel (sq ft) _____ (See Sample Drawing 14C for more information)		
	The width of the stream where the water begins to overflow its banks. Bankfull width (ft) _____		
	The invert of the stream 100-feet from structure (ft)	Upstream _____ Downstream _____	
	Is the existing culvert perched? <input type="checkbox"/> No <input type="checkbox"/> Yes If Yes, provide a profile of the channel bottom at the high and low points for a distance of 200 feet upstream and downstream of the culvert.		
Complete this form for each bridge / culvert location.			
Bridge	Number of bridge spans	Existing	Proposed
	Bridge type (concrete box beam, concrete I-beam, timber, etc.)		
	Bridge span (length perpendicular to stream) (ft)		
	Bridge width (parallel to stream) (ft)		
	Bottom of bridge beam (ft)	Upstream _____ Downstream _____	
	Stream invert elevation at bridge (ft)	Upstream _____ Downstream _____	
	Bridge rise from bottom of beam to streambed (ft)		
	Culvert	Number of culverts	1
Culvert type (arch, bottomless, box, circular, elliptical, etc.)		circular	circular
Culvert material (concrete, corrugated metal, plastic, etc.)		CMP	CMP
Culvert length (ft)		41	2 EA @ 86 FT
Culvert <input type="checkbox"/> width <input checked="" type="checkbox"/> diameter (ft)		1	2 EA @ 1.5 FT
Culvert height prior to any burying (ft)		1	1.5
Depth culvert will be buried (ft)		0	0
Elevation of culvert crown (ft)		Upstream 947.90 Downstream 947.95	948.61 948.47
Higher elevation of <input checked="" type="checkbox"/> culvert invert OR <input type="checkbox"/> streambed within culvert (ft)		Upstream 946.90 Downstream 946.95	947.11 946.97
Complete for both Bridges and Culverts		Entrance design (mitered, projecting, wingwalls, etc.)	unknown, buried
	Total structure waterway opening above streambed (sq ft)	0	
	Total structure waterway area below the 100-year elevation (sq ft) (if known)		
	Elevation of road grade at structure (ft)	949.07	952.54
	Elevation of low point in road (ft)	949.05	LP removed
	Distance from low point of road to mid-point of bridge crossing (ft)	19 FT	LP removed
	Length of approach fill from edge of bridge/culvert to existing grade (ft)	220	220
	A Licensed Professional Engineer may certify that your project will not cause a harmful interference for a range of flood discharges up to and including the 100-year flood discharge. The "Required Certification Language" is found under "forms" on the "maps, forms and documents" link from the www.mi.gov/jointpermit page or a copy may be requested by phone, email, or mail. A hydraulic report supporting this certification may also be required. Is Certification Language attached? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		

**TABLE OF IMPACTS - Nixon / Green / Dhu
Varren Roundabout**

LOCATION 1	LOCATION 2	LOCATION 3
Wetland F (West of roundabout, north side of Dhu Varren Road)	Wetland J (NW quadrant of intersection)	Wetland Z (SW quadrant of intersection)

Application Section

10 - PROJECTS IMPACTING INLAND LAKES, STREAMS, GREAT LAKES, WETLANDS OR FLOODPLAINS

OHWM	945.10	948.00 along Dhu Varren Road 948.91 along Nixon Road	948.00 along Dhu Varren Road near equalization pipe. No water present at prop outlet pipe near STA 66+00
Observed Water Elevation	945.10 on 9/19/2016	948.25 along Dhu Varren Road (4/7/2016) 949.16 along Nixon Road (4/7/2016)	948.25 along Dhu Varren Road near equalization pipe (4/7/2016). No water present at prop outlet pipe near STA 66+00 (9/19/2016)

A: Projects requiring fill

Proposed Activity	Fill in wetland due to sidewalk construction.	Fill in wetland due to road reconstruction.	Fill in wetland due to road reconstruction.
Length (ft)	81	84	221
Average Width (ft)	15	4	55
Max depth (ft)	2	1	6
Total volume (cyd)	47	5	1833
Volume below OHWM (cyd)	3	0	50
Max water depth (ft)	0.5	0	1.0
Area filled (ac)	0.026	0.006	0.278
Using filter fabric?	No	No	No
Fill extent into water (ft)	All fill is in the water, cutting thru wetland	No fill in water	varies 55' - 62'
Fill extent upland (ft)	No fill upland, cutting thru wetland	upland is the existing road	upland is the existing road
Type of clean fill	Engineered backfill	Engineered backfill	Engineered backfill
Source of clean fill	commercial	commercial	commercial

B: Projects requiring dredging or excavation

Proposed Activity	No dredging - fill only	No dredging - fill only	No dredging - fill only
Length (ft)			
Width (ft)			
Max depth (ft)			
Total volume (cyd)			
Volume below OHWM (cyd)			
Method			

N/A

N/A

N/A

TABLE OF IMPACTS - Nixon / Green / Dhu Varren Roundabout		LOCATION 1	LOCATION 2	LOCATION 3
Application Section		Wetland F (West of roundabout, north side of Dhu Varren Road)	Wetland J (NW quadrant of intersection)	Wetland Z (SW quadrant of intersection)

C: Projects Requiring Riprap				
Waterward of OHWM				
Riprap areas are irregular shapes. Length and width are approximate. See plan sheets for more information	Length (ft)	N/A	@ outlet pipe = 0 @ equalization pipes = 4	@ outlet pipe = 0 @ equalization pipes = 4
	Width (ft)	N/A	@ outlet pipe = 0 @ equalization pipes = 11	@ outlet pipe = 0 @ equalization pipes = 11
	Depth (ft)	N/A	2	2
	Volume (cyd)	N/A	@ outlet pipe = 0 @ equalization pipes = 4	@ outlet pipe = 0 @ equalization pipes = 4
Landward of OHWM				
Riprap areas are irregular shapes. Length and width are approximate. See plan sheets for more information	Length (ft)	N/A	@ outlet pipe = 7 @ equalization pipes = 3	@ outlet pipe = 7 @ equalization pipes = 3
	Width (ft)	N/A	@ outlet pipe = 6 @ equalization pipes = 11	@ outlet pipe = 6 @ equalization pipes = 11
	Depth (ft)	N/A	2	2
	Volume (cyd)	N/A	@ outlet pipe = 3 @ equalization pipes = 3	@ outlet pipe = 3 @ equalization pipes = 3

J: Intake pipes or outlet pipes				
Outlet to	wetland			
Number of pipes	1 - outlet			
Pipe diameter (in)	12			
Invert Elevation	948.50			
Does pipe discharge below OHWM	no			
Is water treated before discharge	yes - hydrodynamic separator and riprap			
Type - <u>headwall</u> or <u>end section</u>	end section			
Headwall / end section dimensions				
Length (ft)	6.3			
Width (ft)	2.8			
Height (ft)	1.8			
N/A				
No water present				
Yes - grassy swale, catch basin with sump, and rip rap at outlet				

K: ACTIVITIES THAT MAY IMPACT WETLANDS				
Fill				
Maximum length (ft)	81	84	221	221
Maximum width (ft)	22	4	62	62
Area (ac)	0.026	0.006	0.278	0.278
Average depth (ft)	1.2	0.6	4.1	4.1
Volume (cyd)	47	5	1,833	1,833

TABLE A - WETLAND IMPACTS BY DESIGN ALTERNATIVE

Description	Exhibit #	Design Date	Wetland F (ac)	Wetland J (ac)	Wetland Z (ac)	Wetland NE (ac)	Total (ac)
Aligned Signal from intersection study	Exhibit 1	March, 2015	0.026	0.109	0.382	0.000	0.517
Aligned Roundabout with bypass from	Exhibit 2	March, 2015	0.026	0.109	0.388	0.000	0.523
Preliminary Design Phase	Exhibit 6	July, 2016	0.026	0.161	0.313	0.000	0.500
Final Design	Exhibit 7	October, 2016	0.026	0.006	0.278	0.000	0.310

mailing address

# & street	city	parcel number	name
2700 MAITLAND DR	Ann Arbor	09-09-15-102-101	SMILLIE FRANCES DRURY TRUST
2701 MAITLAND DR	Ann Arbor	09-09-15-102-099	PALMQUIST KENT D & BONNEVIEVE L
2702 MAITLAND DR	Ann Arbor	09-09-15-102-102	LUDWIG KENNETH & MARGARET
2703 MAITLAND DR	Ann Arbor	09-09-15-102-098	WU JUDIE P
2704 MAITLAND DR	Ann Arbor	09-09-15-102-103	DELANO NANCY & DELANO JEFFREY
2705 MAITLAND DR	Ann Arbor	09-09-15-102-097	HENSTOCK JENNIFER LYN
2706 MAITLAND DR	Ann Arbor	09-09-15-102-104	MANDICH, LLC
2707 MAITLAND DR	Ann Arbor	09-09-15-102-096	RABOURN FAMILY TRUST
2710 MAITLAND DR	Ann Arbor	09-09-15-102-122	DENTON ELEANOR & PAUL
2712 MAITLAND DR	Ann Arbor	09-09-15-102-123	MOSS FRED JR & MOSS MARY
2714 MAITLAND DR	Ann Arbor	09-09-15-102-124	GONG BIN & GAO KEFEI
2716 MAITLAND DR	Ann Arbor	09-09-15-102-125	WEIGEL JOHN II & CAROL
2720 MAITLAND DR	Ann Arbor	09-09-15-102-132	SCHWARTZ EDWARD & ROCHELLE
2721 MAITLAND DR	Ann Arbor	09-09-15-102-126	DEMURO RICHARD & NANCY
2722 MAITLAND DR	Ann Arbor	09-09-15-102-133	KOLIAS JOHN T & ELENI
2723 MAITLAND DR	Ann Arbor	09-09-15-102-127	WILSON WILLIAM E TRUST
2724 MAITLAND DR	Ann Arbor	09-09-15-102-134	GLOVER ROY & MARILYN
2726 MAITLAND DR	Ann Arbor	09-09-15-102-135	WERTHAUSER ALLEN NEIL & JUDITH E
2730 MAITLAND DR	Ann Arbor	09-09-15-102-128	JOHNSON ELIZABETH JUDSON
2732 MAITLAND DR	Ann Arbor	09-09-15-102-129	KEELEY SABRINA E & POISSON EDMOND C
2734 MAITLAND DR	Ann Arbor	09-09-15-102-130	MONTAGUE CHRISTINA
2736 MAITLAND DR	Ann Arbor	09-09-15-102-131	MOORMAN EDWARD JR & NANCY
2740 MAITLAND DR	Ann Arbor	09-09-15-102-118	MAYBAUM JONATHAN & WENDY B
2742 MAITLAND DR	Ann Arbor	09-09-15-102-119	HAGSTROM CARL G & ANDERSON DEBORAH
2744 MAITLAND DR	Ann Arbor	09-09-15-102-120	DEMURO DAVID A
2746 MAITLAND DR	Ann Arbor	09-09-15-102-121	GRAFTON FAMILY LIVING TRUST
2751 MAITLAND DR	Ann Arbor	09-09-15-102-139	YAMAMOTO DANIEL S & MARIA
2753 MAITLAND DR	Ann Arbor	09-09-15-102-138	KAELIN NANCY
2755 MAITLAND DR	Ann Arbor	09-09-15-102-137	JAKES VIRGINIA
2757 MAITLAND DR	Ann Arbor	09-09-15-102-136	GRIFFIN JOSEPH W JR & PENELOPE
2760 MAITLAND DR	Ann Arbor	09-09-15-102-105	CAMPBELL MARJORIE ANN
2762 MAITLAND DR	Ann Arbor	09-09-15-102-106	LAVOIE GEORGE A

2764 MAITLAND DR	Ann Arbor	09-09-15-102-107	HSIEH TE-LING
2766 MAITLAND DR	Ann Arbor	09-09-15-102-108	MCCORD RICHARD & LYNN
2780 MAITLAND DR	Ann Arbor	09-09-15-102-114	KRASNOW CHARLES G
2781 MAITLAND DR	Ann Arbor	09-09-15-102-112	TRIGGER SUSAN P TRUST
2782 MAITLAND DR	Ann Arbor	09-09-15-102-115	MERKLE ROGER A & KAREN E
2783 MAITLAND DR	Ann Arbor	09-09-15-102-111	NA GUN-NAM & KIM EUNJU
2784 MAITLAND DR	Ann Arbor	09-09-15-102-116	KUANG MIN
2785 MAITLAND DR	Ann Arbor	09-09-15-102-110	KHALIDI MAYA
2786 MAITLAND DR	Ann Arbor	09-09-15-102-117	WILLIAM GEORGE MILNE & MILNE MADLYN
2787 MAITLAND DR	Ann Arbor	09-09-15-102-109	WELLS JOAN B
2820 WINDWOOD DR	Ann Arbor	09-09-14-209-054	THC ANN ARBOR WP LLC
2701 BARCLAY WAY	Ann Arbor	09-09-10-400-083	HANSEN SEAN O & JESSICA
2703 BARCLAY WAY	Ann Arbor	09-09-10-400-084	WALDRON CLIVE
2705 BARCLAY WAY	Ann Arbor	09-09-10-400-086	YE XIANGYI
2707 BARCLAY WAY	Ann Arbor	09-09-10-400-085	AGARWAL SAILESH & MADHUR
2709 BARCLAY WAY	Ann Arbor	09-09-10-400-087	CHEN CHRISTINE & CHARNG-NING
2711 BARCLAY WAY	Ann Arbor	09-09-10-400-088	LI XIAOXIN
2713 BARCLAY WAY	Ann Arbor	09-09-10-400-090	PAUL ALYSSA R
2715 BARCLAY WAY	Ann Arbor	09-09-10-400-089	CHIA YUNG SAN LLOYD & VALERIECHEW M
2717 BARCLAY WAY	Ann Arbor	09-09-10-400-091	COLCORD SCOTT A
2719 BARCLAY WAY	Ann Arbor	09-09-10-400-092	SALVI ASHOK & ASHWIN A
2721 BARCLAY WAY	Ann Arbor	09-09-10-400-094	SAUNDERS BRIAN D & ERIKA H
2723 BARCLAY WAY	Ann Arbor	09-09-10-400-093	AURORA MEGAN E & PETER H
2725 BARCLAY WAY	Ann Arbor	09-09-10-400-159	MA PHUONG
2727 BARCLAY WAY	Ann Arbor	09-09-10-400-158	LEE JUN YEOP & MINJUNG
2729 BARCLAY WAY	Ann Arbor	09-09-10-400-160	HELMUTH DWIGHT H
2730 BARCLAY WAY	Ann Arbor	09-09-10-400-002	CHUNG WOO WON
2731 BARCLAY WAY	Ann Arbor	09-09-10-400-161	KIM SARAH H
2732 BARCLAY WAY	Ann Arbor	09-09-10-400-003	WANG JIANJUN & LI QIANQIAN
2733 BARCLAY WAY	Ann Arbor	09-09-10-400-163	HOFFMAN ELIZABETH BARRON TRUST
2734 BARCLAY WAY	Ann Arbor	09-09-10-400-004	WANG ADRIEN
2735 BARCLAY WAY	Ann Arbor	09-09-10-400-162	HU BANGXIN

2736 BARCLAY WAY	Ann Arbor	09-09-10-400-005	LEE KUEI & YAO T & MEI H
2737 BARCLAY WAY	Ann Arbor	09-09-10-400-164	PEREZ OMAR & IRENE & VANESSA
2738 BARCLAY WAY	Ann Arbor	09-09-10-400-006	WANG YUHONG
2739 BARCLAY WAY	Ann Arbor	09-09-10-400-165	SELL JEREMY D
2740 BARCLAY WAY	Ann Arbor	09-09-10-400-007	TAMADDONI SEYED H & HEDIEH
2741 BARCLAY WAY	Ann Arbor	09-09-10-400-167	LEE EDWARD Y
2742 BARCLAY WAY	Ann Arbor	09-09-10-400-008	WUNDER JENNIFER A
2743 BARCLAY WAY	Ann Arbor	09-09-10-400-166	MORENO MANUEL G
2744 BARCLAY WAY	Ann Arbor	09-09-10-400-009	XIE WEINA
2745 BARCLAY WAY	Ann Arbor	09-09-10-400-168	LEONARD ERIC M
2746 BARCLAY WAY	Ann Arbor	09-09-10-400-010	BUCKLER MEGHAN R
2747 BARCLAY WAY	Ann Arbor	09-09-10-400-169	ZHANG XIA
2748 BARCLAY WAY	Ann Arbor	09-09-10-400-011	THORNBURG MARGARET & ANN MARIE
2749 BARCLAY WAY	Ann Arbor	09-09-10-400-171	JI SHAOWEN
2751 BARCLAY WAY	Ann Arbor	09-09-10-400-170	DENG YANZHEN & TIAN YOU
2752 BARCLAY WAY	Ann Arbor	09-09-10-400-080	XIE ZHIXING & LI LIPING
2753 BARCLAY WAY	Ann Arbor	09-09-10-400-172	PATEL ATUL
2754 BARCLAY WAY	Ann Arbor	09-09-10-400-079	XUE JISAN
2755 BARCLAY WAY	Ann Arbor	09-09-10-400-173	TREPKOWSKI NATHAN R
2756 BARCLAY WAY	Ann Arbor	09-09-10-400-078	KOGULAN NALAYINI & PALANIANDY
2758 BARCLAY WAY	Ann Arbor	09-09-10-400-077	LACIN SINAN N
2759 BARCLAY WAY	Ann Arbor	09-09-10-400-095	JANG SEONG YEUL & KI-BEOM
2761 BARCLAY WAY	Ann Arbor	09-09-10-400-096	JONES EMILY
2762 BARCLAY WAY	Ann Arbor	09-09-10-400-076	KUO IRENE R & KUO MOLLY E
2763 BARCLAY WAY	Ann Arbor	09-09-10-400-098	POLCE SEAN & EVANS-POLCE REBECCA
2764 BARCLAY WAY	Ann Arbor	09-09-10-400-075	COMBI CHRISTINE
2765 BARCLAY WAY	Ann Arbor	09-09-10-400-097	SUROVELL EDWARD D TRUST
2766 BARCLAY WAY	Ann Arbor	09-09-10-400-074	ATEESH, LLC
2767 BARCLAY WAY	Ann Arbor	09-09-10-400-099	SHYU GWO CHING & JENG JING-YI TRUST
2768 BARCLAY WAY	Ann Arbor	09-09-10-400-073	LI XIA
2769 BARCLAY WAY	Ann Arbor	09-09-10-400-100	HUANG LUJUN & XUEQIN SONG &
2770 BARCLAY WAY	Ann Arbor	09-09-10-400-072	SUNNY SIDE STUDIO INC
2771 BARCLAY WAY	Ann Arbor	09-09-10-400-102	SABALIUNAS MEDEA
2773 BARCLAY WAY	Ann Arbor	09-09-10-400-101	JAN NAJEEB

2774 BARCLAY WAY	Ann Arbor	09-09-10-400-012	LIU ZIJUAN
2775 BARCLAY WAY	Ann Arbor	09-09-10-400-103	ROJAS-CARO SANDRA E
2776 BARCLAY WAY	Ann Arbor	09-09-10-400-013	MUTTALIB AZHAR & LUBNA
2777 BARCLAY WAY	Ann Arbor	09-09-10-400-104	LEE CHANG S
2778 BARCLAY WAY	Ann Arbor	09-09-10-400-014	GIEDRAITIS ANDRIUS & KASTYTIS
2779 BARCLAY WAY	Ann Arbor	09-09-10-400-106	MUKAI TAKEO
2780 BARCLAY WAY	Ann Arbor	09-09-10-400-015	JIANG LI
2781 BARCLAY WAY	Ann Arbor	09-09-10-400-105	SILVEIRA MARIA J
2782 BARCLAY WAY	Ann Arbor	09-09-10-400-016	PERIAM DAVID
2784 BARCLAY WAY	Ann Arbor	09-09-10-400-017	HASAN AHMED A K & TAHMINA
2785 BARCLAY WAY	Ann Arbor	09-09-10-400-144	PATEL SUNIK S & SONIA S
2786 BARCLAY WAY	Ann Arbor	09-09-10-400-018	KREIN SARAH
2787 BARCLAY WAY	Ann Arbor	09-09-10-400-145	KAPLAN HUSNU
2788 BARCLAY WAY	Ann Arbor	09-09-10-400-019	LIU YANFANG
2789 BARCLAY WAY	Ann Arbor	09-09-10-400-147	ZHANG DIANYUN
2790 BARCLAY WAY	Ann Arbor	09-09-10-400-020	WANG GUO G
2791 BARCLAY WAY	Ann Arbor	09-09-10-400-146	HOVICK ALEXANDER P
2792 BARCLAY WAY	Ann Arbor	09-09-10-400-021	LAI JOYCE J
2793 BARCLAY WAY	Ann Arbor	09-09-10-400-148	KUMAR VIVEK & ARUN
2794 BARCLAY WAY	Ann Arbor	09-09-10-400-022	KARVE PADMAKAR V
2795 BARCLAY WAY	Ann Arbor	09-09-10-400-149	YU PEIYU
2796 BARCLAY WAY	Ann Arbor	09-09-10-400-023	ZHANG MINGMING & WEN XIAOQUAN
2797 BARCLAY WAY	Ann Arbor	09-09-10-400-151	LUDWIG BRIAN & JULIE
2798 BARCLAY WAY	Ann Arbor	09-09-10-400-024	SHANTZ TARA N TRUST
2799 BARCLAY WAY	Ann Arbor	09-09-10-400-150	SRINIVASAN SHARAN &
2800 BARCLAY WAY	Ann Arbor	09-09-10-400-025	LIU YUHAN
2801 BARCLAY WAY	Ann Arbor	09-09-10-400-152	PAN ZHIXING & CHEN LINGYU
2803 BARCLAY WAY	Ann Arbor	09-09-10-400-153	NORRIS MATTHEW
2804 BARCLAY WAY	Ann Arbor	09-09-10-400-071	GUO MING & ZHANG LI LI
2805 BARCLAY WAY	Ann Arbor	09-09-10-400-155	WANG LIZHEN
2806 BARCLAY WAY	Ann Arbor	09-09-10-400-070	CHIANG CLAIRE CHIU-JUAN
2807 BARCLAY WAY	Ann Arbor	09-09-10-400-154	LEE TING-YING
2808 BARCLAY WAY	Ann Arbor	09-09-10-400-069	SHAH KAAHAN & PRADEEP
2809 BARCLAY WAY	Ann Arbor	09-09-10-400-156	GUO YAPING & LUO CHRISTINA M

2810 BARCLAY WAY	Ann Arbor	09-09-10-400-068	SHAHEEN MEGAN ELAINE ADELE &
2811 BARCLAY WAY	Ann Arbor	09-09-10-400-157	APOSTOL AMY FATIMA-RAGUDOS
2812 BARCLAY WAY	Ann Arbor	09-09-10-400-067	JUAREZ TERESA & MAXIMINO
2813 BARCLAY WAY	Ann Arbor	09-09-10-400-107	MAN PIU FRANCIS & CHEN SHU-CHUN
2814 BARCLAY WAY	Ann Arbor	09-09-10-400-066	ROYLE JULIANNE & KENNETH
2815 BARCLAY WAY	Ann Arbor	09-09-10-400-108	TASLIM RICKY HARTANTO & MARISSA C
2816 BARCLAY WAY	Ann Arbor	09-09-10-400-065	BRANSKI PAWEL
2817 BARCLAY WAY	Ann Arbor	09-09-10-400-109	KEMPKE CAMILLE
2818 BARCLAY WAY	Ann Arbor	09-09-10-400-064	STACEY ROBERTA G
2819 BARCLAY WAY	Ann Arbor	09-09-10-400-110	LIN CHENG-MAO
2820 BARCLAY WAY	Ann Arbor	09-09-10-400-063	MOHAMMED FARRUKH TAMKANATH
BARCLAY CT VACANT	Ann Arbor	09-09-26-102-079	CITY OF ANN ARBOR
BARCLAY CT VACANT	Ann Arbor	09-09-26-102-080	CITY OF ANN ARBOR

50420 TAMARACK TRAIL Northville, MI 48168 - Toll MI VI Limited Partnership (Toll Brothers)

NIXON / GREEN / DHU VARREN ROUNDABOUT

SUPPLEMENTAL PLAN SHEETS FOR PROPOSED DESIGN

CITY OF ANN ARBOR PROJECT MANAGEMENT

IN COOPERATION WITH THE
MICHIGAN DEPARTMENT OF TRANSPORTATION
CONGESTION MITIGATION AND AIR QUALITY PROGRAM
AND THE
FEDERAL HIGHWAY ADMINISTRATION

NIXON RD/DHU VARREN RD/GREEN RD ROUNDABOUT

CONTROL SECTION NO. XXX XXXXX; JOB NO. XXXXXX; FED. PROJ. NO. CMG-XXXXXXX; FED. ITEM NO. XX XXXX
SHEET INDEX

SHEET NO.	TITLE
1	COVER SHEET
2-5	TYPICAL CROSS SECTIONS
6	ALIGNMENT SHEET
7-9	MISCELLANEOUS DETAILS
10	GENERAL NOTES
11	LEGEND
12-24	REMOVAL SHEET, CONSTRUCTION SHEET, & PROFILE SHEET

THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE PERFORMED IN ACCORDANCE WITH THE 2011 ADAPTED "A PRACTICE ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS" AND THE TRAFFIC CONTROL IN CONSTRUCTION DISTRICTS, THE 2011 "MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DISTRICTS".

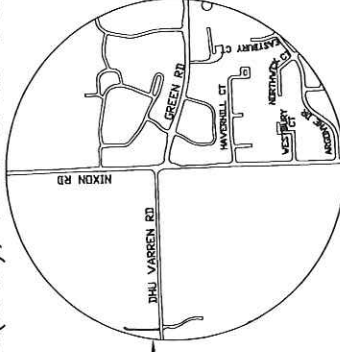
THE PROPOSED IMPROVEMENTS COVERED BY THESE PLANS ARE DESIGNED IN ACCORDANCE WITH THE 2011 ADAPTED "A PRACTICE ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS" AND THE TRAFFIC CONTROL IN CONSTRUCTION DISTRICTS, THE 2011 "MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DISTRICTS".

TRAFFIC DATA

	2016	2036	COMM	%	SPEED
NIXON RD (N)	4,569	8,940	1	35	40
NIXON RD (S)	6,925	10,530	3	30	35
GREEN RD	5,075	8,340	2	35	40
DHU VARREN RD	4,695	7,670	3	35	40

PERMITS REQUIRED TO BE OBTAINED BY THE CONTRACTOR PRIOR TO THE BEGINNING OF CONSTRUCTION AND THE RESPONSIBILITY FOR OBTAINING PERMIT FEES.

PERMIT	ISSUING AUTHORITY
LANE CLOSURE PERMIT	CITY OF ANN ARBOR PROJECT MANAGEMENT UNIT
"NO PARKING" SIGN PERMIT	CITY OF ANN ARBOR PROJECT MANAGEMENT UNIT
GRADING/ SOIL EROSION & SEDIMENTATION CONTROL PERMIT	CITY OF ANN ARBOR PLANNING AND DEVELOPMENT
STREET CLOSURE PERMIT	CITY OF ANN ARBOR PLANNING AND DEVELOPMENT
NEW PERMIT	CITY OF ANN ARBOR PLANNING AND DEVELOPMENT
WASTEWATER COUNTY ROAD CONSTRUCTION PERMIT	WASTEWATER COUNTY ROAD COMMISSION
WASTEWATER COUNTY ROAD REPAIR PERMIT	WASTEWATER COUNTY ROAD COMMISSION
WASTEWATER COUNTY ROAD MAINTENANCE PERMIT	WASTEWATER COUNTY ROAD COMMISSION
WASTEWATER COUNTY ROAD REPAIR PERMIT	WASTEWATER COUNTY ROAD COMMISSION
WASTEWATER COUNTY ROAD MAINTENANCE PERMIT	WASTEWATER COUNTY ROAD COMMISSION
WASTEWATER COUNTY ROAD REPAIR PERMIT	WASTEWATER COUNTY ROAD COMMISSION
WASTEWATER COUNTY ROAD MAINTENANCE PERMIT	WASTEWATER COUNTY ROAD COMMISSION
WASTEWATER COUNTY ROAD REPAIR PERMIT	WASTEWATER COUNTY ROAD COMMISSION
WASTEWATER COUNTY ROAD MAINTENANCE PERMIT	WASTEWATER COUNTY ROAD COMMISSION



CITY DEPARTMENTAL REVIEW

SENIOR SURVEYOR	SENIOR ENGINEER	FIELD OPERATING	C.E.S. SUPERVISOR	TRAFFIC	SOIL EROSION

CONTRACT FOR: 0.30 MILES OF ROAD IMPROVEMENTS. THE PROJECT INCLUDES THE CONSTRUCTION OF A MODERN ROUNDABOUT AT THE INTERSECTION OF NIXON/GREEN/DHU VARREN ROADS. OTHER MAJOR ITEMS OF WORK INCLUDE STORM SEWER AND STORMWATER IMPROVEMENTS, SIDEWALK, AND STREET LIGHTING.

SEAL

FOR KOTLYAR, P.E., MICHIGAN NO. XXXXX

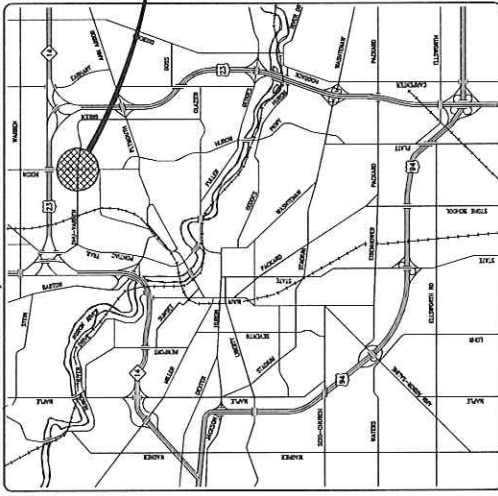
DATE

PREPARED UNDER THE SUPERVISION OF

STEVE LOVELAND, P.E., MICHIGAN NO. 49187

DATE

PROJECT NO.
0128-16-0010
SHEET 1 OF 24



CITY FILE NO. 2007XXX

THE FOLLOWING UTILITIES ARE LOCATED IN OR NEAR THE RIGHT-OF-WAY FOR THE PROJECT.

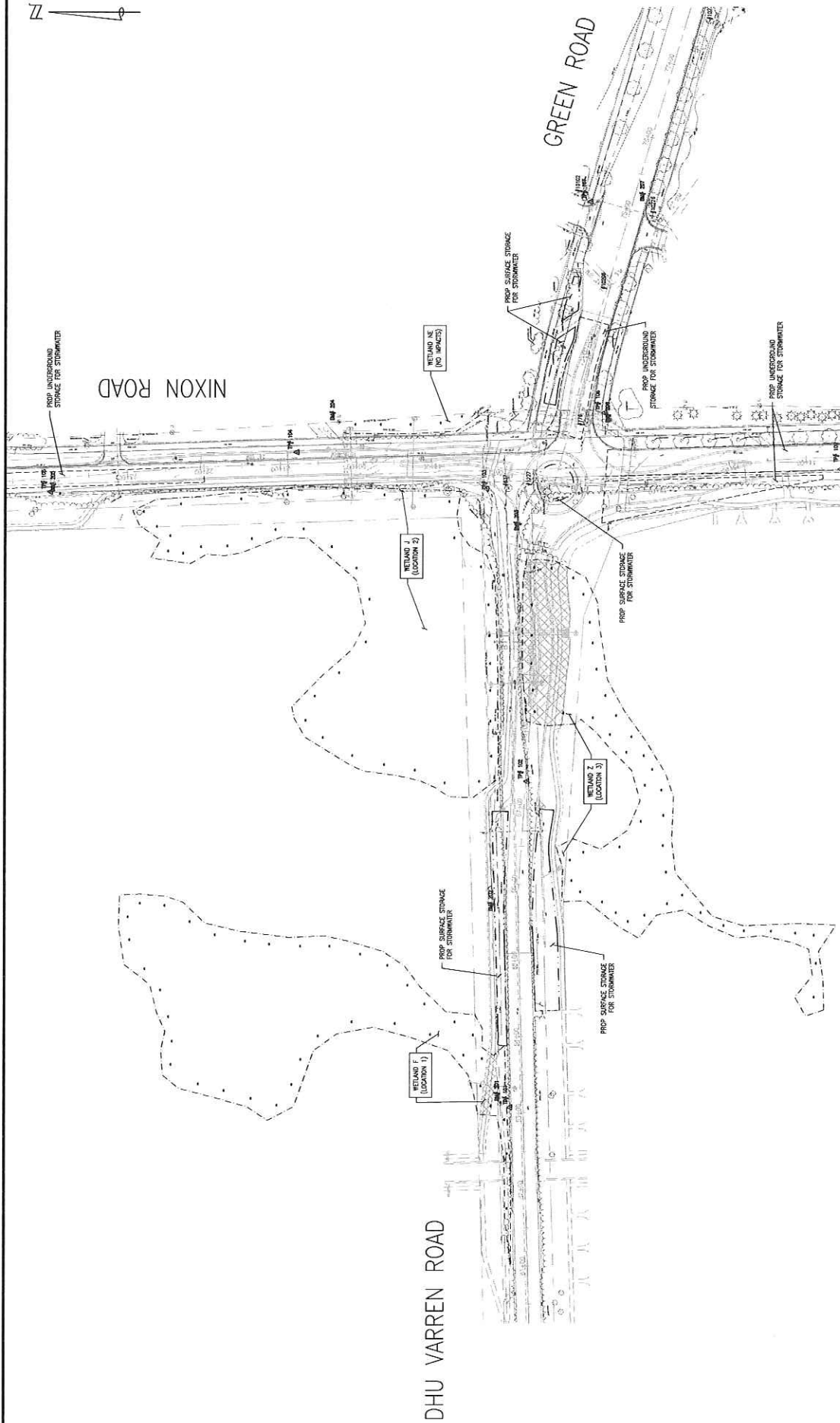
PUBLIC UTILITIES

CITY OF ANN ARBOR FIELD OPERATIONS SERVICES UNIT	DOWNY DR
WATER, SEWER AND STORM	CLAY CORNER
SEWER/SEWALS/STREETLIGHTS	CLAY CORNER
PRIVATE UTILITIES	CLAY CORNER
AIRTEL-PHONE	CLAY CORNER
OTC DUCTRY-ELECTRIC	CLAY CORNER
CONCRETE-CABLE	CLAY CORNER
OTC DUCTRY-GAS	CLAY CORNER
MC-PHONE	CLAY CORNER



3 WORKING DAYS BEFORE YOU DIG
CALL 800-482-7171 (TOLL FREE)

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 54, THE CONTRACTOR SHALL OBTAIN L-800-482-7171 A MANUAL OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE OBLIGATION TO OBTAIN "TOLL FREE" UTILITIES WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR
 NIXON RD/DHU VARREN RD/GREEN RD
 ROUNDABOUT
 OVERALL PROJECT AREA

REV. NO.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY

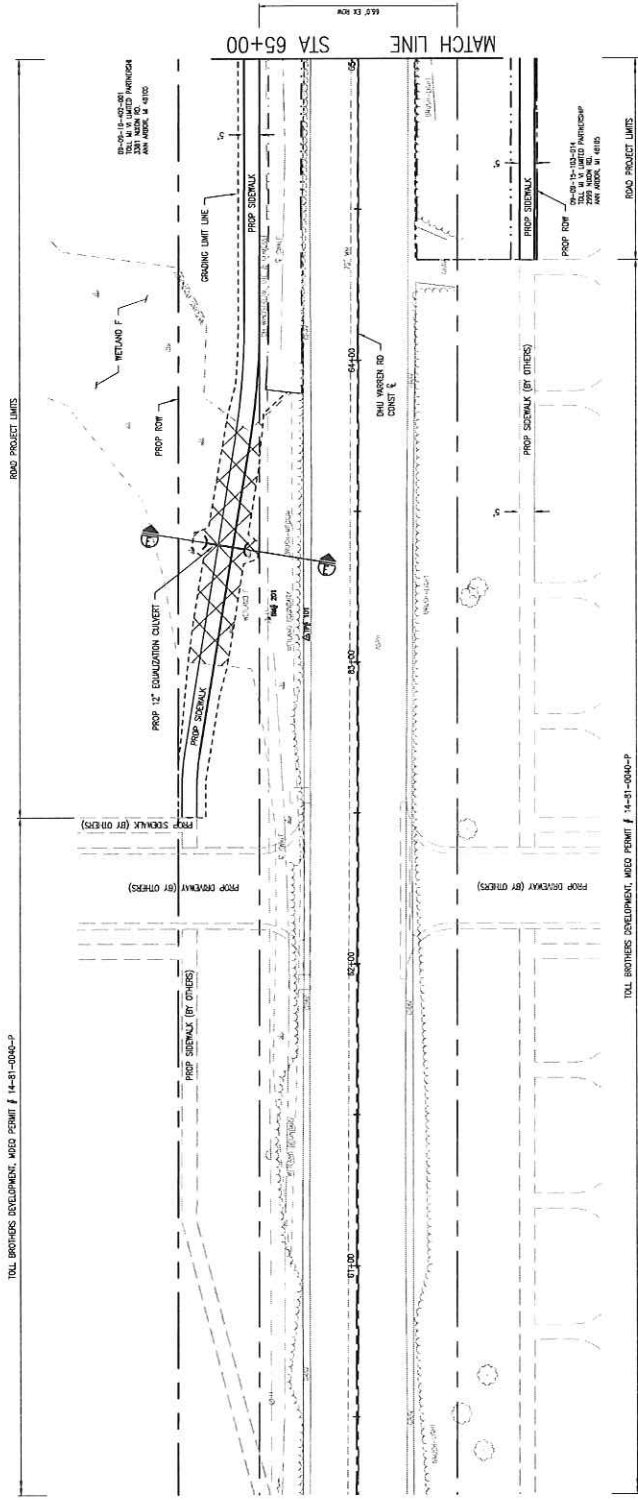


SCALE	INCH
HOR. 1"=40'	
VERT. 1"=10'	
DRAWING NO.	0126-16-0010
SHEET NO.	11 OF 22

DATE	DESCRIPTION	DATE	DRAWN BY	CHECKED BY

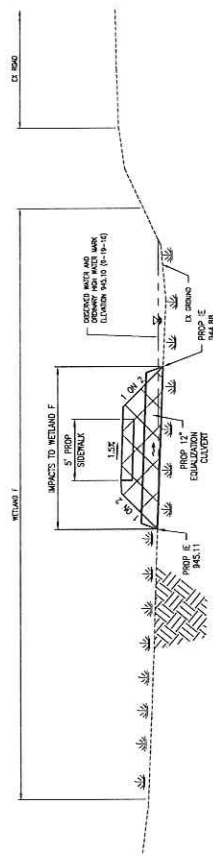


DHU VARREN ROAD



TOL BROTHERS DEVELOPMENT, MOJO POINT # 14-81-0000-P

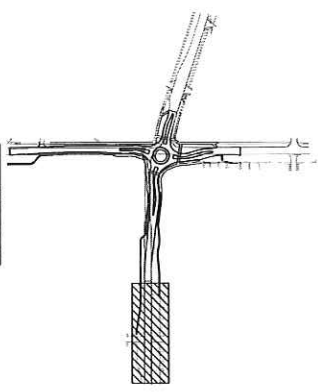
ROAD PROJECT LIMITS



SECTION VIEW E-E: WETLAND F IMPACTS

SCALE = NOT TO SCALE

SHEET LOCATION



LEGEND



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR
 NIXON RD/DHU VARREN RD/GREEN RD
 ROUNDABOUT
 WETLAND F

SCALE: HORIZ. 1"=20' VERT. 1"=2'

DRAWING NO. 012B-16-0010

SHEET NO. 22 OF 23

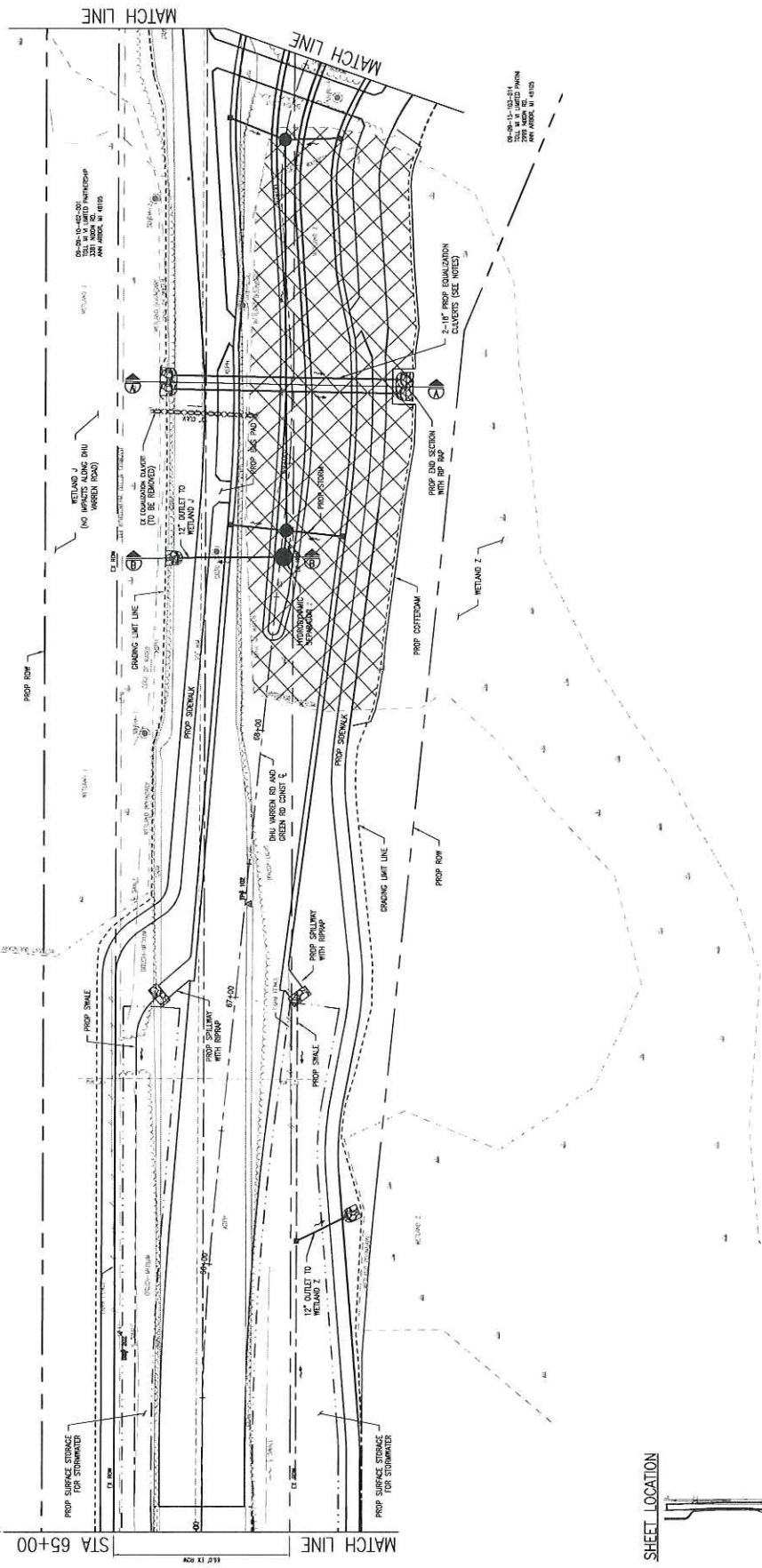
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DATE	DESCRIPTION	DATE	DRAWN	CHECKED



APPROVED BY

DHU VARREN ROAD



LEGEND



IMPACTS WITHIN WETLANDS

- NOTES:
1. SHOW BETWEEN WETLAND 1 AND WETLAND 2 MUST BE MAINTAINED AT ALL TIMES.
 2. SUGGESTED LOCATION OF COTTERDAMS AS SHOWN ON PLANS IS APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DESIGN THE DRAINING PLANS IN ACCORDANCE WITH THE SOIL EROSION AND SEDIMENTATION CONTROL (SESC) MANUALS MUST BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE MICHIGAN DEPARTMENT OF TRANSPORTATION SESC MANUAL AND THE CITY OF ANN ARBOR STORMWATER MANUAL AS SHOWN IN THE PLANS.

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

NIXON RD/DHU VARREN RD/GREEN RD
ROUNDABOUT
WETLAND J & Z

DRAWING NO. 0128-16-0010
WETLAND J & Z
SHEET NO. 03 OF 06

APPROVED BY: CHLEY

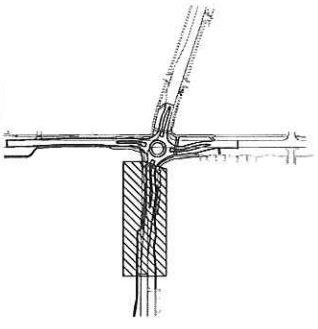
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ISSUE	BOOK	DATE	DESCRIPTION

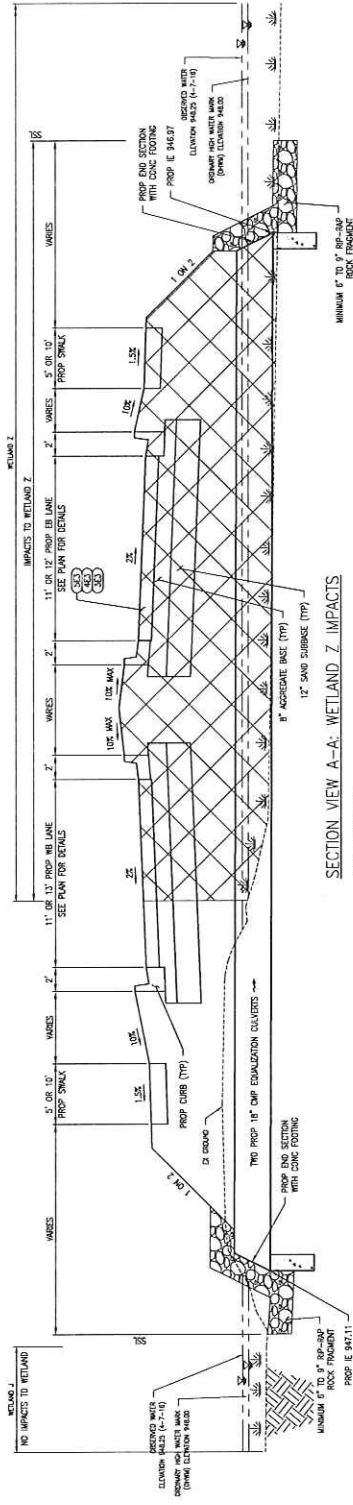


OHM

SHEET LOCATION

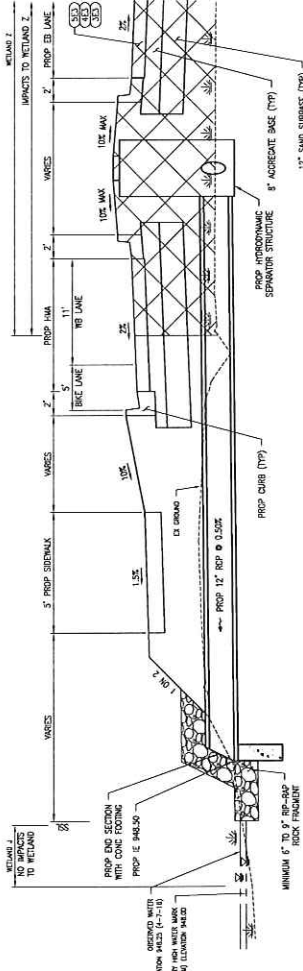


DHU VARREN ROAD



SECTION VIEW A-A: WETLAND Z IMPACTS

SCALE = NOT TO SCALE



SECTION VIEW B-B: OUTLET TO WETLAND J

SCALE = NOT TO SCALE

LEGEND



IMPACTS WITHIN WETLANDS

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

NIXON RD/DHU VARREN RD/GREEN RD
ROUNDABOUT

SCALE
HOR. 1"=20'
VERT. 1"=2'

DRAWING NO.
012B-16-0010

SHEET NO. 24 OF 25

APPROVED BY

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BOOK

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ISSUE

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DATE

DESCRIPTION

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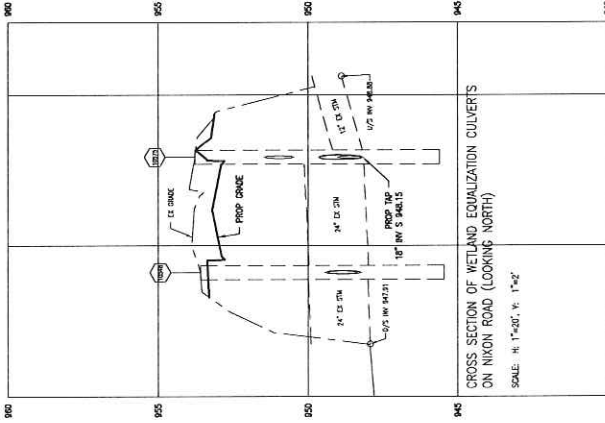
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ISSUE

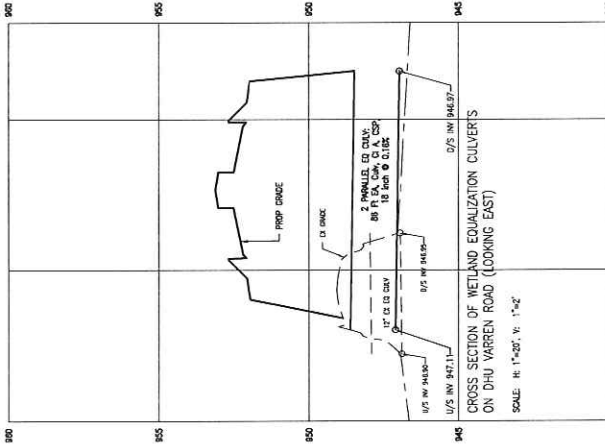


OHM



CROSS SECTION OF WETLAND EQUALIZATION CULVERTS
ON NIXON ROAD (LOOKING NORTH)

SCALE: H: 1"=20', V: 1"=2'



CROSS SECTION OF WETLAND EQUALIZATION CULVERTS
ON DHU WARREN ROAD (LOOKING EAST)

SCALE: H: 1"=20', V: 1"=2'

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

NIXON RD/DHU WARREN RD/GREEN RD
ROUNDBABOUT

DRAWING NO. 012B-16-0010

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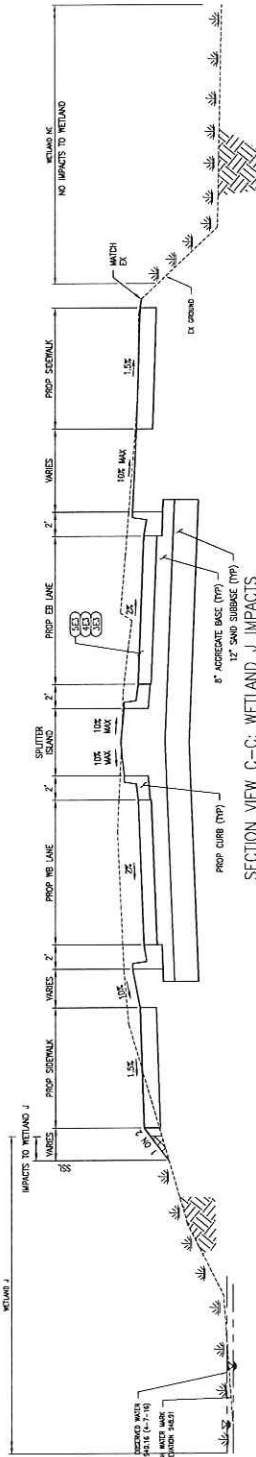
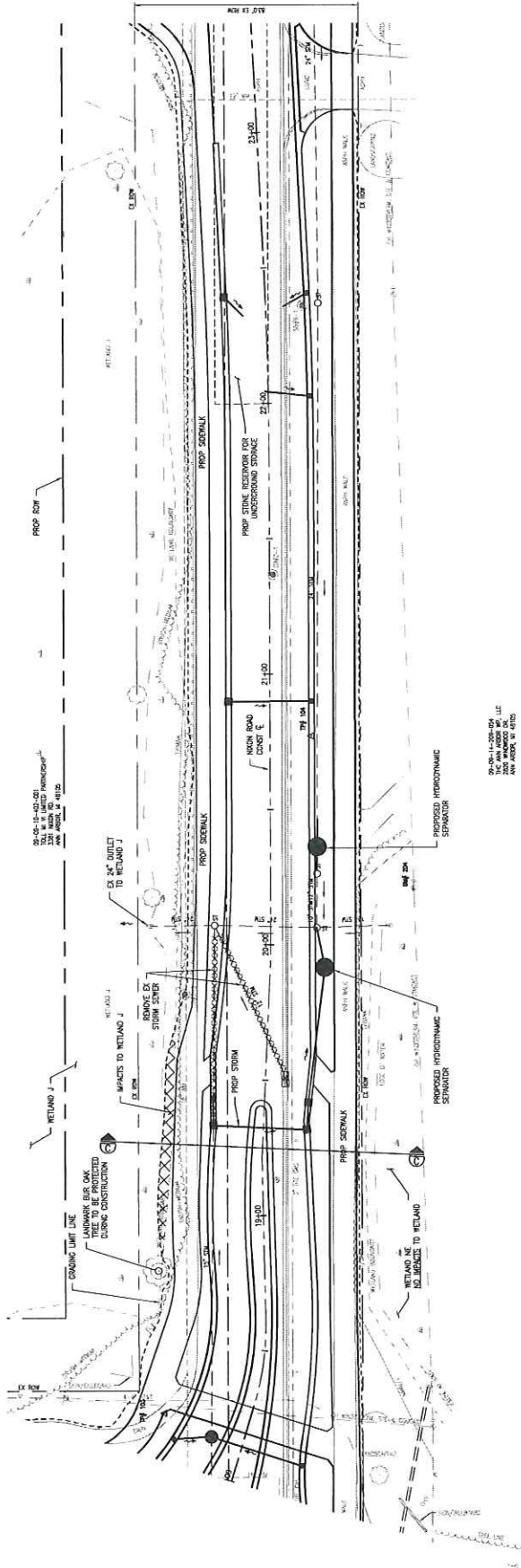
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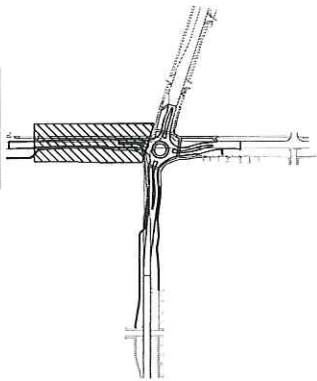
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NIXON ROAD



SHEET LOCATION



LEGEND
 IMPACTS WITHIN WETLANDS

- NOTES:
1. SUGGESTED LOCATION OF CURB/TERRACES AS SHOWN ON PLANS IS APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DESIGN THE CURB/TERRACES IN ACCORDANCE WITH THE CURRENT EDITION OF THE NIXON ROAD STANDARD SPECIFICATIONS FOR CONSTRUCTION.
 2. SOIL EROSION AND SEDIMENTATION CONTROL (SESC) MEASURES MUST BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE NIXON ROAD STANDARD SPECIFICATIONS FOR CONSTRUCTION.

SCALE	INCH
HORIZ. 1"=20'	
VERT. 1"=2'	
DRAWING NO.	0128-16-0010
PROJECT	NIXON RD/DHU VARREN RD/GREEN RD ROUNDABOUT
WETLAND J	
SHEET NO.	25 OF 25

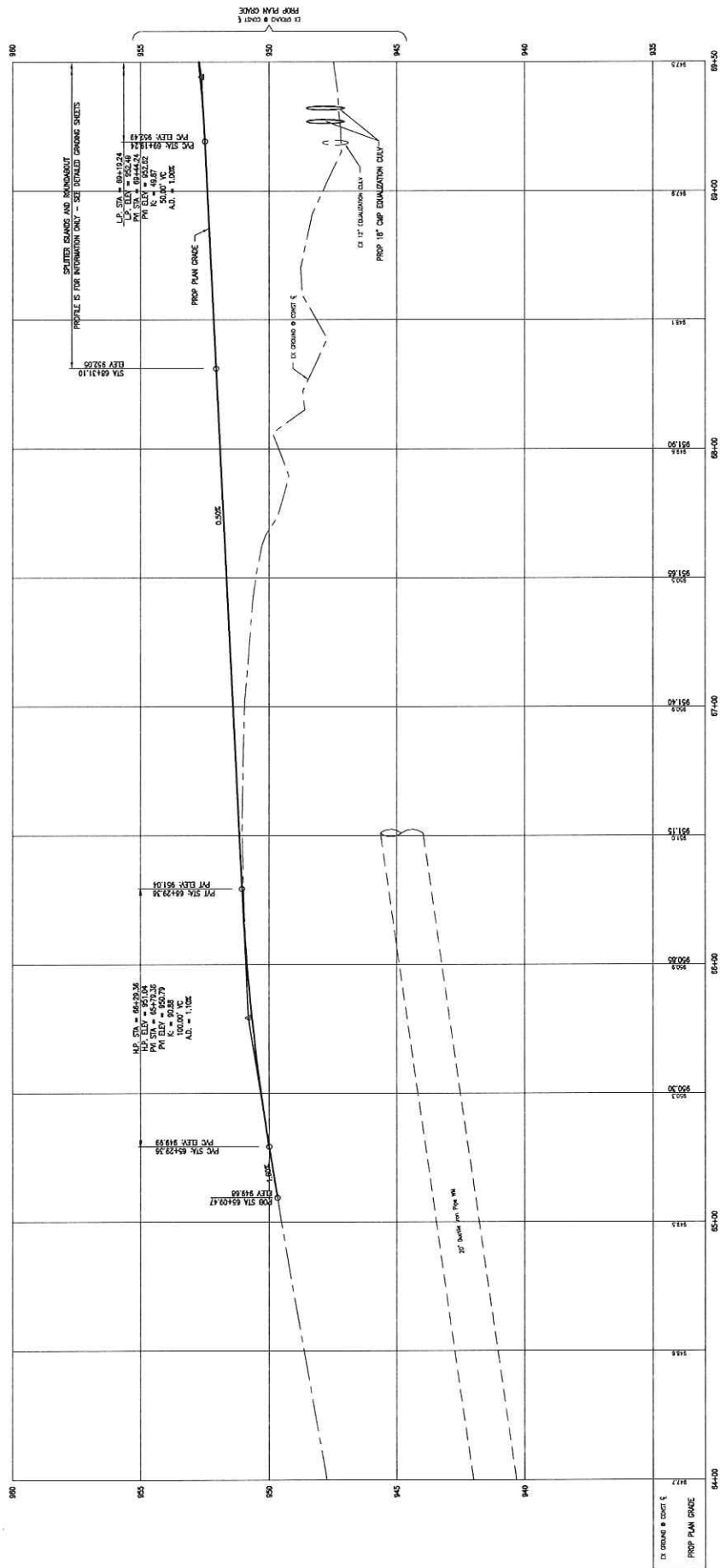
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BY	BY	BY	BY
CHECKED	CHECKED	CHECKED	CHECKED
APPROVED	APPROVED	APPROVED	APPROVED

DATE	DATE	DATE	DATE
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BY	BY	BY	BY
CHECKED	CHECKED	CHECKED	CHECKED
APPROVED	APPROVED	APPROVED	APPROVED



APPROVED BY: _____

DHU VAREN ROAD



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

NIXON RD/DHU VAREN RD/GREEN RD
ROUNDABOUT

PROFILE (CL)

APPROVED BY: _____

SCALE: 1" = 20'

HORIZ. 1" = 20'

VERT. 1" = 2'

DRAWING NO. 012B-16-0010

SHEET NO. 14 OF 36

REV. NO.	DESCRIPTION	DATE	DR. BY	CHK. BY

SITE

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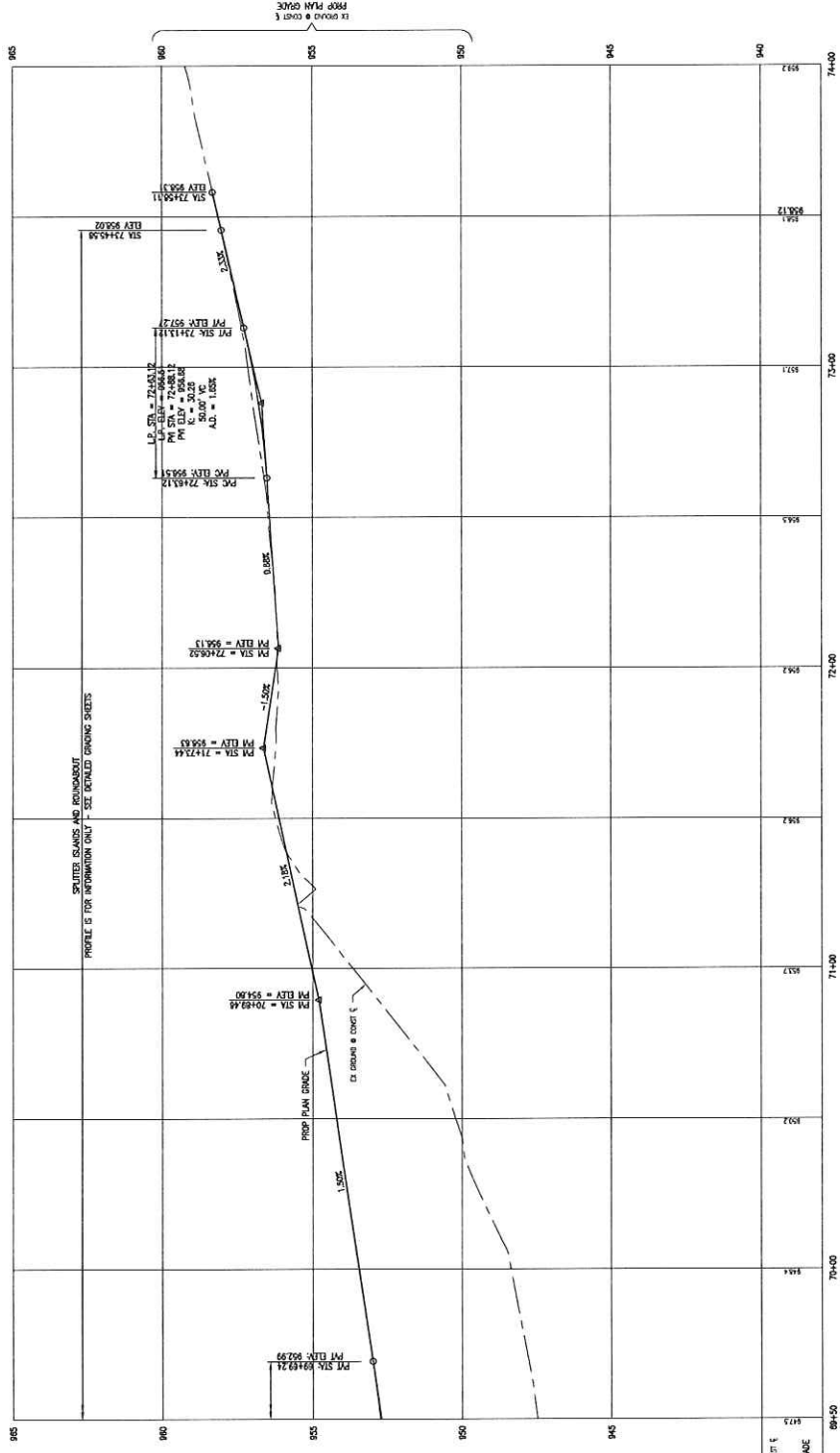
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BOOK

SURVEY

DATE

DHU VARREN & GREEN ROAD



73	EXISTING & CON'T E
72	PROP PLAN GRADE

PROFILE IS FOR INFORMATION ONLY - SEE DETAIL DRAWING SHEETS

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**NIXON RD/DHU VARREN RD/GREEN RD
ROUNDABOUT**

PROFILE (C)

DRAWING NO. 012B-16-0010
SHEET NO. 17 OF 24

REV. NO.	DESCRIPTION	DATE	DRBY	CHKY

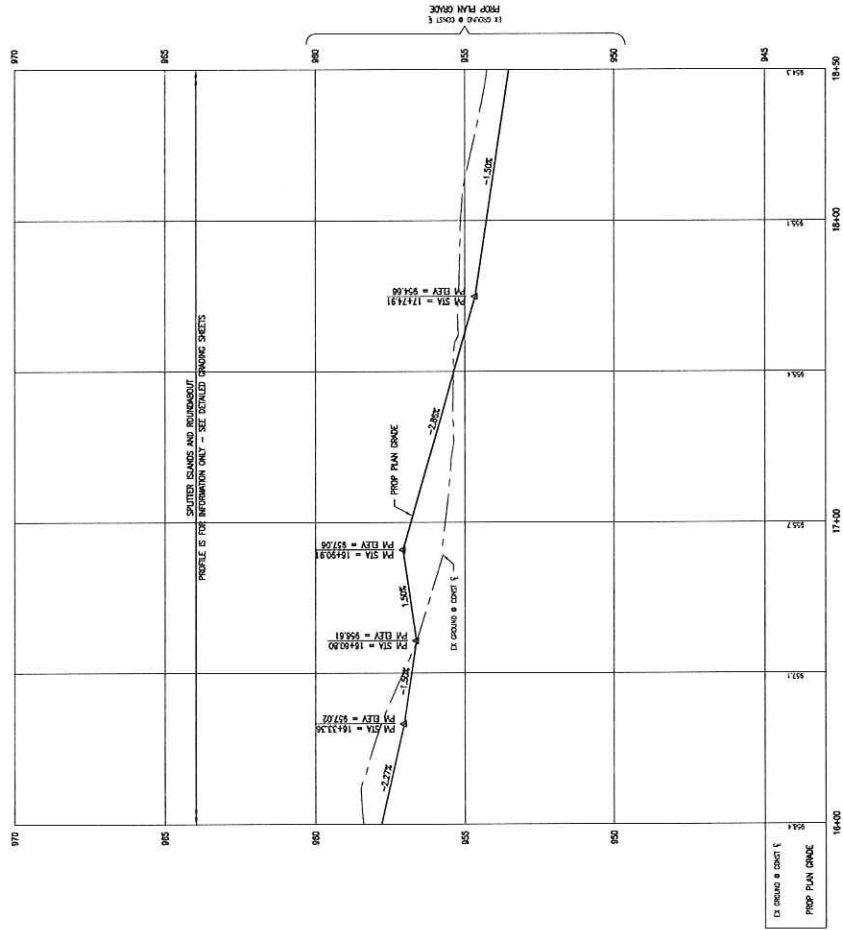
DATE	ISSUE

MARK	BOOK	MARK	BOOK

MARK	BOOK	MARK	BOOK



NIXON ROAD



SPLITTER ISLANDS AND ROUNDABOUT
PROFILE IS FOR INFORMATION ONLY - SEE DETAILED GRADING SHEETS

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**NIXON RD/DHU WARREN RD/GREEN RD
ROUNDABOUT**

PROFILE (CL)

DRAWING NO.
0128-16-0010

SHEET NO. J.E. OF 24.

REV. NO.	DESCRIPTION	DATE	DRBY	CHKY

OHM

SURVEY
BOOK

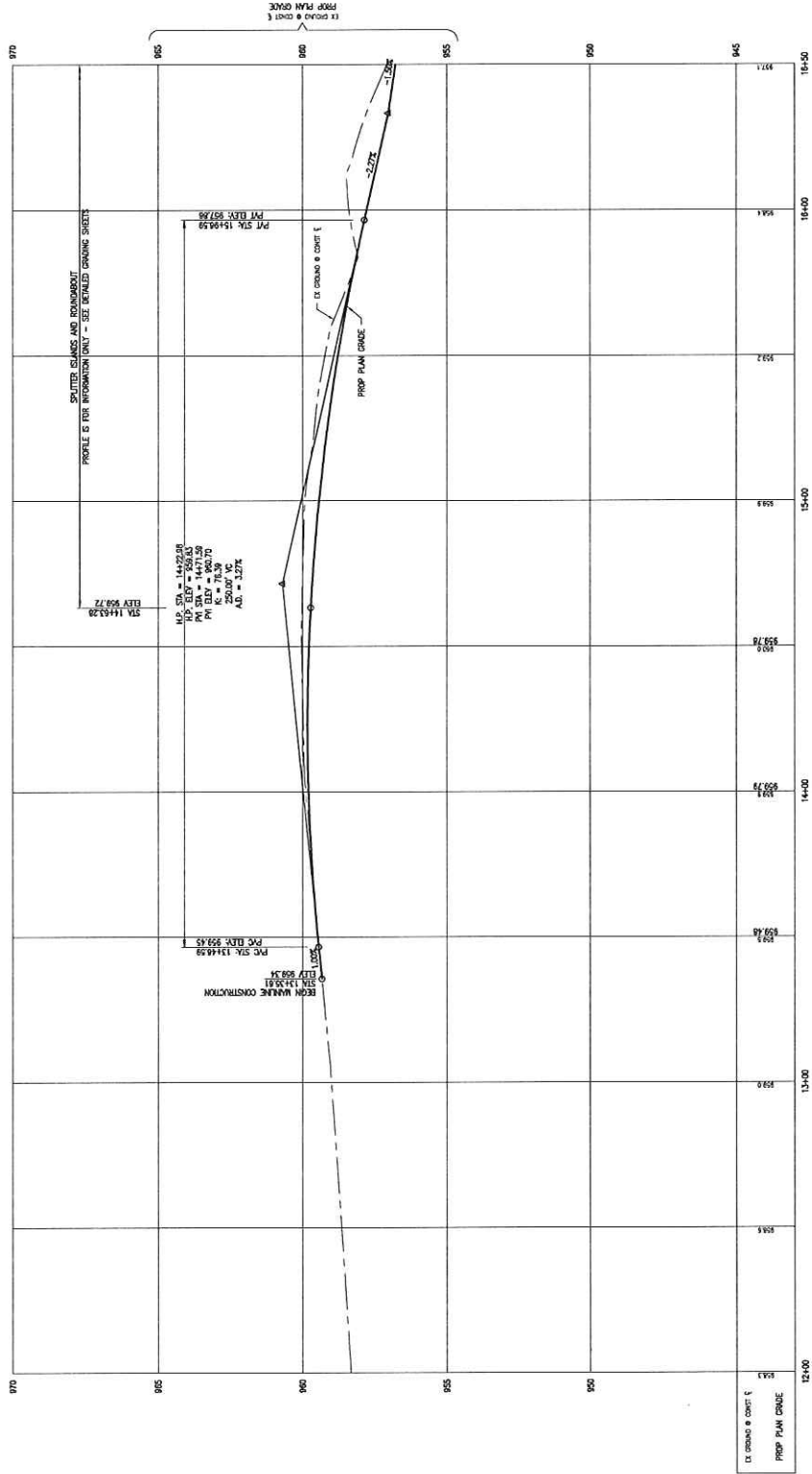
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APPROVED

NIXON ROAD



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

NIXON RD/DHU VAREEN RD/GREEN RD
ROUNDABOUT
PROFILE (CL)

SCALE: HORIZ. 1"=20'
VERT. 1"=2'

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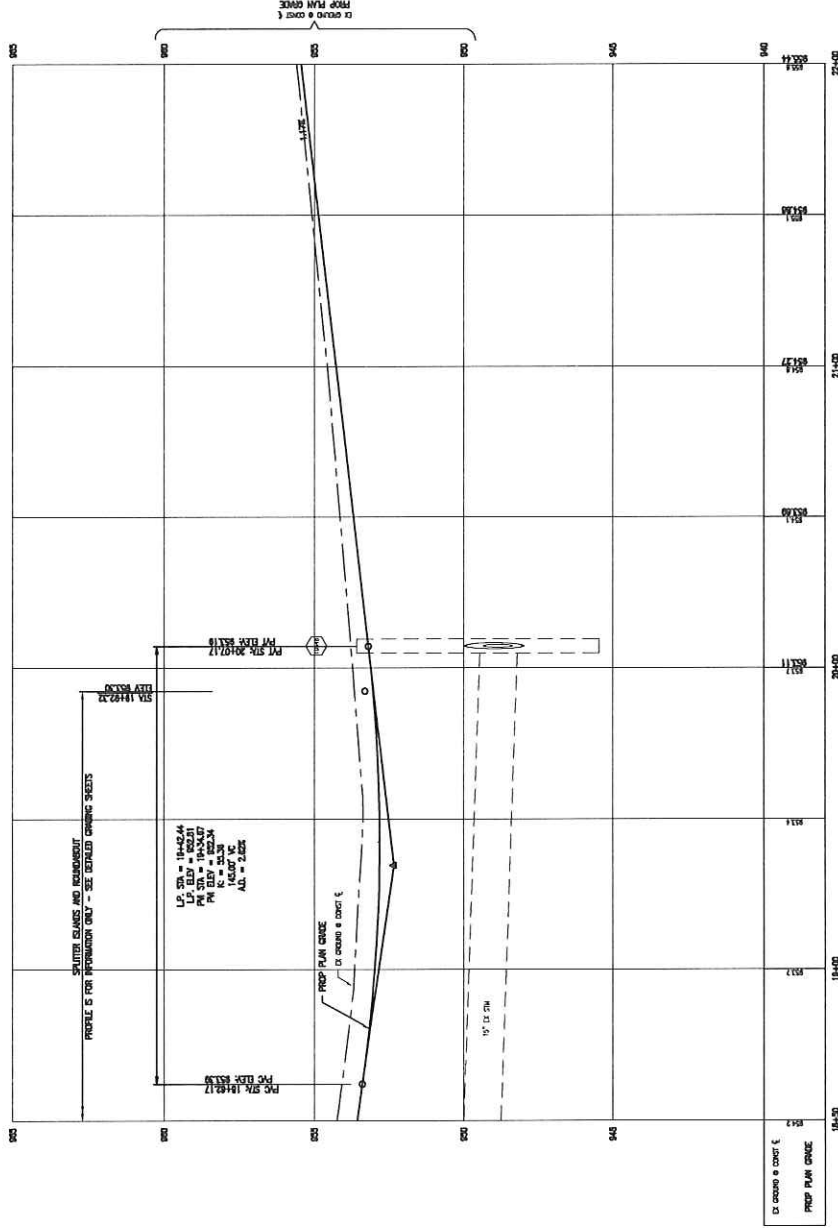
SHEET NO. 21 OF 24

REV. NO.	DESCRIPTION	DATE	DESIGNED BY	CHECKED BY



MARK	BOOK	DATE	DESCRIPTION

NIXON ROAD



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR
**NIXON RD/DHU VARREN RD/GREEN RD
 ROUNDABOUT
 PROFILE (CL)**

SCALE
 HORIZ. 1" = 40'
 VERT. 1" = 2'

DRAWING NO.
 0128-18-0010

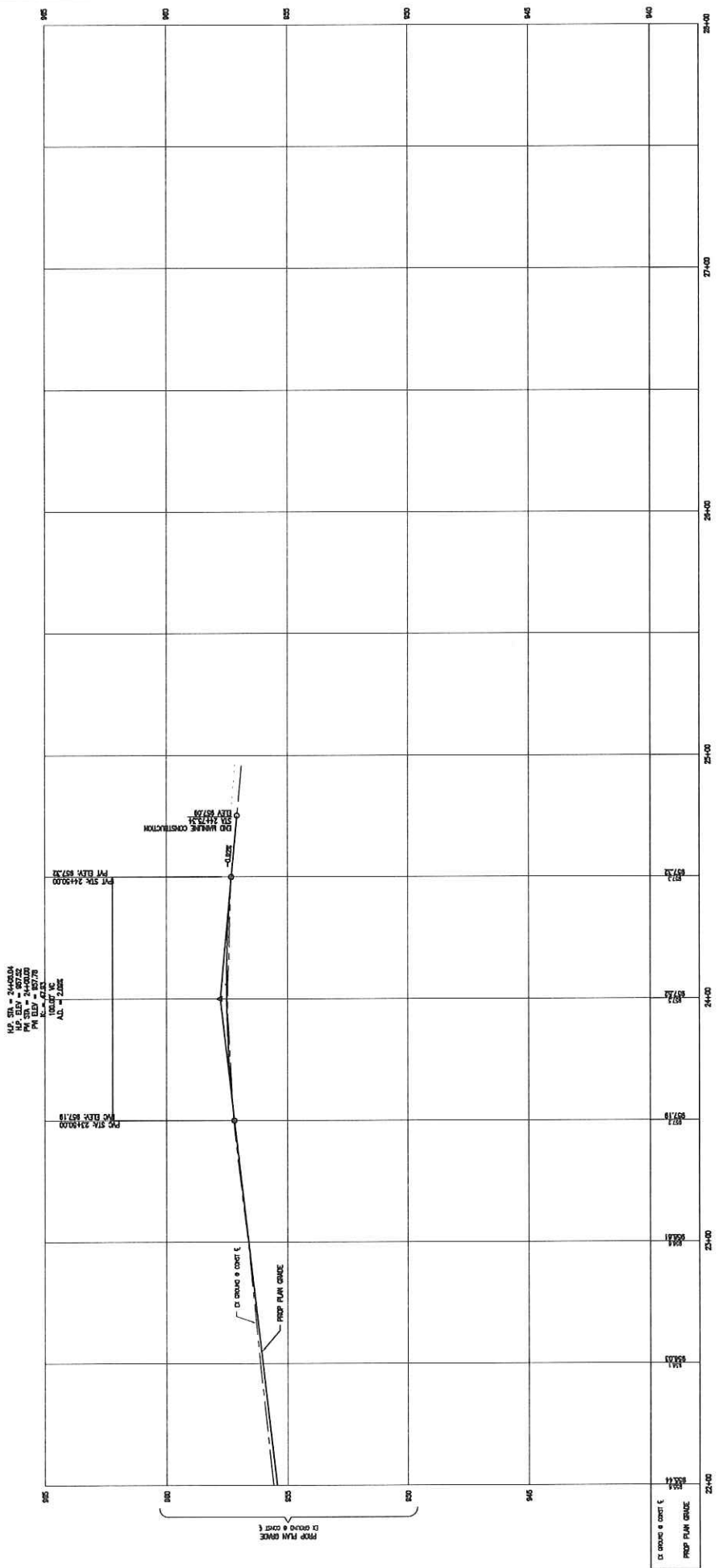
SHEET NO. 1 OF 1

REV.	DATE	DESCRIPTION
XXX	XXX	XXX
XXX	XXX	XXX

DATE	BY	CHK	APP	REV. NO.	DATE	DESCRIPTION
				XXX	XXX	XXX
				XXX	XXX	XXX

APPROVED BY

NIXON ROAD



I.P. STA = 24+00.00
 I.P. ELEV = 82.28
 P.I. STA = 24+50.00
 P.I. ELEV = 82.28
 P.A. STA = 24+50.00
 P.A. ELEV = 82.28
 SLOPE = 0.00%
 A.S. = 2.00%

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

NIXON RD/DHU VARREN RD/GREEN RD
ROUNDABOUT

SCALE: 1" = 40'

DRAWING NO. 0128-16-0010

SHEET NO. 1 OF 3

APPROVED BY: [Signature]

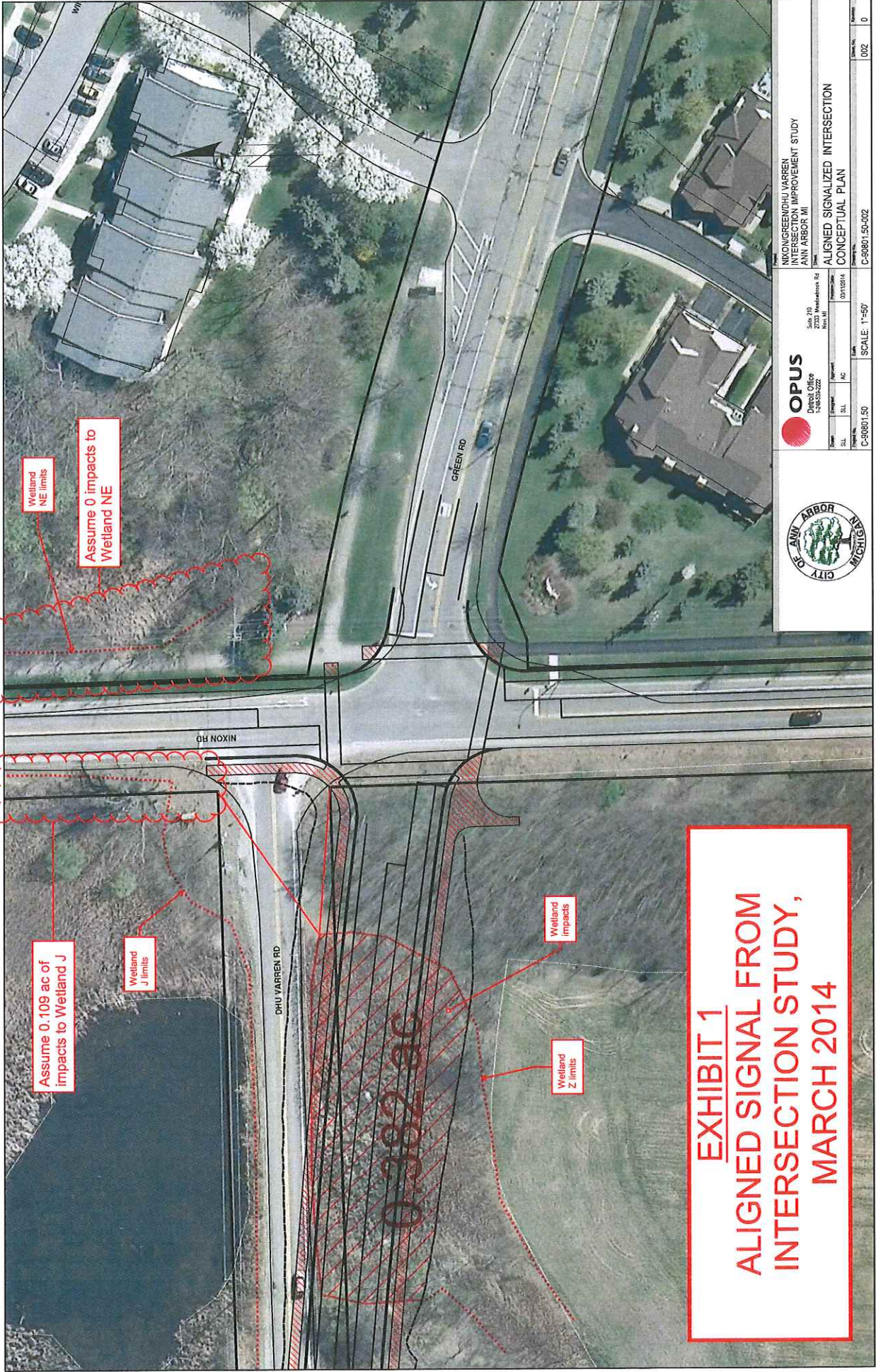
REV. NO.	DESCRIPTION	DATE	DRBY	CHKY



DATE	BY	BOOK	DESCRIPTION

NIXON / GREEN / DHU VARREN ROUNDABOUT

DESIGN ITERATIONS



Wetland NE limits
Assume 0 impacts to Wetland NE

Assume 0.109 ac of impacts to Wetland J

Wetland J limits

Wetland impacts

Wetland Z limits

EXHIBIT 1
ALIGNED SIGNAL FROM INTERSECTION STUDY, MARCH 2014



OPUS
Detroit Office
1-800-532-2222

Client	SL	AC	Scale	1"=50'
Project	SL	AC	Date	03/10/14

NIXON/GREEN/DHU WARREN
INTERSECTION IMPROVEMENT STUDY
ANN ARBOR, MI

ALIGNED SIGNALIZED INTERSECTION
CONCEPTUAL PLAN

C-0807.50
SCALE: 1"=50'
DATE: 03/10/14
DRAWN BY: 002
CHECKED BY: 0

Original Sheet: See A-13.8 (11/13/17) Plot Date: 23 Jun 2015 @ 3:19 PM Path: C:\USP\LE\3081005_02\02\Sheet\A-13.8\City of Ann Arbor\01_Project Planning\Final\Concept\0807.50 Aligned Signal Working Draft.dwg 1 of 19

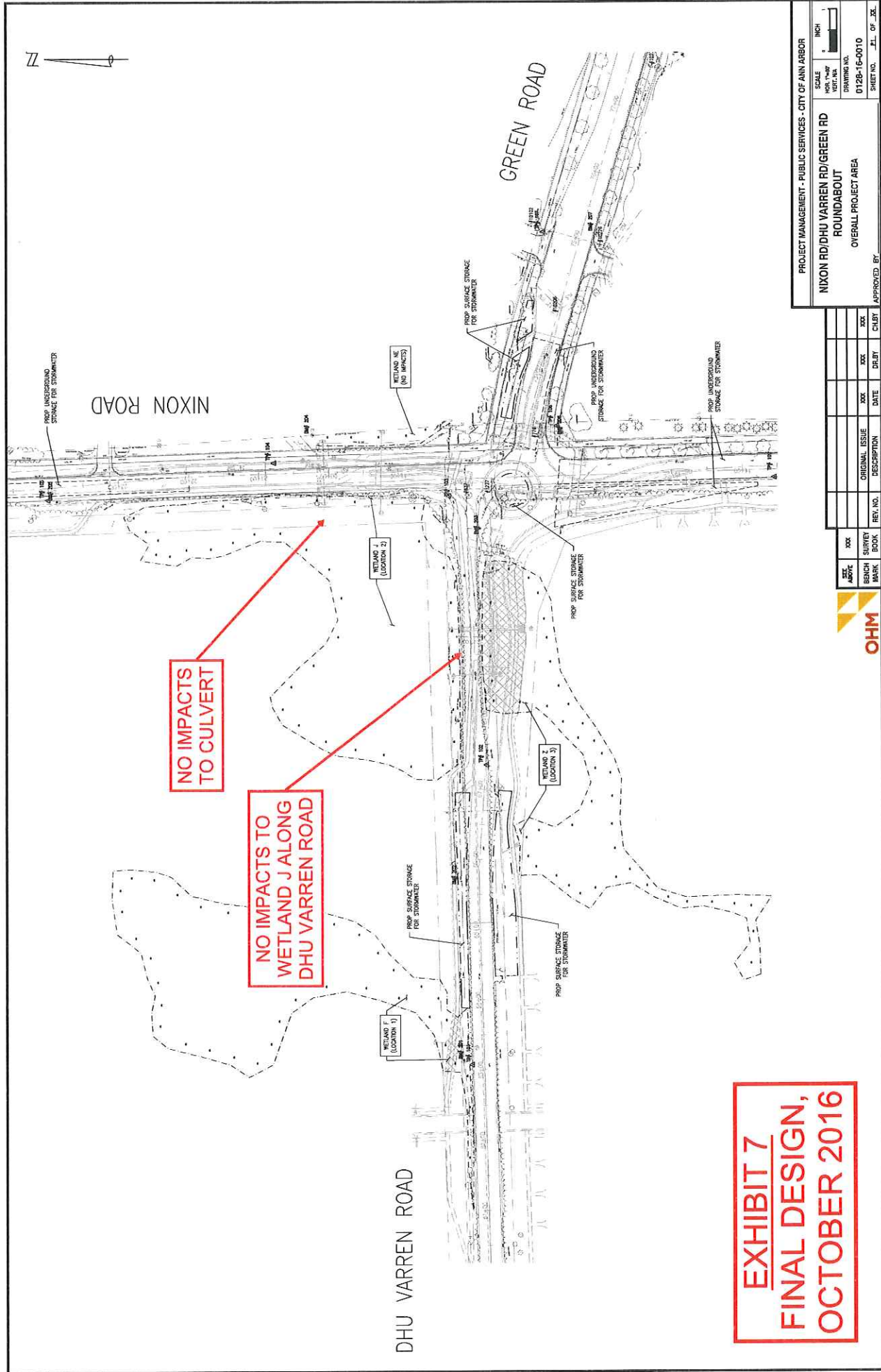


EXHIBIT 7
FINAL DESIGN,
OCTOBER 2016



REV. NO.	DESCRIPTION	DATE	DRBY	CHKD

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR
 NIXON RD/DHU VARREN RD/GREEN RD
 ROUNDABOUT
 OVERALL PROJECT AREA

SCALE: 1" = 40' (VERTICAL)
 DRAWING NO. 012B-16-0010
 SHEET NO. 11 OF 22

APPROVED BY: _____



Technical Memorandum

Date: November 7, 2016

To: John Skubinna

cc: Transportation Unit, WRD-DEQ

From: OHM Advisors

Re: Analysis of varying rainfall frequency events for Nixon / Green / Dhu Varren Roundabout

Background

Previous evaluation considered the use of underground stormwater flood storage as a method for mitigating the impacts of increasing impervious surfaces and avoiding adverse impacts to the local wetland. This analysis originally focused on the change in the wetland's peak water surface elevation and peak discharge from the wetland resulting from the 100-year (1%) storm event, as required by local jurisdiction, under baseline (existing) conditions, post-development without detention, and post-development WITH detention. Our initial conclusions were that 41,277 cubic feet of underground stormwater flood storage was able to effectively mitigate the impact of increased stormwater runoff and satisfy local requirements by resulting in no adverse impacts to the wetland during the 100-year / 24-hour duration design storm under the proposed roadway improvement scenario.

Evaluation of Multiple Design Storms

To predict the hydrologic impacts on the wetland during higher frequency storm events using the proposed 41,277 cubic feet of underground stormwater flood storage, model simulations were performed for the 1-year (100%), 2-year (50%), 5-year (20%), and 10-year (10%) storms using SCS Type II, 24-hour rainfall distributions and rainfall depths from NOAA Atlas 14. Model simulations under the post-development WITH detention scenario demonstrate the 41,277 cubic feet of proposed stormwater flood storage will result in a negligible reduction in the wetland peak water surface elevation during higher frequency storm events (see Table 1 and Figure 1). Under the storm events of higher frequency, peak flows are approximately equivalent to baseline (existing) conditions, while the peak discharge for the 100-year storm event is significantly reduced (see Table 1 and Figure 1). Considering the proposed storage volume was sized to handle the 100-year storm event and satisfy local requirements, the small changes observed during the higher frequency storm events are expected. The slight reduction in peak water surface elevations, combined with the control or reduction of peak discharges, demonstrates the proposed stormwater flood storage will effectively mitigate the impacts of the additional impervious surface created by the proposed round-about project and prevent adverse impacts on the wetland during storms of varying frequencies.

Impacts of Twin 18-inch Culverts

The proposed twin 18-inch diameter culverts are intended to convey all discharge from the north wetland area, as opposed to relying on the roadway as an overflow weir during large wet weather events, which has been observed under baseline (existing) conditions. The culverts will merely serve as equalization pipes to the wetland south of Dhu Varren Road. The outlet from the wetland south of Dhu Varren Road controls the prevailing water level in the wetlands both north and south of Dhu Varren Road, which are currently equalized by the existing CMP culvert. As such, the proposed twin 18-inch culverts will not impact the prevailing water levels of either wetland or downstream waters, in the absence of rainfall. During wet weather, the 18-inch culverts will allow similar flows to pass between the wetlands, but instead of the flows overtopping the roadway, they will be conveyed wholly within the culverts.



Table 1 – Key Hydrologic Metrics: Wetland North of Dhu Varren Road

Peak Water Elevation (ft)	1-year	2-year	5-year	10-year	100-year
Baseline	947.50	947.54	947.65	947.92	948.21
Round-About	947.47	947.52	947.63	947.73	948.30
Round-About & Storage	947.39	947.41	947.46	947.49	947.88
Peak Discharge (cfs)	1-year	2-year	5-year	10-year	100-year
Baseline	0.6	0.7	1.1	1.4	16.5
Round-About	1.3	1.8	2.9	4.2	8.0
Round-About & Storage	0.7	0.8	1.2	1.5	5.3

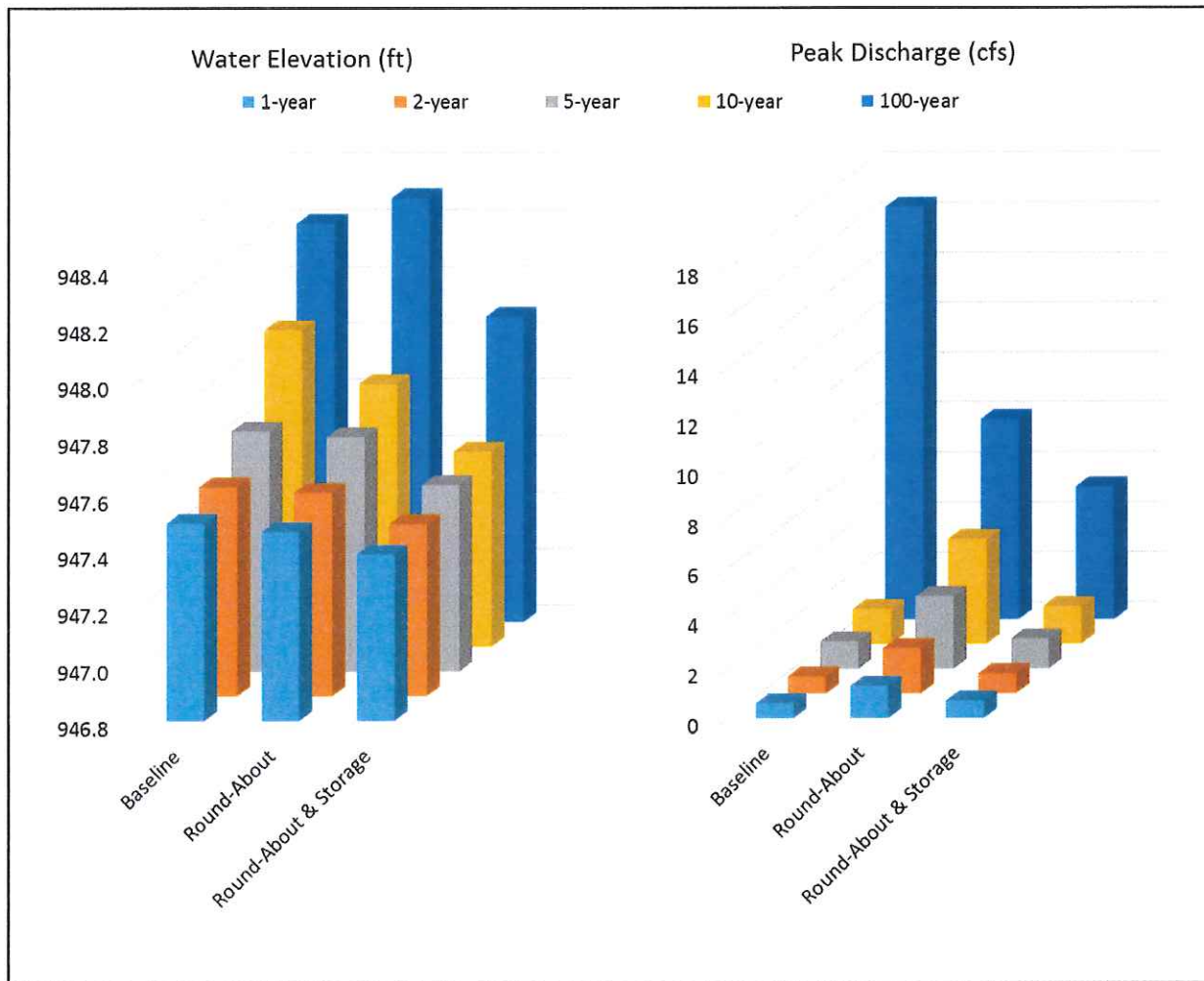


Figure 1