AGENDA

CHARTER TOWNSHIP OF MERIDIAN
PLANNING COMMISSION – REGULAR MEETING
June 11, 2018 7PM

1. CALL MEETING TO ORDER
2. PUBLIC REMARKS
3. APPROVAL OF AGENDA
4. APPROVAL OF MINUTES
   A. May 21, 2018 Regular Meeting

5. COMMUNICATIONS - NONE
6. PUBLIC HEARINGS
   A. Commercial Planned Unit Development #18024 (Affinity 9 Investments), construct 4,534 square foot Panera restaurant with drive-through window at 2080 Grand River Avenue.
   B. Special Use Permit #18051 (Singh), construct a multiple family housing development with seven dwelling units at 1954 Saginaw Highway.
   C. Mixed Use Planned Unit Development #18034 (Meridian Investment Group, LLC), construct 70,213 square foot mixed use building with 88 dwelling units at 2875 Northwind Drive.
   D. Special Use Permit #18031 (Meridian Investment Group, LLC), construct building greater than 25,000 square feet in size at 2875 Northwind Drive.
   E. Special Use Permit #18041 (Meridian Investment Group, LLC), placement of fill and grading in the floodplain of the Red Cedar River at 2875 Northwind Drive.

7. UNFINISHED BUSINESS - NONE
8. OTHER BUSINESS - NONE
9. TOWNSHIP BOARD, PLANNING COMMISSION OFFICER, COMMITTEE CHAIR, AND STAFF COMMENTS OR REPORTS
10. PROJECT UPDATES
    A. New Applications - NONE
    B. Site Plans Received
       1. Site Plan Review #18-07 (Wieland), construct 29,270 square foot church at 6322 Newton Road

    C. Site Plans Approved - NONE

11. PUBLIC REMARKS
12. ADJOURNMENT
13. POST SCRIPT: KEN LANE

TENTATIVE PLANNING COMMISSION AGENDA

June 25, 2018

1. PUBLIC HEARINGS
   A. Special Use Permit #18061 (Meridian Township), replace drain structure in the floodplain of the Pine Lake Outlet Drain adjacent to the Old Raby Trail located east of Raby Road, south of Haslett Road, and west of Marsh Road.

2. UNFINISHED BUSINESS

   A. Commercial Planned Unit Development #18024 (Affinity 9 Investments), construct 4,534 square foot Panera restaurant with drive-through window at 2080 Grand River Avenue.
   B. Special Use Permit #18051 (Singh), construct a multiple family housing development with seven dwelling units at 1954 Saginaw Highway.
   C. Mixed Use Planned Unit Development #18034 (Meridian Investment Group, LLC), construct 70,213 square foot mixed use building with 88 dwelling units at 2875 Northwind Drive.
   D. Special Use Permit #18031 (Meridian Investment Group, LLC), construct building greater than 25,000 square feet in size at 2875 Northwind Drive.
   E. Special Use Permit #18041 (Meridian Investment Group, LLC), placement of fill and grading in the floodplain of the Red Cedar River at 2875 Northwind Drive.

3. OTHER BUSINESS
   A. Future Land Use Map review.

CHARTER TOWNSHIP OF MERIDIAN
PLANNING COMMISSION
REGULAR MEETING MINUTES

DRAFT

May 21, 2018
5151 Marsh Road, Okemos, MI 48864-1198
517-853-4560, Town Hall Room, 7:00 P.M.

PRESENT: **Commissioners Richards, Ianni, Premoe, Scott-Craig, Stivers, Trezise, and Lane**
ABSENT: **Commissioners Shrewsbury and Cordill**
STAFF: **Director of Community Planning and Development Mark Kieselbach, Principal Planner Peter Menser**

1. Call meeting to order

Chair Ianni called the regular meeting to order at 7:00 P.M.

2. Public Remarks - None

3. Approval of Agenda

Vice-Chair Scott-Craig moved to approve the agenda as written.
Supported by Commissioner Stivers.
VOICE VOTE: Motion approved unanimously.

4. Approval of Minutes

A. May 14, 2018 Regular Meeting

Vice-Chair Scott-Craig moved to approve the minutes as written.
Supported by Commissioner Trezise.
VOICE VOTE: Motion approved unanimously.

5. Communications

A. Dee Freeman RE: Rezoning #18040
B. Fred & Erin Rodammer RE: Rezoning #18040
C. Anna Lee RE: Rezoning #18040
D. Spencer & Mary Soka RE: Rezoning #18040
E. Reha Emden RE: Rezoning #18040
F. Tom Jury RE: Rezoning #18040
G. Nasreen Ahmad RE: Rezoning #18070
H. Chun-Min Chang & Wan-Ching Lin RE: Rezoning #18040
I. Thomas & Mary Kearney RE: Rezoning #18040
J. Petition RE: Rezoning #18040
K. Petition RE: Rezoning #18040
L. Mark Clouse RE: Rezoning #18050

6. Public Hearings - None

7. Unfinished Business

A. Zoning Amendment #18060 (Township Board), amend Section 86-404 of the Code of Ordinances to add outdoor recreation activities as uses ancillary to a bowling alley, indoor recreation facility, or health and physical fitness establishment by special use permit in the C-2 (Commercial) zoning district.

Commissioner Premoe moved to approve the amendment to Section 86-404 of the Code of Ordinances using the language provided by staff.
Supported by Vice-Chair Scott-Craig.

ROLL CALL VOTE:
YEAS: Commissioners Premoe, Vice-Chair Scott-Craig, Trezise, Richards, Stivers, Lane and Chair Ianni
NAYS: None
MOTION CARRIES: 7-0.

B. Rezoning #18070 (M78 Insite Venture LLC), rezone approximately 41.04 acres located at 6365 Newton Road from RD (Multiple Family) to C-2 (Commercial).

Commissioner Trezise moved to recommend approval of the rezoning request.
Supported by Commissioner Premoe.

ROLL CALL VOTE:
YEAS: Commissioner Trezise, Premoe, Vice-Chair Scott-Craig, Richards, Stivers, Lane and Chair Ianni
NAYS: None
MOTION CARRIES: 7-0.

8. Other Business

A. Form-Based Code Final Comments

Principal Planner Menser stated the suggestions and comments have been provided to the consultants from "Shaping the Avenue" to draft the ordinance language. He commented the consultants are available in June if needed but the agenda is full for the June 11th meeting.

Commissioner Premoe asked Principal Planner Menser if he could provide a summary of comments and questions staff provided to the consultants.

Principal Planner Menser said he would send a synopsis via email to the Commissioners.

Vice-Chair Scott-Craig commented the Grand River Corridor is atypical and he would like further clarification about whether it would be optional or mandatory to use Form Based Code along the entire corridor and he asked what the next step is for adopting Form Based Code.

Principal Planner Menser replied the consultants will draft ordinance language and submit it to staff for presentation to the Planning Commission.

B. Future Land Use Map review

Principal Planner Menser stated he would like to propose and in depth review of the Future Land Use Map included in the Master Plan. His proposal would be to proceed section by section of the map to refine and identify potential problems with the overall map.

The Commissioners support an in depth review process for the Future Land Use Map.

Principal Planner Menser said he would prepare the first section for review for the June 25th meeting.

9. TOWNSHIP BOARD, PLANNING COMMISSION OFFICER, COMMITTEE CHAIR, AND STAFF COMMENTS OR REPORTS

Vice-Chair Scott-Craig gave a brief summary of the 4/12/18 and 5/3/18 Economic Development Corporation (EDC) meetings.

Commissioner Richards gave a brief summary of the 5/17/18 Transportation Commission Meeting.

Principal Planner Menser commented printed versions of the large scale maps for the June 11, 2018 will be available in the Community Planning and Development office for the Commissioners as well as in the digital packet.

10. PROJECT UPDATES

A. New Applications - None
B. Site Plan Received - None
C. Site Plans Approved
   1. Site Plan Review #18-16-10 (Oliver Hatcher Construction), revision to approved site plan for Marriot Courtyard hotel at 3545 Meridian Crossing Drive.

11. PUBLIC REMARKS-NONE

12. ADJOURNMENT

Commissioner Premoe moved to adjourn the meeting.
Supported by Commissioner Richards.
VOICE VOTE: Motion carried unanimously.

Chair Ianni adjourned the regular meeting at 7:25 p.m.

Respectfully Submitted,

Angela M. Ryan
Recording Secretary

To: **Planning Commission**

From: **Peter Menser, Principal Planner**

Justin Quagliata, Assistant Planner

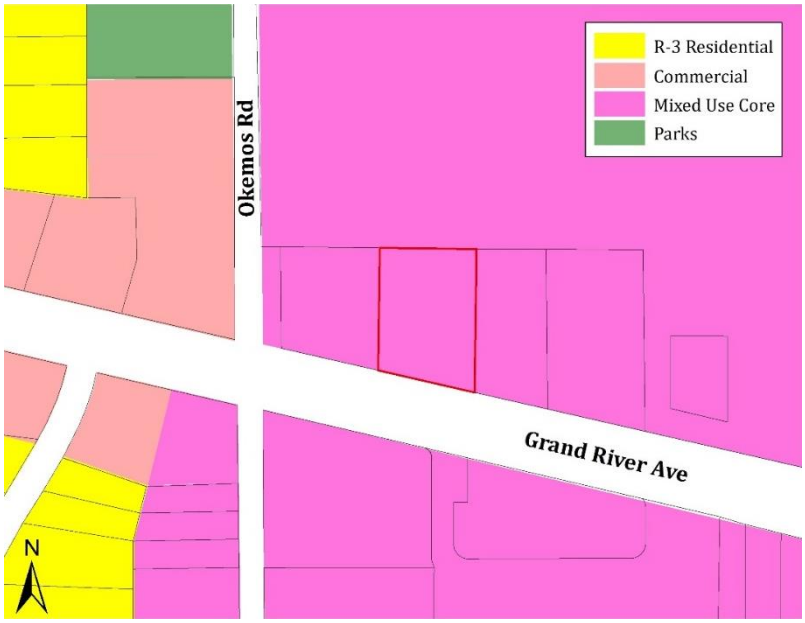
Date: **June 7, 2018**

Re: **<u>Commercial Planned Unit Development #18024 (Affinity 9 Investments, LLC)</u>, demolish existing restaurant and construct a new restaurant with drive-through window at 2080 Grand River Avenue.**

Jeffrey W. Kyes of Kebs, Inc., on behalf of Affinity 9 Investments, LLC, has submitted a request to establish a commercial planned unit development (C-PUD) at 2080 Grand River Avenue. The 1.16 acre subject site is zoned C-2 (Commercial). The redevelopment plans include the demolition of the existing Mongolian BBQ restaurant and the construction of a new approximately 4,534 square foot Panera restaurant with drive-through window. A portion of the project site is located in the floodplain. The Township requires special use permits for a drive-through window and work in the floodplain. However, a C-PUD serves as the special use permit review for any case requiring a special use permit. The Planning Commission reviewed a C-PUD concept plan for the project at its meeting on January 8, 2018.

The Future Land Use Map from the 2017 Master Plan designates the subject property in the Mixed Use Core category.

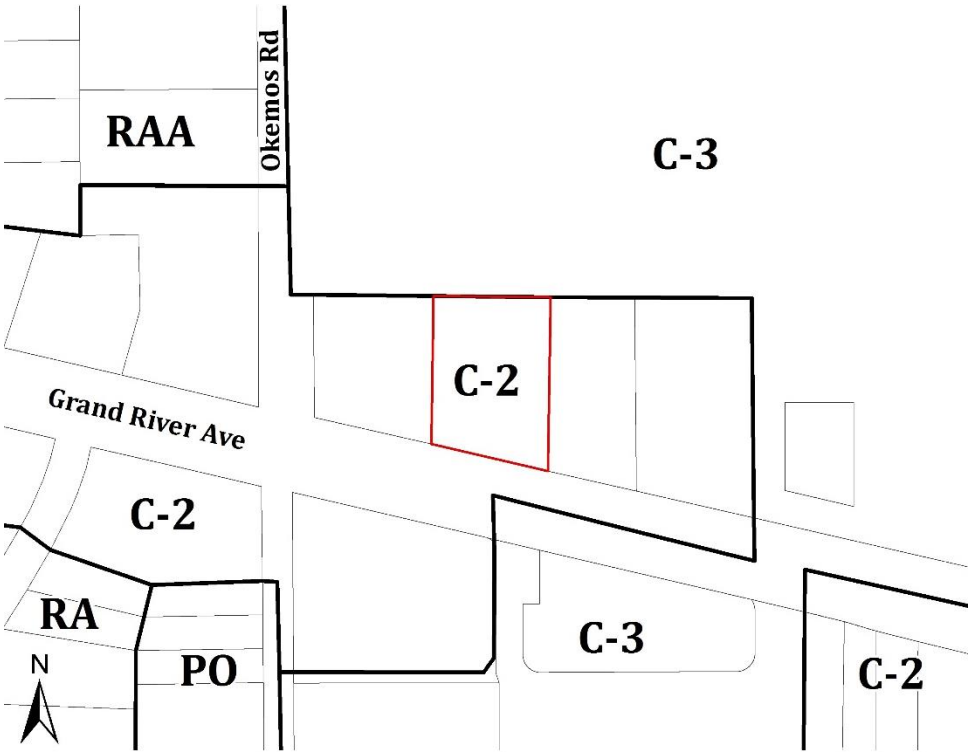
FUTURE LAND USE MAP



Zoning

The subject site is zoned C-2 (Commercial). With 200.51 feet of frontage on Grand River Avenue and 1.16 acres of lot area, the site meets and exceeds the minimum requirements of 100 feet of lot frontage and 4,000 square feet of lot area for the C-2 zoning district. A C-PUD is permitted in the C-1, C-2, C-3 (Commercial), and CS (Community Service) zoning districts. All uses permitted by right and by special use permit in the underlying C-2 zoning district are permitted in a C-PUD.

ZONING MAP



Physical Features

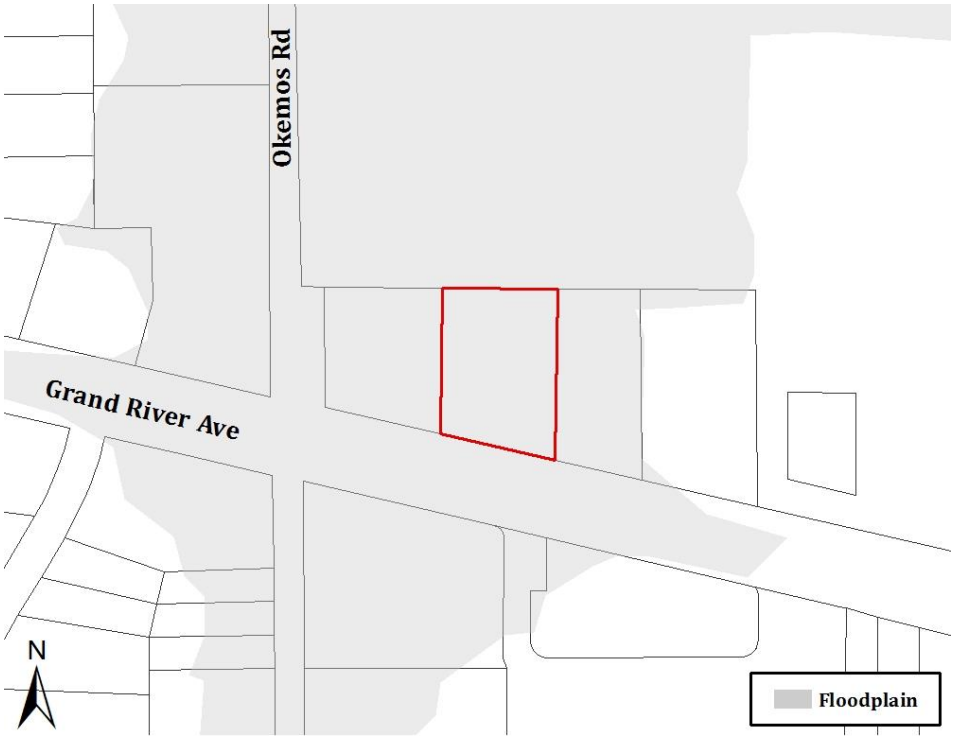
The site is currently developed with a vacant 4,929 square foot restaurant building, a paved parking lot, shrubs and bushes, and an associated access drive. Landscaping consisting of grass and street trees is installed between the parking lot and Grand River Avenue. The site does not have any special designation on the Township Greenspace Plan.

Floodplain

A portion of the project site is located in the floodplain. The submitted site plan depicts the elevation of the floodplain at 842.1 feet above mean sea level; the lowest floor of the new building will be located one foot above the floodplain. The applicant is proposing to place 150 cubic yards of fill in the floodplain to facilitate re-grading of the parking lot to eliminate parking and sidewalk grades that are currently over 5% and reduce parking lot runoff to Grand River Avenue. A 410 cubic yard storm water detention area is proposed to the west of the site entrance, and also serves as compensating excavation for fill in the floodplain.

The Michigan Department of Environmental Quality (MDEQ) reviewed the proposed work in the floodplain and issued approval on May 3, 2018. The Township requires a special use permit for work in the floodplain; however, a C-PUD serves as the special use permit review for any case requiring a special use permit, including work in the floodplain.

Floodplain Map



Wetlands

Township Wetland #21-3 is located to the north of the subject site. A delineation was conducted by the Township's Environmental Consultant to determine the boundary, regulatory status, and size of the wetland. Section 86-471 of the Code of Ordinances requires that all structures and grading activities be set back 40 feet from a delineated wetland boundary and that a natural vegetation strip be maintained within 20 feet of the wetland boundary.

Wetland Map



Streets and Traffic

Access to the site will be from Grand River Avenue, which is classified as a Principal Arterial on the Street Setbacks and Service Drives Map (Section 86-367). Grand River Avenue is a four lane road with curb and gutter and a center turn lane. A seven foot wide pedestrian-bicycle pathway is installed along the frontage of the site. The most recent (2016) traffic count information from the Michigan Department of Transportation (MDOT) for Grand River Avenue, between Okemos Road and Marsh Road, showed a total of 23,554 vehicles in a 24 hour period.

A traffic impact study is required for new special uses which would generate over 100 directional trips during a peak hour of traffic, or over 750 trips on an average day. The applicant submitted a traffic impact study prepared by Traffic Engineering Associates, Inc. dated December 2017 that provides information on traffic generated by the proposed C-PUD. The study looks at existing, background (future traffic volumes without the traffic generated by the proposed development), and future level of service (LOS) during the AM (7:30-8:30 a.m.) and PM (5:00-6:00 p.m.) peak hours at the following three intersections around the project site:

- Grand River Avenue and Okemos Road
- Grand River Avenue and Marsh Road
- Grand River Avenue and Meijer/Chick-Fil-A driveway

The traffic study notes that existing traffic at the studied intersections all operate at an acceptable LOS (LOS D or better) during the AM and PM peak hours, with the exception of several movements at the intersection of Grand River Avenue and Okemos Road, and at the Grand River Avenue and Meijer/Chick-Fil-A driveway. The study shows that background traffic at the studied intersections will operate at an acceptable level of service during AM and PM peak hours, with the exception of several movements at the intersection of Grand River Avenue and Okemos Road, and at the Grand River Avenue and Meijer/Chick-Fil-A driveway.

For future traffic, the study indicates that all studied intersections will continue to operate at an acceptable LOS during the AM and PM peak hours, with the exception of several movements at the following intersections:

Grand River Avenue and Okemos Road

- During the AM peak hour, the westbound through-right movement on Grand River Avenue is expected to operate at a LOS E with 70.3 seconds of vehicle delay, an increase of 7.3 seconds from background conditions.

- During the AM peak hour, the northbound left turn movement on Okemos Road to westbound Grand River Avenue is projected to operate at a LOS F with 83.4 seconds of vehicle delay.

- During the PM peak hour, the eastbound through movement on Grand River Avenue is anticipated to operate at a LOS F with 75.5 seconds of vehicle delay, an increase of 5.1 seconds from background conditions.

- During the PM peak hour, the northbound left turn movement on Okemos Road to westbound Grand River Avenue is expected to operate at a LOS E with 65.0 seconds of vehicle delay.

- During the PM peak hour, the northbound through-right movement on Okemos Road is projected to operate at a LOS E with 60.8 seconds of vehicle delay.

- During the PM peak hour, the southbound left turn movement on Okemos Road to eastbound Grand River Avenue is anticipated to operate at a LOS E with 63.3 seconds of vehicle delay, an increase of 0.5 seconds from background conditions.

Grand River Avenue and Marsh Road

- During the AM peak hour, the westbound through movement on Grand River Avenue is projected to operate at a LOS E with 61.2 seconds of vehicle delay, an increase of 6.6 seconds from background conditions.

- During the PM peak hour, the eastbound through-right movement on Grand River Avenue is anticipated to operate at a LOS E with 55.6 seconds of vehicle delay, an increase of 1.0 second from background conditions.

- During the PM peak hour, the southbound left turn movement on Marsh Road to eastbound Grand River Avenue is expected to operate at a LOS E with 64.6 seconds of vehicle delay.

Grand River Avenue and Meijer/Chick-Fil-A driveway

- During the PM peak hour, the northbound left turn movement from the Meijer/Chick-Fil-A driveway to westbound Grand River Avenue is projected to operate at a LOS F with 80.9 seconds of vehicle delay, an increase of 2.5 seconds from background conditions.

The traffic impact study estimated traffic generation for the proposed project based on a 4,375 square foot *Fast-Food Restaurant with Drive-Through Window*, which is Land Use Code 934 in the Institute of Transportation Engineers (ITE) Trip Generation Manual. Land Use Code 934 describes a restaurant characterized by a large carry-out clientele, long hours of service, and high turnover rates for eat-in customers. The following table estimates traffic generation for the proposed project.

	Proposed C-PUD
Peak Hour trips	176 (a.m.) 143 (p.m.)
Total Weekday Traffic	2,060 trips

The applicant's traffic consultant recommends that a three lane site entrance/exit be designed for the site driveway on Grand River Avenue to provide one exclusive exiting left turn lane, one exiting right turn lane, and one entering lane. Additionally, MDOT guidelines show that there is justification for a right turn lane for westbound Grand River Avenue at the site driveway.

Utilities

The existing building is served by municipal water and sanitary sewer, both of which are available to serve the proposed redevelopment. The location and capacity of utilities will be reviewed in detail during site plan review if the C-PUD is approved.

Staff Analysis

The applicant is proposing to develop the site using the commercial planned unit development (C-PUD) ordinance. A C-PUD is reviewed in accordance with the provisions of Section 86-444 of the Code of Ordinances. A C-PUD serves as the special use permit review for any case requiring a special use permit, therefore separate approvals are not required. For this project the special use permits that would normally be required for a drive-through window and work in the floodplain will be covered under the C-PUD review. A special use permit is reviewed in accordance with the provisions of Section 86-126 of the Code of Ordinances. Section 86-436(n) of the Code of Ordinances provides additional standards for projects in the floodplain, which are as follows:

1. All new residential structures and residential structures requiring substantial improvements shall have the lowest floor, including basement, elevated to one foot above the level of the base flood elevation.

2. All new nonresidential structures and nonresidential structures requiring substantial improvements shall have the lowest floor, including basement, elevated to one foot above the level of the base flood elevation or shall be floodproofed to one foot above the level of the base flood elevation.

3. Excavation and shaping of the floodway fringe shall be conducted in such a manner as to maintain or improve the natural impoundment capacity of the base flood elevation. In no case shall the impoundment capacity of the floodway fringe be reduced.

The lowest floor of the new building will be located one foot above the floodplain elevation of 842.1. The placement of 150 cubic yards of fill in the floodplain when considered along with the compensating cut of 410 cubic yards for the storm water detention area, will not reduce the impoundment capacity of the floodplain.

The Code of Ordinances standards for a drive-through include provisions for an order window, stacking for three cars, and a bypass lane. The submitted site plan indicates the project meets the ordinance standards for a drive-through window.

The C-PUD process mirrors that of the mixed use planned unit development (MUPUD) process, with public hearings held by both the Planning Commission and Township Board. The Planning Commission makes a recommendation on the project with the Township Board having final approval.

Following is a summary of the project's consistency with the C-PUD ordinance standards. As part of this project analysis, standards for the underlying C-2 zoning district and other requirements applicable to development in the C-2 district will be compared to what is proposed on the submitted site plan.

Land use: All uses permitted by right and by special use permit in the underlying C-2 zoning district are permitted in a C-PUD. The proposed land use is a restaurant with drive-through window.

Performance objectives: Minimum C-PUD performance objectives include the following:

- *Provide good internal and external access to the street for pedestrians and bicycles* – a painted cross walk is proposed to connect pedestrians and bicyclists to the building from the pathway along Grand River Avenue to the restaurant.

- *Minimize environmental impacts by using green building and site development standards* – the submitted site plan does not indicate whether environmental impacts will be minimized.

- *Enhance access to alternative transportation modes including public transportation* – the subject site is located along CATA route 1.

- *Use of quality building materials* – generally, building materials in a C-PUD should include, but are not limited to, wood, brick, clapboards, beadboard, glass, and stone. Other materials such as vinyl, aluminum, and other metal sidings should be avoided. All buildings should be completed on all sides with acceptable materials. The design of the building should relate to and blend with the facades of adjacent buildings and complement streetscape improvements in the area. The proposed building material for the restaurant is a brick masonry system. A sample board of the building materials submitted by the applicant will be displayed at the public hearing.

- *Provide for buffering between any conflicting feature of the design and an adjacent residential land use* – the site is surrounded entirely by commercial land uses.

- *Adherence to smart growth principles* – the proposed project would redevelop a previously developed site and is located within the Urban Services Boundary.

- *Preference for parking located in the rear or side yard* – the setbacks for a parking area and the number of parking spaces required can be waived in a C-PUD. 47 parking spaces are required for the project and the applicant is proposing 52 parking spaces. Parking is located in the front, rear, and side yards.

Railings, benches, trash receptacles, or bicycle racks: Accessory items such as railings, benches, trash receptacles, or bicycle racks shall be of commercial quality and complement the building design and style. Three bicycle racks (six bicycle parking spaces) are shown on the submitted site plans. Information on proposed railings, benches, trash receptacles, or other accessory items were not provided.

The following section summarizes other aspects of the project:

Bicycle parking: One bicycle parking space is required for every ten motor vehicle parking spaces required. There are 47 parking spaces required; therefore the project must have a minimum of five bicycle parking spaces. Three bicycle parking racks (six bicycle parking spaces) are shown on the submitted site plan near the main entry to the building.

Landscaping: Proposed landscaping must generally comply with the provisions of the Code of Ordinances. Section 86-758 of the Code of Ordinances outlines the typical landscape requirements for off-street parking areas including landscaped islands at least ten feet in width, building perimeter landscaping at least four feet in width, a minimum of 200 square feet of interior landscaping for every ten parking spaces, and two interior canopy trees per ten parking spaces. Section 86-473 provides standards for street trees. A landscape plan was provided and notes building perimeter landscaping is to be determined.

Outdoor lighting: The C-PUD ordinance requires site lighting to comply with the Outdoor Lighting Ordinance (Section 38-371). A photometric plan was submitted and will be reviewed in detail during site plan review if the C-PUD is approved.

Waiver requests

The C-PUD ordinance is intended to provide flexibility for the Planning Commission and Township Board to set appropriate standards during the review process. The C-PUD ordinance generally waives the standard requirements for lot size, setbacks, number of required parking spaces, building perimeter landscaping, and impervious surface coverage, provided the purpose and intent of the ordinance is incorporated into the overall development plan. Based on the submitted site plan the applicant is requesting the following waivers for the project:

Impervious surface coverage

The maximum impervious surface allowed in the C-2 zoning district is 70 percent. The project proposes 74.10 percent. A waiver of 4.10% is requested.

Parking lot landscape buffer (side and rear)

A 15 foot wide landscaped buffer is required between a parking area and a property line. The submitted site plan shows landscape buffers of 13.14 feet, 3.79 feet, and 4.00 feet from the north, east, and west property lines and is therefore requesting waivers of 6.86 feet, 11.21 feet, and 11.00 feet.

Wetland setback

All structures and grading activities are required to be set back 40 feet from regulated wetlands equal to or greater than two acres in area. The applicant is proposing an 11.63 foot parking setback from the north property line. A waiver of 28.37 feet is requested.

Natural vegetation strip

A 20 foot natural vegetation strip must be maintained from the edge of a regulated wetland. The applicant is proposing a six foot grading setback. A waiver of 14 feet is requested.

Amenities

One or more amenities are required for every C-PUD project. Examples of amenities are grouped into categories in the zoning ordinance, which include conservation, environment, accessibility, parks, recreation and culture, social interaction, and site and building design. If multiple amenities are shown, the ordinance suggests they should represent multiple categories. Criteria to determine whether a proposed amenity is acceptable for consideration are found in Section 86-444(e)(2) of the C-PUD ordinance.

Sheet 1 of the submitted site plan shows the proposed amenities for the project, including connection to the pedestrian-bicycle pathway along Grand River Avenue and public Wi-Fi.

Planning Commission Options

The Planning Commission may recommend approval, approval with conditions, or denial of the C-PUD. A resolution will be provided at a future meeting.

Attachments

1. Application and supporting materials
2. Site plans dated April 16, 2018, received by the Township on April 17, 2018
3. Floor plan and building elevations dated October 24, 2017, received by the Township on April 17, 2018

G:\Community Planning & Development\Planning\COMMERCIAL PLANNED UNIT DEVELOPMENT (CPUD)\2018\CPUD 18024 (Affinity 9 Investments)\CPUD 18024.pc1.docx

CPUD Fee
$ 500.00

CHARTER TOWNSHIP OF MERIDIAN
DEPARTMENT OF COMMUNITY PLANNING AND DEVELOPMENT
5151 MARSH ROAD, OKEMOS, MI 48864
PHONE: (517) 853-4560, FAX: (517) 853-4095

COMMERCIAL PLANNED UNIT DEVELOPMENT APPLICATION

Before submitting this application for review, an applicant shall participate in the pre-application conference with the Director of Community Planning and Development to discuss the requirements for a Commercial Planned Unit Development.

Part I

A. Applicant AFFINITY 9 INVESTMENTS (TOM HANNAWA)
Address of Applicant 1721 MAPLELAWN AVE. HAZEL PARK MICH. 48030
Telephone - Work 248-861-1661 E-Mail thannaw@comcast.net Fax 248-298-0531
Interest in property (circle one): Owner Tenant Option Other _____
(Please attach a list of all persons with an ownership interest in the property.)

B. Site address / location / parcel number 2080 W. GRAND RIVER AVE, OKEMOS
Legal description (please attach if necessary) SEE SITE PLAN
Current zoning C-2
Project name 2080 GRAND RIVER CPUD

C. Developer (if different than applicant) _____
Address _____
Telephone: Work _____ E-Mail _____ Fax _____

D. Architect, Engineer Planner or Surveyor responsible for design of project if different from applicant:
Name JEFFREY W. KYES, KEBS, INC
Address 2116 HASLETT RD. HASLETT, MI 48840
Telephone(s) (517) 339-1014 E-Mail jkyes@kebs.com Fax (517) 339-8047

E. Acreage of all parcels in the project: Gross 1.17 Net 1.17

F Proposed Uses and Site Amenities:

1. Use(s)
   a. Type(s) RESTAURANT WITH DRIVE THROUGH
   b. Gross Floor Area 4,534
   c. Usable floor area 1400± PARKING BASED ON SEATING 95 SEATS
   e. Number of employees 15
   f. Hours of operation _____

3. Number of Parking Spaces Required: 47
   Number of Parking Spaces Proposed: 52
4. Proposed Amenities: Type CONNECTION TO PUBLIC PATHWAY SYSTEM
   Type PUBLIC WIFI
   Type _____
   Type _____

G. The following support materials must be submitted with the application:

1. Nonrefundable fee.
2. Legal Description of the property. (A sealed survey may be required)

3. Evidence of property ownership or a letter from the property owner authorizing the request submitted with proof of property owner from the author of the letter.

4. A site analysis indicating the principal factors which influenced design decisions. The analysis shall include but need not be limited to: soil conditions, topography, surrounding land uses, and surrounding pedestrian and vehicular circulation systems.

5. If the project is to be phased, a document generally describing the proposed phasing program.

6. A written request identifying each waiver and each amenity.

7. A map drawn to an engineer's scale of the total property showing its location in the township and its relation to adjacent property.

8. A reproducible two foot contour topographic map based on United States Geological Survey (USGS) drawn at the same scale as the site plan and showing existing relief features on the site.

9. A schematic layout of the proposed storm sewer system.

10. Site Plans: 16 copies (Fifteen (15) 24"x36" and one 8½" x11") of a Site Plan drawn to a readable scale containing the following (may be a multiple site plans for readability):
    - Total property, its location in the Township, its relationship to adjacent properties
    - Boundaries of subject property
    - Location and dimensions of all existing and proposed structures
    - Approximate location and distance of all structures within 100 feet of the subject property
    - Proposed means of vehicular and pedestrian ingress and egress to the subject property
    - Public and private roads and streets, rights-of-way and easements indicating names and widths of streets which abut or cross the site
    - Existing and proposed parking spaces and vehicular and pedestrian circulation patterns
    - Dimensions of setbacks from streets, property lines and between buildings on the site
    - Location of proposed amenities
    - Location and size of existing utilities including power lines and towers, both above and below ground
    - Amount and location and calculation of all impervious surfaces
    - Verified boundaries of all natural water features and required setback lines

11. Building elevations (all sides) drawn to scale and in color. Elevations should be accompanied by material samples or a display board of the proposed exterior materials and colors.

12. A Traffic Study (if the project will exceed 100 vehicle trips during the peak hours of the roadway(s), prepared by a qualified traffic engineer, based on the most current edition of *Evaluating Traffic Impact Studies: A Recommended Practice for Michigan Communities*, published by the State Department of Transportation.

13. Natural Features Study for previously undeveloped properties which includes a written description of natural features proposed to be retained, removed, or modified. Natural features shall include, but are not limited to, wetlands, floodways, floodway fringe, waterbodies, significant stands of trees or individual trees greater than 12 inches dbh, identified groundwater vulnerable areas, slopes greater than 20 percent.

14. A lighting plan (see Chapter 38, Article VII).

15. Copies of comments from reviewing agencies such as, but not limited to, the following:
    - Ingham County Road Commission
    - Ingham County Drain Commission
    - Michigan Department of Transportation (if applicable)
    - Michigan Department of Environmental Quality (if applicable)

H. Any other information specified by the Director of Community Planning and Development which is deemed necessary to evaluate the application.

Part II

I (we) hereby grant permission for members of the Charter Township of Meridian's Boards and/or Commissions, Township staff member(s) and the Township's representatives or experts the right to enter onto the above described property (or as described in the attached information) in my (our) absence for the purpose of gathering information including but not limited to the taking and the use of photographs.

☒ Yes ☐ No (Please check one)

By the signature(s) attached hereto, I (we) certify that the information provided within this application and accompanying documentation is, to the best of my (our) knowledge, true and accurate

Signature of Applicant — Date: 4-9-18

Type/Print Name

Fee: _____ Received by: _____

Date: _____

Pre-Application Meeting Held: _____ Date

Application Complete: _____ Date By: _____ Staff

KEBS, INC
Engineering • Surveying

May 7, 2018

RECEIVED
MAY 07 2018

Mark Kieselbach
Community Planning and Development Director
Meridian Charter Township
5151 Marsh Road
Okemos, MI 48864

RE: 2080 W. Grand River Avenue CPUD Site Analysis

Mr. Kieselbach,

This letter is to provide a site analysis for the re-development of the property located at 2080 W. Grand River Ave, Okemos, MI. The existing building on the site is currently vacant with the closing of the Mongolian BBQ that occupied the building until the beginning of this year. The owner of the property is planning on demolishing the outdated building and constructing a new Panera Bread Co building with drive through using the Commercial Planned Unit Development Ordinance.

The site is currently fully developed with building and parking. The site is unique due to the amount of flood plain on the property, existing parking setbacks which do not meet Ordinance requirements and an existing wetland located at the north end of the property that has a required buffer that encroaches on the site.

There were 2 main goals in coming up with a new layout for a restaurant with drive through, required parking and frontage road requirement.

The first goal was to limit the impact the project would have on the existing flood plain on the site. Currently only a small portion of the site where the building is located is above the flood plain. The proposed building was moved a little closer to Grand River Ave. which is more in line with the neighboring buildings. Fill in the flood plain is required to keep the proposed building floor 1' above the 100 year flood plan as required by Ordinance, MDEQ and FEMA. A joint flood plain application has been submitted to the MDEQ and Township. The application shows a fill of 150 cubic yards in the flood plain and a cut of 410 cubic yards for a net increase in flood plain volume of 260 cubic yards.

The second goal for this project was to try and reduce the amount of waivers needed on the site compared to the existing site. Attached to this site analysis is a list of waivers being requested along with a comparison to the existing site conditions.

The proposed use is dependent on deliveries provided by semi-trucks. The proposed layout has taken into account the turning radius needed to get delivery vehicles on and off the site without impacting Grand River Ave. or neighboring properties. The site is laid out to provide

the required frontage road in the future when adjacent properties are redeveloped. There will also be a non-motorized connection from the Grand River Ave. pathway to the proposed building.

The developer and Kebs, Inc. look forward to discussing the CPUD with Staff, Planning Commission and Township Board. We hope to be in the position to start construction in the fall of 2018 or spring of 2019

If you have any questions or concerns please feel free to contact me.

Thank you,

Jeffrey W. Kyes
Kebs, Inc.

RECEIVED
MAY 07 2018

2080 W. Grand River Avenue CPUD Waiver List

Below please find the list of waivers being requested and comparison to the existing site.

Section 86-402-(17) Maximum impervious area 70%. The proposed impervious area for the site is 74.10% which will require a waiver of 4.10%. The existing site has an impervious coverage of 79.25%. The proposed site has a reduction of 5.15% in impervious coverage.

Section 86-756(14) 15' side and rear parking setback required. The proposed site will require waivers from this section on the west, north and ease sides.

The proposed parking setback on the west side of the property is 4.00' which will require an 11.00' waiver. The existing setback is 6.1'. This is the only proposed waiver that is slightly more than what is currently constructed.

The proposed parking setback on the north side of the property is 13.14' which requires a waiver of 1.86'. The existing setback is 7.4'

The proposed parking setback on the east side of the property is 3.79' which requires a waiver of 11.21'. The existing setback is 3.6'

Section 86-471(b)(1) 40' wetland buffer required. The proposed parking setback from the existing wetlands is 11.63' which requires a 28.37' waiver. The parking area is currently 6.92'.

Section 86-471(b)(1) 20' natural strip from a wetlands. The proposed project shows grading of the site to 6' from the existing wetlands requiring a waiver of 14'. The area will remain grass after construction. There is not a comparison to the existing site since the work was all ready completed.

Patrick E. Lindemann

Ingham County Drain Commissioner

PO Box 220
707 Buhl Avenue
Mason, MI 48854-0220

Phone: (517) 676-8395
Fax: (517) 676-8364
http://dr.ingham.org



Carla Hornbuckle Cloe
Deputy Drain Commissioner

Paul C. Pratt
Deputy Drain Commissioner

David C. Love
Chief of Engineering and Inspection

Sheridan Lewis
Administrative Assistant

COPY

May 2, 2018

Meridian Charter Township Planning Commission
5151 Marsh Road
Okemos, MI 48864

RE: Panera Okemos CPUD – Site Re-development
2080 W. Grand River Avenue
CPUD - Conceptual Plan Review; Drain Office #18039

Meridian Charter Township Planning Commission:

We are in receipt of an April 16, 2018 request by KEBS, Inc. on behalf of Panera for a preliminary site plan review of the restaurant re-construction project at this site.

This conceptual review is offered as a courtesy to the Meridian Charter Township Planning Commission only and should not be construed by the project owner or others as formal submission to the Ingham County Drain Commissioner for site plan or drainage review.

The Ingham County Drain Commissioner (ICDC) offers the Meridian Charter Township Planning Commission the following conceptual review comments on the stormwater system for this project:

1. The site is in the Okemos Drain Drainage District and is currently served by the Okemos Drain, a county drain, which flows through a regulated wetland north of the site.
2. The site is located in the 100-year floodplain. There is frequent floodling in the Okemos Drain floodplain, caused mainly by the back-up of the Red Cedar River.
3. As a Phase II community, Meridian Charter Township should take every opportunity to require developers to provide some form of cleansing of the runoff water before it goes off-site into a wetland. The Drain Commissioner's Standards require that all development in areas overseen by the Drain Commissioner's Office be evaluated with low impact design principles that provide the potential for keeping as much runoff on the site as possible.

4. Drainage plans must meet the Rules of the Ingham County Drain Commissioner for low impact development (LID), pretreating the first 1.0-inch of runoff from the site and outletting the treated water to a positive public outlet.

We appreciate the opportunity to comment on this plan. It is an honor and a privilege to serve you and the other businesses, citizens and municipalities of Ingham County.

Sincerely,

David C. Love
Ingham County Drain Engineer

cc: Jeff Kyes, P.E., KEBS, Inc.

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.mcgi.state.mi.us/wetlands/*

Project Address (road, if no street address)	Zip Code	Municipality (Township/Village/City)	County
2080 GRAND RIVER AVENUE	*48864*	*MERIDIAN CHARTER TOWNSHIP*	*INGHAM*

Property Tax Identification Number(s)	Latitude	Township/Range/Section (TRS)
33-02-02-21-226-004	*42.7225* N	T *4* N or S; R *21* E or W;
Subdivision/Plat and Lot Number	Longitude	Sec *21*
	- *84 4262* W	OR Private Claim # _____

2 Applicant and Agent Information

Owner/Applicant (individual or corporate name)	Agent/Contractor (firm name and contact person)
AFFINITY 9 INVESTMENTS, LLC	*KEBS, INC. - JEFF KYES*
Mailing Address *1721 MAPLELANE AVE.*	Mailing Address *2116 HASLETT ROAD*
City *HAZEL PARK* State *MI* Zip Code *48030*	City *HASLETT* State *MI* Zip Code *48840*
Contact Phone Number *248-361-1666* Fax *248-298-0531*	Contact Phone Number *517-339-1014* Fax *517-339-8047*
Email	E-mail *jkyes@kebs.com*

☐ No ☒ 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 *2080 GRAND RIVER AVE.*	Preapplication File Number – – –P
Name of Water body *RED CEDAR RIVER*	Date project staked/flagged

The proposed project is on, within, or involves (check all that apply)

☐ an inland lake (5 acres or more)
☐ a pond (less than 5 acres)
☐ a stream, river, ditch or drain
☐ a legally established County Drain
Date Drain was established
☐ a channel/canal
☐ 500 feet of an existing water body
☐ a Great Lake or Section 10 Waters
☐ a wetland
☒ a 100-year floodplain
☐ a dam
☐ a designated high risk erosion area
☐ a designated critical dune area
☐ a designated environmental area

Project Use

☐ private
☒ commercial
☐ public/government
☐ project is receiving federal/state transportation funds
☐ Wetland Restoration
☐ other

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 *REMOVE EXISTING BUILDING AND EXISTING ASPHALT PARKING. FILL AS NEEDED IN FLOODPLAIN AROUND NEW BUILDING, CONSTRUCT NEW BUILDING. REGRADE FOR NEW PARKING AREA AND REMOVE MATERIAL FROM FLOODPLAIN AS NEEDED TO ELMINATE GRADES IN EXCESS OF 5% TO MEET TOWNSHIP STANDARDS, ADD WALKS AND CURBS. ADD SEDIMENT BASINS AND EQUALIZER PIPE FOR WATER QUALITY STANDARDS. PROVIDE DRAINAGE FOR NEW PARKING AREA TO REDUCE PARKING AREA RUN OFF TO GRAND RIVER AVENUE. COMPENSATING CUT FOR FILL PLACED IN FLOOD PLAIN TO BE ACCOMPLISHED WITH GRADING AND REMOVAL OF MATERIAL FROM NEW PARKING AREA. CONNECT TO EXISTING ON SITE PRIVATE ENCLOSED STORM DRAIN.*

Construction Sequence and Methods *INSTALL SOIL EROSION MEASURES, REMOVE EXISTING BUILDING, CONSTRUCT NEW BUILDING, REGRADE PARKING AND ADD CURB AND WALKS WHERE REQUIRED. REVEGITATE DISTURBED AREAS.*

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.

REMOVE EXISTING BUILDING AND PARKING PARKING AREAS TO PROVIDE FOR NEW BUILDING AND PARKING AREA. IMPROVE PUBLIC SAFETY BY ELIMITATING PARKING AND SIDEWALK GRADES THAT ARE CURRENTLY OVER 5% AND REDUCE PARKING LOT RUNOFF TO GRAND RIVER AVENUE.

Describe the alternatives considered to avoid or minimize resource impacts. Include factors such as, but to limited to, alternative locations, project layout and design, and construction technologies. For utility crossings include alternative routes and construction methods.

INITIAL LAYOUTS HAD THE PROPOSED BUILDING WITHIN THE EXISTING UPLAND AREA AT THE BACK OF THE PARCEL; HOWEVER, THAT ELIMINATED THE DEPTH NEEDED FOR A DRIVE THRU LANE MADE TRUCK TURNING MOVEMENTS IMPOSSIBLE TO SERVICE THE SITE. THE CURRENT DESIGN ALLOWS FOR A TURNING LANE, MEETS TRUCK TURNING REQUIREMENTS FOR DELIVERIES, PROVIDES FOR FUTURE CROSS LOT PARKING DRIVE ACCESS, AND ALLOWS FOR GRADING AND DRAINAGE IMPROVEMENTS TO BE MADE COMPARED TO THE EXISTING SITE.

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

Names of roads of closest intersection ***OKEMOS ROAD & GRAND RIVER AVE***

Directions from main intersection to the project site, with distances from the best and nearest visible landmark and water body ***2ND PARCEL EAST OF OKEMOS ROAD ON THE NORTH SIDE OF GRAND RIVER AVENUE.***

Description of buildings on the site *(color; 1 or 2 story, other)*	Description of adjacent landmarks or buildings *(address; color; etc)*
EXISTING RESTAURANT WITH TAN BRICK	***PROJECT SITE IS EAST OF PAYLESS SHOE STORE AND WEST OF DISCOUNT TIRE.***

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

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
MERIDIAN TOWNSHIP	***SPECIAL USE PERMIT FOR WORK IN FLOODPLAIN***		***TO BE APPLIED FOR***		
INGHAM COUNTY DRAIN COMMISSIONER	***SOIL EROSION PERMIT***		***TO BE APPLIED FOR***		

7 Compliance

If a permit is issued, when will the activity begin? (M/D/Y) ***AUG 2018***	Proposed completion date (M/D/Y) ***SEPTEMBER 2019***

☒ 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.*

☐ Established Lake Board ☐ Lake Association	Contact Person	Mailing Address	City	State and Zip Code

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
LANSING MART LLC	***C/O GERSHENSON REALTY & INVESTMENTS, 31500 NORTHWESTERN HWY, SUITE 100***	***FARMINGTON***	***MI. 48334***
SANLYSE, LLC	***185 NW SPANISH RIVER BLVD., SUITE 100***	***BOCA RATON***	***FL. 33431***
REINALT THOMAS REALTY CO.	***DEPT. 1100 MIL11 20225 SCOTTSDALE RD.***	***SCOTTSDALE***	***AZ. 85225***

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.			
☒ Property Owner ☐ Agent/Contractor ☐ Corp. or Public Agency / Title	Printed Name	Signature	Date

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) 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 ***NEW BUILDING & PARKING LOT REGRADING***

Dimensions of fill (ft)	Total volume (cubic yards)	Volume below OHWM (cubic yards)
Length ***205*** Width ***160*** Maximum Depth ***1.4***	***150***	***0***
Maximum water depth in fill area (ft) ***0***	Area filled (sq ft) ***19,175***	Will filter fabric be used under proposed fill? ☒ No ☐ Yes (If Yes, type)

Fill will extend ***0*** feet into the water from the shoreline and upland feet out of the water.

Type of clean fill ☐ peastone % ☐ sand % ☐ gravel % ☒ other ***COMMERCIAL***

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 ***PARKING LOT REGRADING***

Dimensions (ft)	Total volume (cu yds)	Volume below OHWM (cu yds)
Length Width Maximum Depth ***SEE TABLES***	***410***	***0***

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 ☐ on-site ☒ landfill ☐ USACE confined disposal facility ☐ 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?
☒ No ☐ 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 ***8*** width ***5*** depth ***0.67***	Volume(cu yd) ***1.0x9 = 9.0***
Riprap landward of the ordinary high water mark: dimensions (ft) length width depth	Volume(cu yd)

Type and size of riprap (inches) ☐ field stone ☒ angular rock ***.50*** ☒ other ***.50***	Will filter fabric or pea stone be used under proposed riprap? ☐ No ☒ Yes, Type ***AMOCO 4551***

12 Activities That May Impact Wetlands (See Sample Drawings 8 & 9). Complete other Sections as applicable.

- 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.
  - ➧ 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?	☒ No ☐ Yes	➧ If Yes, provide a copy or WIP number:
Has a professional wetland delineation been conducted for this parcel?	☐ No ☒ Yes	➧ If Yes, provide a copy with data sheets
Is there a recorded DEQ easement on the property?	☒ No ☐ Yes	➧ If Yes, provide the easement number
Did the applicant purchase the property before October 1, 1980?	☒ No ☐ Yes	➧ If Yes, provide documentation.
Is any grading or mechanized land clearing proposed?	☒ No ☐ Yes	➧ If Yes, label the locations on the site plan.
Has any of the proposed grading or mechanized land clearing been completed?	☒ No ☐ Yes	➧ If Yes, label the locations on the site plan

Proposed Activity

☐ boardwalk or deck (Section 10I)	☐ bridges and culverts (Section 14)	☐ designated environmental area
☐ dewatering	☐ draining surface water	☐ driveway / road
☐ fences (Section 10L)	☐ fill or dredge	☐ restoration
☐ septic system	☐ stormwater discharge (Section 10J)	☐ other

	Dimensions	Area	Average depth (ft)	Volume (cu yd)
FILL	maximum length (ft) maximum width (ft)	☐ acres ☐ sq ft		
DREDGE	maximum length (ft) maximum width (ft)	☐ acres ☐ sq ft		

Spoils Disposal

Dredged or excavated spoils will be placed ☐ on-site ☐ landfill ☐ USACE confined disposal facility ☐ 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:
☐ public sewer ☐ 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? ☐ No ☐ Yes
If Yes, has a permit been issued? ☐ No ☐ Yes ➧ Provide a copy of the permit.

Describe the wetland impacts, the proposed use or development, and the alternatives considered:

Does the project impact more than 1/3 acre of wetland? ☐ No ☐ 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:

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.

13 Floodplain Activities (See Sample Drawing 5 and others. Complete other applicable sections.)

- For more information go to www.mi.gov/floodplainmanagement. This site also lists the projects and requirements for an expedited floodplain review under "Expedited Review Information for Minor Floodplain Projects."
- Examples of projects proposed within the non-floodway portions of the 100-year-floodplain which may qualify for an expedited review: Open pile decks and boardwalks; residences, commercial/industrial facilities, garages and accessory structures; parking lots; pavilions, gazebos, large community playground structures; residential swimming pools
- Examples of projects proposed within the floodway portions of the floodplain which may qualify for an expedited review: Open pile decks and boardwalks, (non-enclosed) that are anchored to prevent floatation and that do not extend over the bed and bank of a watercourse; parking lots constructed at grade or resurfacing that is no more than 4 inches above the existing grade; dry hydrants that do not require fill placement; scientific structure such as staff gauges, water monitoring devices, water quality testing devices, and core sampling devices which meet specific design criteria and fish structures that meet specific design criteria.
- For expedited review include:
  - ➧ Photographs of the work site labeled to identify what is being shown and with the direction of the photo clearly indicated. Include photographs of any river or stream adjacent to the project.
  - ➧ A letter or statement from the local unit of government acknowledging your proposed application. See the website for sample wording.
- A hydraulic analysis or hydrologic analysis may be required to fully assess floodplain impacts.
- The state building code requires an Elevation Certificate for any building construction or addition in a floodplain. A sample form can be found at www.fema.gov/nfip/elvinst.shtm.
  - ➧ Attach additional sheets or tables for multiple proposed floodplain activities and provide hydraulic calculations.
  - ➧ Show reference datum used on plans.

Proposed Activity ☒ fill ☒ excavation or cut ☐ other	100-year floodplain elevation (ft) (if known) ***842.10*** Datum ☐ NGVD 29 ☒ NAVD 88 ☐ other
Site is NA feet above ☐ ordinary high water mark (OHWM) OR ☐ observed water level. Date of observation (M/D/Y)	
Fill volume below the 100-year floodplain elevation (cu yds) ***120***	Compensating cut volume below the 100-year floodplain elevation (cu yds) ***410***

Buildings and/or Additions

Type of construction is ☐ residential ☐ garage/pole barn ☐ non residential ☒ other ***COMMERCIAL***

Construction is ☒ new ☐ addition AND Serviced by ☐ public sewer ☐ private septic ☒ other ***RECONSTRUCTION***

Lowest adjacent grade (ft): existing ***837.52***
proposed ***837.52***
datum ☐ NGVD 29 ☒ NAVD 88 ☐ other

Existing Structure Information		Proposed Structure Information	
Foundation type	☐ basement	Foundation type	☐ basement
☒ concrete slab on grade	☐ pilings	☒ concrete slab on grade	☐ pilings
☐ crawl space	☐ other	☐ crawl space	☐ other
Foundation floor elevation (ft) ***843.93***		Foundation floor elevation (ft) ***843.10***	
Height of crawl space/basement from finished foundation floor to bottom of floor joists (ft) ***NA***		Height of crawl space/basement from finished foundation floor to bottom of floor joists (ft) ***NA***	
Elevation of 1st floor above basement floor/crawl space (ft) ***NA***		Elevation of 1st floor above basement floor/crawl space (ft) ***NA***	

For enclosed areas below the flood elevation, such as a crawl space, garages and accessory structures:
Area of proposed foundation (sq ft) ***NA***
Elevation of proposed enclosed area (ft) ***NA*** datum ☐ NGVD 29 ☐ NAVD 88 ☐ other

Number of flood vents ***NA*** net opening of each vent (sq inches) ***NA*** lowest elevation of flood vents (ft)

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) *842.10* ☐ above or ☐ below the Reference Point of Date observed		
Reference datum used ☐ NGVD 29 ☐ NAVD 88 ☒ IGLD 85 (Great Lakes coastal areas) ☐ 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? ☐ No ☐ 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.		Existing	Proposed
Bridge			
Number of bridge spans			
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		*0*	*1*
Culvert type (arch, bottomless, box, circular, elliptical, etc.)		*NA*	*12" DIA., EQUALIZER PIPE*
Culvert material (concrete, corrugated metal, plastic, etc.)		*NA*	*CONC.*
Culvert length (ft)		*NA*	*68*
Culvert ☐ width ☒ diameter (ft)		*NA*	*NA*
Culvert height prior to any burying (ft)		*NA*	*1*
Depth culvert will be buried (ft)		*NA*	*0*
Elevation of culvert crown (ft)	Upstream	*NA*	*838.94*
	Downstream	*NA*	*838.94*
Higher elevation of ☒ culvert invert OR ☐ streambed within culvert (ft)	Upstream	*NA*	*837.94*
	Downstream	*NA*	*837.94*
Complete for both Bridges and Culverts			
Entrance design (mitered, projecting, wingwalls, etc.)		*NA*	*MITERED END SECTION*
Total structure waterway opening above streambed (sq ft)		*NA*	*.785*
Total structure waterway area below the 100-year elevation (sq ft) (if known)		*NA*	*.785*
Elevation of road grade at structure (ft)		*NA*	*839.25*
Elevation of low point in road (ft)		*NA*	*839.25*
Distance from low point of road to mid-point of bridge crossing (ft)		*NA*	*17*
Length of approach fill from edge of bridge/culvert to existing grade (ft)		*NA*	*34*

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? ☒ No ☐ Yes

2080 Grand River

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN



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PERMIT NO WRD011311
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Page 1 of 10

LEGAL DESCRIPTION:

A parcel of land in the Northeast 1/4 of Section 21, T4N, R1W, Meridian Township, Ingham County, Michigan, the surveyed boundary of said parcel described as: Commencing at the North 1/4 corner of said Section 21; thence N88°47'52"E along the North line of said Section 21 a distance of 1355.76 feet to the Northwest corner of the East 1/2 of said Northeast 1/4; thence S00°36'29"E along the West line of the East 1/2 of said Northeast 1/4 as monumented a distance of 1306.27 feet; thence N89°58'36"E 231.35 feet to the point of beginning of this description; thence continuing N89°58'36"E 199.82 feet; thence S01°52'11"W 279.62 feet to the Northerly line of Grand River Avenue (M-43); thence N77°03'29"W along said Northerly line 200.51 feet; thence N01°09'11"E 234.53 feet to the point of beginning; said parcel containing 1.16 acres more or less; said parcel subject to all easements and restrictions if any.

BENCHMARKS

BENCHMARK #1 ELEV. = 842.24 (NAVD88)
CENTER OF BLACK "X", NORTH SIDE OF CONCRETE LIGHT POLE BASE, IN SOUTHWEST CURB ISLAND OF FOUR CURB ISLANDS IN FRONT OF #2080 GRAND RIVER AVENUE, 75' NORTH-NORTHEAST OF BACK OF CURB OF GRAND RIVER AVENUE AND ±43' WESTERLY OF CENTERLINE OF ENTRANCE DRIVE TO #2080 GRAND RIVER AVENUE.

BENCHMARK #2 ELEV. = 840.83 (NAVD88)
NORTH FLANGE BOLT, UNDER "8" IN "1968", FIRE HYDRANT, ±24' NORTH-NORTHEAST OF BACK OF CURB OF GRAND RIVER AVENUE, ±14' EASTERLY OF THE EXTENSION OF THE WESTERLY WALL LINE OF #2080 GRAND RIVER AVENUE.



EX. SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 837.05
NW INV. = 834.97

CATCH BASIN #101
RIM ELEV. = 840.16
10" RCP N INV. = 837.86
PROP. I.E. 12" S 837.88

CATCH BASIN #102
RIM ELEV. = 840.23
6" VCP NW INV. = 838.63

SANITARY MANHOLE #200
RIM ELEV. = 839.43
8" PVC NE INV. = 830.40
15" RCP E INV. = 828.73
15" RCP SW INV. = 828.72

SANITARY MANHOLE #201
RIM ELEV. = 837.14
15" RCP NE INV. = 828.87
15" RCP W INV. = 828.84

REVISIONS
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SHEET 1 OF 10

KEBS, INC.

2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047

Marshall Office
Ph. 269-781-9800

SCALE: NONE
PROJECT MGR. LBP
APPROVED BY: JWK

2080 Grand River
LOCATION MAP & LEGAL
FLOOD PLAIN CUT & FILL

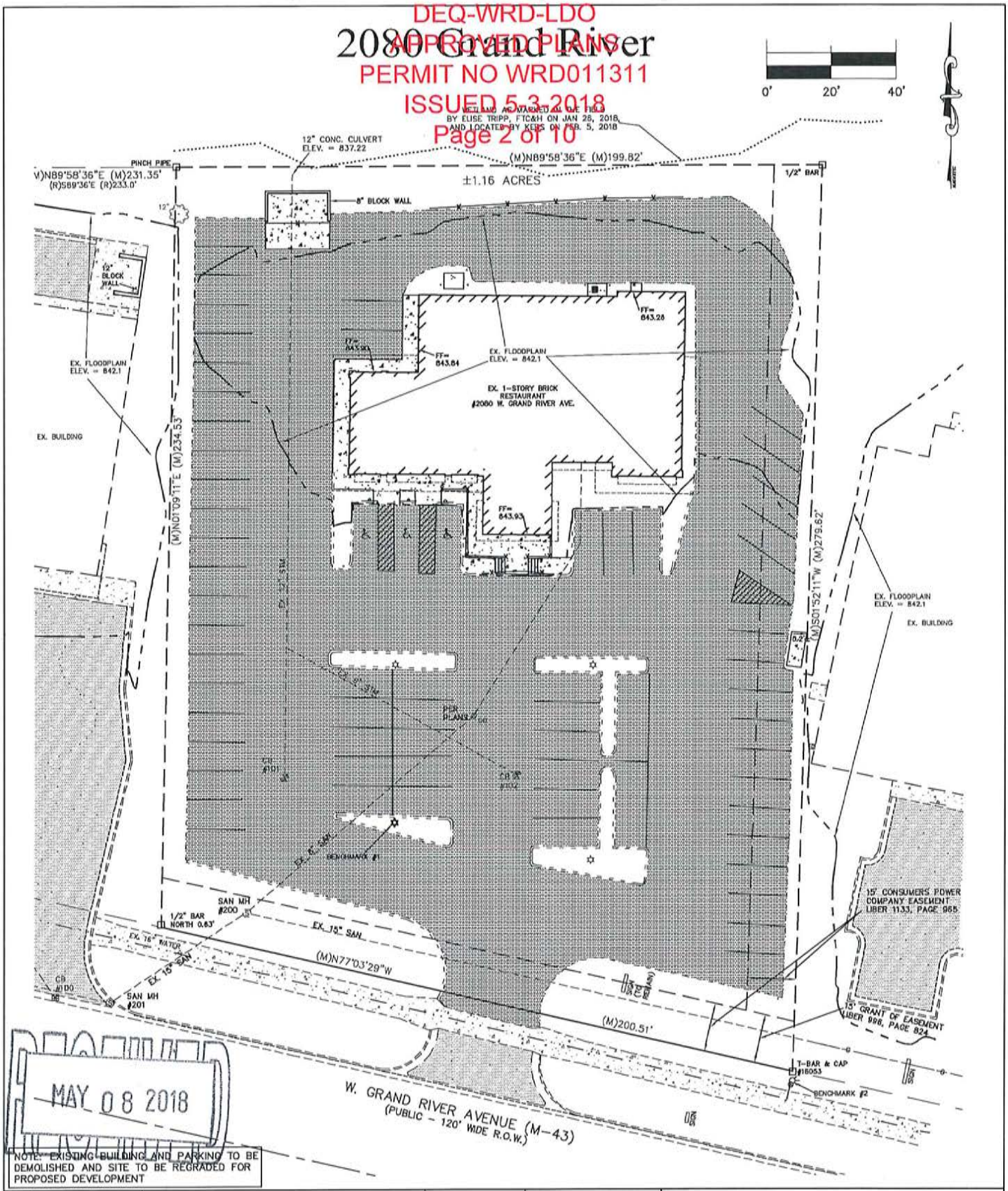
AUTHORIZED BY:
AFFINITY 9 INVESTMENTS, LLC

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2080 Grand River



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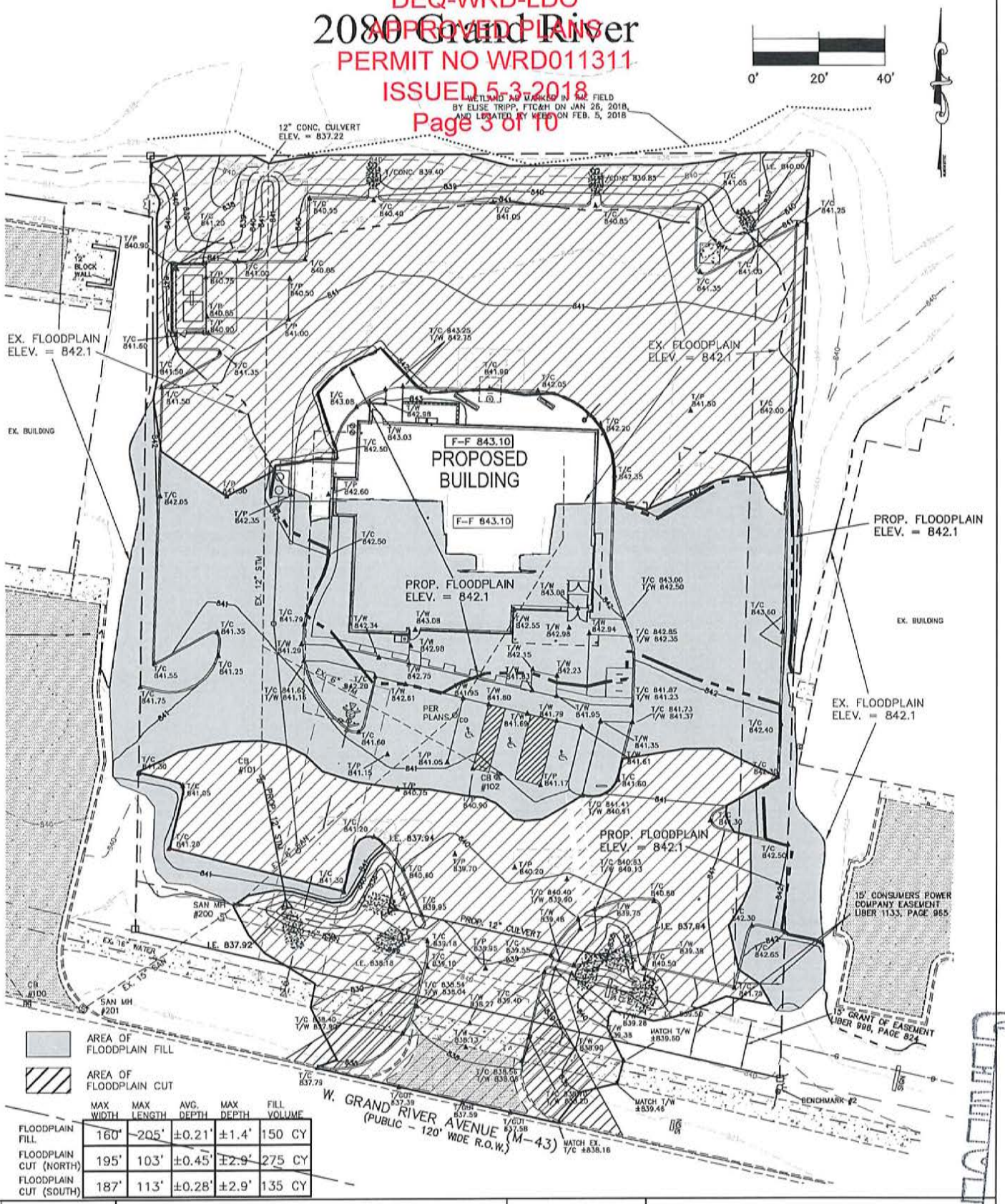
NOTE: EXISTING BUILDING AND PARKING TO BE DEMOLISHED AND SITE TO BE REGRADED FOR PROPOSED DEVELOPMENT

SHEET 2 OF 10	REVISIONS	KEBS, INC.	SCALE: 1"=40'	2080 Grand River
	4-16-18 SUBMITTAL	2116 HASLETT ROAD, HASLETT, MI 48840 PH. 517-339-1014 FAX. 517-339-8047	PROJECT MGR. LBP	EXISTING SITE FLOOD PLAIN CUT & FILL
		Marshall Office Ph. 269-781-9800	APPROVED BY: JWK	AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC JOB #: 91998

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2080 Grand River



	MAX WIDTH	MAX LENGTH	AVG. DEPTH	MAX DEPTH	FILL VOLUME
FLOODPLAIN FILL	160'	205'	±0.21'	±1.4'	150 CY
FLOODPLAIN CUT (NORTH)	195'	103'	±0.45'	±2.9'	275 CY
FLOODPLAIN CUT (SOUTH)	187'	113'	±0.28'	±2.9'	135 CY

SHEET 3 OF 10

REVISIONS
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Ph. 269-781-9800

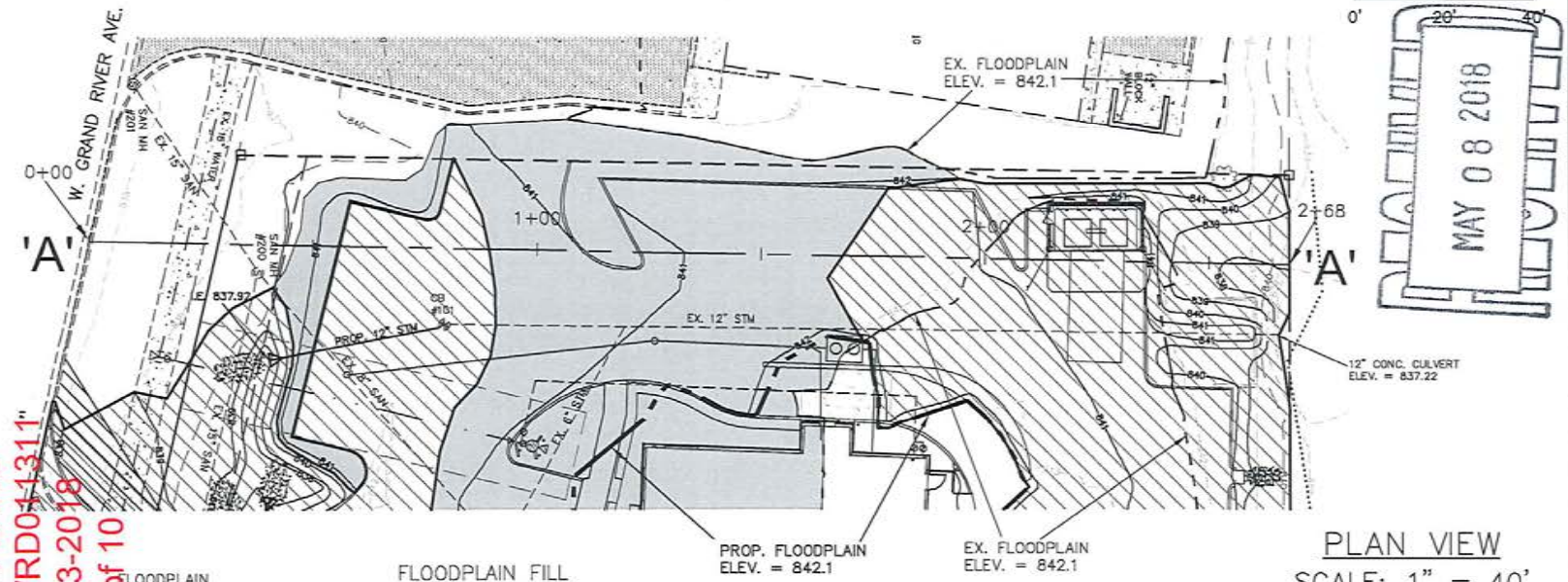
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2080 Grand River
PROPOSED SITE
FLOOD PLAIN CUT & FILL

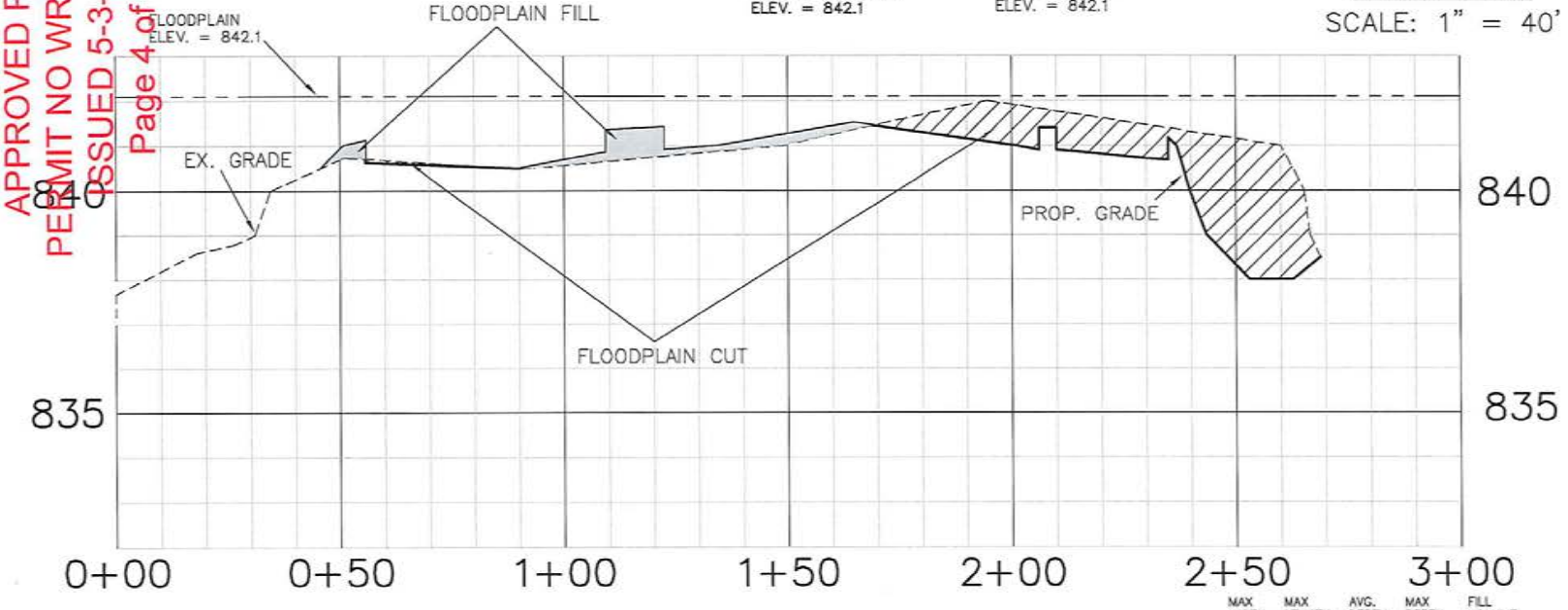
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PLAN VIEW
SCALE: 1" = 40'



PROFILE VIEW
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

AREA OF FLOODPLAIN FILL
AREA OF FLOODPLAIN CUT

SECTION A–A

	MAX WIDTH	MAX LENGTH	AVG. DEPTH	MAX DEPTH	FILL VOLUME
FLOODPLAIN FILL	160'	205'	±0.21'	±1.4'	150 CY
FLOODPLAIN CUT (NORTH)	195'	103'	±0.45'	±2.9'	275 CY
FLOODPLAIN CUT (SOUTH)	187'	113'	±0.28'	±2.9'	135 CY

2080 Grand River

CROSS SECTION A–A
FLOOD PLAIN CUT & FILL

AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC

JOB #: 91998

SCALE: 1"=40'
PROJECT MGR. LBP
APPROVED BY: JWK

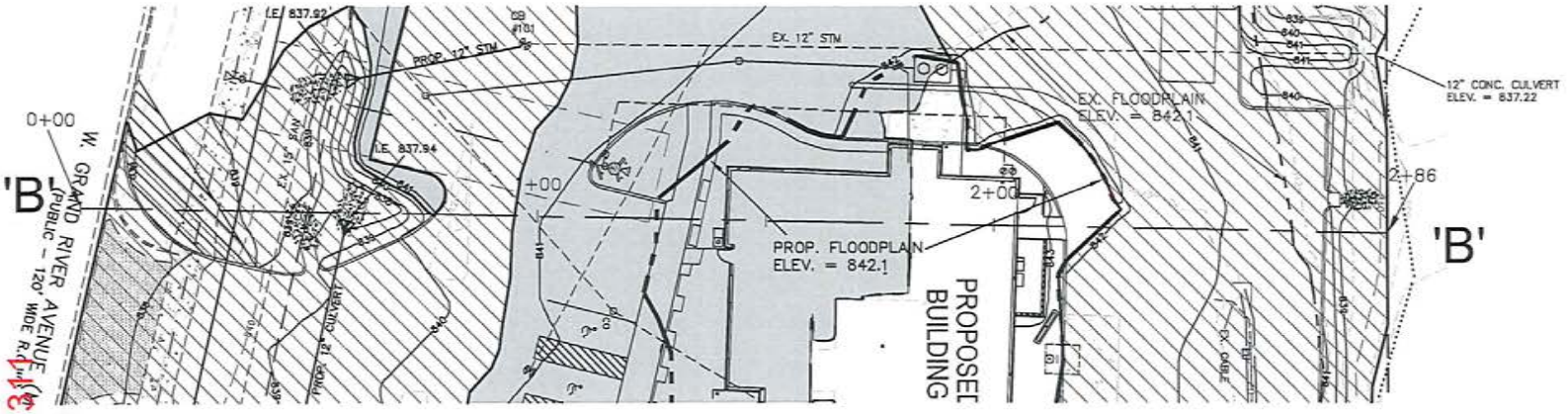
KEBS, INC.
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

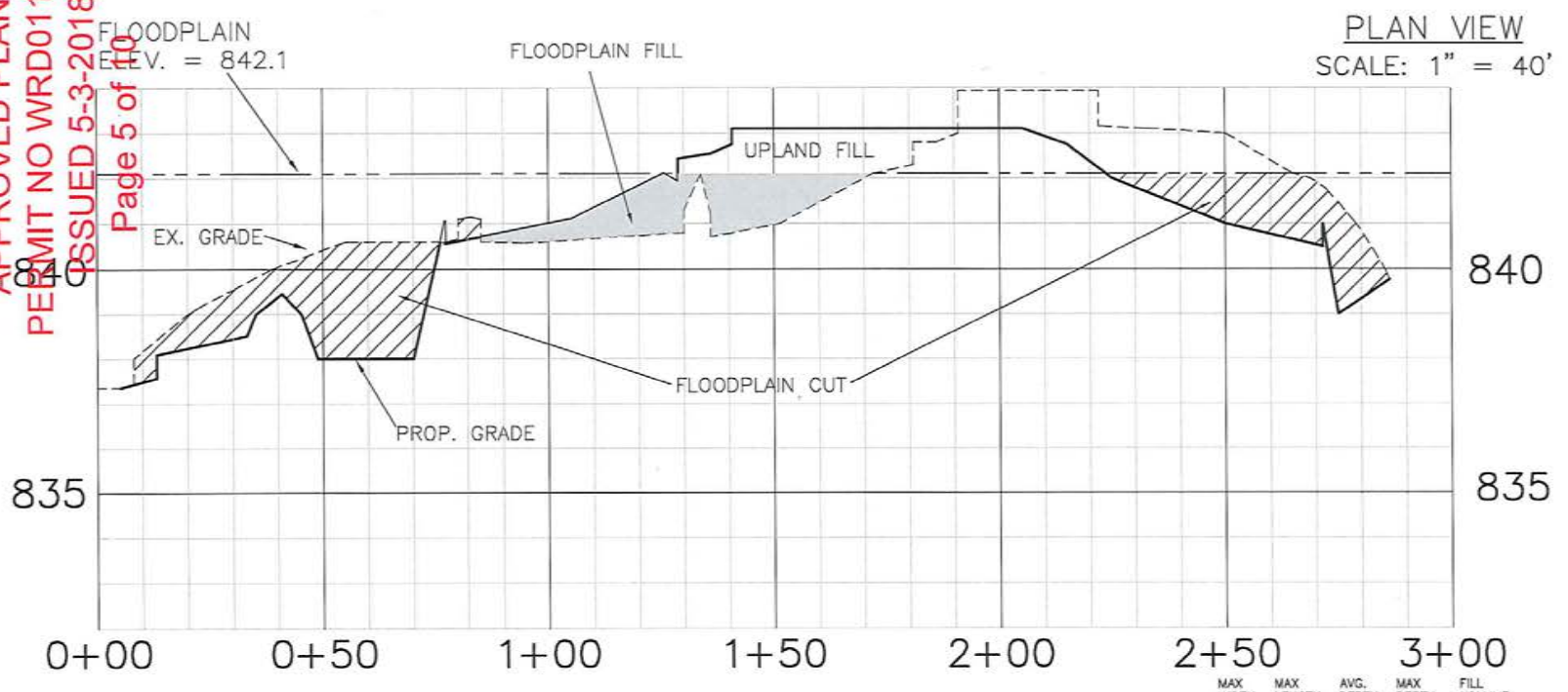
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4-16-18 SUBMITTAL

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PLAN VIEW
SCALE: 1" = 40'

PROFILE VIEW
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

AREA OF FLOODPLAIN FILL

AREA OF FLOODPLAIN CUT

SECTION B–B

	MAX WIDTH	MAX LENGTH	AVG. DEPTH	MAX DEPTH	FILL VOLUME
FLOODPLAIN FILL	160'	205'	±0.21'	±1.4'	150 CY
FLOODPLAIN CUT (NORTH)	195'	103'	±0.45'	±2.9'	275 CY
FLOODPLAIN CUT (SOUTH)	187'	113'	±0.28'	±2.9'	135 CY

2080 Grand River

CROSS SECTION B–B
FLOOD PLAIN CUT & FILL

JOB # 91998

AUTHORIZED BY:
AFFINITY 9 INVESTMENTS, LLC

SCALE: 1"=40'
PROJECT MGR. LBP
APPROVED BY: JWK

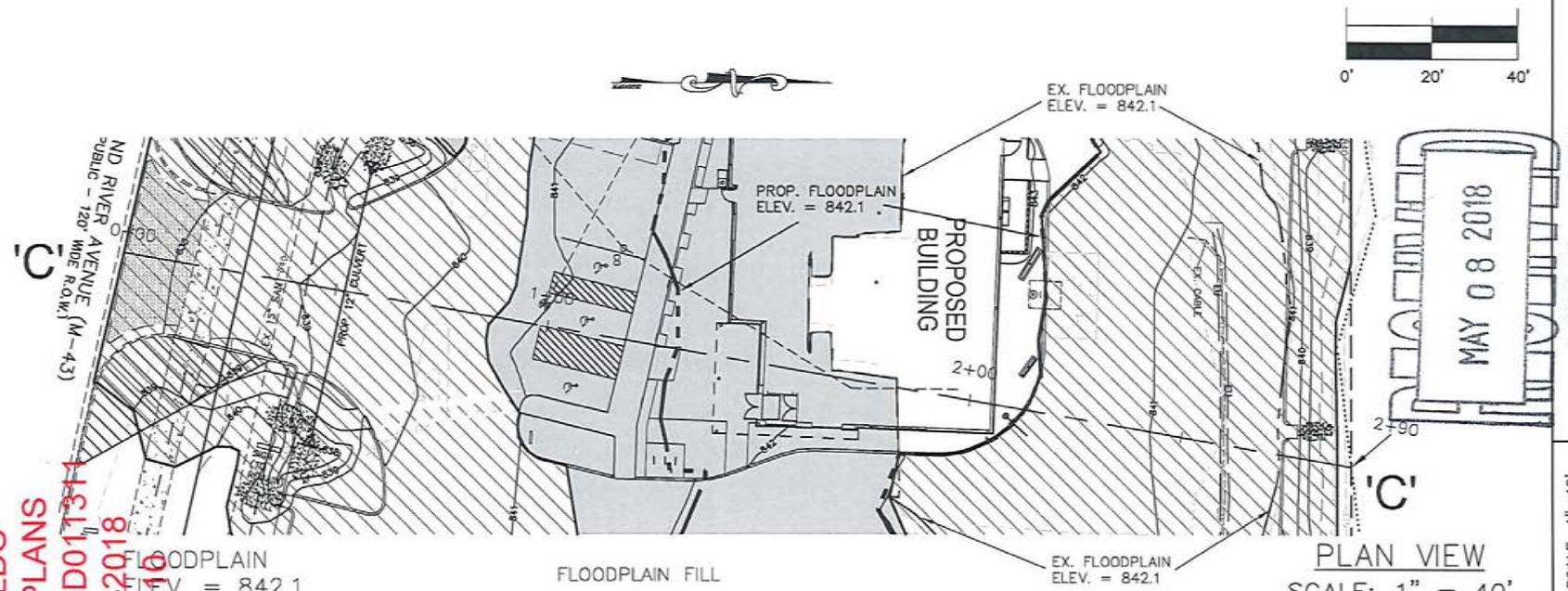
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2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

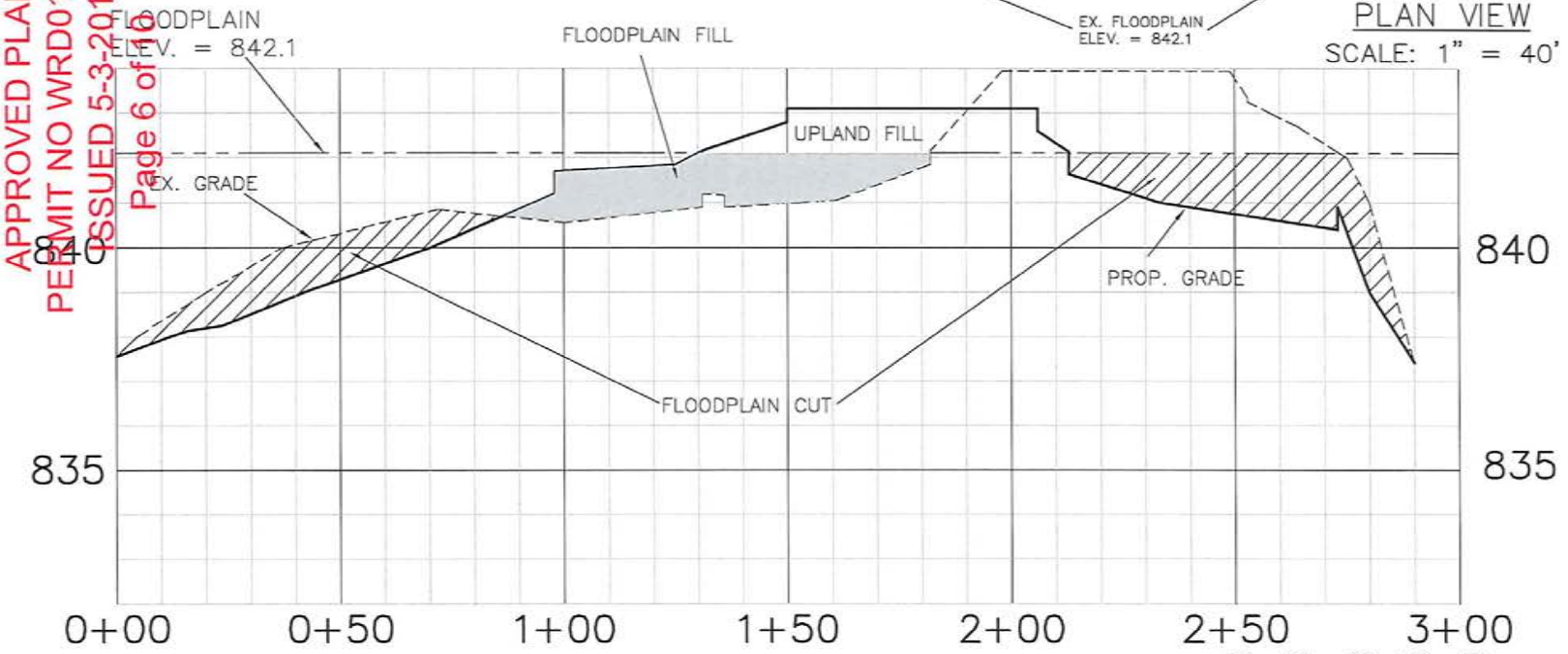
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PROFILE VIEW
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

AREA OF FLOODPLAIN FILL

AREA OF FLOODPLAIN CUT

SECTION C–C

	MAX WIDTH	MAX LENGTH	AVG. DEPTH	MAX DEPTH	FILL VOLUME
FLOODPLAIN FILL	160'	205'	±0.21'	±1.4'	150 CY
FLOODPLAIN CUT (NORTH)	195'	103'	±0.45'	±2.9'	275 CY
FLOODPLAIN CUT (SOUTH)	187'	113'	±0.28'	±2.9'	135 CY

2080 Grand River

CROSS SECTION C–C
FLOOD PLAIN CUT & FILL

JOB #: 91998

AUTHORIZED BY:
AFFINITY 9 INVESTMENTS, LLC

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SCALE: 1"=40'
PROJECT MGR. LBP
APPROVED BY: JWK

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2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
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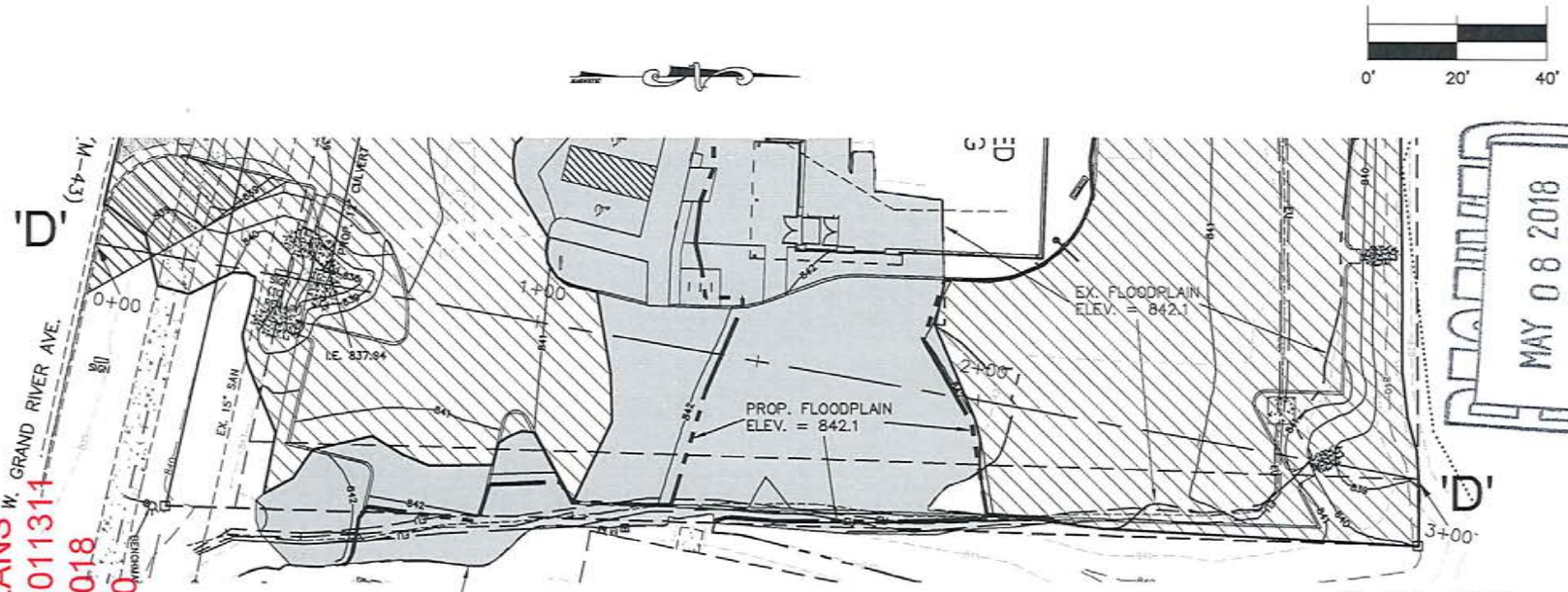
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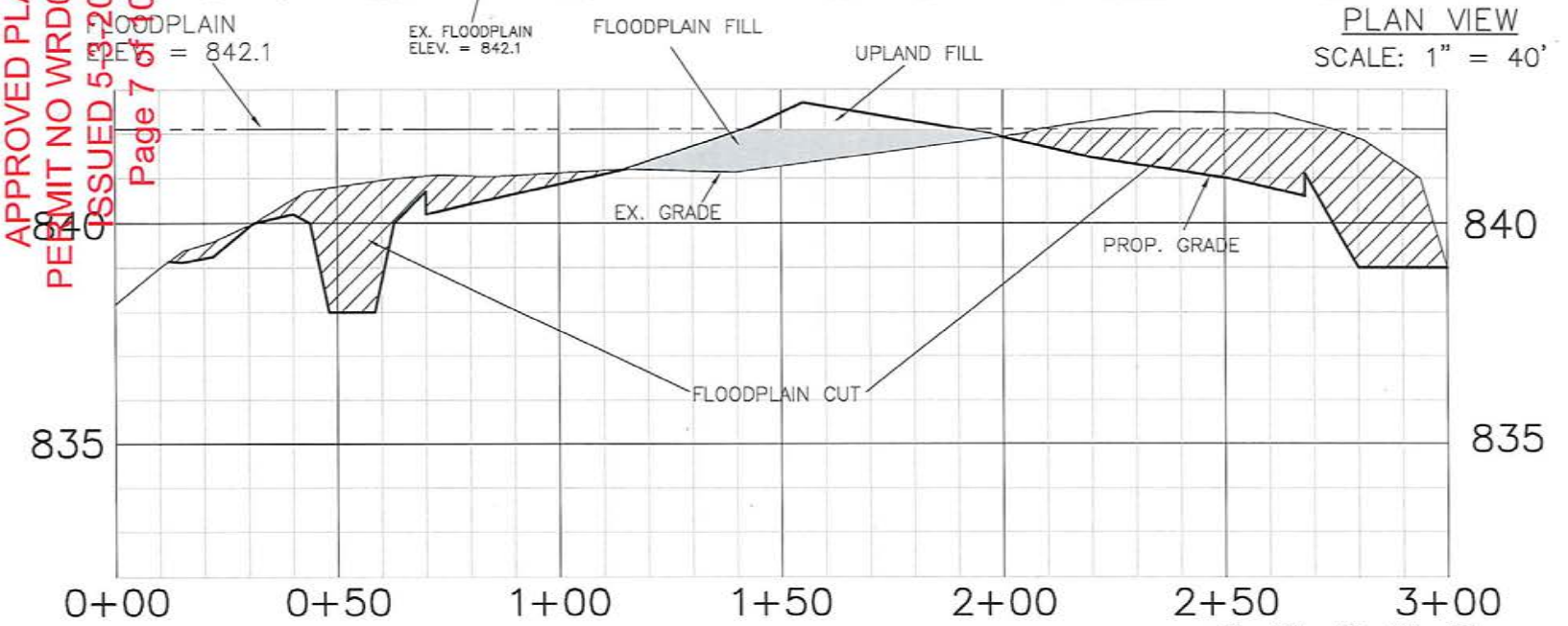
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PLAN VIEW
SCALE: 1" = 40'



PROFILE VIEW
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

AREA OF FLOODPLAIN FILL
AREA OF FLOODPLAIN CUT

SECTION D–D

	MAX WIDTH	MAX LENGTH	AVG. DEPTH	MAX DEPTH	FILL VOLUME
FLOODPLAIN FILL	160'	205'	±0.21'	±1.4'	150 CY
FLOODPLAIN CUT (NORTH)	195'	103'	±0.45'	±2.9'	275 CY
FLOODPLAIN CUT (SOUTH)	187'	113'	±0.28'	±2.9'	135 CY

2080 Grand River

CROSS SECTION D–D
FLOOD PLAIN CUT & FILL

JOB # 91998

AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC

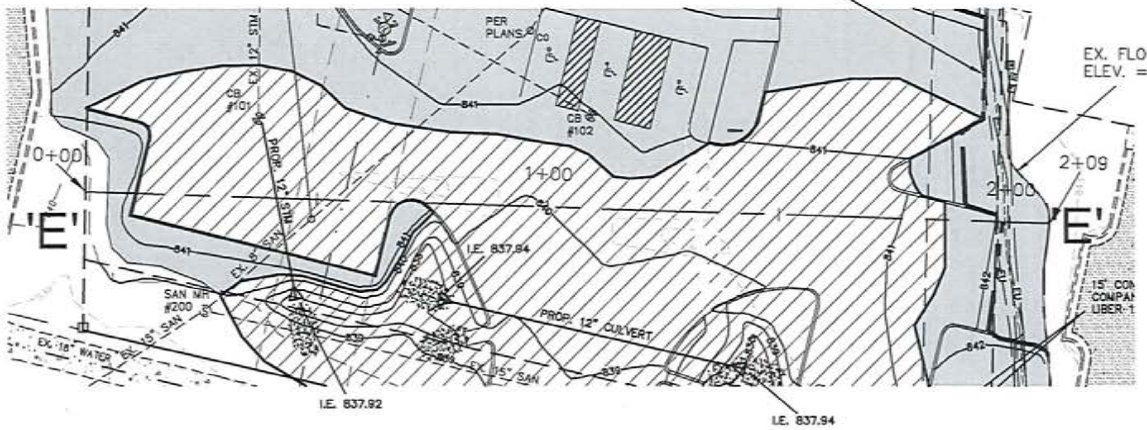
SCALE: 1"=40'
PROJECT MGR. LBP
APPROVED BY: JWK

KEBS, INC.
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

REVISIONS
4-16-18 SUBMITTAL

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APPROVED PLANS
PERMIT NO WRD011311
ISSUED 5-3-2018
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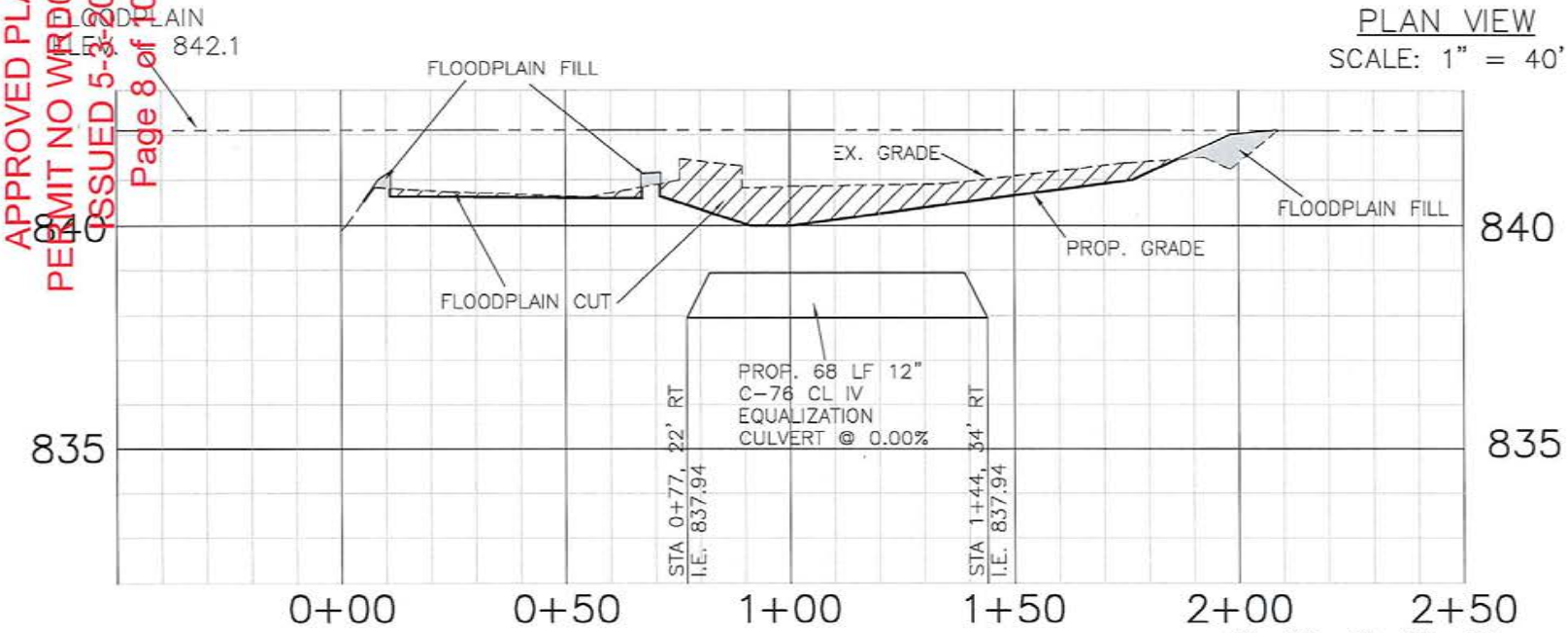
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0' 20' 40'

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PLAN VIEW
SCALE: 1" = 40'



PROFILE VIEW
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

AREA OF FLOODPLAIN FILL
AREA OF FLOODPLAIN CUT

SECTION E-E

	MAX WIDTH	MAX LENGTH	AVG. DEPTH	MAX DEPTH	FILL VOLUME
FLOODPLAIN FILL	160'	205'	±0.21'	±1.4'	150 CY
FLOODPLAIN CUT (NORTH)	195'	103'	±0.45'	±2.9'	275 CY
FLOODPLAIN CUT (SOUTH)	187'	113'	±0.28'	±2.9'	135 CY

Grand River

CROSS SECTION E-E
FLOOD PLAIN CUT & FILL

JOB # 91998

AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC

SCALE: 1"=40'
PROJECT MGR. LBP
APPROVED BY: JMK

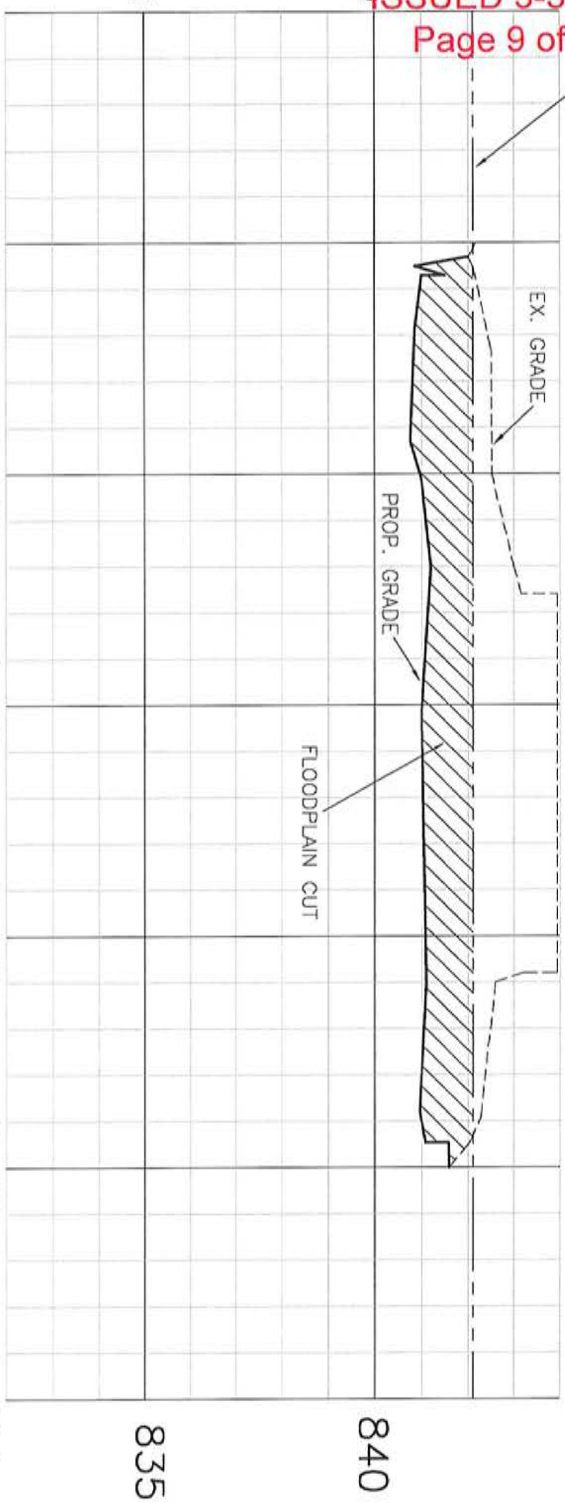
KEBS, INC.
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

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PROFILE VIEW

SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

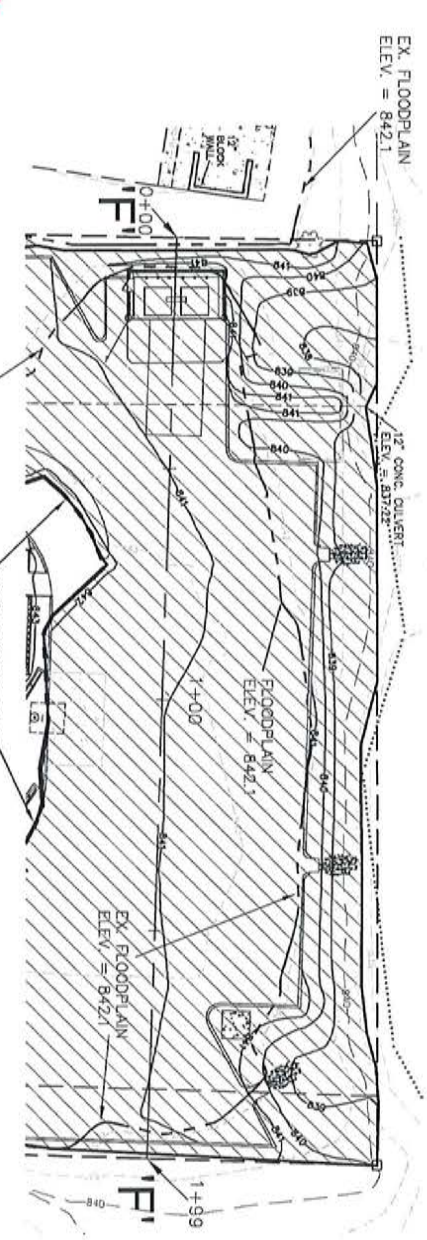


AREA OF FLOODPLAIN FILL

AREA OF FLOODPLAIN CUT

SECTION F-F

	FLOODPLAIN FILL	FLOODPLAIN CUT (NORTH)	FLOODPLAIN CUT (SOUTH)
MAX WIDTH	160'	195'	187'
MAX LENGTH	205'	103'	113'
AVG. DEPTH	±0.21'	±0.45'	±0.28'
MAX DEPTH	±1.4'	±2.9'	±2.9'
FILL VOLUME	150 CY	275 CY	135 CY



PLAN VIEW

SCALE: 1" = 40'

0' 20' 40'

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REVISIONS	KEBS, INC.	SCALE: 1"=40'	2080 Grand River
4-16-18 SUBMITTAL	2116 HASLETT ROAD, HASLETT, MI 48840 PH. 517-339-1014 FAX. 517-339-8047 Marshall Office Ph. 269-781-9800	PROJECT MGR. LBP	LOCATION MAP & LEGAL FLOOD PLAIN CUT & FILL
		APPROVED BY: JWK	AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC
			JOB # 91998

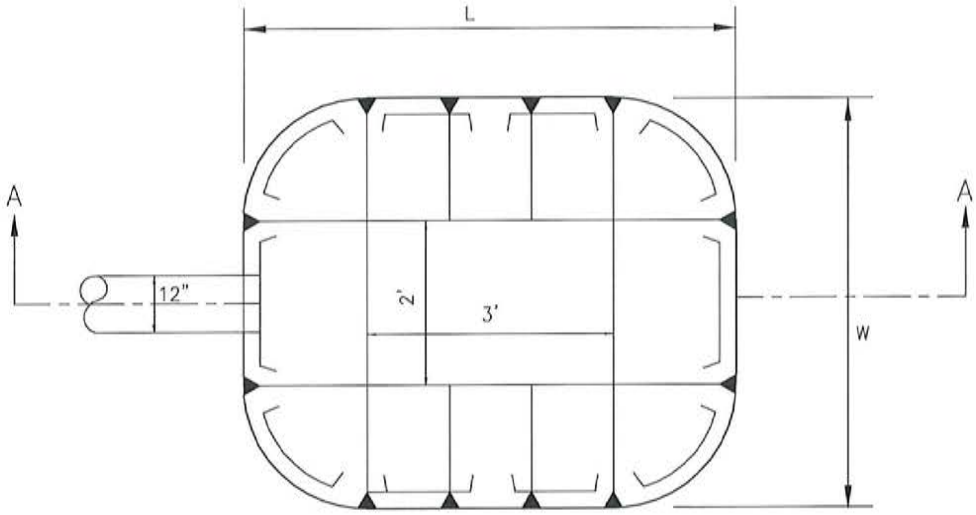
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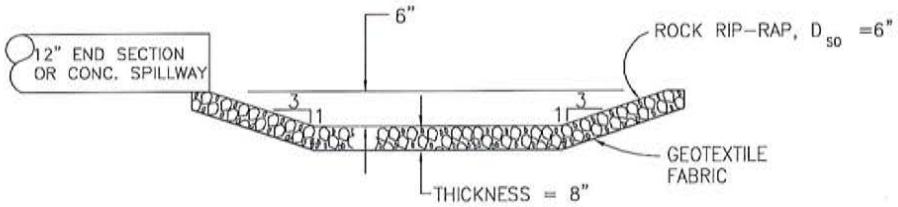
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PERMIT NO WRD011311
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CONSTRUCTION NOTES

1. The sub grade for the filter, riprap or gabion shall be prepared to required lines and grade as shown on the plan. Any fill required in the sub grade shall be compacted to a density of approximately that of the surrounding undisturbed material.
2. The riprap shall conform to the grading limits as shown on the plan.
3. Filter cloth shall be protected from puncturing, cutting or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of cloth over the damaged area. All connecting joints should overlap a minimum of 1 ft. If damage is extensive, replace the entire filter cloth.
4. Stone for the riprap or gabion outlets may be placed by equipment. Riprap shall be placed in a manner to prevent damage to the filter cloth. Hand placement will be required to the extent necessary to prevent damage to the conduits, structures, etc.
5. 3:1 side slopes are approximate.
6. Riprap shall be composed of a well graded mixture of stone size so that 50 percent of the pieces, by weight, shall be larger than 6 inches. A well graded mixture is defined as a mixture composed primarily of larger stone sizes but a sufficient mixture of other sizes to fill the smaller voids between the stones. The diameter of the largest stone shall be 9 inches.
7. Stone for riprap shall consist of field stone or quarry stone. The stone shall be hard, angular and highly resistant to weathering. The specific gravity of the individual stones shall be at least 2.5.
8. The filter shall be filter cloth. The filter cloth can be woven or non-woven monofilament yarns, and shall meet these basic requirements: thickness 20-60 mils, grab strength 90-120 lbs; and shall conform to ASTM D-1777 and ASTM D-1682.



PLAN VIEW OF
RIPRAP AT INLETS AND OUTLETS



SECTION A-A

12" END SECTION OR CONC. SPILLWAY

LENGTH (L) FT.	WIDTH (W) FT.	ESTIMATED AREA (SQ. YD.)	ESTIMATED VOLUME (CU. YD.)
8	5	4.4	1.0

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1.0 CY x 9 RIPRAP AREAS = 9.0 CY TOTAL

SHEET 10 OF 10	REVISIONS	KEBS, INC.	SCALE: 1"=40'	2080 Grand River
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			APPROVED BY: JWK	AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC — JOB # 91998

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Issued On:05/03/2018
Expires On:05/03/2023

NOTICE OF AUTHORIZATION

Permit Number: WRP011311 v. 1
Site Name: 33-2080 Grand River-Okemos

Date Issued: May 3, 2018
Expiration Date: May 3, 2023

The Michigan Department of Environmental Quality, Water Resources Division, P.O. Box 30458, Lansing, Michigan 48909-7958, under provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended; specifically:

- ☒ Part 31, Floodplain Regulatory Authority of the Water Resources Protection.
- ☐ Part 301, Inland Lakes and Streams.
- ☐ Part 303, Wetlands Protection.

Authorized activity:

Demolish existing building and parking area in floodplain at 2080 Grand River, Okemos.

Place approximately 120 cubic yards within the 100-year floodplain to elevate existing grades and construct a new commercial building with lowest floor at least 1 foot above flood level.

Regrade new parking area and stormwater basin, which results in a floodplain cut of 410 cubic yards.

To be conducted at property located in: Ingham County, Waterbody: Red Cedar River
Section 21, Town 04N, Range 01W, Meridian Township.

Permittee:
Affinity 9 Investments, LLC, Thomas Hannawa
1721 Maplelane Avenue
Hazel Park, MI 48030

Donna Cervelli
Lansing District Office
Water Resources Division

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MAY 08 2018

This notice must be displayed at the site of work.
Laminating this notice or utilizing sheet protectors is recommended.
Please refer to the above permit number with any questions or concerns.

DEQ-WRD
WRP011311 v1.0
Approved
Issued On:05/03/2018
Expires On:05/03/2023

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER RESOURCES DIVISION
PERMIT

Issued To:

Affinity 9 Investments, LLC
Attention: Mr. Thomas Hannawa
1721 Maplelane Avenue
Hazel Park, Michigan 48030

Permit No: WRP011311 **v.1**
Submission No.: HND-3NZH-315GX
Site Name: 33-2080 Grand River-Okemos
Issued: May 3, 2018
Revised:
Expires: May 3, 2023

This permit is being issued by the Michigan Department of Environmental Quality (MDEQ), Water Resources Division, under the provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); specifically:

- ☐ **Part 301, Inland Lakes and Streams**
- ☐ **Part 303, Wetlands Protection**
- ☐ **Part 315, Dam Safety**
- ☐ **Part 323, Shorelands Protection and Management**
- ☐ **Part 325, Great Lakes Submerged Lands**
- ☐ **Part 353, Sand Dunes Protection and Management**
- ☒ **Part 31, Water Resources Protection (Floodplain Regulatory Authority)**

Permission is hereby granted, based on permittee assurance of adherence to State of Michigan requirements and permit conditions, to:

Authorized Activity:

Demolish existing building and parking area in floodplain at 2080 Grand River, Okemos.

Place approximately 120 cubic yards within the 100-year floodplain to elevate existing grades and construct a new commercial building with lowest floor at least 1 foot above flood level.

Regrade new parking area and stormwater basin, which results in a floodplain cut of 410 cubic yards.

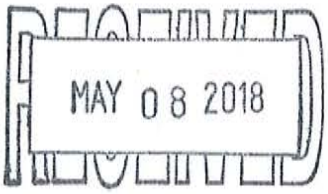
Waterbody Affected: Red Cedar River
Property Location: Ingham County, Meridian Township, Town/Range/Section 04N01W21, Property Tax No. 33-02-02-21-226-004

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Authority granted by this permit is subject to the following limitations:

A. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all terms and conditions of this permit.
B. The permittee, in exercising the authority granted by this permit, shall not cause unlawful pollution as defined by Part 31 of the NREPA.
C. This permit shall be kept at the site of the work and available for inspection at all times during the duration of the project or until its date of expiration.
D. All work shall be completed in accordance with the approved plans and specifications submitted with the application and/or plans and specifications attached to this permit.
E. No attempt shall be made by the permittee to forbid the full and free use by the public of public waters at or adjacent to the structure or work approved.
F. It is made a requirement of this permit that the permittee give notice to public utilities in accordance with 2013 PA 174 (Act 174) and comply with each of the requirements of Act 174.
G. This permit does not convey property rights in either real estate or material, nor does it authorize any injury to private property or invasion of public or private rights, nor does it waive the necessity of seeking federal assent, all local permits, or complying with other state statutes.
H. This permit does not prejudice or limit the right of a riparian owner or other person to institute proceedings in any circuit court of this state when necessary to protect his rights.
I. Permittee shall notify the MDEQ within one week after the completion of the activity authorized by this permit by completing and forwarding the attached preaddressed postcard to the office addressed thereon.
J. This permit shall not be assigned or transferred without the written approval of the MDEQ.
K. Failure to comply with conditions of this permit may subject the permittee to revocation of permit and criminal and/or civil action as cited by the specific state act, federal act, and/or rule under which this permit is granted.
L. All dredged or excavated materials shall be disposed of in an upland site (outside of floodplains, unless exempt under Part 31 of the NREPA, and wetlands).
M. In issuing this permit, the MDEQ has relied on the information and data that the permittee has provided in connection with the submitted application for permit. If, subsequent to the issuance of a permit, such information and data prove to be false, incomplete, or inaccurate, the MDEQ may modify, revoke, or suspend the permit, in whole or in part, in accordance with the new information.
N. The permittee shall indemnify and hold harmless the State of Michigan and its departments, agencies, officials, employees, agents, and representatives for any and all claims or causes of action arising from acts or omissions of the permittee, or employees, agents, or representative of the permittee, undertaken in connection with this permit. The permittee's obligation to indemnify the State of Michigan applies only if the state: (1) provides the permittee or its designated representative written notice of the claim or cause of action within 30 days after it is received by the state, and (2) consents to the permittee's participation in the proceeding on the claim or cause of action. It does not apply to contested case proceedings under the Administrative Procedures Act, 1969 PA 306, as amended, challenging the permit. This permit shall not be construed as an indemnity by the State of Michigan for the benefit of the permittee or any other person.
O. Noncompliance with these terms and conditions and/or the initiation of other regulated activities not specifically authorized shall be cause for the modification, suspension, or revocation of this permit, in whole or in part. Further, the MDEQ may initiate criminal and/or civil proceedings as may be deemed necessary to correct project deficiencies, protect natural resource values, and secure compliance with statutes.
P. If any change or deviation from the permitted activity becomes necessary, the permittee shall request, in writing, a revision of the permitted activity from the MDEQ. Such revision request shall include complete documentation supporting the modification and revised plans detailing the proposed modification. Proposed modifications must be approved, in writing, by the MDEQ prior to being implemented.
Q. This permit may be transferred to another person upon written approval of the MDEQ. The permittee must submit a written request to the MDEQ to transfer the permit to the new owner. The new owner must also submit a written request to the MDEQ to accept transfer. The new owner must agree, in writing, to accept all conditions of the permit. A single letter signed by both parties that includes all of the above information may be provided to the MDEQ. The MDEQ will review the request and, if approved, will provide written notification to the new owner.



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R. Prior to initiating permitted construction, the permittee is required to provide a copy of the permit to the contractor(s) for review. The property owner, contractor(s), and any agent involved in exercising the permit are held responsible to ensure that the project is constructed in accordance with all drawings and specifications. The contractor is required to provide a copy of the permit to all subcontractors doing work authorized by the permit.

S. Construction must be undertaken and completed during the dry period of the wetland. If the area does not dry out, construction shall be done on equipment mats to prevent compaction of the soil.

T. Authority granted by this permit does not waive permit requirements under Part 91, Soil Erosion and Sedimentation Control, of the NREPA, or the need to acquire applicable permits from the County Enforcing Agent (CEA).

U. Authority granted by this permit does not waive permit requirements under the authority of Part 305, Natural Rivers, of the NREPA. A Natural Rivers Zoning Permit may be required for construction, land alteration, streambank stabilization, or vegetation removal along or near a natural river.

V. The permittee is cautioned that grade changes resulting in increased runoff onto adjacent property is subject to civil damage litigation.

W. Unless specifically stated in this permit, construction pads, haul roads, temporary structures, or other structural appurtenances to be placed in a wetland or on bottomland of the water body are not authorized and shall not be constructed unless authorized by a separate permit or permit revision granted in accordance with the applicable law.

X. For projects with potential impacts to fish spawning or migration, no work shall occur within fish spawning or migration timelines (i.e., windows) unless otherwise approved in writing by the Michigan Department of Natural Resources, Fisheries Division.

Y. Work to be done under authority of this permit is further subject to the following special instructions and specifications:

1. Authority granted by this permit does not waive permit or program requirements under Part 91 of the NREPA or the need to acquire applicable permits from the CEA. To locate the Soil Erosion Program Administrator for your county, visit www.mi.gov/deqstormwater and select "Soil Erosion and Sedimentation Control Program" under "Related Links."

2. The authority to conduct the activity as authorized by this permit is granted solely under the provisions of the governing act as identified above. This permit does not convey, provide, or otherwise imply approval of any other governing act, ordinance, or regulation, nor does it waive the permittee's obligation to acquire any local, county, state, or federal approval or authorization necessary to conduct the activity.

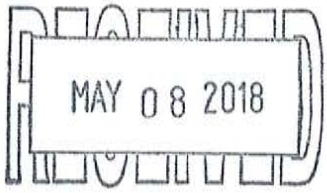
3. No fill, excess soil, or other material shall be placed in any wetland, floodplain, or surface water area not specifically authorized by this permit, its plans, and specifications.

4. This permit does not authorize or sanction work that has been completed in violation of applicable federal, state, or local statutes.

5. The permit placard shall be kept posted at the work site, in a prominent location at all times for the duration of the project, or until permit expiration.

6. This permit is being issued for the maximum time allowed and no extensions of this permit will be granted. Initiation of the construction work authorized by this permit indicates the permittee's acceptance of this condition. The permit, when signed by the MDEQ, will be for a five-year period beginning on the date of issuance. If the project is not completed by the expiration date, a new permit must be sought.

7. The design flood or 1% annual chance (100-year) floodplain elevation at this location on Red Cedar River is 842.1 feet N.A.V. Datum of 1988.



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8. The proposed fill and building are located within a 100-year floodplain included in the community's Flood Insurance Rate Map and/or flood elevation study. The permittee must apply to the Federal Emergency Management Agency (FEMA) for a Letter of Map Revision based on fill (LOMR-F) if engineered earthen fill is placed within the mapped 100-year floodplain. As part of the National Flood Insurance Program (NFIP) requirements the community must ensure that the requirements found in Section 65.5(a) of the FEMA's 44 CFR Part 65 are followed.

9. The structure shall be firmly anchored to prevent flotation or lateral movement.

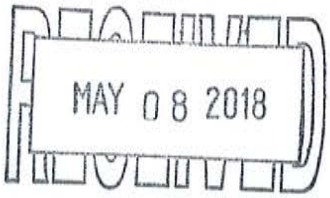
10. This permit does not waive the requirements of Michigan Building Code and its referenced standards, ASCE 7: Minimum Design Loads for Buildings and Other Structures, and ASCE 24: Flood Resistant Design and Construction, for substantial improvements to existing structures or new construction. Please reference the Code for details.

11. The elevation certificate shall be submitted to the local building official. When the project is located in a National Flood Insurance Program (NFIP) community, using the elevation certificate form, found at www.fema.gov/nfip, is encouraged. The form is required if the community participates in the Community Rating System. The form may be used in non-NFIP communities.

Issued By: Donna Cervelli

Donna Cervelli
Lansing District Office
Water Resources Division

cc: Mr. Jeff Kyes, KEBS, Inc.
Meridian Township Clerk
Ingham County Drain Commissioner
Ingham County CEA



DEQ-WRD
WRP011311 v1.0
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Issued On:05/03/2018
Expires On:05/03/2023

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	CHARTER TOWNSHIP OF MERIDIAN, INGHAM COUNTY, MICHIGAN	A portion of Section 21, Township 4 North, Range 1 West, as described in the Warranty Deed, recorded in Liber 1415, Page 650, in the Office of the Register of Deeds, Ingham County, Michigan.
	COMMUNITY NO: 260093	
AFFECTED MAP PANEL	NUMBER: 26065C0156D	
	DATE: 8/16/2011	
FLOODING SOURCE: MUD LAKE/FOSTER DRAIN		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 42.722572, -84.426269 SOURCE OF LAT & LONG: GPS DATUM: NAD 83

DETERMINATION

LOT	BLOCK/ SECTION	SUBDIVISION	STREET	OUTCOME WHAT IS REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88)	LOWEST ADJACENT GRADE ELEVATION (NAVD 88)	LOWEST LOT ELEVATION (NAVD 88)
--	--	--	2080 Grand River Avenue	Structure	X (shaded)	--	842.8 feet	--

Special Flood Hazard Area (SFHA) - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

PORTIONS REMAIN IN THE SFHA/FLOODWAY
eLOMA DETERMINATION

This document provides the Federal Emergency Management Agency's determination regarding a request for a Letter of Map Amendment for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the structure(s) on the property(ies) is/are not located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). This document amends the effective NFIP map to remove the subject property from the SFHA located on the effective NFIP map; therefore, the Federal mandatory flood insurance requirement does not apply. However, the lender has the option to continue the flood insurance requirement to protect its financial risk on the loan. A Preferred Risk Policy (PRP) is available for buildings located outside the SFHA. Information about the PRP and how one can apply is enclosed.

This determination is based on the flood data presently available. If there are any errors on this eLOMA Determination Letter that cause FEMA to rescind and/or nullify the determination the property owner should consult the Licensed Professional that submitted this eLOMA. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Attn: North Wind Resource Partners (NWRP) eLOMA Coordinator, 3601 Eisenhower Avenue, Alexandria, VA 22304-4605, Fax: 703-751-7415.

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

eLOMA

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

Structure Removal:

The following considerations may or may not apply to the determination for your Structure:

PORTIONS OF THE PROPERTY REMAIN IN THE SFHA and/or FLOODWAY - Portions of this property, but not the subject of the Determination document, may remain in the Special Flood Hazard Area (SFHA) and/or the regulatory floodway for the flooding source indicated on the Determination Document. The NFIP regulatory floodway is the area that must remain unobstructed in order to prevent unacceptable increases in base flood elevations. Therefore, no construction may take place in an NFIP regulatory floodway that may cause an increase in the base flood elevation. Therefore, any future construction or substantial improvement on the property remains subject to Federal, State/Commonwealth, and local regulations for floodplain management. The NFIP regulatory floodway is provided to the community as a tool to regulate floodplain development. Modifications to the NFIP regulatory floodway must be accepted by both the Federal Emergency Management Agency (FEMA) and the community involved. Appropriate community actions are defined in Paragraph 60.3(d) of the NFIP regulations. Any proposed revision to the NFIP regulatory floodway must be submitted to FEMA by community officials. The community should contact either the Regional Director (for those communities in Regions I-IV, and VI-X), or the Regional Engineer (for those communities in Region V) for guidance on the data which must be submitted for a revision to the NFIP regulatory floodway. Contact information for each regional office can be obtained by calling the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or from our web site at https://www.fema.gov/regional-contact-information

STUDY UNDERWAY - This determination is based on the flood data presently available. However, the Federal Emergency Management Agency may be currently revising the National Flood Insurance Program (NFIP) map for the community. New flood data could be generated that may affect this property. If a new NFIP map is issued it will supersede this determination. The Federal requirement for the purchase of flood insurance will then be based on the newly revised NFIP map.

EXTRATERRITORIAL JURISDICTION - The subject of the determination is shown on the National Flood Insurance Program map and may be located in an Extraterritorial Jurisdiction area for the community indicated on the Determination Document.

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Attn: North Wind Resource Partners (NWRP) eLOMA Coordinator, NWRP eLOMA Coordinator, 3601 Eisenhower Ave., Alexandria, VA 22304-6439, Fax: 703-751-7415

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

GREAT LAKES - The Federal Emergency Management Agency (FEMA) has based this determination on elevation data which is published in the current Flood Insurance Study for the community. However, the elevations established in the U.S. Army Corps of Engineers (USACE) reports on the Great Lakes are the best available data known to us. If in the future there are any subsequent map revisions to the National Flood Insurance Program map and the USACE reports remain the best available data known, FEMA will use those elevations for any such revisions. Further, be advised that the elevations on the Flood Insurance Rate Map (FIRM) may only reflect the Stillwater elevation for the lake and may not account for the effects of wind driven waves or wave run-up. On-site conditions such as wind speed, wind direction, fetch distance, water depth and the slope of the beach or bluff may result in significant increases to the base flood elevation. Therefore, it is strongly recommended that the requestor be aware of these circumstances and, if warranted, evaluate the effects of wind driven waves along the shoreline of the property.

STATE AND LOCAL CONSIDERATIONS - Please note that this document does not override or supersede any State or local procedural or substantive provisions which may apply to floodplain management requirements associated with amendments to State or local floodplain zoning ordinances, maps, or State or local procedures adopted under the National Flood Insurance Program.

COASTAL BARRIER RESOURCE SYSTEM - The subject of this Determination Document may be located within the Coastal Barrier Resource System (CBRS). Federal financial assistance, including Federal flood insurance, is not available in CBRS areas for new construction or substantial improvements occurring after the date on which the area was declared by Congress to be part of the CBRS or otherwise protected area as required by the Coastal Barrier Resources Act (Public Law 97-348) and the Coastal Barrier Improvement Act 1990 (Public Law 101-591). This date is indicated on the National Flood Insurance Program map. For further information on this property and the CBRS or otherwise protected area designation, contact the U.S. Department of the Interior.

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Attn: North Wind Resource Partners (NWRP) eLOMA Coordinator, NWRP eLOMA Coordinator, 3601 Eisenhower Ave., Alexandria, VA 22304-6439, Fax: 703-751-7415

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

eLOMA

February 1, 2018
Project No. 180225

Mr. Mark Kieselbach
Charter Township of Meridian
5151 Marsh Road
Okemos, MI 48864

Re: Wetland Delineation – WDV #17-08
2080 West Grand River Avenue, Okemos, Ingham County, Michigan

Dear Mr. Kieselbach:

On January 26, 2018, Fishbeck, Thompson, Carr & Huber, Inc. (FTCH) staff conducted a field investigation and delineated wetlands on property located at 2080 West Grand River Avenue, Charter Township of Meridian (Township), Ingham County, Michigan (the Site). As requested by the Township, the adjacent property to the north was also evaluated for wetlands within 40 feet of the subject parcel's property line. The Site is located in the northeast quarter of Section 21 of the Township (Town 4 North, Range 1 West). It is bound by commercial property to the east, west, and south, and undeveloped property to the north. West Grand River Avenue runs along the site's southern property boundary. The Site contains a former Mongolian Barbeque restaurant. The Township wetland map notes Wetland 21-3 is north of the Site. This approximately 1.84-acre emergent and scrub shrub wetland complex is surrounded by roads and development. An approximately 19.11-acre wetland complex (Township Wetland 21-2) is located directly north of Wetland 21-3 and is separated from it by an access road.

The purpose of this letter is to summarize the results of the wetlands investigation. The wetlands investigation was conducted in a manner consistent with the 1987 *Corps of Engineers (USACE) Wetlands Delineation Manual* and 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2). The wetlands identification and delineation procedures outlined in these manuals require evaluation of site vegetation, soils, and hydrologic characteristics. Hydrophytic vegetation decisions are based on the wetland indicator status of species that are dominant in the plant community. Species with indicator statuses of obligate wetland (OBL), facultative wetland (FACW), and facultative (FAC) are considered wetland species, while species with indicator statuses of facultative upland (FACU) and upland (UPL) are considered upland species. FAC species are also commonly present in upland plant communities.

Literature Review

According to the Natural Resources Conservation Service (NRCS) *Web Soil Survey* (Attachment 1), the area of investigation contains Urban land-Capac-Colwood complex, 0 to 4 percent slopes (28 percent hydric rating).

The National Wetlands Inventory (NWI) map (Attachment 2) indicates a seasonally flooded, scrub-shrub wetland (mapping unit PSS1C) is located in the area where Township Wetlands 21-3 and 21-2 are mapped.

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APR 17 2018

1515 Arboretum Drive, SE
Grand Rapids, Michigan 49546
616.575.3824
www.ftch.com
Fishbeck, Thompson, Carr & Huber, Inc.
engineers | scientists | architects | constructors

Site Investigation

The site investigation was conducted on January 26, 2018, after a killing frost, which impaired identification of herbaceous vegetation.

The area north of the Site's parking lot graded steeply down into a low area vegetated with trees and shrubs. The dominant vegetation consisted of wetland species, including eastern cottonwood (*Populus deltoides*, FAC), silver maple (*Acer saccharinum*, FACW), and swamp white oak (*Quercus bicolor*, FACW) trees and dogwood (*Cornus* sp., FACW) and European buckthorn (*Rhamnus cathartica*, FAC) shrubs. A colony of common reed (*Phragmites australis*, FACW) was present at the west end of the area of investigation.

The ground surface was frozen or covered with ice; therefore, evaluation of site soil was impeded. Standing water (i.e. ice) was observed within the wetland, verifying wetland hydrology. Standing water or ice extended to the toe of the slope at the east end of the area of investigation. The western half of the investigated area did not contain standing water but the surface soil appeared very moist.

A U.S. Army Corps of Engineers (USACE) Wetland Determination Data Form was completed at sampling point SP-A to describe site vegetation and hydrology (see Attachment 3). Photographs are included in Attachment 4. Site observations verified the presence of wetland vegetation and hydrology. It is likely wetland soil was also present at SP-A.

The wetland boundary north of the Site was flagged with pink ribbon labelled A1 through A9. Flagged points were surveyed with a handheld global positioning system (GPS) unit. The wetland boundary is noted on Figure 1. SHP files of the wetland boundary were emailed to the Township on January 31, 2018.

FTCH verified that the delineated wetland is hydrologically connected to Township Wetland 21-2 via an approximately 15-inch diameter culvert under the access road that divides the two wetlands.

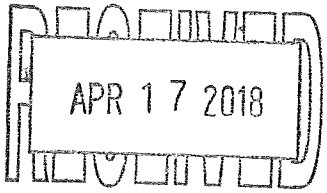
Conclusions

According to Michigan's Natural Resources and Environmental Protection Act (NREPA), Act 451, Section 30301(d), wetlands "contiguous to the Great Lakes or Lake St. Clair, an inland lake or pond, or a river or stream" or "more than 5 acres in size" are regulated by the State of Michigan. Both the State and Township also consider a wetland as regulated if it is separated from a regulated wetland by a barrier, such as a road, if the second wetland is contiguous to a body of water.

Evaluation of aerial photographs and the Ingham County Drain Commissioner's *Meridian Township Southwest Drain Map* confirmed that Township Wetland 21-2 is contiguous to a stream (i.e. the Okemos Drain). Therefore, Wetland 21-2 is regulated by the State and Township, regardless of its size. Additionally, Wetland 21-3 is regulated by the State and Township, even though it is separated from a regulated wetland by a road, due to the noted provisions in State and Township wetland regulations.

A Wetland Use Permit would be required from the Township for any of the following activities within the delineated wetland:

- Placing fill or permitting the placement of fill in regulated wetland.
- Dredging, removing, or permitting the removal of soil or minerals from regulated wetland.
- Constructing, operating, or maintaining any use or development in regulated wetland.
- Draining surface water from regulated wetland.



In addition, the Township requires that all structures and grading activities during site development shall be set back 40 feet from the delineated wetland boundary and a natural vegetation strip shall be maintained within 20 feet of the wetland boundary.

If you have any questions or require additional information, please contact me at 616.464.3738 or email ehtripp@ftch.com.

Sincerely,

FISHBECK, THOMPSON, CARR & HUBER, INC.

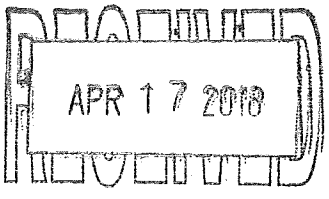
Elise Hansen Tripp, PWS

pmb
Attachments
By email

cc/att: Mr. Peter Menser – Meridian Township

APR 17 2018

Figures





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APR 17 2018

Charter Township of Meridian
2080 West Grand River Avenue, Okemos, Michigan

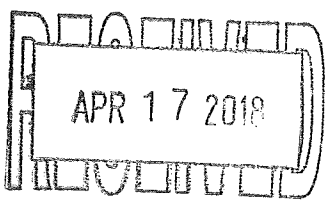
Wetland Delineation

FIGURE NO. 1

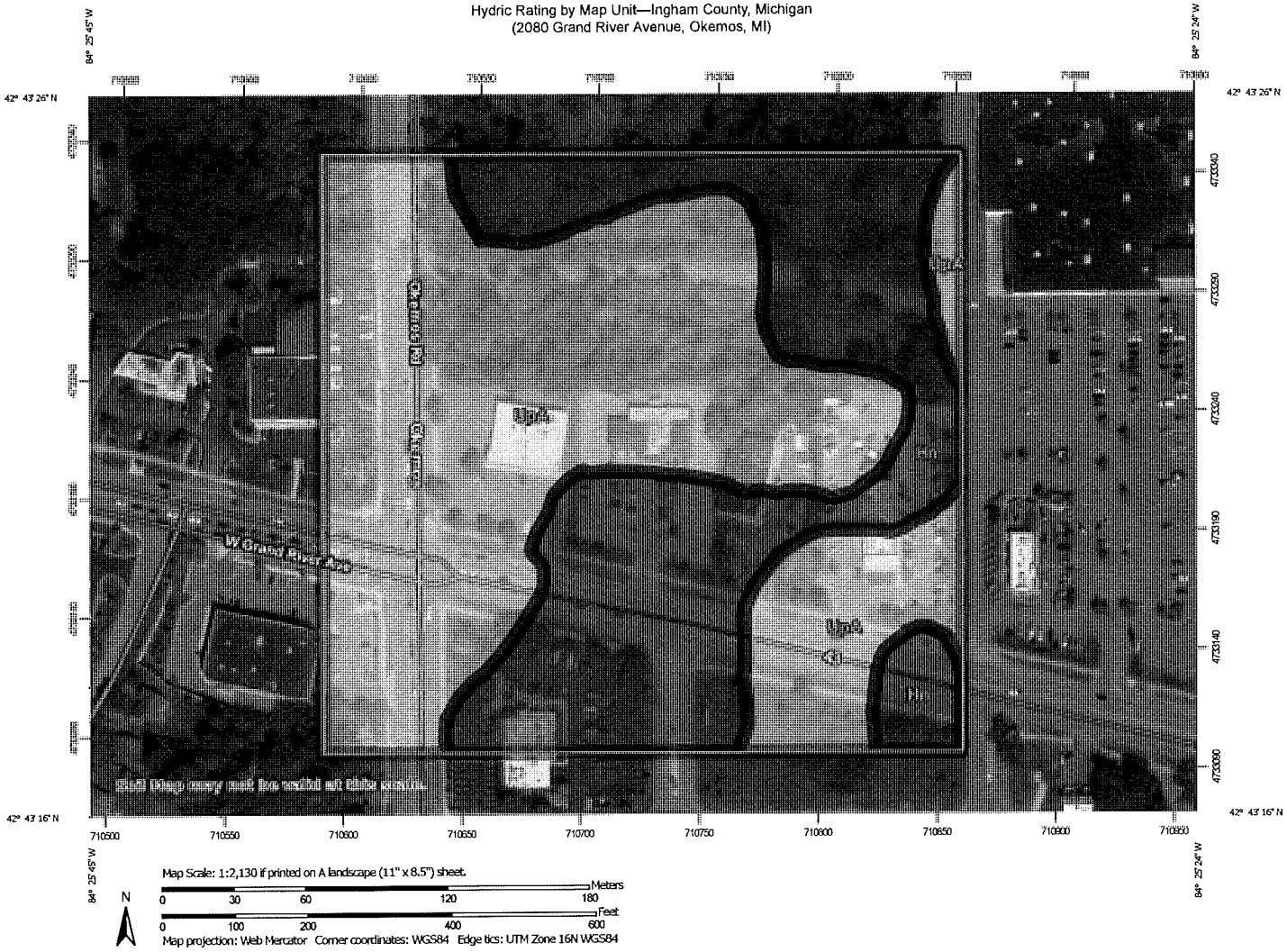
PROJECT NO. 180225

fitch
engineers
scientists
architects
constructors

Attachment 1



Hydric Rating by Map Unit—Ingham County, Michigan
(2080 Grand River Avenue, Okemos, MI)



USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

RECEIVED
APR 17 2018

Hydric Rating by Map Unit—Ingham County, Michigan
(2080 Grand River Avenue, Okemos, MI)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Ingham County, Michigan
Survey Area Data: Version 15, Oct 5, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

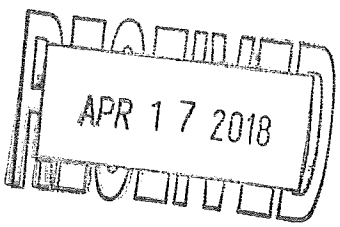
Date(s) aerial images were photographed: Jul 1, 2011—Mar 10, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Hn	Houghton muck, 0 to 1 percent slopes	100	6.4	38.3%
UpA	Urban land-Capac-Colwood complex, 0 to 4 percent slopes	28	10.4	61.7%
Totals for Area of Interest			**16.8**	**100.0%**



Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

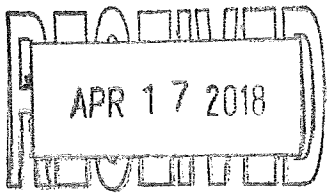
The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).



References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

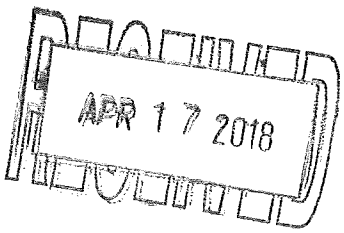
Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

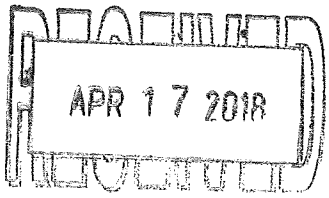
Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower



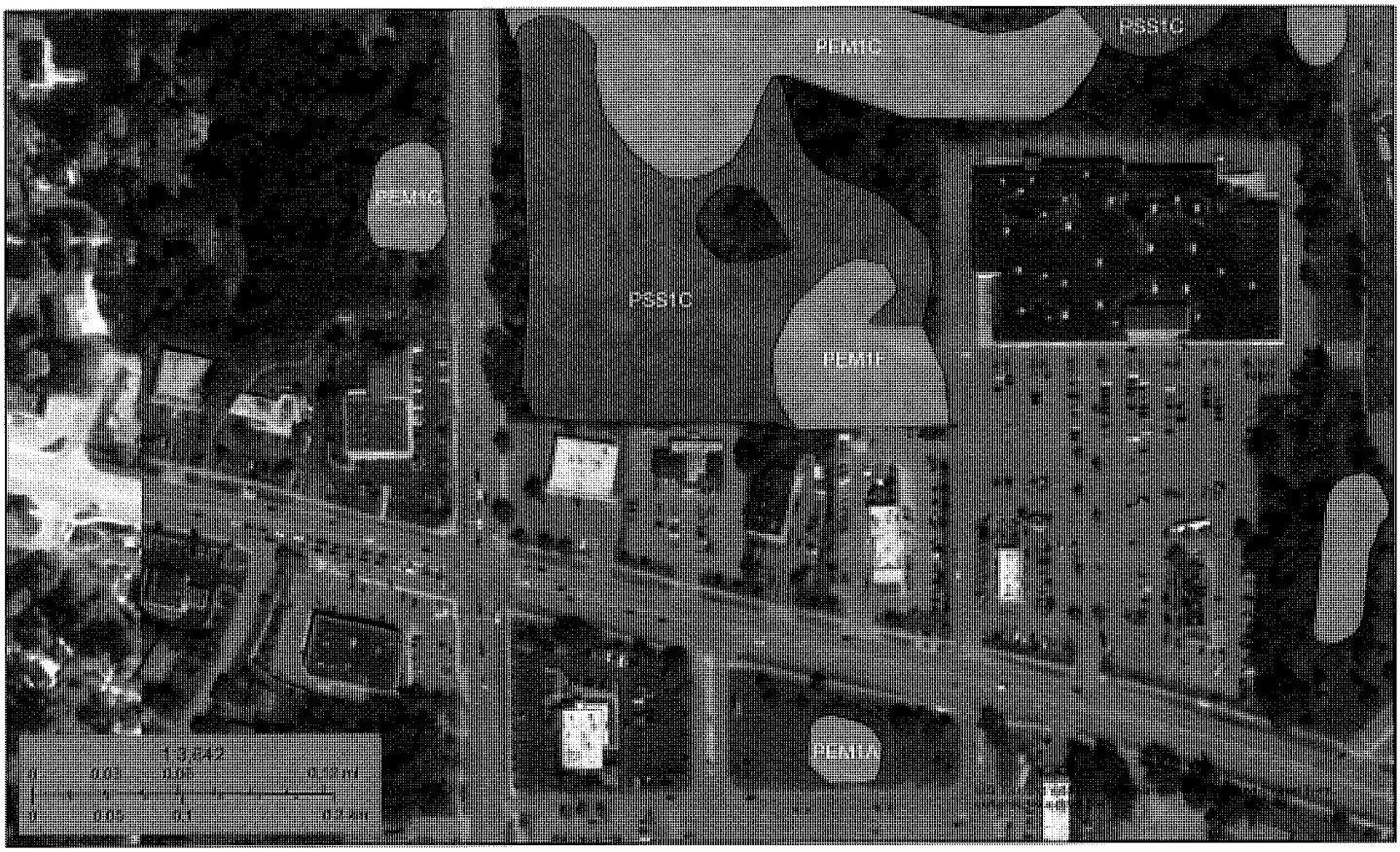
Attachment 2



U.S. Fish and Wildlife Service

National Wetlands Inventory

2080 West Grand River Avenue, Okemos,



January 25, 2018

Wetlands

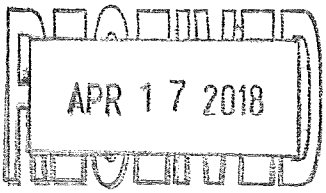
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

APR 17 2018

Attachment 3



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Meridian Twp/WDV 17-08 **City/County:** Meridian Township/Ingham **Sampling Date:** 26-Jan-18

Applicant/Owner: Kebs, Inc. **State:** Michigan **Sampling Point:** SP-A

Investigator(s): Elise Tripp **Section, Township, Range:** S. 21 T. 4N R. 1W

Landform (hillslope, terrace, etc.): Lowland **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR L **Lat.:** 42.72278988 **Long.:** 84.425839387 **Datum:** WGS84

Soil Map Unit Name: Urban land - Capac-Colwood complex, 0-4% slopes **NWI classification:** PSS1C

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks: (Explain alternative procedures here or in a separate report.)
Soil was not evaluated because the ground was frozen.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of 2 required)

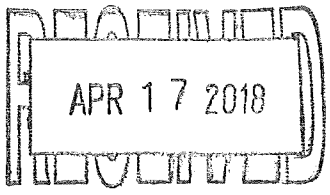
- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☑ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches): 3	
Water Table Present?	Yes ◉	No ○	Depth (inches): 0	**Wetland Hydrology Present?** Yes ◉ No ○
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 0	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



VEGETATION - Use scientific names of plants

Sampling Point: SP-A

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	40	☑	FAC
2. *Acer saccharinum*	10	☑	FACW
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
	50	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. *Populus deltoides*	15	☑	FAC
2. *Rhamnus cathartica*	10	☑	FAC
3. *Lonicera tatarica*	15	☑	FACU
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. *Phalaris arundinacea*	15	☑	FACW
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
12.	0	☐	
	15	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	25	x 2 =	50	
FAC species	65	x 3 =	195	
FACU species	15	x 4 =	60	
UPL species	0	x 5 =	0	
Column Totals:	105	(A)	305	(B)

Prevalence Index = B/A = 2.905

Hydrophytic Vegetation Indicators:

- ☐ **Rapid Test for Hydrophytic Vegetation**
- ☑ **Dominance Test is > 50%**
- ☑ **Prevalence Index is ≤3.0** [1]
- ☐ **Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

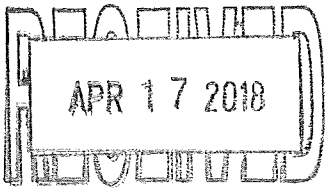
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks: (Include photo numbers here or on a separate sheet.)



*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (LRR R, MLRA 149B)
- ☐ Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ☐ Loamy Mucky Mineral (F1) LRR K, L)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils : [3]

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

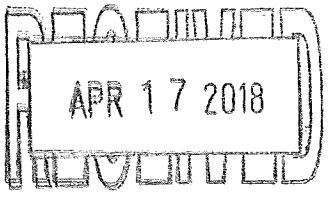
Restrictive Layer (if observed):

Type: _____

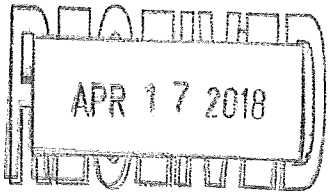
Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:



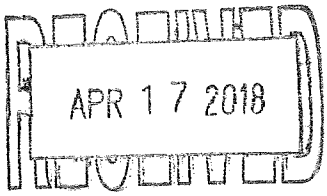
Attachment 4



Fishbeck, Thompson, Carr & Huber, Inc.

Site Photographs
2080 West Grand River Avenue
Okemos, MI

Project No. 180225



Township Wetland 21-3



Looking Northwest of SP-A



Looking Northeast of SP-A

fich	**Project No.:**	Project No. 180225	**Date:** 1/26/2018	**Project Name:**	Meridian Twp/WDV 17-08

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Sampling Point SP-A

fr&h	**Project No.:**	Project No. 180225	**Date:**	1/26/2018	**Project Name:** Meridian Twp/WDV 17-08

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Township Wetland 21-3



Looking East from Western Property Boundary



Looking West from Eastern Property Boundary

Project No.:	Project No. 180225	**Date:**	1/26/2018	**Project Name:**	Meridian Twp/WDV 17-08

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TRAFFIC IMPACT STUDY

For The Proposed

Panera Bread Development

Meridian Charter Township
Ingham County, MI

December, 2017

Prepared by:

Traffic Engineering Associates, Inc.
PO Box 100 • Saranac, Michigan 48881
517/627-6028 FAX: 517/627-6040

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EXECUTIVE SUMMARY

Traffic Engineering Associates, Inc. (TEA) conducted a traffic impact study to determine the distribution of new traffic generated by the proposed Panera Bread development in Meridian Charter Township, Ingham County, Michigan. The project site is located on the north side of Grand River Avenue (M-43), just east of Okemos Road.

The proposed Panera Bread development will consist of a 4,375 square foot building with a drive-thru window. There will be one (1) full access driveway on Grand River Avenue (M-43). The project has an anticipated completion date by the spring of 2019.

TEA, Inc. conducted vehicle counts during the midweek, of a non-holiday week in the month of November, 2017, at the intersection of Grand River Avenue (M-43) and Okemos Road, Grand River Avenue (M-43) and Marsh Road, and Grand River Avenue (M-43) and the Meijer/Chick-Fil-A driveway. Turning movement counts were taken during the AM and PM peak hours. The weekday AM and PM peak hours of existing traffic on the adjoining road system are 7:30 – 8:30 AM and 5:00 – 6:00 PM respectively.

A level of service analysis for existing traffic at the studied intersections during the AM, and PM peak hours was conducted**.** All existing turning movements at the studied intersection operate at an acceptable level of service (LOS D or better) during the AM, and PM peak hours except for several movements at the intersection of Grand River Avenue (M-43) and Okemos Road, and at the Grand River Avenue (M-43) and Meijer/Chick Fil A driveway. An optimization of the existing traffic signal at the Okemos Road intersection showed that the existing traffic signal is currently operating at an optimized condition.

According to the Meridian Township Planning Department, the total population growth for Meridian Charter Township from 2010 to 2016 is six point nine percent (6.9%). Using an annual average growth rate of one point one percent (1.1%), and with an anticipated completion date for the spring of 2019, background growth traffic volumes were calculated. All background turning movements at the studied intersection operate at an acceptable level of service (LOS D or better) during the AM and PM peak hours except for several movements at the intersection of Grand River Avenue (M-43) and Okemos Road, and at the Grand River Avenue (M-43) and Meijer/Chick Fil A driveway. There was a minor increase in the level of service and vehicle delays at all studied intersections.

The ITE trip generation rates for Fast-Food Restaurant with Drive-Through Window (Land Use Code 934) were selected as representing the proposed development. It is projected that the Panera Bread development will generate 176 vehicle trips in the AM peak hour of which 86 trips are pass-by, 143 vehicle trips in the PM peak hour of which 72 trips are pass-by, and 2,060 vehicle trips daily.

For future traffic conditions, all existing geometrics and traffic control were used. All future turning movements at the studied intersections are anticipated to operate at an acceptable level of

service (LOS D or better) during the AM and PM peak hours except for several movements at the intersection of Grand River Avenue (M-43) and Okemos Road, and at the Grand River Avenue (M-43) and Meijer/Chick Fil A driveway. There was a minor increase in the level of service and vehicle delays at all studied intersections. There are no recommendations to change the existing traffic signal timing or phasing at the studied intersections.

It is recommended that a three (3) lane cross-section be designed for the site driveway on Grand River Avenue (M-43) to provide for one (1) exclusive exiting left turn lane, one (1) exiting right turn lane and one (1) entering lane. The MDOT guidelines show that there is justification for a right turn lane for westbound Grand River Avenue (M-43) at the site driveway.

Respectfully Submitted,

David J. Sonnenberg, PE



INTRODUCTION

PROJECT DESCRIPTION

The purpose of this study is to determine the impact from new traffic generated by the proposed Panera Bread development in Meridian Charter Township, Ingham County, Michigan. The project site is located on the north side of Grand River Avenue (M-43) just east of Okemos Road.

The proposed Panera Bread development will consist of a 4,375 square foot building with a drive-thru window. There will be one (1) full access driveway on Grand River Avenue (M-43). The project has an anticipated completion date by the spring of 2019.

SCOPE OF WORK

The scope of work contained in this report is as follows:

- Analysis of existing traffic conditions on the adjoining street system.
- Analysis of background traffic conditions for the future year (spring of 2019) volumes without the proposed Panera Bread development.
- Projection of future traffic volumes to be generated by the proposed Panera Bread development.
- Evaluation of the impact of future traffic with the proposed Panera Bread development.
- Determination of what roadway and traffic control improvements, if any, will be needed to accommodate future (spring of 2019) traffic volumes.

EXISTING CONDITIONS

ROADWAYS AND INTERSECTIONS

Roadways

Grand River Avenue (M-43) is an east-west five-lane roadway with a two-way center left turn lane with concrete curb and gutter. The posted speed limit is 45 mph and there are sidewalks on both sides of the roadway. Grand River Avenue (M-43) is under the jurisdiction of the Michigan Department of Transportation.

Intersections

Grand River Avenue (M-43) and Okemos Road

The intersection of Grand River Avenue (M-43) and Okemos Road is a four-way intersection and is controlled by a traffic signal. The west approach on Grand River Avenue (M-43) is six (6) lanes with one (1) exclusive left turn lane, one (1) exclusive right turn lane, two (2) thru lanes and two (2) outbound lanes. The east approach is five (5) lanes with one (1) exclusive left turn lane, one (1) thru-right lane, one (1) thru lane and two (2) outbound lanes. The north and south approaches on Okemos Road are five (5) lanes with one (1) exclusive left turn lane, one (1) thru-right lane, one (1) thru lane and two (2) outbound lanes. There are pedestrian crossings with pedestrian signals on all four (4) approaches at this intersection.

Grand River Avenue (M-43) and Marsh Road

The intersection of Grand River Avenue (M-43) and Marsh Road is a four-way intersection and is controlled by a traffic signal. The east approach on Grand River Avenue (M-43) is six (6) lanes with one (1) exclusive left turn lane, one (1) exclusive right turn lane, two (2) thru lanes and two (2) outbound lanes. The west approach is five (5) lanes with one (1) exclusive left turn lane, one (1) thru-right lane, one (1) thru lane and two (2) outbound lanes. The north approach on Marsh Road is six (6) lanes with one (1) exclusive left turn lane, one (1) exclusive right turn lane, two (2) thru lanes and two (2) outbound lanes. The south approach is five (5) lanes with one (1) exclusive left turn lane, one (1) thru-right lane, one (1) thru lane and two (2) outbound lanes. There are pedestrian crossings with pedestrian signals on all four (4) approaches at this intersection.

Grand River Avenue (M-43) and Meijer/Chick-Fil-A Driveway

This intersection is a “T” intersection controlled with a stop sign, with the northbound Meijer/Chick-Fil-A driveway stopping for Grand River Avenue (M-43). The west approach on Grand River Avenue (M-43) is a six (6) lane roadway with one (1) two-way left turn lane, two (2) thru lanes, one (1) right turn taper and two (2) outbound lanes. The east approach on Grand River Avenue (M-43) is a five (5) lane roadway with one (1) two-way left turn lane, two (2) thru lanes, and two (2) outbound lanes. The Meijer/Chick-Fil-A driveway is four (4) lanes with one (1) exclusive left turn lane, one (1) exclusive right turn lane and two (2) outbound lanes. It should be noted that the island between the inbound and outbound lanes of the driveway was constructed to discourage left turn movements off of Grand River Avenue (M-43). However, there was no apparent signage stating this and field observations show that westbound vehicles on Grand River Avenue (M-43) are turning left into the driveway. This project will assume that this driveway is a full access driveway.

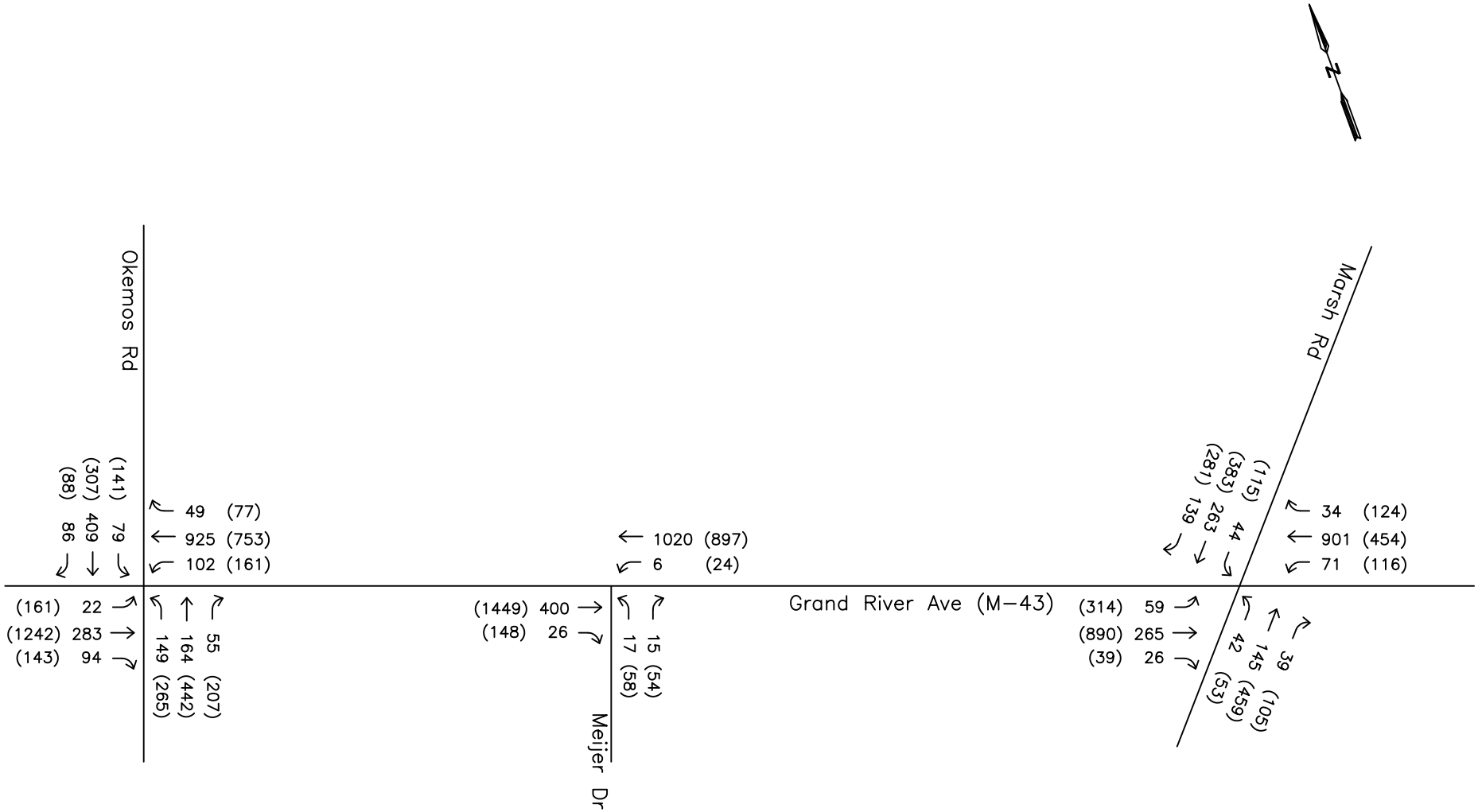
LAND USE

The proposed Panera Bread development will be located on the north side of Grand River Avenue (M-43). The proposed project site has an existing Discount Tire business on the east side and a small strip mall on the west side, each business has their own full access driveway. The surrounding land use is commercial development.

EXISTING TRAFFIC VOLUMES

TEA, Inc. conducted vehicle counts during the midweek, of a non-holiday week in the month of November, 2017, at the intersection of Grand River Avenue (M-43) and Okemos Road, Grand River Avenue (M-43) and Marsh Road, and Grand River Avenue (M-43) and the Meijer/Chick-Fil-A driveway. Turning movement counts were taken during the AM and PM peak hours.

The weekday AM and PM peak hours of existing traffic on the adjoining road system are 7:30 – 8:30 AM and 5:00 – 6:00 PM respectively. The existing peak hour volumes are illustrated in **Figure 1**.



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XXX AM Pk Hr (7:30-8:30 AM) Volumes

(XXX) PM Pk Hr (5:00-6:00 PM) Volumes

FIGURE 1: Existing Traffic – Peak Hours

DATE: December, 2017 | SCALE: NTS | PAGE: 6

LEVEL OF SERVICE ANALYSIS FOR EXISTING TRAFFIC

The critical intersections defined for this study were analyzed according to the methodologies published in the most recent edition of the *Highway Capacity Manual*. The analysis determines the "Level of Service" of the intersections and is based on factors such as the number and types of lanes, signal timing, traffic volumes, pedestrian activity, etc. The level of service (LOS) is defined by average vehicle delay in seconds created by a traffic control device for a given traffic movement or intersection approach.

Level of Service	Delay per Vehicle (seconds)	
	Non-Signalized	Signalized
A	< 10	<10
B	10 to 15	10 to 20
C	15 to 25	20 to 35
D	25 to 35	35 to 55
E	35 to 50	55 to 80
F	> 50	> 80

Levels of Service are expressed in a range from "A" to "F," with "A" being the highest LOS and "F" representing the lowest LOS. Level of service "D" is considered the minimum acceptable LOS in an urban area. The above table shows the thresholds for Levels of Service "A" through "F" for non-signalized and signalized intersections, respectively.

All Level of Service computations contained in this report were based upon the Synchro software package which is approved by the Michigan Department of Transportation (MDOT). Delay per vehicle includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

All existing geometrics and traffic control devices were used to analyze the existing level of service and vehicle delays. The Level of Service analysis for existing traffic during the AM and PM peak hours is summarized in **Table 1.** All existing turning movements at the studied intersection operate at an acceptable level of service (LOS D or better) during the AM and PM peak hours except for the following;

Grand River Avenue (M-43) and Okemos Road

- During the AM peak hour, the westbound thru-right movement on Grand River Avenue (M-43) operates at a LOS E with 58.7 seconds of vehicle delay.

- During the AM peak hour, the northbound left turn movement on Okemos Road to westbound Grand River Avenue (M-43) operates at a LOS E with 78.9 seconds of vehicle delay.

- During the PM peak hour, the eastbound thru movement on Grand River Avenue (M-43) operates at a LOS F with 64.0 seconds of vehicle delay.

- During the PM peak hour, the northbound left turn movement on Okemos Road to westbound Grand River Avenue (M-43) operates at a LOS E with 65.9 seconds of vehicle delay.

- During the PM peak hour, the northbound thru-right movement on Okemos Road operates at a LOS E with 59.5 seconds of vehicle delay.

- During the PM peak hour, the southbound left turn movement on Okemos Road to eastbound Grand River Avenue (M-43) operates at a LOS E with 62.2 seconds of vehicle delay.

Grand River Avenue (M-43) and Marsh Road

- During the PM peak hour, the southbound left turn movement on Marsh Road to eastbound Grand River Avenue (M-43) operates at a LOS E with 64.0 seconds of vehicle delay.

Grand River Avenue (M-43) and Meijer/Chick-Fil-A Driveway

- During the PM peak hour, the northbound left turn movement from the Meijer/Chick-Fil-A driveway to westbound Grand River Avenue (M-43) operates at a LOS F with 72.1 seconds of vehicle delay.

LEVEL OF SERVICE ANALYSIS FOR MITIGATED EXISTING TRAFFIC

All existing geometrics and traffic control devices were used to analyze the existing level of service and vehicle delays to determine if an optimization of the traffic signal timing would improve the level of service and the vehicle delays at both Grand River Avenue (M-43) and Okemos Road, and Grand River Avenue (M-43) and Marsh Road intersections. The optimized traffic signal timing for both intersections showed very little changes in the level of service and the vehicle delays. Both intersection traffic signals are operating at their optimized phasing and timing.

With the existing stop sign control at the Meijer-Chick-Fil-A driveway, and with the driveway already configured with an exclusive left turn lane, the PM peak hour level of service F cannot be improved.

Table 1
Level of Service (LOS) Summary
Existing AM and PM Peak Hour Traffic

Location	Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
		Avg. Delay	LOS	Avg. Delay	LOS
Grand River Avenue (M-43) and Okemos Road	EB Left	35.6	D	37.5	D
	EB Thru	26.0	C	64.0	F
	EB Right	25.7	C	24.2	C
	EB Approach	*26.5*	*C*	*57.6*	*E*
	WB Left	18.8	B	47.7	D
	WB Thru-Right	58.7	E	34.2	C
	WB Approach	*54.6*	*D*	*36.3*	*D*
	NB Left	78.9	E	65.9	E
	NB Thru-Right	46.6	D	59.5	E
	NB Approach	*59.9*	*E*	*62.2*	*E*
	SB Left	34.5	C	62.2	E
	SB Thru-Right	43.8	D	47.6	D
	SB Approach	*42.8*	*D*	*52.0*	*D*
	Intersection	48.1	D	52.5	D
Grand River Avenue (M-43) and Marsh Road	EB Left	15.6	B	31.5	C
	EB Thru-Right	15.6	B	52.1	D
	EB Approach	*15.6*	*B*	*46.7*	*D*
	WB Left	11.3	B	34.0	C
	WB Thru	51.3	D	29.0	C
	WB Right	24.9	C	27.5	C
	WB Approach	*47.6*	*D*	*29.5*	*C*
	NB Left	46.5	D	39.5	D
	NB Thru-Right	46.9	D	43.3	D
	NB Approach	*47.1*	*D*	*43.2*	*D*
	SB Left	43.7	D	64.0	E
	SB Thru	43.8	D	40.6	D
	SB Right	20.0	B	27.7	C
	SB Approach	*36.4*	*D*	*39.4*	*D*
	Intersection	39.7	D	40.8	D

Note: Delay = Average control delay per vehicle in seconds.
LOS = Level of Service

Table 1 (Continued)
Level of Service (LOS) Summary
Existing AM and PM Peak Hour Traffic

Location	Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
		Avg. Delay	LOS	Avg. Delay	LOS
Grand River Avenue (M-43) and Meijer/Chick-Fil-A Driveway	EB Thru-Right	Free	A	Free	A
	EB Approach	*0.0*	*A*	*0.0*	*A*
	WB Left	8.3	A	15.3	C
	WB Thru	Free	A	Free	A
	WB Approach	*0.0*	*A*	*0.4*	A
	NB Left	16.0	C	72.1	F
	NB Right	9.7	A	19.9	C
	NB Approach	*13.0*	*B*	*46.9*	*E*
	Intersection	0.3	A	2.4	A

Note: Delay = Average control delay per vehicle in seconds.
LOS = Level of Service

BACKGROUND CONDITIONS

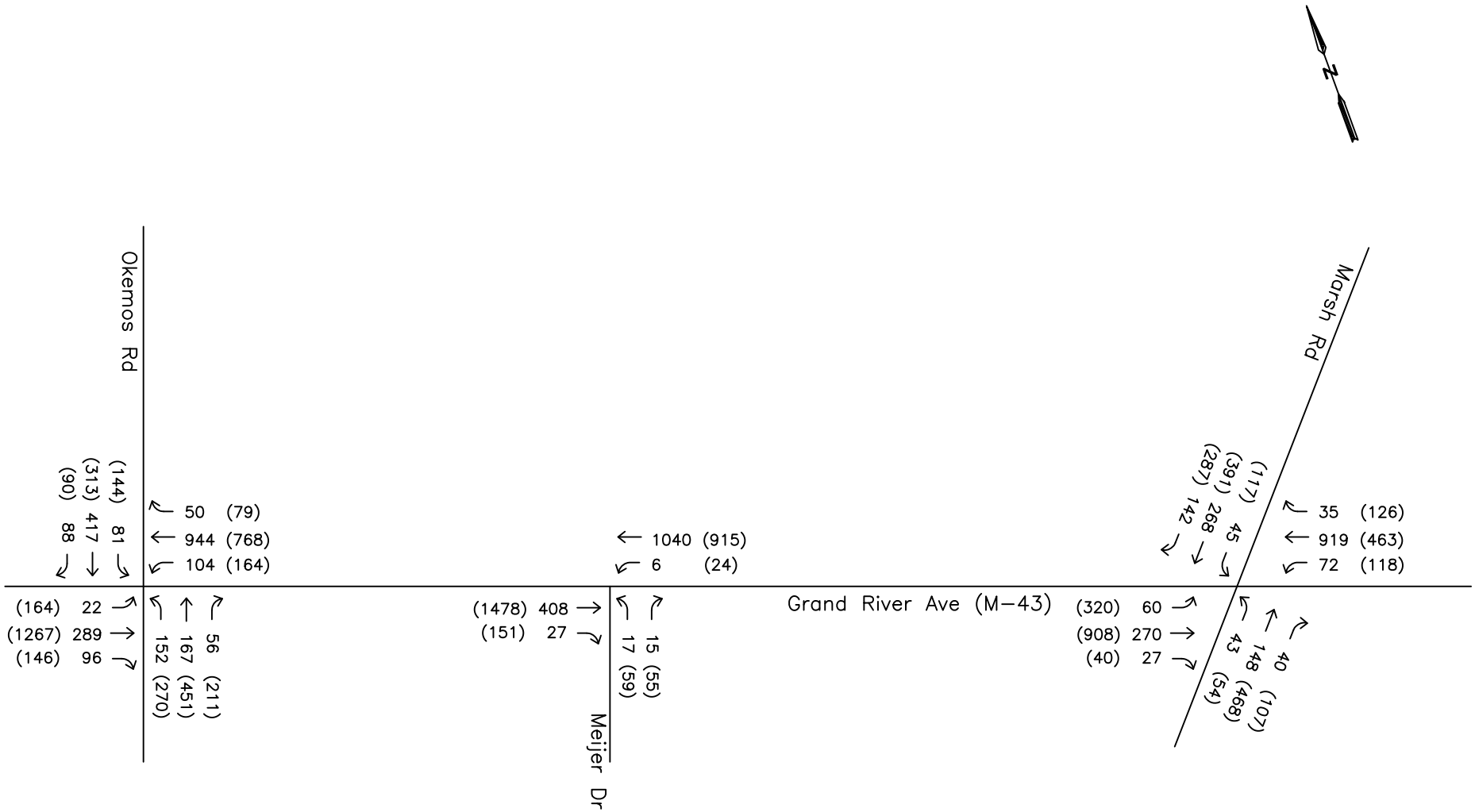
BACKGROUND TRAFFIC GROWTH VOLUMES

Background traffic represents future volumes without the traffic generated by the proposed Panera Bread development. The target year for completion is the spring of 2019, approximately one (1) and one-half year.

According to the Meridian Township Planning Department, the total population growth for Meridian Charter Township from 2010 to 2016 is six point nine percent (6.9%). Using an annual average growth rate of one point one percent (1.1%), and with an anticipated completion date for the spring of 2019, background growth traffic volumes were calculated. Background volumes are displayed in **Figure 2**.

BACKGROUND DEVELOPMENT TRAFFIC VOLUMES

The only new development identified in the project area is the Chick-Fil-A restaurant located across the street from the site, on the south side of Grand River Avenue (M-43). This new facility was open for business when the new traffic counts were taken; therefore, this was not considered a future new development. Background development traffic volumes were not included in this study.



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XXX AM Pk Hr (7:30-8:30 AM) Volumes

(XXX) PM Pk Hr (5:00-6:00 PM) Volumes

FIGURE 2: Background Growth Traffic – Peak Hours

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LEVEL OF SERVICE ANALYSIS FOR BACKGROUND GROWTH TRAFFIC

All existing geometrics and traffic control devices were used to analyze the background growth level of service and vehicle delays.

The Level of Service analysis for background traffic during the AM and PM peak hours is summarized in **Table 2.** All background turning movements at the studied intersection operate at an acceptable level of service (LOS D or better) during the AM and PM peak hours except for the following;

Grand River Avenue (M-43) and Okemos Road

- During the AM peak hour, the westbound thru-right movement on Grand River Avenue (M-43) is expected to operate at a LOS E with 63.0 seconds of vehicle delay, an increase of 4.3 seconds from existing conditions.

- During the AM peak hour, the northbound left turn movement on Okemos Road to westbound Grand River Avenue (M-43) is projected to operate at a LOS F with 83.4 seconds of vehicle delay, an increase of 4.5 seconds from existing conditions.

- During the PM peak hour, the eastbound thru movement on Grand River Avenue (M-43) is anticipated to operate at a LOS F with 70.4 seconds of vehicle delay, an increase of 6.4 seconds from existing conditions.

- During the PM peak hour, the northbound left turn movement on Okemos Road to westbound Grand River Avenue (M-43) is expected to operate at a LOS E with 67.3 seconds of vehicle delay, an increase of 1.4 seconds from existing conditions.

- During the PM peak hour, the northbound thru-right movement on Okemos Road is projected to operate at a LOS E with 60.8 seconds of vehicle delay, an increase of 1.3 seconds from existing conditions.

- During the PM peak hour, the southbound left turn movement on Okemos Road to eastbound Grand River Avenue (M-43) is anticipated to operate at a LOS E with 62.8 seconds of vehicle delay, an increase of 0.6 seconds from existing conditions.

Grand River Avenue (M-43) and Marsh Road

- During the PM peak hour, the southbound left turn movement on Marsh Road to eastbound Grand River Avenue (M-43) is expected to operate at a LOS E with 64.8 seconds of vehicle delay, an increase of 0.8 seconds from existing conditions.

Grand River Avenue (M-43) and Meijer/Chick-Fil-A Driveway

- During the PM peak hour, the northbound left turn movement from the Meijer/Chick-Fil-A driveway to westbound Grand River Avenue (M-43) is projected to operate at a LOS F with 78.4 seconds of vehicle delay, an increase of 6.3 seconds from existing conditions.

Table 2
Level of Service (LOS) Summary
Background Growth for AM and PM Peak Hour Traffic

Location	Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
		Avg. Delay	LOS	Avg. Delay	LOS
Grand River Avenue (M-43) and Okemos Road	EB Left	36.2	D	38.6	D
	EB Thru	26.1	C	70.4	F
	EB Right	25.8	C	24.3	C
	EB Approach	*26.6*	*C*	*62.8*	*E*
	WB Left	19.2	B	49.8	D
	WB Thru-Right	63.0	E	34.8	C
	WB Approach	*58.6*	*E*	*37.1*	*D*
	NB Left	83.4	F	67.3	E
	NB Thru-Right	46.5	D	60.8	E
	NB Approach	*61.7*	*E*	*63.6*	*E*
	SB Left	34.3	C	62.8	E
	SB Thru-Right	44.0	D	47.8	D
	SB Approach	*42.9*	*D*	*52.3*	*D*
	Intersection	50.1	D	55.1	E
Grand River Avenue (M-43) and Marsh Road	EB Left	15.9	B	32.9	C
	EB Thru-Right	15.7	B	54.6	D
	EB Approach	*15.7*	*B*	*48.9*	*D*
	WB Left	11.5	B	34.7	C
	WB Thru	54.6	D	29.1	C
	WB Right	24.9	C	27.6	C
	WB Approach	*50.6*	*D*	*29.8*	*C*
	NB Left	46.5	D	39.3	D
	NB Thru-Right	46.8	D	43.5	D
	NB Approach	*47.0*	*D*	*43.3*	*D*
	SB Left	43.6	D	64.8	E
	SB Thru	43.7	D	40.4	D
	SB Right	20.0	C	28.1	C
	SB Approach	*36.3*	*D*	*39.6*	*D*
	Intersection	41.2	D	41.8	D

Note: Delay = Average control delay per vehicle in seconds.
LOS = Level of Service

Table 2 (Continued)
Level of Service (LOS) Summary
Background Growth for AM and PM Peak Hour Traffic

Location	Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
		Avg. Delay	LOS	Avg. Delay	LOS
Grand River Avenue (M-43) and Meijer/Chick-Fil-A Driveway	EB Thru-Right	Free	A	Free	A
	EB Approach	*0.0*	*A*	*0.0*	*A*
	WB Left	8.3	A	15.6	C
	WB Thru	Free	A	Free	A
	WB Approach	*0.0*	*A*	*0.4*	*A*
	NB Left	16.2	C	78.4	F
	NB Right	9.8	A	20.4	C
	NB Approach	*13.2*	*B*	*50.4*	*F*
	Intersection	0.3	A	2.6	A

Note: Delay = Average control delay per vehicle in seconds.
LOS = Level of Service

LEVEL OF SERVICE ANALYSIS FOR MITIGATED BACKGROUND TRAFFIC

All existing geometrics and traffic control devices were used to analyze the background level of service and vehicle delays to determine if an optimization of the traffic signal timing would improve the level of service and the vehicle delays at both Grand River Avenue (M-43) and Okemos Road, and Grand River Avenue (M-43) and Marsh Road intersections. The optimized traffic signal timing for both intersections showed very little changes in the level of service and the vehicle delays under existing conditions, and with very small increments in the vehicle delay between existing conditions and background conditions, signal optimization is not needed. Both intersection traffic signals are operating at their optimized phasing and timing.

With the existing stop sign control at the Meijer-Chick-Fil-A driveway, and the driveway is already configured with an exclusive left turn lane, the PM peak hour level of service F cannot be improved.

FUTURE CONDITIONS

SITE TRAFFIC GENERATION

The trip generation rates for the Panera Bread development were derived from the ITE Trip Generation Manual (10th edition). The ITE trip generation rates for Fast-Food Restaurant with Drive-Through Window (Land Use Code 934) were selected as representing the proposed 4,375 square foot restaurant. The ITE description of Fast-Food Restaurant with Drive-Through Window is as follows:

This category includes fast-food restaurants with drive-through windows. This type of restaurant is characterized by a large drive-through clientele, long hours of service (some are open for breakfast, all are open for lunch and dinner, some are open late at night or 24 hours per day) and high turnover rates for eat-in customers. These limited-service eating establishments do not provide table service. Non-drive-through patrons generally order at a cash register and pay before they eat.

Primary Trips
Primary trips are made for the specific purpose of visiting the generator (Panera Bread development). Primary trips do add new traffic to the adjoining road system.

Pass-By Trips
Significant shares of trips generated by commercial enterprises are classified as "pass-by" trips. Pass-by trips are already present in the existing traffic stream and represent trips which have other ultimate destinations which are interrupted to visit the commercial site. Pass-by trips are already "passing by" the site and therefore do not add new traffic to the adjoining street system. Pass-by trips are attracted from traffic passing the site on adjacent streets (Grand River Avenue) that offer direct access to the generator (Panera Bread development).

It is projected that the Panera Bread development will generate 176 vehicle trips in the AM peak hour of which 86 trips are pass-by, 143 vehicle trips in the PM peak hour of which 72 trips are pass-by, and 2,060 vehicle trips daily. The projected traffic to be generated by the proposed development is summarized in **Table 3**.

Table 3

Vehicle Trip Generation Summary
Panera Bread Development

Land Use	Size	AM Peak Hour			PM Peak Hour			Weekday
		In	Out	Total	In	Out	Total	Total
Fast-Food Restaurant with Drive-Through Window (Code 934)	4,375 Sq. Ft.	90	86	176	74	69	143	2,060
Pass-By Trips		44	42	86	37	35	72	N/A
Total Primary Trips		**46**	**44**	**90**	**37**	**34**	**71**	**2,060**

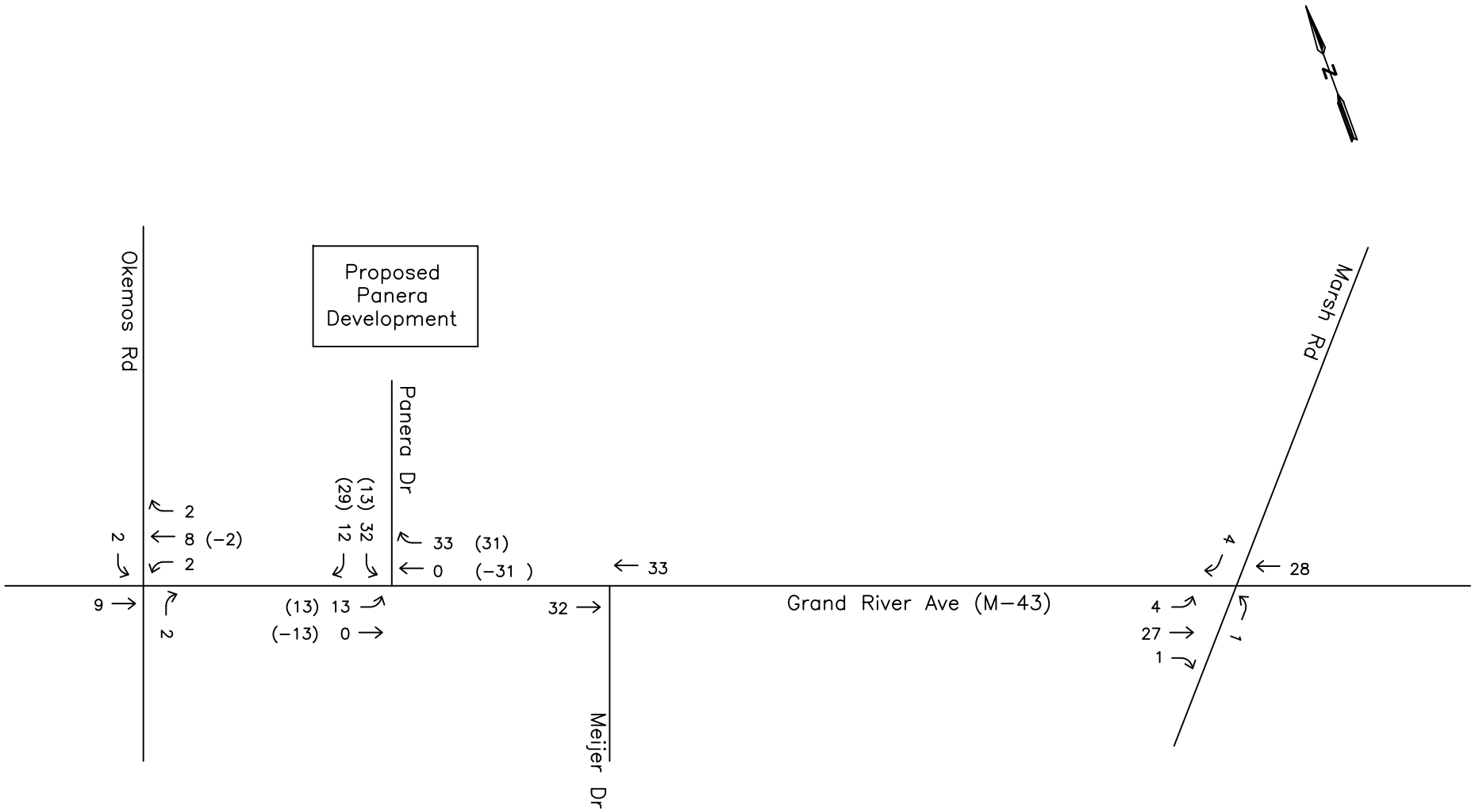
FUTURE SITE TRAFFIC DISTRIBUTION

The commercial traffic distribution was based on existing traffic volumes that entered the project area as commercial retail establishments are a destination, not an origin type of facility. The peak hour distribution for the commercial generated traffic is below.

Direction of Approach and Departure	AM Peak Hour	PM Peak Hour
To/From the WEST on Grand River Avenue	19%	52%
To/From the EAST on Grand River Avenue	60%	19%
To/From the NORTH on Okemos Road	5%	6%
To/From the SOUTH on Okemos Road	4%	9%
To/From the NORTH on Marsh Road	9%	12%
To/From the SOUTH on Marsh Road	3%	2%

The estimated site generated traffic for the proposed Panera Bread development during the AM peak hour is shown in **Figure 3A**, the PM peak hour is illustrated in **Figure 3B**, and the total site traffic is displayed in **Figure 3C**.

Adding the total site generated traffic (**Figure 3C**) to the background growth traffic volumes (**Figure 2**) results in the total future traffic volumes for the weekday AM and PM peak hours, which are illustrated in **Figure 4.**



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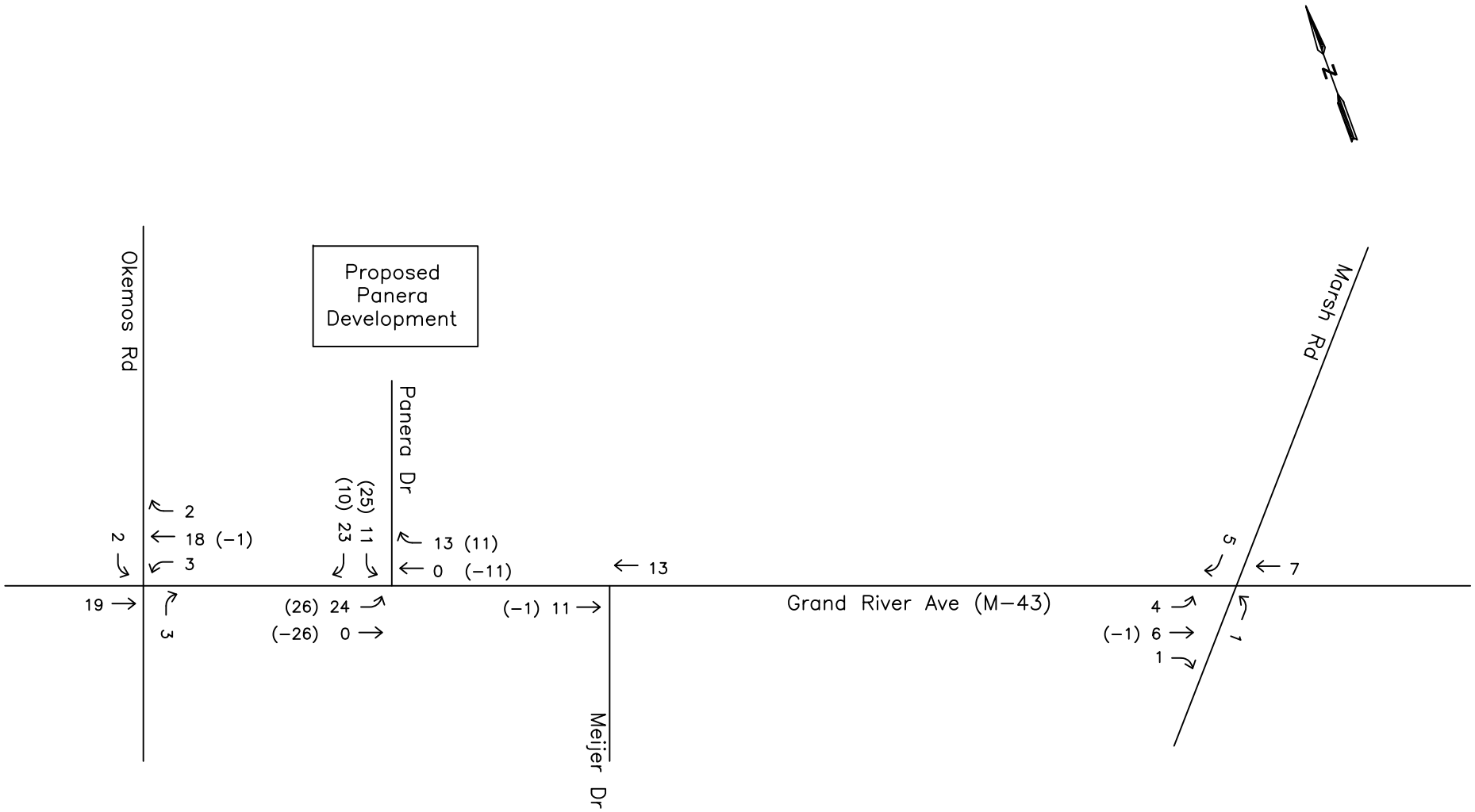
LEGEND

XXX AM Pk Hr Primary Volumes

(XXX) AM Pk Hr Pass-By Volumes

FIGURE 3A: Site Traffic – AM Peak Hour

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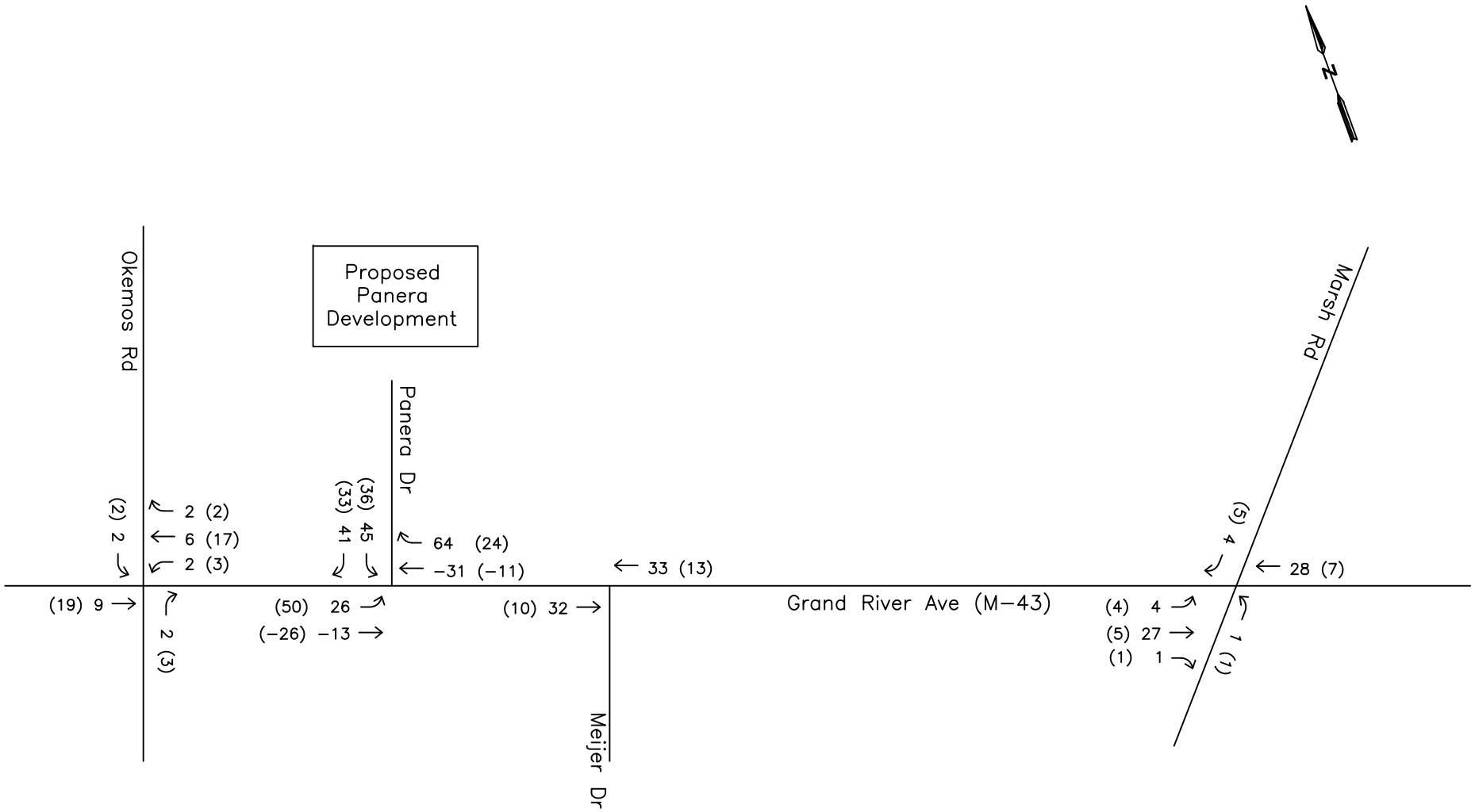
LEGEND

XXX PM Pk Hr Primary Volumes

(XXX) PM Pk Hr Pass-By Volumes

FIGURE 3B: Site Traffic – PM Peak Hour

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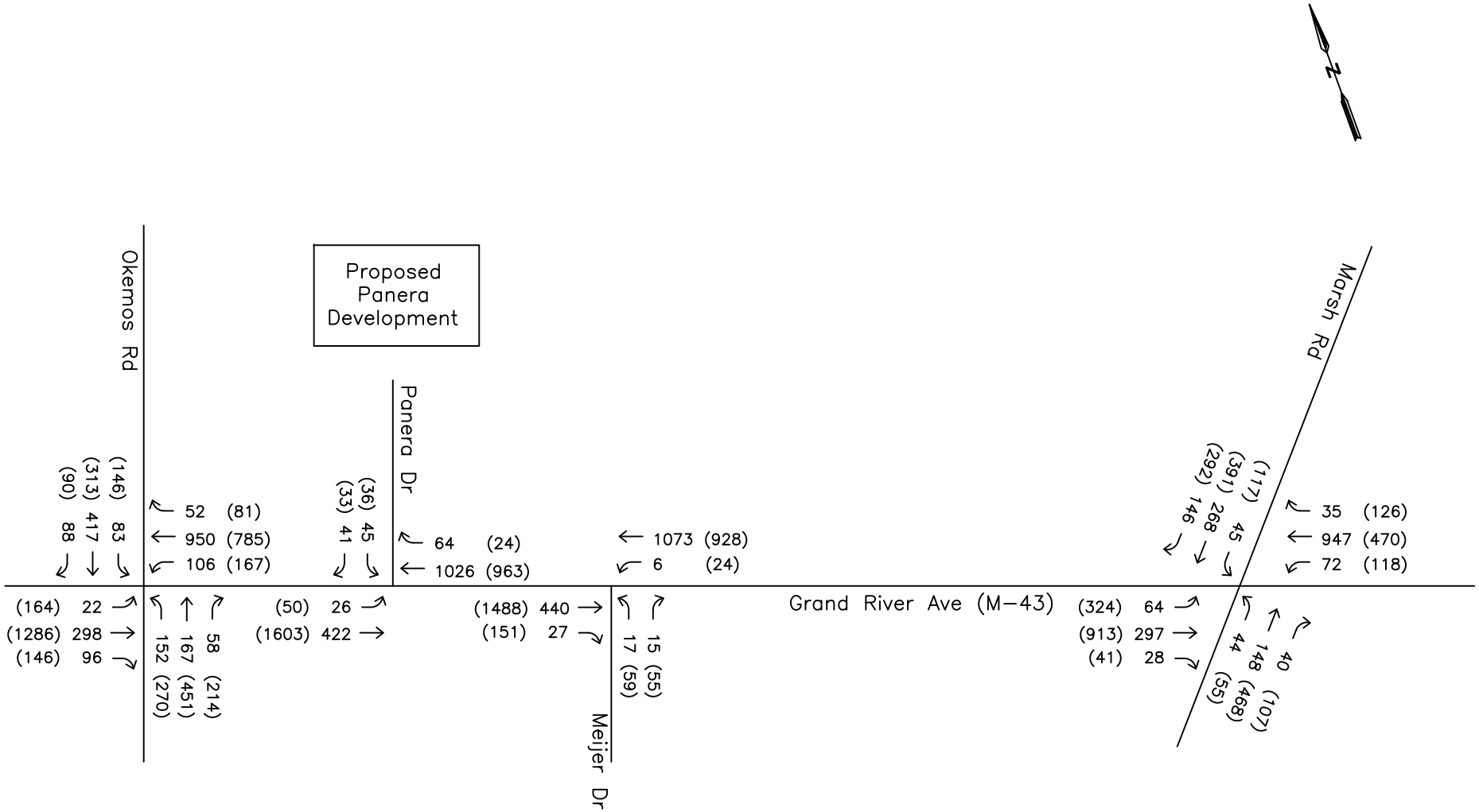
LEGEND

XXX AM Pk Hr (7:30-8:30 AM) Volumes

(XXX) PM Pk Hr (5:00-6:00 PM) Volumes

FIGURE 3C: Total Site Traffic – Peak Hours

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LEGEND

XXX AM Pk Hr (7:30-8:30 AM) Volumes

(XXX) PM Pk Hr (5:00-6:00 PM) Volumes

FIGURE 4: Future Traffic – Peak Hours

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LEVEL OF SERVICE ANALYSIS FOR FUTURE TRAFFIC

The level of service analysis for future AM and PM peak hour traffic is summarized in **Table 4**. For future traffic conditions, all existing geometrics and traffic control were used. All future turning movements at the studied intersections are anticipated to operate at an acceptable level of service (LOS D or better) during the peak hours except for the following movements;

Grand River Avenue (M-43) and Okemos Road

- During the AM peak hour, the westbound thru-right movement on Grand River Avenue (M-43) is expected to operate at a LOS E with 70.3 seconds of vehicle delay, an increase of 7.3 seconds from background conditions.

- During the AM peak hour, the northbound left turn movement on Okemos Road to westbound Grand River Avenue (M-43) is projected to operate at a LOS F with 83.4 seconds of vehicle delay.

- During the PM peak hour, the eastbound thru movement on Grand River Avenue (M-43) is anticipated to operate at a LOS F with 75.5 seconds of vehicle delay, an increase of 5.1 seconds from background conditions.

- During the PM peak hour, the northbound left turn movement on Okemos Road to westbound Grand River Avenue (M-43) is expected to operate at a LOS E with 65.0 seconds of vehicle delay.

- During the PM peak hour, the northbound thru-right movement on Okemos Road is projected to operate at a LOS E with 60.8 seconds of vehicle delay.

- During the PM peak hour, the southbound left turn movement on Okemos Road to eastbound Grand River Avenue (M-43) is anticipated to operate at a LOS E with 63.3 seconds of vehicle delay, an increase of 0.5 seconds from background conditions.

Grand River Avenue (M-43) and Marsh Road

- During the AM peak hour, the westbound thru movement on Grand River Avenue (M-43) is projected to operate at a LOS E with 61.2 seconds of vehicle delay, an increase of 6.6 seconds from background conditions.

- During the PM peak hour, the eastbound thru-right turn movement on Grand River Avenue (M-43) is anticipated to operate at a LOS E with 55.6 seconds of vehicle delay, an increase of 1.0 second from background conditions.

- During the PM peak hour, the southbound left turn movement on Marsh Road to eastbound Grand River Avenue (M-43) is expected to operate at a LOS E with 64.6 seconds of vehicle delay.

Grand River Avenue (M-43) and Meijer/Chick-Fil-A Driveway

- During the PM peak hour, the northbound left turn movement from the Meijer/Chick-Fil-A driveway to westbound Grand River Avenue (M-43) is projected to operate at a LOS F with 80.9 seconds of vehicle delay, an increase of 2.5 seconds from background conditions.

Table 4
Level of Service (LOS) Summary
Future AM and PM Peak Hour Traffic

Location	Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
		Avg. Delay	LOS	Avg. Delay	LOS
Grand River Avenue (M-43) and Okemos Road	EB Left	36.3	D	39.3	D
	EB Thru	26.2	C	75.5	F
	EB Right	25.8	C	24.3	C
	EB Approach	*26.6*	*C*	*67.1*	*E*
	WB Left	20.7	C	51.5	D
	WB Thru-Right	70.3	E	35.5	D
	WB Approach	*65.3*	*E*	*38.1*	*D*
	NB Left	83.4	F	65.0	E
	NB Thru-Right	46.4	D	60.8	E
	NB Approach	*61.6*	*E*	*62.9*	*E*
	SB Left	34.4	C	63.3	E
	SB Thru-Right	44.1	D	47.8	D
	SB Approach	*42.9*	*D*	*52.5*	*D*
	Intersection	53.0	D	56.8	E
Grand River Avenue (M-43) and Marsh Road	EB Left	16.0	B	33.3	C
	EB Thru-Right	16.0	B	55.6	E
	EB Approach	*16.0*	*B*	*49.7*	*D*
	WB Left	11.8	B	34.7	C
	WB Thru	61.2	E	29.2	C
	WB Right	24.9	C	27.6	C
	WB Approach	*56.6*	*E*	*29.8*	*C*
	NB Left	46.5	D	39.4	D
	NB Thru-Right	46.7	D	43.5	D
	NB Approach	*47.0*	*D*	*43.3*	*D*
	SB Left	43.6	D	64.6	E
	SB Thru	43.7	D	40.4	D
	SB Right	20.1	C	28.2	C
	SB Approach	*36.2*	*D*	*39.5*	*D*
	Intersection	43.9	D	42.1	D

Note: Delay = Average control delay per vehicle in seconds.
LOS = Level of Service

Table 4 (Continued)
Level of Service (LOS) Summary
Future AM and PM Peak Hour Traffic

Location	Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
		Avg. Delay	LOS	Avg. Delay	LOS
Grand River Avenue (M-43) and Meijer/Chick-Fil-A Driveway	EB Thru-Right	Free	A	Free	A
	EB Approach	*0.0*	*A*	*0.0*	*A*
	WB Left	8.4	A	15.8	C
	WB Thru	Free	A	Free	A
	WB Approach	*0.0*	*A*	*0.4*	*A*
	NB Left	16.7	C	80.9	F
	NB Right	9.9	A	20.6	C
	NB Approach	*13.5*	*B*	*51.8*	*F*
	Intersection	0.3	A	2.7	A
Grand River Avenue (M-43) and Panera Driveway	EB Left-Thru	1.1	A	5.3	A
	WB Thru-Left	Free	A	Free	A
	SB Left-Right	27.1	D	13.4	B
	Intersection	1.6	A	3.6	A

Note: Delay = Average control delay per vehicle in seconds.
LOS = Level of Service

LEVEL OF SERVICE ANALYSIS FOR MITIGATED FUTURE TRAFFIC

All existing geometrics, traffic control devices and traffic signal timing plans were used to analyze the future mitigated level of service and vehicle delays. The increase in the level of service and vehicle delays were minimal when comparing the background conditions to future conditions at all the studied intersections. There are no recommendations for mitigation for this project.

SIGNIFICANT FINDINGS

DRIVEWAY ANALYSIS FOR A TURN LANE OR TAPER

The Michigan Department of Transportation (MDOT) Geometric Design Guidance Document was used to determine the necessity of a right turn lane/taper, at the Panera Bread development driveway on Grand River Avenue (M-43).

Using the MDOT Geometric Design Guidance Document guideline 1.1.4, Traffic Volume Guidelines for Right-Turn Lanes and Tapers, the results show that the combination of right turning traffic and the peak hour approach volumes during the AM peak hour justify the installation of an westbound right turn lane on Grand River Avenue (M-43) at the site driveway.

INTERSECTION IMPROVEMENT CONSIDERATIONS

Grand River Avenue (M-43) and Okemos Road
This intersection is a signalized intersection. The current cycle length and splits are optimized and no mitigation is recommended for this intersection.

Grand River Avenue (M-43) and Marsh Road
This intersection is a signalized intersection. The current cycle length and splits are optimized and no mitigation is recommended for this intersection.

Grand River Avenue (M-43) and Panera Bread Driveway
The driveway will be controlled by a southbound stop sign. The proposed site plan shows that this driveway will be a full access drive with one (1) inbound lane and one (1) outbound lane. All movements are anticipated to operate at a LOS B or better except during the AM peak hour where the southbound left/right movement from the Panera Bread driveway is projected to operate at a LOS D with a vehicle delay of 27.1 seconds.

The projected future turning volumes from the proposed Panera Bread driveway during the AM peak hour show that the left turning traffic and the right turning traffic is almost equal. If the existing 30 foot driveway were widened to a 36 foot driveway and marked for an exclusive left turn lane and an exclusive right turn lane, the level of service for the left turning traffic would remain the same; however, the level of service for the right turn traffic would improve to a level of service B with only 14.8 seconds of vehicle delay.

The MDOT guidelines show that there is justification for a right turn lane on westbound Grand River Avenue (M-43).

CONCLUSIONS

The findings of this report are as follows:

- It is recommended that the Panera Bread driveway be widened to 36 feet to provide for an exclusive left turn lane and an exclusive right turn lane.

- The MDOT guidelines show that during the AM peak hour, there is justification for a right turn lane for westbound Grand River Avenue (M-43) at the Panera Bread driveway.

SUPPLEMENTAL INFORMATION

Supplemental Information

Site Plan
Vehicle Volume Counts
Timing Plans
LOS Computations
MDOT Traffic Volume Guidelines for
Right-Turn Lanes and Tapers

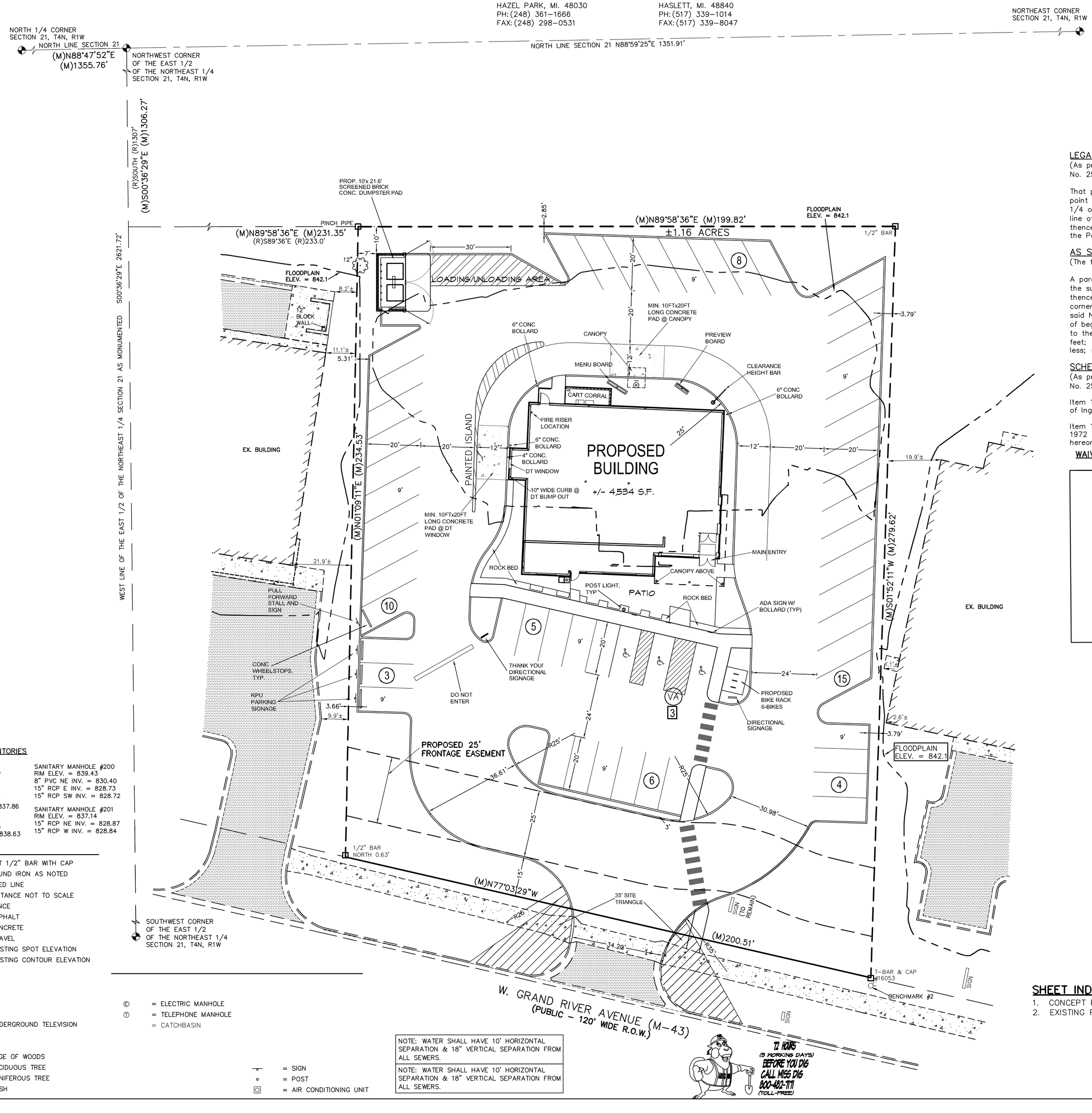
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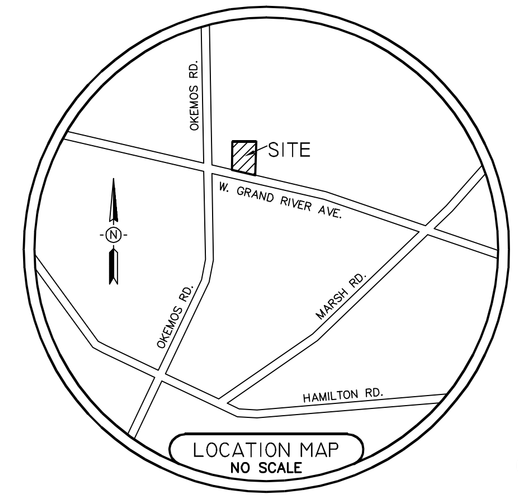
2080 Grand River

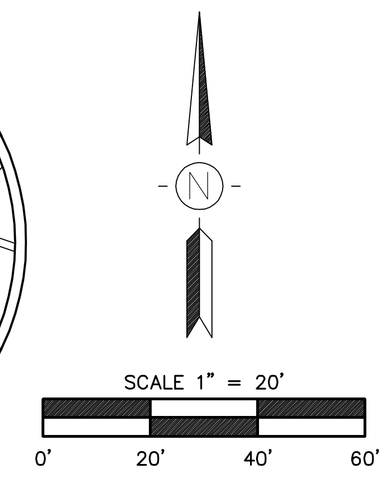
MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

CLIENT:
AFFINITY 9 INVESTMENTS, LLC
1721 MAPLELANE AVE.
HAZEL PARK, MI. 48030
PH:(248) 361-1666
FAX:(248) 298-0531

ENGINEER/SURVEYOR:
KEBS, Inc.
2116 HASLETT RD.
HASLETT, MI. 48840
PH:(517) 339-1014
FAX:(517) 339-8047







LEGAL DESCRIPTION:
(As provided by Devon Title Agency, agents for Old Republic National Title Insurance Company, Commitment No. 253851, Revision #1, dated January 20, 2017)

That part of the Southeast 1/4 of the Northeast ¼ of Section 21, T4N, R1W, described as beginning at a point which is 1307 feet South and 233.0 feet South 89°36' East from the North 1/8 post of the Northeast 1/4 of Section 21; thence South 89°36' East 200.0 feet; thence South 02°14' West 281.2 feet to the North line of US-16 (now M-43 or Grand River Avenue) which is 60 feet at right angles from the centerline; thence along the North line of US-16, North 76°24' West 200.0 feet; thence North 01°18' East 235.4 feet to the Point of Beginning.

AS SURVEYED:
(The following legal description describes the same parcel of land as the provided description)

A parcel of land in the Northeast 1/4 of Section 21, T4N, R1W, Meridian Township, Ingham County, Michigan, the surveyed boundary of said parcel described as: Commencing at the North 1/4 corner of said Section 21; thence N88°47'52"E along the North line of said Section 21 a distance of 1355.76 feet to the Northwest corner of the East 1/2 of said Northeast 1/4; thence S00°36'29"E along the West line of the East 1/2 of said Northeast 1/4 as monumented a distance of 1306.27 feet; thence N89°58'36"E 231.35 feet to the point of beginning of this description; thence continuing N89°58'36"E 199.82 feet; thence S01°52'11"W 279.62 feet to the Northerly line of Grand River Avenue (M-43); thence N77°03'29"W along said Northerly line 200.51 feet; thence N01°09'11"E 234.53 feet to the point of beginning; said parcel containing 1.16 acres more or less; said parcel subject to all easements and restrictions if any.

SCHEDULE B, SECTION II, EXCEPTIONS:
(As provided by Devon Title Agency, agents for Old Republic National Title Insurance Company, Commitment No. 253851, Revision #1, dated January 20, 2017)

Item 17: Terms, conditions and provisions contained in Grant of Easement recorded in Liber 996, Page 824 of Ingham County Records, cross parcel, are plottable and shown hereon.

Item 18: Easement granted to Consumers Power Company, as disclosed by instrument dated December 27, 1972 recorded in Liber 1133, Page 965, Ingham County Records, crosses parcel, is plottable and shown hereon.

WAIVER REQUESTS

SECTION	REQUIREMENT	REASON	WAIVER REQUESTED	COMPARISON TO EXT.
86-402(17)	MAX. 70% IMPERVIOUS AREA	78.77% PROP IMPERVIOUS	8.77% WAIVER	79.25% EXT. IMPERVIOUS
86-756(14) WEST	15' SIDE AND REAR PARKING SETBACK	3.66' PROP PARKING SETBACK	11.34' WAIVER	6.1' EXT. PARKING SETBACK
86-756(14) EAST	15' SIDE AND REAR PARKING SETBACK	3.79' PROP PARKING SETBACK	11.21' WAIVER	3.6' EXT. PARKING SETBACK
86-756(14) NORTH	15' SIDE AND REAR PARKING SETBACK	2.85' PROP PARKING SETBACK	12.15' WAIVER	7.4' EXT. PARKING SETBACK

TOTAL PERVIOUS AREA
10,964 S.F./50,938 S.F. x 100 = 21.52%
TOTAL IMPERVIOUS AREA
39,974 S.F./50,938 S.F. x 100 = 78.48%

PARKING REQUIRED
1/3 SEATS + 1/EMPLOYEE LARGEST SHIFT
REQUIRED = 95 SEATS/3 = 32 SPACES
LARGEST SHIFT = 15 EMPLOYEES = 15
= 47 SPACES

PARKING PROVIDED 51 9'x20'
3 B/F
54 TOTAL SPACES

[1] DENOTES NUMBER OF B/F SPACES
(VA) DENOTES VAN ACCESS B/F SPACES
(0) DENOTES PROPOSED NUMBER OF 9' x 20' PARKING SPACES

SITE ADDRESS: 2080 GRAND RIVER AVE., OKEMOS, MI. 48864

E-91998-CPUD
SURVEY#91998ALT

BENCHMARKS

BENCHMARK #1 ELEV. = 842.24 (NAVD88)
CENTER OF BLACK "X", NORTH SIDE OF CONCRETE LIGHT POLE BASE, IN SOUTHWEST CURB ISLAND OF FOUR CURB ISLANDS IN FRONT OF #2080 GRAND RIVER AVENUE, 75' NORTH-NORTHEAST OF BACK OF CURB OF GRAND RIVER AVENUE AND ±43' WESTERLY OF CENTERLINE OF ENTRANCE DRIVE TO #2080 GRAND RIVER AVENUE.

BENCHMARK #2 ELEV. = 840.83 (NAVD88)
NORTH FLANGE BOLT, UNDER "8" IN "1968", FIRE HYDRANT, ±24' NORTH-NORTHEAST OF BACK OF CURB OF GRAND RIVER AVENUE, ±14' EASTERLY OF THE EXTENSION OF THE WESTERLY WALL LINE OF #2060 GRAND RIVER AVENUE.

LEGEND

- EXT. CONTOURS
- EXT. WATER MAIN
- EXT. SANITARY SEWER
- EXT. STORM SEWER
- EXT. ELEVATIONS
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

EX. SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 837.05
NW INV. = 834.97

CATCH BASIN #101
RIM ELEV. = 840.16
10" RCP N INV. = 837.86

CATCH BASIN #102
RIM ELEV. = 840.23
6" VCP NW INV. = 838.63

SANITARY MANHOLE #200
RIM ELEV. = 839.43
8" PVC NE INV. = 830.40
15" RCP E INV. = 828.73
15" RCP SW INV. = 828.72

SANITARY MANHOLE #201
RIM ELEV. = 837.14
15" RCP NE INV. = 828.87
15" RCP W INV. = 828.84

EX. LEGEND

- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- = EXISTING SPOT ELEVATION
- = EXISTING CONTOUR ELEVATION
- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
- = CATCHBASIN
- C = UNDERGROUND TELEVISION
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH
- = SIGN
- = POST
- = AIR CONDITIONING UNIT

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

SHEET INDEX

1. CONCEPT PLAN
2. EXISTING PLAN

REVISIONS

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

2080 Grand River
CONCEPT PLAN

SCALE: 1"= 20'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 12-1-17	PROJECT MGR. JWK	SHEET 1 OF 2
AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC c/o THOMAS HANNAWA		JOB #: 91998

I:\91\91998\dwg\E-91998-CPUD.dwg, 12/1/2017 7:37:34 AM, sbass

Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Marsh Rd. & Grand River
County/City: Meridian Charter Twp.
Weather: Sunny
Counted By: DES

File Name : Grand River & Marsh - AM
Site Code : 11091702
Start Date : 11/9/2017

Groups Printed- Passenger Vehicles - Heavy Vehicles - Bicycles

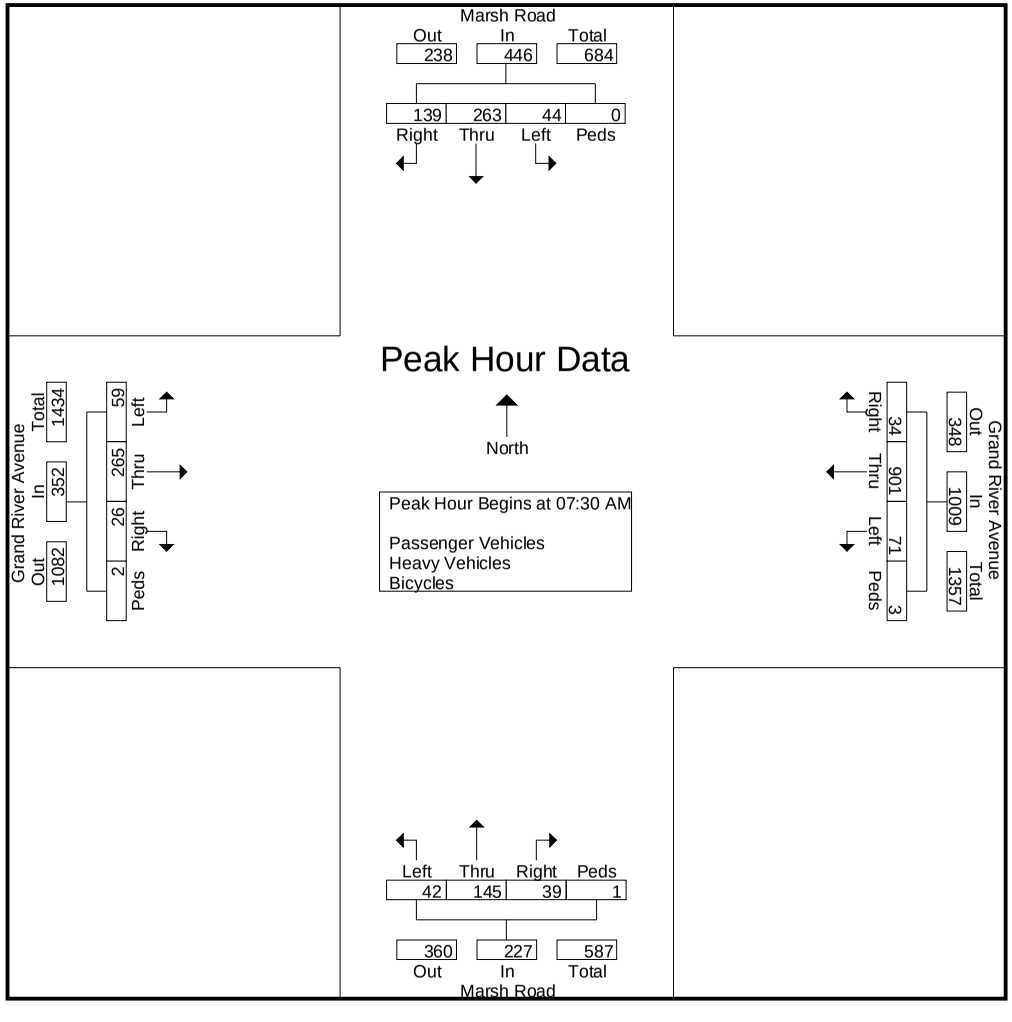
	Marsh Road From North					Grand River Avenue From East					Marsh Road From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	6	29	25	0	60	12	107	4	0	123	4	24	4	0	32	11	35	2	0	48	263
07:15 AM	8	50	22	0	80	4	148	2	0	154	2	34	6	0	42	4	48	3	2	57	333
07:30 AM	12	69	33	0	114	18	257	13	0	288	6	40	4	0	50	7	53	3	2	65	517
07:45 AM	20	65	30	0	115	13	258	8	1	280	13	49	12	1	75	13	72	4	0	89	559
Total	46	213	110	0	369	47	770	27	1	845	25	147	26	1	199	35	208	12	4	259	1672
08:00 AM	7	74	33	0	114	25	205	7	1	238	11	28	10	0	49	21	68	8	0	97	498
08:15 AM	5	55	43	0	103	15	181	6	1	203	12	28	13	0	53	18	72	11	0	101	460
08:30 AM	18	64	32	0	114	22	208	12	0	242	7	36	10	0	53	16	62	13	0	91	500
08:45 AM	10	66	34	0	110	20	202	12	0	234	14	64	20	0	98	22	74	6	1	103	545
Total	40	259	142	0	441	82	796	37	2	917	44	156	53	0	253	77	276	38	1	392	2003
Grand Total	86	472	252	0	810	129	1566	64	3	1762	69	303	79	1	452	112	484	50	5	651	3675
Apprch %	10.6	58.3	31.1	0		7.3	88.9	3.6	0.2		15.3	67	17.5	0.2		17.2	74.3	7.7	0.8		
Total %	2.3	12.8	6.9	0	22	3.5	42.6	1.7	0.1	47.9	1.9	8.2	2.1	0	12.3	3	13.2	1.4	0.1	17.7	
Passenger Vehicles																					
% Passenger Vehicles	97.7	97.9	98.4	0	98	93	97.6	95.3	100	97.2	94.2	99.7	96.2	100	98.2	100	96.3	94	100	96.8	97.4
Heavy Vehicles	2	10	4	0	16	9	37	3	0	49	4	1	3	0	8	0	18	3	0	21	94
% Heavy Vehicles	2.3	2.1	1.6	0	2	7	2.4	4.7	0	2.8	5.8	0.3	3.8	0	1.8	0	3.7	6	0	3.2	2.6
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Marsh Road From North					Grand River Avenue From East					Marsh Road From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	12	69	33	0	114	18	257	**13**		**288**									**2**		
07:45 AM	**20**	65	30	0	**115**	13	**258**	8	**1**	280	**13**	**49**	12	**1**	**75**	13	**72**	4	0	89	**559**
08:00 AM	7	**74**	33	0	114	**25**	205	7	1	238	11	28	10	0	49	**21**	68	8	0	97	498
08:15 AM	5	55	**43**	0	103	15	181	6	1	203	12	28	**13**	0	53	18	72	**11**	0	**101**	460
Total Volume	44	263	139	0	446	71	901	34	3	1009	42	145	39	1	227	59	265	26	2	352	2034
% App. Total	9.9	59	31.2	0		7	89.3	3.4	0.3		18.5	63.9	17.2	0.4		16.8	75.3	7.4	0.6		
PHF	.550	.889	.808	.000	.970	.710	.873	.654	.750	.876	.808	.740	.750	.250	.757	.702	.920	.591	.250	.871	.910

Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Marsh Rd. & Grand River
County/City: Meridian Charter Twp.
Weather: Sunny
Counted By: DES

File Name : Grand River & Marsh - AM
Site Code : 11091702
Start Date : 11/9/2017
Page No : 2



Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Marsh Rd. & Grand River Ave.
County/City: Meridian Charter Twp
Weather: Sunny
Counted By: DES

File Name : Grand River & Marsh - PM
Site Code : 11091702
Start Date : 11/9/2017
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles - Bicycles

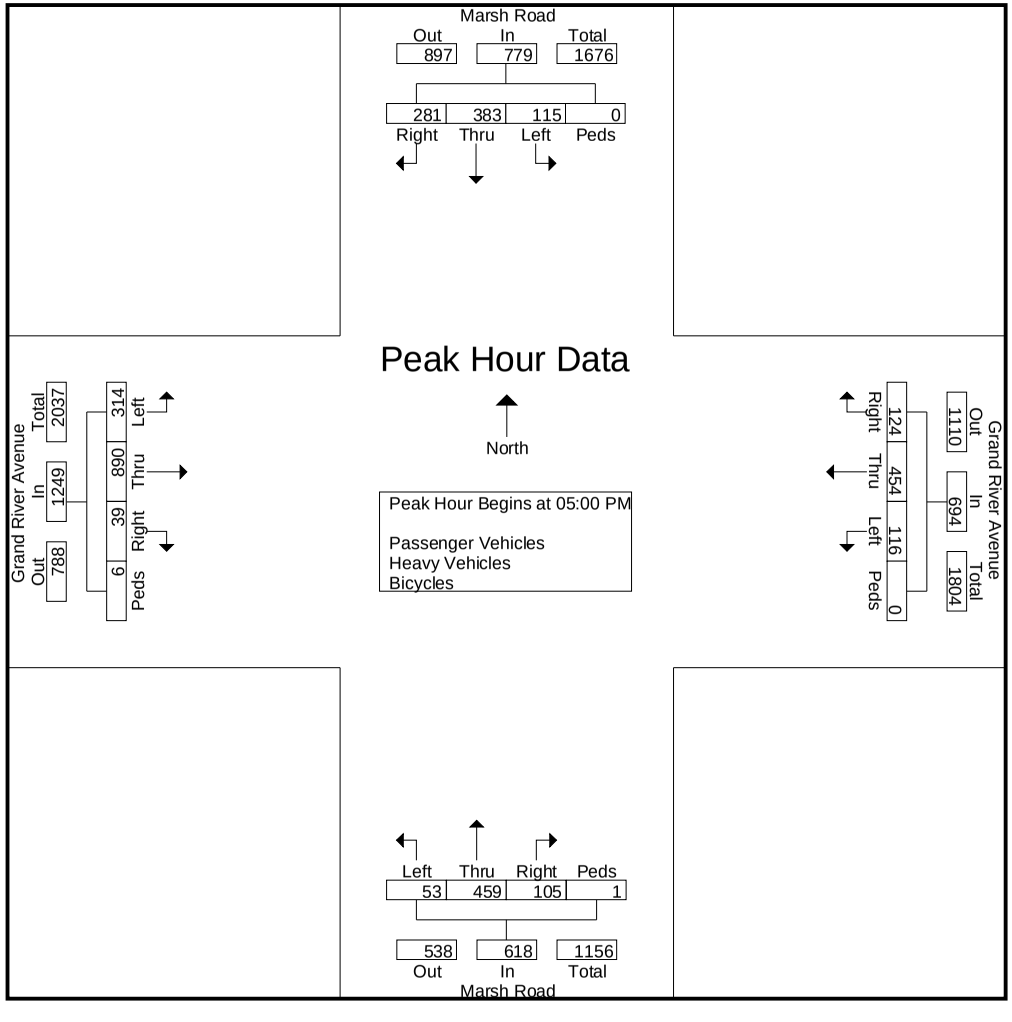
	Marsh Road From North					Grand River Avenue From East					Marsh Road From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	29	83	49	0	161	20	119	23	0	162	22	98	31	1	152	68	153	7	1	229	704
04:15 PM	34	76	49	0	159	19	95	28	0	142	14	96	25	0	135	79	171	9	2	261	697
04:30 PM	38	87	71	0	196	29	116	29	1	175	11	95	17	2	125	69	197	12	0	278	774
04:45 PM	33	92	80	0	205	29	104	37	0	170	16	114	16	0	146	80	180	8	2	270	791
Total	134	338	249	0	721	97	434	117	1	649	63	403	89	3	558	296	701	36	5	1038	2966
05:00 PM	26	91	61	0	178	34	106	31	0	171	13	100	22	0	135	71	204	13	3	291	775
05:15 PM	27	97	75	0	199	27	134	22	0	183	16	122	31	0	169	80	248	13	0	341	892
05:30 PM	30	85	67	0	182	26	121	32	0	179	15	108	34	1	158	82	236	8	3	329	848
05:45 PM	32	110	78	0	220	29	93	39	0	161	9	129	18	0	156	81	202	5	0	288	825
Total	115	383	281	0	779	116	454	124	0	694	53	459	105	1	618	314	890	39	6	1249	3340
Grand Total	249	721	530	0	1500	213	888	241	1	1343	116	862	194	4	1176	610	1591	75	11	2287	6306
Apprch %	16.6	48.1	35.3	0		15.9	66.1	17.9	0.1		9.9	73.3	16.5	0.3		26.7	69.6	3.3	0.5		
Total %	3.9	11.4	8.4	0	23.8	3.4	14.1	3.8	0	21.3	1.8	13.7	3.1	0.1	18.6	9.7	25.2	1.2	0.2	36.3	
Passenger Vehicles																					
% Passenger Vehicles	99.2	98.9	99.4	0	99.1	98.1	98.3	99.2	100	98.4	86.2	99.9	97.9	100	98.2	99.8	99.8	98.7	100	99.8	99
Heavy Vehicles	2	8	3	0	13	4	15	2	0	21	16	1	4	0	21	1	3	1	0	5	60
% Heavy Vehicles	0.8	1.1	0.6	0	0.9	1.9	1.7	0.8	0	1.6	13.8	0.1	2.1	0	1.8	0.2	0.2	1.3	0	0.2	1
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Marsh Road From North					Grand River Avenue From East					Marsh Road From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	26	91	61	0	178	**34**												**13**	**3**		
05:15 PM	27	97	75	0	199	27	**134**	22	0	**183**	**16**	122	31	0	**169**	80	**248**	13	0	**341**	**892**
05:30 PM	30	85	67	0	182	26	121	32	0	179	15	108	**34**	**1**	158	**82**	236	8	3	329	848
05:45 PM	**32**	**110**	**78**	0	**220**	29	93	**39**	0	161	9	**129**	18	0	156	81	202	5	0	288	825
Total Volume	115	383	281	0	779	116	454	124	0	694	53	459	105	1	618	314	890	39	6	1249	3340
% App. Total	14.8	49.2	36.1	0		16.7	65.4	17.9	0		8.6	74.3	17	0.2		25.1	71.3	3.1	0.5		
PHF	.898	.870	.901	.000	.885	.853	.847	.795	.000	.948	.828	.890	.772	.250	.914	.957	.897	.750	.500	.916	.936

Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Marsh Rd. & Grand River Ave.
County/City: Meridian Charter Twp
Weather: Sunny
Counted By: DES

File Name : Grand River & Marsh - PM
Site Code : 11091702
Start Date : 11/9/2017



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PO Box 100
Saranac, MI 48881
517-627-6028

Location: Meijer Drive & Grand River Ave
County/City: Meridian Charter Township
Weather: Sunny
Counted By: TH

File Name : Grand River & Meijer Driveway - AM
Site Code : 11081701
Start Date : 11/8/2017
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles - Bicycles

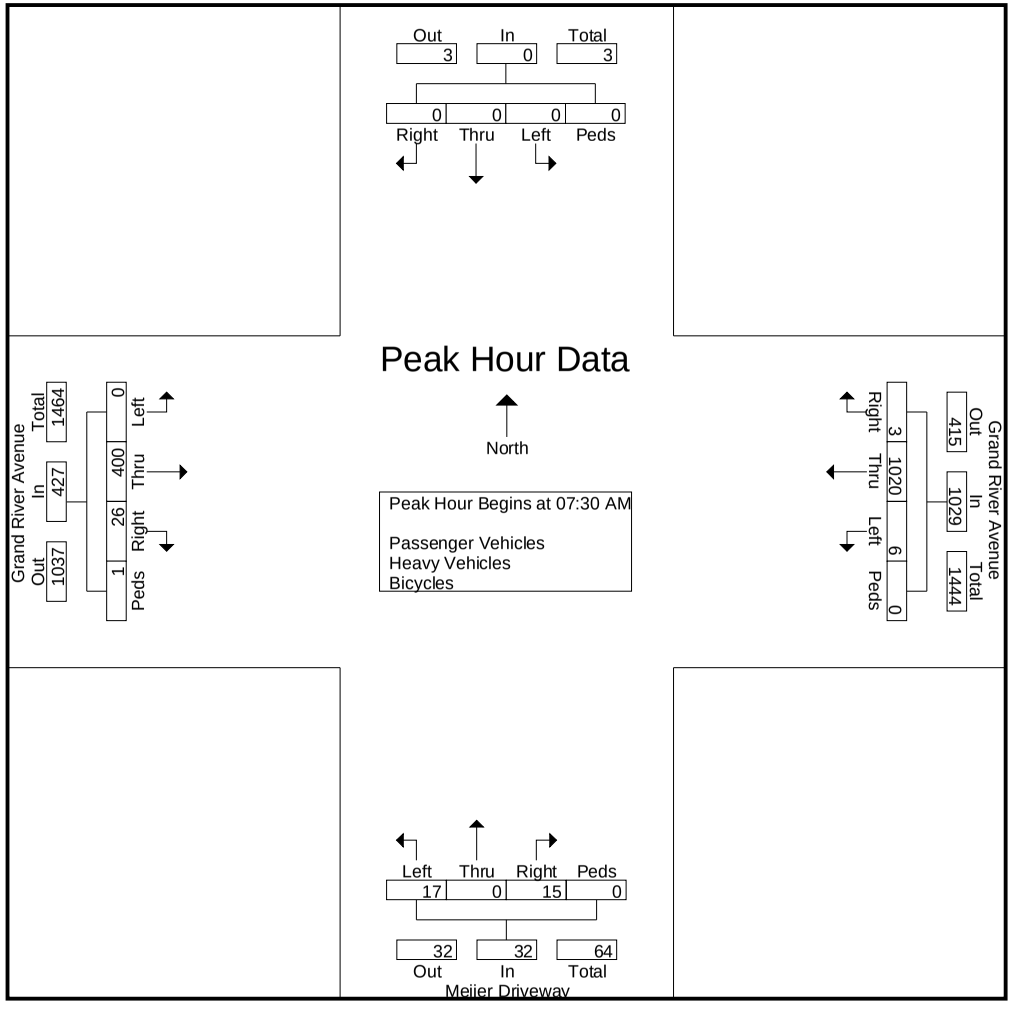
	From North					Grand River Avenue From East					Meijer Driveway From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	1	161	0	0	162	3	0	1	0	4	0	58	1	0	59	225
07:15 AM	0	0	0	0	0	0	230	0	0	230	4	0	0	0	4	0	61	3	0	64	298
07:30 AM	0	0	0	0	0	1	304	1	0	306	3	0	3	0	6	0	106	4	0	110	422
07:45 AM	0	0	0	0	0	5	274	1	0	280	6	0	4	0	10	0	93	7	1	101	391
Total	0	0	0	0	0	7	969	2	0	978	16	0	8	0	24	0	318	15	1	334	1336
08:00 AM	0	0	0	0	0	0	209	0	0	209	3	0	4	0	7	0	95	9	0	104	320
08:15 AM	0	0	0	0	0	0	233	1	0	234	5	0	4	0	9	0	106	6	0	112	355
08:30 AM	0	0	0	0	0	1	233	0	0	234	3	0	2	0	5	1	122	9	0	132	371
08:45 AM	0	0	0	0	0	2	224	0	0	226	6	0	7	0	13	0	144	7	0	151	390
Total	0	0	0	0	0	3	899	1	0	903	17	0	17	0	34	1	467	31	0	499	1436
Grand Total	0	0	0	0	0	10	1868	3	0	1881	33	0	25	0	58	1	785	46	1	833	2772
Apprch %	0	0	0	0		0.5	99.3	0.2	0		56.9	0	43.1	0		0.1	94.2	5.5	0.1		
Total %	0	0	0	0	0	0.4	67.4	0.1	0	67.9	1.2	0	0.9	0	2.1	0	28.3	1.7	0	30.1	
Passenger Vehicles																					
% Passenger Vehicles	0	0	0	0	0	100	97.4	100	0	97.4	100	0	96	0	98.3	100	95.4	97.8	100	95.6	96.9
Heavy Vehicles	0	0	0	0	0	0	48	0	0	48	0	0	1	0	1	0	36	1	0	37	86
% Heavy Vehicles	0	0	0	0	0	0	2.6	0	0	2.6	0	0	4	0	1.7	0	4.6	2.2	0	4.4	3.1
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	From North					Grand River Avenue From East					Meijer Driveway From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	1	**304**	**1**		**306**							**106**				**422**
07:45 AM	0	0	0	0	0	**5**	274	1	0	280	**6**	0	**4**	0	**10**	0	93	7	**1**	101	391
08:00 AM	0	0	0	0	0	0	209	0	0	209	3	0	4	0	7	0	95	**9**	0	104	320
08:15 AM	0	0	0	0	0	0	233	1	0	234	5	0	4	0	9	0	106	6	0	**112**	355
Total Volume	0	0	0	0	0	6	1020	3	0	1029	17	0	15	0	32	0	400	26	1	427	1488
% App. Total	0	0	0	0		0.6	99.1	0.3	0		53.1	0	46.9	0		0	93.7	6.1	0.2		
PHF	.000	.000	.000	.000	.000	.300	.839	.750	.000	.841	.708	.000	.938	.000	.800	.000	.943	.722	.250	.953	.882

Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Meijer Drive & Grand River Ave
County/City: Meridian Charter Township
Weather: Sunny
Counted By: TH

File Name : Grand River & Meijer Driveway - AM
Site Code : 11081701
Start Date : 11/8/2017
Page No : 2



Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Meijer Drive & Grand River Ave
County/City: Meridian Charter Twp
Weather: Sunny
Counted By: TH

File Name : Grand River & Meijer Driveway - PM
Site Code : 11081701
Start Date : 11/8/2017
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles - Bicycles

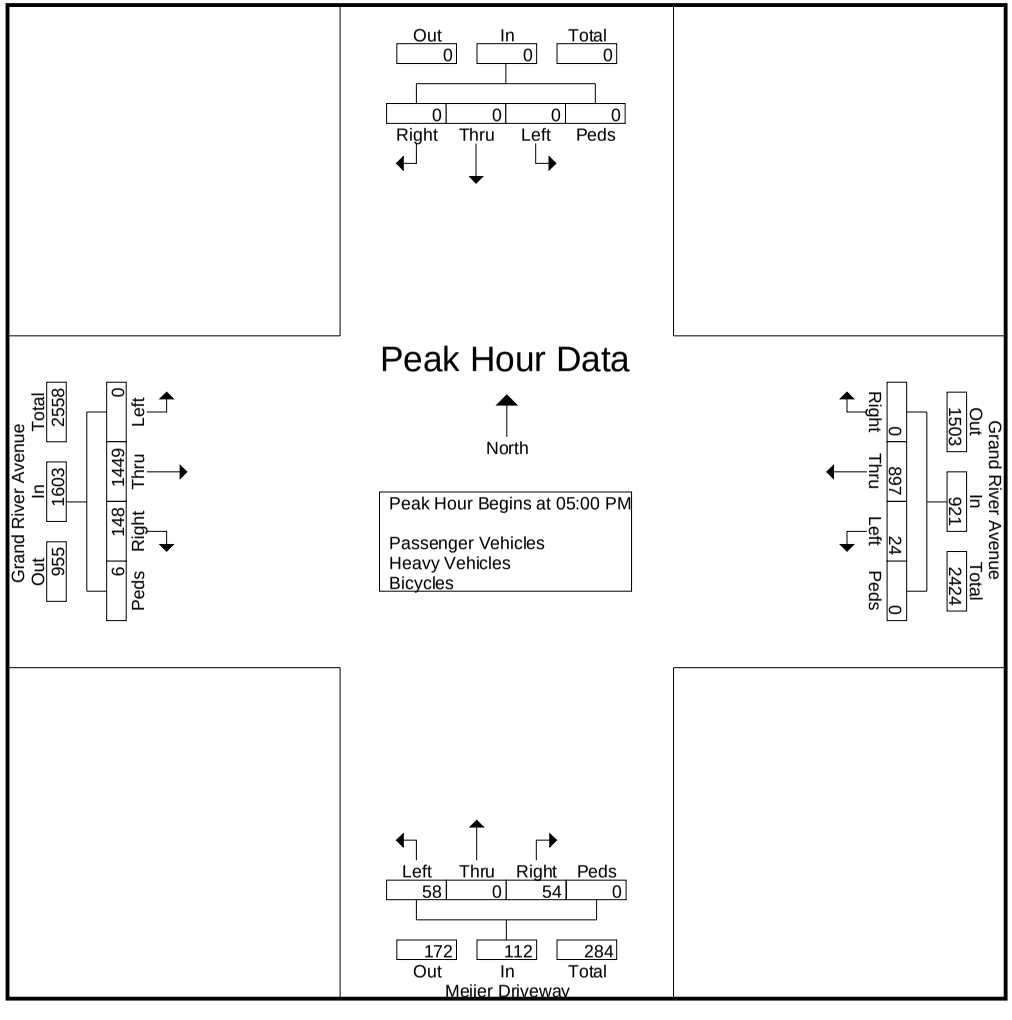
	From North					Grand River Avenue From East					Meijer Driveway From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	4	193	0	1	198	8	0	16	0	24	0	250	43	0	293	515
04:15 PM	0	0	1	0	1	6	186	0	0	192	12	0	14	0	26	0	261	20	0	281	500
04:30 PM	0	0	0	0	0	5	203	0	0	208	7	0	9	1	17	0	254	23	1	278	503
04:45 PM	0	0	0	0	0	6	190	0	0	196	10	0	12	0	22	1	348	33	3	385	603
Total	0	0	1	0	1	21	772	0	1	794	37	0	51	1	89	1	1113	119	4	1237	2121
05:00 PM	0	0	0	0	0	6	205	0	0	211	12	0	10	0	22	0	370	32	1	403	636
05:15 PM	0	0	0	0	0	8	222	0	0	230	11	0	14	0	25	0	373	34	2	409	664
05:30 PM	0	0	0	0	0	3	238	0	0	241	18	0	16	0	34	0	363	44	2	409	684
05:45 PM	0	0	0	0	0	7	232	0	0	239	17	0	14	0	31	0	343	38	1	382	652
Total	0	0	0	0	0	24	897	0	0	921	58	0	54	0	112	0	1449	148	6	1603	2636
Grand Total	0	0	1	0	1	45	1669	0	1	1715	95	0	105	1	201	1	2562	267	10	2840	4757
Apprch %	0	0	100	0		2.6	97.3	0	0.1		47.3	0	52.2	0.5		0	90.2	9.4	0.4		
Total %	0	0	0	0	0	0.9	35.1	0	0	36.1	2	0	2.2	0	4.2	0	53.9	5.6	0.2	59.7	
Passenger Vehicles																					
% Passenger Vehicles	0	0	100	0	100	100	98	0	100	98	100	0	100	100	100	100	98.6	99.6	100	98.7	98.5
Heavy Vehicles	0	0	0	0	0	0	34	0	0	34	0	0	0	0	0	0	35	1	0	36	70
% Heavy Vehicles	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1.4	0.4	0	1.3	1.5
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	From North					Grand River Avenue From East					Meijer Driveway From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	6	205	0	0	211	12	0	10	0	22	0	370	32	1	403	636
05:15 PM	0	0	0	0	0	**8**											**373**		**2**	**409**	
05:30 PM	0	0	0	0	0	3	**238**	0	0	**241**	**18**	0	**16**	0	**34**	0	363	**44**	2	409	**684**
05:45 PM	0	0	0	0	0	7	232	0	0	239	17	0	14	0	31	0	343	38	1	382	652
Total Volume	0	0	0	0	0	24	897	0	0	921	58	0	54	0	112	0	1449	148	6	1603	2636
% App. Total	0	0	0	0		2.6	97.4	0	0		51.8	0	48.2	0		0	90.4	9.2	0.4		
PHF	.000	.000	.000	.000	.000	.750	.942	.000	.000	.955	.806	.000	.844	.000	.824	.000	.971	.841	.750	.980	.963

Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Meijer Drive & Grand River Ave
County/City: Meridian Charter Twp
Weather: Sunny
Counted By: TH

File Name : Grand River & Meijer Driveway - PM
Site Code : 11081701
Start Date : 11/8/2017
Page No : 2



Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Okemos Rd. & Grand River
County/City: Meridian Charter Twp.
Weather: Sunny
Counted By: DES

File Name : Grand River & Okemos - AM
Site Code : 11081701
Start Date : 11/8/2017

Groups Printed- Passenger Vehicles - Heavy Vehicles - Bicycles

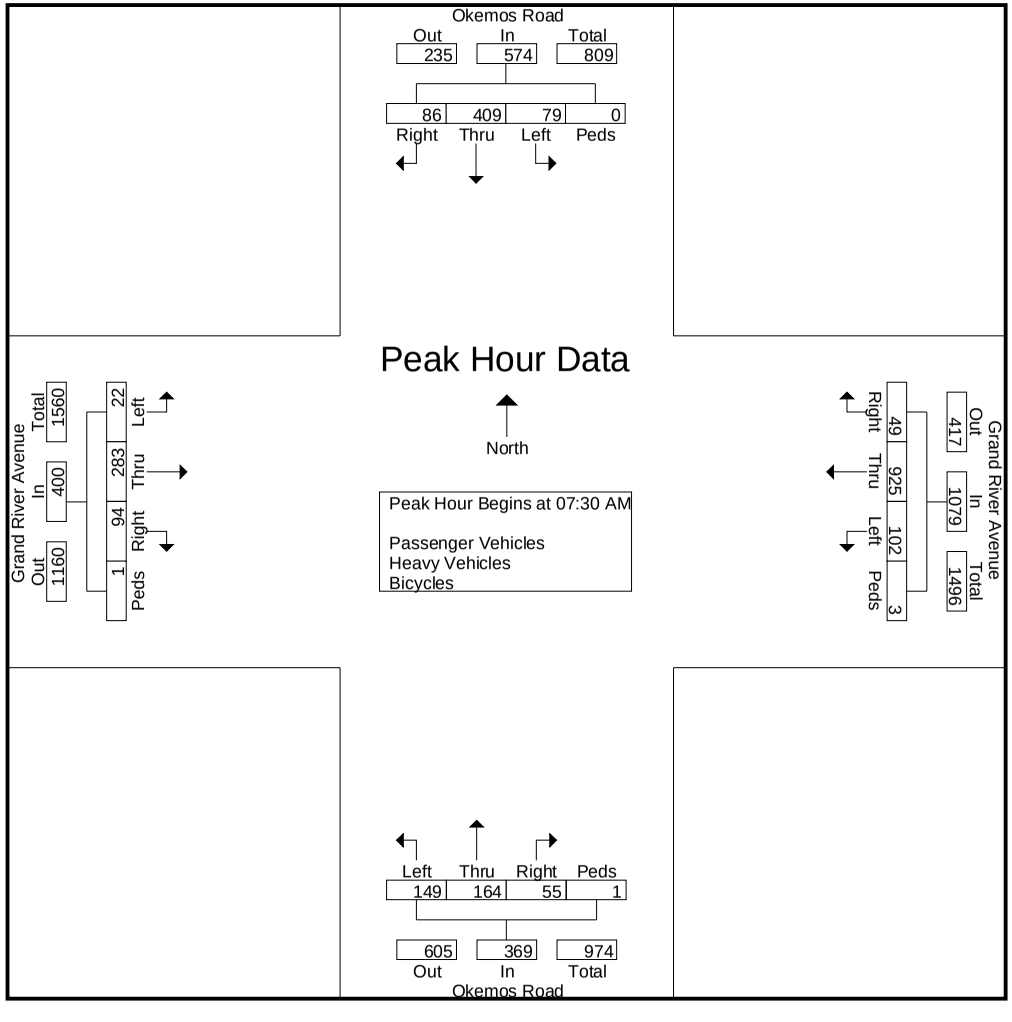
	Okemos Road From North					Grand River Avenue From East					Okemos Road From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	9	41	15	0	65	12	105	8	0	125	13	20	6	1	40	6	44	9	0	59	289
07:15 AM	5	56	24	0	85	24	160	11	0	195	20	30	4	0	54	4	43	24	1	72	406
07:30 AM	16	91	20	0	127	28	240	10	1	279	39	40	12	1	92	5	69	22	1	97	595
07:45 AM	24	118	35	0	177	25	263	15	1	304	29	48	17	0	94	8	71	23	0	102	677
Total	54	306	94	0	454	89	768	44	2	903	101	138	39	2	280	23	227	78	2	330	1967
08:00 AM	20	103	8	0	131	24	213	12	0	249	43	48	13	0	104	7	67	24	0	98	582
08:15 AM	19	97	23	0	139	25	209	12	1	247	38	28	13	0	79	2	76	25	0	103	568
08:30 AM	16	91	26	0	133	36	187	7	0	230	29	46	29	2	106	14	64	25	0	103	572
08:45 AM	21	83	21	0	125	23	207	12	1	243	47	63	29	0	139	4	95	16	0	115	622
Total	76	374	78	0	528	108	816	43	2	969	157	185	84	2	428	27	302	90	0	419	2344
Grand Total	130	680	172	0	982	197	1584	87	4	1872	258	323	123	4	708	50	529	168	2	749	4311
Apprch %	13.2	69.2	17.5	0		10.5	84.6	4.6	0.2		36.4	45.6	17.4	0.6		6.7	70.6	22.4	0.3		
Total %	3	15.8	4	0	22.8	4.6	36.7	2	0.1	43.4	6	7.5	2.9	0.1	16.4	1.2	12.3	3.9	0	17.4	
Passenger Vehicles																					
% Passenger Vehicles	96.9	98.5	100	0	98.6	97	97.3	98.9	100	97.3	98.4	99.7	97.6	100	98.9	100	96.6	98.2	100	97.2	97.8
Heavy Vehicles	4	10	0	0	14	6	43	1	0	50	4	1	3	0	8	0	18	3	0	21	93
% Heavy Vehicles	3.1	1.5	0	0	1.4	3	2.7	1.1	0	2.7	1.6	0.3	2.4	0	1.1	0	3.4	1.8	0	2.8	2.2
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Okemos Road From North					Grand River Avenue From East					Okemos Road From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	16	91	20	0	127	**28**			**1**					**1**					**1**		
07:45 AM	**24**	**118**	**35**	0	**177**	25	**263**	**15**	1	**304**	29	**48**	**17**	0	94	**8**	71	23	0	102	**677**
08:00 AM	20	103	8	0	131	24	213	12	0	249	**43**	48	13	0	**104**	7	67	24	0	98	582
08:15 AM	19	97	23	0	139	25	209	12	1	247	38	28	13	0	79	2	**76**	**25**	0	**103**	568
Total Volume	79	409	86	0	574	102	925	49	3	1079	149	164	55	1	369	22	283	94	1	400	2422
% App. Total	13.8	71.3	15	0		9.5	85.7	4.5	0.3		40.4	44.4	14.9	0.3		5.5	70.8	23.5	0.2		
PHF	.823	.867	.614	.000	.811	.911	.879	.817	.750	.887	.866	.854	.809	.250	.887	.688	.931	.940	.250	.971	.894

Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Okemos Rd. & Grand River
County/City: Meridian Charter Twp.
Weather: Sunny
Counted By: DES

File Name : Grand River & Okemos - AM
Site Code : 11081701
Start Date : 11/8/2017
Page No : 2



Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Okemos Rd. & Grand River Ave.
County/City: Meridian Charter Twp.
Weather: Sunny
Counted By: DES

File Name : Grand River & Okemos - PM
Site Code : 11081701
Start Date : 11/8/2017
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles - Bicycles

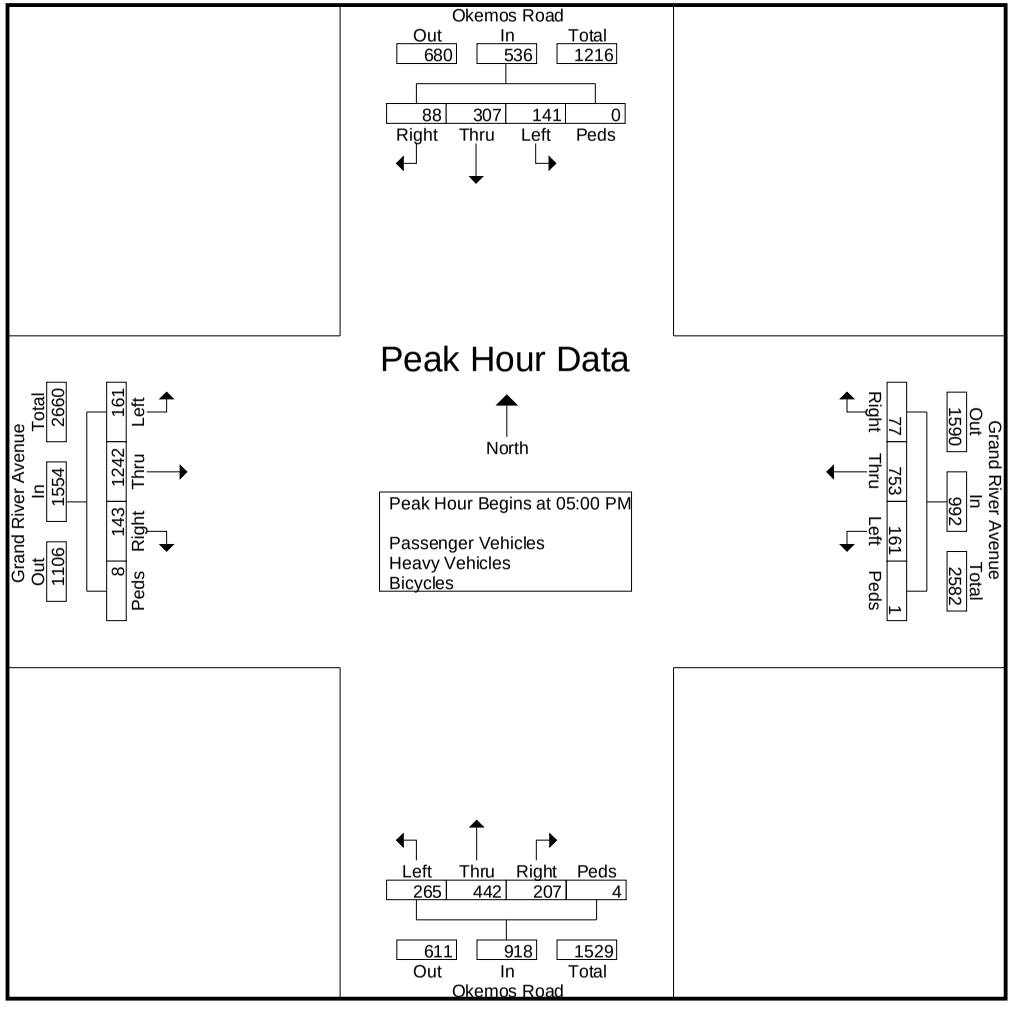
	Okemos Road From North					Grand River Avenue From East					Okemos Road From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	26	51	26	0	103	40	152	7	0	199	63	101	36	4	204	36	229	31	1	297	803
04:15 PM	21	46	24	0	91	47	134	13	0	194	71	103	29	0	203	19	220	31	0	270	758
04:30 PM	20	53	21	0	94	31	185	24	1	241	51	99	30	0	180	35	265	34	1	335	850
04:45 PM	38	78	23	0	139	34	146	14	0	194	58	96	39	0	193	31	300	39	7	377	903
Total	105	228	94	0	427	152	617	58	1	828	243	399	134	4	780	121	1014	135	9	1279	3314
05:00 PM	28	93	25	0	146	39	165	13	0	217	58	114	49	0	221	49	325	39	2	415	999
05:15 PM	35	76	16	0	127	36	183	26	1	246	76	116	50	0	242	47	315	32	1	395	1010
05:30 PM	46	68	25	0	139	40	201	18	0	259	63	122	45	0	230	30	319	43	2	394	1022
05:45 PM	32	70	22	0	124	46	204	20	0	270	68	90	63	4	225	35	283	29	3	350	969
Total	141	307	88	0	536	161	753	77	1	992	265	442	207	4	918	161	1242	143	8	1554	4000
Grand Total	246	535	182	0	963	313	1370	135	2	1820	508	841	341	8	1698	282	2256	278	17	2833	7314
Apprch %	25.5	55.6	18.9	0		17.2	75.3	7.4	0.1		29.9	49.5	20.1	0.5		10	79.6	9.8	0.6		
Total %	3.4	7.3	2.5	0	13.2	4.3	18.7	1.8	0	24.9	6.9	11.5	4.7	0.1	23.2	3.9	30.8	3.8	0.2	38.7	
Passenger Vehicles																					
% Passenger Vehicles	98.4	97.2	99.5	0	97.9	98.7	98	99.3	100	98.2	99.8	99.9	99.4	100	99.8	100	99.2	99.6	100	99.3	99
Heavy Vehicles	4	15	1	0	20	4	27	1	0	32	1	1	2	0	4	0	19	1	0	20	76
% Heavy Vehicles	1.6	2.8	0.5	0	2.1	1.3	2	0.7	0	1.8	0.2	0.1	0.6	0	0.2	0	0.8	0.4	0	0.7	1
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Okemos Road From North					Grand River Avenue From East					Okemos Road From South					Grand River Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	28	**93**	**25**		**146**											**49**	**325**			**415**	
05:15 PM	35	76	16	0	127	36	183	**26**	**1**	246	**76**	116	50	0	**242**	47	315	32	1	395	1010
05:30 PM	**46**	68	25	0	139	40	201	18	0	259	63	**122**	45	0	230	30	319	**43**	2	394	**1022**
05:45 PM	32	70	22	0	124	**46**	**204**	20	0	**270**	68	90	**63**	**4**	225	35	283	29	**3**	350	969
Total Volume	141	307	88	0	536	161	753	77	1	992	265	442	207	4	918	161	1242	143	8	1554	4000
% App. Total	26.3	57.3	16.4	0		16.2	75.9	7.8	0.1		28.9	48.1	22.5	0.4		10.4	79.9	9.2	0.5		
PHF	.766	.825	.880	.000	.918	.875	.923	.740	.250	.919	.872	.906	.821	.250	.948	.821	.955	.831	.667	.936	.978

Traffic Engineering Associates, Inc.
PO Box 100
Saranac, MI 48881
517-627-6028

Location: Okemos Rd. & Grand River Ave.
County/City: Meridian Charter Twp.
Weather: Sunny
Counted By: DES

File Name : Grand River & Okemos - PM
Site Code : 11081701
Start Date : 11/8/2017
Page No : 2



TRAFFIC SIGNAL TIMING PERMIT

	PHASE	1	2	3	4	5	6	7	8			
APPROACH		EB LT	WB	NB LT	SB	WB LT	EB	SB LT	NB			
MINIMUM GREEN		5	10	5	7	5	10	5	10			
PASSAGE		3.0	0.0	3.0	2.0	3.0	0.0	3.0	2.0			
MAXIMUM NO. 1		13	37	13	37	13	37	13	37			
MAXIMUM NO. 2		0	0	0	0	0	0	0	0			
YELLOW CHANGE		4.3	4.3	3.9	3.9	4.3	4.3	3.9	3.9			
RED CLEARANCE		1.9	1.9	2.5	2.5	1.9	1.9	2.5	2.5			
WALK		0	7	0	7	7	7	7	7			
PEDESTRIAN CLEARANCE		0	20	0	22	0	20	0	22			
EXTENDED PED. CLEARANCE		0	0	0	0	0	0	0	0			
REST IN WALK		0	0	0	0	0	0	0	0			
INITIALIZATION		1	4	1	1	1	4	1	1			
NON-ACT RESPONSE		0	1	0	0	0	1	0	0			
VEHICLE RECALL		0	3	0	0	0	3	0	0			
PEDESTRIAN RECALL		0	0	0	0	0	0	0	0			
NON-LOCK MEMORY		0	0	0	0	0	0	0	0			
DUAL ENTRY		0	1	0	1	0	1	0	1			
	CYCLE									O1	O2	O3
DIAL 1	SPLIT 1	100	13	37	13	37	13	37	13	37	18		
DIAL 2	SPLIT 1	100	13	37	13	37	13	37	13	37	77		
DIAL 3	SPLIT 1	100	13	37	13	37	13	37	13	37	56		
DIAL	SPLIT											
DIAL	SPLIT											
DIAL	SPLIT											
	MODE	0	1	0	0	0	1	0	0			

PHASE

1 EB M-43 (GRAND RIVER) LEFT

2 WB M-43 (GRAND RIVER) THRU

3 NB MARSH ROAD LEFT

4 SB MARSH ROAD THRU

5 WB M-43 (GRAND RIVER) LEFT

6 EB M-43 (GRAND RIVER) THRU

7 SB MARSH ROAD LEFT

8 NB MARSH ROAD THRU

D1/S1/O1: NORMAL
D2/S1/O1: 06:00-09:00 MON-FRI
D3/S1/O1: 15:00-18:30 MON-FRI

OVERLAPS

Overlap Phase	*Load Bays*	*Phases Overlapped*	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN
A = EB M-43 LEFT			0.0	4.3	1.9	1	2
B = NB MARSH LEFT			0.0	3.9	2.5	3	4
C = WB M-43 LEFT			0.0	4.3	1.9	5	6
D = SB MARSH LEFT			0.0	3.9	2.5	7	8

TIMING INSTALLED

REMARKS

PHASES # 4 AND # 8 HAVE BEEN TAKEN OFF OF MAXIMUM RECALL DUE TO TRAFFIC LOOPS BEING INSTALLED IN THE MARSH ROAD THRU LANES.

THIS TRAFFIC SIGNAL UNDERWENT OPTIMIZATION BY PARSONS IN APRIL 2008.

PREPARED BY: HHH DATE: 03/20/09

FLASH HOURS: DAILY ☐ NONE ☒

to

NIGHT FLASH:

FY = FR =

CONFLICT FLASH:

FY = M-43 FR = ALL OTHERS

CONTROLLER TYPE:
☒ EPAC
☐ Other:

PRE-EMPT ☒
COUNTDOWN PEDS ☐

LOCATION:
M-43 (GRAND RIVER)/MARSH ROAD
CITY/TWP: MERIDIAN TOWNSHIP
COUNTY : INGHAM

MILE POINT	CONTROL SECTION-SPOT #
4.58	33082-01-014

Job # (If Applicable): 88119C

Page 3 included only if Pre-Empt Checked

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION

Controller Type:
- [x] EPAC
- [ ] Other:

System Type:
- [x] Closed Loop
  - [ ] Stand By
  - [x] Group 1
  - [ ] Group 2

Address: 05
- [ ] TBC
- [ ] TBC/GPS
- [ ] None
- [ ] Other:

If TBC, Synch by:
- [x] TOD
- [ ] Event

Interconnect Type:
- [ ] Hardwire
- [ ] Fiber-Optic
- [x] Radio
- [ ] Phone Drop
- [ ] None
- [ ] Other:

If Phone Drop, Phone #

Controller Status:
- [ ] Master
- [x] Slave
- [ ] Isolated
- [ ] TBC

If Slave, Master Location:
M-43 @ OKEMOS

Master Spot # : 33082-01-016

LEFT-TURN PHASING

Phase # / Description	*Permissive-Protected* Lead	*Permissive-Protected* Lag	*Protected-Only* Split	*Protected-Only* Lead	*Protected-Only* Lag
PHASE 1: EB M-43 LEFT	☐	☒	☐	☐	☐
PHASE 3: NB MARSH LEFT	☐	☒	☐	☐	☐
PHASE 5: WB M-43 LEFT	☐	☒	☐	☐	☐
PHASE 7: SB MARSH LEFT	☐	☒	☐	☐	☐

RING AND BARRIER STRUCTURE

	B1				B2				B3				B4			
R1	2	1			4	3										
R2	6	5			8	7										
R3																
R4																

VEHICULAR AND PEDESTRIAN DETECTION

Approach	*Vehicular Detection* Movements and Call Delay (s) Left	Thru	Right	Type Loop	Video	Other	*Pedestrian Detection* Push-Button Crossing Locations
EB M-43 (GRAND RIVER)	☒	☐	☐	☒	☐	☐	S. LEG OF M-43
WB M-43 (GRAND RIVER)	☒	☐	☐	☒	☐	☐	N. LEG OF M-43
NB MARSH ROAD	☒	☐	☐	☒	☐	☐	E. LEG OF M-43
SB MARSH ROAD	☒	☐	☐	☒	☐	☐	W. LEG OF M-43
	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	

DISAPPEARING LEGEND CASE SIGNS

ADDITIONAL DIAL SPLIT DATA

		PHASE	1	2	3	4	5	6	7	8	O1	O2	O3
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											

COORDINATION DATA

Operation Mode	1
Coordination Mode	2
Maximum Mode	0
Correction Mode	2
Offset Mode	0
Force Mode	0
Max Dwell	0
Yield Period	0

REMARKS:

ADDITIONAL OVERLAP DATA

Overlap Phase	*Load Bays*	*Phases Overlapped*	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN
E = SB Marsh RTGA		1	0.0	0.0	0.0		
=							
=							
=							

PREPARED BY: HHH DATE: 03/20/09

☒ MDOT ☐ County ☐ City ☐ Consultant

LOCATION:
M-43 (GRAND RIVER)/MARSH ROAD

CONTROL SECTION-SPOT #
33082-01-014

CLEAR PAGE 2

PREEMPTION INFORMATION FORM

Preemption Description: EB EMERGENCY VEHICLE

Preempt # = 1	Time (s)	Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SEL Ped Cl	22	Vehicle	Track																
SEL Yellow	4.3		Dwell	G	R	R	R	R	G	R	R								
SEL Red Cl	2.5		Cycle																
TRACK Green	0		Exit				1				1								
TRACK Ped Cl	0	Ped	Track																
TRACK Yellow	0.0		Dwell		DW		DW		DW		DW								
TRACK Red CL	0.0		Cycle																
DWELL Green	0	Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl	0		Track																
RET Yellow	4.3		Dwell																
RET Red Cl	1.9		Cycle																

☐ Locking
☒ Non-Locking

Delay (s)	0
Extend (s)	0
Duration (s)	0
Max Call (s)	180
Lockout (s)	0
Link PE #	0

Preemption Description: WB EMERGENCY VEHICLE

Preempt # = 2	Time (s)	Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SEL Ped Cl	22	Vehicle	Track																
SEL Yellow	4.3		Dwell	R	G	R	R	G	R	R	R								
SEL Red Cl	2.5		Cycle																
TRACK Green	0		Exit				1				1								
TRACK Ped Cl	0	Ped	Track																
TRACK Yellow	0.0		Dwell		DW		DW		DW		DW								
TRACK Red CL	0.0		Cycle																
DWELL Green	0	Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl	0		Track																
RET Yellow	4.3		Dwell																
RET Red Cl	1.9		Cycle																

☐ Locking
☒ Non-Locking

Delay (s)	0
Extend (s)	0
Duration (s)	0
Max Call (s)	180
Lockout (s)	0
Link PE #	0

Preemption Description: NB EMERGENCY VEHICLE

Preempt # = 3	Time (s)	Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SEL Ped Cl	22	Vehicle	Track																
SEL Yellow	4.3		Dwell	R	R	G	R	R	R	R	G								
SEL Red Cl	2.5		Cycle																
TRACK Green	0		Exit		1				1										
TRACK Ped Cl	0	Ped	Track																
TRACK Yellow	0.0		Dwell		DW		DW		DW		DW								
TRACK Red CL	0.0		Cycle																
DWELL Green	0	Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl	0		Track																
RET Yellow	4.1		Dwell																
RET Red Cl	2.5		Cycle																

☐ Locking
☒ Non-Locking

Delay (s)	0
Extend (s)	0
Duration (s)	0
Max Call (s)	180
Lockout (s)	0
Link PE #	0

Preemption Description: SB EMERGENCY VEHICLE

Preempt # = 4	Time (s)	Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SEL Ped Cl	22	Vehicle	Track																
SEL Yellow	4.3		Dwell	R	R	R	G	R	R	G	R								
SEL Red Cl	2.5		Cycle																
TRACK Green	0		Exit		1				1										
TRACK Ped Cl	0	Ped	Track																
TRACK Yellow	0.0		Dwell		DW		DW		DW		DW								
TRACK Red CL	0.0		Cycle																
DWELL Green	0	Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl	0		Track																
RET Yellow	4.1		Dwell																
RET Red Cl	2.5		Cycle																

☐ Locking
☒ Non-Locking

Delay (s)	0
Extend (s)	0
Duration (s)	0
Max Call (s)	180
Lockout (s)	0
Link PE #	0

Preempt System Data

Ring	1	2	3	4		
MIN GRN/WLK (s)	7.0	7.0				
Priority	PE/FL	PE1/2	PE2/3	PE3/4	PE4/5	PE5/6
Status	0	0	0	0		

REMARKS :

REVISED PRE-EMPT
INGHAM COUNTY SIGNAL OPTIMIZATION

OPTIMIZED BY PARSONS

PREPARED BY: HHH DATE: 03/20/09

LOCATION:
M-43 (GRAND RIVER)/MARSH ROAD

CONTROL SECTION-SPOT #
33082-01-014

CLEAR PAGE 3

TRAFFIC SIGNAL TIMING PERMIT

	PHASE	1	2	3	4	5	6	7	8			
APPROACH		EB LT	WB	SB LT	NB	WB LT	EB	NB LT	SB			
MINIMUM GREEN		5	10	5	7	5	10	5	7			
PASSAGE		3.0	0.0	3.0	3.0	3.0	0.0	3.0	3.0			
MAXIMUM NO. 1		14	45	16	36	14	45	16	36			
MAXIMUM NO. 2		0	0	0	0	0	0	0	0			
YELLOW CHANGE		4.3	4.3	3.9	3.9	4.3	4.3	3.9	3.9			
RED CLEARANCE		1.9	1.9	2.5	2.5	1.9	1.9	2.5	2.5			
WALK		0	7	0	7	0	7	0	7			
PEDESTRIAN CLEARANCE		0	15	0	20	0	15	0	20			
EXTENDED PED. CLEARANCE		0	1	0	1	0	1	0	1			
REST IN WALK		0	0	0	0	0	0	0	0			
INITIALIZATION		1	4	1	1	1	4	1	1			
NON-ACT RESPONSE		0	1	0	0	0	1	0	0			
VEHICLE RECALL		0	3	0	0	0	3	0	0			
PEDESTRIAN RECALL		0	2	0	0	0	2	0	0			
NON-LOCK MEMORY		1	0	1	0	1	0	1	0			
DUAL ENTRY		0	1	0	1	0	1	0	1			
	CYCLE									O1	O2	O3
DIAL 1 SPLIT 1	100	14	45	13	28	14	45	13	28	80		
DIAL 2 SPLIT 1	100	13	38	13	36	13	38	13	36	74		
DIAL 3 SPLIT 1	100	13	43	16	28	13	43	16	28	13		
DIAL SPLIT												
DIAL SPLIT												
DIAL SPLIT												
	MODE	0	1	0	0	0	1	0	0			

PHASE

1 EB M-43 (GRAND RIVER) LEFT

2 WB M-43 (GRAND RIVER) THRU

3 SB OKEMOS ROAD LEFT

4 NB OKEMOS ROAD THRU

5 WB M-43 (GRAND RIVER) LEFT

6 EB M-43 (GRAND RIVER) THRU

7 NB OKEMOS ROAD LEFT

8 SB OKEMOS ROAD THRU

D1/S1/O1: NORMAL
D2/S1/O1: 06:00-09:00 MONDAY - FRIDAY
D3/S1/O1: 15:00-18:30 MONDAY - FRIDAY

THIS SUBJECT INTERSECTION IS INCORPORATED WITHIN A CLOSED-LOOP SYSTEM. THE MASTER CONTROLLER IS ALSO LOCATED AT THIS SUBJECT INTERSECTION.

OVERLAPS

Overlap Phase	*Load Bays*	*Phases Overlapped*	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN
A = EB M-43 Lefts "FYA"	9		0.0	4.3	1.9	1	2
B = SB Okemos Lefts "FYA"	10		0.0	3.9	2.5	3	4
C = WB M-43 Lefts "FYA"	11		0.0	4.3	1.9	5	6
D = NB Okemos Lefts "FYA"	12		0.0	3.9	2.5	7	8

TIMING INSTALLED 01/31/12

REMARKS

16-LOAD-SWITCH, BASE-MOUNTED EPAC TYPE CONTROLLER.

THE PASSAGE TIMES IN RELATION TO PHASES # 4 AND # 8 HAVE BEEN REVISED.

ALL LEFT TURNS OPERATE ON A LAGGING, PERMISSIVE-PROTECTED BASIS VIA UTILIZING FLASHING-YELLOW-ARROW SIGNAL HEAD DISPLAYS.

PREPARED BY: HHH DATE: 01/27/12

FLASH HOURS: DAILY ☐ NONE ☒ to

NIGHT FLASH:

FY = FR =

CONFLICT FLASH:

FY = M-43 (GRAND RVR) THRUS & LEFTS FR = ALL OTHERS

CONTROLLER TYPE:
☒ EPAC
☐ Other:

PRE-EMPT ☒
COUNTDOWN PEDS ☐

LOCATION:
M-43 (GRAND RIVER) AT OKEMOS ROAD
CITY/TWP: MERIDIAN TOWNSHIP
COUNTY : INGHAM

MILE POINT 4.19
CONTROL SECTION-SPOT # 33082-01-016
Job # (If Applicable):

Page 3 included only if Pre-Empt Checked

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION

Controller Type:
- [x] EPAC
- [ ] Other:

System Type:
- [x] Closed Loop
  - [ ] Stand By
  - [x] Group 1
  - [ ] Group 2
  - Address: 03
- [ ] TBC
- [ ] TBC/GPS
- [ ] None
- [ ] Other:

If TBC, Synch by:
- [x] TOD
- [ ] Event

Interconnect Type:
- [ ] Hardwire
- [ ] Fiber-Optic
- [x] Radio
- [ ] Phone Drop
- [ ] None
- [ ] Other:

If Phone Drop, Phone #

Controller Status:
- [x] Master
- [ ] Slave
- [ ] Isolated
- [ ] TBC

If Slave, Master Location:

Master Spot # :

LEFT-TURN PHASING

Phase # / Description	Permissive-Protected Lead	Permissive-Protected Lag	Protected-Only Split	Protected-Only Lead	Protected-Only Lag
PHASE 1: EB M-43 (GRAND RIVER) LEFT	☐	☒	☐	☐	☐
PHASE 3: SB OKEMOS ROAD LEFT	☐	☒	☐	☐	☐
PHASE 5: WB M-43 (GRAND RIVER) LEFT	☐	☒	☐	☐	☐
PHASE 7: NB OKEMOS ROAD LEFT	☐	☒	☐	☐	☐

RING AND BARRIER STRUCTURE

	B1				B2				B3				B4			
R1	2	1			4	3										
R2	6	5			8	7										
R3																
R4																

VEHICULAR AND PEDESTRIAN DETECTION

Approach	Vehicular Detection: Movements and Call Delay (s) Left	Thru	Right	Type Loop	Video	Other	Pedestrian Detection: Push-Button Crossing Locations
NB OKEMOS ROAD	☒	☒	☐	☒	☐	☐	E. LEG OF M-43
SB OKEMOS ROAD	☒	☒	☐	☒	☐	☐	W. LEG OF M-43
EB M-43 (GD RIVER)	☒	☐	☐	☒	☐	☐	
WB M-43 (GD RIVER)	☒	☐	☐	☒	☐	☐	
	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	

DISAPPEARING LEGEND CASE SIGNS

ADDITIONAL DIAL SPLIT DATA

		PHASE	1	2	3	4	5	6	7	8	O1	O2	O3
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											
DIAL	SPLIT	CYCLE											

COORDINATION DATA

Operation Mode	1
Coordination Mode	0
Maximum Mode	0
Correction Mode	3
Offset Mode	0
Force Mode	0
Max Dwell	0
Yield Period	0

REMARKS:

ADDITIONAL OVERLAP DATA

Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN
=							
=							
=							
=							

PREPARED BY: HHH DATE: 01/27/12

☒ MDOT ☐ County ☐ City ☐ Consultant

LOCATION: M-43 (GRAND RIVER) AT OKEMOS ROAD

CONTROL SECTION-SPOT # 33082-01-016

CLEAR PAGE 2

PREEMPTION INFORMATION FORM

Preemption Description: EB EMERGENCY VEHICLE

Preempt # = 1	Time (s)	Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SEL Ped Cl	20	Vehicle	Track																
SEL Yellow	4.3		Dwell	G	R	R	R	R	G	R	R								
SEL Red Cl	2.5		Cycle																
TRACK Green	0		Exit				1				1								
TRACK Ped Cl	0	Ped	Track																
TRACK Yellow	0.0		Dwell		DW		DW		DW		DW								
TRACK Red CL	0.0		Cycle																
DWELL Green	10		Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl	0	Overlap Vehicle	Track																
RET Yellow	4.3		Dwell																
RET Red Cl	1.9		Cycle																

☐ Locking
☒ Non-Locking

Delay (s)	0
Extend (s)	0
Duration (s)	0
Max Call (s)	180
Lockout (s)	0
Link PE #	0

Preemption Description: WB EMERGENCY VEHICLE

Preempt # = 2	Time (s)	Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SEL Ped Cl	20	Vehicle	Track																
SEL Yellow	4.3		Dwell	R	G	R	R	G	R	R	R								
SEL Red Cl	2.5		Cycle																
TRACK Green	0		Exit				1				1								
TRACK Ped Cl	0	Ped	Track																
TRACK Yellow	0.0		Dwell		DW		DW		DW		DW								
TRACK Red CL	0.0		Cycle																
DWELL Green	10		Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl	0	Overlap Vehicle	Track																
RET Yellow	4.3		Dwell																
RET Red Cl	1.9		Cycle																

☐ Locking
☒ Non-Locking

Delay (s)	0
Extend (s)	0
Duration (s)	0
Max Call (s)	180
Lockout (s)	0
Link PE #	0

Preemption Description: NB EMERGENCY VEHICLE

Preempt # = 3	Time (s)	Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SEL Ped Cl	20	Vehicle	Track																
SEL Yellow	4.3		Dwell	R	R	R	G	R	R	G	R								
SEL Red Cl	2.5		Cycle																
TRACK Green	0		Exit		1				1										
TRACK Ped Cl	0	Ped	Track																
TRACK Yellow	0.0		Dwell		DW		DW		DW		DW								
TRACK Red CL	0.0		Cycle																
DWELL Green	10		Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl	0	Overlap Vehicle	Track																
RET Yellow	3.9		Dwell																
RET Red Cl	2.5		Cycle																

☐ Locking
☒ Non-Locking

Delay (s)	0
Extend (s)	0
Duration (s)	0
Max Call (s)	180
Lockout (s)	0
Link PE #	0

Preemption Description: SB EMERGENCY VEHICLE

Preempt # = 4	Time (s)	Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SEL Ped Cl	20	Vehicle	Track																
SEL Yellow	4.3		Dwell	R	R	G	R	R	R	R	G								
SEL Red Cl	2.5		Cycle																
TRACK Green	0		Exit		1				1										
TRACK Ped Cl	0	Ped	Track																
TRACK Yellow	0.0		Dwell		DW		DW		DW		DW								
TRACK Red CL	0.0		Cycle																
DWELL Green	10		Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl	0	Overlap Vehicle	Track																
RET Yellow	3.9		Dwell																
RET Red Cl	2.5		Cycle																

☐ Locking
☒ Non-Locking

Delay (s)	0
Extend (s)	0
Duration (s)	0
Max Call (s)	180
Lockout (s)	0
Link PE #	0

Preempt System Data

Ring	1	2	3	4		
MIN GRN/WLK (s)	7.0	7.0				
Priority	PE/FL	PE1/2	PE2/3	PE3/4	PE4/5	PE5/6
Status	1	1	0	0		

REMARKS :

PREPARED BY: HHH DATE: 01/27/12

LOCATION:
M-43 (GRAND RIVER) AT OKEMOS ROAD

CONTROL SECTION-SPOT #
33082-01-016

CLEAR PAGE 3

HCM 2010 Signalized Intersection Summary
1014: Marsh Road & Grand River Ave (M-43)

12/05/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	59	265	26	71	901	34	42	145	39	44	263	139
Future Volume (veh/h)	59	265	26	71	901	34	42	145	39	44	263	139
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	68	305	30	81	1024	39	55	191	51	46	277	146
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.76	0.76	0.76	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	2	2	2
Cap, veh/h	579	993	97	838	1079	482	170	290	75	209	421	634
Arrive On Green	0.56	0.62	0.62	0.28	0.31	0.31	0.04	0.10	0.10	0.05	0.12	0.12
Sat Flow, veh/h	1757	3225	315	1757	3505	1563	1774	2779	723	1774	3539	1579
Grp Volume(v), veh/h	68	165	170	81	1024	39	55	120	122	46	277	146
Grp Sat Flow(s),veh/h/ln	1757	1752	1788	1757	1752	1563	1774	1770	1733	1774	1770	1579
Q Serve(g_s), s	0.0	4.4	4.5	0.0	28.6	1.8	0.0	6.5	6.8	0.0	7.5	0.0
Cycle Q Clear(g_c), s	0.0	4.4	4.5	0.0	28.6	1.8	0.0	6.5	6.8	0.0	7.5	0.0
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	579	540	551	838	1079	482	170	184	181	209	421	634
V/C Ratio(X)	0.12	0.31	0.31	0.10	0.95	0.08	0.32	0.65	0.68	0.22	0.66	0.23
Avail Cap(c_a), veh/h	579	540	551	838	1079	482	217	542	530	230	1083	929
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	14.1	14.2	11.3	33.8	24.6	45.4	43.0	43.2	43.1	42.1	19.8
Incr Delay (d2), s/veh	0.1	1.5	1.5	0.0	17.5	0.3	1.1	3.8	4.4	0.5	1.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.3	2.4	1.1	16.4	0.8	1.5	3.4	3.5	1.2	3.8	2.7
LnGrp Delay(d),s/veh	15.6	15.6	15.6	11.3	51.3	24.9	46.5	46.9	47.5	43.7	43.8	20.0
LnGrp LOS	B	B	B	B	D	C	D	D	D	D	D	B
Approach Vol, veh/h		403			1144			297			469	
Approach Delay, s/veh		15.6			47.6			47.1			36.4	
Approach LOS		B			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.4	37.0	10.3	18.3	34.4	37.0	11.8	16.8
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 31	6.6	30.6	* 6.8	* 31	6.6	30.6
Max Q Clear Time (g_c+I1), s	2.0	30.6	2.0	9.5	2.0	6.5	2.0	8.8
Green Ext Time (p_c), s	0.1	0.2	0.1	2.0	0.1	1.7	0.1	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	39.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	283	94	102	925	49	149	164	55	79	409	86
Future Volume (veh/h)	22	283	94	102	925	49	149	164	55	79	409	86
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	23	298	99	115	1039	55	167	184	62	98	505	106
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.89	0.89	0.89	0.89	0.89	0.89	0.81	0.81	0.81
Percent Heavy Veh, %	3	3	3	3	3	3	1	1	1	1	1	1
Cap, veh/h	350	1115	497	588	1077	57	190	281	92	398	622	130
Arrive On Green	0.15	0.32	0.32	0.20	0.42	0.42	0.07	0.11	0.11	0.17	0.21	0.21
Sat Flow, veh/h	1757	3505	1564	1757	3386	179	1792	2648	865	1792	2944	615
Grp Volume(v), veh/h	23	298	99	115	538	556	167	122	124	98	306	305
Grp Sat Flow(s),veh/h/ln	1757	1752	1564	1757	1752	1812	1792	1787	1726	1792	1787	1772
Q Serve(g_s), s	0.0	6.3	4.6	0.0	29.9	29.9	5.2	6.6	6.9	0.0	16.3	16.4
Cycle Q Clear(g_c), s	0.0	6.3	4.6	0.0	29.9	29.9	5.2	6.6	6.9	0.0	16.3	16.4
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.50	1.00		0.35
Lane Grp Cap(c), veh/h	350	1115	497	588	557	576	190	189	183	398	378	375
V/C Ratio(X)	0.07	0.27	0.20	0.20	0.96	0.97	0.88	0.65	0.68	0.25	0.81	0.82
Avail Cap(c_a), veh/h	350	1115	497	588	557	576	190	529	511	398	529	524
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	25.4	24.8	18.6	28.3	28.3	44.9	42.9	43.1	34.2	37.5	37.6
Incr Delay (d2), s/veh	0.1	0.6	0.9	0.2	30.4	29.8	34.0	3.7	4.3	0.3	6.3	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.2	2.1	2.0	19.0	19.6	6.3	3.4	3.5	2.3	8.6	8.8
LnGrp Delay(d),s/veh	35.6	26.0	25.7	18.8	58.7	58.1	78.9	46.6	47.4	34.5	43.8	44.3
LnGrp LOS	D	C	C	B	E	E	E	D	D	C	D	D
Approach Vol, veh/h		420			1209			413			709	
Approach Delay, s/veh		26.5			54.6			59.9			42.8	
Approach LOS		C			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.5	38.0	23.5	17.0	21.5	38.0	13.0	27.5
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 32	6.6	29.6	* 6.8	* 32	6.6	29.6
Max Q Clear Time (g_c+I1), s	2.0	31.9	2.0	8.9	2.0	8.3	7.2	18.4
Green Ext Time (p_c), s	0.1	0.0	0.3	1.3	0.1	2.0	0.0	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	48.1
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	400	26	6	1020	17	15
Future Vol, veh/h	400	26	6	1020	17	15
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	84	84	80	80
Heavy Vehicles, %	4	4	3	3	2	2
Mvmt Flow	421	27	7	1214	21	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	449	0	1057	225
Stage 1	-	-	-	-	436	-
Stage 2	-	-	-	-	621	-
Critical Hdwy	-	-	4.16	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.23	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1101	-	220	778
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	498	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1101	-	218	777
Mov Cap-2 Maneuver	-	-	-	-	348	-
Stage 1	-	-	-	-	618	-
Stage 2	-	-	-	-	495	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	348	777	-	-	1101	-
HCM Lane V/C Ratio	0.061	0.024	-	-	0.006	-
HCM Control Delay (s)	16	9.7	-	-	8.3	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

HCM 2010 Signalized Intersection Summary
1014: Marsh Road & Grand River Ave (M-43)

12/05/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	314	890	39	116	454	124	53	459	105	115	383	281
Future Volume (veh/h)	314	890	39	116	454	124	53	459	105	115	383	281
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1863	1863	1863	1863	1900	1881	1881	1881
Adj Flow Rate, veh/h	341	967	42	122	478	131	58	504	115	129	430	316
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.91	0.91	0.91	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	2	2	2	2	2	2	1	1	1
Cap, veh/h	553	1085	47	407	1090	485	279	622	141	161	610	552
Arrive On Green	0.17	0.31	0.31	0.17	0.31	0.31	0.09	0.22	0.22	0.05	0.17	0.17
Sat Flow, veh/h	1810	3524	153	1774	3539	1574	1774	2866	651	1792	3574	1596
Grp Volume(v), veh/h	341	495	514	122	478	131	58	310	309	129	430	316
Grp Sat Flow(s),veh/h/ln	1810	1805	1872	1774	1770	1574	1774	1770	1747	1792	1787	1596
Q Serve(g_s), s	3.1	26.2	26.2	0.2	10.8	6.3	0.0	16.6	16.8	2.9	11.3	0.0
Cycle Q Clear(g_c), s	3.1	26.2	26.2	0.2	10.8	6.3	0.0	16.6	16.8	2.9	11.3	0.0
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	553	556	577	407	1090	485	279	384	379	161	610	552
V/C Ratio(X)	0.62	0.89	0.89	0.30	0.44	0.27	0.21	0.81	0.81	0.80	0.70	0.57
Avail Cap(c_a), veh/h	553	556	577	407	1090	485	279	542	535	192	1094	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	33.0	33.0	33.6	27.7	26.1	39.1	37.2	37.2	45.8	39.1	26.7
Incr Delay (d2), s/veh	2.1	19.1	18.5	0.4	1.3	1.4	0.4	6.1	6.5	18.2	1.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	15.9	16.4	2.8	5.4	2.9	1.5	8.7	8.8	4.3	5.7	7.2
LnGrp Delay(d),s/veh	31.5	52.1	51.5	34.0	29.0	27.5	39.5	43.3	43.8	64.0	40.6	27.7
LnGrp LOS	C	D	D	C	C	C	D	D	D	E	D	C
Approach Vol, veh/h		1350			731			677			875	
Approach Delay, s/veh		46.7			29.5			43.2			39.4	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.7	37.0	15.9	23.5	23.7	37.0	11.2	28.1
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 31	6.6	30.6	* 6.8	* 31	6.6	30.6
Max Q Clear Time (g_c+I1), s	5.1	12.8	2.0	13.3	2.2	28.2	4.9	18.8
Green Ext Time (p_c), s	0.3	3.1	0.2	3.5	0.6	1.5	0.1	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	40.8
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	161	1242	143	161	753	77	265	442	207	141	307	88
Future Volume (veh/h)	161	1242	143	161	753	77	265	442	207	141	307	88
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1863	1863	1900	1900	1900	1900	1863	1863	1900
Adj Flow Rate, veh/h	171	1321	152	175	818	84	279	465	218	153	334	96
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	0	0	0	2	2	2
Cap, veh/h	357	1290	573	265	1168	120	316	520	242	186	422	120
Arrive On Green	0.11	0.36	0.36	0.11	0.36	0.36	0.13	0.22	0.22	0.06	0.16	0.16
Sat Flow, veh/h	1792	3574	1588	1774	3239	333	1810	2389	1112	1774	2720	770
Grp Volume(v), veh/h	171	1321	152	175	447	455	279	350	333	153	215	215
Grp Sat Flow(s),veh/h/ln	1792	1787	1588	1774	1770	1801	1810	1805	1696	1774	1770	1720
Q Serve(g_s), s	0.0	36.8	6.9	5.4	22.0	22.0	10.5	19.2	19.5	4.6	11.9	12.3
Cycle Q Clear(g_c), s	0.0	36.8	6.9	5.4	22.0	22.0	10.5	19.2	19.5	4.6	11.9	12.3
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.66	1.00		0.45
Lane Grp Cap(c), veh/h	357	1290	573	265	638	650	316	393	369	186	275	267
V/C Ratio(X)	0.48	1.02	0.27	0.66	0.70	0.70	0.88	0.89	0.90	0.82	0.78	0.80
Avail Cap(c_a), veh/h	357	1290	573	265	638	650	316	409	384	238	401	390
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	32.6	23.0	41.7	27.9	27.9	41.8	38.8	38.8	45.7	41.4	41.6
Incr Delay (d2), s/veh	1.0	31.4	1.1	5.9	6.3	6.2	24.1	20.7	23.1	16.5	6.2	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	23.7	3.2	5.1	11.8	12.0	9.8	11.8	11.5	5.1	6.3	6.4
LnGrp Delay(d),s/veh	37.5	64.0	24.2	47.7	34.2	34.1	65.9	59.5	62.0	62.2	47.6	49.1
LnGrp LOS	D	F	C	D	C	C	E	E	E	E	D	D
Approach Vol, veh/h		1644			1077			962			583	
Approach Delay, s/veh		57.6			36.3			62.2			52.0	
Approach LOS		E			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.4	43.0	13.0	28.6	17.4	43.0	19.4	22.2
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 37	9.6	23.1	* 6.8	* 37	9.6	23.1
Max Q Clear Time (g_c+I1), s	2.0	24.0	6.6	21.5	7.4	38.8	12.5	14.3
Green Ext Time (p_c), s	0.4	4.3	0.2	0.7	0.0	0.0	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	52.5
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1449	148	24	897	58	54
Future Vol, veh/h	1449	148	24	897	58	54
Conflicting Peds, #/hr	0	6	6	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	82	82
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	1525	156	25	944	71	66

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1687	0	2132	847
Stage 1	-	-	-	-	1609	-
Stage 2	-	-	-	-	523	-
Critical Hdwy	-	-	4.14	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.22	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	375	-	~ 43	309
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	565	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	375	-	~ 40	307
Mov Cap-2 Maneuver	-	-	-	-	119	-
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	527	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	46.9
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	119	307	-	-	375	-
HCM Lane V/C Ratio	0.594	0.215	-	-	0.067	-
HCM Control Delay (s)	72.1	19.9	-	-	15.3	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	3	0.8	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 2010 Signalized Intersection Summary
1014: Marsh Road & Grand River Ave (M-43)

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	59	265	26	71	901	34	42	145	39	44	263	139
Future Volume (veh/h)	59	265	26	71	901	34	42	145	39	44	263	139
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	69	311	30	82	1044	39	56	195	52	47	282	149
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.76	0.76	0.76	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	2	2	2
Cap, veh/h	571	995	95	832	1079	482	170	294	76	210	427	634
Arrive On Green	0.56	0.62	0.62	0.28	0.31	0.31	0.04	0.11	0.11	0.05	0.12	0.12
Sat Flow, veh/h	1757	3232	310	1757	3505	1563	1774	2780	723	1774	3539	1579
Grp Volume(v), veh/h	69	168	173	82	1044	39	56	122	125	47	282	149
Grp Sat Flow(s),veh/h/ln	1757	1752	1789	1757	1752	1563	1774	1770	1733	1774	1770	1579
Q Serve(g_s), s	0.0	4.5	4.6	0.0	29.4	1.8	0.0	6.6	6.9	0.0	7.6	0.0
Cycle Q Clear(g_c), s	0.0	4.5	4.6	0.0	29.4	1.8	0.0	6.6	6.9	0.0	7.6	0.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	571	540	551	832	1079	482	170	187	183	210	427	634
V/C Ratio(X)	0.12	0.31	0.31	0.10	0.97	0.08	0.33	0.65	0.68	0.22	0.66	0.24
Avail Cap(c_a), veh/h	571	540	551	832	1079	482	217	542	530	230	1083	926
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.8	14.2	14.2	11.4	34.1	24.6	45.4	42.9	43.1	43.1	42.0	19.8
Incr Delay (d2), s/veh	0.1	1.5	1.5	0.1	20.5	0.3	1.1	3.8	4.4	0.5	1.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.4	2.4	1.1	17.3	0.8	1.5	3.5	3.5	1.3	3.8	2.7
LnGrp Delay(d),s/veh	15.9	15.7	15.7	11.5	54.6	24.9	46.5	46.8	47.5	43.6	43.7	20.0
LnGrp LOS	B	B	B	B	D	C	D	D	D	D	D	C
Approach Vol, veh/h		410			1165			303			478	
Approach Delay, s/veh		15.7			50.6			47.0			36.3	
Approach LOS		B			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.2	37.0	10.3	18.5	34.2	37.0	11.8	17.0
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 31	6.6	30.6	* 6.8	* 31	6.6	30.6
Max Q Clear Time (g_c+I1), s	2.0	31.4	2.0	9.6	2.0	6.6	2.0	8.9
Green Ext Time (p_c), s	0.1	0.0	0.1	2.1	0.1	1.7	0.1	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	41.2
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	283	94	102	925	49	149	164	55	79	409	86
Future Volume (veh/h)	22	283	94	102	925	49	149	164	55	79	409	86
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	24	304	101	117	1060	56	171	188	63	99	515	108
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.89	0.89	0.89	0.89	0.89	0.89	0.81	0.81	0.81
Percent Heavy Veh, %	3	3	3	3	3	3	1	1	1	1	1	1
Cap, veh/h	338	1115	497	579	1077	57	190	285	93	402	632	132
Arrive On Green	0.15	0.32	0.32	0.20	0.42	0.42	0.07	0.11	0.11	0.17	0.21	0.21
Sat Flow, veh/h	1757	3505	1564	1757	3386	179	1792	2652	862	1792	2944	615
Grp Volume(v), veh/h	24	304	101	117	548	568	171	125	126	99	312	311
Grp Sat Flow(s),veh/h/ln	1757	1752	1564	1757	1752	1813	1792	1787	1726	1792	1787	1772
Q Serve(g_s), s	0.0	6.5	4.7	0.0	30.9	31.0	5.4	6.7	7.0	0.0	16.6	16.7
Cycle Q Clear(g_c), s	0.0	6.5	4.7	0.0	30.9	31.0	5.4	6.7	7.0	0.0	16.6	16.7
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.50	1.00		0.35
Lane Grp Cap(c), veh/h	338	1115	497	579	557	576	190	192	186	402	384	380
V/C Ratio(X)	0.07	0.27	0.20	0.20	0.98	0.98	0.90	0.65	0.68	0.25	0.81	0.82
Avail Cap(c_a), veh/h	338	1115	497	579	557	576	190	529	511	402	529	524
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.1	25.5	24.9	19.0	28.6	28.6	45.0	42.8	43.0	34.0	37.3	37.4
Incr Delay (d2), s/veh	0.1	0.6	0.9	0.2	34.4	33.9	38.4	3.7	4.3	0.3	6.7	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.2	2.2	2.1	20.2	20.8	6.7	3.5	3.6	2.3	8.9	9.0
LnGrp Delay(d),s/veh	36.2	26.1	25.8	19.2	63.0	62.5	83.4	46.5	47.3	34.3	44.0	44.5
LnGrp LOS	D	C	C	B	E	E	F	D	D	C	D	D
Approach Vol, veh/h		429			1233			422			722	
Approach Delay, s/veh		26.6			58.6			61.7			42.9	
Approach LOS		C			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.1	38.0	23.7	17.2	21.1	38.0	13.0	27.9
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 32	6.6	29.6	* 6.8	* 32	6.6	29.6
Max Q Clear Time (g_c+I1), s	2.0	33.0	2.0	9.0	2.0	8.5	7.4	18.7
Green Ext Time (p_c), s	0.1	0.0	0.3	1.4	0.1	2.0	0.0	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	50.1
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	400	26	5	1020	17	15
Future Vol, veh/h	400	26	5	1020	17	15
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	84	84	80	80
Heavy Vehicles, %	4	4	3	3	2	2
Mvmt Flow	429	28	6	1239	22	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	458	0	1075	230
Stage 1	-	-	-	-	444	-
Stage 2	-	-	-	-	631	-
Critical Hdwy	-	-	4.16	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.23	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1092	-	214	772
Stage 1	-	-	-	-	614	-
Stage 2	-	-	-	-	492	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1092	-	213	771
Mov Cap-2 Maneuver	-	-	-	-	343	-
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	489	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	343	771	-	-	1092	-
HCM Lane V/C Ratio	0.063	0.025	-	-	0.006	-
HCM Control Delay (s)	16.2	9.8	-	-	8.3	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

HCM 2010 Signalized Intersection Summary
1014: Marsh Road & Grand River Ave (M-43)

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	314	890	39	116	454	124	53	459	105	115	383	281
Future Volume (veh/h)	314	890	39	116	454	124	53	459	105	115	383	281
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1863	1863	1863	1863	1900	1881	1881	1881
Adj Flow Rate, veh/h	348	987	43	125	487	133	59	514	118	132	439	322
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.91	0.91	0.91	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	2	2	2	2	2	2	1	1	1
Cap, veh/h	539	1085	47	393	1090	485	283	631	144	164	620	547
Arrive On Green	0.17	0.31	0.31	0.17	0.31	0.31	0.10	0.22	0.22	0.05	0.17	0.17
Sat Flow, veh/h	1810	3523	153	1774	3539	1574	1774	2862	654	1792	3574	1596
Grp Volume(v), veh/h	348	506	524	125	487	133	59	317	315	132	439	322
Grp Sat Flow(s),veh/h/ln	1810	1805	1872	1774	1770	1574	1774	1770	1746	1792	1787	1596
Q Serve(g_s), s	3.8	26.9	26.9	0.7	11.0	6.4	0.0	17.0	17.2	3.1	11.6	0.0
Cycle Q Clear(g_c), s	3.8	26.9	26.9	0.7	11.0	6.4	0.0	17.0	17.2	3.1	11.6	0.0
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	539	556	577	393	1090	485	283	390	385	164	620	547
V/C Ratio(X)	0.65	0.91	0.91	0.32	0.45	0.27	0.21	0.81	0.82	0.81	0.71	0.59
Avail Cap(c_a), veh/h	539	556	577	393	1090	485	283	542	534	192	1094	759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.3	33.3	33.3	34.2	27.8	26.2	38.9	37.0	37.1	45.7	38.9	27.1
Incr Delay (d2), s/veh	2.7	21.3	20.8	0.5	1.3	1.4	0.4	6.5	6.9	19.1	1.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	16.6	17.2	2.9	5.6	3.0	1.5	9.0	9.0	4.5	5.9	7.4
LnGrp Delay(d),s/veh	32.9	54.6	54.0	34.7	29.1	27.6	39.3	43.5	44.0	64.8	40.4	28.1
LnGrp LOS	C	D	D	C	C	C	D	D	D	E	D	C
Approach Vol, veh/h		1378			745			691			893	
Approach Delay, s/veh		48.9			29.8			43.3			39.6	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.1	37.0	16.1	23.8	23.1	37.0	11.4	28.5
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 31	6.6	30.6	* 6.8	* 31	6.6	30.6
Max Q Clear Time (g_c+I1), s	5.8	13.0	2.0	13.6	2.7	28.9	5.1	19.2
Green Ext Time (p_c), s	0.2	3.1	0.2	3.6	0.6	1.1	0.1	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	41.8
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	161	1242	143	161	753	77	265	442	207	141	307	88
Future Volume (veh/h)	161	1242	143	161	753	77	265	442	207	141	307	88
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1863	1863	1900	1900	1900	1900	1863	1863	1900
Adj Flow Rate, veh/h	175	1348	155	178	835	85	285	475	222	156	340	98
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	0	0	0	2	2	2
Cap, veh/h	344	1290	573	258	1170	119	319	526	244	189	428	122
Arrive On Green	0.11	0.36	0.36	0.11	0.36	0.36	0.13	0.22	0.22	0.07	0.16	0.16
Sat Flow, veh/h	1792	3574	1588	1774	3242	330	1810	2391	1110	1774	2718	772
Grp Volume(v), veh/h	175	1348	155	178	456	464	285	358	339	156	220	218
Grp Sat Flow(s),veh/h/ln	1792	1787	1588	1774	1770	1802	1810	1805	1697	1774	1770	1720
Q Serve(g_s), s	0.1	36.8	7.1	5.7	22.6	22.6	10.9	19.7	19.9	4.7	12.2	12.5
Cycle Q Clear(g_c), s	0.1	36.8	7.1	5.7	22.6	22.6	10.9	19.7	19.9	4.7	12.2	12.5
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.65	1.00		0.45
Lane Grp Cap(c), veh/h	344	1290	573	258	638	650	319	397	373	189	279	271
V/C Ratio(X)	0.51	1.05	0.27	0.69	0.71	0.71	0.89	0.90	0.91	0.83	0.79	0.81
Avail Cap(c_a), veh/h	344	1290	573	258	638	650	319	409	384	238	401	389
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.4	32.6	23.1	42.2	28.1	28.1	41.7	38.7	38.8	45.6	41.3	41.5
Incr Delay (d2), s/veh	1.2	37.8	1.2	7.6	6.7	6.6	25.6	22.1	24.5	17.2	6.5	7.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	24.9	3.3	5.3	12.2	12.4	10.1	12.3	11.9	5.2	6.5	6.5
LnGrp Delay(d),s/veh	38.6	70.4	24.3	49.8	34.8	34.6	67.3	60.8	63.3	62.8	47.8	49.4
LnGrp LOS	D	F	C	D	C	C	E	E	E	E	D	D
Approach Vol, veh/h		1678			1098			982			594	
Approach Delay, s/veh		62.8			37.1			63.6			52.3	
Approach LOS		E			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	43.0	13.2	28.8	17.0	43.0	19.6	22.5
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 37	9.6	23.1	* 6.8	* 37	9.6	23.1
Max Q Clear Time (g_c+I1), s	2.1	24.6	6.7	21.9	7.7	38.8	12.9	14.5
Green Ext Time (p_c), s	0.5	4.3	0.1	0.6	0.0	0.0	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	55.1
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1449	148	24	897	58	54
Future Vol, veh/h	1449	148	24	897	58	54
Conflicting Peds, #/hr	0	6	6	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	82	82
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	1556	159	26	963	72	67

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1721	0	2174	863
Stage 1	-	-	-	-	1641	-
Stage 2	-	-	-	-	533	-
Critical Hdwy	-	-	4.14	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.22	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	364	-	~ 41	302
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	558	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	364	-	~ 38	300
Mov Cap-2 Maneuver	-	-	-	-	115	-
Stage 1	-	-	-	-	145	-
Stage 2	-	-	-	-	518	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	50.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	115	300	-	-	364	-
HCM Lane V/C Ratio	0.627	0.224	-	-	0.071	-
HCM Control Delay (s)	78.4	20.4	-	-	15.6	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	3.2	0.8	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 2010 Signalized Intersection Summary
1014: Marsh Road & Grand River Ave (M-43)

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	64	297	28	72	947	35	44	148	40	45	268	146
Future Volume (veh/h)	64	297	28	72	947	35	44	148	40	45	268	146
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	74	341	32	82	1076	40	58	195	53	47	282	154
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.76	0.76	0.76	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	2	2	2
Cap, veh/h	563	998	93	817	1079	482	171	294	78	210	428	633
Arrive On Green	0.56	0.62	0.62	0.28	0.31	0.31	0.04	0.11	0.11	0.05	0.12	0.12
Sat Flow, veh/h	1757	3240	302	1757	3505	1563	1774	2767	733	1774	3539	1579
Grp Volume(v), veh/h	74	183	190	82	1076	40	58	123	125	47	282	154
Grp Sat Flow(s),veh/h/ln	1757	1752	1790	1757	1752	1563	1774	1770	1731	1774	1770	1579
Q Serve(g_s), s	0.0	5.1	5.2	0.0	30.7	1.8	0.0	6.7	7.0	0.0	7.6	0.0
Cycle Q Clear(g_c), s	0.0	5.1	5.2	0.0	30.7	1.8	0.0	6.7	7.0	0.0	7.6	0.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	563	540	551	817	1079	482	171	188	184	210	428	633
V/C Ratio(X)	0.13	0.34	0.34	0.10	1.00	0.08	0.34	0.65	0.68	0.22	0.66	0.24
Avail Cap(c_a), veh/h	563	540	551	817	1079	482	218	542	530	230	1083	925
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	14.3	14.3	11.8	34.6	24.6	45.3	42.9	43.1	43.1	42.0	19.9
Incr Delay (d2), s/veh	0.1	1.7	1.7	0.1	26.6	0.3	1.2	3.8	4.4	0.5	1.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.7	2.8	1.2	18.8	0.8	1.6	3.4	3.6	1.3	3.8	2.8
LnGrp Delay(d),s/veh	16.0	16.0	16.0	11.8	61.2	24.9	46.5	46.7	47.4	43.6	43.7	20.1
LnGrp LOS	B	B	B	B	E	C	D	D	D	D	D	C
Approach Vol, veh/h		447			1198			306			483	
Approach Delay, s/veh		16.0			56.6			47.0			36.2	
Approach LOS		B			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.1	37.0	10.4	18.5	34.1	37.0	11.9	17.0
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 31	6.6	30.6	* 6.8	* 31	6.6	30.6
Max Q Clear Time (g_c+I1), s	2.0	32.7	2.0	9.6	2.0	7.2	2.0	9.0
Green Ext Time (p_c), s	0.1	0.0	0.1	2.1	0.1	1.9	0.1	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	43.9
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	298	96	106	950	52	152	167	58	83	417	88
Future Volume (veh/h)	22	298	96	106	950	52	152	167	58	83	417	88
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	23	314	101	119	1067	58	171	188	65	102	515	109
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.89	0.89	0.89	0.89	0.89	0.89	0.81	0.81	0.81
Percent Heavy Veh, %	3	3	3	3	3	3	1	1	1	1	1	1
Cap, veh/h	335	1115	497	574	1075	58	190	285	95	401	632	133
Arrive On Green	0.15	0.32	0.32	0.15	0.32	0.32	0.07	0.11	0.11	0.17	0.21	0.21
Sat Flow, veh/h	1757	3505	1564	1757	3380	184	1792	2629	881	1792	2939	619
Grp Volume(v), veh/h	23	314	101	119	553	572	171	126	127	102	312	312
Grp Sat Flow(s),veh/h/ln	1757	1752	1564	1757	1752	1812	1792	1787	1723	1792	1787	1771
Q Serve(g_s), s	0.0	6.7	4.7	0.0	31.4	31.5	5.4	6.8	7.1	0.0	16.6	16.8
Cycle Q Clear(g_c), s	0.0	6.7	4.7	0.0	31.4	31.5	5.4	6.8	7.1	0.0	16.6	16.8
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.51	1.00		0.35
Lane Grp Cap(c), veh/h	335	1115	497	574	557	576	190	194	187	401	384	381
V/C Ratio(X)	0.07	0.28	0.20	0.21	0.99	0.99	0.90	0.65	0.68	0.25	0.81	0.82
Avail Cap(c_a), veh/h	335	1115	497	574	557	576	190	529	510	401	529	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.2	25.5	24.9	20.6	34.0	34.0	45.0	42.8	42.9	34.1	37.3	37.4
Incr Delay (d2), s/veh	0.1	0.6	0.9	0.2	36.3	35.8	38.4	3.7	4.3	0.3	6.7	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.3	2.2	2.3	20.8	21.5	6.7	3.5	3.6	2.4	9.0	9.0
LnGrp Delay(d),s/veh	36.3	26.2	25.8	20.7	70.3	69.8	83.4	46.4	47.3	34.4	44.1	44.6
LnGrp LOS	D	C	C	C	E	E	F	D	D	C	D	D
Approach Vol, veh/h		438			1244			424			726	
Approach Delay, s/veh		26.6			65.3			61.6			42.9	
Approach LOS		C			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.1	38.0	23.7	17.2	21.1	38.0	13.0	27.9
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 32	6.6	29.6	* 6.8	* 32	6.6	29.6
Max Q Clear Time (g_c+I1), s	2.0	33.5	2.0	9.1	2.0	8.7	7.4	18.8
Green Ext Time (p_c), s	0.1	0.0	0.3	1.4	0.1	2.1	0.0	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	53.0
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	440	27	6	1073	17	15
Future Vol, veh/h	440	27	6	1073	17	15
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	84	84	80	80
Heavy Vehicles, %	4	4	3	3	2	2
Mvmt Flow	463	28	7	1277	21	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	493	0	1131	247
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	653	-
Critical Hdwy	-	-	4.16	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.23	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1060	-	197	753
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	480	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1060	-	196	752
Mov Cap-2 Maneuver	-	-	-	-	329	-
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	477	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	329	752	-	-	1060	-
HCM Lane V/C Ratio	0.065	0.025	-	-	0.007	-
HCM Control Delay (s)	16.7	9.9	-	-	8.4	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	422	1026	64	45	41
Future Vol, veh/h	26	422	1026	64	45	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	84	84	92	92
Heavy Vehicles, %	4	4	3	3	2	2
Mvmt Flow	27	444	1221	76	49	45

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1298	0	-	0	1537	649
Stage 1	-	-	-	-	1260	-
Stage 2	-	-	-	-	277	-
Critical Hdwy	4.18	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.24	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	519	-	-	-	107	412
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	745	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	519	-	-	-	100	412
Mov Cap-2 Maneuver	-	-	-	-	189	-
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	694	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	27.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	519	-	-	-	255
HCM Lane V/C Ratio	0.053	-	-	-	0.367
HCM Control Delay (s)	12.3	0.4	-	-	27.1
HCM Lane LOS	B	A	-	-	D
HCM 95th %tile Q(veh)	0.2	-	-	-	1.6

HCM 2010 Signalized Intersection Summary
1014: Marsh Road & Grand River Ave (M-43)

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	324	913	41	118	470	126	55	468	107	117	391	292
Future Volume (veh/h)	324	913	41	118	470	126	55	468	107	117	391	292
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1863	1863	1863	1863	1900	1881	1881	1881
Adj Flow Rate, veh/h	352	992	45	124	495	133	60	514	118	131	439	328
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.91	0.91	0.91	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	2	2	2	2	2	2	1	1	1
Cap, veh/h	537	1083	49	393	1090	485	282	631	144	163	621	549
Arrive On Green	0.17	0.31	0.31	0.17	0.31	0.31	0.10	0.22	0.22	0.05	0.17	0.17
Sat Flow, veh/h	1810	3516	160	1774	3539	1574	1774	2862	654	1792	3574	1596
Grp Volume(v), veh/h	352	509	528	124	495	133	60	317	315	131	439	328
Grp Sat Flow(s),veh/h/ln	1810	1805	1871	1774	1770	1574	1774	1770	1746	1792	1787	1596
Q Serve(g_s), s	4.3	27.2	27.2	0.7	11.3	6.4	0.0	17.0	17.2	3.1	11.6	0.0
Cycle Q Clear(g_c), s	4.3	27.2	27.2	0.7	11.3	6.4	0.0	17.0	17.2	3.1	11.6	0.0
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	537	556	576	393	1090	485	282	390	385	163	621	549
V/C Ratio(X)	0.66	0.92	0.92	0.32	0.45	0.27	0.21	0.81	0.82	0.80	0.71	0.60
Avail Cap(c_a), veh/h	537	556	576	393	1090	485	282	542	534	192	1094	760
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.5	33.4	33.4	34.2	27.8	26.2	39.0	37.0	37.1	45.7	38.9	27.1
Incr Delay (d2), s/veh	2.9	22.2	21.7	0.5	1.4	1.4	0.4	6.5	6.9	18.8	1.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	17.0	17.5	2.9	5.7	3.0	1.5	9.0	9.0	4.4	5.9	7.5
LnGrp Delay(d),s/veh	33.3	55.6	55.0	34.7	29.2	27.6	39.4	43.5	44.0	64.6	40.4	28.2
LnGrp LOS	C	E	E	C	C	C	D	D	D	E	D	C
Approach Vol, veh/h		1389			752			692			898	
Approach Delay, s/veh		49.7			29.8			43.3			39.5	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.2	37.0	16.1	23.8	23.2	37.0	11.4	28.5
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 31	6.6	30.6	* 6.8	* 31	6.6	30.6
Max Q Clear Time (g_c+I1), s	6.3	13.3	2.0	13.6	2.7	29.2	5.1	19.2
Green Ext Time (p_c), s	0.1	3.2	0.2	3.6	0.6	1.0	0.1	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	42.1
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	1286	146	167	785	81	270	451	211	146	313	90
Future Volume (veh/h)	164	1286	146	167	785	81	270	451	211	146	313	90
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1863	1863	1900	1900	1900	1900	1863	1863	1900
Adj Flow Rate, veh/h	174	1368	155	182	853	88	284	475	222	159	340	98
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	0	0	0	2	2	2
Cap, veh/h	336	1290	573	255	1168	120	322	526	244	192	428	122
Arrive On Green	0.10	0.36	0.36	0.10	0.36	0.36	0.13	0.22	0.22	0.07	0.16	0.16
Sat Flow, veh/h	1792	3574	1588	1774	3237	334	1810	2391	1110	1774	2718	772
Grp Volume(v), veh/h	174	1368	155	182	466	475	284	358	339	159	220	218
Grp Sat Flow(s),veh/h/ln	1792	1787	1588	1774	1770	1801	1810	1805	1697	1774	1770	1720
Q Serve(g_s), s	0.4	36.8	7.1	5.9	23.3	23.3	10.8	19.7	19.9	4.9	12.2	12.5
Cycle Q Clear(g_c), s	0.4	36.8	7.1	5.9	23.3	23.3	10.8	19.7	19.9	4.9	12.2	12.5
Prop In Lane	1.00		1.00	1.00		0.19	1.00		0.65	1.00		0.45
Lane Grp Cap(c), veh/h	336	1290	573	255	638	650	322	397	373	192	279	271
V/C Ratio(X)	0.52	1.06	0.27	0.71	0.73	0.73	0.88	0.90	0.91	0.83	0.79	0.81
Avail Cap(c_a), veh/h	336	1290	573	255	638	650	322	409	384	238	401	389
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.9	32.6	23.1	42.5	28.3	28.3	41.6	38.7	38.8	45.5	41.3	41.5
Incr Delay (d2), s/veh	1.4	42.9	1.2	9.1	7.2	7.1	23.5	22.1	24.5	17.8	6.5	7.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	25.8	3.3	5.5	12.7	12.9	9.9	12.3	11.9	5.3	6.5	6.5
LnGrp Delay(d),s/veh	39.3	75.5	24.3	51.5	35.5	35.4	65.0	60.8	63.3	63.3	47.8	49.4
LnGrp LOS	D	F	C	D	D	D	E	E	E	E	D	D
Approach Vol, veh/h		1697			1123			981			597	
Approach Delay, s/veh		67.1			38.1			62.9			52.5	
Approach LOS		E			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.8	43.0	13.4	28.8	16.8	43.0	19.7	22.5
Change Period (Y+Rc), s	* 6.2	* 6.2	6.4	6.4	* 6.2	* 6.2	6.4	6.4
Max Green Setting (Gmax), s	* 6.8	* 37	9.6	23.1	* 6.8	* 37	9.6	23.1
Max Q Clear Time (g_c+I1), s	2.4	25.3	6.9	21.9	7.9	38.8	12.8	14.5
Green Ext Time (p_c), s	0.4	4.2	0.1	0.6	0.0	0.0	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	56.8
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1488	151	24	928	59	55
Future Vol, veh/h	1488	151	24	928	59	55
Conflicting Peds, #/hr	0	6	6	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	82	82
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	1566	159	25	977	72	67

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1731	0	2191	869
Stage 1	-	-	-	-	1652	-
Stage 2	-	-	-	-	539	-
Critical Hdwy	-	-	4.14	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.22	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	360	-	~ 40	299
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	555	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	360	-	~ 37	298
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	143	-
Stage 2	-	-	-	-	516	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	51.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	113	298	-	-	360	-
HCM Lane V/C Ratio	0.637	0.225	-	-	0.07	-
HCM Control Delay (s)	80.9	20.6	-	-	15.8	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	3.2	0.8	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

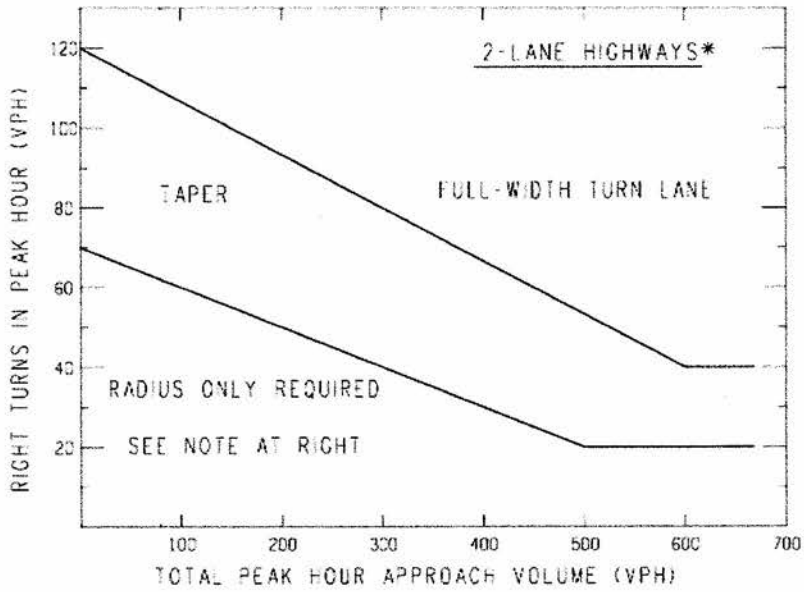
Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	1603	963	24	36	33
Future Vol, veh/h	50	1603	963	24	36	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	92	92
Heavy Vehicles, %	1	1	2	2	2	2
Mvmt Flow	53	1687	1014	25	39	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1039	0	-	0	1975	519
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	949	-
Critical Hdwy	4.12	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.21	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	671	-	-	-	54	502
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	337	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	671	-	-	-	0	502
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	0	-

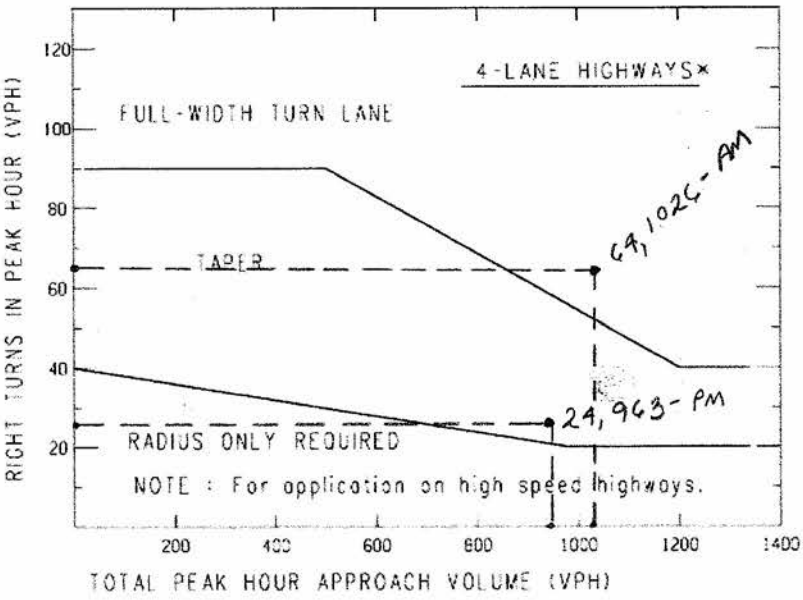
Approach	EB	WB	SB
HCM Control Delay, s	5.3	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	671	-	-	-	502
HCM Lane V/C Ratio	0.078	-	-	-	0.149
HCM Control Delay (s)	10.8	5.1	-	-	13.4
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.5



NOTE: For posted speeds at or under 45 mph, peak hour right turns greater than 40 vph, and total peak hour approach less than 300 vph, adjust right turn volumes.

Adjust peak hour
Right turns = Peak hour
Right turns – 20



*If a center left-turn lane exists (ie 3 or 5 lane roadway), subtract the number of left turns in approach volume form the total approach volume to get an adjusted total approach volume.

Sample Problem: The Design Speed is 55 mph. The Peak Hour Approach Volume is 300 vph. The Number of Right Turns in the Peak Hous is 100 vph. Determine if a right turn lane is recommended.

Solution: Figure indicates that the intersection of 300 vph and 100 vph is located above the upper trend line; thus, a right-turn lane may be recommended.

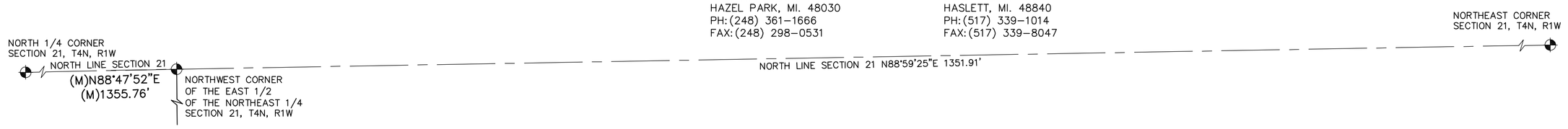
C.P.U.D. PLAN FOR:

2080 Grand River

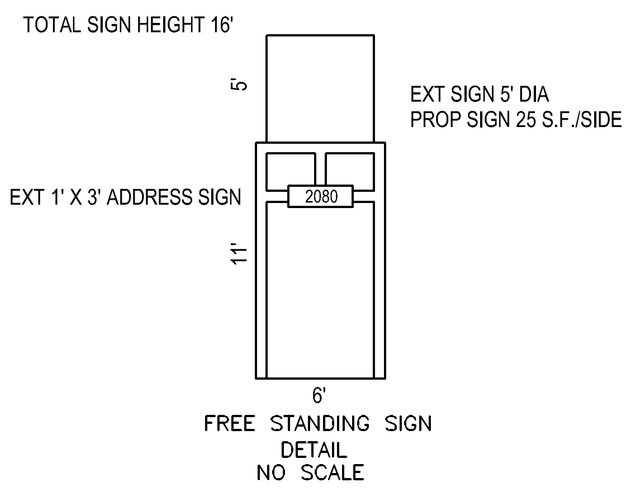
MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

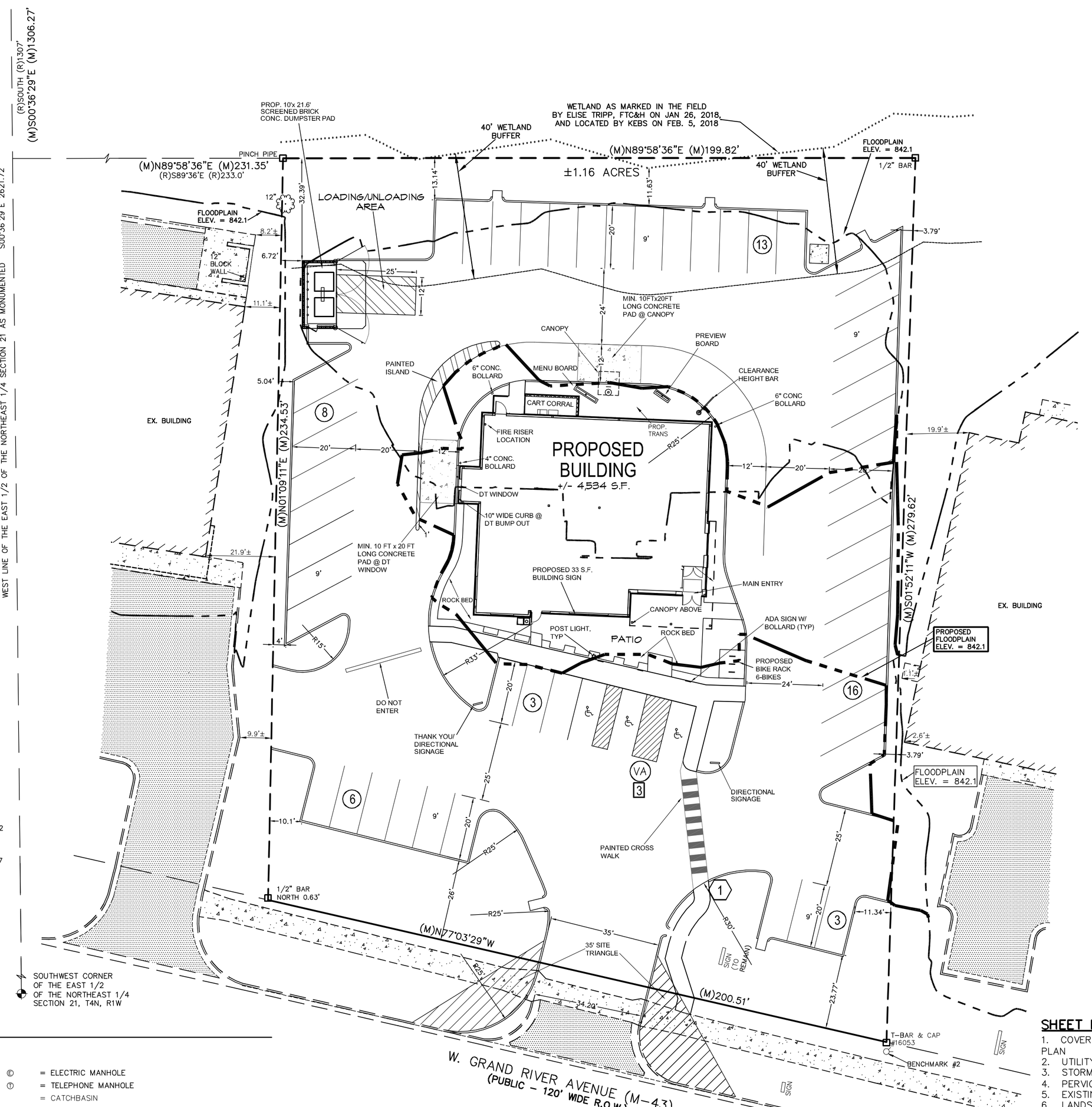
CLIENT:
AFFINITY 9 INVESTMENTS, LLC
1721 MAPLELANE AVE.
HAZEL PARK, MI. 48030
PH:(248) 361-1666
FAX:(248) 298-0531

ENGINEER/SURVEYOR:
KEBS, Inc.
2116 HASLETT RD.
HASLETT, MI. 48840
PH:(517) 339-1014
FAX:(517) 339-8047









LEGAL DESCRIPTION:
(As provided by Devon Title Agency, agents for Old Republic National Title Insurance Company, Commitment No. 253851, Revision #1, dated January 20, 2017)

That part of the Southeast 1/4 of the Northeast ¼ of Section 21, T4N, R1W, described as beginning at a point which is 1307 feet South and 233.0 feet South 89°36' East from the North 1/8 post of the Northeast 1/4 of Section 21; thence South 89°36' East 200.0 feet; thence South 02°14' West 281.2 feet to the North line of US-16 (now M-43 or Grand River Avenue) which is 60 feet at right angles from the centerline; thence along the North line of US-16, North 76°24' West 200.0 feet; thence North 01°18' East 235.4 feet to the Point of Beginning.

AS SURVEYED:
(The following legal description describes the same parcel of land as the provided description)

A parcel of land in the Northeast 1/4 of Section 21, T4N, R1W, Meridian Township, Ingham County, Michigan, the surveyed boundary of said parcel described as: Commencing at the North 1/4 corner of said Section 21; thence N88°47'52"E along the North line of said Section 21 a distance of 1355.76 feet to the Northwest corner of the East 1/2 of said Northeast 1/4; thence S00°36'29"E along the West line of the East 1/2 of said Northeast 1/4 as monumented a distance of 1306.27 feet; thence N89°58'36"E 231.35 feet to the point of beginning of this description; thence continuing N89°58'36"E 199.82 feet; thence S01°52'11"W 279.62 feet to the Northerly line of Grand River Avenue (M-43); thence N77°03'29"W along said Northerly line 200.51 feet; thence N01°09'11"E 234.53 feet to the point of beginning; said parcel containing 1.16 acres more or less; said parcel subject to all easements and restrictions if any.

SCHEDULE B, SECTION II, EXCEPTIONS:
(As provided by Devon Title Agency, agents for Old Republic National Title Insurance Company, Commitment No. 253851, Revision #1, dated January 20, 2017)

Item 17: Terms, conditions and provisions contained in Grant of Easement recorded in Liber 996, Page 824 of Ingham County Records, cross parcel, are plottable and shown hereon.

Item 18: Easement granted to Consumers Power Company, as disclosed by instrument dated December 27, 1972 recorded in Liber 1133, Page 965, Ingham County Records, crosses parcel, is plottable and shown hereon.

WAIVER REQUESTS

SECTION	REQUIREMENT	REASON	WAIVER REQUESTED	COMPARISON TO EXT.
86-402(17)	MAX. 70% IMPERVIOUS AREA	74.10% PROP IMPERVIOUS	4.10% WAIVER	79.25% EXT. IMPERVIOUS
86-756(14) WEST	15' SIDE AND REAR PARKING SETBACK	4.00' PROP PARKING SETBACK	11.00' WAIVER	6.1' EXT. PARKING SETBACK
86-756(14) EAST	15' SIDE AND REAR PARKING SETBACK	3.79' PROP PARKING SETBACK	11.21' WAIVER	3.6' EXT. PARKING SETBACK
86-756(14) NORTH	15' SIDE AND REAR PARKING SETBACK	13.14' PROP PARKING SETBACK	6.86' WAIVER	7.4' EXT. PARKING SETBACK
86-471(b)(1)	40' SETBACK FROM WETLAND	11.63' PROP PARKING SETBACK	28.37' WAIVER	6.92' EXT. PARKING SETBACK
86-471(C)(1)	20' NATURAL STRIP FROM WETLAND	6' PROPOSED GRADING SETBACK	14' WAIVER	NA

AMENITIES:
1. CONNECTION TO NON MOTORIZED PUBLIC PATHWAY
2. PUBLIC WIFI

TOTAL PERVIOUS AREA
13,195 S.F./50,938 S.F. x 100 = 25.90%
TOTAL IMPERVIOUS AREA
37,743 S.F./50,938 S.F. x 100 = 74.10%

PARKING REQUIRED
1/3 SEATS + 1/EMPLOYEE LARGEST SHIFT
REQUIRED = 95 SEATS/3 = 32 SPACES
LARGEST SHIFT = 15 EMPLOYEES = 15
= 47 SPACES

PARKING PROVIDED 49 9'x20'
3 B/F
52 TOTAL SPACES

[1] DENOTES NUMBER OF B/F SPACES
(VA) DENOTES VAN ACCESS B/F SPACES
(0) DENOTES PROPOSED NUMBER OF 9' x 20' PARKING SPACES

SITE ADDRESS: 2080 GRAND RIVER AVE., OKEMOS, MI. 48864

E-91998-CPUDJEFF-TRUCK
SURVEY#91998ALT

BENCHMARKS

BENCHMARK #1 ELEV. = 842.24 (NAVD88)
CENTER OF BLACK "X", NORTH SIDE OF CONCRETE LIGHT POLE BASE, IN SOUTHWEST CURB ISLAND OF FOUR CURB ISLANDS IN FRONT OF #2080 GRAND RIVER AVENUE, 75' NORTH-NORTHEAST OF BACK OF CURB OF GRAND RIVER AVENUE AND ±43' WESTERLY OF CENTERLINE OF ENTRANCE DRIVE TO #2080 GRAND RIVER AVENUE.

BENCHMARK #2 ELEV. = 840.83 (NAVD88)
NORTH FLANGE BOLT, UNDER "8" IN "1968", FIRE HYDRANT, ±24' NORTH-NORTHEAST OF BACK OF CURB OF GRAND RIVER AVENUE, ±14' EASTERLY OF THE EXTENSION OF THE WESTERLY WALL LINE OF #2060 GRAND RIVER AVENUE.

EX. SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 837.05
NW INV. = 834.97

CATCH BASIN #101
RIM ELEV. = 840.16
10" RCP N INV. = 837.86

CATCH BASIN #102
RIM ELEV. = 840.23
6" VCP NW INV. = 838.63

SANITARY MANHOLE #200
RIM ELEV. = 839.43
8" PVC NE INV. = 830.40
15" RCP E INV. = 828.73
15" RCP SW INV. = 828.72

SANITARY MANHOLE #201
RIM ELEV. = 837.14
15" RCP NE INV. = 828.87
15" RCP W INV. = 828.84

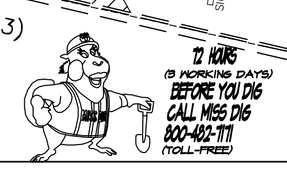
EX. LEGEND
- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- = EXISTING SPOT ELEVATION
- = EXISTING CONTOUR ELEVATION

LEGEND
- EXT. CONTOURS
- EXT. WATER MAIN
- EXT. SANITARY SEWER
- EXT. STORM SEWER
- EXT. ELEVATIONS
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
- = CATCHBASIN
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH
- = SIGN
- = POST
- = AIR CONDITIONING UNIT

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.



SHEET INDEX

1. COVER SHEET & AMENITIES PLAN
2. UTILITY PLAN
3. STORM & GRADING PLAN
4. PERVIOUS/IMPERVIOUS PLAN
5. EXISTING PLAN
6. LANDSCAPE PLAN

REVISIONS
2-6-18 BOARD REVIEW
3-23-18 CLIENT
4-16-18 CPUD SUBMITTAL

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

2080 Grand River
COVERSHEET & AMENITIES PLAN

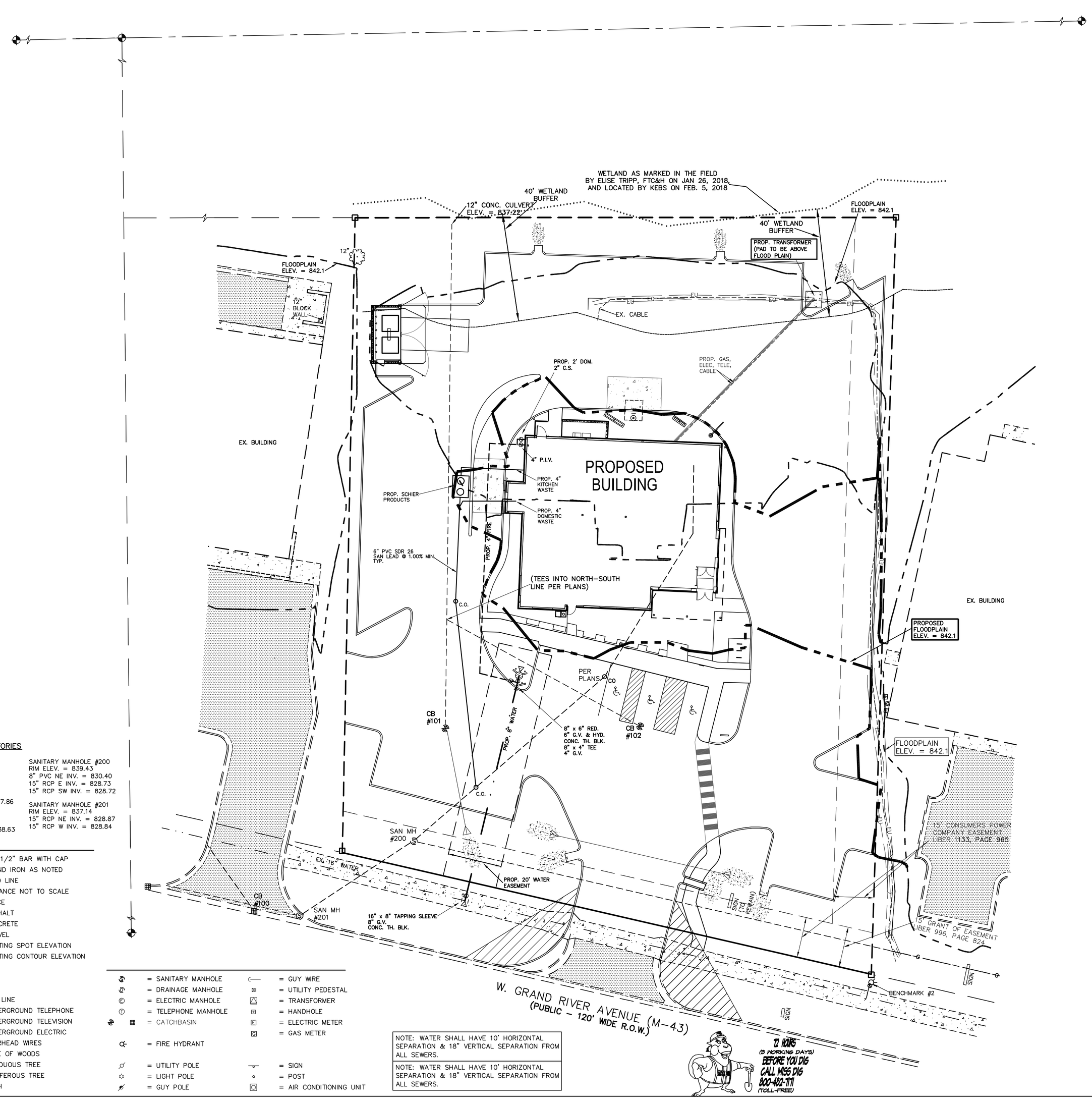
SCALE: 1"= 20'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 12-1-17	PROJECT MGR. JWK	SHEET 1 OF 6
AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC c/o THOMAS HANNAWA		JOB #: 91998

I:\91\91998\dwg\E-91998-CPUDJEFF-TRUCK.dwg, 4/17/2018 7:39:44 AM, sbass

C.P.U.D. PLAN FOR:

2080 Grand River

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN



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LEGEND

- EXT. CONTOURS
- EXT. WATER MAIN
- EXT. SANITARY SEWER
- EXT. STORM SEWER
- EXT. ELEVATIONS
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

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15" RCP NE INV. = 828.87
15" RCP W INV. = 828.84

EX. LEGEND

- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- 880.0 = EXISTING SPOT ELEVATION
- 880 = EXISTING CONTOUR ELEVATION

- = GAS LINE
- = UNDERGROUND TELEPHONE
- = UNDERGROUND TELEVISION
- = UNDERGROUND ELECTRIC
- = OVERHEAD WIRES
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH

- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
- = CATCHBASIN
- = FIRE HYDRANT
- = UTILITY POLE
- = LIGHT POLE
- = GUY POLE
- = GUY WIRE
- = UTILITY PEDESTAL
- = TRANSFORMER
- = HANDHOLE
- = ELECTRIC METER
- = GAS METER
- = SIGN
- = POST
- = AIR CONDITIONING UNIT

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

SITE ADDRESS: 2080 GRAND RIVER AVE., OKEMOS, MI. 48864

E-91998-CPUDJEFF-TRUCK SURVEY#91998ALT

REVISIONS
2-6-18 BOARD REVIEW
3-23-18 CLIENT
4-16-18 CPUD SUBMITTAL

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

2080 Grand River

UTILITY PLAN

SCALE: 1"= 20'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 12-1-17	PROJECT MGR. JWK	SHEET 2 OF 6
AUTHORIZED BY: AFFINITY 9, INVESTMENTS, LLC c/o THOMAS HANNAWA		JOB #: 91998

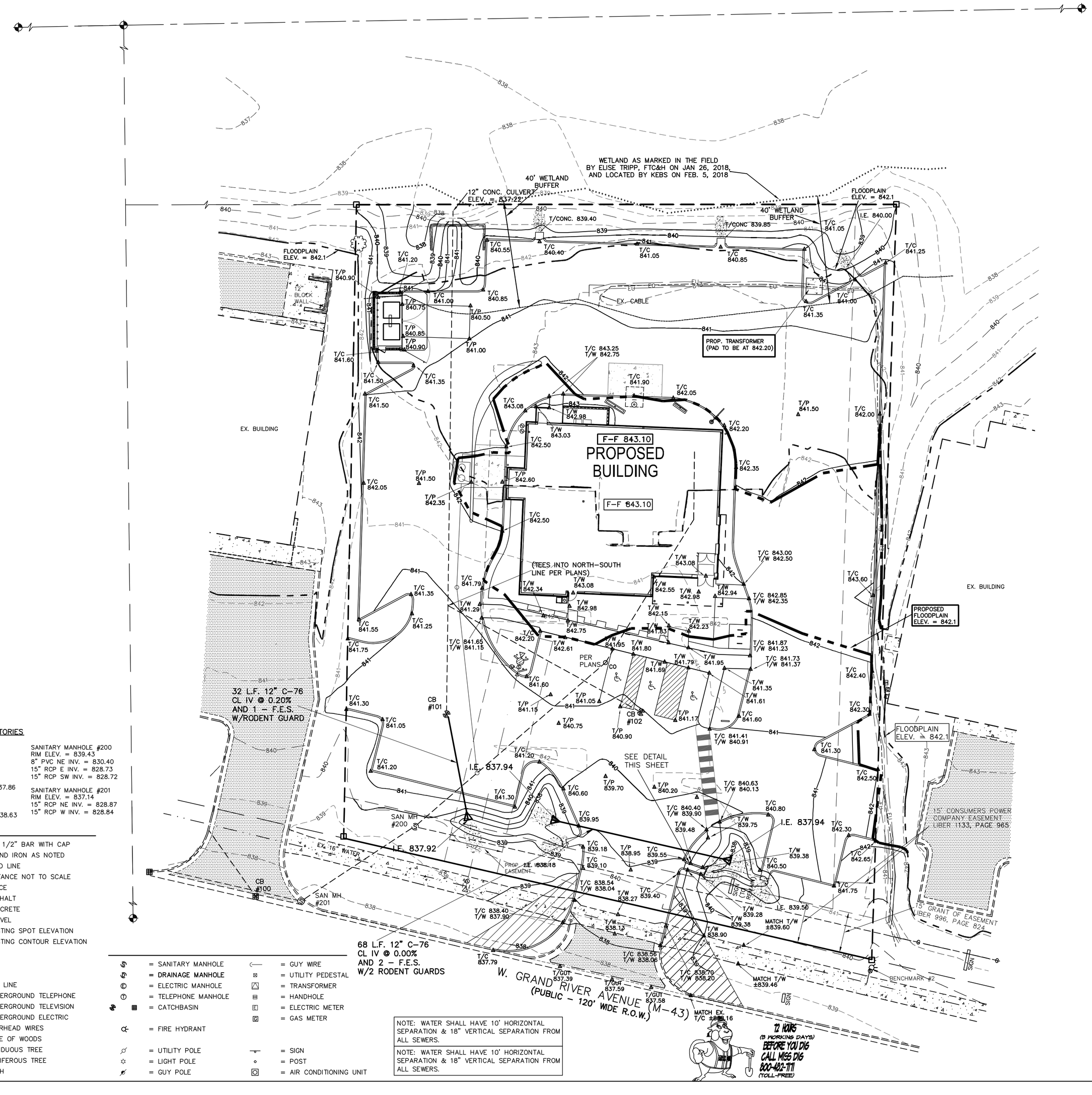
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NOTE: ALL GRADES SHOWN ARE FOR FINAL CONSTRUCTED CONDITIONS AND CONTRACTOR IS RESPONSIBLE FOR HOLDING DOWN GRADES AS THEY OR THE DEVELOPER DEEMS NECESSARY FOR BASEMENT SPOILS, TOPSOILS ETC...

C.P.U.D. PLAN FOR:

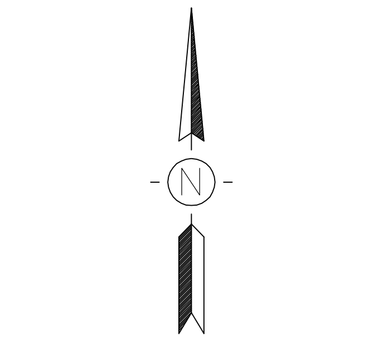
2080 Grand River

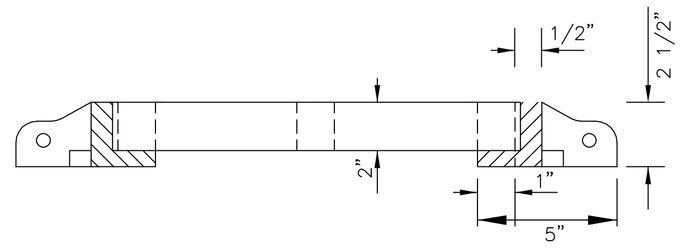
MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

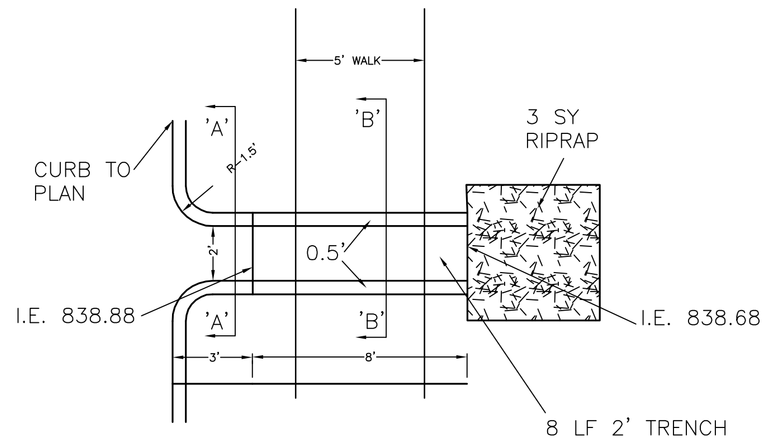


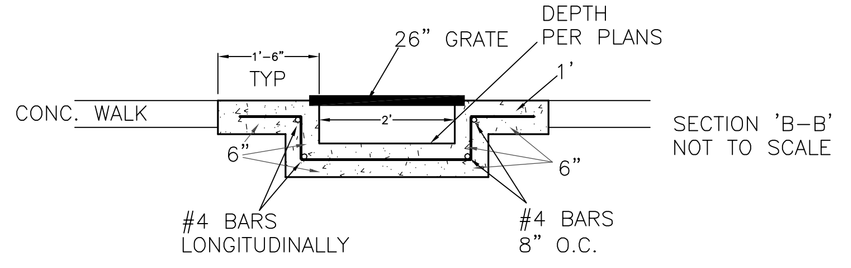
NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

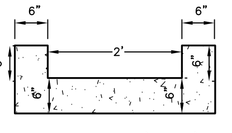
NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.











SECTION 'A-A' NOT TO SCALE

EX. SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 837.05
NW INV. = 834.97

CATCH BASIN #101
RIM ELEV. = 840.16
10" RCP N INV. = 837.86

CATCH BASIN #102
RIM ELEV. = 840.23
6" VCP NW INV. = 838.63

SANITARY MANHOLE #200
RIM ELEV. = 839.43
8" PVC NE INV. = 830.40
15" RCP E INV. = 828.73
15" RCP SW INV. = 828.72

SANITARY MANHOLE #201
RIM ELEV. = 837.14
15" RCP NE INV. = 828.87
15" RCP W INV. = 828.84

BENCHMARKS

BENCHMARK #1 ELEV. = 842.24 (NAVD88)
CENTER OF BLACK "X", NORTH SIDE OF CONCRETE LIGHT POLE BASE, IN SOUTHWEST CURB ISLAND OF FOUR CURB ISLANDS IN FRONT OF #2080 GRAND RIVER AVENUE, 75' NORTH-NORTHEAST OF BACK OF CURB OF GRAND RIVER AVENUE AND ±43' WESTERLY OF CENTERLINE OF ENTRANCE DRIVE TO #2080 GRAND RIVER AVENUE.

BENCHMARK #2 ELEV. = 840.83 (NAVD88)
NORTH FLANGE BOLT, UNDER "8" IN "1968", FIRE HYDRANT, ±24' NORTH-NORTHEAST OF BACK OF CURB OF GRAND RIVER AVENUE, ±14' EASTERLY OF THE EXTENSION OF THE WESTERLY WALL LINE OF #2060 GRAND RIVER AVENUE.

EX. LEGEND

- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- 860 = EXISTING SPOT ELEVATION
- 860 = EXISTING CONTOUR ELEVATION

LEGEND

- EXT. CONTOURS
- W — W EXT. WATER MAIN
- SAN — SAN EXT. SANITARY SEWER
- ST — ST EXT. STORM SEWER
- 860.00 EXT. ELEVATIONS
- W — W PROPOSED WATER MAIN
- SAN — SAN PROPOSED SANITARY SEWER
- ST — ST PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

- G — G = GAS LINE
- TU — TU = UNDERGROUND TELEPHONE
- C — C = UNDERGROUND TELEVISION
- EU — EU = UNDERGROUND ELECTRIC
- EO — EO = OVERHEAD WIRES
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH
- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
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- = ELECTRIC METER
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- = POST
- = AIR CONDITIONING UNIT

SITE ADDRESS: 2080 GRAND RIVER AVE., OKEMOS, MI. 48864

E-91998-CPUDJEFF-TRUCK
SURVEY#91998ALT

REVISIONS
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2080 Grand River
STORM & GRADING PLAN

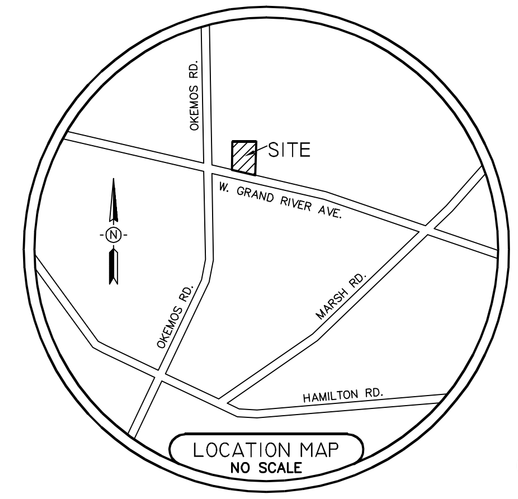
SCALE: 1"= 20'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 12-1-17	PROJECT MGR. JWK	SHEET 3 OF 6
AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC c/o THOMAS HANNAWA		JOB #: 91998

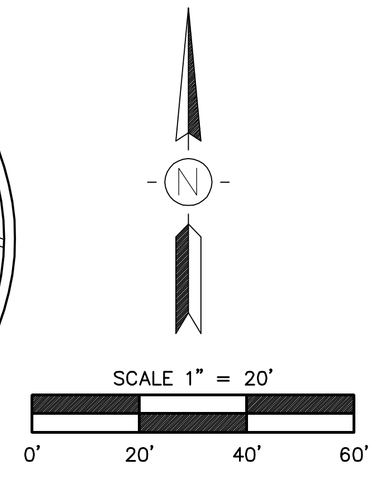
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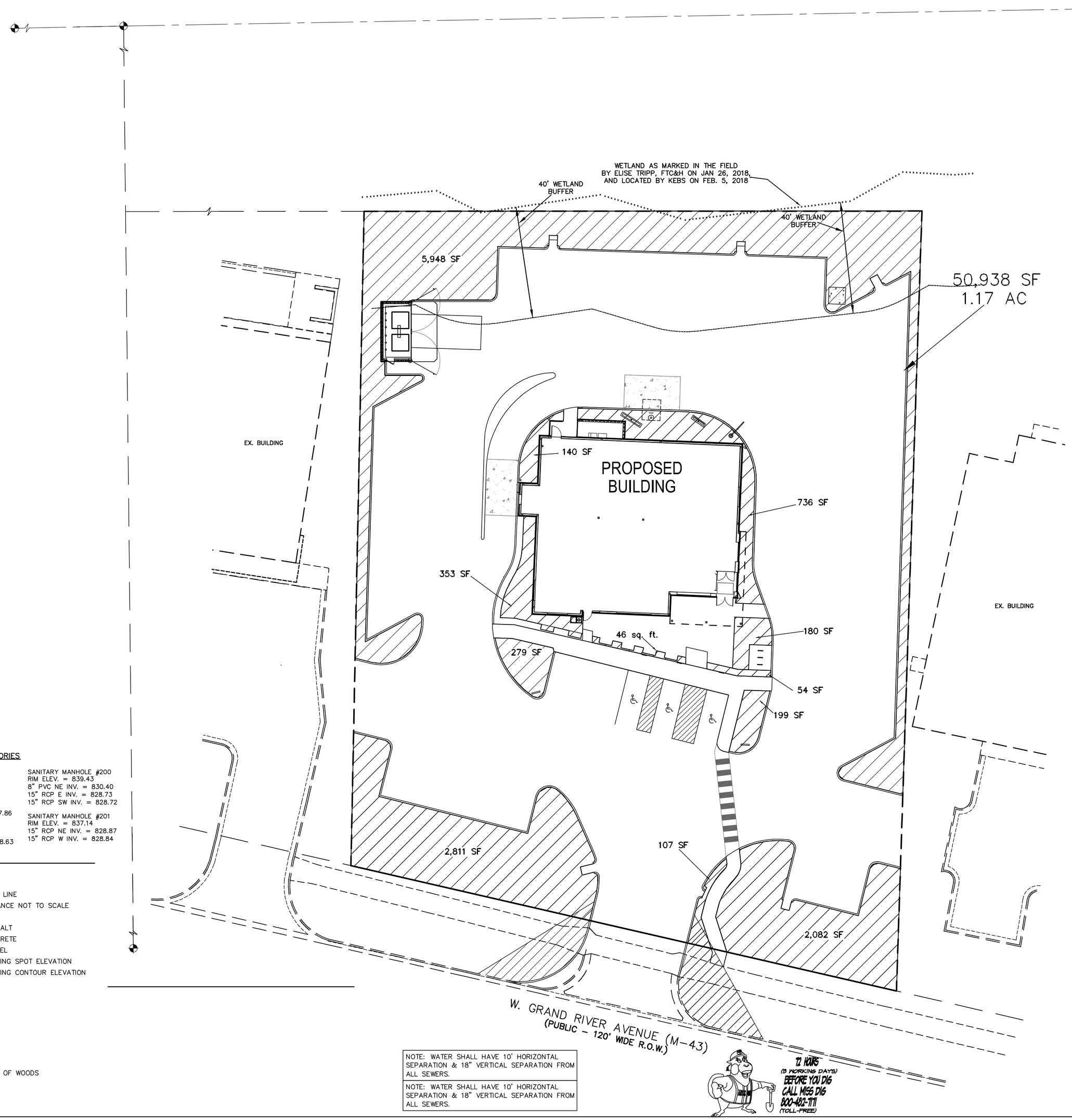
C.P.U.D. PLAN FOR:

2080 Grand River

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN







TOTAL PERVIOUS AREA
13,195 S.F./50,938 S.F. x 100 = 25.90%
TOTAL IMPERVIOUS AREA
37,743 S.F./50,938 S.F. x 100 = 74.10%

EX. SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 837.05
NW INV. = 834.97

CATCH BASIN #101
RIM ELEV. = 840.16
10" RCP N INV. = 837.86

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RIM ELEV. = 840.23
6" VCP NW INV. = 838.63

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RIM ELEV. = 839.43
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EX. LEGEND

= DEED LINE
= DISTANCE NOT TO SCALE
= ASPHALT
= CONCRETE
= GRAVEL
= EXISTING SPOT ELEVATION
= EXISTING CONTOUR ELEVATION
= EDGE OF WOODS

LEGEND

EXT. CONTOURS
EXT. WATER MAIN
EXT. SANITARY SEWER
EXT. STORM SEWER
EXT. ELEVATIONS
PROPOSED WATER MAIN
PROPOSED SANITARY SEWER
PROPOSED STORM SEWER
MANHOLE (NEW)
PROPOSED C.B.
MANHOLE (EX.)
UTILITY EASEMENT
CENTER LINE OF ROAD
ROAD RIGHT OF WAY
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SITE ADDRESS: 2080 GRAND RIVER AVE., OKEMOS, MI. 48864

E-91998-CPUDJEFF-TRUCK SURVEY#91998ALT

REVISIONS
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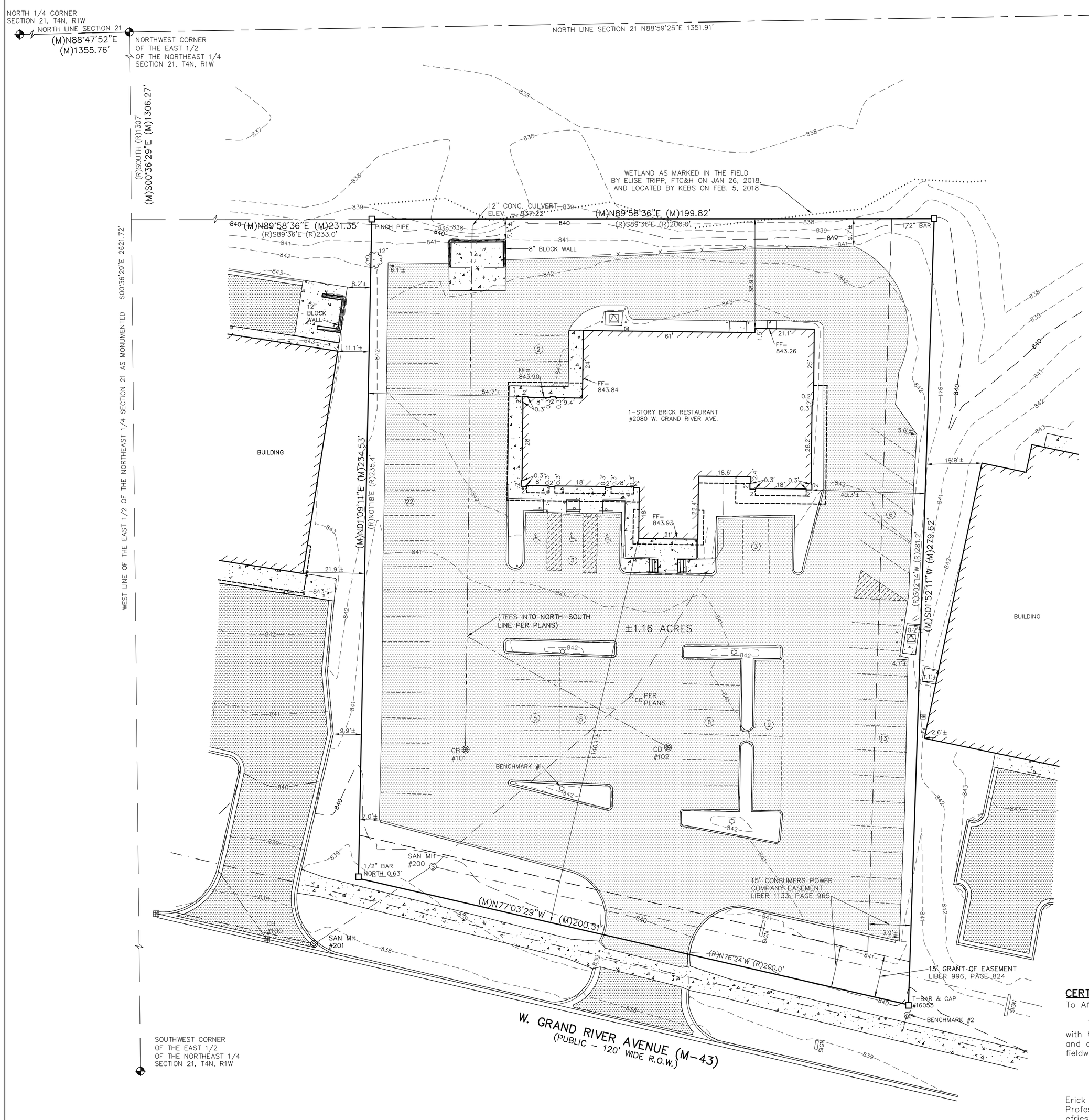
2080 Grand River

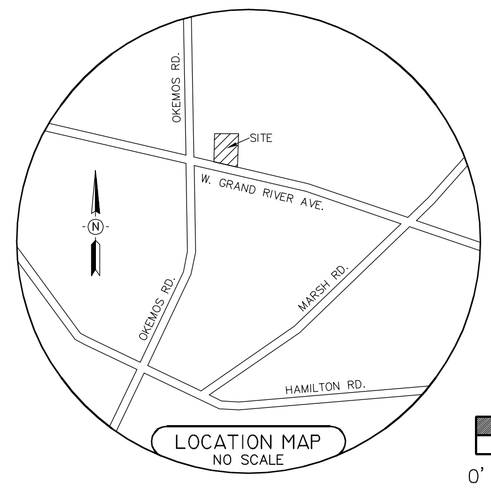
PERVIOUS/IMPERVIOUS PLAN

SCALE: 1"= 20'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 12-1-17	PROJECT MGR. JWK	SHEET 4 OF 6
AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC c/o THOMAS HANNAWA		JOB #: 91998

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EXISTING PLAN
ALTA/NSPS LAND TITLE SURVEY
"2080 W. GRAND RIVER AVENUE, OKEMOS, MI 28864"





SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 837.05
NW INV. = 834.97

CATCH BASIN #101
RIM ELEV. = 840.16
10" RCP N INV. = 837.86

CATCH BASIN #102
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LEGEND

- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = BUILDING OVERHANG
- = ASPHALT
- = CONCRETE
- = EXISTING CONTOUR ELEVATION
- = BUILDING OVERHANG
- = SANITARY SEWER
- = STORM SEWER
- = DECIDUOUS TREE
- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = CATCHBASIN
- = FIRE HYDRANT
- = VALVE
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- = UTILITY PEDESTAL
- = TRANSFORMER
- = HANDHOLE
- = ELECTRIC METER
- = GAS METER
- = WATER METER
- = SIGN
- = POST

LEGAL DESCRIPTION:

(As provided by Devon Title Agency, agents for Old Republic National Title Insurance Company, Commitment No. 253851, Revision #1, dated January 20, 2017)

That part of the Southeast 1/4 of the Northeast ¼ of Section 21, T4N, R1W, described as beginning at a point which is 1307 feet South and 233.0 feet South 89°36' East from the North 1/8 post of the Northeast 1/4 of Section 21; thence South 89°36' East 200.0 feet; thence South 02°14' West 281.2 feet to the North line of US-16 (now M-43 or Grand River Avenue) which is 60 feet at right angles from the centerline; thence along the North line of US-16, North 76°24' West 200.0 feet; thence North 01°18' East 235.4 feet to the Point of Beginning.

AS SURVEYED:

(The following legal description describes the same parcel of land as the provided description)

A parcel of land in the Northeast 1/4 of Section 21, T4N, R1W, Meridian Township, Ingham County, Michigan, the surveyed boundary of said parcel described as: Commencing at the North 1/4 corner of said Section 21; thence N88°47'52"E along the North line of said Section 21 a distance of 1355.76 feet to the Northwest corner of the East 1/2 of said Northeast 1/4; thence S00°36'29"E along the West line of the East 1/2 of said Northeast 1/4 as monumented a distance of 1306.27 feet; thence N89°58'36"E 231.35 feet to the point of beginning of this description; thence continuing N89°58'36"E 199.82 feet; thence S01°52'11"W 279.62 feet to the Northerly line of Grand River Avenue (M-43); thence N77°03'29"W along said Northerly line 200.51 feet; thence N01°09'11"E 234.53 feet to the point of beginning; said parcel containing 1.16 acres more or less; said parcel subject to all easements and restrictions if any.

SCHEDULE B, SECTION II, EXCEPTIONS:

(As provided by Devon Title Agency, agents for Old Republic National Title Insurance Company, Commitment No. 253851, Revision #1, dated January 20, 2017)

Item 17: Terms, conditions and provisions contained in Grant of Easement recorded in Liber 996, Page 824 of Ingham County Records, cross parcel, are plottable and shown hereon.

Item 18: Easement granted to Consumers Power Company, as disclosed by instrument dated December 27, 1972 recorded in Liber 1133, Page 965, Ingham County Records, crosses parcel, is plottable and shown hereon.

SURVEYOR'S NOTES:

1. This plan was made at the direction of the parties named hereon and is intended solely for their immediate use. Survey prepared from fieldwork performed in May 2017.

2. All bearings and distances on the survey are record and measured unless otherwise noted. All bearings are Michigan State Plane South Zone grid bearings obtained from GPS observations using corrections obtained from the Lansing C.O.R.S.

3. All dimensions are in feet and decimals thereof.

4. All elevations are North American Vertical Datum of 1988 (NAVD88).

5. No building tie dimensions are to be used for establishing the property lines.

6. There are no observable potential encroachments onto the subject property from adjoining lands, or from the subject property onto adjoining lands, except as shown hereon.

7. Parcel has direct access to public Grand River Avenue.

ALTA/NSPS LAND TITLE SURVEY – TABLE "A" REQUIREMENTS:

Item 1: Shown on the survey map.

Item 2: Address of the surveyed property: 2080 W. Grand River Avenue, Okemos, MI 48864.

Item 3: By scaled map location and graphic plotting only, this property lies entirely within Flood Zone "AE", areas within the 1% annual chance floodplain, according to the National Flood Insurance Program, Flood Insurance Rate Map for the Charter Township of Meridian, Ingham County, Michigan, Community Panel No. 260093 0156 D, dated August 16, 2011.

Item 4: 1.16 Acres (50,937 square feet)

Item 5: Shown on the survey map.

Item 7a: Shown on the survey map.

Item 8: Shown on the survey map.

Item 9: Parking:
Regular Parking Spaces: 64
Disabled Parking Spaces: 3
Total on-site Parking Spaces: 67

CERTIFICATION:

To Affinity 9 Investments, LLC; Devon Title Agency; and Old Republic National Title Insurance Company:

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2016 "Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys," jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 5, 7a, 8, and 9 of Table A thereof. The fieldwork was completed on May 6, 2016.

Erick R. Friestrom Date of Plat or Map:
Professional Surveyor No. 53497
efriestrom@kebs.com

REVISIONS	COMMENTS
05/17/2017	ORIGINAL
3/23/2018	CLIENT REVIEW
4-16-2018	CPUD SUBMITTAL

KEBS, INC. ENGINEERING AND LAND SURVEYING
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 · FAX 517-339-8047
WWW.KEBS.COM
Marshall Office – Ph. 269-781-9800

DRAWN BY SSF | SECTION 21, T4N, R1W
FIELD WORK BY NAW | JOB NUMBER: 91998.ALT
SHEET 5 OF 6

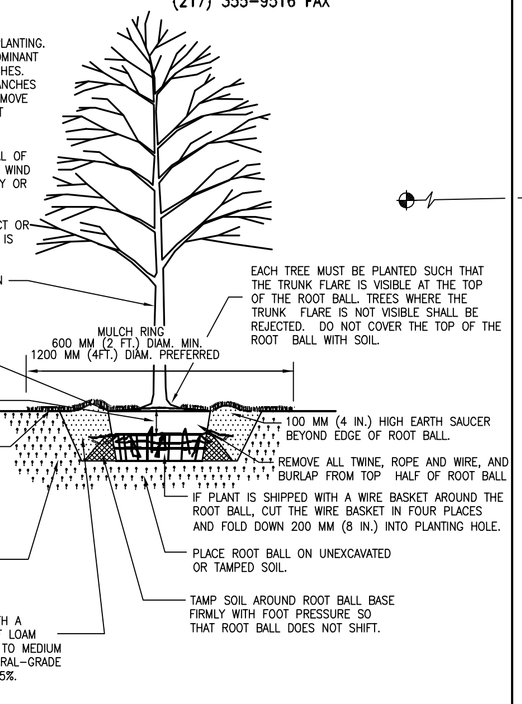
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INTERNATIONAL SOCIETY OF ARBORICULTURE

INTERNATIONAL SOCIETY OF ARBORICULTURE
1400 WEST ANTHONY DRIVE
CHAMPAIGN, IL 61821
(217) 355-9411
(217) 355-9516 FAX

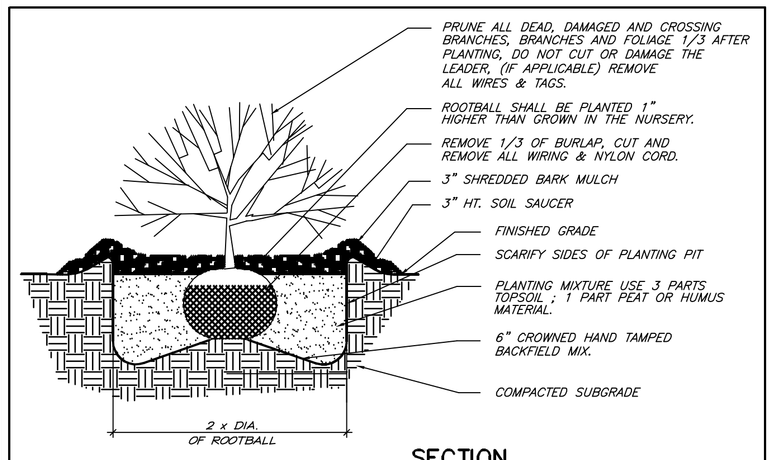
DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO-DOMINANT LEADERS, AND BROKEN OR DEAD BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED; HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.

STAKE TREES ONLY UPON THE APPROVAL OF THE LANDSCAPE ARCHITECT OR IN HIGH WIND AREAS OR IF ROOT BALL IS VERY SANDY OR WET CLAY SOIL.
WRAP TREE TRUNKS ONLY UPON THE APPROVAL OF THE LANDSCAPE ARCHITECT OR WHEN TRUNK ORIENTATION AT NURSERY IS UNKNOWN.



TREE PLANTING DETAIL - B&B TREES IN ALL SOIL TYPES

NOTE: THIS DETAIL ASSUMES THAT THE PLANTING SPACE IS LARGER THAN 2400 MM (8 FT.) SQUARE, OPEN TO THE SKY, AND NOT COVERED BY ANY PAVING OR GRATING.



SECTION

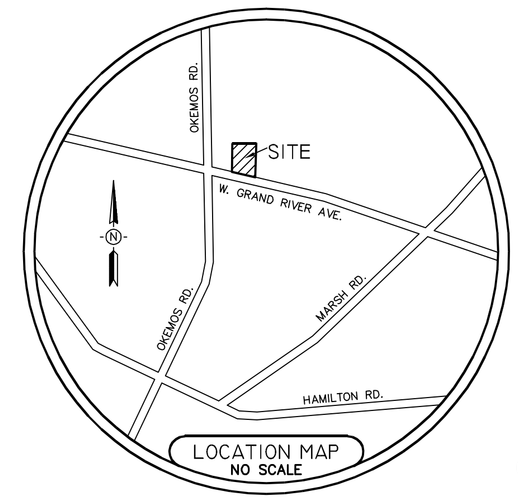
SHRUB PLANTING DETAIL

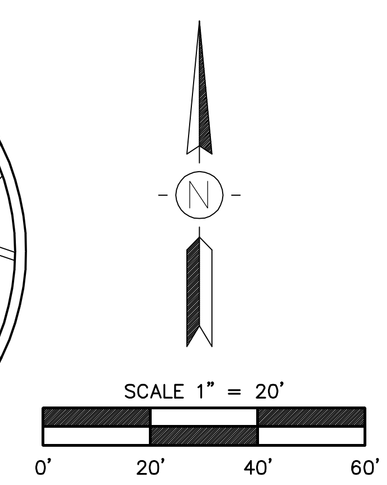
NOT TO SCALE

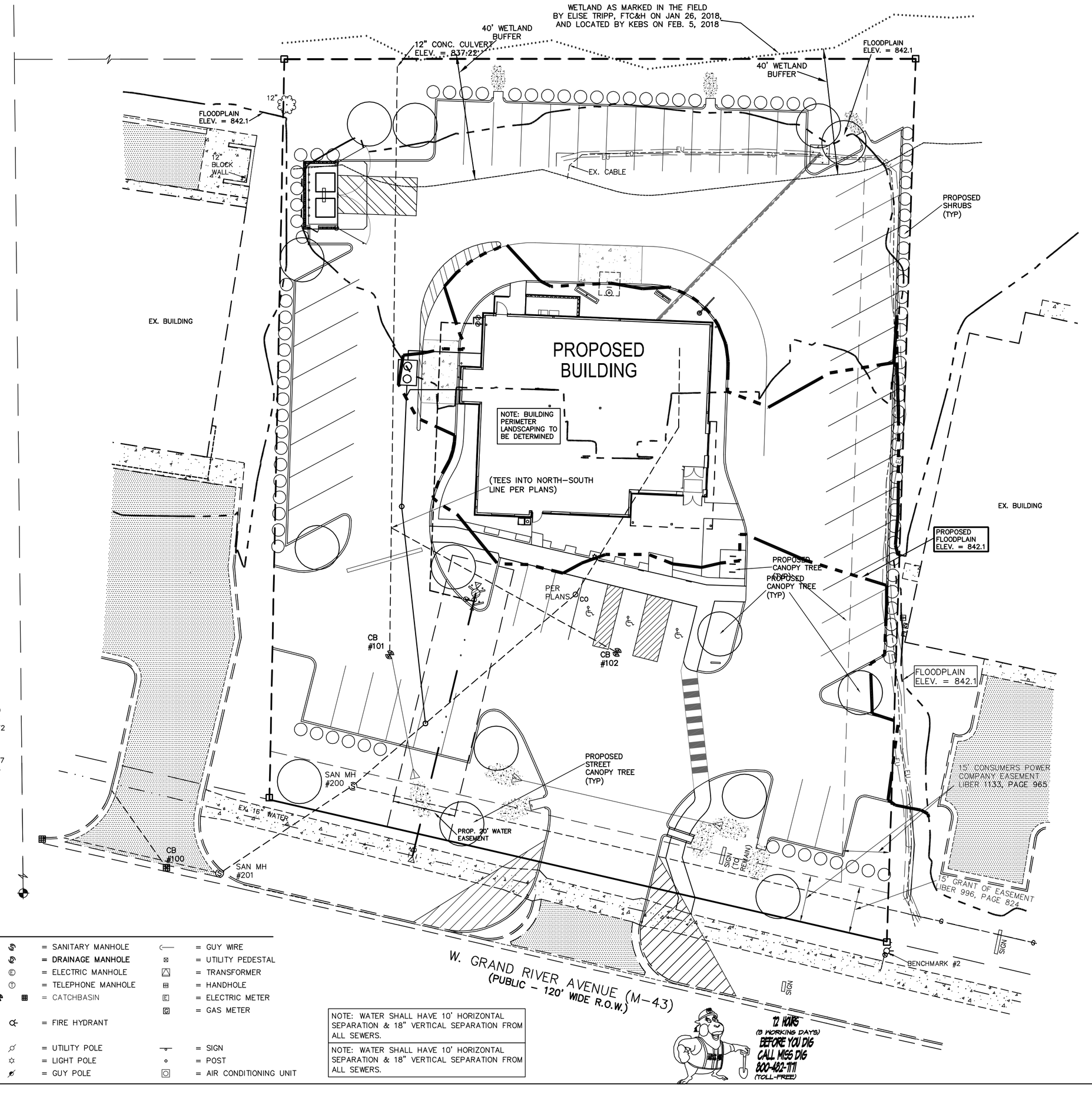
LANDSCAPE NOTES

1. INSTALL 3" X 12 GA. EDGING TO SEPARATE LAWN FROM PLANTING BED. (AROUND SHRUBS ONLY)
2. INSTALL 3" DEEP SHREDDED BARK MULCH TO ALL PLANTING AREAS/BEDS AND TREE SAUCERS (NO POLY-FILM).
3. INSTALL A KENTUCKY BLUEGRASS SOD (SUN/SHADE) VARIETY) THAT IS FREE OF WEEDS.
3A. SEED AREAS WITH THE FOLLOWING:
25% SYBSPORT KENTUCKY BLUEGRASS
25% NASSAM KENTUCKY BLUEGRASS
20% BRYISTOL KENTUCKY BLUEGRASS
10% PERINNIAL RYE GRASS
APPLY AT THE RATE OF 2 TO 3 LBS. PER 1,000 SQUARE FOOT.
4. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES, PIPES AND STRUCTURES, AS WELL AS THE LOCATION OF EXISTING TREES AND VEGETATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COST INCURRED DUE TO DAMAGE/REMOVAL OF SAID ELEMENTS.
5. ANY DISCREPANCIES BETWEEN PLANS, NOTES, DETAILS AND EXISTING CONDITIONS SHALL BE IMMEDIATELY REPORTED TO THE OWNER'S AUTHORIZED REPRESENTATIVE FOR REVIEW AND DECISION. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATION.
6. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING MATERIALS/IMPROVEMENTS, DAMAGED DURING CONSTRUCTION.
7. SITE BOUNDARY, TOPOGRAPHY, UTILITIES AND OTHER BASE INFORMATION PROVIDED BY OTHERS.
8. CONTRACTOR SHALL VERIFY QUANTITIES SHOWN ON PLANT SCHEDULES AND THOSE INDICATED ON PLANS. CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF QUANTITIES DRAWN.
9. CONTRACTOR SHALL MAKE MINOR ADJUSTMENTS TO PLANT MATERIAL LOCATIONS IN FIELD, AS NECESSARY. THE LOCATION OF ALL PLANT MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE OWNER'S AUTHORIZED REPRESENTATIVE.
10. ALL PLANT MATERIAL SHALL BE OF THE SIZES CALLED FOR IN THE PLANT SCHEDULES. ANY PLANT MATERIAL NOT MEETING THE SIZED AND/OR QUALITY AS CALLED FOR SHALL BE REMOVED FROM SITE. ALL TREES SHALL BE INSPECTED AND APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE. NO SUBSTITUTIONS OF PLANT MATERIAL SHALL BE MADE WITHOUT APPROVAL FROM THE OWNER'S AUTHORIZED REPRESENTATIVE.
11. ALL PROPOSED TREES OVER 2" CAL. SHALL BY GUYED/STAKED SECURE, SEE EVERGREEN TREE PLANTING/GUYING DETAIL, OR DECIDUOUS TREES PLANTING/STAKING DETAIL WHERE APPLICABLE.
12. ALL PLANTING BEDS TO BE TREATED WITH PRE-EMERGENT HERBICIDE. CONTRACTOR SHALL INSURE THAT PROPOSED PLANT MATERIAL IS RESISTANT TO THE HERBICIDE PROPERTIES AND THAT HERBICIDE APPLICATION FOLLOWS THE MANUFACTURER'S SPECIFICATIONS AND IS APPLIED IN ACCORDANCE WITH SOUND HORTICULTURAL PRACTICES.
13. CONTRACTOR SHALL DETERMINE APPROPRIATE PLANTING BACKFILL MIXES (BASED ON SOILS/SUBSURFACE CONDITIONS,) AND REVIEW ALTERNATIVES WITH OWNER'S AUTHORIZED REPRESENTATIVE PRIOR TO INSTALLATION.

C.P.U.D. PLAN FOR:
2080 Grand River
MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN







LEGAL DESCRIPTION:

(As provided by Devon Title Agency, agents for Old Republic National Title Insurance Company, Commitment No. 253851, Revision #1, dated January 20, 2017)

That part of the Southeast 1/4 of the Northeast ¼ of Section 21, T4N, R1W, described as beginning at a point which is 1307 feet South and 233.0 feet South 89°36' East from the North 1/8 post of the Northeast 1/4 of Section 21; thence South 89°36' East 200.0 feet; thence South 02°14' West 281.2 feet to the North line of US-16 (now M-43 or Grand River Avenue) which is 60 feet at right angles from the centerline; thence along the North line of US-16, North 76°24' West 200.0 feet; thence North 01°18' East 235.4 feet to the Point of Beginning.

AS SURVEYED:

(The following legal description describes the same parcel of land as the provided description)

A parcel of land in the Northeast 1/4 of Section 21, T4N, R1W, Meridian Township, Ingham County, Michigan, the surveyed boundary of said parcel described as: Commencing at the North 1/4 corner of said Section 21; thence N88°47'52"E along the North line of said Section 21 a distance of 1355.76 feet to the Northwest corner of the East 1/2 of said Northeast 1/4; thence S00°36'29"E along the West line of the East 1/2 of said Northeast 1/4 as monumented a distance of 1306.27 feet; thence N89°58'36"E 231.35 feet to the point of beginning of this description; thence continuing N89°58'36"E 199.82 feet; thence S01°52'11"W 279.62 feet to the Northerly line of Grand River Avenue (M-43); thence N77°03'29"W along said Northerly line 200.51 feet; thence N01°09'11"E 234.53 feet to the point of beginning; said parcel containing 1.16 acres more or less; said parcel subject to all easements and restrictions if any.

SCHEDULE B, SECTION II, EXCEPTIONS:

(As provided by Devon Title Agency, agents for Old Republic National Title Insurance Company, Commitment No. 253851, Revision #1, dated January 20, 2017)

Item 17: Terms, conditions and provisions contained in Grant of Easement recorded in Liber 996, Page 824 of Ingham County Records, cross parcel, are plottable and shown hereon.

Item 18: Easement granted to Consumers Power Company, as disclosed by instrument dated December 27, 1972 recorded in Liber 1133, Page 965, Ingham County Records, crosses parcel, is plottable and shown hereon.

BENCHMARKS

BENCHMARK #1 ELEV. = 842.24 (NAVD88)
CENTER OF BLACK "X", NORTH SIDE OF CONCRETE LIGHT POLE BASE, IN SOUTHWEST CURB ISLAND OF FOUR CURB ISLANDS IN FRONT OF #2080 GRAND RIVER AVENUE, 75' NORTH-NORTHEAST OF BACK OF CURB OF GRAND RIVER AVENUE AND ±43' WESTERLY OF CENTERLINE OF ENTRANCE DRIVE TO #2080 GRAND RIVER AVENUE.

BENCHMARK #2 ELEV. = 840.83 (NAVD88)
NORTH FLANGE BOLT, UNDER "8" IN "1968", FIRE HYDRANT, ±24' NORTH-NORTHEAST OF BACK OF CURB OF GRAND RIVER AVENUE, ±14' EASTERLY OF THE EXTENSION OF THE WESTERLY WALL LINE OF #2060 GRAND RIVER AVENUE.

EX. SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 837.05
NW INV. = 834.97

CATCH BASIN #101
RIM ELEV. = 840.16
10" RCP N INV. = 837.86

CATCH BASIN #102
RIM ELEV. = 840.23
6" VCP NW INV. = 838.63

SANITARY MANHOLE #200
RIM ELEV. = 839.43
8" PVC NE INV. = 830.40
15" RCP E INV. = 828.73
15" RCP SW INV. = 828.72

SANITARY MANHOLE #201
RIM ELEV. = 837.14
15" RCP NE INV. = 828.87
15" RCP W INV. = 828.84

EX. LEGEND

- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- 1880 = EXISTING SPOT ELEVATION
- 880 = EXISTING CONTOUR ELEVATION

LEGEND

- EXT. CONTOURS
- W — W EXT. WATER MAIN
- SAN — SAN EXT. SANITARY SEWER
- ST — ST EXT. STORM SEWER
- 880 EXT. ELEVATIONS
- W — W PROPOSED WATER MAIN
- SAN — SAN PROPOSED SANITARY SEWER
- ST — ST PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

- G — GAS LINE
- TU — UNDERGROUND TELEPHONE
- C — UNDERGROUND TELEVISION
- EU — UNDERGROUND ELECTRIC
- EO — OVERHEAD WIRES
- EDGE OF WOODS
- DECIDUOUS TREE
- CONIFEROUS TREE
- BUSH

- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
- = CATCHBASIN
- = FIRE HYDRANT
- = UTILITY POLE
- = LIGHT POLE
- = GUY POLE
- = GUY WIRE
- = UTILITY PEDESTAL
- = TRANSFORMER
- = HANDHOLE
- = ELECTRIC METER
- = GAS METER
- = SIGN
- = POST
- = AIR CONDITIONING UNIT

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

2,597 S.F. LANDSCAPE TOTAL
LANDSCAPE REQUIRED = 200 S.F./10 PARKING SPACES
52 SPACES/10 x 200 = 1,040 S.F.
LANDSCAPE AREA PROVIDED = 1,440 S.F.

INTERIOR TREES REQUIRED
2 CANOPY TREES/10 SPACES
52/10 x 2 = 10.4 = 11 TREES
TREES PROVIDED = 11

STREET TREES REQUIRED
1 TREE/70' OF FRONTAGE
200/70 = 2.85 = 3
PROVIDED = 3

SITE ADDRESS: 2080 GRAND RIVER AVE., OKEMOS, MI. 48864

E-91998-CPUDJEFF-TRUCK SURVEY#91998ALT

REVISIONS
2-6-18 BOARD REVIEW
3-23-18 CLIENT
4-16-18 CPUD SUBMITTAL

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

2080 Grand River
LANDSCAPE PLAN

SCALE: 1"= 20'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 12-1-17	PROJECT MGR. JWK	SHEET 6 OF 6
AUTHORIZED BY: AFFINITY 9 INVESTMENTS, LLC c/o THOMAS HANNAWA		JOB #: 91998

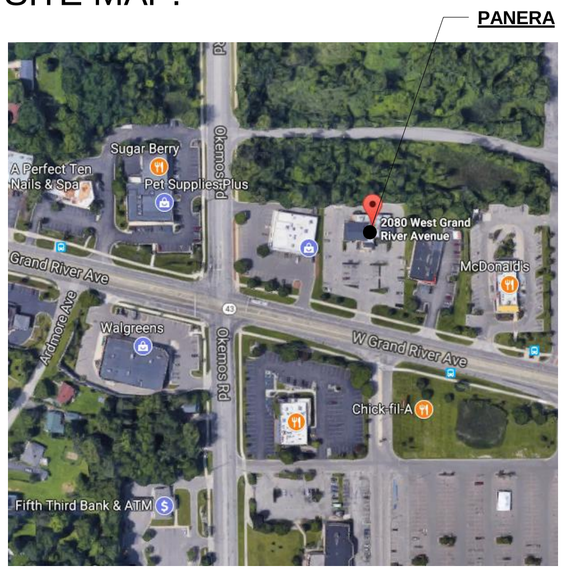
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10/24/2017 10:10:43 AM

PERMIT / BID SET

PANERA BREAD BAKERY-CAFE #0715
2080 GRAND RIVER AVE
OKEMOS, MI 48864

SITE MAP:



SEAT COUNT INFORMATION:

CATEGORY:	EXISTING:	PROPOSED:
NO. OF SEATS:	-	95 INT, 26 EXT
EFFECTIVE SEATING:	-	-
NO. OF PARKING SPACES:	-	-
NO. OF REGISTERS:	-	4
NO. OF TABLES:	-	32 INT, 13 EXT

CODE INFORMATION

APPLICABLE CODES & REGULATIONS:

BUILDING CODE:	2015 MICHIGAN BUILDING CODE
PLUMBING CODE:	2015 MICHIGAN PLUMBING CODE
ELECTRICAL CODE:	2014 NATIONAL ELECTRICAL CODE
MECHANICAL CODE:	2015 MICHIGAN MECHANICAL CODE
FIRE PROTECTION:	2015 INTERNATIONAL FIRE CODE
ENERGY CODE:	2015 ENERGY ENERGY CODE
ACCESSIBILITY CODE:	2009 ICC/ANSI A117.1

CODE CLASSIFICATION:

A. OCCUPANCY GROUP:	A2 - ASSEMBLY
B. CONSTRUCTION CLASSIFICATION:	TYPE V-B
C. AUTOMATIC FIRE SUPRESSION SYSTEM INSTALLED:	NO

AREA BREAKDOWN:

GROSS SF	4,509 SQ FT
LEASEABLE SPACE	4,060 SQ FT

TRAVEL DISTANCE:

ALLOWED TRAVEL DISTANCE:	250 FT
ACTUAL TRAVEL DISTANCE:	102'-8" FT MAX

PROTOTYPE INFORMATION

THIS SET OF DOCUMENTS INCORPORATES ALL REVISIONS THROUGH PROTOTYPE UPDATE #2017.00.02

REVISION ISSUE LOG

REVISION #	ISSUE DATE	DESCRIPTION	AFFECTED SHEETS	REMARKS
1		-		

CONTACT LIST

PANERA BREAD DEVELOPMENT MANAGER:
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brian.barnard@panerabread.com

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DESIGN CONSULTANT:
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mhinchcliffe@arcv.com

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PHONE 517-853-4516

PLUMBING / MECH DEPARTMENT CONTACT:
MERIDIAN TOWNSHIP, BUILDING DIVISION
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	A510	INTERIOR PERSPECTIVES
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	A011	TRASH ENCLOSURE DETAILS
	A012	SITE SIGNAGE PLAN
	A013	DRIVE-THRU SIGNAGE DETAILS
	A014	ENLARGED PATIO PLAN
	A100	SLAB PLAN- DIMENSIONED
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	A102	ROOF PLAN
	A111	ROOF DETAILS
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Sheet Count: 97

Bakery-Cafe:

#0715

Project Team:

ARCVISION INCORPORATED
SAINT LOUIS / DALLAS
ARCHITECTURE • ENGINEERING • STORE PLANNING

Professional Seal:

Project Title:

Bakery Cafe #0715
2080 GRAND RIVER AVE
OKEMOS, MI 48864

PERMIT / BID SET

Consultant Copyright Placeholder

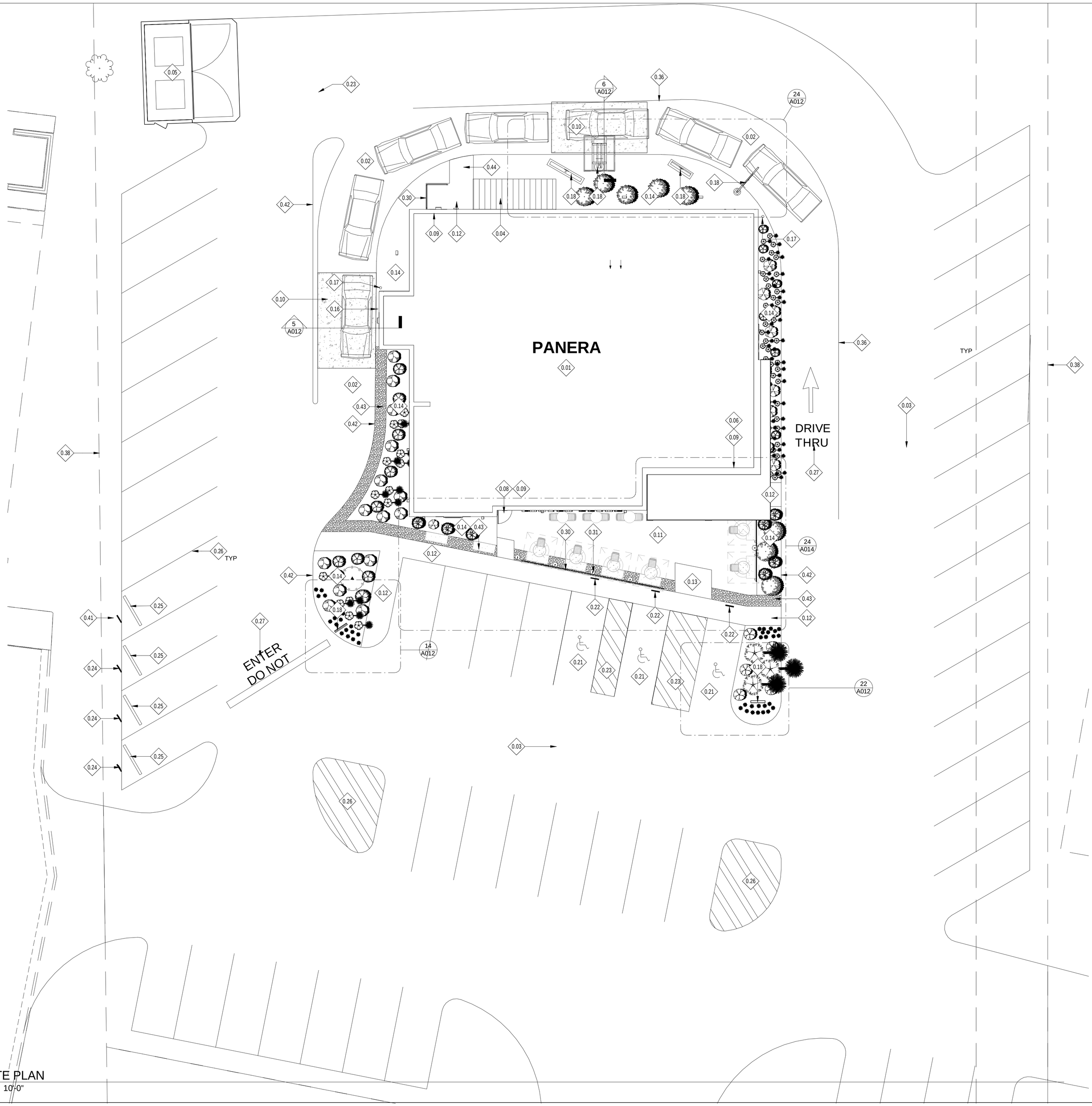
No.	Description	Date
1	-	

COVER SHEET

Project Number: 170686
Drawn By: CAO, MH
Issue Date: 10.24.17

Sheet Number: G000

PB 2015.01



1 SITE PLAN
1" = 10'-0"

GENERAL NOTES:

A. SITE PLAN PROVIDED FOR REFERENCE, REFER TO CIVIL DOCUMENTS FOR ADDITIONAL INFORMATION.
B. LANDSCAPE HAS BEEN INTENTIONALLY EXCLUDED FROM THIS SHEET, SEE CIVIL DRAWINGS FOR ALL LANDSCAPE INFORMATION AND REQUIREMENTS.
C. ALL WORK SHALL COMPLY WITH THE REGULATION AND ORDINANCES OF MERIDIAN TOWNSHIP, MI AND ANY OTHER APPLICABLE CODES.
D. THE GENERAL CONTRACTOR (G.C.) SHALL CONTACT LOCAL UTILITIES TO VERIFY ALL SIZES, LOCATIONS, AND CONNECTION POINTS FOR ALL UTILITIES AFFECTED.
E. ANY CONNECTIONS, DISCONNECTIONS, AND INSTALLATIONS TO LOCAL UTILITIES SHALL BE MADE IN ACCORDANCE WITH APPLICABLE CODES.
F. EXTERIOR BUILDING SIGN FURNISHED AND INSTALLED BY OWNER'S SIGN VENDOR, G.C. TO PROVIDE POWER.
G. G.C. TO VERIFY EXISTING SITE CONDITIONS PRIOR TO BID. ALSO PROVIDE CONTINUOUS CURB CUTS AND SMOOTH PAVEMENT & CURB TRANSITIONS BETWEEN NEW AND EXISTING CONDITIONS AS REQUIRED FOR SITE WORK AS REQUIRED.
H. G.C. SHALL PROVIDE AND INSTALL ELECTRICAL CONDUIT AND STRUCTURAL FOOTINGS FOR ALL NEW SITE DRIVE-THRU SIGNAGE (TYPICAL).
I. REFER TO CIVIL DOCUMENTS FOR GENERAL SITE LIGHTING.

KEYED NOTES

0.01 PROPOSED PANERA CAFE SPACE.
0.02 DRIVE THRU LANE.
0.03 ASPHALT PAVING; REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
0.04 CART CORRAL; LOCATE ELECTRICAL CABINETS AT EXTERIOR WALL OF MAIN BUILDING THIS LOCATION.
0.05 PROPOSED TRASH ENCLOSURE AND CONCRETE PAD BY LANDLORD; REFER TO SHEET A012 SHELL DRAWINGS FOR ADDITIONAL INFORMATION.
0.06 PRIMARY BUILDING ENTRANCE
0.08 SECONDARY ENTRANCE; REFER TO SHEET A611 FOR ADDITIONAL INFORMATION.
0.09 GC TO PROVIDE MAXIMUM THRESHOLD HEIGHT OF 1/2"
0.10 DRIVE-THRU CONCRETE PAD; REFER TO CIVIL DRAWINGS AND SHEET A011 FOR ADDITIONAL INFORMATION.
0.11 CONCRETE PATIO; REFER TO SHEET A014 FOR ADDITIONAL INFORMAITON.
0.12 PROPOSED CONCRETE SIDEWALK, PROVIDE BROOM FINISH PERPENDICULAR TO BUILDING, TYPICAL. REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
0.13 ACCESSIBLE RAMP; REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION AND DETAILS.
0.14 PROPOSED LANDSCAPE AREA; REFER TO LANDSCAPE DRAWINGS FOR ADDITIONAL INFORMATION TO UTILIZE LOCAL FLORA.
0.16 4" CONCRETE PIPE BOLLARD, REFER TO 14/A014
0.17 6" CONCRETE PIPE BOLLARD, REFER TO 10/A014
0.18 NEW DRIVE THRU SIGNAGE; SEE SHEET A013 FOR FURTHER INFORMATION. ALSO SEE SHOP DRAWINGS.
0.21 PROPOSED ACCESSIBLE PARKING STALL; REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
0.22 BOLLARD MOUNTED ACCESSIBLE SIGNAGE; REFER TO 22/A014 FOR FURTHER INFORMATION.
0.23 PROPOSED PAINTED STRIPED CROSS WALK; REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
0.24 PROPOSED RAPID PICK-UP PARKING LOCATIONS AND BOLLARD MOUNTED SIGNAGE. REFER TO 18/A014 & VENDORS SHOP DRAWINGS FOR SIGNAGE INFORMATION.
0.25 PROPOSED CONCRETE WHEEL STOPS; REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
0.26 PARKING STRIPING; REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
0.27 PROPOSED DIRECTIONAL PAVEMENT PAINTING; REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
0.30 PATIO RAILING BY PANERA, COLOR: TO MATCH #AF-155 WEIMARANER. REFER TO 13/A014, BY TENANT
0.31 PATIO SIDEWALK LIGHT BY PANERA. REFER TO TENANT REFLECTED CEILING PLAN FOR FURTHER INFORMATION.
0.36 PROVIDE DRIVE LANE STRIPING. SEE CIVIL DRAWINGS FOR FURTHER INFORMATION.
0.38 LINE INDICATES AREA OF EASEMENT, REFER TO CIVIL DRAWINGS FOR FURTHER INFORMATION.
0.41 DRIVE THRU PULL FORWARD SPACE AND SIGNAGE, REFER TO 18/A014.
0.42 CONCRETE CURB, REFER TO CIVIL FOR FURTHER INFORMATION.
0.43 ROCK BED LANDSCAPING. REFER TO CIVIL FOR FURTHER INFORMATION.
0.44 CONCRETE SERVICE RAMP, REFER TO CIVIL FOR FURTHER INFORMATION.

Bakery-Cafe:

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Bakery Cafe #0715
2080 GRAND RIVER AVE
OKEMOS, MI 48864

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No.	Description	Date

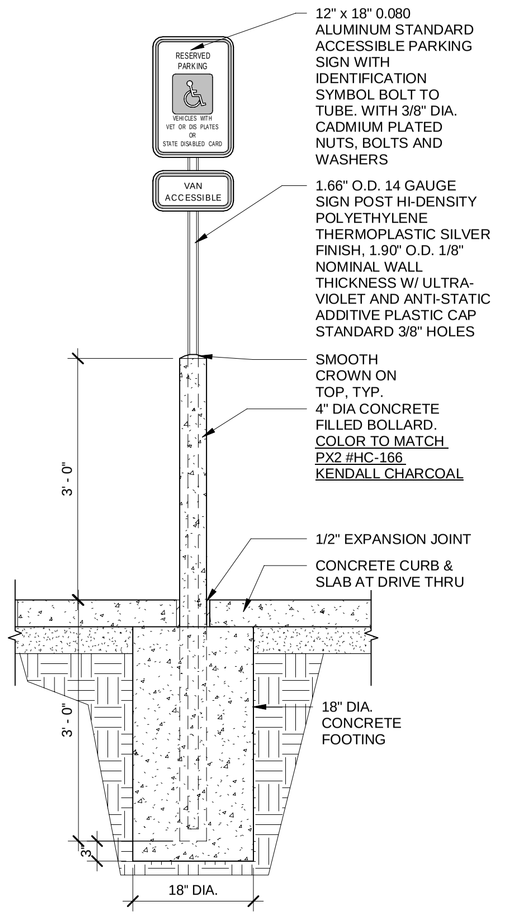
ARCHITECTURAL SITE PLAN

Project Number: 170686
Drawn By: CAO, MH
Issue Date: 10.24.17
DPM: BRIAN B.
DM: DAN C.
CPM: KEVIN C.

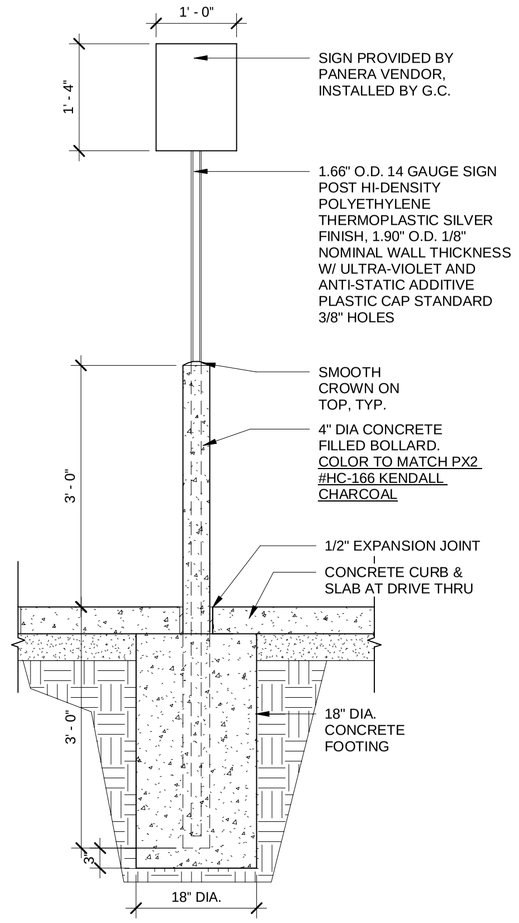
Sheet Number: A001

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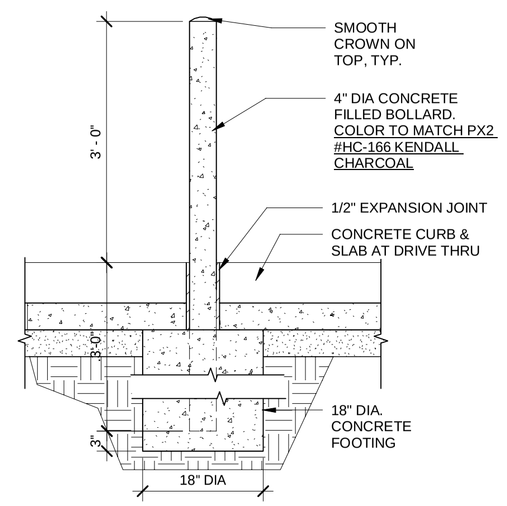
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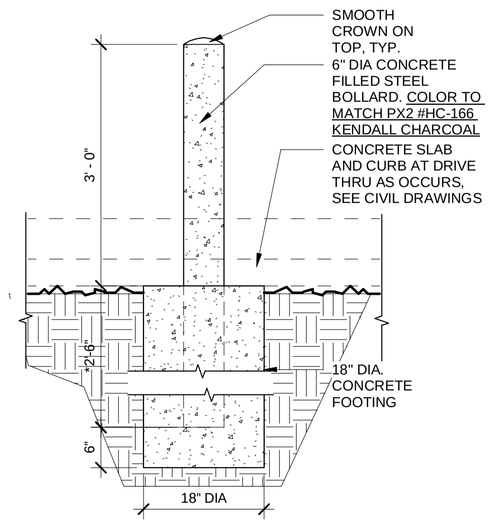
22 DETAIL @ ACCESSIBLE SIGNAGE
3/4" = 1'-0"



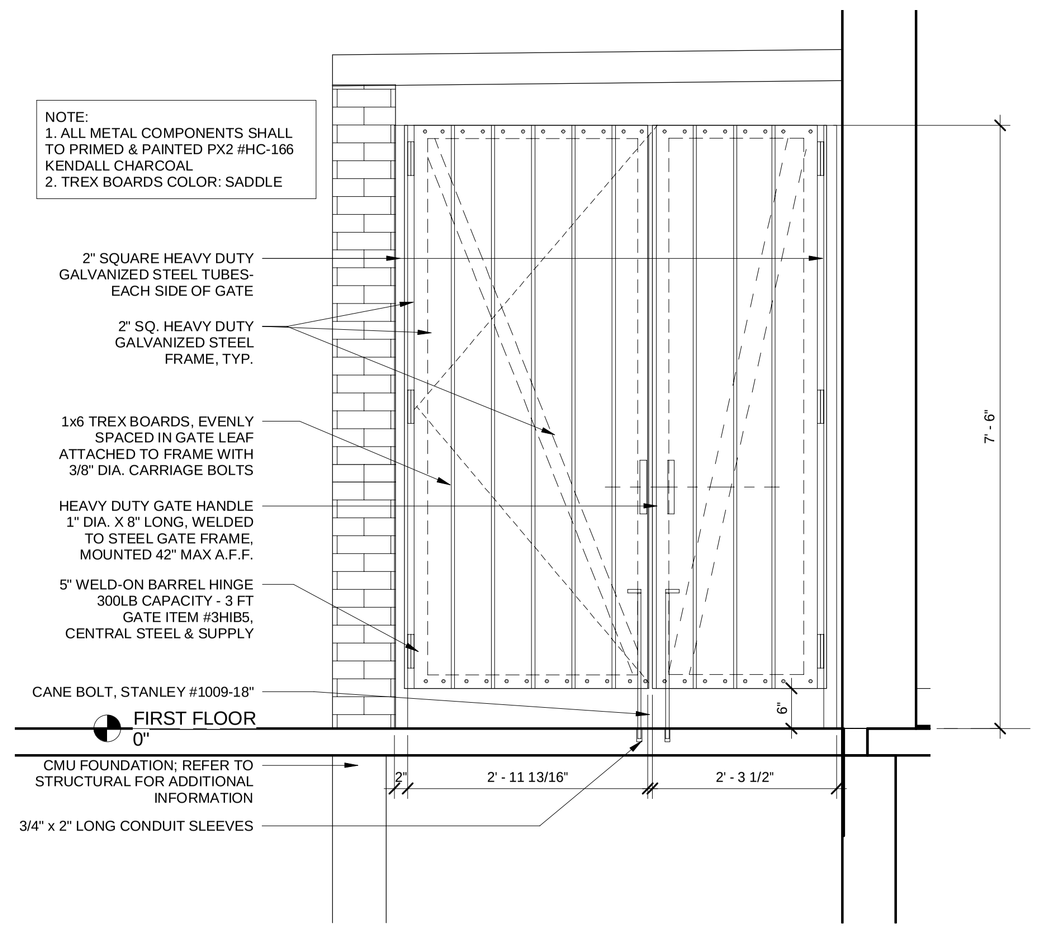
18 BOLLARD DETAIL @ SIGNAGE
3/4" = 1'-0"



14 BOLLARD DETAIL @ DRIVE THRU WDW.
3/4" = 1'-0"



10 BOLLARD DETAIL
3/4" = 1'-0"

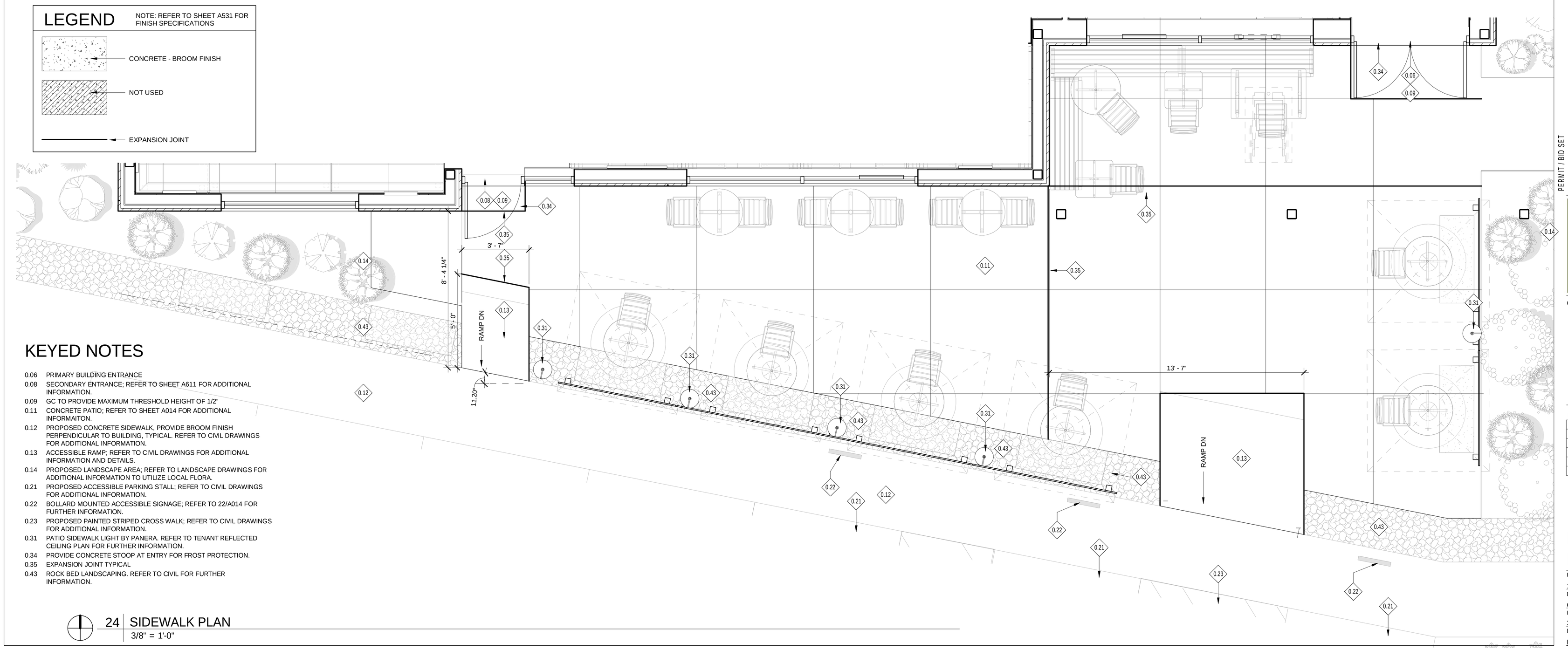


6 CART CORRAL GATE DETAIL
3/4" = 1'-0"

LEGEND

NOTE: REFER TO SHEET A531 FOR FINISH SPECIFICATIONS

- CONCRETE - BROOM FINISH
- NOT USED
- EXPANSION JOINT



24 SIDEWALK PLAN
3/8" = 1'-0"

KEYED NOTES

0.06 PRIMARY BUILDING ENTRANCE
0.08 SECONDARY ENTRANCE; REFER TO SHEET A611 FOR ADDITIONAL INFORMATION.
0.09 GC TO PROVIDE MAXIMUM THRESHOLD HEIGHT OF 1/2"
0.11 CONCRETE PATIO; REFER TO SHEET A014 FOR ADDITIONAL INFORMAITON.
0.12 PROPOSED CONCRETE SIDEWALK, PROVIDE BROOM FINISH PERPENDICULAR TO BUILDING, TYPICAL. REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
0.13 ACCESSIBLE RAMP; REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION AND DETAILS.
0.14 PROPOSED LANDSCAPE AREA; REFER TO LANDSCAPE DRAWINGS FOR ADDITIONAL INFORMATION TO UTILIZE LOCAL FLORA.
0.21 PROPOSED ACCESSIBLE PARKING STALL; REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
0.22 BOLLARD MOUNTED ACCESSIBLE SIGNAGE; REFER TO 22/A014 FOR FURTHER INFORMATION.
0.23 PROPOSED PAINTED STRIPED CROSS WALK; REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
0.31 PATIO SIDEWALK LIGHT BY PANERA. REFER TO TENANT REFLECTED CEILING PLAN FOR FURTHER INFORMATION.
0.34 PROVIDE CONCRETE STOOP AT ENTRY FOR FROST PROTECTION.
0.35 EXPANSION JOINT TYPICAL
0.43 ROCK BED LANDSCAPING. REFER TO CIVIL FOR FURTHER INFORMATION.

10/24/2017 10:12:35 AM

PB 2015.01

Bakery-Cafe:

#0715

Project Team:

ARCVISION INCORPORATED
SAINT LOUIS / DALLAS
ARCHITECTURE • ENGINEERING • STORE PLANNING

Professional Seal:

Project Title:

Bakery Cafe # 0715
2080 GRAND RIVER AVE
OKEMOS, MI 48864

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ENLARGED PATIO PLAN

Project Number: 170686
Drawn By: CAO, MH
Issue Date: 10.24.17
Sheet Number: A014

DPM:	DM:	CPM:
BRIAN B.	DAN C.	KEVIN C.

10/24/2017 11:52:50 AM



1 | PERSPECTIVE VIEW



2 | PERSPECTIVE VIEW



3 | PERSPECTIVE VIEW

PB 2015.01

Bakery-Cafe:

#0715

Project Team:

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SAINT LOUIS / DALLAS
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Professional Seal:

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OKEMOS, MI 48864

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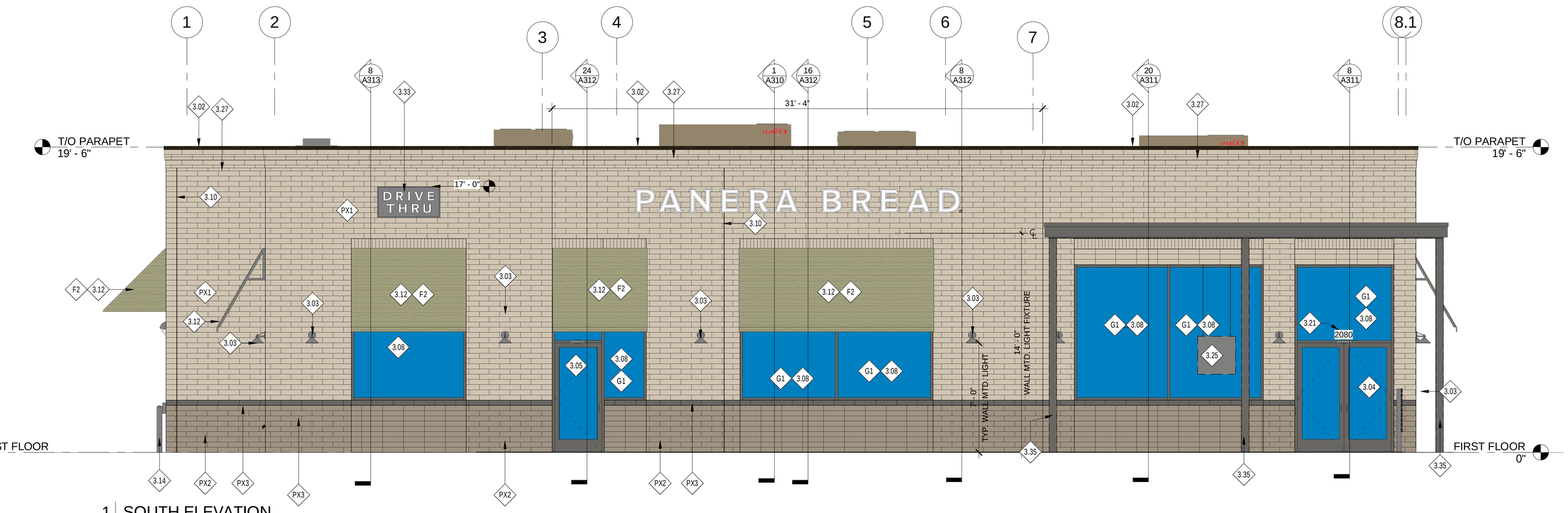
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No.	Description	Date

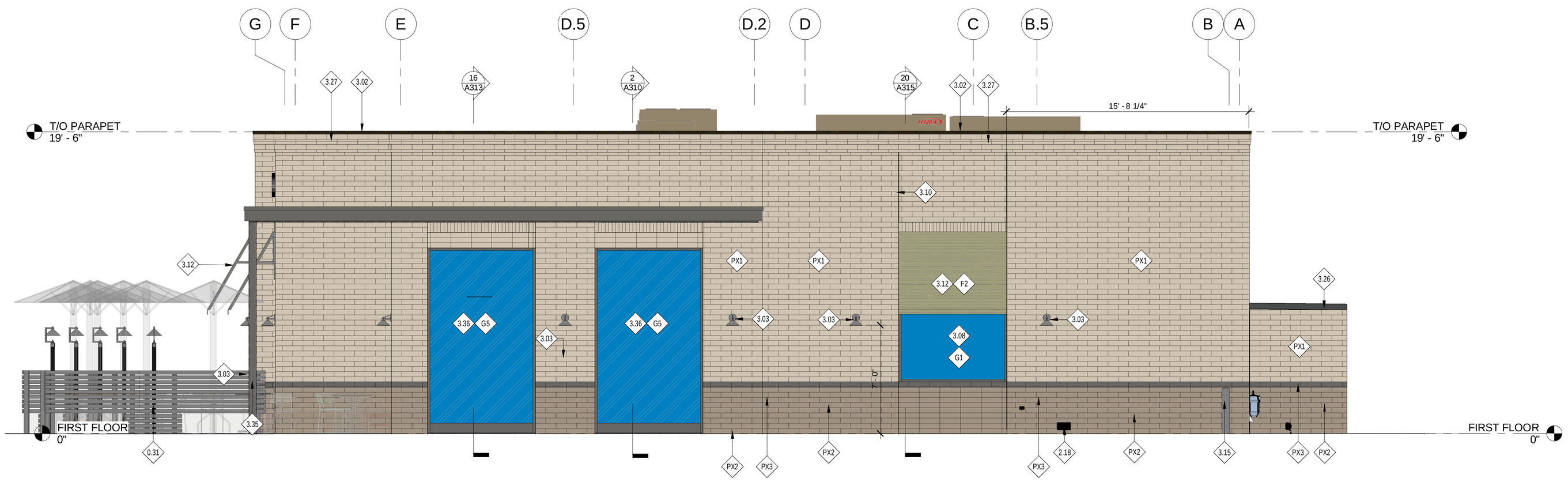
EXTERIOR PERSPECTIVES

Project Number: 170686
Drawn By: ARCV, MH
Issue Date: 10.24.17
DPM: BRIAN B.
DM: DAN C.
CPM: KEVIN C.

Sheet Number: A300



1 SOUTH ELEVATION
1/4" = 1'-0"



2 EAST ELEVATION
1/4" = 1'-0"

GENERAL NOTES:

A. ALL GLAZING TO BE G1 UNLESS NOTED OTHERWISE. FOR STOREFRONT / WINDOW ELEVATIONS SEE SHEET A611.

KEYED NOTES

0.31 PATIO SIDEWALK LIGHT BY PANERA. REFER TO TENANT REFLECTED CEILING PLAN FOR FURTHER INFORMATION.
2.18 NEW EXTERIOR GROUND LIGHT
3.02 PRE-FINISHED METAL COPING | FINISH: TO MATCH HC-166 KENDALL CHARCOAL
3.03 WALL MOUNTED LIGHT FIXTURE. FIXTURES SHALL BE PROVIDED AND INSTALLED BY GC. GC TO PROVIDE POWER AS REQUIRED. REFER TO REFLECTED CEILING PLAN FOR ADDITIONAL INFORMATION.
3.04 MAIN ENTRANCE/EXIT | REFER TO A601 AND A611 FOR ADDITIONAL INFORMATION.
3.05 SECONDARY ENTRANCE/EXIT | REFER TO A601 AND A611 FOR ADDITIONAL INFORMATION.
3.08 ALUMINUM STOREFRONT SYSTEM WITH 1" INSULATED GLAZING. COLOR: TO MATCH HC-166 KENDALL CHARCOAL REFER TO SHEET A611 FOR FURTHER INFORMATION.
3.10 CONTROL JOINT(S) WHERE INDICATED | PROVIDE SEALANT TO MATCH ADJACENT WALL MATERIAL.
3.12 PRE-MANUFACTURED FABRIC AWNING PROVIDED AND INSTALLED BY SIGN VENDOR UNDER SEPARATE PERMIT. GC SHALL PROVIDE APPROPRIATE BLOCKING AS REQUIRED BY SIGN VENDOR. REFER TO SHOP DRAWINGS FOR ADDITIONAL INFORMATION.
3.14 4" DIA. CONCRETE BOLLARD | FINISH: PAINT TO MATCH P107' | REFER TO SHEET A014 FOR FURTHER INFORMATION
3.15 6" DIA. CONCRETE BOLLARD | FINISH: PAINT P107 | REFER TO SHEET A014 FOR FURTHER INFORMATION
3.21 BUILDING ADDRESS SIGN | VERIFY SIZE, LOCATION, AND STYLE WITH LOCAL FIRE DEPARTMENT
3.25 PANERA LOGO SIGN, SEE SIGN SHOPS FOR MORE INFORMATION. PROVIDE BLOCKING AS REQURIED.
3.26 STANDING SEAM METAL ROOFING SYSTEM AND EDGE PIECE BY MFR., 12" SPACING. | COLOR: TO MATCH HC-166 KENDALL CHARCOAL
3.27 BRICK CORNICE TO BE CONSTRUCTED USING ENDUROMAX BRICK WALL SYSTEM. REFER TO DETAIL FOR FURTHER INFORMATION.
3.33 INTERNALLY ILLUMINATED LED 'DRIVE THRU' SIGN BY TENANT. COLOR: BLACK CHANNEL WITH REVERSE (HALO) ILLUMINATION AND WHITE LETTERS. ALL SIGNAGE UNDER SEPARATE PERMIT. G.C. SHALL PROVIDE BLOCKING IN WALL FOR SIGN AND PROVIDE ACCESS PANEL ON BACKSIDE OF PARAPET FOR ACCESS AS REQUIED.
3.35 PREFABRICATED ALUMINUM ENTRY CANOPY CONSTRUCTION. ALL EXPOSED ALUMINUM TO BE FINISHED TO MATCH HC-166 KENDALL CHARCOAL.
3.36 ALUMINUM STOREFRONT SYSTEM WITH 1-1/8" INSULATED GLAZING. COLOR: TO MATCH HC-166 KENDALL CHARCOAL REFER TO SHEET A611 FOR FURTHER INFORMATION
F2 FABRIC AWNING | OPEN ENDED SLAB | COLOR: ASPEN FABRIC, (4' PROJECTION / 5' HEIGHT AT TYPICAL & 5' PROJECTION @ DRIVE THRU)
G1 ALUMINUM STOREFRONT | 2" x 4 1/2" PROFILE | THERMAL BREAK | COLOR: #HC-166 KENDALL CHARCOAL | 1" CLEAR INSULATED GLAZING: PPG SOLARBAN 70XL (OR APPROVED EQUAL) | REFER TO SHEET A611 FOR ADDITIONAL INFORMATION
G5 ALUMINUM STOREFRONT | 2" x 6" PROFILE | THERMAL BREAK | COLOR: #HC-166 KENDALL CHARCOAL | 1-1/8" CLEAR INSULATED GLAZING: PPG SOLARBAN 70XL (OR APPROVED EQUAL) | REFER TO SHEET A611 FOR ADDITIONAL INFORMATION
PX1 PAINT SYSTEM OVER BRICK MASONRY SYSTEM | MFR: ENDURAMAX, CLAY BRICK, MODULAR | COLOR: #955 BERBER WHITE
PX2 PAINT SYSTEM OVER BRICK MASONRY SYSTEM | MFR: ENDURAMAX, CLAY BRICK, MODULAR | COLOR: #AF-155 WEINMARANER
PX3 PAINT SYSTEM OVER BRICK MASONRY SYSTEM | MFR: ENDURAMAX, CLAY BRICK, MODULAR | COLOR: #HC-166 KENDALL CHARCOAL

Bakery-Cafe:

#0715

Project Team:

ARCVISION INCORPORATED
SAINT LOUIS / DALLAS
ARCHITECTURE • ENGINEERING • STORE PLANNING

Professional Seal:

Project Title:

Bakery Cafe #0715
2080 GRAND RIVER AVE
OKEMOS, MI 48864

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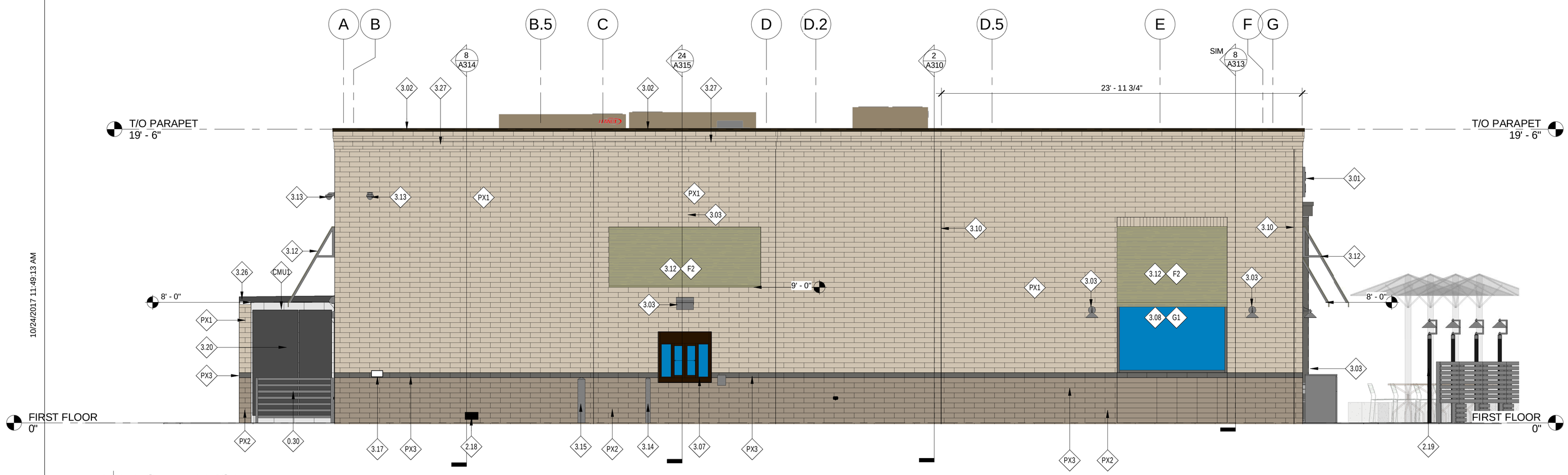
EXTERIOR ELEVATIONS

Project Number: 170686
Drawn By: CAO, MH
Issue Date: 10.24.17
DPM: BRIAN B.
DM: DAN C.
CPM: KEVIN C.

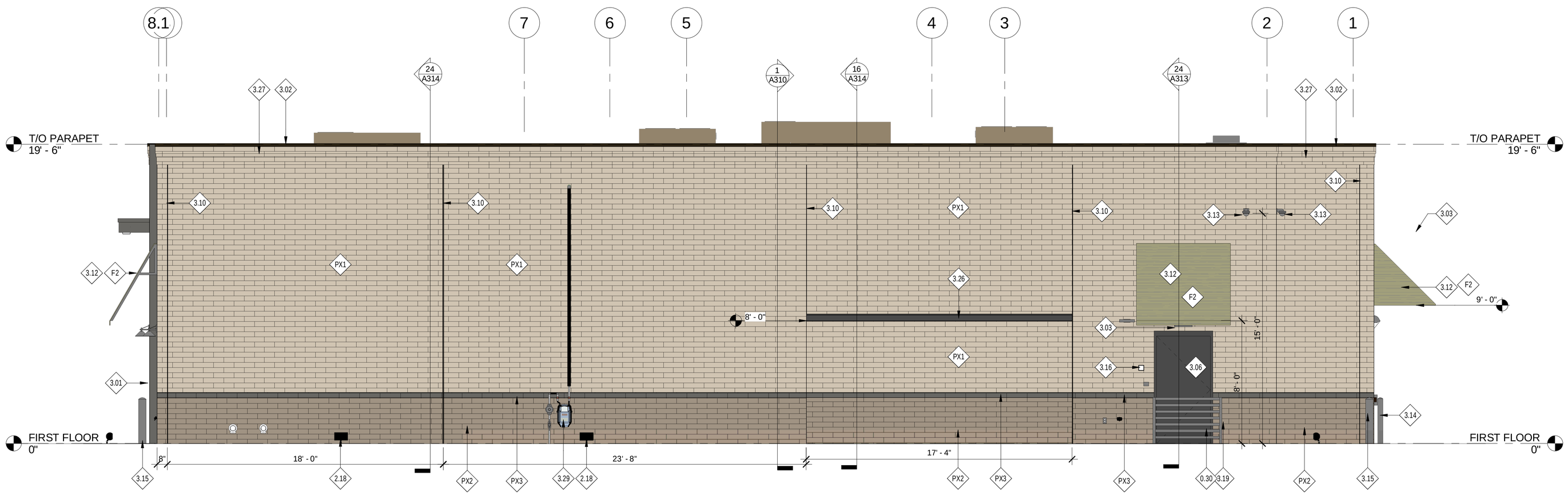
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1 WEST ELEVTION
1/4" = 1'-0"



2 NORTH ELEVATION
1/4" = 1'-0"

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GENERAL NOTES:

A. ALL GLAZING TO BE G1 UNLESS NOTED OTHERWISE. FOR STOREFRONT / WINDOW ELEVATIONS SEE SHEET A611.

KEYED NOTES

0.30 PATIO RAILING BY PANERA, COLOR: TO MATCH #AF-155 WEIMARANER. REFER TO 13/A014, BY TENANT

2.18 NEW EXTERIOR GROUND LIGHT

2.19 SIDEWALK POLE LIGHT FIXTURE

3.01 INTERNALLY ILLUMINATED CLIP LETTERS PROVIDED AND INSTALLED BY SIGN VENDOR UNDER SEPARATE PERMIT; G.C. TO PROVIDE BLOCKING IN WALL FOR SIGN AND PROVIDE ACCESS PANEL ON BACKSIDE OF PARAPET FOR ACCESS AS REQUIRED. (UNDER SEPARATE SIGNAGE PERMIT)

3.02 PRE-FINISHED METAL COPING | FINISH: TO MATCH HC-166 KENDALL CHARCOAL

3.03 WALL MOUNTED LIGHT FIXTURE. FIXTURES SHALL BE PROVIDED AND INSTALLED BY GC. GC TO PROVIDE POWER AS REQUIRED. REFER TO REFLECTED CEILING PLAN FOR ADDITIONAL INFORMATION.

3.06 HOLLOW METAL SERVICE DOOR. REFER TO A601 FOR ADDITIONAL INFORMATION. | PAINT TO MATCH HAC-166 KENDALL CHARCOAL.

3.07 DRIVE-THRU WINDOW | MFR: QUIKSERV | MODEL: FM42E | COLOR TO MATCH STOREFRONT.

3.08 ALUMINUM STOREFRONT SYSTEM WITH 1" INSULATED GLAZING. COLOR: TO MATCH HC-166 KENDALL CHARCOAL REFER TO SHEET A611 FOR FURTHER INFORMATION.

3.10 CONTROL JOINT(S) WHERE INDICATED | PROVIDE SEALANT TO MATCH ADJACENT WALL MATERIAL.

3.12 PRE-MANUFACTURED FABRIC AWNING PROVIDED AND INSTALLED BY SIGN VENDOR UNDER SEPARATE PERMIT. GC SHALL PROVIDE APPROPRIATE BLOCKING AS REQUIRED BY SIGN VENDOR. REFER TO SHOP DRAWINGS FOR ADDITIONAL INFORMATION.

3.13 SECURITY CAMERA INSTALLED BY TENANT | COORDINATE ROUGH-IN LOCATION(S) AND HEIGHTS WITH PANERA CONSTRUCTION MANAGER PRIOR TO INSTALLATION.

3.14 4" DIA. CONCRETE BOLLARD | FINISH: PAINT TO MATCH P107' | REFER TO SHEET A014 FOR FURTHER INFORMATION

3.15 6" DIA. CONCRETE BOLLARD | FINISH: PAINT P107 | REFER TO SHEET A014 FOR FURTHER INFORMATION

3.16 FIRE DEPARTMENT ACCESS BOX | INSTALLED ADJACENT SERVICE DOOR. COORDINATE LOCATION WITH LOCAL FIRE DEPARTMENT.

3.17 FIRE DEPARTMENT CONNECTION (FDC) BY LANDLORD

3.19 HOSE BIBB | RECESSED STAINLESS STEEL BOX. REFER TO PLUMBING DRAWINGS FOR LOCATION AND ADDITIONAL INFORMATION. INSTALLED BY TENANT.

3.20 GATE ENCLOSURE AT CART CORRAL | MFR: TREX COMPOSITE PLANK | COLOR: SADDLE.

3.26 STANDING SEAM METAL ROOFING SYSTEM AND EDGE PIECE BY MFR., 12" SPACING. | COLOR: TO MATCH HC-166 KENDALL CHARCOAL

3.27 BRICK CORNICE TO BE CONSTRUCTED USING ENDUROMAX BRICK WALL SYSTEM. REFER TO DETAIL FOR FURTHER INFORMATION.

3.29 GAS METER - REFER TO PLUMBING DRAWINGS FOR FURTHER INFORMATION

CMU1 SMOOTH FACE CONCRETE BLOCK, PAINT TO MATCH MAIN BUILDING

F2 FABRIC AWNING | OPEN ENDED SLAB | COLOR: ASPEN FABRIC, (4' PROJECTION / 5' HEIGHT AT TYPICAL & 5' PROJECTION @ DRIVE THRU)

G1 ALUMINUM STOREFRONT | 2" x 4 1/2" PROFILE | THERMAL BREAK | COLOR: #HC-166 KENDALL CHARCOAL | 1" CLEAR INSULATED GLAZING: PPG SOLARBAN 70XL (OR APPROVED EQUAL) | REFER TO SHEET A611 FOR ADDITIONAL INFORMATION

PX1 PAINT SYSTEM OVER BRICK MASONRY SYSTEM | MFR: ENDURAMAX, CLAY BRICK, MODULAR | COLOR: #955 BERBER WHITE

PX2 PAINT SYSTEM OVER BRICK MASONRY SYSTEM | MFR: ENDURAMAX, CLAY BRICK, MODULAR | COLOR: #AF-155 WEINMARANER

PX3 PAINT SYSTEM OVER BRICK MASONRY SYSTEM | MFR: ENDURAMAX, CLAY BRICK, MODULAR | COLOR: #HC-166 KENDALL CHARCOAL

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Bakery-Cafe:

#0715

Project Team:

ARCVISION INCORPORATED
SAINT LOUIS / DALLAS
ARCHITECTURE • ENGINEERING • STORE PLANNING

Professional Seal:

Project Title:

Bakery Cafe #0715
2080 GRAND RIVER AVE
OKEMOS, MI 48864

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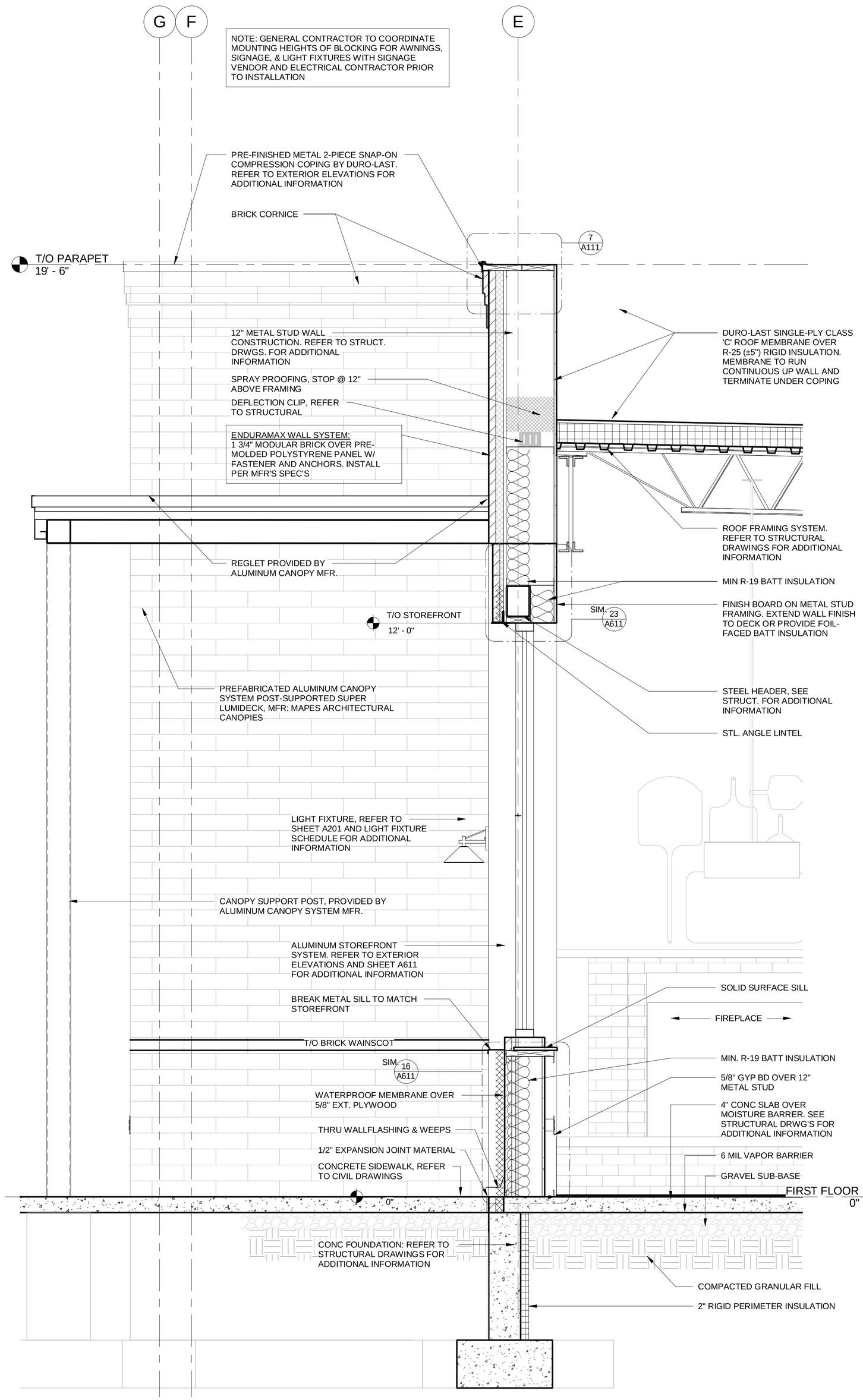
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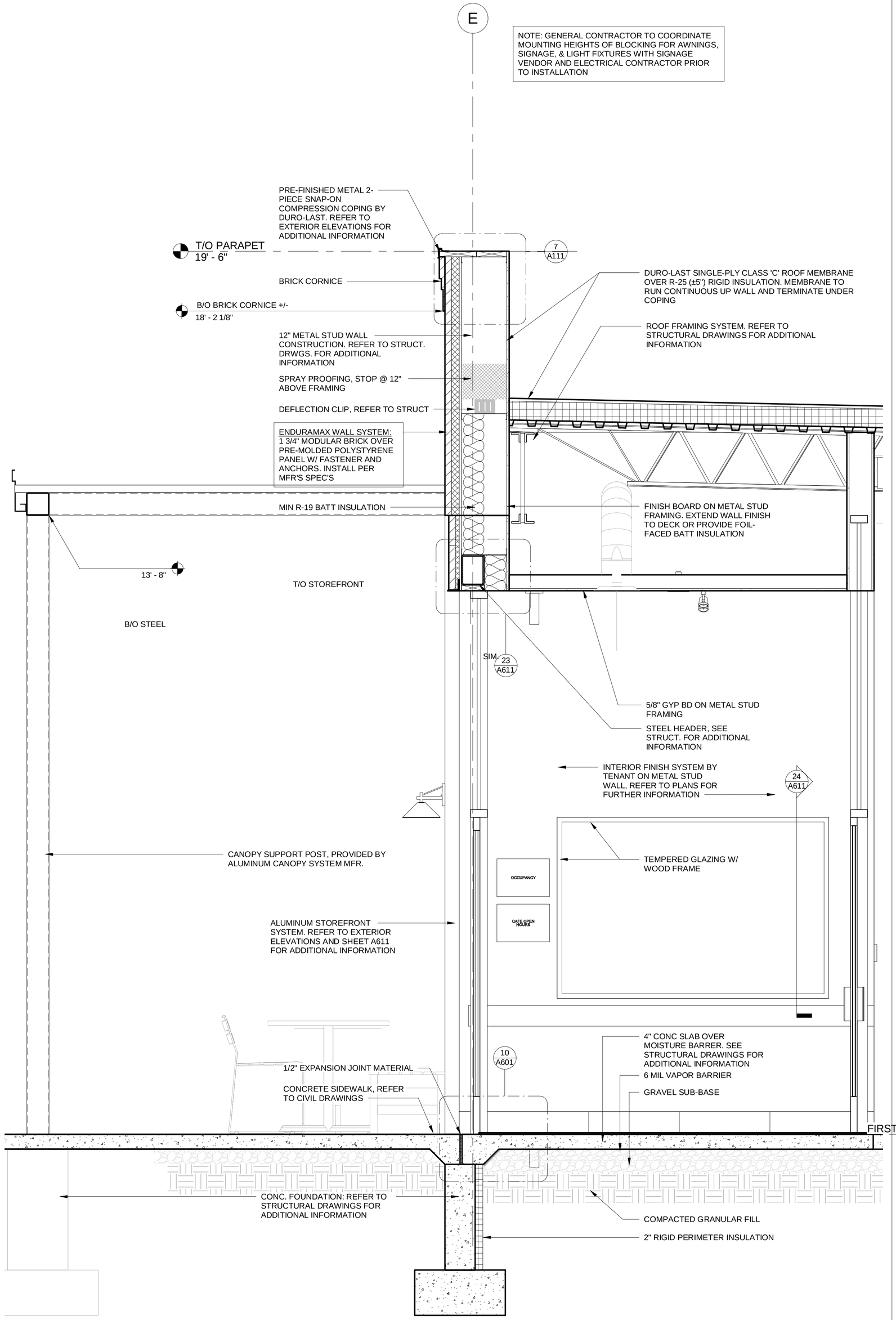
EXTERIOR ELEVATIONS

Project Number: 170686
Drawn By: CAO, MH
Issue Date: 10.24.17
DPM: BRIAN B.
DM: DAN C.
CPM: KEVIN C.

Sheet Number: A302



20 WALL SECTION
3/4" = 1'-0"



8 WALL SECTION @ ENTRY
3/4" = 1'-0"

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Bakery-Cafe:

#0715

Project Team:

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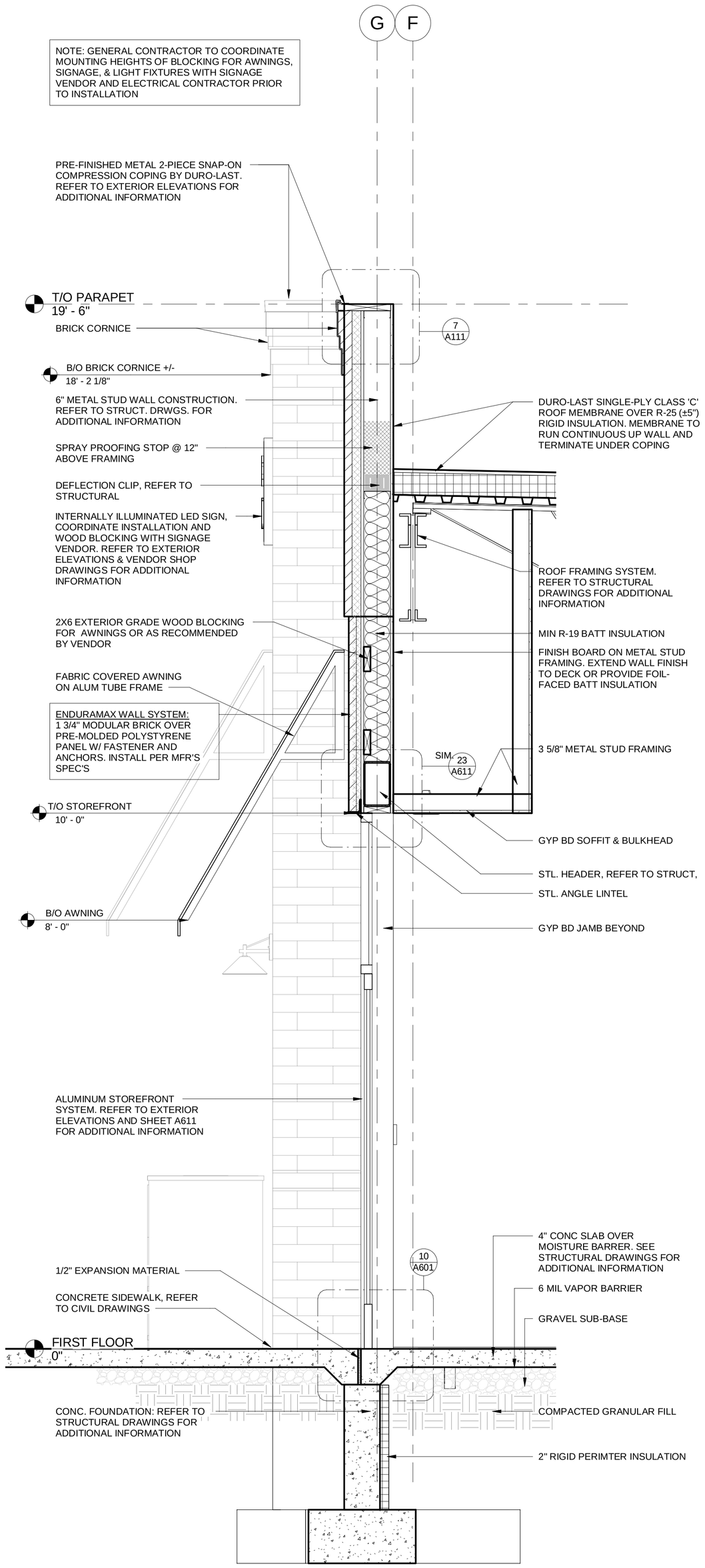
No.	Description	Date

WALL SECTIONS

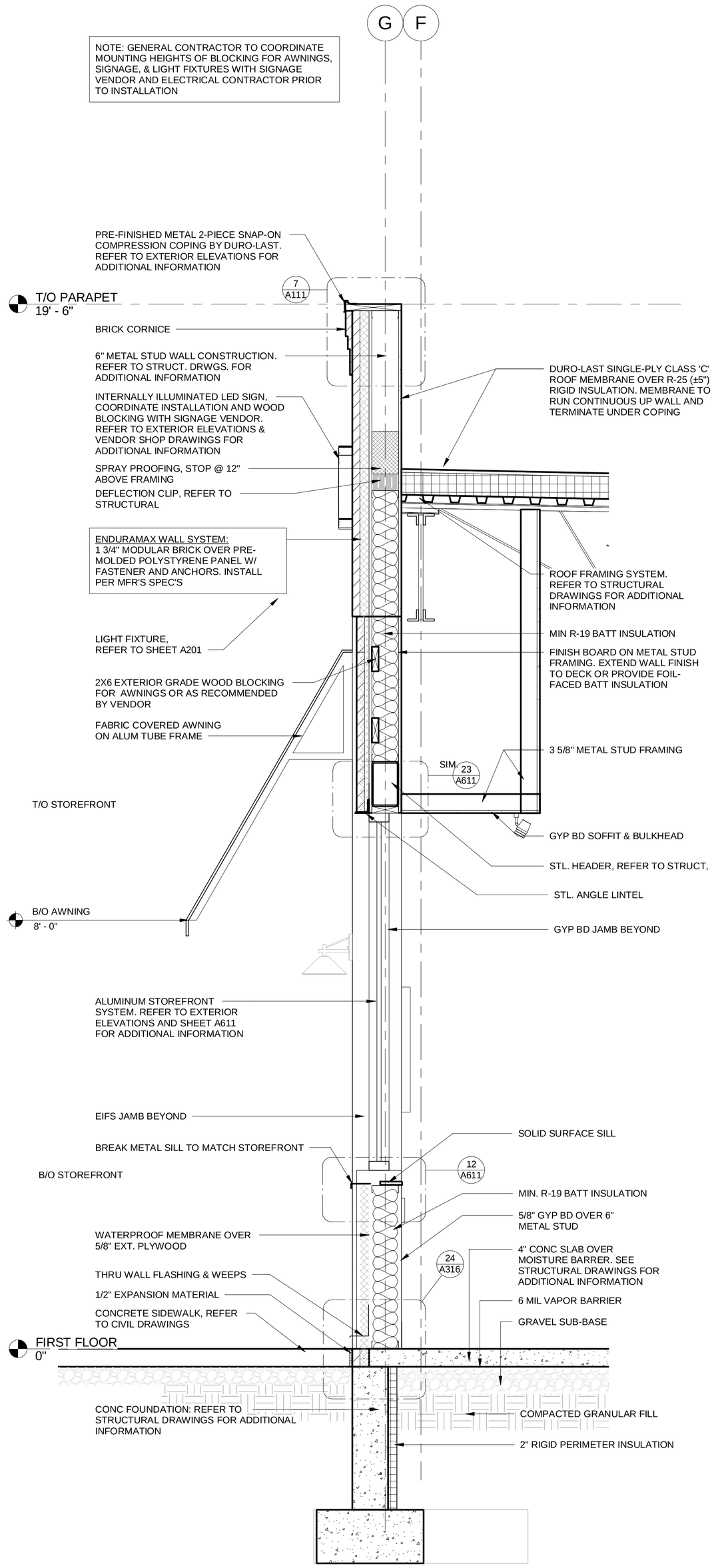
Project Number: 170686
Drawn By: CAO, MH
Issue Date: 10.24.17
DPM: BRIAN B.
DM: DAN C.
CPM: KEVIN C.

Sheet Number: A311

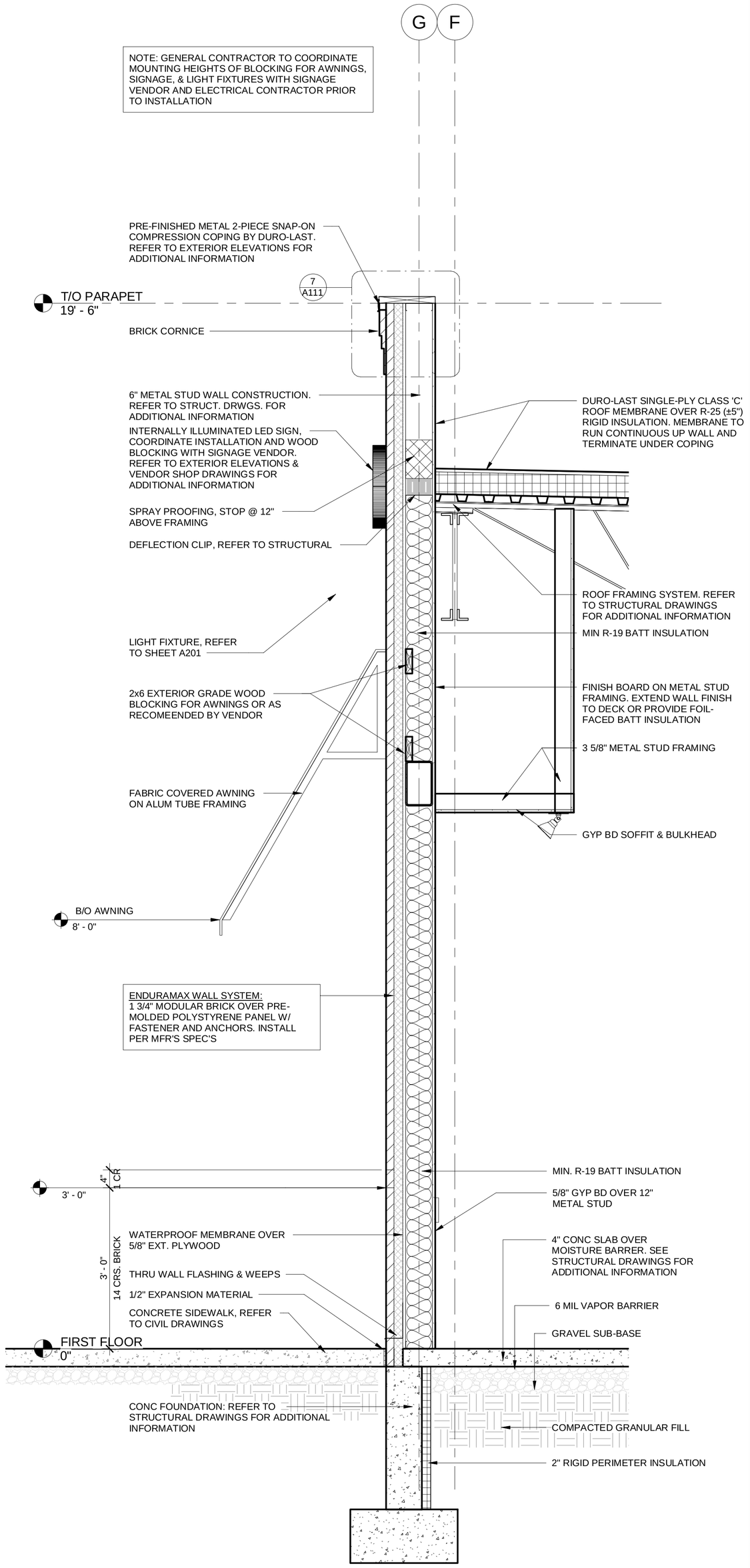
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24 WALL SECTION
3/4" = 1'-0"



16 WALL SECTION
3/4" = 1'-0"



8 WALL SECTION
3/4" = 1'-0"

Bakery-Cafe:

#0715

Project Team:

ARCVISION INCORPORATED
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WALL SECTIONS

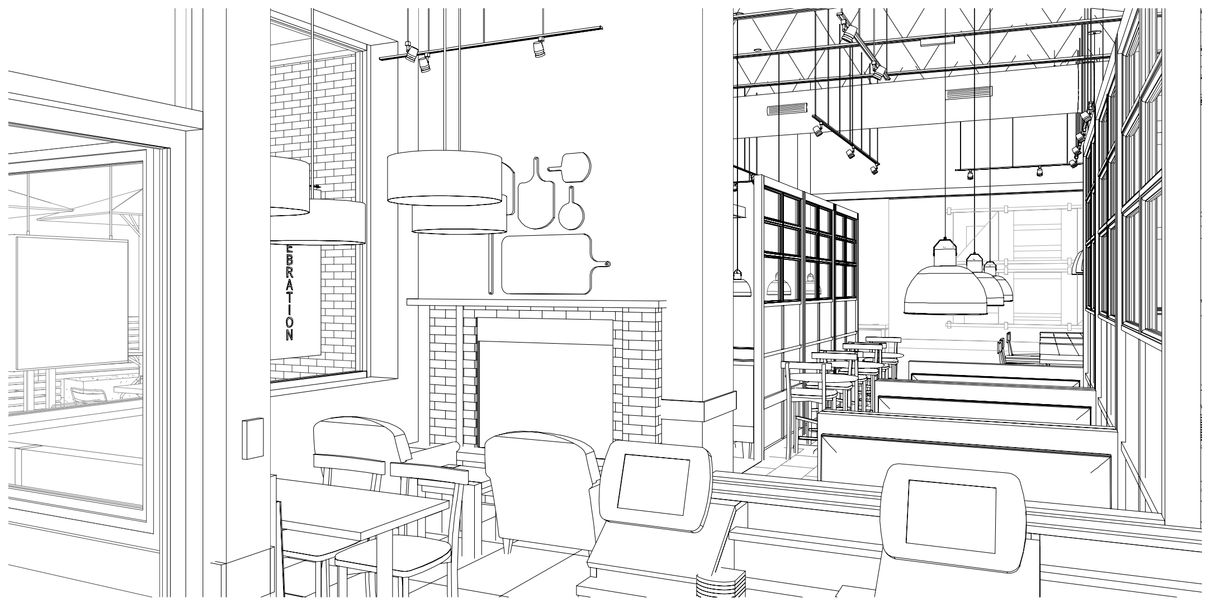
Project Number: 170686
Drawn By: CAO, MH
Issue Date: 10.24.17
DPM: BRIAN B.
DM: DAN C.
CPM: KEVIN C.

Sheet Number: A312

PB 2015.01



1 INTERIOR VIEW @ KIOSK



2 INTERIOR VIEW @ FIREPLACE



3 INTERIOR VIEW @ GATHERING TABLE



4 INTERIOR VIEW @ HOT/COLD BEV.



5 INTERIOR VIEW @ EXPO



6 INTERIOR VIEW @ DINING



7 INTERIOR VIEW 2 CONSOLIDATION



8 INTERIOR VIEW @ BAKERY

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Bakery-Cafe:

#0715

Project Team:

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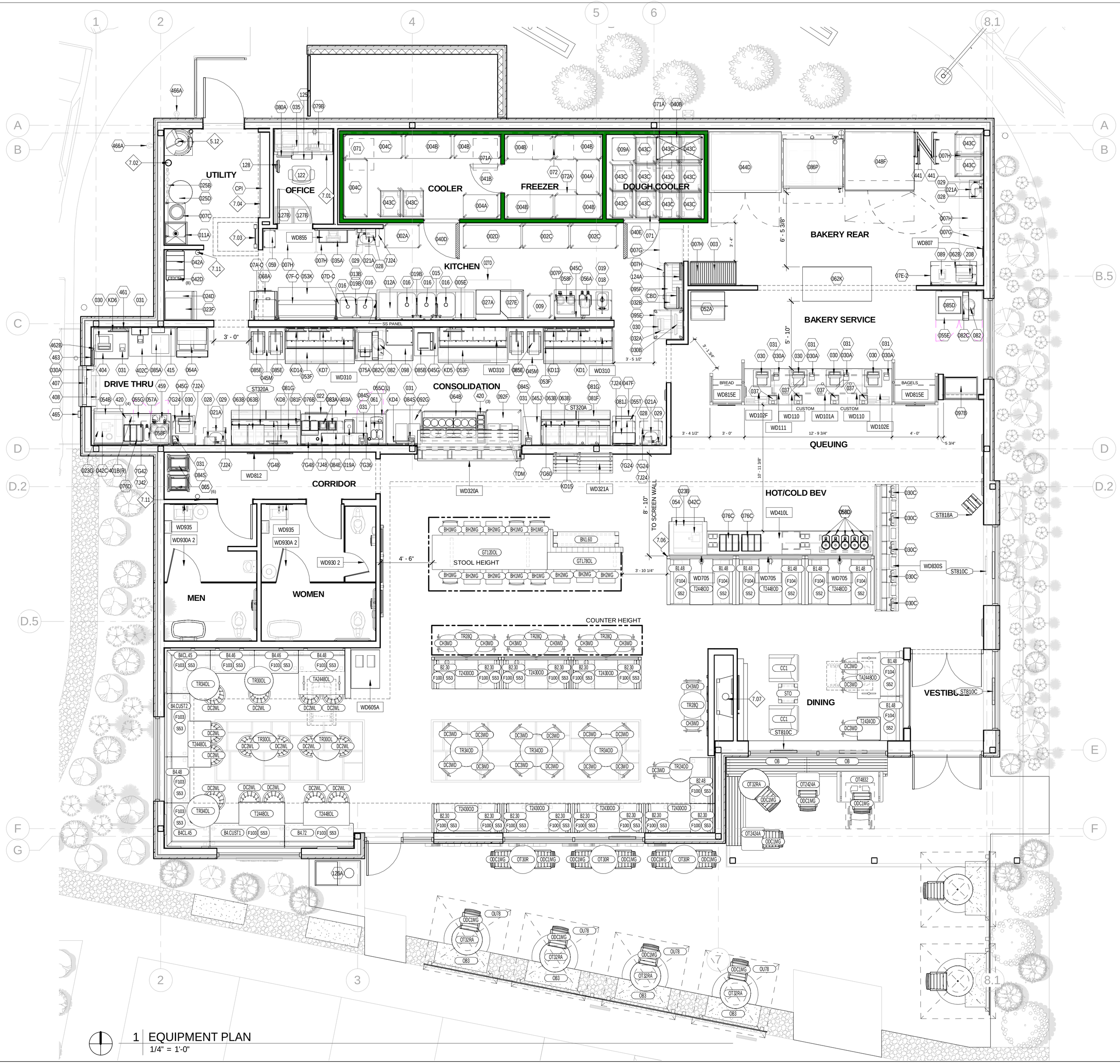
No.	Description	Date

Project Title:

INTERIOR PERSPECTIVES

Project Number: 170686
Drawn By: Author
Issue Date: 10.24.17
Sheet Number: A510

DPM:	DM:	CPM:
D. WILLIS	DM	J. CARTER



GENERAL NOTES:

A. G.C. TO PROVIDE MANAGER OFFICE LAMINATE TOP. ALMOND COLOR PREFERRED; WHITE ALLOWED IF ALMOND IS NOT AVAILABLE. REFER TO ELEVATIONS FOR ADDITIONAL INFORMATION.

KEYED NOTES

5.12 WATER HEATER LOCATION TO BE LOCATED ON STAND. SEE DETAIL 14/A523.

7.01 OFFICE SAFE TO BE INSTALLED FLUSH WITH THE FRONT OF THE DESK ON THE RIGHT HAND SIDE.

7.02 FIRE SPRINKLER RISER LOCATION. FIRE SPRINKLER DESIGN PROVIDED BY OTHERS UNDER SEPARATE PERMIT.

7.03 ALUMINUM ROOF LADDER

7.04 CPI PANEL

7.06 DINING SCREEN WALL FURNITURE, REFER TO 19/A521 FOR SUPPORT TO STRUCTURE ABOVE DETAIL AND EQUIPMENT PLAN FOR SCREEN PLACEMENT LOCATION.

7.07 FIREPLACE | MFR: NAPOLEON, MODEL NO. HD46-HDF46KSB-MKRY(2)-RAK46

7.11 LOCATION OF APPROVED FIRE EXTINGUISHER RATED 2A-10BC. LOCATE WITHIN 30' TRAVEL DISTANCE FROM LIKE EXTINGUISHER.

FURNITURE:

UPHOLSTERY:	REFER TO PLAN TAGS
BOOTH TYPE:	WOOD
COMMUNITY TABLE:	PER PLAN
TABLE TOPS:	PER PLAN
TABLE BASE TYPE:	STANDARD
CHAIR TYPE:	G4 PER PLAN
STOOL HEIGHT CHAIR:	G4 PER PLAN
TABLE SERVICE: APPLICABLE TO THIS MARKET?	YES
CO2 MONITORING: IS THIS REQUIRED?	NO
CAL133: IS THIS REQUIRED?	NO
MILLWORK:	
BAKERY FRONT PANELS:	WD30
BREAD/BAGEL WALL:	WD31
CHAIR RAIL/CAP:	WD33
RPU UNIT FINISH:	WD30
P2.0 WALL FINISH:	WD33

DESIGN NOTES:

EQUIPMENT PLAN LEGEND:

XXX — ROOM NUMBER SYMBOL
XXXX — SIGNAGE IDENTIFICATION SYMBOL
XXXX — EQUIPMENT IDENTIFICATION SYMBOL
STXXXXX — STEEL IDENTIFICATION SYMBOL
WDXXXXX — WOOD IDENTIFICATION SYMBOL
REL — RELOCATION INDICATION SYMBOL
FURN-ID — FURNITURE IDENTIFICATION SYMBOL
101 — DOOR NUMBER SYMBOL
? — FABRIC DESIGNATION SYMBOL (SEE A-4.8 SHEET)

Bakery-Cafe:

#0715

Project Team:

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OKEMOS, MI 48864

PERMIT / BID SET

Panera BREAD

Consultant Copyright Placeholder

No.	Description	Date

FLOOR PLAN EQUIPMENT

Project Number: 170686
Drawn By: ARCV, MH
Issue Date: 10.24.17
DPM: BRIAN B.
DM: DAN C.
CPM: KEVIN C.

Sheet Number: A703

10/24/2017 10:19:21 AM

PB 2015.01

To: **Planning Commission**

From: **Peter Menser, Principal Planner**

Keith Chapman, Assistant Planner

Date: **June 8, 2018**

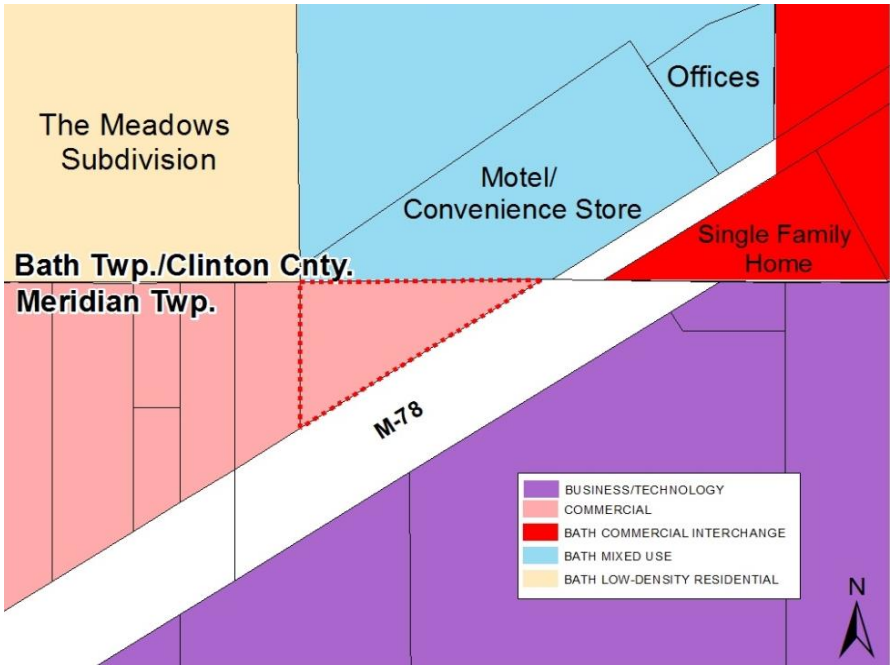
Re: **<u>Special Use Permit #18051 (Singh)</u>, construct a multiple family housing development with seven dwelling units at 1954 Saginaw Highway.**

Balaram Singh has requested a Special Use Permit for the construction of a multiple family housing development with seven dwelling units at 1954 Saginaw Highway**.** Special use permits are required for any single family structure on a parcel containing three or more living units and for any development containing a mix of one-family and two-family dwellings, each of which is not proposed to be located on a separately recorded lot. The applicant submitted a site plan depicting a development with seven multiple family residential units. The site will consist of a new two-story, five-unit multiple family residential building, the existing single family house, and conversion of the existing garage to a single family house.

The site will be developed in two phases with phase one consisting of the existing single family house and existing garage and phase two being the five-unit multiple family residential building. The property was rezoned (REZ #16070) in 2016 from RR (Rural Residential) to RDD (Multiple Family-5 units per acre).

2017 FUTURE LAND USE MAP

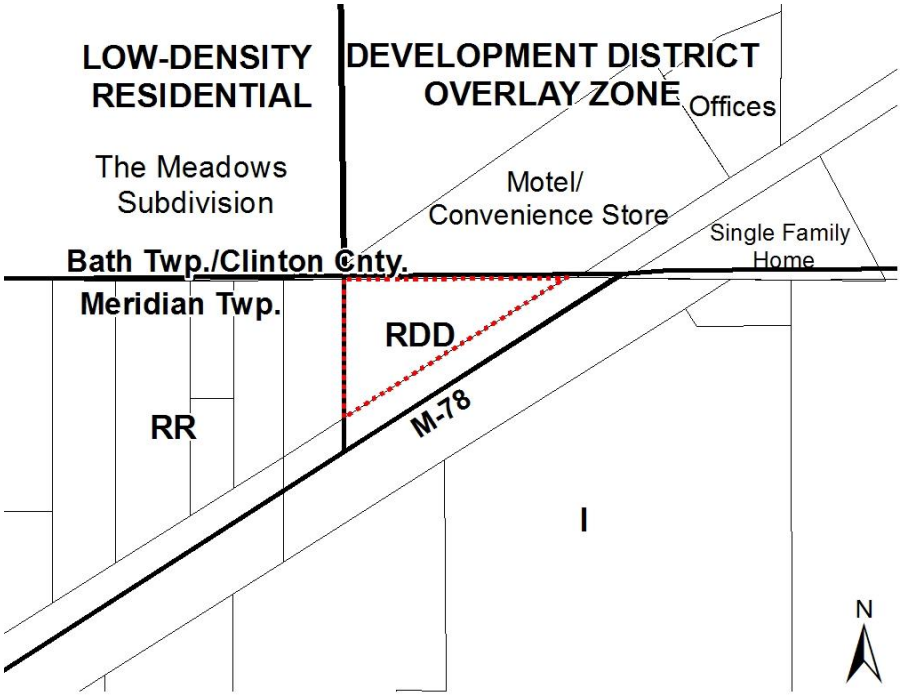
The Future Land Use Map from the 2017 Master Plan designates the subject property in the Commercial category.



ZONING MAP

The subject site is zoned RDD (Multiple Family). With 555.24 feet of lot width on Saginaw Highway and 1.61 acres (70,131.60 sq. ft.) in lot area, the site meets the minimum standards for the RDD zoning district. The following table illustrates the minimum lot width and lot area requirements for the RR and RDD zoning districts:

	Lot Width (feet)	Lot Area (sq. ft.)
RDD district	100	8,000 for single family development, no minimum for multiple family



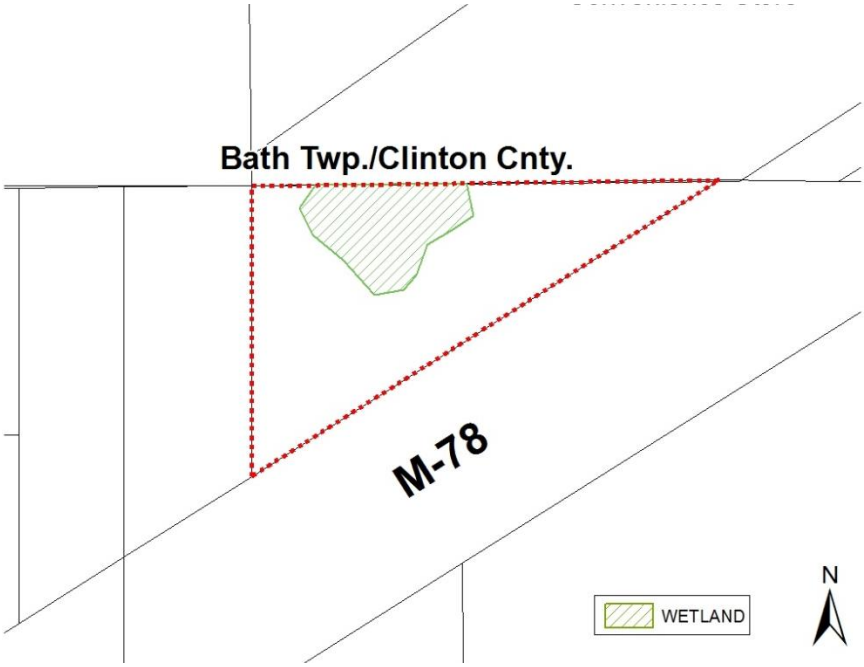
Physical Features

A one-story, 1,008 square foot single family house built in 1940 and a 1,984 square foot, two-stall garage occupies the site. There is lawn area to the west of the garage which transitions to woods along the west property line. The property slopes from the rear of the house towards a marsh area at the north. The Flood Insurance Rate Map (FIRM) for Meridian Township indicates the property is not located in a floodplain.

Wetlands

The applicant submitted a wetland delineation report conducted by Marx Wetlands, LLC dated January 7, 2016. The report indicates that there is one 0.28 acre wetland area located along the north property line. The wetland appears to be regulated by both the Michigan Department of Environmental Quality (MDEQ) and Meridian Township as it is within 500 feet of a pond located north of the subject site. The wetland delineation report submitted by the applicant has not been verified by the Township's Environmental Consultant. Any future development on the property will require verification of the delineation prior to application, which will provide additional information on the wetland boundary, regulatory status, and required setbacks.

Wetland Map

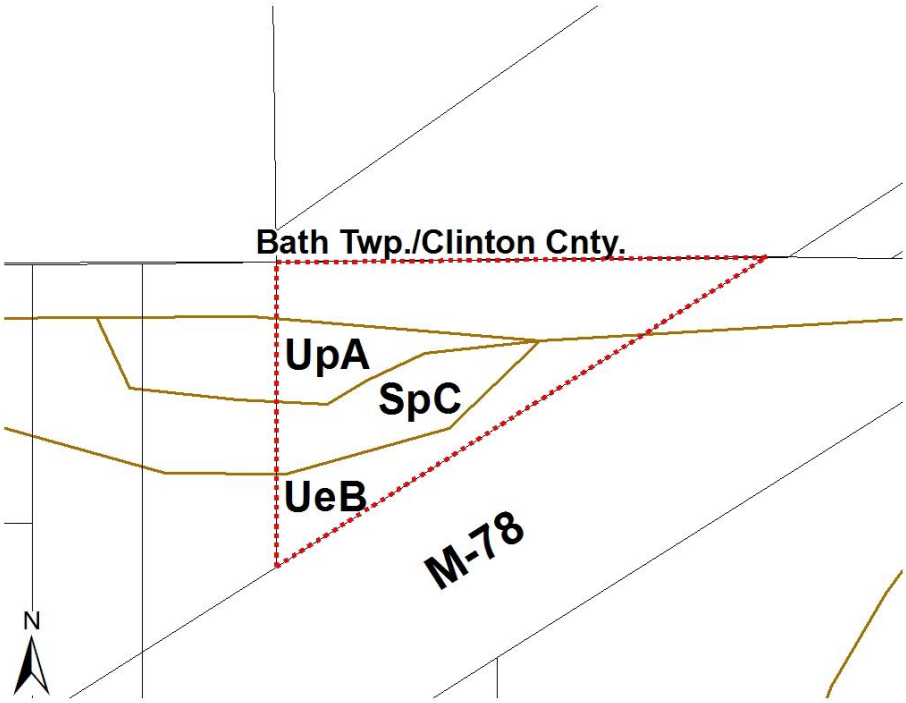


Soils

The following chart summarizes soil information for the subject site.

SOIL ASSOCIATION	SEVERE LIMITATIONS
SpC (Spinks)	Slope
UeB (Urban Land-Boyer/Spinks)	None
UpA (Urban Land-Capac/Colwood)	Ponding

Soils Map



Streets & Traffic

The site fronts on Saginaw Highway (B.R. 69/M-78). Saginaw Highway is a four-lane divided highway designated as a Principal Arterial. The Township's Pedestrian/Bicycle Master Plan shows a seven foot wide paved pathway along the Saginaw Highway frontage of the parcel is proposed. The most recent (2015) traffic count information from the Michigan Department of Transportation (MDOT) for Saginaw Highway showed a total of 14,300 vehicles in a 24 hour period. The information below shows traffic generation of the proposed seven apartment units. A traffic study is not required because the project does not generate over 100 directional trips during a peak hour of traffic.

	Seven Apartment Units
Peak Hour trips	3.85 (a.m.) 4.69 (p.m.)
Weekday trips	46.55

Utilities

Public water service is not available on or in the vicinity of the subject property. The existing house is served by a well. In 2014 the Township Board approved a resolution to allow the applicant to connect to public sanitary sewer service from Bath Township. The site plan shows there is sewer on the site available for connection. The applicant will be required to connect the existing home and the garage that will be converted to a home to the sanitary sewer that is located on site as part of phase one. Once the applicant constructs the five-unit multiple family residential building in phase two, then the applicant will have to connect all buildings on the property to public water. Township Board approval will be required to extend water services from Bath Township, the nearest water service available.

Staff Analysis

The request is to construct a multiple family housing development with seven dwelling units at 1954 Saginaw Highway. The applicant submitted a site plan that shows a total of seven units; a new two-story, five-unit multiple family residential building, the existing single family house, and conversion of the existing garage to a single family house. A special use permit is required for any single structure on a single parcel of land containing three or more living units and for any development containing one-family dwellings, each of which is not proposed to be located on a separately recorded lot. The Zoning Ordinance requires that multiple family buildings provide two parking spaces per unit and set aside 25% of the required parking for future expansion. The site is required a total of 18 parking spaces and only 16 spaces are provided. The applicant will need to show the additional two parking spaces on the site plan or ask for a variance.

Typically, all construction related to the special use must be completed within 36 months from the effective date of the special use permit, unless specifically approved as a phased development. In this case, the RDD district states in cases where construction has not been commenced within a one-year period after approval, the permit shall automatically become null and void and all rights thereunder shall terminate. The Planning Commission may authorize a single extension of the special use permit for not more than one year.

The following is a summary of the project's consistency with the RDD ordinance standards.

Lot coverage: All buildings including accessory buildings shall not occupy more than 35% of the net area of land included within the limits of the proposed project or any stage in the development of the proposed project which may receive approval under this chapter. The subject site has proposed lot coverage of 7.82%.

Open space: A minimum of 35% of the total land area of the project exclusive of drives and parking areas must be set aside as open space. All land used for open space must be improved for the use of all residents of the development. The submitted site plan shows the open space as 76.63%. However, the wetlands located on the site are not improved for the use of all residents and cannot be counted as open space; therefore the subject site has an open space of 59.25%.

Single-family district setback: No multiple-family building designed, erected, or used for three or more families shall be located closer than 50 feet to any single-family residential zone line nor shall any accessory building to a multiple structure containing three or more dwelling units be located closer than 50 feet to any single-family residential zone line. The property to the west is zoned RR (Rural Residential). A 50 foot setback is shown on the west side of the property.

Distance between buildings: In no case shall any building be located closer than 25 feet to any other building. The existing single family home and garage that will be converted to a single family home are approximately 48 feet apart. The proposed two-story, five-unit multiple family residential building and the garage that will be converted to a single family home are approximately 145 feet apart.

Maximum building height: Maximum building height shall not exceed 2 1/2 stories or 35 feet. The proposed two-story, five-unit multiple family residential building will be 29 feet tall and the heights of the two single family units is not provided.

Parking: The RDD parking requirement is 2 spaces for each dwelling unit, plus an expansion capacity of 25%. There are seven units and with the 25% expansion capacity the site must have 18 parking spaces. The site plan shows a total of 16 parking spaces and two provided in the garage. A garage cannot be counted as a parking space. Each phase in the development will be required to meet the number of spaces required based on the number of units.

If the Planning Commission decides to approve the request, the staff recommends the following conditions:

- The applicant receives a letter from the Ingham County Health Department approving the shared use of the well.
- The applicant completes the phasing of utilities to the site.

Planning Commission Options

The Planning Commission may approve, approve with conditions, or deny the special use permit. A resolution will be provided at a future meeting.

Attachments

1. Special Use Permit Application and supporting documents

CHARTER TOWNSHIP OF MERIDIAN
DEPARTMENT OF COMMUNITY PLANNING AND DEVELOPMENT
5151 MARSH ROAD, OKEMOS, MI 48864
PLANNING DIVISION PHONE: (517) 853-4560, FAX: (517) 853-4095

SPECIAL USE PERMIT APPLICATION

Before submitting this application for review, an applicant may meet with the Director of Community Planning and Development to discuss the requirements for a special use permit and/or submit a conceptual plan for review to have preliminary technical deficiencies addressed prior to submittal of the application. If the property or land use is located in the following zoning districts RD, RC, RCC, RN then the applicant must meet with the Planning Director to discuss technical difficulties before filing a formal application.

Part I

A. Applicant BALARAM K. SINGH
Address of Applicant
PO BOX 48, HASLETT, MI 48840
Telephone - Work _____ Home (517) 420-1514 Fax _____ Email gebal721@gmail.com
Interest in property (circle one): (Owner) Tenant Option Other
(Please attach a list of all persons with an ownership interest in the property.)

B. Site address / location / parcel number 1954 SAGINAW HWY 33-02-02-03-101-001
Legal description (please attach if necessary)
SEE SITE PLAN
Current zoning RDD
Use for which permit is requested / project name 7 RENTAL UNITS
Corresponding ordinance number 86-376(d)(2) 86-376(e)

C. Developer (if different than applicant) OWNER/APP.
Address _____
Telephone – Work _____ Home _____ Fax _____

D. Architect, Engineer Planner or Surveyor responsible for design of project if different from applicant:
Name JEFFREY W. KYES, KEBS, INC
Address 2116 HASLETT RD. HASLETT, MI 48840
Telephone – Work (517) 339-1014 Home (517) 202-2738 Fax (517) 339-8047

E. Acreage of all parcels in the project: Gross 1.61 Net ~~1.61~~ 1.33

F. Explain the project and development phases:

G. Total number of:
Existing: structures 2 bedrooms 5 offices ___ parking spaces 4 carports ___ garages 2 Proposed: structures 1 bedrooms 10 offices ___ parking spaces 16 carports ___ garages 2

H. Square footage: existing buildings 2784 proposed buildings 2700/floor - 2 FLOORS
Usable Floor area: existing buildings 2784 proposed buildings 5400

I. If employees will work on the site, state the number of full time and part time employees working per shift and hours of operation:

J. Existing Recreation: Type NA Acreage _____
Proposed Recreation: Type NA Acreage _____

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Existing Open Space: Type WOODED & WETLAND Acreage 1.46 AC
Proposed Open Space: Type WOODED & WETLAND Acreage 1.24 AC

K. If Multiple Housing:
Total acres of property 1.61
Acres in floodplain _____ Percent of total _____
Acres in wetland (not in floodplain) 0.28 Percent of total 17.4%
Total dwelling units 7

Dwelling unit mix:		
Number of single family detached:	for Rent 2	Condo _____
Number of duplexes:	for Rent _____	Condo _____
Number of townhouses:	for Rent _____	Condo _____
Number of garden style apartments:	for Rent 5	Condo _____
Number of other dwellings:	for Rent _____	Condo _____

L. The following support materials must be submitted with the application:

1. Nonrefundable Fee.
2. Legal Description of the property.
3. Evidence of fee or other ownership of the property.
4. Site Plan containing the information listed in the attachment to this application.
5. Architectural sketches showing all sides and elevations of the proposed buildings or structures, including the project entrance, as they will appear upon completion. The sketches should be accompanied by material samples or a display board of the proposed exterior materials and colors.
6. A Traffic Study, prepared by a qualified traffic engineer, based on the most current edition of *Evaluating Traffic Impact Studies: A Recommended Practice for Michigan Communities*, published by the State Department of Transportation.
   a. A traffic assessment will be required for the following:
      1) New special uses which could, or expansion or change of an existing special use where increase in intensity would, generate between 50 to 99 directional trips during a peak hour of traffic.
      2) All other special uses requiring a traffic assessment as specified in the Township Code of Ordinances, Chapter 86, Article IV, Division 2.
   b. A traffic impact study will be required for the following:
      1) New special uses which would, or expansion or change of an existing special use where increase in intensity would, generate over 100 directional trips or more during a peak hour of traffic, or over 750 trips on an average day.
      2) All other special uses requiring a traffic assessment as specified in the Township Code of Ordinances, Chapter 86, Article IV, Division 2.
7. Natural features assessment which includes a written description of the anticipated impacts on the natural features at each phase and at project completion that contains the following:
   a. An inventory of natural features proposed to be retained, removed, or modified. Natural features shall include, but are not limited to, wetlands, significant stands of trees or individual trees greater than 12 inches dbh, floodways, floodplains, waterbodies, identified groundwater vulnerable areas, slopes greater than 20 percent, ravines, and vegetative cover types with potential to sustain significant or endangered wildlife.
   b. Description of the impacts on natural features.
   c. Description of any proposed efforts to mitigate any negative impacts.

The natural features assessment may be waived by the Director of Community Planning and Development in certain circumstances.

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M. Any other information specified by the Director of Community Planning and Development which is deemed necessary to evaluate the application.

N. In addition to the above requirements, for zoning districts, RD, RC, RCC, RN, and CV and Group Housing Residential Developments the following is required:

1. Existing and proposed contours of the property at two foot intervals based on United States Geological Survey (USGS) data.
2. Preliminary engineering reports in accordance with the adopted Township water and sewer standards, together with a letter of review from the Township Engineer.
3. Ten copies of a report on the intent and scope of the project including, but not limited to: Number, size, volume, and dimensions of buildings; number and size of living units; basis of calculations of floor area and density and required parking; number, size, and type of parking spaces; architectural sketches of proposed buildings.
4. Seven copies of the project plans which the Township shall submit to local agencies for review and comments.

O. In addition to the above requirements, a special use application in zoning district RP requires the following material as part of the site plan:

1. A description of the operations proposed in sufficient detail to indicate the effects of those operations in producing traffic congestion, noise, glare, air pollution, water pollution, fire hazards or safety hazards or the emission of any potentially harmful or obnoxious matter or radiation.
2. Engineering and architectural plans for the treatment and disposal of sewerage and industrial waste tailings, or unusable by-products.
3. Engineering and architectural plans for the handling of any excessive traffic congestion, noise, glare, air pollution, or the emission of any potentially harmful or obnoxious matter or radiation.

P. In addition to the above requirements, a special use application for a use in the Floodway Fringe of zoning district CV requires the following:

1. A letter of approval from the State Department of Environmental Quality.
2. A location map including existing topographic data at two-foot interval contours at a scale of one inch representing 100 feet.
3. A map showing proposed grading and drainage plans including the location of all public drainage easements, the limits, extent, and elevations of the proposed fill, excavation, and occupation.
4. A statement from the County Drain Commissioner, County Health Department, and Director of Public Works and Engineering indicating that they have reviewed and approved the proposal.

Q. In addition to the above requirements, a special use application for a use in the Groundwater Recharge area or zoning district CV requires the following:

1. A location map including existing topographic data at two-foot interval contours.
2. A map showing proposed grading and drainage plans including the location of all public drainage easements, the limits and extent of the proposed fill, excavation, and occupation.
3. A statement from the County Drain Commissioner, County Health Department, and Director of Public Works and Engineering indicating that they have reviewed and approved the proposal.

R. In addition to the above requirements, the Township Code of Ordinances, Article VI, should be reviewed for the following special uses: group housing residential developments, mobile home parks, nonresidential structures and uses in residential districts, planned community and regional shopping center developments, sand or gravel pits and quarries, sod farms, junk yards, sewage treatment and disposal installations, camps and clubs for outdoor sports and buildings greater than 25,000 square feet in gross floor area.

S.

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Part II

SUP REQUEST STANDARDS
Township Code of Ordinances, Section 86-126

Applications for Special Land Uses will be reviewed with the standards stated below. An application that complies with the standards stated in the Township Ordinance, conditions imposed pursuant to the Ordinance, other applicable Ordinances, and State and Federal statutes will be approved. Your responses to the questions below will assist the Planning Commission in its review of your application.

(1) The project is consistent with the intent and purposes of this chapter.

(2) The project is consistent with applicable land use policies contained in the Township's comprehensive development plan of current adoption.

(3) The project is designed, constructed, operated, and maintained so as to be harmonious and appropriate in appearance with the existing or intended character of the general vicinity and that such a use will not change the essential character of the same area.

(4) The project will not adversely affect or be hazardous to existing neighboring uses.

(5) The project will not be detrimental to the economic welfare of surrounding properties or the community.

(6) The project is adequately served by public facilities, such as existing roads, schools, stormwater drainage, public safety, public transportation, and public recreation, or that the persons or agencies responsible for the establishment of the proposed use shall be able to provide any such service.

(7) The project is adequately served by public sanitation facilities if so designed. If on-site sanitation facilities for sewage disposal, potable water supply, and storm water are proposed, they shall be properly designed and capable of handling the longterm needs of the proposed project.

(8) The project will not involve uses, activities, processes, materials, and equipment and conditions of operation that will be detrimental to any persons, property, or the general welfare by reason of excessive production of traffic, noise, smoke, fumes, glare, or odors.

(9) The project will not directly or indirectly have a substantial adverse impact on the natural resources of the Township, including, but not limited to, prime agricultural soils, water recharge areas, lakes, rivers, streams, major forests, wetlands, and wildlife areas.

Part III

I (we) hereby grant permission for members of the Charter Township of Meridian's Boards and/or Commissions, Township staff member(s) and the Township's representatives or experts the right to enter onto the above described property (or as described in the attached information) in my (our) absence for the purpose of gathering information including but not limited to the taking and the use of photographs.

☒ Yes ☐ No (Please check one)

By the signature(s) attached hereto, I (we) certify that the information provided within this application and accompanying documentation is, to the best of my (our) knowledge, true and accurate

B L S — 12/7/2017

Signature of Applicant — Date

Balaram K. SINGH

Type/Print Name

Fee: $500 — Received by/Date: Peter Menser 12-18-17

DEC 18 2017

S.U.P. PLAN FOR:
1954 E. M-78
MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

LEGAL DESCRIPTION:
(As provided in KEBS, Inc. Certified Boundary Survey, Job No. 87585.BND)
A parcel of land in the Northwest fractional 1/4 of Section 3, T4N, R1W, Meridian Township, Ingham County, Michigan, the surveyed boundary of said parcel described as: Beginning at the Northwest corner of said fractional Section 3; thence N89°44'21"E along the Standard North line of said Section 3 a distance of 473.68 feet to the Northwesterly right-of-way line of Saginaw Highway (M-78); thence S57°29'13"W along said Northwesterly line 555.24 feet to the West line of said Section 3; thence N01°03'17"W along said West line 296.33 feet to the Point of Beginning; said parcel containing 1.61 acres, more or less; said parcel subject to all easements and restrictions if any.

SEWER INVENTORIES

CATCH BASIN #100
RIM- 866.94
18" RCP NW- 864.19
18" RCP SE- 864.08

CATCH BASIN #101
RIM- 858.60
18" RCP NNW- 855.74
18" RCP NE- 855.64

CATCH BASIN #102
RIM- 860.63
TOP OF WATER- 857.74

CATCH BASIN #103
RIM- 859.27
24" CPP NE- 855.50
6" PVC NE- 857.02
24" RCP SE- NOT ACCESSIBLE
(TOO RECESSED FOR MEASUREMENT)
18" RCP SW- NOT ACCESSIBLE
(TOO RECESSED FOR MEASUREMENT)

CATCH BASIN #104
RIM- 861.91
24" CPP NE- 855.82
24" CPP SW- 855.77

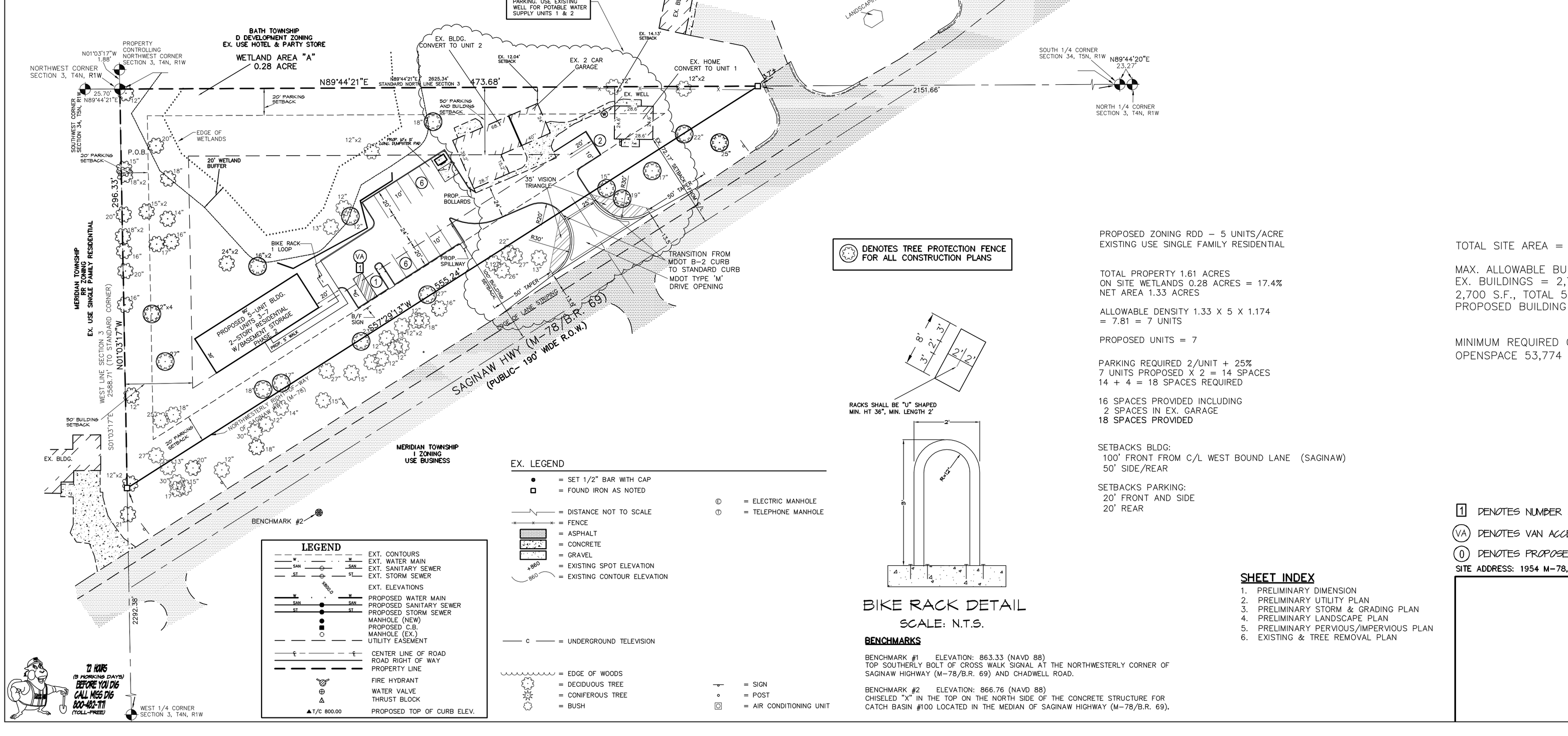
SANITARY MANHOLE #200
RIM- 864.21
6" PVC EAST- 860.86
4" PVC SE- 860.91
PROP. 6" SW 860.96

SANITARY MANHOLE #201
RIM- 866.11
8" RCP NE- 858.29
4" PVC SW- 858.33
6" RCP NW- 858.31

SANITARY MANHOLE #202
RIM- 860.46
8" PVC NE- 851.97
6" RCP SOUTH- 852.66
8" PVC SW- 852.73

SANITARY MANHOLE #203
RIM- 859.42
8" PVC NE- 851.03
8" PVC SW- 851.06

SANITARY MANHOLE #204
RIM- 860.74
10" PVC NORTH- 847.81
10" PVC NE- 847.84
10" PVC SW- 850.12



LEGEND
- EXT. CONTOURS
- EXT. WATER MAIN
- EXT. SANITARY SEWER
- EXT. STORM SEWER
- EXT. ELEVATIONS
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

EX. LEGEND
- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- = EXISTING SPOT ELEVATION
- = EXISTING CONTOUR ELEVATION
- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
- c = UNDERGROUND TELEVISION
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH
- = SIGN
- = POST
- = AIR CONDITIONING UNIT

DENOTES TREE PROTECTION FENCE FOR ALL CONSTRUCTION PLANS

RACKS SHALL BE "U" SHAPED
MIN. HT 36", MIN. LENGTH 2'

BIKE RACK DETAIL
SCALE: N.T.S.

BENCHMARKS

BENCHMARK #1 ELEVATION: 863.33 (NAVD 88)
TOP SOUTHERLY BOLT OF CROSS WALK SIGNAL AT THE NORTHWESTERLY CORNER OF SAGINAW HIGHWAY (M-78/B.R. 69) AND CHADWELL ROAD.

BENCHMARK #2 ELEVATION: 866.76 (NAVD 88)
CHISELED "X" IN THE TOP ON THE NORTH SIDE OF THE CONCRETE STRUCTURE FOR CATCH BASIN #100 LOCATED IN THE MEDIAN OF SAGINAW HIGHWAY (M-78/B.R. 69).

PROPOSED ZONING RDD – 5 UNITS/ACRE
EXISTING USE SINGLE FAMILY RESIDENTIAL

TOTAL PROPERTY 1.61 ACRES
ON SITE WETLANDS 0.28 ACRES = 17.4%
NET AREA 1.33 ACRES

ALLOWABLE DENSITY 1.33 X 5 X 1.174
= 7.81 = 7 UNITS

PROPOSED UNITS = 7

PARKING REQUIRED 2/UNIT + 25%
7 UNITS PROPOSED X 2 = 14 SPACES
14 + 4 = 18 SPACES REQUIRED

16 SPACES PROVIDED INCLUDING
2 SPACES IN EX. GARAGE
18 SPACES PROVIDED

SETBACKS BLDG:
100' FRONT FROM C/L WEST BOUND LANE (SAGINAW)
50' SIDE/REAR

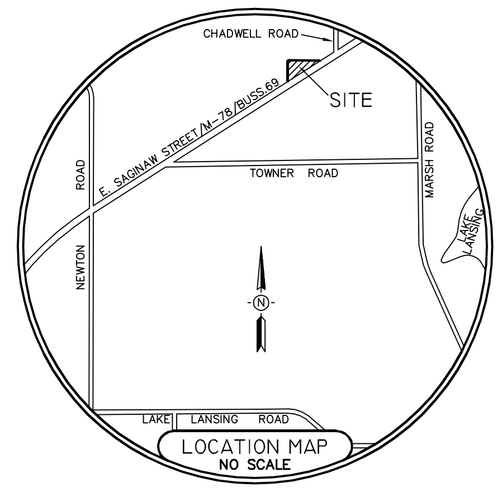
SETBACKS PARKING:
20' FRONT AND SIDE
20' REAR

TOTAL SITE AREA = 70,176 S.F.

MAX. ALLOWABLE BUILDING COVERAGE = 30%
EX. BUILDINGS = 2,789 S.F., PROP. BUILDINGS 2,700 S.F., TOTAL 5,489 S.F./70,176 S.F.
PROPOSED BUILDING COVERAGE = 7.82%

MINIMUM REQUIRED OPENSPACE = 35%
OPENSPACE 53,774 S.F./70,176 S.F. = 76.63%

SCALE 1" = 40'
0' 40' 80' 120'



CLIENT:
BALARAM K. SINGH
PO Box 48
HASLETT, MI. 48840
PH:(517) 420-1514

ENGINEER/SURVEYOR:
KEBS, Inc.
2116 HASLETT RD.
HASLETT, MI. 48840
PH:(517) 339-1014
FAX:(517) 339-8047

SHEET INDEX

1. PRELIMINARY DIMENSION
2. PRELIMINARY UTILITY PLAN
3. PRELIMINARY STORM & GRADING PLAN
4. PRELIMINARY LANDSCAPE PLAN
5. PRELIMINARY PERVIOUS/IMPERVIOUS PLAN
6. EXISTING & TREE REMOVAL PLAN

[1] DENOTES NUMBER OF B/F SPACES
(VA) DENOTES VAN ACCESS B/F SPACES
(0) DENOTES PROPOSED NUMBER OF 10' x 20' PARKING SPACES

SITE ADDRESS: 1954 M-78, HASLETT MI 48840

SURVEY#92134.TOP

REVISIONS
12-8-17 S.U.P. SUBMITTAL
1-19-18 TWP. PRELIM. REVIEW

KEBS, INC.
KYES ENGINEERING
BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

1954 E. M-78
PRELIMINARY DIMENSION & LANDSCAPE PLAN

SCALE: 1"= 40'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 6-26-17	PROJECT MGR. JWK	SHEET 1 OF 6
AUTHORIZED BY: BALARAM K. SINGH		JOB #: 92134

I:\92\92134\dwg\E-92134-SUP.dwg, 5/15/2018 1:32:46 PM, sbass

S.U.P. PLAN FOR:
1954 E. M-78
MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

SEWER INVENTORIES

CATCH BASIN #100
RIM– 866.94
18" RCP NW– 864.19
18" RCP SE– 864.08

CATCH BASIN #101
RIM– 858.60
18" RCP NNW– 855.74
18" RCP NE– 855.64

CATCH BASIN #102
RIM– 860.63
TOP OF WATER– 857.74

CATCH BASIN #103
RIM– 859.27
24" CPP NE– 855.50
6" PVC NE– 857.02
24" RCP SE– NOT ACCESSIBLE
(TOO RECESSED FOR MEASUREMENT)
18" RCP SW– NOT ACCESSIBLE
(TOO RECESSED FOR MEASUREMENT)

CATCH BASIN #104
RIM– 861.91
24" CPP NE– 855.82
24" CPP SW– 855.77

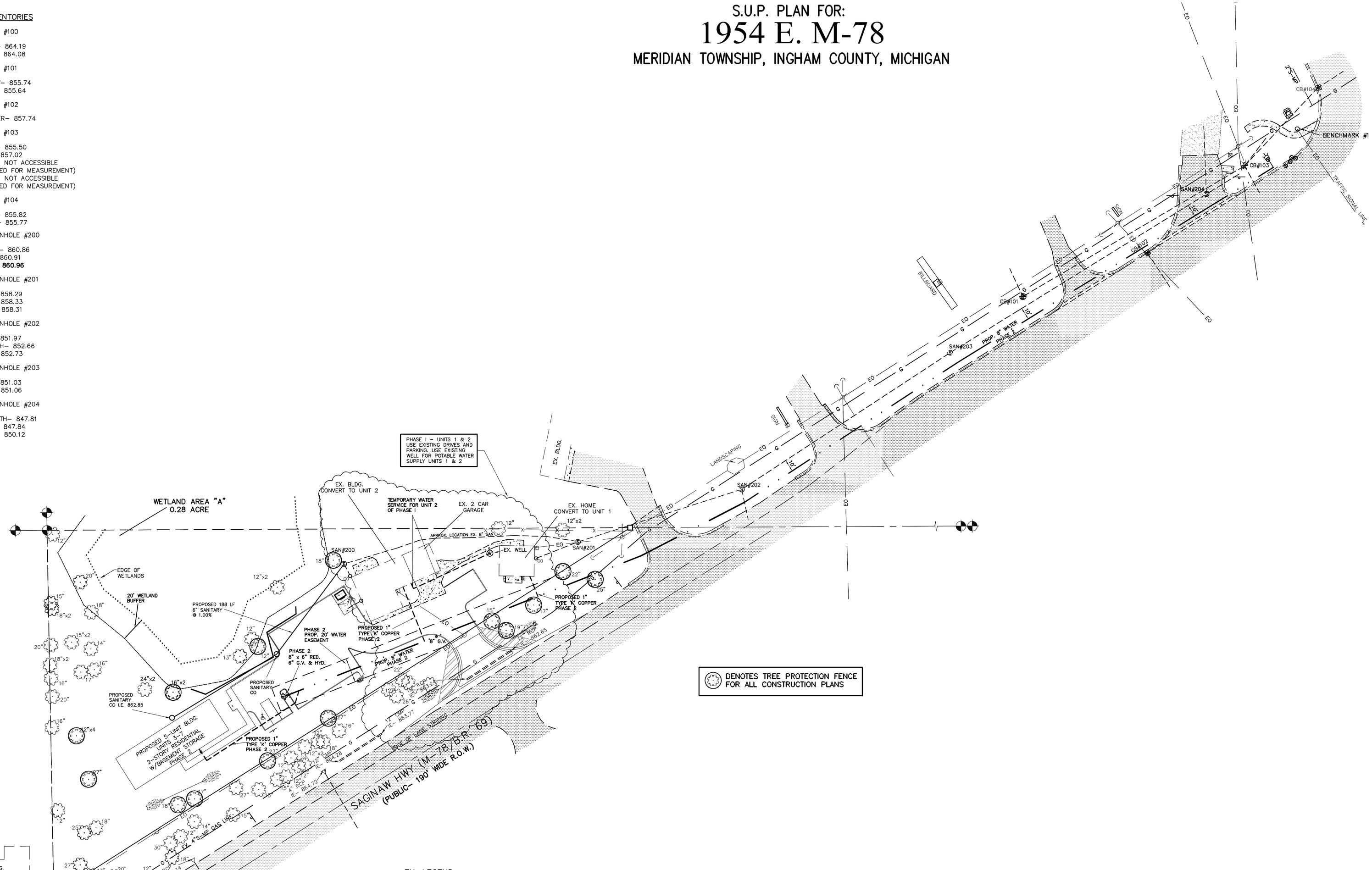
SANITARY MANHOLE #200
RIM– 864.21
6" PVC EAST– 860.86
4" PVC SE– 860.91
PROP. 6" SW 860.96

SANITARY MANHOLE #201
RIM– 866.11
8" RCP NE– 858.29
4" PVC SW– 858.33
6" RCP NW– 858.31

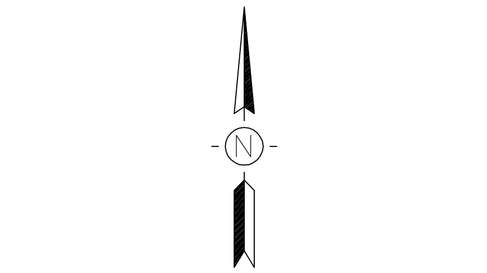
SANITARY MANHOLE #202
RIM– 860.46
8" PVC NE– 851.97
6" RCP SOUTH– 852.66
8" PVC SW– 852.73

SANITARY MANHOLE #203
RIM– 859.42
8" PVC NE– 851.03
8" PVC SW– 851.06

SANITARY MANHOLE #204
RIM– 860.74
10" PVC NORTH– 847.81
10" PVC NE– 847.84
10" PVC SW– 850.12



DENOTES TREE PROTECTION FENCE FOR ALL CONSTRUCTION PLANS



EX. LEGEND

- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- = EXISTING SPOT ELEVATION
- = EXISTING CONTOUR ELEVATION
- = GAS LINE
- = UNDERGROUND TELEPHONE
- = UNDERGROUND TELEVISION
- = UNDERGROUND ELECTRIC
- = OVERHEAD WIRES
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH
- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
- = FIRE HYDRANT
- = VALVE
- = UTILITY POLE
- = LIGHT POLE
- = GUY POLE
- = GUY WIRE
- = UTILITY PEDESTAL
- = TRANSFORMER
- = HANDHOLE
- = ELECTRIC METER
- = GAS METER
- = WATER METER
- = SIGN
- = POST
- = AIR CONDITIONING UNIT
- = WELL

LEGEND

- EXT. CONTOURS
- EXT. WATER MAIN
- EXT. SANITARY SEWER
- EXT. STORM SEWER
- EXT. ELEVATIONS
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.



BENCHMARKS

BENCHMARK #1 ELEVATION: 863.33 (NAVD 88)
TOP SOUTHERLY BOLT OF CROSS WALK SIGNAL AT THE NORTHWESTERLY CORNER OF SAGINAW HIGHWAY (M-78/B.R. 69) AND CHADWELL ROAD.

BENCHMARK #2 ELEVATION: 866.76 (NAVD 88)
CHISELED "X" IN THE TOP ON THE NORTH SIDE OF THE CONCRETE STRUCTURE FOR CATCH BASIN #100 LOCATED IN THE MEDIAN OF SAGINAW HIGHWAY (M-78/B.R. 69).

SITE ADDRESS: 1954 M-78, HASLETT MI 48840

SURVEY#92134.TOP

REVISIONS
12-8-17 S.U.P. SUBMITTAL
1-19-18 TWP. PRELIM. REVIEW

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

1954 E. M-78
PRELIMINARY UTILITY PLAN

SCALE: 1"= 40'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 6-26-17	PROJECT MGR. JWK	SHEET 2 OF 6
AUTHORIZED BY: BALARAM K. SINGH		JOB #: 92134

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S.U.P. PLAN FOR:
1954 E. M-78
MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

SEWER INVENTORIES

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18" RCP NW– 864.19
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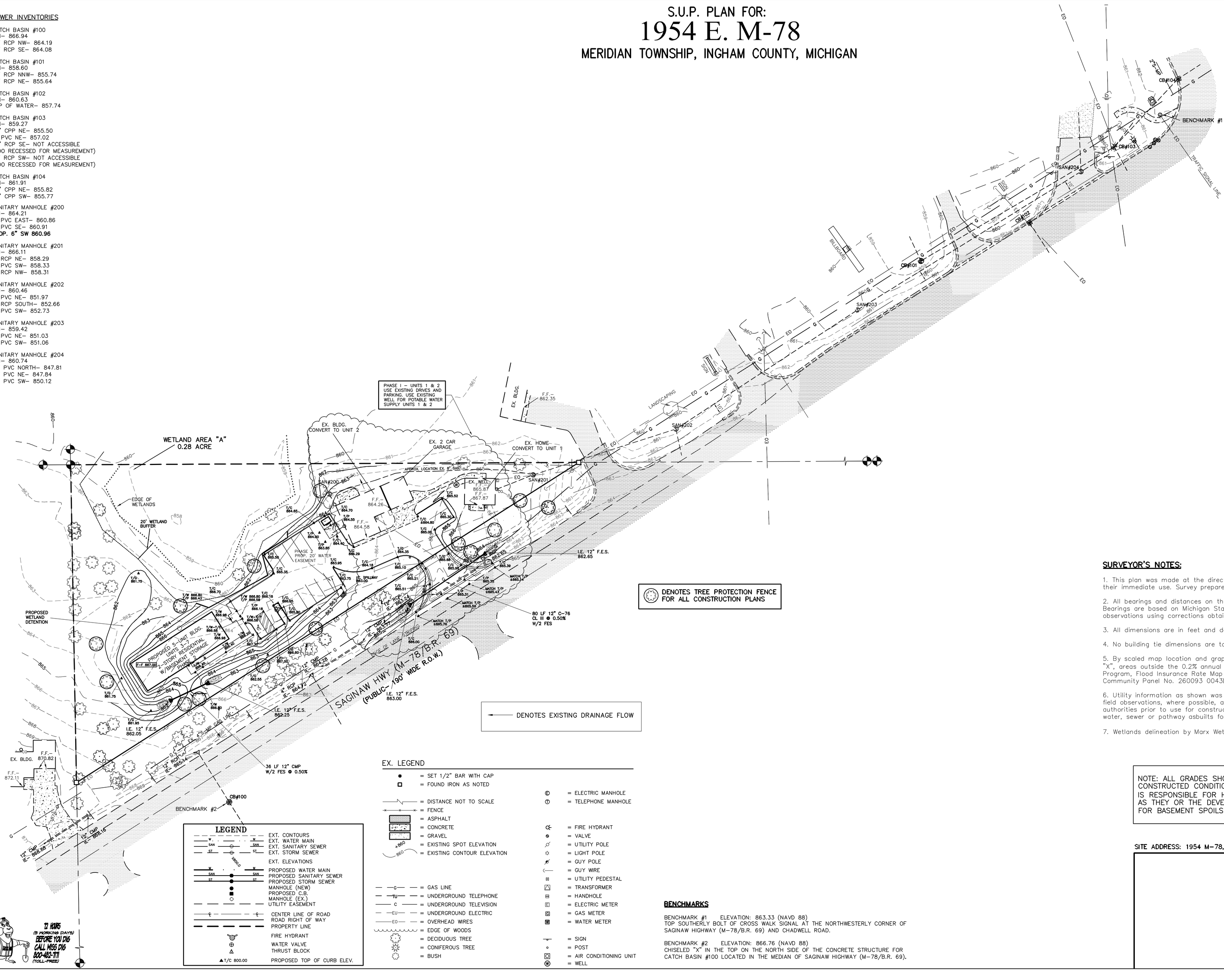
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4" PVC SE– 860.91
PROP. 6" SW 860.96

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8" RCP NE– 858.29
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6" RCP SOUTH– 852.66
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RIM– 859.42
8" PVC NE– 851.03
8" PVC SW– 851.06

SANITARY MANHOLE #204
RIM– 860.74
10" PVC NORTH– 847.81
10" PVC NE– 847.84
10" PVC SW– 850.12



DENOTES TREE PROTECTION FENCE FOR ALL CONSTRUCTION PLANS

DENOTES EXISTING DRAINAGE FLOW

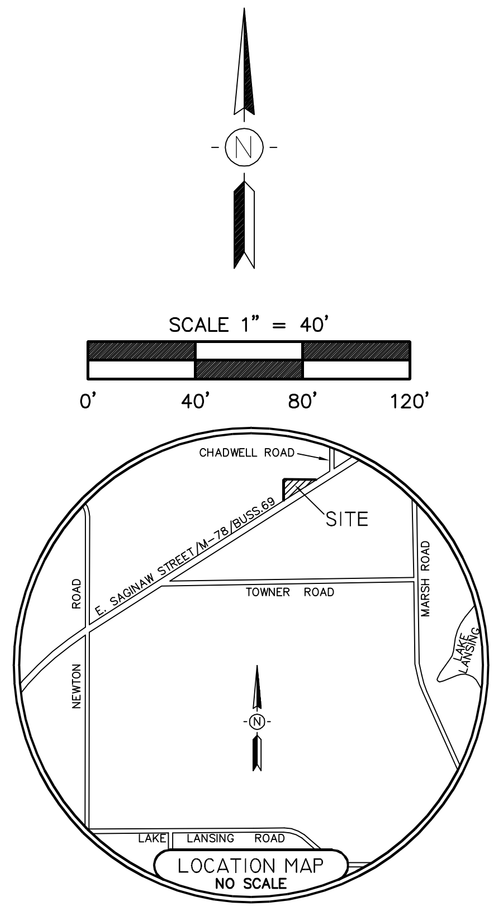
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- WATER VALVE
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- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.





SURVEYOR'S NOTES:

1. This plan was made at the direction of the parties named hereon and is intended solely for their immediate use. Survey prepared from fieldwork performed in June 2017.

2. All bearings and distances on the survey are record and measured unless otherwise noted. Bearings are based on Michigan State Plane South Zone grid bearings obtained from GPS observations using corrections obtained from the Lansing C.O.R.S.. Elevations based on NAVD 88.

3. All dimensions are in feet and decimals thereof.

4. No building tie dimensions are to be used for establishing the property lines.

5. By scaled map location and graphic plotting only, this property lies entirely within Flood Zone "X", areas outside the 0.2% annual chance floodplain, according to the National Flood Insurance Program, Flood Insurance Rate Map for Charter Township of Meridian, Ingham County, Michigan, Community Panel No. 260093 0043D, dated August 16, 2011.

6. Utility information as shown was obtained from available public records and from supporting field observations, where possible, and is subject to verification in the field by the appropriate authorities prior to use for construction. According to Meridian Charter Township, there is no water, sewer or pathway asbuilts for the subject parcel.

7. Wetlands delineation by Marx Wetlands, LLC on 12/16/15.

BENCHMARKS

BENCHMARK #1 ELEVATION: 863.33 (NAVD 88)
TOP SOUTHERLY BOLT OF CROSS WALK SIGNAL AT THE NORTHWESTERLY CORNER OF SAGINAW HIGHWAY (M-78/B.R. 69) AND CHADWELL ROAD.

BENCHMARK #2 ELEVATION: 866.76 (NAVD 88)
CHISELED "X" IN THE TOP ON THE NORTH SIDE OF THE CONCRETE STRUCTURE FOR CATCH BASIN #100 LOCATED IN THE MEDIAN OF SAGINAW HIGHWAY (M-78/B.R. 69).

NOTE: ALL GRADES SHOWN ARE FOR FINAL CONSTRUCTED CONDITIONS AND CONTRACTOR IS RESPONSIBLE FOR HOLDING DOWN GRADES AS THEY OR THE DEVELOPER DEEMS NECCESSARY FOR BASEMENT SPOILS, TOPSOILS ETC...

SITE ADDRESS: 1954 M-78, HASLETT MI 48840

SURVEY#92134.TOP

REVISIONS
12-8-17 S.U.P. SUBMITTAL
1-19-18 TWP. PRELIM. REVIEW

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PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

1954 E. M-78
PRELIMINARY STORM & GRADING PLAN

SCALE: 1"= 40'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 6-26-17	PROJECT MGR. JWK	SHEET 3 OF 6
AUTHORIZED BY: BALARAM K. SINGH		JOB #: 92134

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S.U.P. PLAN FOR:

1954 E. M-78

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

LEGAL DESCRIPTION:
(As provided in KEBS, Inc. Certified Boundary Survey, Job No. 87585.BND)
A parcel of land in the Northwest fractional 1/4 of Section 3, T4N, R1W, Meridian Township, Ingham County, Michigan, the surveyed boundary of said parcel described as: Beginning at the Northwest corner of said fractional Section 3; thence N89°44'21"E along the Standard North line of said Section 3 a distance of 473.68 feet to the Northwesterly right-of-way line of Saginaw Highway (M-78); thence S57°29'13"W along said Northwesterly line 555.24 feet to the West line of said Section 3; thence N01°03'17"W along said West line 296.33 feet to the Point of Beginning; said parcel containing 1.61 acres, more or less; said parcel subject to all easements and restrictions if any.

SEWER INVENTORIES

CATCH BASIN #100
RIM= 866.94
18" RCP NW= 864.19
18" RCP SE= 864.08

CATCH BASIN #101
RIM= 858.60
18" RCP NNW= 855.74
18" RCP NE= 855.64

CATCH BASIN #102
RIM= 860.63
TOP OF WATER= 857.74

CATCH BASIN #103
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24" CPP NE= 855.50
6" PVC NE= 857.02
24" RCP SE= NOT ACCESSIBLE
(TOO RECESSED FOR MEASUREMENT)
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CATCH BASIN #104
RIM= 861.91
24" CPP NE= 855.82
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SANITARY MANHOLE #200
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6" PVC EAST= 860.86
4" PVC SE= 860.91
PROP. 6" SW 860.96

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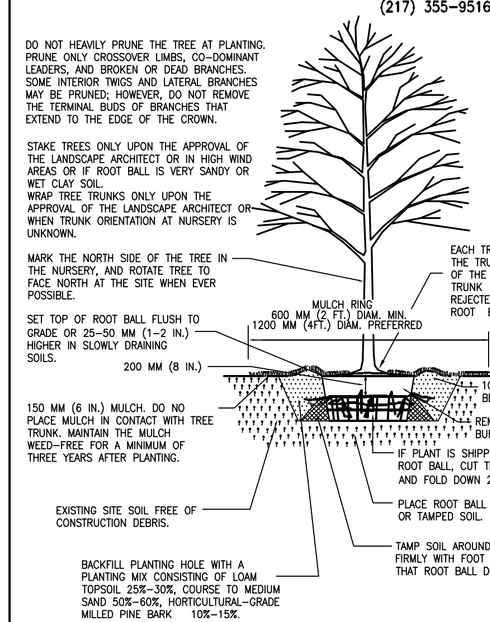
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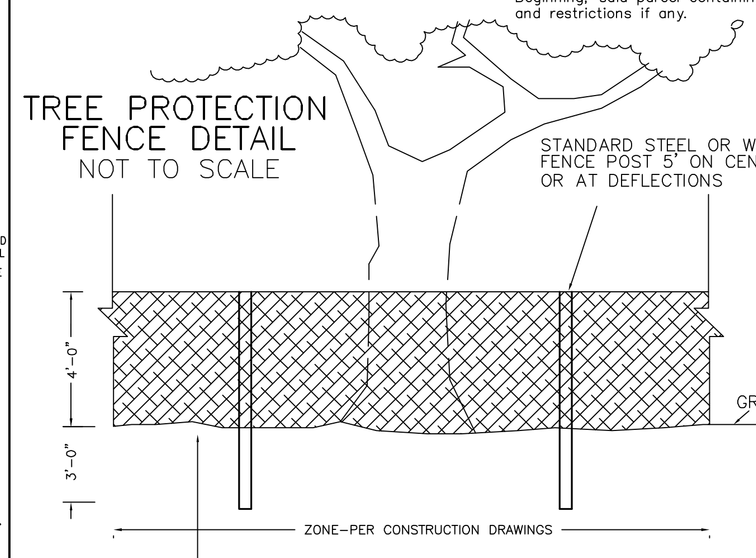
SANITARY MANHOLE #204
RIM= 860.74
10" PVC NORTH= 847.81
10" PVC NE= 847.84
10" PVC SW= 850.12

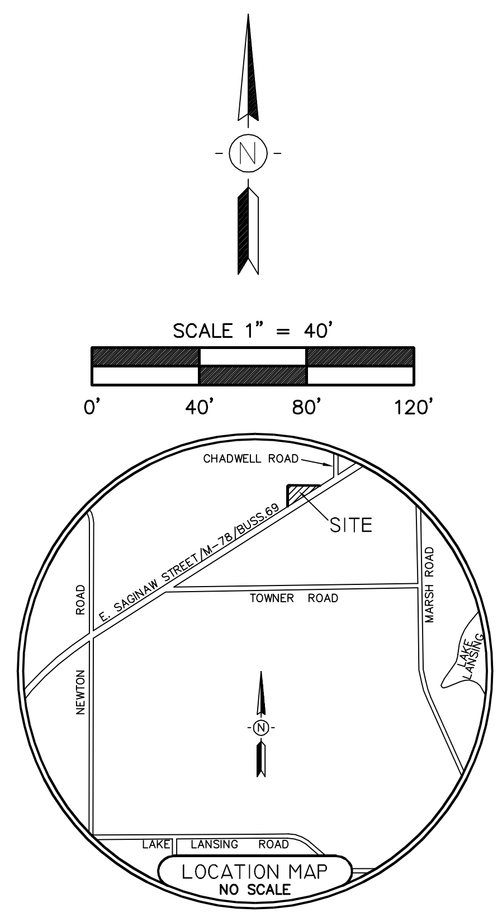
INTERNATIONAL SOCIETY OF ARBORICULTURE

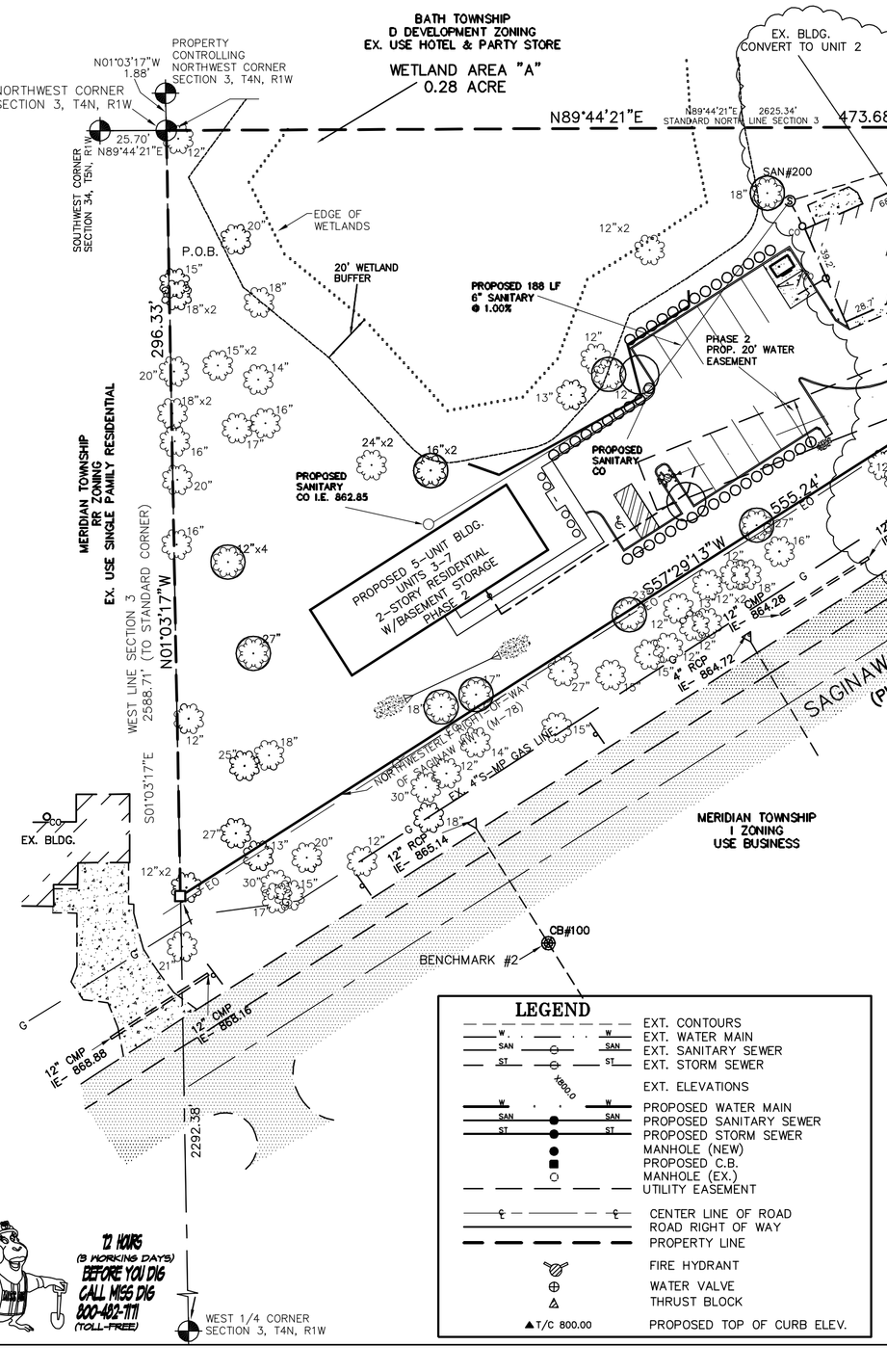
INTERNATIONAL SOCIETY OF ARBORICULTURE
1400 WEST ANTHONY DRIVE
CHAMPAIGN, IL 61821
(217) 355-9411
(217) 355-9516 FAX



TREE PLANTING DETAIL - B&B TREES IN ALL SOIL TYPES
NOTE: THIS DETAIL ASSUMES THAT THE PLANTING SPACE IS LARGER THAN 2400 MM (8 FT.) SQUARE, OPEN TO THE SKY, AND NOT COVERED BY ANY PAVING OR GRATING.






BATH TOWNSHIP
D DEVELOPMENT ZONING
EX. USE HOTEL & PARTY STORE
WETLAND AREA "A"
0.28 ACRE
PROPERTY CONTROLLING NORTHWEST CORNER SECTION 3, T4N, R1W
N01°03'17"W 1.88'
NORTHWEST CORNER SECTION 3, T4N, R1W
N89°44'21"E 25.70'
N89°44'21"E 473.68'
2625.34' STANDARD NORTH LINE SECTION 3
SOUTHWEST CORNER SECTION 34, T5N, R1W
EX. BLDG. CONVERT TO UNIT 2
EX. 2 CAR GARAGE
EX. HOME CONVERT TO UNIT 1
PHASE 1 - UNITS 1 & 2 USE EXISTING DRIVES AND PARKING. USE EXISTING WELL FOR POTABLE WATER SUPPLY UNITS 1 & 2
APPROX. LOCATION EX. 8" SANITARY
EX. WELL
SAN#200
SAN#201
SAN#202
SAN#203
EDGE OF WETLANDS
20' WETLAND BUFFER
P.O.B.
PROPOSED 188 LF 6" SANITARY @ 1.00%
PHASE 2 PROP. 20' WATER EASEMENT
PROPOSED SANITARY CO
PROPOSED SANITARY CO I.E. 862.85
PROPOSED 5-UNIT BLDG. UNITS 3-5 2-STORY RESIDENTIAL W/BASEMENT STORAGE PHASE 2
MERIDIAN TOWNSHIP RE ZONING EX. USE SINGLE FAMILY RESIDENTIAL
WEST LINE SECTION 3 2656.71' (TO STANDARD CORNER)
N01°03'17"W 296.33'
S01°03'17"E 2292.38'
S57°29'13"W 555.24'
2151.66'
SAGINAW HWY (M-78/B.R. 69) (PUBLIC- 190' WIDE R.O.W.)
TOP OF PAVEMENT
EX. BLDG.
MERIDIAN TOWNSHIP I ZONING USE BUSINESS
CB#100
BENCHMARK #2
CB#101
CB#102
CB#103
CB#104
BENCHMARK #1
SOUTH 1/4 CORNER SECTION 34, T5N, R1W N89°44'20"E 23.27'
NORTH 1/4 CORNER SECTION 3, T4N, R1W
WEST 1/4 CORNER SECTION 3, T4N, R1W
TRAFFIC SIGNAL LINE
BILLBOARD
SIGN
LANDSCAPING
FOLIAGE LINE STRIPING
12" CMP I.E.= 865.16
12" CMP I.E.= 865.88
12" RCP I.E.= 865.14
12" RCP I.E.= 864.72
12" CMP I.E.= 863.77
15" RCP I.E.= 863.24
15" RCP I.E.= 863.28
12" RCP I.E.= 864.28
T/C= 865.85
T/C= 866.76
T/C= 866.85
T/C= 867.00
T/C= 867.10
T/C= 867.20
T/C= 867.30
T/C= 867.40
T/C= 867.50
T/C= 867.60
T/C= 867.70
T/C= 867.80
T/C= 867.90
T/C= 868.00
T/C= 868.10
T/C= 868.20
T/C= 868.30
T/C= 868.40
T/C= 868.50
T/C= 868.60
T/C= 868.70
T/C= 868.80
T/C= 868.90
T/C=

S.U.P. PLAN FOR:
1954 E. M-78
MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

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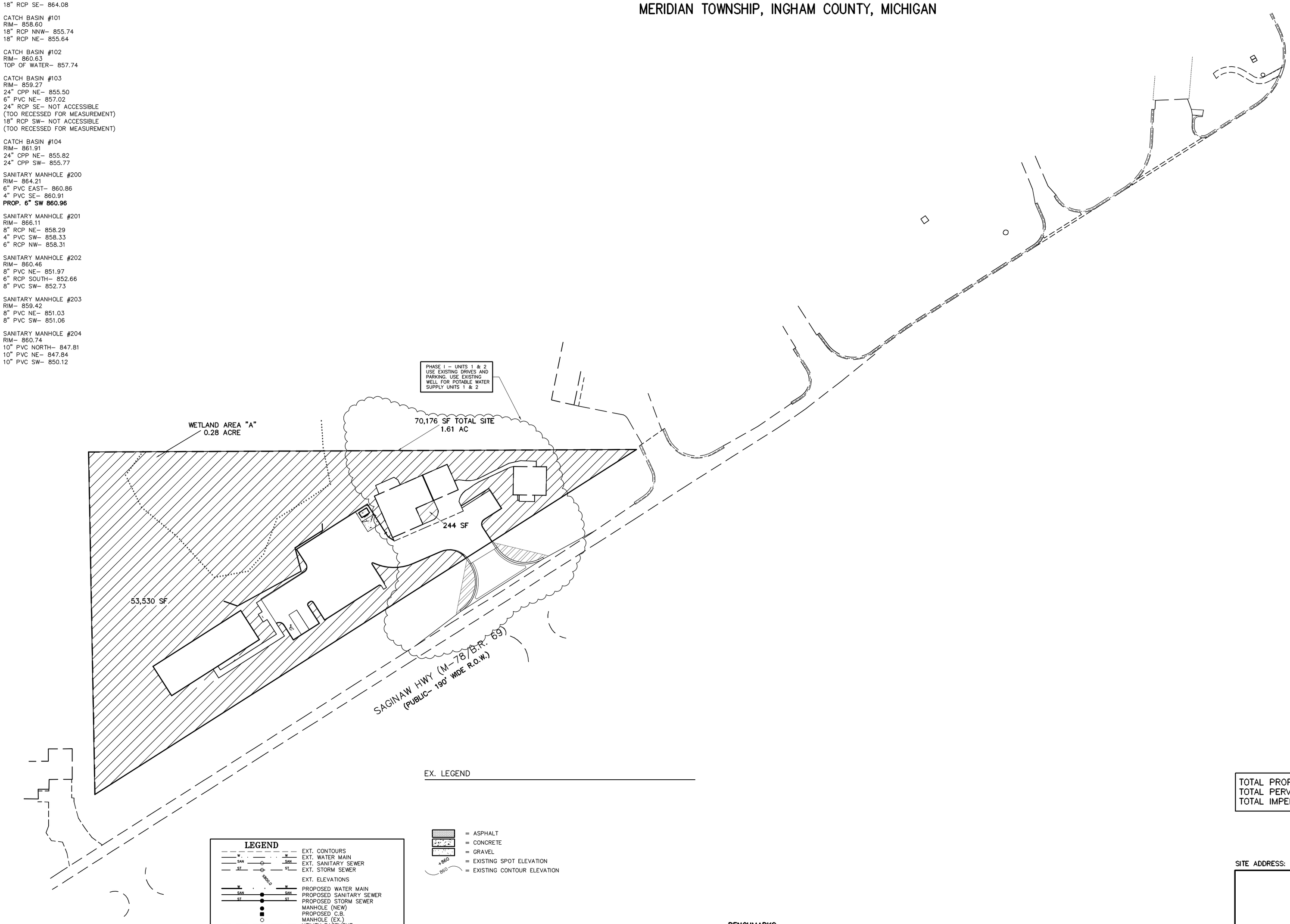
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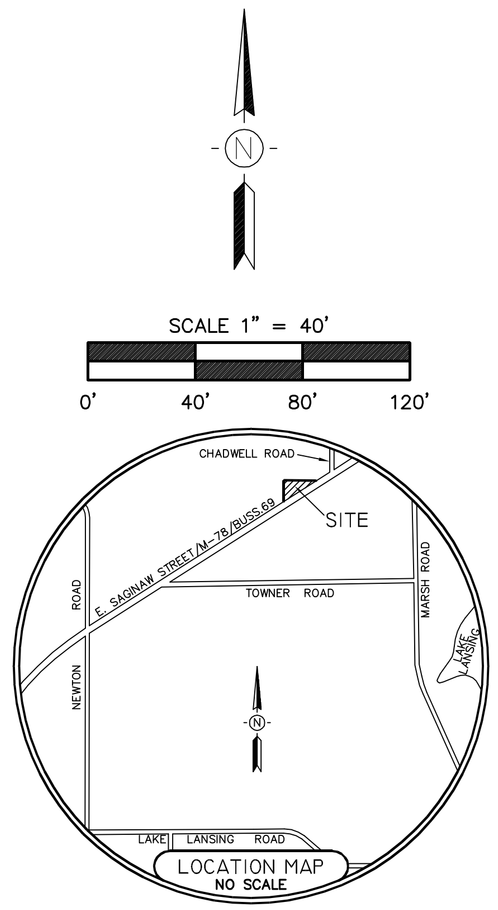
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LEGEND

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- ROAD RIGHT OF WAY
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- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

- = ASPHALT
- = CONCRETE
- = GRAVEL
- +860 = EXISTING SPOT ELEVATION
- 860 = EXISTING CONTOUR ELEVATION

TOTAL PROPERTY = 70,176 S.F.
TOTAL PERVIOUS AREA = 553774 S.F. = 76.63%
TOTAL IMPERVIOUS AREA = 16,402 S.F. = 23.37%

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BENCHMARK #1 ELEVATION: 863.33 (NAVD 88)
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1954 E. M-78
PERVIOUS/IMPERVIOUS PLAN

SCALE: 1"= 40'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 6–26–17	PROJECT MGR. JWK	SHEET 5 OF 6
AUTHORIZED BY: BALARAM K. SINGH		JOB #: 92134

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TOPOGRAPHIC SURVEY

FOR: BALARAM K. SINGH

"1954 M-78, HASLETT MI 48840"
EXISTING PLAN

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CATCH BASIN #101
RIM- 858.60
18" RCP NNW- 855.74
18" RCP NE- 855.64

CATCH BASIN #102
RIM- 860.63
TOP OF WATER- 857.74

CATCH BASIN #103
RIM- 859.27
24" CPP NE- 855.50
6" PVC NE- 857.02
24" RCP SE- NOT ACCESSIBLE
(TOO RECESSED FOR MEASUREMENT)
18" RCP SW- NOT ACCESSIBLE
(TOO RECESSED FOR MEASUREMENT)

CATCH BASIN #104
RIM- 861.91
24" CPP NE- 855.82
24" CPP SW- 855.77

SANITARY MANHOLE #200
RIM- 864.21
6" PVC EAST- 860.86
4" PVC SE- 860.91

SANITARY MANHOLE #201
RIM- 866.11
8" RCP NE- 858.29
4" PVC SW- 858.33
6" RCP NW- 858.31

SANITARY MANHOLE #202
RIM- 860.46
8" PVC NE- 851.97
6" RCP SOUTH- 852.66
8" PVC SW- 852.73

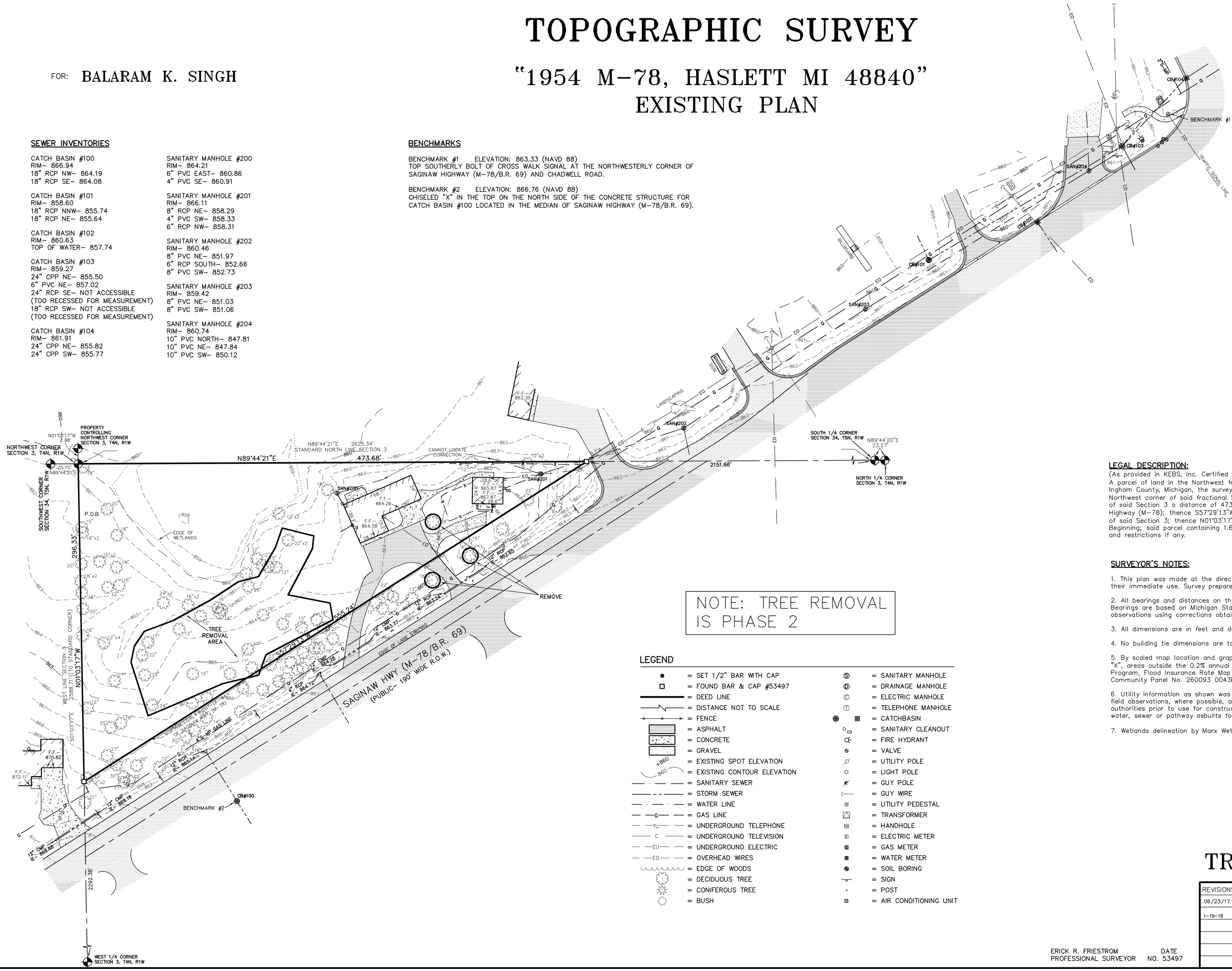
SANITARY MANHOLE #203
RIM- 859.42
8" PVC NE- 851.03
8" PVC SW- 851.06

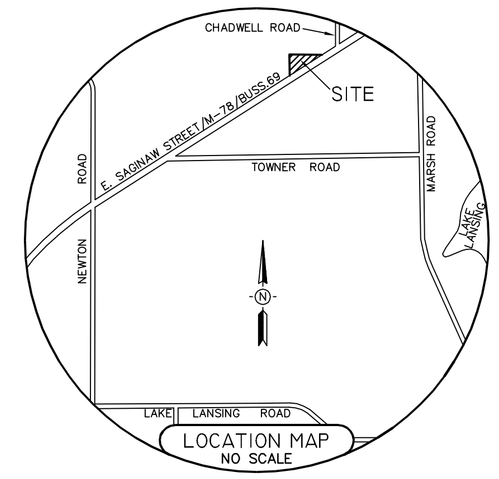
SANITARY MANHOLE #204
RIM- 860.74
10" PVC NORTH- 847.81
10" PVC NE- 847.84
10" PVC SW- 850.12

BENCHMARKS

BENCHMARK #1 ELEVATION: 863.33 (NAVD 88)
TOP SOUTHERLY BOLT OF CROSS WALK SIGNAL AT THE NORTHWESTERLY CORNER OF SAGINAW HIGHWAY (M-78/B.R. 69) AND CHADWELL ROAD.

BENCHMARK #2 ELEVATION: 866.76 (NAVD 88)
CHISELED "X" IN THE TOP ON THE NORTH SIDE OF THE CONCRETE STRUCTURE FOR CATCH BASIN #100 LOCATED IN THE MEDIAN OF SAGINAW HIGHWAY (M-78/B.R. 69).





SCALE 1" = 40'
0' 40' 80' 120'

NOTE: TREE REMOVAL IS PHASE 2

LEGEND

- = SET 1/2" BAR WITH CAP
- = FOUND BAR & CAP #53497
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- = EXISTING SPOT ELEVATION
- = EXISTING CONTOUR ELEVATION
- = SANITARY SEWER
- = STORM SEWER
- = WATER LINE
- = GAS LINE
- = UNDERGROUND TELEPHONE
- = UNDERGROUND TELEVISION
- = UNDERGROUND ELECTRIC
- = OVERHEAD WIRES
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH
- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
- = CATCHBASIN
- = SANITARY CLEANOUT
- = FIRE HYDRANT
- = VALVE
- = UTILITY POLE
- = LIGHT POLE
- = GUY POLE
- = GUY WIRE
- = UTILITY PEDESTAL
- = TRANSFORMER
- = HANDHOLE
- = ELECTRIC METER
- = GAS METER
- = WATER METER
- = SOIL BORING
- = SIGN
- = POST
- = AIR CONDITIONING UNIT

LEGAL DESCRIPTION:

(As provided in KEBS, Inc. Certified Boundary Survey, Job No. 87585.BND)
A parcel of land in the Northwest fractional 1/4 of Section 3, T4N, R1W, Meridian Township, Ingham County, Michigan, the surveyed boundary of said parcel described as: Beginning at the Northwest corner of said fractional Section 3; thence N89°44'21"E along the Standard North line of said Section 3 a distance of 473.68 feet to the Northwesterly right-of-way line of Saginaw Highway (M-78); thence S57°29'13"W along said Northwesterly line 555.24 feet to the West line of said Section 3; thence N01°03'17"W along said West line 296.33 feet to the Point of Beginning; said parcel containing 1.61 acres, more or less; said parcel subject to all easements and restrictions if any.

SURVEYOR'S NOTES:

1. This plan was made at the direction of the parties named hereon and is intended solely for their immediate use. Survey prepared from fieldwork performed in June 2017.

2. All bearings and distances on the survey are record and measured unless otherwise noted. Bearings are based on Michigan State Plane South Zone grid bearings obtained from GPS observations using corrections obtained from the Lansing C.O.R.S.. Elevations based on NAVD 88.

3. All dimensions are in feet and decimals thereof.

4. No building tie dimensions are to be used for establishing the property lines.

5. By scaled map location and graphic plotting only, this property lies entirely within Flood Zone "X", areas outside the 0.2% annual chance floodplain, according to the National Flood Insurance Program, Flood Insurance Rate Map for Charter Township of Meridian, Ingham County, Michigan, Community Panel No. 260093 0043D, dated August 16, 2011.

6. Utility information as shown was obtained from available public records and from supporting field observations, where possible, and is subject to verification in the field by the appropriate authorities prior to use for construction. According to Meridian Charter Township, there is no water, sewer or pathway asbuilts for the subject parcel.

7. Wetlands delineation by Marx Wetlands, LLC on 12/16/15.

ERICK R. FRIESTROM DATE
PROFESSIONAL SURVEYOR NO. 53497

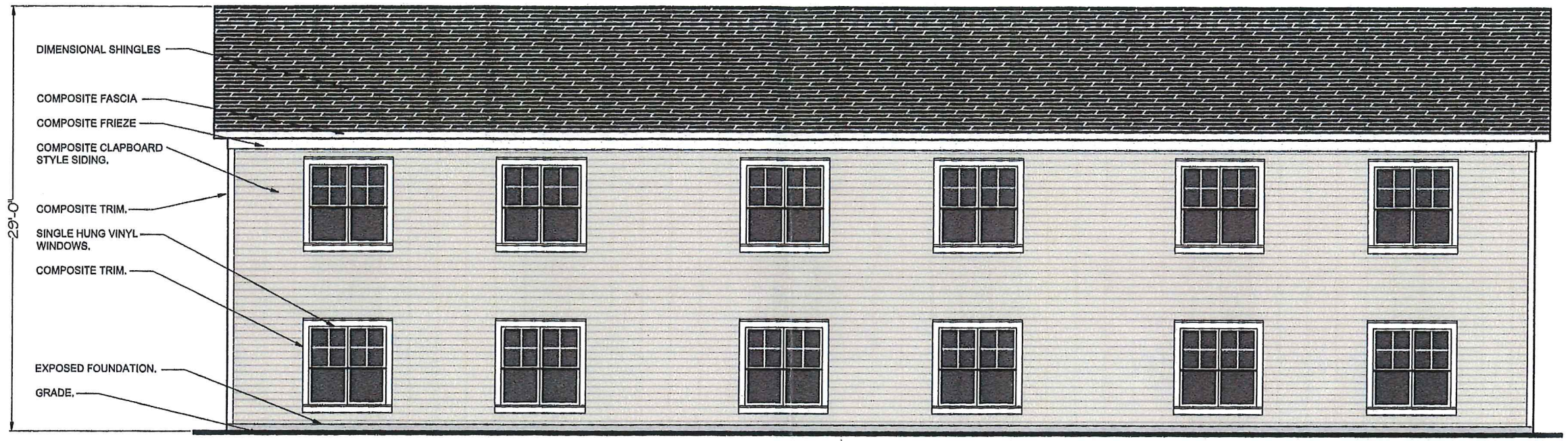
EXISTING & TREE REMOVAL PLAN

REVISIONS	COMMENTS
06/23/17	ORIGINAL
1-19-18	TWP. PRELIM. REVIEW

KEBS, INC. ENGINEERING AND LAND SURVEYING
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX 517-339-8047
WWW.KEBS.COM
Marshall Office - Ph. 269-781-9800

DRAWN BY SLH	SECTION 3, T4N, R1W
FIELD WORK BY NAW	JOB NUMBER: 92134.TOP
SHEET 6 OF 6	

I:\92\92134\dwg\E-92134TOP.EXISTING PLAN.dwg, 5/15/2018 1:36:30 PM, sbass



SOUTH ELEVATION

SCALE: 1/8" = 1'-0"



NORTH ELEVATION

SCALE: 1/8" = 1'-0"

SHEET TITLE
APARTMENT - ELEVATIONS

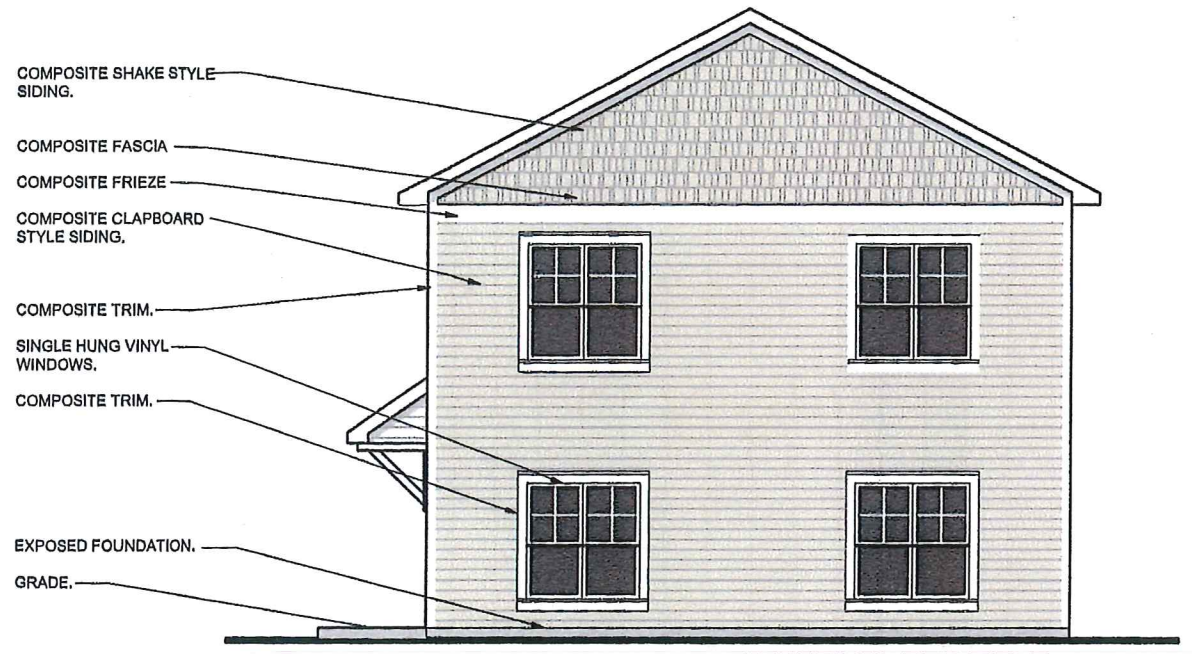
PROJECT
B.K. SINGH - 1954 EAST M-78

DRAWING
2.0

RECEIVED
MAY 0 1 2018

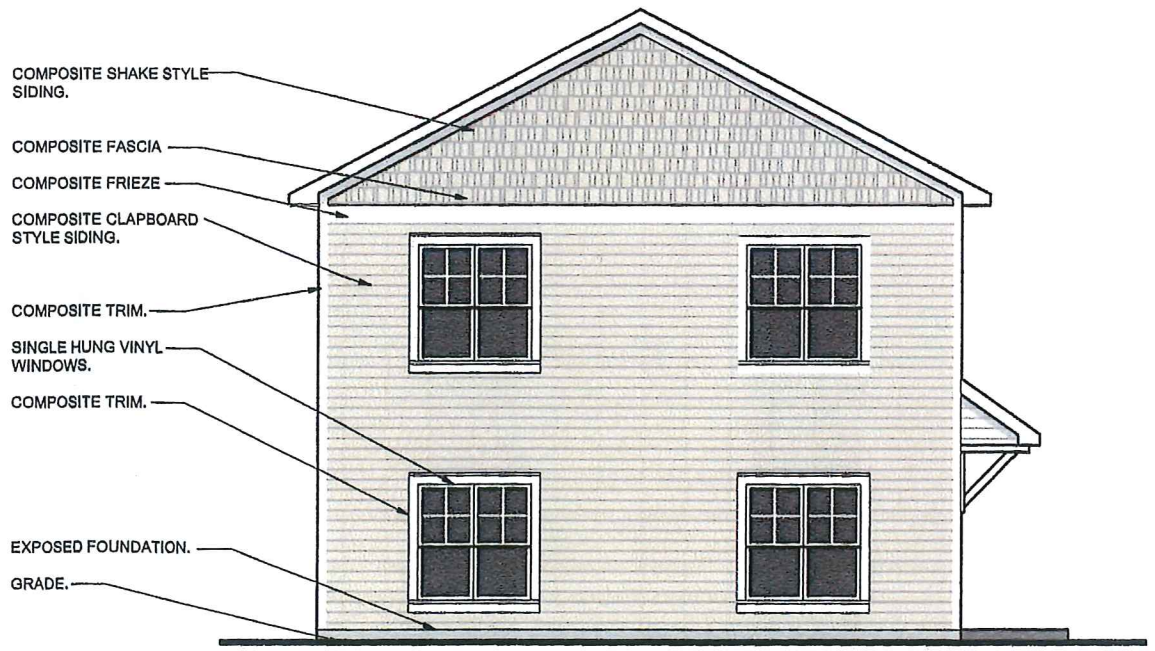
REF:
PROJECT NO: 201809
DATE: 3/26/2018
FILE: SCHEMATIC.DWG

DRAWN BY: TRC
CHK'D BY: TRC



WEST ELEVATION

SCALE: 1/8" = 1'-0"



EAST ELEVATION

SCALE: 1/8" = 1'-0"

SHEET TITLE
APARTMENT - ELEVATIONS

PROJECT
B.K. SINGH - 1954 EAST M-78

DRAWING
3.0

RECEIVED
MAY 0 1 2018

REF:
PROJECT NO: 201809
DATE: 3/26/2018
FILE: SCHEMATIC.DWG

DRAWN BY: TRC
CHK'D BY: TRC

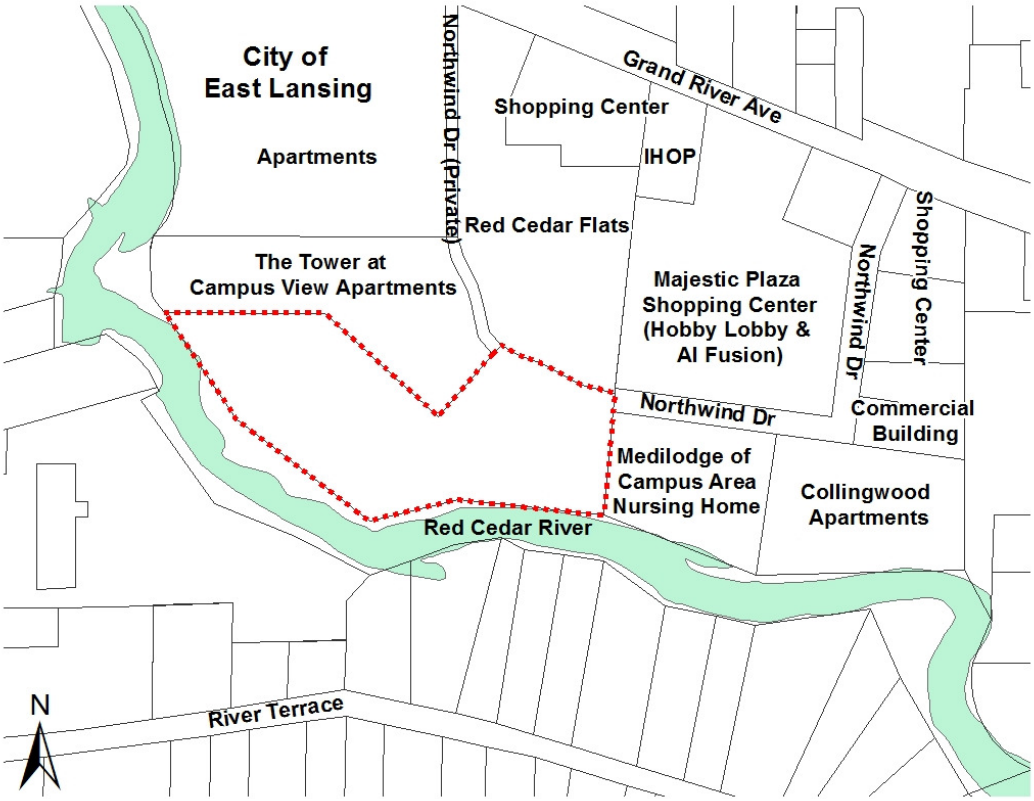
To: **Planning Commission**

From: **Peter Menser, Principal Planner**

Date: **June 5, 2018**

Re: **Mixed Use Planned Unit Development #18034 (Meridian Investment Group, LLC), construct 70,213 square foot mixed use building with 3,115 square feet of commercial space and 88 apartments.**

Meridian Investment Group, LLC has submitted a mixed use planned unit development (MUPUD) proposal for a project identified as Red Cedar Manor. The proposal includes the demolition of an existing two-story, 40,504 square foot office building at 2875 Northwind Drive and construction of a new three-story, 70,213 square foot mixed use building in approximately the same footprint. The 9.13 acre parcel is located in both the RCC (Multiple Family) and PO (Professional and Office) zoning districts. Of the total 9.13 acre site, 4.99 acres is located in the PO zoning district, which is the portion of the property proposed for a MUPUD. The map below depicts the site location and surrounding land uses.



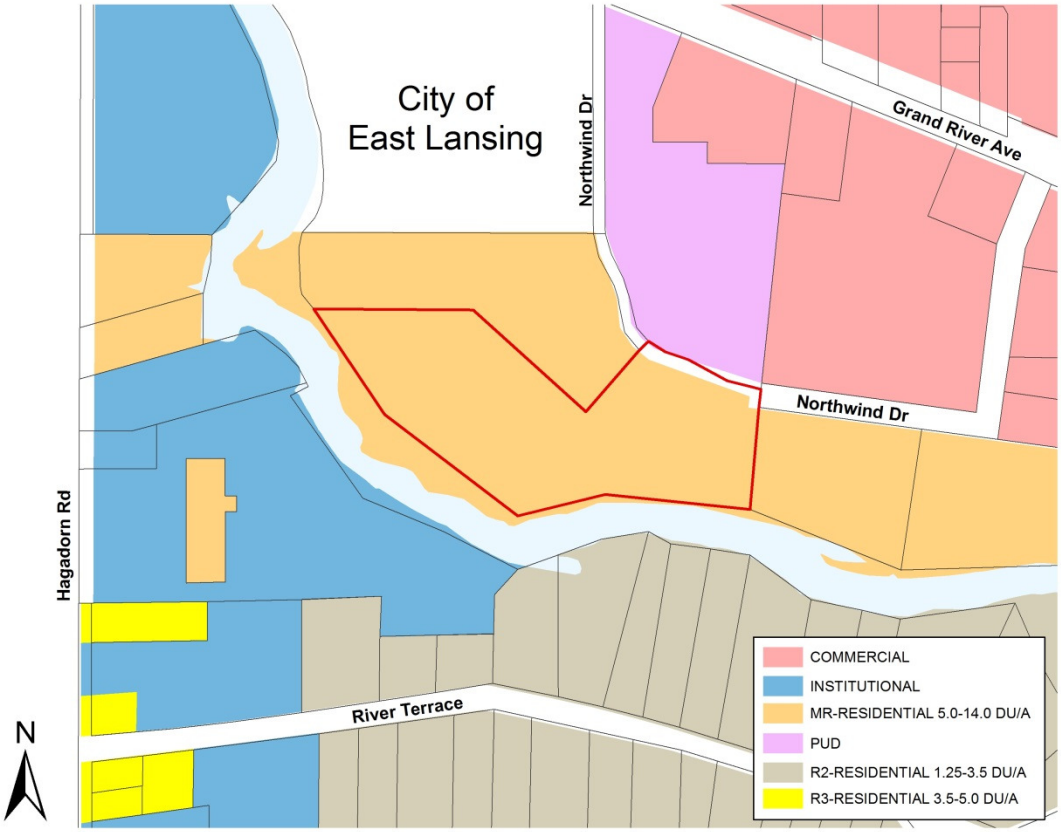
The new building will have a total of 88 apartments divided amongst the first, second, and third floors. The portion of the building along the Red Cedar River includes a lower level, which will have 12 apartments. The apartments consist of 65 one bedroom and 23 two bedroom units. A 3,115 square foot commercial space is shown on the first floor of the building.

In addition to the MUPUD, special use permits (SUP) are required for constructing a building totaling more than 25,000 square feet in gross floor area (SUP #18031) and for grading and fill activities in the floodplain of the Red Cedar River (SUP #18041). The special use permits are being processed concurrently with the MUPUD request.

Master Plan

The property is designated on the Future Land Use Map from the 2017 Master Plan as MR-Residential, 5.0-14.0 dwelling units per acre.

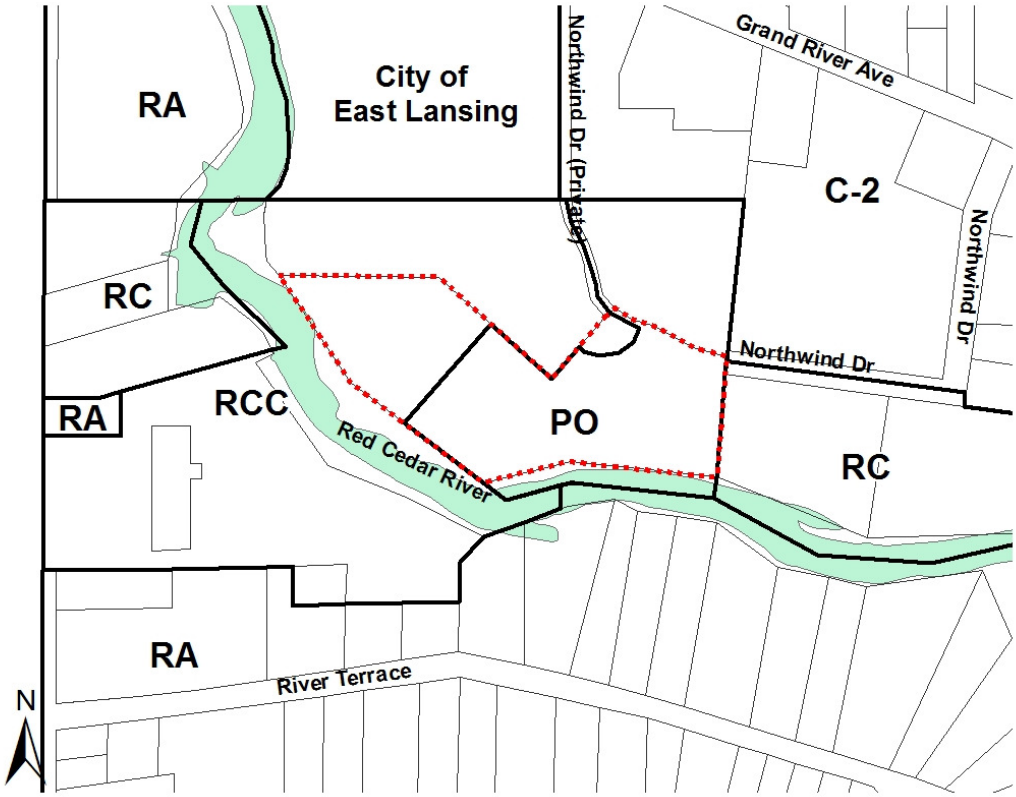
FUTURE LAND USE MAP



Zoning

The proposed project is located in the PO (Professional and Office) zoning district. The PO zoning district allows for a MUPUD but only where public water and sewer are available, and when the MUPUD is adjacent to land zoned and developed in a single-family residential district, the height of buildings in the MUPUD are limited to being no taller than the abutting residential district would allow.

ZONING MAP



Physical Features

The property is currently occupied by a two-story 40,504 square foot office building that was constructed in 1978 along with a parking lot and associated access drives.

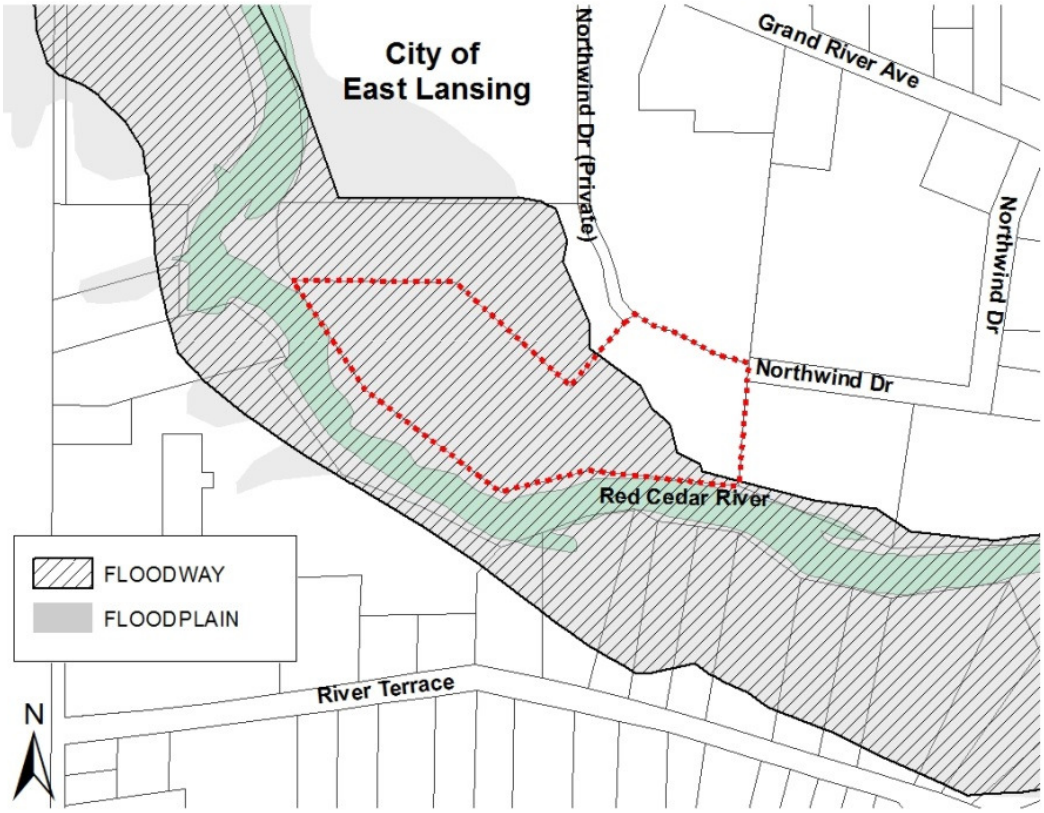
Floodplain

The property is located in both the floodplain and floodway of the Red Cedar River. The applicant is proposing to place 357 cubic yards of fill in the floodplain to facilitate re-grading of the parking lot to address existing steep slopes related to ADA and Ingham County Road Department standards for parking lots. A 481 cubic yard detention basin is proposed to the west of the parking lot to provide storm water pre-treatment and serve as compensating excavation for the fill in the floodplain.

The Code of Ordinances allows the placement of fill in the floodplain, subject to the provision of an equal or greater compensating cut in the floodplain to maintain flood water impoundment capacity and approval of a special use permit from the Planning Commission. Special Use Permit (SUP) #18041 addresses the proposed work in the floodplain and is running concurrent with the MUPUD. The applicant has also applied for a Michigan Department of Environmental Quality (MDEQ) permit for the work in the floodplain.

Both the existing and proposed building on the property are located outside of the floodplain. The lowest floor of the new building will be located one foot above the floodplain elevation of 840.9.

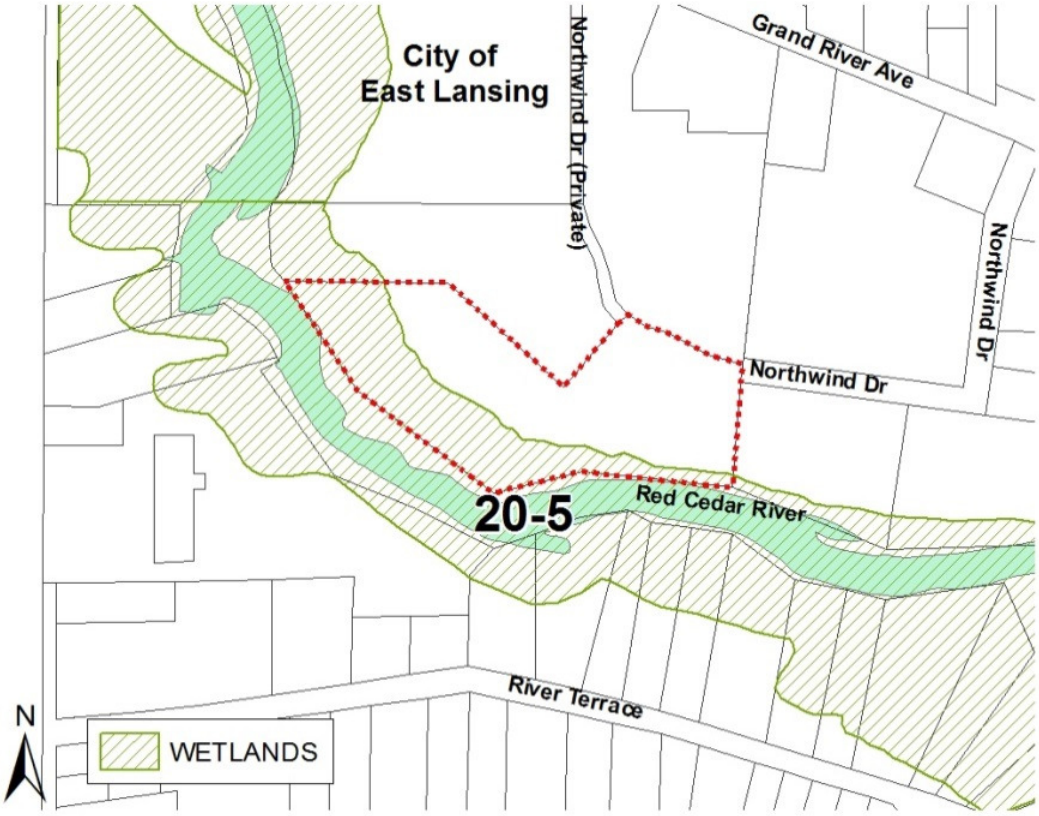
FLOODPLAIN MAP



Wetlands

Approximately 1.73 acres of Township Wetland #20-5 is located on the project site. A wetland delineation was conducted by the applicant's wetland consultant and the delineation was verified by the Township's wetland consultant in April of 2018. Wetland #20-5 is regulated by the Township as well as the Michigan Department of Environmental Quality due its proximity to the Red Cedar River. A 40 foot water features setback must be maintained from the delineated boundary of the wetland. As proposed, grading for the proposed detention basin may extend into the 40 foot wetland setback, which would require a waiver as part of the MUPUD.

WETLAND MAP



Streets and Traffic

The subject site is located on the south side of Northwind Drive, a two lane road classified as a local street in the 2017 Master Plan. Northwind Drive runs south off Grand River Avenue just west of Brookfield Drive and meets again with Grand River Avenue at a signalized intersection near the entrance to the Whole Foods store. The west portion of Northwind Drive adjacent to the Red Cedar Flats development is a private road owned by the applicant. The eastern leg, beginning at the subject property and heading out to the signalized intersection at Grand River Avenue, is a public road. Traffic counts are not available from the Ingham County Road Department (ICRD) for Northwind Drive.

The applicant provided a letter from Traffic Engineering Associates (TEA) Inc. comparing traffic generation of the existing use of the property as an office building to the proposed use as a mixed use development. A traffic study for the project was not required as the proposed development will not generate 100 vehicle trips during a peak hour of the adjacent roadway. The proposed project generates 36 trips during the AM peak hour and 64 during the PM peak hour.

In 2015 a traffic study submitted for the Red Cedar Flats MUPUD project provided information on the level of service (LOS) at the two Northwind Drive/Grand River Avenue intersections. The study noted that, after the Red Cedar Flats project was completed, the left turn movement from Northwind Drive (Private) on to Grand River Avenue would operate at a LOS F and that the northbound left turn movement from Northwind Drive on to Grand River Avenue at the signalized intersection would operate at a LOS E. Level of service is ranked A-F, with a LOS of D or better considered to be acceptable. The left turn movement from Northwind Drive (Private) on to Grand River Avenue was ranked as a LOS F prior to the development of the Red Cedar Flats project.

A five foot wide sidewalk is located on the east side of Northwind Drive (Private), connecting Grand River Avenue to the subject site. A sidewalk is located on the north side of Northwind Drive (Public), connecting the subject site to the signalized intersection at Grand River Avenue.

The 2017 Master Plan shows a proposed 10 foot wide paved Cross County trail along the north side of the Red Cedar River from Hagadorn Road to Lake Lansing. A portion of the Cross Country trail is located along the southern portion of the subject property. The applicant will be required to construct the portion of the trail located on the property as part of the MUPUD. A 20 foot wide easement is shown on the submitted site plan in the location of the planned trail.

Utilities

The current office building on the property is served by municipal water and sanitary sewer and are available to serve the proposed new mixed use building. The exact location and capacity of utilities will be reviewed in detail during site plan review if the MUPUD and SUPs are approved.

Parking

The Township Code of Ordinances requires two parking spaces for each dwelling unit plus an additional 25% expansion capacity. Five (minimum) to 5.5 (maximum) parking spaces per 1,000 square feet of gross floor area are required for the commercial space. With 88 dwelling units and 3,115 square feet of commercial space, a total of 236 parking spaces would be required for the project.

One bicycle parking space for every 10 required vehicle parking spaces is also required in addition to the required motor vehicle parking. With 236 motor vehicle parking spaces, 24 bicycle parking spaces are required for the project. 64 bicycle parking spaces (32 bicycle racks) are proposed in four different areas on the property.

The ordinance allows the number of required motor vehicle parking spaces on the site to be reduced by one motor vehicle parking space for every two bicycle parking spaces installed on a site, up to a maximum of 10 percent of the total number of required motor vehicle parking spaces. Using this formula the required number of motor vehicle parking spaces can be reduced by 23 spaces. With the allowed reduction granted for bicycle parking, the total required motor vehicle parking is reduced to 213 spaces.

The submitted site plan proposes 116 parking spaces on the site. 36 additional spaces are located in the circular drive located on the parcel owned by the applicant but in a portion of the property zoned RCC (Multiple Family) and not included in the MUPUD. While the additional 36 parking spaces will be available for use by the tenants of the new development, they will not be counted towards the total parking spaces in the project. With 213 required parking spaces and 116 proposed spaces the applicant will be seeking a 97 space waiver from the Township Board as part of the MUPUD approval.

Staff Analysis

The applicant has requested to construct a 70,213 square mixed use building with 88 units and 3,115 square feet of commercial space using the MUPUD process for a project identified as Red Cedar Manor. In a MUPUD request the Planning Commission makes a recommendation on the project and the Township Board makes the final decision. When reviewing the project the Planning Commission should consider the appropriateness of the requested waivers, the proposed amenities and related review criteria, and the design standards as outlined in Section 86-440(f) of the Code of Ordinances.

The MUPUD ordinance generally waives the standard requirements for lot size, yards, frontage requirements, setbacks, maximum impervious surface, and type and size of dwelling unit, provided the purpose and intent of the ordinance are incorporated into the overall development plan. The MUPUD ordinance is intended to provide flexibility for the Planning Commission and Township Board to set appropriate standards during the review process.

The following is a summary of the project's consistency with the MUPUD ordinance standards. As part of this project analysis, standards for the underlying PO zoning district will be compared to what is proposed on the submitted site plan.

Land Use: All uses permitted by right and by special use permit in the underlying zoning district are allowed in a MUPUD. A MUPUD in the PO zoning district allows only neighborhood-oriented commercial uses such as personal service establishments, restaurants and cafes (bars/taverns are prohibited), grocery stores, banks, or retail. The type, size, and location of the proposed commercial uses must be depicted on a site plan and approved by the Township Board at the time the MUPUD is considered.

Density: The submitted plan proposes 88 dwelling units on 4.99 acres for a density of 17.64 dwelling units per acre (du/a). In a MUPUD, residential density is allowed up to 14 du/a for a redevelopment project, but can be increased to 18 du/a with the provision of four or more unique and extraordinary amenities acceptable to the Township. The four amenities required to qualify for the density bonus to 18 du/a must be in addition to the one amenity required for the MUPUD.

Phasing: The applicant has not provided a phasing plan for the proposed project. Staff is under the impression the entirety of the project will completed in one phase.

Amenities: One or more amenities are required for every MUPUD project and should represent multiple categories from the list of amenity categories which are Conservation; Environment; Parks, Recreation, and Culture; Social Interaction; and Site and Building Design. Criteria to determine whether a proposed amenity is acceptable for consideration can be found in Section 86-440(e)(2) of the MUPUD ordinance. The four amenities required to qualify for the density bonus to 18 du/a must be in addition to the one amenity required for the MUPUD, so a minimum of five amenities are required for the project.

The submitted site plan lists the following amenities: connection to non-motorized pathway and future river trail, easement to be granted to Township for river trail, increased pervious area, and covered bike parking.

Building height: The maximum building height allowed in a MUPUD is 45 feet. One exception is that in a MUPUD proposed on land zoned PO, when adjacent to land zoned and developed in a single-family residential district, building height is limited to being no taller than the abutting residential district would allow. Building elevations are provided in the MUPUD application materials but the elevations are not scaled and do not indicate the height of the building. The applicant has indicated that the building is approximately 36 feet in height. The applicant has also indicated that the southern side of the building, the side facing the Red Cedar River, is approximately 47 feet in height due to the level of the adjacent grade as it slopes down toward the river. A waiver from the 45 foot maximum height is not required as the extra building height is the result of the sloping grade in this area of the site.

Building materials: Generally, building materials in a MUPUD should include, but are not limited to, wood, brick, clapboards, beadboard, glass, and stone. Other materials such as vinyl, aluminum, and metal sidings should be avoided. All buildings should be completed on all sides with accepted materials. The design of the building should relate to and blend with the facades of adjacent buildings and complement streetscape improvements in the area. The proposed building materials for the building are a mix of concrete block and fiber cement board panels in different colors. Elevations of the building were submitted that show the different building materials for the project. A sample board of the building materials submitted by the applicant will be displayed at the public hearing.

Architectural design: The MUPUD ordinance states that buildings wider than 50 feet shall be divided into increments of not more than 50 feet through articulation of the façade. Scaled building elevations have not been provided however it appears the building as proposed provides the required façade articulation. The MUPUD ordinance also requires that windows cover no less than 50% of nonresidential street level facades. Based on the submitted floor plans the 3,115 commercial space is located on the north building façade, along Northwind Drive. The submitted building elevations show windows along Northwind Drive that appear to cover at least 50% of façade at the street level.

Railings, benches, trash receptacles, or bicycle racks: Accessory items such as railings, benches, trash receptacles, or bicycle racks are required to be of commercial quality and complement the building design and style. The submitted architectural renderings of the building shows railings for the balcony units and benches but details were not provided to indicate the materials of these items. The submitted site plan shows 32 bicycle racks on the site but does not note the style or material of the racks. The Township requires the use of an inverted "U" shaped bicycle rack but will consider other styles if the racks are functionally equivalent.

Trash and recycling: A dumpster is shown on the submitted site plan at the south east corner of the proposed building. The Township requires any proposed trash or recycling structure to be screened by an enclosure.

Parking: The setbacks for a parking area and the number of parking spaces required can be waived in a MUPUD. 213 parking spaces are required for the project and the applicant is proposing 116 spaces.

Landscaping: Proposed landscaping must generally comply with the provisions of the Code of Ordinances. Landscaping should be designed to preserve existing significant natural features and to buffer service areas, parking lots, or dumpsters. A mix of evergreen and deciduous plants and trees are preferred, along with seasonal accent plantings. A minimum of four feet of landscaped area is required around the perimeter of the building. While not required as part of the MUPUD application, a landscape plan for the project was submitted.

Lighting: The MUPUD ordinance requires site lighting to comply with the Outdoor Lighting Ordinance and limits street lighting intended to provide illumination for pedestrians on the sidewalk to no taller than 15 feet in height. Information on site lighting was provided and will be reviewed in detail during site plan review if the project proceeds.

Signs: A sign program is required as part of the MUPUD application showing the style, size, number, and location of any proposed signs and is approved as part of the MUPUD. The submitted plans show a 9' 3" monument sign located on the east side of the driveway at Northwind Drive. Freestanding signs are generally not permitted in a MUPUD. Exceptions for freestanding signs of the monument type may be permitted when a building is set back a minimum of 15 feet from the right-of-way (ROW) line with the resulting yard set aside for permanent public open space. The building is set back approximately 14 feet from the Northwind Drive ROW. The freestanding sign is required to be at least 10 feet back from the Northwind Drive ROW. The proposed sign is not shown on the site plan so staff is unable to verify if the 10 foot setback has been met.

Sidewalks: Generally, sidewalks in a MUPUD must be a minimum of five feet in width. Seven foot wide sidewalks are required when a sidewalk is located immediately adjacent to an off-street parking area. The submitted site plan shows seven foot wide sidewalks connecting the parking lots to the building. A five foot wide sidewalk connecting Northwind Drive to the Cross Country trail along the Red Cedar River is proposed in the area east of the building.

Waiver requests

The MUPUD generally waives the standard requirements for lot size, setbacks, type and size of dwelling unit, lot frontage, number of required parking spaces, and impervious surface coverage, provided the purpose and intent of the ordinance are incorporated into the overall development plan. Based on the submitted site plan the applicant is requesting the following waivers for the Red Cedar Manor project.

Front yard setback

A 25 foot front yard setback from the street right-of-way (ROW) line is required along Northwind Drive. At its closest point the proposed building is located 13.99 feet from the Northwind Drive ROW. A waiver of 11.01 feet is requested for the front yard building setback.

Setback from residential zoning district

In the PO zoning district no structure is permitted within 50 feet of any residential district boundary line. The proposed building is located 19.47 feet from the RC (Multiple Family) property to the east. A waiver of 30.53 feet is requested for the setback from the residential zoning district boundary.

Parking lot setback

Where a parking area with a capacity of 50 or more vehicles adjoins a residential district a landscaped buffer at least 40 feet wide must be provided between the parking area and the adjoining property line. At its closest point the parking lot on the north side of the property is located 2.49 feet from the RCC zoning district line. A waiver of 37.51 feet is requested for the parking lot setback from a residential zoning district.

Parking

213 parking spaces are required for the project based on the number of residential units and commercial space in the building. 116 parking spaces are proposed by the applicant. A waiver of 97 parking spaces is requested.

Wetland setback

All structures and grading activities shall be setback at least 40 feet from the delineated boundary of a wetland. Grading activities related to the proposed detention pond appear to be within approximately 25 feet of the wetland. A waiver of 15 feet will be required for the grading within a wetland setback unless the applicant can provide information showing there will be no grading within the setback.

Planning Commission Options

The Planning Commission may recommend approval, approval with conditions, or denial of the proposed MUPUD. The Planning Commission is required to make a recommendation on the MUPUD within 60 days of the date of the public hearing. A resolution will be provided at a future meeting.

Attachments

1. Application and attachments.
2. Site plan prepared by Kebs, Inc. dated May 5, 2017 and received by the Township on April 25, 2018.
3. Architectural renderings, floor plans, building elevations, and sign plan prepared by ASL dated April 25, 2018 and received by the Township May 14, 2018.
4. Landscape plan prepared by Outdoor Living, Inc. dated February 28, 2018 and received by the Township on April 25, 2018.

G:\Community Planning & Development\Planning\MIXED USE PLANNED UNIT DEVELOPMENTS (MUPUD)\2018\MUPUD 18034 (Meridian Investment Group LLC) Red Cedar Manor\MUPUD 18034.pc1.docx

CHARTER TOWNSHIP OF MERIDIAN
DEPARTMENT OF COMMUNITY PLANNING AND DEVELOPMENT
5151 MARSH ROAD, OKEMOS, MI 48864
PHONE: (517) 853-4560, FAX: (517) 853-4095

MIXED USE PLANNED UNIT DEVELOPMENT APPLICATION

Before submitting this application for review, an applicant shall participate in the pre-application conference with the Director of Community Planning and Development to discuss the requirements for a Mixed Use Planned Unit Development.

Part I

A. Applicant MERIDIAN INVESTMENT GROUP, LLC - C/O ECKHARDT & ASSOCIATES
Address of Applicant 2875 NORTHWIND DR - STE 235, EAST LANSING, MI 48823
Telephone - Work 517-664-4114 E-Mail TOM@EC-ASSOC.COM Fax 517-664-4144
Interest in property (circle one): (Owner) Tenant Option Other _____
(Please attach a list of all persons with an ownership interest in the property.)

B. Site address / location / parcel number 2875 NORTHWIND DR - 33-02-02-20-128-003
Legal description (please attach if necessary) SEE ATTACHED
Current zoning P.O.
Project name RED CEDAR MANOR

C. Developer (if different than applicant) _____
Address _____
Telephone: Work _____ E-Mail _____ Fax _____

D. Architect, Engineer Planner or Surveyor responsible for design of project if different from applicant:
Name KEBS INC - JEFF KYES
Address 2116 HASLETT RD, HASLETT, MI 48840
Telephone(s) 517-339-1014 E-Mail JKYES@KEBS.COM Fax 517-339-8047

E. Acreage of all parcels in the project: Gross 4.891 Net 4.891

F Proposed Uses and Site Amenities:

1. Non-residential uses:
   a. Type OFFICE / RETAIL
   b. Percent of project area 1.5%
   c. Total square feet for non-residential uses 3,115 ft²
   d. Usable floor area 20,425
   e. Number of employees (TBD)
   f. Hours of operation (TBD) 8:00 AM - 9:00 PM

2. Residential Uses:
   a. Percent of project area 31.5%
   b. Total dwelling units 88
   c. Dwelling unit mix:
      i. Number of single family detached: for Rent ____ Condo ____
      ii. Number of duplexes: for Rent ____ Condo ____
      iii. Number of townhouses: for Rent ____ Condo ____
      iv. Number of garden style apartments: for Rent ____ Condo ____
      v. Number of other dwellings: for Rent 88 Condo ____
      (APARTMENTS)

APR 25 2018

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7. A schematic layout of the proposed storm sewer system.

8. ~~Architectural sketches~~ ELEVATIONS of all ~~elevation~~ SIDES of proposed buildings or structures, AND PROJECT ENTRANCES; NAME PROPOSED MATERIALS AND COLORS ~~including the project entrances, as they will appear upon completion~~. The ~~sketches~~ ELEVATIONS should be accompanied by material samples or a display board of the proposed exterior materials and colors.

9. Floor plans of ~~proposed~~ OF BOTH residential units AND NON-RESIDENTIAL SPACES.

10. A Traffic Study (if the project will exceed 100 vehicle trips during the peak hours of the roadway(s), prepared by a qualified traffic engineer, based on the most current edition of *Evaluating Traffic Impact Studies: A Recommended Practice for Michigan Communities*, published by the State Department of Transportation.

11. Natural Features Study for previously undeveloped properties which includes a written description of natural features proposed to be retained, removed, or modified. Natural features shall include, but are not limited to, wetlands, floodways, floodway fringe, waterbodies, significant stands of trees or individual trees greater than 12 inches dbh, identified groundwater vulnerable areas, slopes greater than 20 percent.

12. Preliminary engineering reports in accordance with the adopted Township water and sewer standards, together with a letter of review from the Township Engineer.

13. A sign program illustrating size and location of each proposed sign type.

~~14. A lighting plan (see Chapter 38, Article VII).~~

15. Copies of comments from reviewing agencies such as, but not limited to, the following:
    - Ingham County Road Commission
    - Ingham County Drain Commission
    - Michigan Department of Transportation (if applicable)
    - Michigan Department of Environmental Quality (if applicable)
    - The appropriate school board (as applicable)
    - ENVIRONMENTAL COMMISSION
    - FIRE DEPARTMENT

H. Any other information specified by the Director of Community Planning and Development which is deemed necessary to evaluate the application.

Part II

I (we) hereby grant permission for members of the Charter Township of Meridian's Boards and/or Commissions, Township staff member(s) and the Township's representatives or experts the right to enter onto the above described property (or as described in the attached information) in my (our) absence for the purpose of gathering information including but not limited to the taking and the use of photographs.

☒ Yes ☐ No (Please check one)

By the signature(s) attached hereto, I (we) certify that the information provided within this application and accompanying documentation is to the best of my (our) knowledge, true and accurate

April 23, 2018

MERIDIAN INVESTMENT GROUP, LLC — DATE

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4/16/18

Signature of Applicant

Date

BY: SCOTT A. CHAPPELLE, ITS: AUTHORIZED SIGNATORY

Type/Print Name

Fee: $990.00

Received by Walter Mendez

Date: 5-25-18

Pre-Application Meeting Held: _____ Date

Application Complete: _____ Date

By: _____ Staff

APR 25 2018

RED CEDAR MANOR

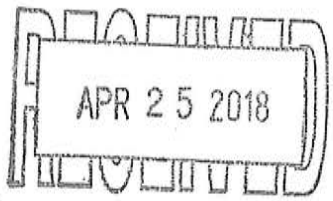
MIXED USE PLANNED UNIT DEVELOPMENT APPLICATION

Meridian Investment Group LLC

23-Apr-18

SUPPORT MATERIALS FOR MUPUD

1. Nonrefundable fee of $940.00 enclosed ($500 plus $5/DU)
2. Legal Description - Attached
3. Warranty Deed - Attached
4. Written Description of Project - Attached
5. Project Zoning - Attached
6. Site Plan - ~~20~~ 13 sets of 24"x36"drawings prepared by KEBS Inc are attached. An 11" x 17" set of drawings is attached as part of the application
7. Topographic Survey - Attached
8. Schematic layout of the proposed utilities - Attached
9. Architectural Sketches - 21 Sets of 11" x 17" color drawings prepared by ASL Architectural of the proposed building is attached.
10. Floor Plans of proposed units - Attached
11. Traffic Study - The trip generation comarison study completed by TEA is attached
12. Natural Features assessment - No Natural Features assessment is required as this is a "Redevelopment" of an existing site.
13. Wetland Verification - Attached
14. Preliminary layout of water and sanitary sewer - Attached
15. Proposed Sign Program - Attached
16. Lighting Plan - Attached
17. Copies of comments - None returned yet!



ECKHARDT & ASSOCIATES, P.C.

ATTORNEYS AT LAW

April 25, 2018

Mr. Mark Kieselbach
Director
Community Planning and Development
Meridian Charter Township
5151 Marsh Road
Okemos, Michigan 48864

RE: 2875 Northwind Drive
MUPUD and SUP Application

Mr. Kieselbach:

This office represents Meridian Investment Group LLC. I have enclosed completed applications and related fees requesting approval of a Mixed Use Planned Unit Development and a Special Use Permit for the above-referenced property. This proposed "redevelopment" contains 4.891 acres and will have 88 dwelling units and approximately 3,100 square feet of office/retail pace.

In addition, the following documents are enclosed: Legal Description, Warranty Deed, Trip generation comparison, Wetlands Verification, Environmental Permits Checklist, Health Impact Assessment, 21 sets of full-size scalable civil drawings and 21 sets of color 11" x 17" architectural drawings, along with a material sample board. A "Natural Features" assessment was not performed as this is a "redevelopment" of an existing developed site. A MDEQ permit application has been filed, for work being performed within the 100 year floodplain.

We understand that a Planning Commission, public hearing will be scheduled for Monday, May 21 at 7:00 p.m. concerning the requested applications.

Sincerely,

Eckhardt & Associates, PC

Thomas R. Eckhardt

Enclosures

2875 Northwind Drive, Suite 235
East Lansing, MI 48823

TELEPHONE:
(517) 336-6736
FACSIMILE:
(517) 336-4499

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Red Cedar Manor

Red Cedar Manor embodies the very best in an Urban/Traditional Development. The project will couple the principals of a redevelopment of a Traditional suburban office development with a redevelopment of a new Urbanism concept within a Traditional Neighborhood.

Urban/Traditional Neighborhood:

The goal of the Manor is not to simply create more residential housing but instead build a thriving residential neighborhood, which appeals to all generations of renters. The first floor of the mixed use building along Northwind Drive will contain roughly 3,115 of Retail and Office space, mostly occupied by Professionals or support for the tenants. The Manor has community transit, including footpaths, bike paths and easy access to municipal transportation. The bus stop at E Grand River Avenue (approx. ¼ mi north) allowing connections to MSU, East Lansing and areas to the east, while also being connected to over 70.6 miles of existing pathways. Thus allowing everyone to work, relax and play together.

Connectivity within the development to the hub will be one of the keys to instilling a sense of community. The project will provide 32 bicycle parking spaces, 18 of which will be covered.

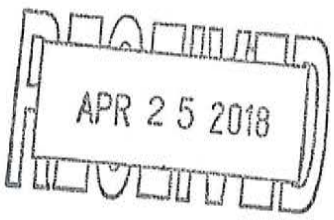
The Manor redevelopment will increased the existing "green" pervious space by about 5% to almost 62% of the site. This is an increase of green space in an Urban Neighborhood, where most developments barely provide 25%. The development will offer a wide array of unit types ranging from one (1) to two (2) bedrooms, each with their own bathroom with almost 40% having direct views to the Red Cedar River.

Unit Types:

Over 90% of the units will have balconies, providing a unique sense of open space while maintaining tenant privacy. Almost Seventy-five (75) % of the units will be one (1) bedroom – 1 bath apartments. The balance of the units will be a mix of one (1) bedroom units with a den and two (2) bedroom units, all with private baths. These unit types will appeal to a broad range of residents, including professionals and offer an upscale yet affordable alternative to existing rental units in the surrounding area.

Unit Finishes:

Residents will find the Manor is designed to feel warm and inviting while featuring a very urban up-scale, low maintenance exterior. The units will typically have faux wood floors in the den and kitchen areas, laminate tile in the baths and plush carpet flooring in the bedrooms. Residents will enjoy a gourmet kitchen with granite countertops and designer cabinets. All appliances, including range, dishwasher, refrigerator and microwave range hood will be Stainless steel and state of the art. Each unit will have a separate laundry area that will include a full size washer and dryer. All appurtenances will have a solid feel and weight about them while having a clean, streamlined urban look and design.



RED CEDAR MANOR

Redevelopment

Existing Construction -		40,504 sqft
New Construction -		
Retail/Office	3,115 GSF	
Mix-Use Apartments	67,098 GSF	
	TOTAL	70,213 GSF

Dwelling Unit Mix

Mix-Use Apartments		
Lower Level	12 units	8 (One Bedrooms) 1 (One Bedrooms + Den) 3 (Two Bedrooms) 15 Beds
First Floor	22 units	17 (One Bedrooms) 1 (One Bedrooms + Den) 4 (Two Bedrooms) 26 Beds
2nd Floor	27 units	20 (One Bedrooms) 1 (One Bedrooms + Den) 6 (Two Bedrooms) 33 Beds
3rd Floor	27 units	20 (One Bedrooms) 1 (One Bedrooms + Den) 6 (Two Bedrooms) 33 Beds
APARTMENT TOTALS	65 (One Bedrooms) 4 (One Bedrooms + Den) 19 (Two Bedrooms) 107 Beds 1.2 Ave # Beds/unit 762 Ave GSF/Unit 627 Ave GSF/Bed	

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4/16/18

April 4, 2018
Project No. 180564

Mr. Mark Kieselbach
Charter Township of Meridian
5151 Marsh Road
Okemos, MI 48864

Re: Wetland Verification and Regulatory Review – WDV 18-01
2875 Northwind Drive, East Lansing, MI

Dear Mark:

At the request of the Charter Township of Meridian (Township), FTCH's sub-consultant, Peterson Environmental (PE), has inspected the flagged boundaries at the referenced site. It should be noted that we are uncertain when Gary Marx of Marx Wetlands, LLC (Marx) delineated and flagged the wetland boundaries, as no delineation report was provided to the Township or FTCH for review.

On March 22, 2018, PE conducted the site inspection and determined wetland boundaries flagged by Marx directly west of the parking lot/end of Northwind Drive were accurate. In addition, PE identified and flagged additional wetland boundaries for the entire 1.46-acre wetland, which were not flagged by Marx, and do not exist within the assumed proposed project area outlined in gold on Figure 1. Additional information regarding PE's delineation can be found in the attached report.

We appreciate the opportunity to assist in the review of this file. If you have any questions or require additional information, please contact me at 517.887.4018 or clpitchford@ftch.com.

Sincerely,

FISHBECK, THOMPSON, CARR & HUBER, INC.

Cheryl Pitchford

Cheryl L. Pitchford

pmb
Attachments
By email

cc/att: Mr. Peter Menser – Meridian Township

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the northwest property line, then comes into the property up to the southeast in close proximity to the parking area or end of Northwind Drive. The flagged area along the river is predominately a steep slope down to the river with some narrow areas of adjacent wetlands. No other wetland areas were identified on the property.

The wetland investigation was conducted in accordance with the US Army Corps of Engineers (USACE) 1987 manual and USACE regional supplement. A completed Wetland Data Form for this wetland area is enclosed.

Site Investigation

On March 22, 2018, Peterson Environmental inspected the newly flagged, old wetland boundary flags and not flagged areas of the property. The wetland areas on the property were flagged, reflagged as appropriate, confirmed and located with GPS. The enclosed Figure 1 depicts the location of the confirmed wetland boundary on the property. The wetland is 1.46 acres in size. It is a floodplain, predominately forested with some areas of buttonbush wetland.

The following summarizes Peterson Environmental's findings:

Peterson Environmental verified the presence of dominant wetland vegetation, hydric soils, and wetland hydrology in the identified wetland at wetland sampling point SP-A, noted on Figure 1. The flags identifying this wetland are AB1-AB44 connected to A12-A27. Green Ash (Fraxinus pennsylvanica) - FACW, Eastern cottonwood (Populus deltoides) - FACW, buttonbush (Cephalanthus occidentalis) - OBL, Tartarian honeysuckle (Lonicera tatarica) - FAC were the dominant species observed and are typically found in wetland areas. The wetland was saturated to the surface and water was present in the soil pit at a depth of 2 inches, confirming the presence of wetland hydrology. A soil pit excavated at SP-A contained a loamy clay soil, Munsell Soil Color 10YR 2/1 from 0-18 inches, verifying the presence of hydric soil. Data obtained from SP-A is summarized in the Wetland Determination Data Form in Attachment 1. The wetland boundaries are depicted on Figure 1.



SP-A Wetland

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A Wetland Use Permit would be required from the Township for any of the following activities within wetland regulated by the Township:

- Placing fill or permitting the placement of fill in regulated wetland.
- Dredging, removing, or permitting the removal of soil or minerals from regulated wetland.
- Constructing, operating, or maintaining any use or development in regulated wetland.
- Draining surface water from regulated wetland.

In addition, the Township requires that all structures and grading activities during site development shall be set back 40 feet from the delineated wetland boundary and a natural vegetation strip shall be maintained within 20 feet of the wetland boundary. Wetland mitigation will be required for forested wetland impacts by creating new wetland at a 2 to 1 ratio (wetland created to wetland impacted).

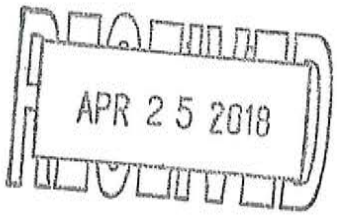
The property is also regulated by the MDEQ under Part 303 – Wetland Protection, Part 31 – Water Resources Protection (Floodplain) and Part 301 – Inland Lakes and Streams. A permit must also be obtained from the MDEQ prior to conducting most filling, dredging and/or draining activities or maintaining a use of a regulated wetland. A permit must also be obtained from the MDEQ for work, such as filling, dredging and structure placement within a stream or 100-year floodplain of a stream.

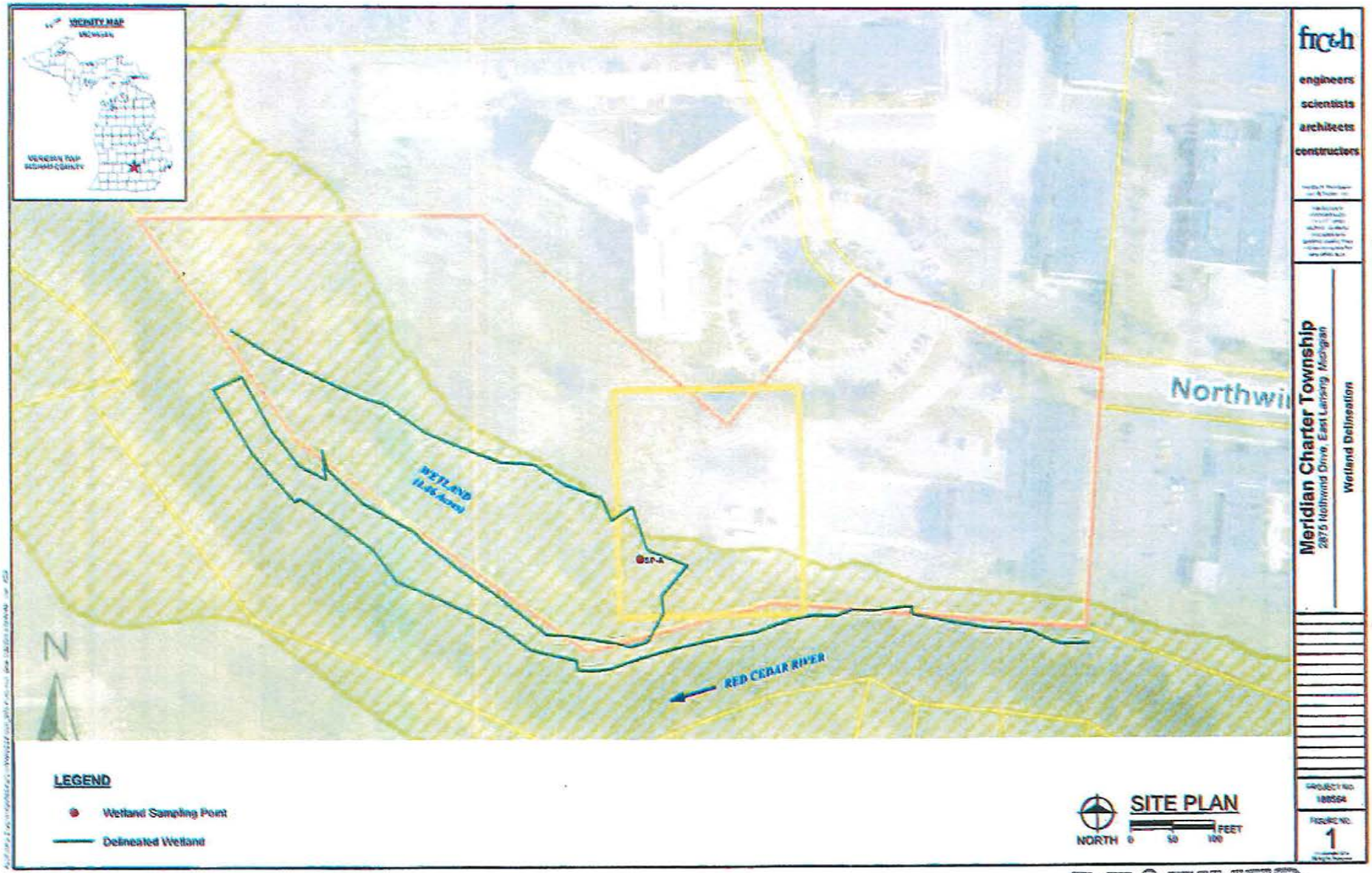
We appreciate the opportunity to assist in the review of this property. If you have any questions or require additional information, please contact me at 616.402.7592 or adrienne@petersonenviro.com.

Sincerely,

Peterson Environmental
Adrienne Peterson

Enclosures





fr&h
engineers
scientists
architects
constructors

Meridian Charter Township
2875 Hollwood Drive, East Lansing Michigan
Wetland Delineation

PROJECT NO.
188564

FIGURE NO.
1

APR 25 2018

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: WDV 18-01: 2875 Northwind Drive City/County: East Lansing, Ingham Sampling Date: 3/22/18

Applicant/Owner: Ron Calhoun State: MI Sampling Point: Wetland A

Investigator(s): Adrienne Peterson Section, Township, Range: 04, T1N, R20W

Landform (hillside, terrace, etc): Flat Local relief (concave, convex, none): none Slope %: 0-4

Subregion (LRR or MLRA): LRR L Lat: 42.72471 Long: -84.46823 Datum:

Soil Map Unit Name: Urban Land - Marlette complex, 2 to 12% slopes NWI classification: PF01C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)
Recent flooding and evaluation prior to the growing season made the site evaluation challenging

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- x High Water Table (A2)
- X Saturation (A3)
- x Water Marks (B1)
- x Sediment Deposits (B2)
- x Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- x Sparsely Vegetated Concave Surface (B8)
- x Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches): ____
Water Table Present?	Yes x	No ____	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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SOIL

Sampling Point Wetland A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- ___ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ___ High Chroma Sands (S11) (LRR K, L)
- ___ Loamy Mucky Mineral (F1) (LRR K, L)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (LRR K, L)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ___ Coast Prairie Redox (A16) (LRR K, L, R)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ___ Polyvalue Below Surface (S8) (LRR K, L)
- ___ Thin Dark Surface (S9) (LRR K, L)
- ___ Iron-Manganese Masses (F12) (LRR K, L, R)
- ___ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ___ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

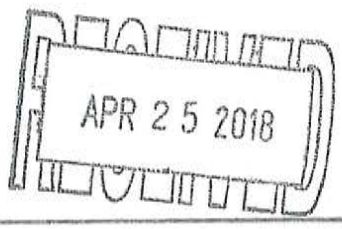
Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)



CHARTER TOWNSHIP OF MERIDIAN
ENVIRONMENTAL PERMITS CHECKLIST

Name: MERIDIAN INVESTMENT GROUP, LLC - C/O ECKHART AND ASSOCIATES
Mailing Address: 2875 NORTHWIND DR. STE 235, EAST LANSING, MI 48823
Telephone: 517-664-4114 **Fax:** 517-664-4104 **E-Mail:** TOM@EC-DEVCO.COM
Type of Business (if applicable): MIXED USE - HOUSING, OFFICE/RETAIL
Owner/Manager: SCOTT A. CHAPPELLE / AUTHORIZED SIGNATORY
Date: APRIL 16, 2018 **Signature:**

Circle (Y/N) the items that may pertain to your project or facility; then contact the office(s) listed to determine specific requirements. Return a copy of this checklist to the Department of Community Planning & Development as part of your project or development submittal – even if the approvals have not yet been obtained. This list includes the most common permits and approvals related to water and air quality, waste, and the environment. Other permits and approvals, including Township approvals may also be necessary.

1. (Y) N Will the project involve the discharge of any type of wastewater to a storm sewer, drain, lake, wetland, or other surface water? Contact: **MDEQ/Water Resources @ (517) 241-8993; MDEQ/Land & Water Features Programs @ (517) 373-9244; Meridian Township Dept. of Community Planning and Development @ (517) 853-4560.**

2. (Y) N Will the project involve any construction work, fill with any material, or soil disturbance in the 100-year floodplain? Contact: **MDEQ Land & Water Featured Programs @ (517)373-9244 and Meridian Township Dept. of Community Planning & Development @ (1517) 853-4560.**

3. Y (N) Will the project involve the direct or indirect discharge of waste, waste effluent, wastewater, pollutants, and/or cooling water into the groundwater or on the ground? Contact: **MDEQ/Groundwater Permits Program @ (517) 373-8148.**

4. Y (N) Will the project involve construction or alteration of any sewage collection or treatment facility? Contact: **MDNRE/Water Bureau @ (517) 335-4176.** For discharging to surface waters; Contact: **MDEQ/Water Resources @ (517) 241-1346.** For discharging to groundwater; Contact: **MDEQ/Groundwater Permits Program,@ (517) 373-8148.**

5. Y (N) Will the project or facility store or use chemicals, petroleum products, or salt? Depending on the type of substance, secondary containment and a Pollution Incident Prevention Plan (PIPP) may be required. Contact: **MDEQ/Water Resources, Part 5 Rules Program @ (517) 373-1623; Ingham County Health Department; Environmental Health Division @ (517) 887-4312; Meridian Township Fire Admin. @ (517) 853-4700.**

6. Y (N) Will the project involve the installation, operation, or removal of an underground or above ground storage tank containing a petroleum product or hazardous substance? Contact: **MDEQ/Storage Tank & Solid Waste Section @ (517) 335-7211 and Meridian Township Fire Administration @.(517) 853-4700.**

7. Y (N) Will the project involve liquefied petroleum gas storage tanks, container filling station, or a compressed natural gas dispensing station? Contact: **MDEQ/Storage Tank & Solid Waste Section @ (517) 335-2690.**

8. Y (N) Will the project involve the generation of hazardous waste or medical waste? Hazardous Waste Contact: **MDEQ/Waste & Hazardous Materials @ (517) 335-9875.** Medical Waste Contact: **MDEQ/Medical Waste Program @ (517) 335-1146.**

9. Y (N) Will the project involve the on-site treatment, storage, or disposal of hazardous waste? Contact: **MDEQ/Waste & Hazardous Materials @ (517) 335-2690.**

10. Y (N) Will the project involve the transport of hazardous waste or non-hazardous liquid industrial waste? Contact: **MDEQ/Waste & Hazardous Materials @ (517) 335-2690.**

11. Y (N) Will the project involve landfilling, transferring or processing solid non-hazardous wastes on site? Contact: **MDEQ/Waste & Hazardous Materials @ (517) 335-2690.**

12. Y (N) Will the project involve the installation, construction, reconstruction, relocation, or alteration of any process or process equipment (including air pollution control equipment) which could emit air contaminants, such as boilers, generators, and sandblasting. Contact: **MDEQ/Air Quality @ (517) 373-7023.**

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13. Y (N) Will the project or facility involve the storage, mixing, or distribution of pesticides or fertilizers in bulk quantities? Contact: **Michigan Department of Agriculture Rural Development/Region 6 Pesticide & Plant Pest Management @ (517) 335-1830.**

14. (Y) N Will the project involve a manmade change in the natural cover (land clearing) and/or topography of land, such as cut/fill activities that may contribute to soil erosion/sedimentation? Contact: **Meridian Township Dept. of Public Works & Engineering @ (517) 853-4440 and MDEQ/Land & Water Feature Programs @ (517) 373-9244.**

15. (Y) N Will the project involve any dredging, filling with any material, or construction in, across, under, or within 500 feet of a river, stream, creek, ditch, drain, lake, pond, swamp, or wetland(s)? Contact: **MDEQ/Land & Water Feature Programs @ (517) 373-9244 and Meridian Township Dept. of Community Planning & Development (517) 853-4560.**

16. Y (N) Will an on-site wastewater treatment system or septic system be installed?
For subsurface sanitary sewage disposal in quantities of 10,000 gallons per day or less: For any subsurface discharge or sanitary sewage in quantities equal to or greater than 10,000 gallons per day. Contact: **MDEQ/Resource Management @ (517) 335-4035.**

For subsurface disposal of sanitary sewage in quantities of 6,000 to 10,000 gallons per day: In addition to obtaining a construction permit from the Ingham County Health Department, submit a state wastewater discharge notification form. Flow monitoring and reporting are required. Contact: **MDEQ/Resource Management @ (517) 335-4035.**

For industrial or commercial wastewater (other than sanitary sewage) in any quantity. Contact: **MDEQ/Waste & Hazardous Materials @ (517) 335-2690.**

17. (Y) N Will the project involve construction of a water supply well or extension of a water supply service from an existing water system? Contact: **MDEQ/Water Bureau @ (517) 335-6127 and Ingham County Health Dept./Environmental Health @ (517) 887-4312.**

18. Y (N) Are there out-of-service water wells, abandoned water wells, or cisterns on the site? (drinking water, irrigation & monitoring wells). Contact: **MDEQ/Water Bureau @ (517) 241-1377; Ingham County Health Dept./Environmental Health @ (517) 887-4312; and Meridian Township Department of Community Planning & Development @ (517) 853-4560.**

19. Y (N) Will the project involve a subdivision or site condominium project utilizing individual on-site subsurface disposal systems or individual wells? Contact: **Ingham County Health Dept./Environmental Health @ (517) 887-4312.**

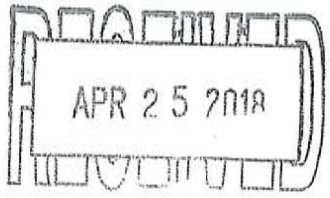
20. Y (N) Will the project involve the on-site storage of sanitary sewage prior to transport and disposal off-site (pump and haul)? Contact: **MDEQ/Resource Management @ (517) 335-4035.**

21. Y (N) Has the site/facility ever been subject to a remedial action, limited closure, or other environmental cleanup response under Part 201, Natural Resources and Environmental Protection Act (NREPA)? Is the property currently subject to a response action? Has a Baseline Environmental Assessment (BEA) been completed for the property? Contact: **MDEQ/Remediation & Redevelopment @ (517) 373-8815 and/or MDEQ/Waste & Hazardous Materials @ (517) 335-9837.**

22. Y (N) Will the project involve the installation of a seawall or bulkhead? Contact: **MDEQ/Land & Water Feature Programs @ (517) 373-9244 and Meridian Township Dept. of Community Planning & Development @ (517) 853-4560.**

Notes:

- **For assistance with permits and approvals from the Michigan Department of Environmental Quality (MDEQ), including coordination among MDEQ divisions, contact the Office of Environmental Assistance at (517) 373-9244 or (800) 662-9278.**
- **For Spill/Release reporting to the MDEQ, call (517) 373-8481.**
- **For pollution emergencies, call the MDEQ at (800) 292-4706 in Michigan and (517) 373-7660 outside of Michigan.**



4/16/18

CHARTER TOWNSHIP OF MERIDIAN
HEALTH IMPACT ASSESSMENT

Please circle the appropriate answer and provide written responses to each applicable question. For those questions which are not applicable, please indicate so on the form. Attach additional sheets if more space is needed to respond.
Please submit the completed form with your application – **incomplete/illegible forms will be returned.**

Person Completing this form: R. CALHOUN **Phone #** 614-416-8074 **Email address:** RONCOC-DEV CO.COM
Project name: RED CEDAR MANOR **Address/location:** 2875 NORTHWIND **Case #** _____
Type of project (circle each applicable): Residential X **Commercial** X **Office** __ **Industrial** __ **Mixed** __ **Public**

Water Quality

Y (N) Does the project require access to public water and sewer?
If NO, what is the source of water for the proposed project or development? MERIDIAN TWP - PUBLIC
What is the estimated daily water demand?) _____

N/A (Y) N If public water is required, is there available capacity to handle this project in the municipal facilities?
(Y) N Is the project/development within existing municipal service areas?
N/A Y N If a private well will be used, is the water considered potable (safe)?
N/A Y N Will the water supply require on-site treatment, such as iron removal?
N/A Y N Are there nearby sources of potential water contamination?
Y (N) Are there underground storage tanks within 1000 feet (or distance specified by local ordinance) of the project?
Y (N) Are there gasoline or oil pipelines?
Y (N) Is there a nearby known source of contaminated soil?
Y (N) Is site located within a wellhead protection zone?
Y (N) Are there abandoned wells on the site?
(Y) N Are there any wetlands on the site? If YES what is/are the size(s) of the wetland(s)? 1.73 AC
(Y) N Is the project located in a known floodplain?
Y (N) Will the project create bodies (e.g., detention ponds) of water that might provide habitat for mosquitoes?
(Y) N Has a plan been submitted based on best management practices for managing water/soil erosion during construction?
Y (N) Will the proposed project affect groundwater recharge?
Y (N) Does the project have a substantial percentage of the parcel covered by impervious (e.g., hard) surfaces? 38.05 %
(Y) N Does the project affect the overall percentage of impervious surfaces in the watershed or allowed by local community?
DECREASE FROM EXISTING

Wastewater

Y (N) Does the project/development require an on-site wastewater system?
N/A Y N Are the soils appropriate to support a septic system?
Y (N) Will any animal waste from household pets or domestic animals generated by the development be disposed of safely?
(Y) N Is project/development within the service area of the municipal sewage system?
N/A (Y) N Does the municipal sewage system have sufficient capacity to service the development?

Air Quality

(Y) N Does the project/development entail demolition activities?
(Y) N If YES, has the presence of asbestos and lead been determined?
(Y) N Are there plans for mitigating dust?
Y (N) Will the project/development result in increased stationary air emissions?
N/A Y N If YES, have the necessary permits been obtained?
Y (N) Will the project result in increased mobile-source air emissions, not including automobiles?
Y (N) Will the project result in increased air emissions from automobiles?
Y (N) Has the project accommodated public transit (e.g., bus stops) in its design?
(Y) N Is the proposed use compatible with adjacent uses?
Y (N) Is the site near known areas affected by radon?
Y (N) Are nonmotorized transportation options available for those who do not own or do not want to use their cars?
Y (N) Do anticipated emissions include controlled contaminants (e.g., VOCs, mercury)?

RECEIVED
APR 25 2018

Solid & Hazardous Waste Disposal

Y (N) Is the proposed project or development located near any facility handling or disposing of hazardous waste?
Y (N) Is there historic evidence of solid or hazardous waste disposal or releases on or adjacent to the site?
Y (N) Are there plans in place to prevent the release of hazardous materials into the environment in emergencies?

4/16/18

CHARTER TOWNSHIP OF MERIDIAN
HEALTH IMPACT ASSESSMENT

Please circle the appropriate answer and provide written responses to each applicable question. For those questions which are not applicable, please indicate so on the form. Attach additional sheets if more space is needed to respond. Please submit the completed form with your application – **incomplete/illegible forms will be returned.**

Y (N) Does the project entail hazardous waste disposal?
N/A Y N If YES, is the proposed waste handling or disposal activity compatible with adjacent land use and/or zoning?
Y (N) Is the proposed waste handling or disposal activity compatible with the Ingham County Solid Waste Management Plan?
Y (N) Is the facility near vulnerable uses (e.g. nursing homes) that may require contingency planning for emergencies?
(Y) N Does the project provide on-site recycling compatible with the Ingham County Solid Waste Management Plan?

Noise

Y (N) Is the project/development likely to generate noises that will create a nuisance to neighboring uses?
Y (N) Are there engineered or non-engineered measures that can be employed to mitigate nuisance noises?
Y (N) Does the generated noise violate the noise ordinance?

Social Capital

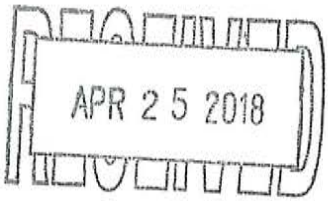
(Y) N Does the project/development promote interaction between neighbors?
(Y) N Is the physical design of the project harmonious with the overall neighborhood?

Physical Activity & Injury Prevention

(Y) N Does the project/development provide mobility options for those who cannot drive?
(Y) N Does the project have sidewalks that lead to local destinations?
(Y) N Does the project have or connect to a trail system for walking or biking?
(Y) N Does the width of the sidewalk meet walkability standards?
What is the proposed width of the sidewalks? 5'-0"
(Y) N Does the project provide adequate open space and recreational facilities for the new residents?
Y (N) Does this public open space provide trails for walking?
(Y) N Does this project provide bike racks for safely storing bicycles?
(Y) N Does the project/development contain elements that enhance the feeling of neighborhood safety?
EXISTING N Are local streetlights being provided?
(Y) N Are dwellings oriented toward the street to provide "eyes on the street"?
(Y) N Can a child walk safely to school?
What is the distance to area schools? 1-MI WEST
Y (N) Does the route to school contain known dangerous intersections?
Y (N) Are there crossing guards at these intersections?
(Y) N Is visibility good? Can drivers see (short) children?
Y (N) Will the project/development contain a significant elderly population?
(Y) N Can the elderly walk to important destinations (e.g., the post office, bank, library)?
(Y) N Does the project contain design elements to calm traffic?
Y (N) Are there: street trees, speed humps, extended corners, raised street crossings?
Y (N) For projects with side-streets, does the plan include pedestrian crossing signals and mid-street islands?
Y (N) Does the project present unsafe conditions or deter access and free mobility for the physically handicapped?
(Y) N Is public transportation available?
Where is the nearest public transport stop? 1/4 MI - NORTH
(Y) N Is the bus stop protected from the elements?
(Y) N Is the proposed project located within easy range of fire fighting facilities?

Health Equity & Food Systems

(Y) N Does the project provide for a diversity of housing types to accommodate a variety of income groups?
(Y) N Does this price represent an "affordable house" given the area median income?
(Y) N Is the proposed project/development located in an area that provides easy access to healthy foods?
What is the distance to the nearest full service grocery store? ADJOINING
What is the distance to the nearest convenience store? ADJOINING
Y (N) Does the neighborhood have a disproportionate number of liquor/party stores?



4/16/18

CHARTER TOWNSHIP OF MERIDIAN
HEALTH IMPACT ASSESSMENT

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Y (N) Does the neighborhood have a disproportionate number of food-serving establishments that serve alcohol?
Y (N) Is the project/development located in a neighborhood or region characterized by concentrated poverty?
Y (N) Are area residents involved in the planning process?
Y (N) Are disadvantaged populations at greater risk of exposure to environmental hazards?
Y (N) Is the project located in a neighborhood or region characterized by disproportionately negative health characteristics?

Growth Objectives

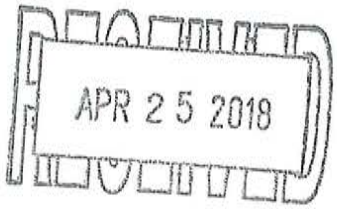
Y (N) Is the project located within the designated growth area of the Tri-County Regional Growth Project?
(Y) N Could the project be developed on already urbanized land with pre-existing infrastructure and urban services?
Y (N) Does the project take place on agricultural land characterized by superior / very productive soils?
Y (N) Is the project site on state-defined unique or important soils?
Y (N) Will the project involve any man-made change in the natural cover or topography of the land?
N/A Y N If yes, have proper permits and approvals been obtained?
Y (N) Is the project located near active farms that employ common agricultural practices such as spreading manure on fields?
Y (N) Could the project, if approved, potentially result in incompatible uses or interfere with current farming activity?

Ecological Value

Y (N) Is the project/development likely to adversely affect a state or federally protected species of wildlife or vegetation?
Y (N) Does the location contain potential habitat for a protected species/ecosystems of local, regional, or state importance?

If you have questions or are unsure how to respond to any of the questions, please feel free to contact the Meridian Township Department of Community Planning & Development at 517-853-4560. Incomplete and/or illegible forms will be returned to the applicant.

Revision date: June 2015



4/16/18

Traffic Engineering Associates, Inc.
517/627-6028 FAX: 517/627-6040
PO Box 100
Saranac, Michigan 48881

Scott Chappelle
Meridian Investment Group, LLC
2875 Northwind Drive, Suite 235
East Lansing, MI 48823

April 17, 2018

Dear Mr. Chappelle:

Traffic Engineering Associates, Inc. (TEA) conducted a trip generation comparison for the proposed development for the Red Cedar Manor Development in the Meridian Charter Township, Ingham County, Michigan.

PROJECT DESCRIPTION

Currently, there is an existing three (3) story office building with 36,257 square feet of space on the site. This will be razed and a three (3) story apartment building will be built with 88 apartment units and a 3,115 square foot gym that is expected to be open to the public.

TRAFFIC ANALYSIS

Existing Use
For this analysis, trip generation rates were derived from the ITE TRIP GENERATION MANUAL (10th edition). The ITE trip generation rates for General Office Building (Land Use Code 710) were selected as representing the existing 36,257 square feet of office space. The ITE description of General Office Building is as follows:

A general office building houses multiple tenants; it is a location where affairs of businesses, commercial or industrial organizations, or professional persons or firms are conducted. An office building or buildings may contain a mixture of tenants including professional services, insurance companies, investment brokers, and tenant services, such as a bank or savings and loan institution, a restaurant, or cafeteria and service retail facilities.

It is projected that the existing land use generated 61 vehicle trips during the AM peak hour, 43 vehicle trips during the PM peak hour, and a weekday total of 397 vehicle trips.

Existing Vehicle Trips

Description	Size	AM Peak Hour			PM Peak Hour			Weekday
		In	Out	Total	In	Out	Total	
General Office Building (Land Use Code 710)	36,257 Sq. Ft.	52	9	61	7	36	43	397

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Proposed Use

For the proposed use, the ITE trip generation rates for Multifamily Housing (Mid-Rise) (Land Use Code 221), were selected as representing the proposed 88 unit apartment building. The ITE description of Multifamily Housing (Mid-Rise) is as follows:

Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and 10 levels (floors).

The ITE trip generation rates for Health/Fitness Club (Land Use Code 492) were selected as representing the proposed 3,115 square foot gym. The ITE description of Health/Fitness Club is as follows:

A health/fitness club is a privately-owned facility that primarily focuses on individual fitness or training. It typically provides exercise classes; weightlifting, fitness and gymnastics equipment; spas; locker rooms; and small restaurants or snack bars. This land use may also include ancillary facilities, such as swimming pools, whirlpools, saunas, tennis, racquetball and handball courts, and limited retail. These facilities are membership clubs that may allow access to the general public for a fee.

The ITE Trip Generation Manual does not provide weekday trip generation rates for Health/Fitness Club. It is projected that the proposed site will generate 36 vehicle trips during the AM peak hour and 64 vehicle trips during the PM peak hour, and 478 weekday trips.

Proposed Vehicle Trips

Description	Size	AM Peak Hour			PM Peak Hour			Weekday
		In	Out	Total	In	Out	Total	
Multifamily Housing (Mid-Rise) (Land Use Code 221)	88 Units	8	24	32	24	15	39	478
Health/Fitness Club (Land Use Code 492)	3,115 sq. ft.	2	2	4	14	11	25	N/A
Total		**10**	**26**	**36**	**38**	**26**	**64**	**478**

COMPARISON

A comparison of the existing site traffic versus the proposed redevelopment site traffic shows that the proposed redevelopment is expected to generate 25 less vehicle trips in the AM peak hour, 21 more vehicle trips in the PM peak hour and add 81 trips over a 24 hour period.

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Comparison Vehicle Trips

Description	AM Peak Hour			PM Peak Hour			Weekday
	In	Out	Total	In	Out	Total	
Existing Land Use	52	9	61	7	36	43	397
Proposed Land Use	10	26	36	38	26	64	478
Total	**-42**	**17**	**-25**	**31**	**-10**	**21**	**81**

FINDINGS

In accordance with the Meridian Charter Township standards, a traffic impact assessment is required when the proposed development will generate 50 to 99 directional trips during a peak hour of traffic; or, a traffic impact statement is required if the proposed development will generate 100 directional trips or more during a peak hour of traffic, or over 750 trips on an average day.

The results of the comparison between the existing site and the proposed site show that there will be a decrease in the AM peak hour vehicle trips to the proposed redevelopment and a small increase in the PM peak hour and weekday 24-hour vehicle trips. The comparison shows that the threshold for either a traffic assessment or a traffic impact study is not met.

If you have any questions, please write or call.

Sincerely,

David J. Sonnenberg, PE

APR 25 2018

APR 25 2018

CLIENT:

MERIDIAN INVESTMENT GROUP, LLC
5000 NORTHWOOD DR.
E. LANSING, MI. 48823
PH: (517) 664-4111
FAX: (517) 664-4151

ENGINEER/SURVEYOR:

KEBS, Inc.
2116 HASLETT RD.
HASLETT, MI. 48840
PH: (517) 339-1014
FAX: (517) 339-8047

M.U.P.U.D. & S.U.P. PLAN FOR:

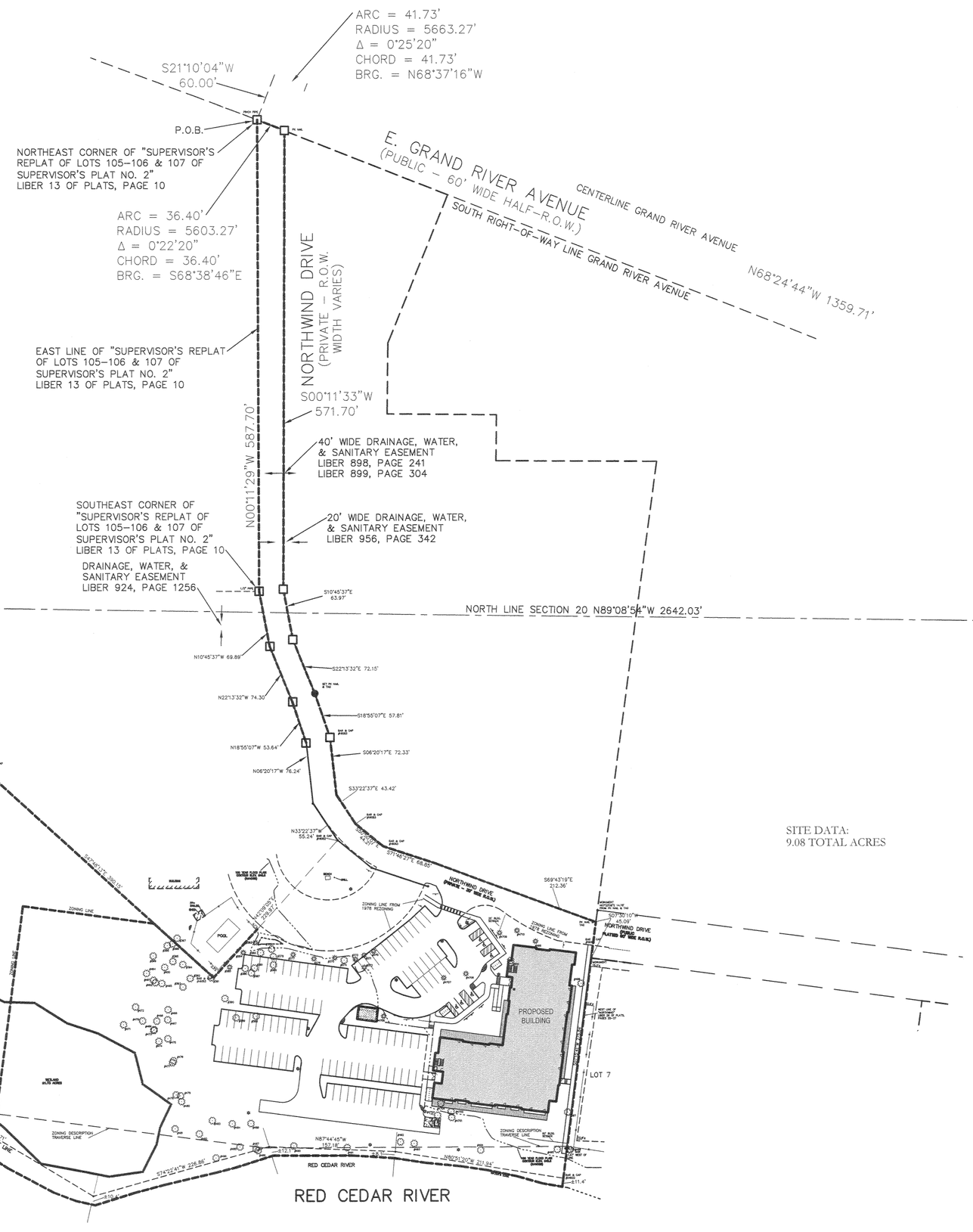
Red Cedar Manor

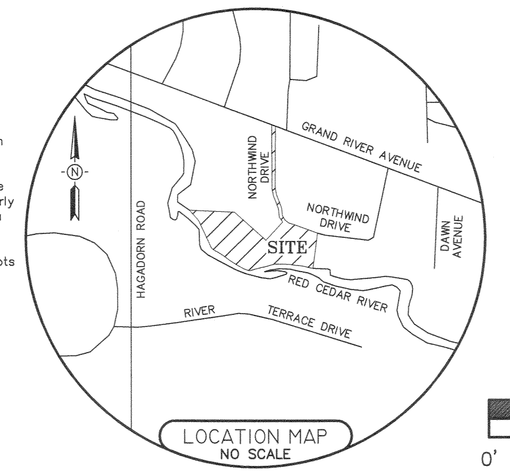
MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

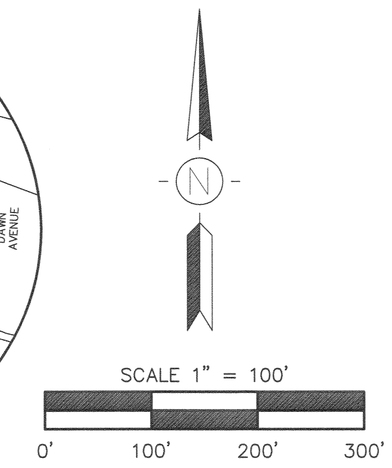
LEGAL DESCRIPTION:

AS SURVEYED:
(The following legal description describes the same parcel of land as the provided description)

A parcel of land in the Southwest 1/4 of Section 17, and the Northwest 1/4 of Section 20, T4N, R1W, Meridian Township, Ingham County, Michigan, the surveyed boundary of said parcel described as: Commencing at the South 1/4 corner of said Section 17; thence N00°11'57"W along the North–South 1/4 line of said Section 17 a distance of 174.04 feet to the centerline of Grand River Avenue; thence N68°24'44"W along said centerline 1359.71 feet; thence Northwesterly 41.73 feet along said centerline and a curve to the left, said curve having a radius of 5663.27 feet, a delta angle of 0°25'20", and a chord of 41.73 feet bearing N68°37'16"W; thence S21°10'04"W perpendicular to said centerline 60.00 feet to the Northeast corner of Supervisor's Replat of Lots 105–106 & 107 of Supervisor's Plat No. 2, Meridian Township, Ingham County, Michigan, as recorded in Liber 13 of Plats, Page 10, Ingham County Records, and the Southerly right–of–way line of Grand River Avenue, and the point of beginning of this description; thence Southeasterly 36.40 feet along said Southerly right–of–way line and a curve to the right, said curve having a radius of 5603.27 feet, a delta angle of 0°22'20", and a chord of 36.40 feet bearing S68°38'46"E to the Easterly line of private Northwind Drive; thence along the Easterly and Northerly lines of said Northwind Drive the following nine courses: S00°11'33"W 571.70 feet, S10°45'37"E 63.97 feet, S22°13'32"E 72.15 feet, S18°55'07"E 57.81 feet, S06°20'17"E 72.33 feet, S03°22'37"E 43.42 feet, S05°50'07"E 44.21 feet, S71°46'27"E 68.85 feet, and S89°43'19"E 212.36 feet to the Westerly line of plat of Northwind, Meridian Township, Ingham County, Michigan, as recorded in Liber 26 of plats, Pages 25–27, Ingham County, Michigan, Records; thence S07°30'10"W along said Westerly line 45.09 feet to the Northwest corner of Lot 7 of said plat of Northwind; thence S07°15'41"W along the West line of said Lot 7 a distance of 275.84 feet to a point on an intermediate traverse line, said point being N07°15'41"E ±11.4 feet from the water's edge of Red Cedar River; thence along said traverse line the following six courses: N80°51'20"W 211.94 feet, N87°44'45"W 157.18 feet, S74°22'41"W 226.86 feet, N59°06'41"W 401.71 feet, N24°40'04"W 281.37 feet, and N36°02'10"W 86.12 feet to a point N89°39'16"E ±10.0 feet from said water's edge of Red Cedar River; thence N89°39'16"E 373.62 feet; thence S47°48'13"E 390.15 feet; thence N42°09'05"E 229.97 feet; to the Westerly line of said Northwind Drive; thence along the Westerly line of said Northwind Drive the following five courses: N33°22'37"W 55.24 feet, N06°20'17"W 76.24 feet, N18°55'07"W 53.64 feet, N22°13'32"W 74.30 feet, and N10°45'37"W 69.89 feet to the Southeast corner of said Supervisor's Replat of Lots 105–106 & 107 of Supervisor's Plat No. 2; thence N00°11'29"W along the East line of said Supervisor's Replat of Lots 105–106 & 107 of Supervisor's Plat No. 2 a distance of 587.70 feet to the point of beginning of this description; said parcel containing 9.08 acres more or less within said traverse line, and also including all lands lying between said traverse line and Red Cedar River; said parcel subject to all easements and restrictions if any.









WAIVER REQUESTS

SECTION	REQUIREMENT	REASON	WAIVER REQUESTED	EXISTING
86–432 (d)(3)(c)	BLDG. 50' FROM RESIDENTIAL ZONED PROPERTY	PROP. BLDG SETBACK 19.47'	30.53' WAIVER	20.00' EXISTING BLDG SETBACK
86–755	236 PARKING SPACES REQUIRED NOTE: 36 SPACES OWNED OFF SITE	116 ONSITE SPACES 152 TOTAL SPACES	120 SPACE WAIVER 84 SPACE WAIVER	98 SPACES ON SITE 134 TOTAL EXISTING SPACES
86–756 (10)	40' PARKING SETBACK FROM RESIDENTIAL ZONED PROPERTY	PROP. PARKING SETBACK 2.49'	37.51' WAIVER	9.09' EXISTING SETBACK
86–367	25' FRONT YARD BUILDING SETBACK	PROP. BUILDING SETBACK 13.99'	11.01' WAIVER	31.94' EXISTING SETBACK

SITE ZONED RCC & P.O.

P.O. ZONED AREA 4.99 ACRES

ONLY P.O. ZONED PROPERTY IN MUPUD REQUEST

REQUIRED BUILDING SETBACK P.O.
50' FROM RESIDENTIAL DISTRICT

PROPOSED BUILDING SETBACKS
FROM RESIDENTIAL DISTRICT 19.47' - 30.53" WAIVER REQUIRED

REQUIRED PARKING SETBACKS
40' FROM RESIDENTIAL DISTRICT
15' FROM ALL OTHER SIDES

PROPOSED PARKING SETBACK
FROM RESIDENTIAL DISTRICT 8.73' - 31.27' WAIVER REQUIRED

MAXIMUM ALLOWABLE IMPERVIOUS AREA 75%
TOTAL PROPOSED IMPERVIOUS AREA 37.84 %

BLULIDING INFO (MIXED USE)

3,115 G.S.F. COMMERCIAL/OFFICE
17,310 G.S.F. RESIDENTIAL FIRST FLOOR
8,938 G.S.F. RESIDENTIAL LOWER LEVEL
20,425 G.S.F. RESIDENTIAL SECOND FLOOR
20,425 G.S.F. RESIDENTIAL THIRD FLOOR
70,213 G.S.F. TOTAL FLOOR AREA
88 UNITS
(69) 1 BR
(19) 2 BR
107 BEDS TOTAL

OVERALL PROPOSED DENSITY
88 UNITS/4.99 ACRS = 17.64 UNITS ACRE

SITE DATA:
9.08 TOTAL ACRES

PROPOSED OPENSPACE
TOTAL PROPERTY = 217,283 S.F. (± 4.99 AC.)
TOTAL PERVIOUS AREA = 135,059 SF = 62.16%
TOTAL IMPERVIOUS = 82,224 SF = 37.84%

EXISTING OPENSPACE
TOTAL PROPERTY = 217,283 S.F. (± 4.99 AC.)
TOTAL PERVIOUS AREA = 128,543 SF = 59.16%
TOTAL IMPERVIOUS = 88,740 SF = 40.84%

LEGEND

W	EXT. WATER MAIN
SAN	EXT. SANITARY SEWER
ST	EXT. STORM SEWER
000.0	EXT. ELEVATIONS
W	PROPOSED WATER MAIN
SAN	PROPOSED SANITARY SEWER
ST	PROPOSED STORM SEWER
	MANHOLE (NEW)
	PROPOSED C.B.
	MANHOLE (EX.)
	UTILITY EASEMENT
	CENTER LINE OF ROAD
	ROAD RIGHT OF WAY
	PROPERTY LINE
	FIRE HYDRANT
	WATER VALVE
	THRUST BLOCK
▲T/C 800.00	PROPOSED TOP OF CURB ELEV.

LEGEND

- ● = SET 1/2" BAR WITH CAP
- □ = FOUND ILLEGIBLE OR UNMARKED BAR & CAP UNLESS NOTED
- ——— = DEED LINE
- ——\——— = DISTANCE NOT TO SCALE



BENCHMARKS

BENCHMARK #1 ELEV. = 850.21 (NAVD88)
SOUTH FLANGE BOLT, UNDER "M" IN "MADE IN USA", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, ACROSS FROM ENTRANCE DRIVE TO #2875 NORTHWIND DRIVE.

BENCHMARK #2 ELEV. = 852.56 (NAVD88)
NORTH FLANGE BOLT, UNDER "6" IN "1962", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, 70' NORTH AND 25' EAST OF NORTHEAST CORNER OF #2875 NORTHWIND DRIVE.

SITE ADDRESS:
2875 NORTHWIND DRIVE
EAST LANSING, MI 48823

TAX IDENTIFICATION #.
(2875) 33–02–02–20–128–003
NORTHWIND DRIVE PARCEL:
33–02–02–20–126–003

SHEET INDEX

1. COVERSHEET/OVERALL PLAN
2. SITE & UTILITY PLAN
3. GRADING & FLOODPLAIN PLAN
4. EX. PERVIOUS/IMPERVIOUS PLAN
5. PROP. PERVIOUS/IMPERVIOUS PLAN
6. AMENITIES PLAN
7. EXISTING FEATURES PLAN

E–90403–MUPUD–SUP
90403.BND

REVISIONS
3–9–18 MUPUD & SUP SUBMITTAL

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517–339–1014 FAX. 517–339–8047
Marshall Office
Ph. 269–781–9800

Red Cedar Manor
OVERALL/COVER SHEET

SCALE: 1"= 100'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 5–5–17	PROJECT MGR. JWK	SHEET 1 OF 7
AUTHORIZED BY: MERIDIAN INVESTMENT GROUP, LLC		JOB #: 90403

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M.U.P.U.D. & S.U.P. PLAN FOR:

Red Cedar Manor

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

CLIENT:
MERIDIAN INVESTMENT GROUP, LLC
5000 NORTHWOOD DR.
E. LANSING, MI. 48823
PH:(517) 664-4111
FAX:(517) 664-4151

ENGINEER/SURVEYOR:
KEBS, Inc.
2116 HASLETT RD.
HASLETT, MI. 48840
PH:(517) 339-1014
FAX:(517) 339-8047

BUILDING COVERAGE:

TOTAL BLDG. COVERAGE = 20,716
S.F. =9.53%

PARKING REQUIRED
COMMERCIAL 3,115/1000 x 5 =
16 SPACES
RESIDENTIAL 88 x 2 = 176
SPACES
PLUS 25% = 176 x .25 = 44
SPACES

TOTAL PARKING REQUIRED 236
SPACES
BEFORE ALLOWABLE REDUCTIONS

PARKING DATA:

TOTAL PARKING PROVIDED ON SITE 110 STANDARD
110 STANDARD
6 BARRIER FREE
116 SPACES ON SITE
36 SPACES OWNED OFF SITE
152 SPACES TOTAL PROPOSED

BIKE PARKING REQUIRED = 24 SPACES
28 OPEN SPACES PROPOSED
36 COVERED SPACES PROPOSED
64 TOTAL SPACES PROPOSED

SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 839.94
12" HDPE N INV. = 832.84
12" HDPE NE INV. = 831.57
12" HDPE SW INV. = 831.52

STORM MANHOLE #101
RIM ELEV. = 840.53
12" RCP N INV. = 831.23
18" RCP NE INV. = 831.29
12" RCP SE INV. = 831.37
18" RCP SW INV. = 831.11

STORM MANHOLE #102
RIM ELEV. = 833.14
18" RCP NE INV. = 829.44
18" RCP SW INV. = 829.34

SANITARY MANHOLE #200
RIM ELEV. = 848.48
4" PVC E INV. = 845.18
4" PVC SE INV. = 845.10
6" PVC NW INV. = 845.07

SANITARY MANHOLE #201
RIM ELEV. = 844.44
6" RCP SE INV. = 834.33
6" RCP NW INV. = 834.31

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

EX. LEGEND

- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- 860 = EXISTING SPOT ELEVATION
- 860 = EXISTING CONTOUR ELEVATION
- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
- = CATCHBASIN
- = SANITARY CLEANOUT
- = FIRE HYDRANT
- = VALVE
- = UTILITY POLE
- = LIGHT POLE
- = GUY POLE
- = GUY WIRE
- = UTILITY PEDESTAL
- = TRANSFORMER
- = HANDHOLE
- = ELECTRIC METER
- = GAS METER
- = WATER METER
- = GAS LINE
- = UNDERGROUND TELEPHONE
- = UNDERGROUND TELEVISION
- = UNDERGROUND ELECTRIC
- = OVERHEAD WIRES
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH
- = SIGN
- = POST
- = AIR CONDITIONING UNIT



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

BENCHMARKS

BENCHMARK #1 ELEV. = 850.21 (NAVD88)
SOUTH FLANGE BOLT, UNDER "M" IN "MADE IN USA", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, ACROSS FROM ENTRANCE DRIVE TO #2875 NORTHWIND DRIVE.

BENCHMARK #2 ELEV. = 852.56 (NAVD88)
NORTH FLANGE BOLT, UNDER "6" IN "1962", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, 70' NORTH AND 25' EAST OF NORTHEAST CORNER OF #2875 NORTHWIND DRIVE.

LEGEND

- EXT. CONTOURS
- EXT. WATER MAIN
- EXT. SANITARY SEWER
- EXT. STORM SEWER
- EXT. ELEVATIONS
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

NOTE: PROPOSED WATER & SANITARY SEWER SHALL BE WITHIN A 20' EASEMENT

PROPOSED SA#1
T/CAS 847.50
I.E. 8" NW 835.63

[1] DENOTES NUMBER OF B/F SPACES
(VA) DENOTES VAN ACCESS B/F SPACES
(0) DENOTES PROPOSED NUMBER OF 9' x 20' PARKING SPACES
(0) DENOTES PROPOSED NUMBER OF 10' x 18' PARKING SPACES

SCALE 1" = 30'
0' 30' 60' 90'

REVISIONS
3-9-18 MUPUD & SUP SUBMITTAL

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Marshall Office
Ph. 269-781-9800

Red Cedar Manor
SITE & UTILITY PLAN

SCALE: 1"= 30'	DESIGNER: JWK	APPROVED BY: JWK	
DATE: 5-5-17	PROJECT MGR. JWK	SHEET 2 OF 7	
AUTHORIZED BY: MERIDIAN INVESTMENT GROUP, LLC		JOB #: 90403	

E-90403-MUPUD-SUP
SURVEY# 90403.BND

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M.U.P.U.D. & S.U.P. PLAN FOR:

Red Cedar Manor

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

SCALE 1" = 30'

0' 30' 60' 90'

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18" RCP NE INV. = 829.44
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4" PVC SE INV. = 845.10
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- = FOUND IRON AS NOTED
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- +8800 = EXISTING SPOT ELEVATION
- 850 = EXISTING CONTOUR ELEVATION
- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
- = CATCHBASIN
- = SANITARY CLEANOUT
- = FIRE HYDRANT
- = VALVE
- = UTILITY POLE
- = LIGHT POLE
- = GUY POLE
- = GUY WIRE
- = UTILITY PEDESTAL
- = TRANSFORMER
- = HANDHOLE
- = ELECTRIC METER
- = GAS METER
- = WATER METER
- = SIGN
- = POST
- = AIR CONDITIONING UNIT
- = GAS LINE
- = UNDERGROUND TELEPHONE
- = UNDERGROUND TELEVISION
- = UNDERGROUND ELECTRIC
- = OVERHEAD WIRES
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH



BENCHMARKS

BENCHMARK #1 ELEV. = 850.21 (NAVD88)
SOUTH FLANGE BOLT, UNDER "M" IN "MADE IN USA", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, ACROSS FROM ENTRANCE DRIVE TO #2875 NORTHWIND DRIVE.

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NORTH FLANGE BOLT, UNDER "6" IN "1962", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, 70' NORTH AND 25' EAST OF NORTHEAST CORNER OF #2875 NORTHWIND DRIVE.

LEGEND

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- EXT. WATER MAIN
- EXT. SANITARY SEWER
- EXT. STORM SEWER
- 850.0 EXT. ELEVATIONS
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

E-90403-MUPUD-SUP
SURVEY# 90403.BND

REVISIONS
3-9-18 MUPUD & SUP SUBMITTAL

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Red Cedar Manor
GRADING & FLOODPLAIN PLAN

SCALE: 1"= 30'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 5-5-17	PROJECT MGR. JWK	SHEET 3 OF 7
AUTHORIZED BY: MERIDIAN INVESTMENT GROUP, LLC		JOB #: 90403

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EX. PERVIOUS/IMPERVIOUS PLAN

"2875 NORTHWIND DRIVE AND VACANT GRAND RIVER AVENUE, EAST LANSING, MI 48823"

FOR: **MERIDIAN INVESTMENT GROUP, LLC**

SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 839.94
12" HDPE N INV. = 832.84
12" HDPE NE INV. = 831.57
12" HDPE SW INV. = 831.52

STORM MANHOLE #101
RIM ELEV. = 840.53
12" RCP N INV. = 831.23
18" RCP NE INV. = 831.29
12" RCP SE INV. = 831.37
18" RCP SW INV. = 831.11

STORM MANHOLE #102
RIM ELEV. = 833.14
18" RCP NE INV. = 829.44
18" RCP SW INV. = 829.34

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BENCHMARK #2 ELEV. = 852.56 (NAVD88)
NORTH FLANGE BOLT, UNDER "6" IN "1962", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, 70' NORTH AND 25' EAST OF NORTHEAST CORNER OF #2875 NORTHWIND DRIVE.

EXISTING IMPERVIOUS 88,740 S.F. = 40.84%
EXISTING PERVIOUS 128,543 S.F. = 59.16%

N

SCALE 1" = 30'
0' 30' 60' 90'

TOTAL SITE = 217,283 SF
4.99 AC

88,307 SF

NORTHWIND DRIVE
(PRIVATE - 30' WIDE R.O.W.)

NORTHWIND DRIVE
(PUBLIC
PLATTED 60' WIDE R.O.W.)

7,766 SF
3,342 SF
7,293 SF
2,316 SF
1,528 SF
99 SF
163 SF
712 SF
848 SF
167 SF
1,685 SF
33 SF
60 SF
776 SF
6,468 SF
-60 SF
-33 SF
7,166 SF

RED CEDAR RIVER

RED CEDAR RIVER

LEGEND

- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = BRICK
- 860 = EXISTING CONTOUR ELEVATION
- = SANITARY SEWER
- = STORM SEWER
- —G— = GAS LINE
- —EO— = OVERHEAD WIRES
- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = CATCHBASIN
- = SANITARY CLEANOUT
- = FIRE HYDRANT
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- = UTILITY POLE
- = LIGHT POLE
- = GUY WIRE
- = UTILITY PEDESTAL
- = TRANSFORMER
- = SIGN
- = POST
- = AIR CONDITIONING UNIT

SURVEYOR'S NOTES:

1. This plan was made at the direction of the parties named hereon and is intended solely for their immediate use. Survey prepared from fieldwork performed in April 2017.

2. All bearings and distances on the survey are record and measured unless otherwise noted. All bearings are Michigan State Plane South Zone grid bearings obtained from GPS observations using corrections obtained from the Lansing C.O.R.S.

3. All dimensions are in feet and decimals thereof.

4. All elevations are North American Vertical Datum of 1988 (NAVD88).

5. No building tie dimensions are to be used for establishing the property lines.

6. Wetlands shown are as delineated by Marx Wetlands, LLC, on March 17, 2017.

PRELIMINARY

ERICK R. FRIESTROM DATE
PROFESSIONAL SURVEYOR NO. 53497

REVISIONS	COMMENTS
03/31/2017	PRELIMINARY
04/18/2017	REVISED PRELIMINARY
3-9-18	MUPUD & SUP SUBMITTAL

KEBS, INC. ENGINEERING AND LAND SURVEYING
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX 517-339-8047
WWW.KEBS.COM
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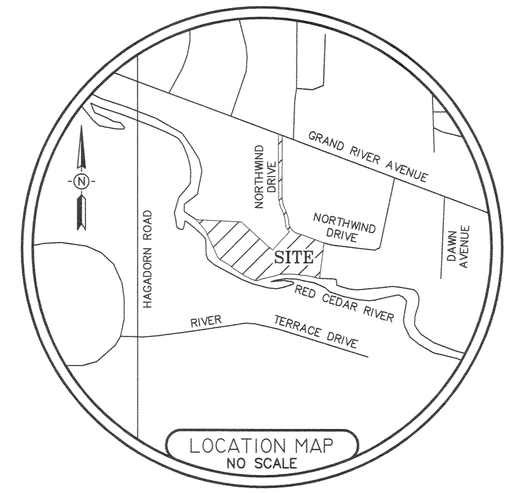
DRAWN BY SSF | SECTION 20, T4N, R1W
FIELD WORK BY AH | JOB NUMBER: 90403.BND
SHEET 4 OF 7

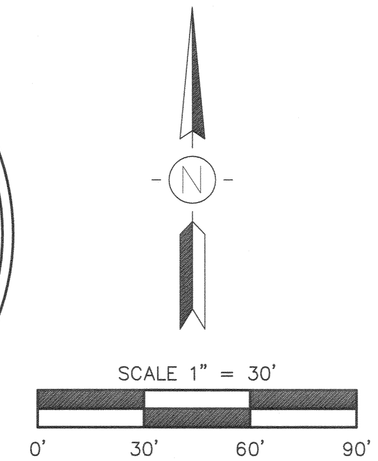
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M.U.P.U.D. & S.U.P. PLAN FOR:

Red Cedar Manor

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN





SEWER INVENTORIES

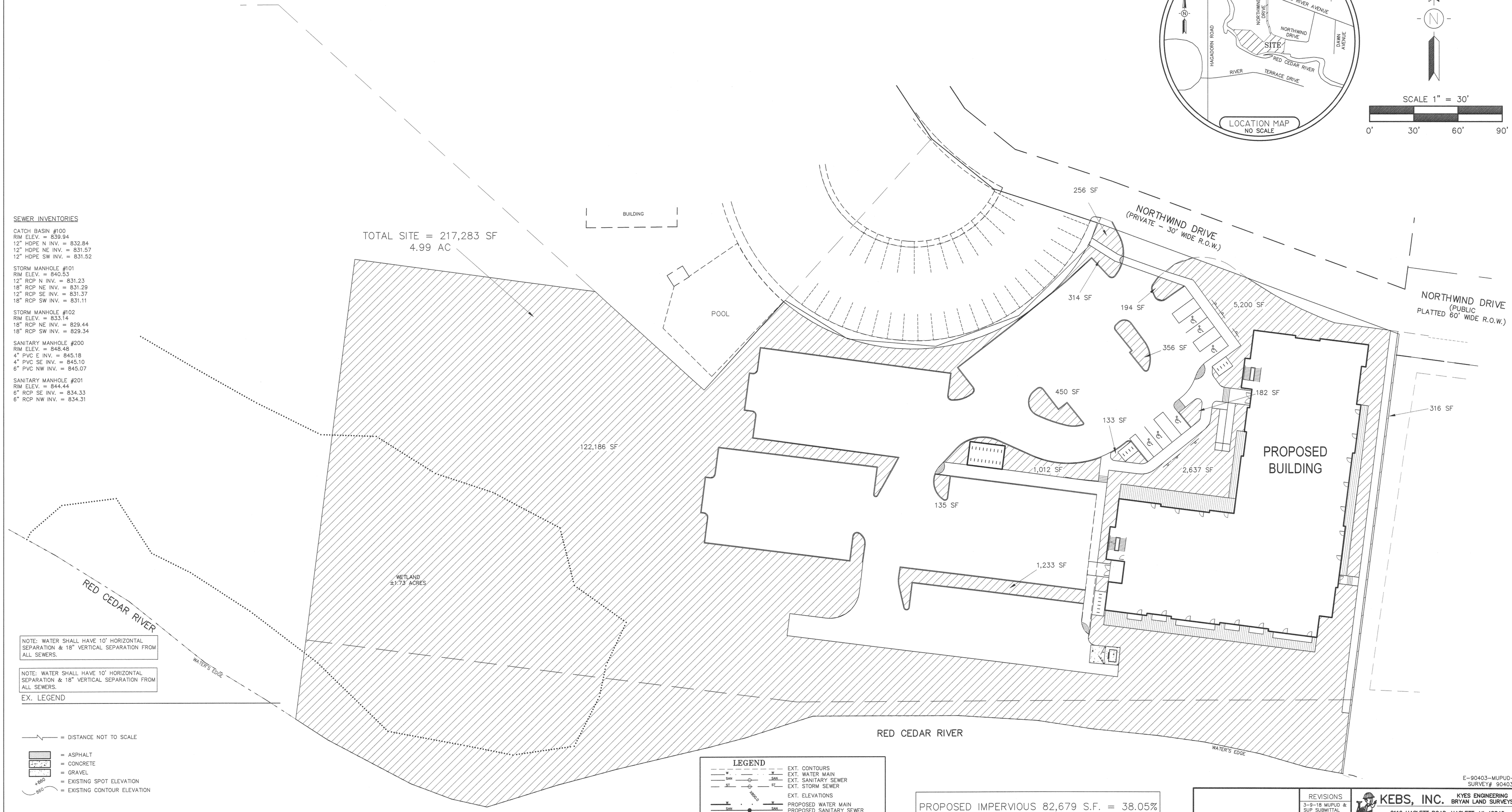
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= ASPHALT
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= GRAVEL
= EXISTING SPOT ELEVATION
= EXISTING CONTOUR ELEVATION
= UNDERGROUND TELEVISION



BENCHMARKS

BENCHMARK #1 ELEV. = 850.21 (NAVD88)
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- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
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- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

PROPOSED IMPERVIOUS 82,679 S.F. = 38.05%
PROPOSED PERVIOUS 134,604 S.F. = 61.95%

E-90403-MUPUD-SUP
SURVEY# 90403.BND

REVISIONS
3-9-18 MUPUD & SUP SUBMITTAL

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KYES ENGINEERING
BRYAN LAND SURVEYS
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PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

Red Cedar Manor

PROPOSED PERVIOUS/IMPERVIOUS PLAN

SCALE: 1"= 30'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 5-5-17	PROJECT MGR. JWK	SHEET 5 OF 7
AUTHORIZED BY: MERIDIAN INVESTMENT GROUP, LLC		JOB #: 90403

L:\90\90403\dwg\E-90403-MUPUP-SUP.dwg, 4/12/2018 10:13:02 AM, jkyes

M.U.P.U.D. & S.U.P. PLAN FOR:

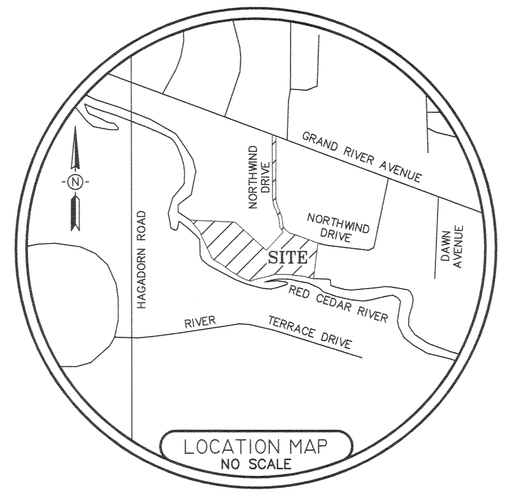
Red Cedar Manor

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

1978 ZONING LEGAL DESCRIPTION:

AS PROVIDED:

That part of the Northwest 1/4 of Section 20, T4N, R1W, Meridian Township, Ingham County, Michigan, commencing at the North 1/4 corner of said Section 20, (South 1/4 corner of Section 17), thence along the North–South 1/4 line of said Section 17 N0°14'W 113.83' feet to the Southerly right of way line of Grand River Avenue, 60 feet from the centerline thereof, thence along said right of way line N68°36'W 860.35 feet, thence S7°25'W 806.78 feet to the point of beginning, said point being on the West line of NORTHWINDS, a subdivision recorded in Liber 26 of Plats on pages 25, 26 and 27, Ingham County Records, thence along said West line S7°25'W 281.05 feet to a traverse point, said point being 82 feet from the water's edge of the Red Cedar River, as measured along the projection of the last described line, thence along a traverse line S89°57'W 377.33 feet to a traverse point N15°53'50"W 20 feet, more or less, from said water's edge, thence N82°35'W 335.87 feet, thence N7°27"E 260.63 feet, thence S82°35'E 165.68 feet, thence S48°00'E 100.0 feet, thence N42°00'E 80.00 feet, thence S58°00'E 50.0 feet, thence S85°00'E 60.00 feet, thence N70°00'E 60.0 feet, thence N45°28'07"E 66.84 feet, thence N19°33'39"E 50.0 feet, thence S68°49'E 212.29 feet to the point of beginning; also that land lying between the traverse line described above and the centerline of the Red Cedar River; above described parcel containing 4.891 acres of land, more or less.
Surveyed area of above described parcel 4.99 acres of land, more or less.



SCALE 1" = 30'

0' 30' 60' 90'

BENCHMARK #1

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- = AIR CONDITIONING UNIT



BENCHMARKS

BENCHMARK #1 ELEV. = 850.21 (NAVD88)
SOUTH FLANGE BOLT, UNDER "M" IN "MADE IN USA", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, ACROSS FROM ENTRANCE DRIVE TO #2875 NORTHWIND DRIVE.

BENCHMARK #2 ELEV. = 852.56 (NAVD88)
NORTH FLANGE BOLT, UNDER "6" IN "1962", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, 70' NORTH AND 25' EAST OF NORTHEAST CORNER OF #2875 NORTHWIND DRIVE.

LEGEND

- EXT. CONTOURS
- EXT. WATER MAIN
- EXT. SANITARY SEWER
- EXT. STORM SEWER
- EXT. ELEVATIONS
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

AMENITIES:

1. CONNECTION TO NON MOTORIZED PATHWAY AND FUTURE RIVER TRAIL
2. EASEMENT TO BE GRANTED TO TOWNSHIP FOR RIVER TRAIL
3. INCREASED PERVIOUS AREA 37.16% ABOVE MIN. 25% = 62.17%
4. COVERED BIKE PARKING

E-90403-MUPUD-SUP
SURVEY# 90403.BND

REVISIONS
3-9-18 MUPUD & SUP SUBMITTAL

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

Red Cedar Manor
AMENITIES PLAN

SCALE: 1"= 30'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 5-5-17	PROJECT MGR. JWK	SHEET 6 OF 7
AUTHORIZED BY: MERIDIAN INVESTMENT GROUP, LLC		JOB #: 90403

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EXISTING FEATURES PLAN

"2875 NORTHWIND DRIVE AND VACANT GRAND RIVER AVENUE, EAST LANSING, MI 48823"

FOR: **MERIDIAN INVESTMENT GROUP, LLC**

SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 839.94
12" HDPE N INV. = 832.84
12" HDPE NE INV. = 831.57
12" HDPE SW INV. = 831.52

STORM MANHOLE #101
RIM ELEV. = 840.53
12" RCP N INV. = 831.23
18" RCP NE INV. = 831.29
12" RCP SE INV. = 831.37
18" RCP SW INV. = 831.11

STORM MANHOLE #102
RIM ELEV. = 833.14
18" RCP NE INV. = 829.44
18" RCP SW INV. = 829.34

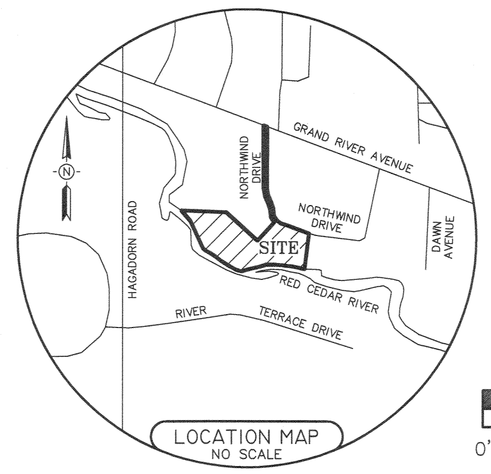
SANITARY MANHOLE #200
RIM ELEV. = 848.48
4" PVC E INV. = 845.18
4" PVC SE INV. = 845.10
6" PVC NW INV. = 845.07

SANITARY MANHOLE #201
RIM ELEV. = 844.44
6" RCP SE INV. = 834.33
6" RCP NW INV. = 834.31

BENCHMARKS

BENCHMARK #1 ELEV. = 850.21 (NAVD88)
SOUTH FLANGE BOLT, UNDER "M" IN "MADE IN USA", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, ACROSS FROM ENTRANCE DRIVE TO #2875 NORTHWIND DRIVE.

BENCHMARK #2 ELEV. = 852.56 (NAVD88)
NORTH FLANGE BOLT, UNDER "6" IN "1962", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, 70' NORTH AND 25' EAST OF NORTHEAST CORNER OF #2875 NORTHWIND DRIVE.



N

SCALE 1" = 30'
0' 30' 60' 90'

BUILDING
CB #100
FF= 840.90
SHED
STM MH #101
POOL
SAN MH #201
BENCH
GRILL
BENCHMARK #1
30' INGRESS & EGRESS EASEMENT LIBER 1452, PAGE 551
30' TELEPHONE EASEMENT LIBER 2268, PAGE 1161
30' CABLE EASEMENT LIBER 2359, PAGE 422
NORTHWIND DRIVE (PRIVATE - 30' WIDE R.O.W.)
20' WIDE DRAINAGE, WATER & SANITARY EASEMENT LIBER 956, PAGE 342
BENCHMARK #2
NORTHWIND DRIVE (PUBLIC PLATTED 60' WIDE R.O.W.)
100 YEAR FLOOD PLAIN CONTOUR ELEV. 840.9 (NAVD88)
15.66'
19.09'
FF= 848.09
FF= 848.07
FF= 848.04
FF= 842.22
3-STORY BRICK BUILDING #2875 NORTHWIND DR.
SAN MH #200
8'x8' SHED
13.01'
STM MH #102
18" RCP CULVERT ELEV. = 828.53
WETLAND ±1.73 ACRES
RED CEDAR RIVER
WATER'S EDGE
RED CEDAR RIVER
WATER'S EDGE

LEGEND

● = SET 1/2" BAR WITH CAP	Ⓢ = SANITARY MANHOLE
□ = FOUND IRON AS NOTED	Ⓓ = DRAINAGE MANHOLE
= DEED LINE	= CATCHBASIN
= DISTANCE NOT TO SCALE	= SANITARY CLEANOUT
= FENCE	= FIRE HYDRANT
= ASPHALT	= VALVE
= CONCRETE	= UTILITY POLE
= BRICK	= LIGHT POLE
860 = EXISTING CONTOUR ELEVATION	= GUY WIRE
= SANITARY SEWER	= UTILITY PEDESTAL
= STORM SEWER	= TRANSFORMER
= GAS LINE	= SIGN
—EO— = OVERHEAD WIRES	= POST
	= AIR CONDITIONING UNIT

SURVEYOR'S NOTES:

1. This plan was made at the direction of the parties named hereon and is intended solely for their immediate use. Survey prepared from fieldwork performed in April 2017.

2. All bearings and distances on the survey are record and measured unless otherwise noted. All bearings are Michigan State Plane South Zone grid bearings obtained from GPS observations using corrections obtained from the Lansing C.O.R.S.

3. All dimensions are in feet and decimals thereof.

4. All elevations are North American Vertical Datum of 1988 (NAVD88).

5. No building tie dimensions are to be used for establishing the property lines.

6. Wetlands shown are as delineated by Marx Wetlands, LLC, on March 17, 2017.

PRELIMINARY

ERICK R. FRIESTROM DATE
PROFESSIONAL SURVEYOR NO. 53497

REVISIONS	COMMENTS
03/31/2017	PRELIMINARY
04/18/2017	REVISED PRELIMINARY
3-9-18	MUPUD & SUP SUBMITTAL

KEBS, INC. ENGINEERING AND LAND SURVEYING
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX 517-339-8047
WWW.KEBS.COM
Marshall Office – Ph. 269-781-9800

DRAWN BY SSF	SECTION 20, T4N, R1W
FIELD WORK BY AH	JOB NUMBER: 90403.BND
SHEET 7 OF 7	

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RED CEDAR MANOR

MUPUD-SUP Submission Set 04.25.18

TOTAL BUILDING S.F.
70,213 S.F.
TOTAL:UNITS 88 (107 BEDROOMS)



architecture | design
ASL
2875 Northwind Dr. East Lansing, MI 48823



architecture | design

RED CEDAR MANOR



architecture | design

RED CEDAR MANOR



architecture | design

RED CEDAR MANOR



architecture | design

RED CEDAR MANOR



architecture | design

ASL

RED CEDAR MANOR



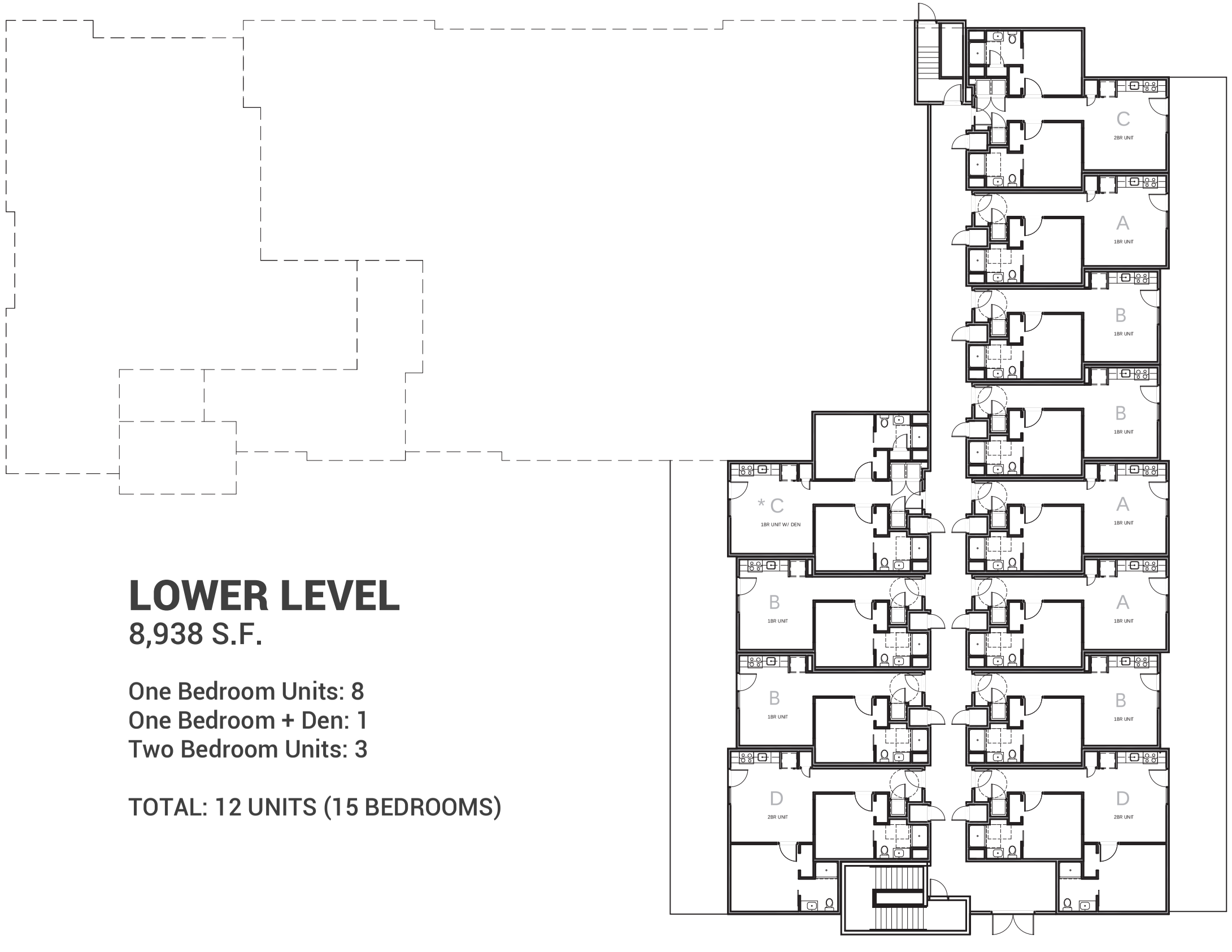
architecture | design

RED CEDAR MANOR



architecture | design

RED CEDAR MANOR



LOWER LEVEL
8,938 S.F.

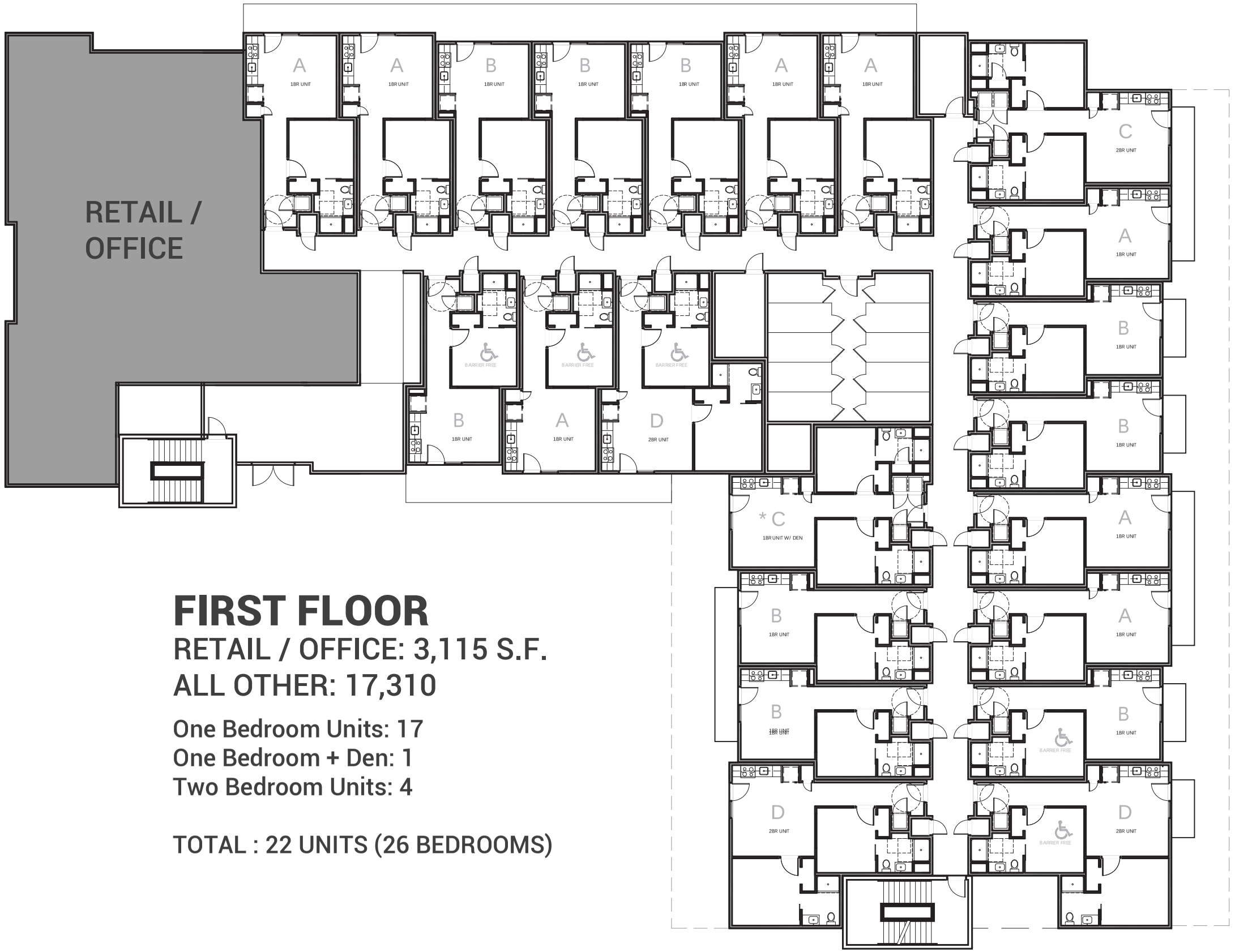
One Bedroom Units: 8
One Bedroom + Den: 1
Two Bedroom Units: 3

TOTAL: 12 UNITS (15 BEDROOMS)

N

architecture | design

RED CEDAR MANOR



FIRST FLOOR

RETAIL / OFFICE: 3,115 S.F.
ALL OTHER: 17,310

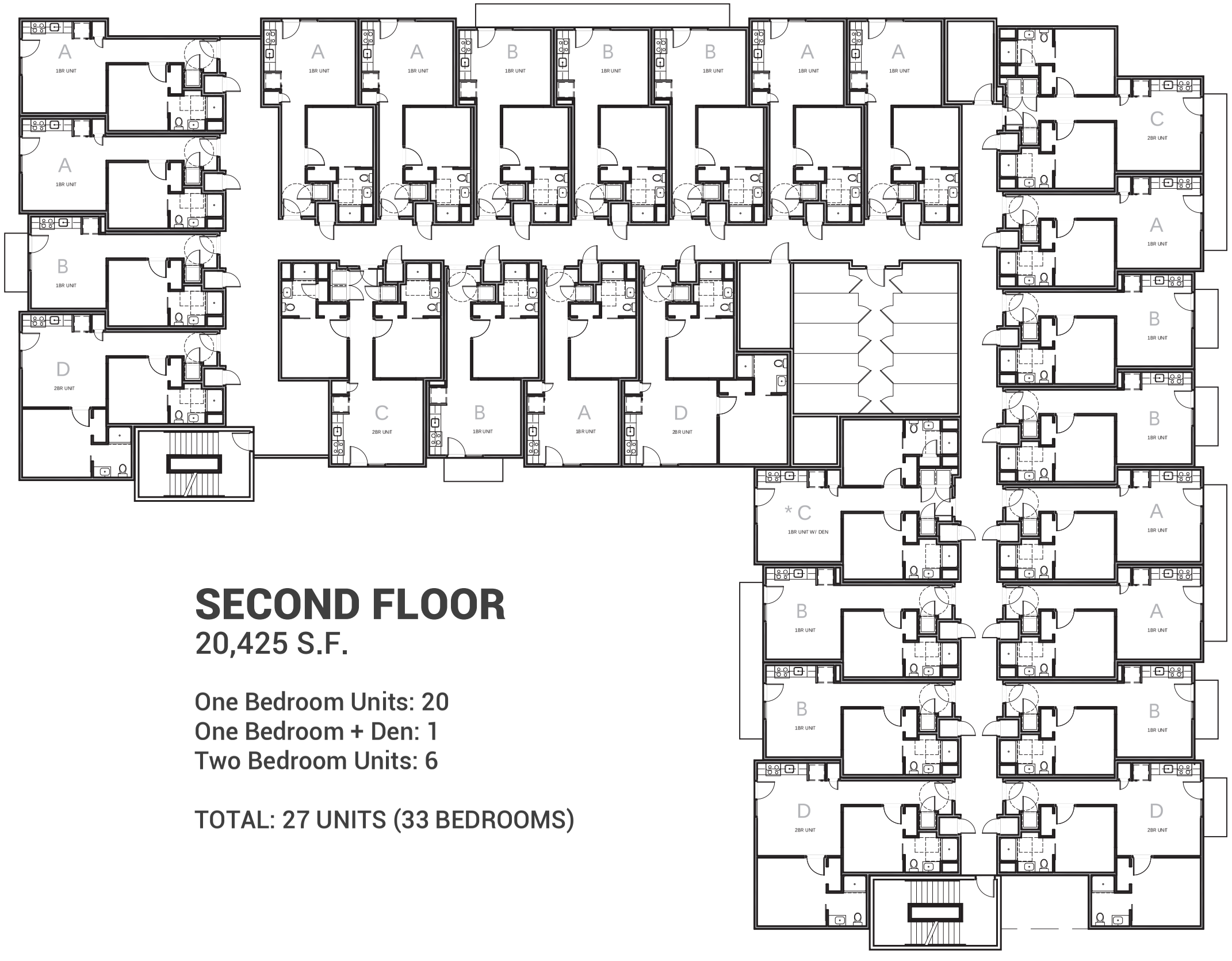
One Bedroom Units: 17
One Bedroom + Den: 1
Two Bedroom Units: 4

TOTAL : 22 UNITS (26 BEDROOMS)

N

architecture | design

RED CEDAR MANOR



SECOND FLOOR
20,425 S.F.

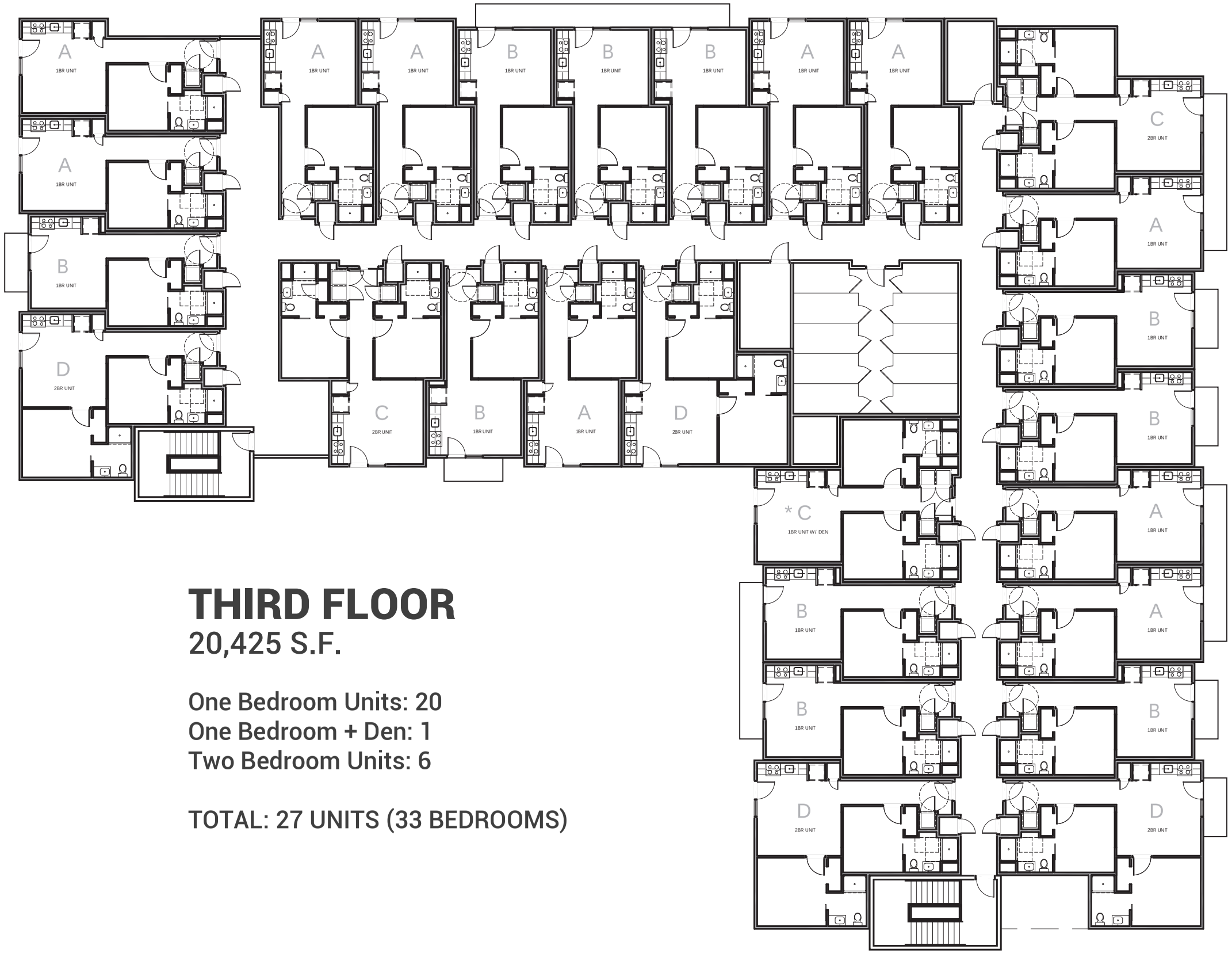
One Bedroom Units: 20
One Bedroom + Den: 1
Two Bedroom Units: 6

TOTAL: 27 UNITS (33 BEDROOMS)

N

architecture | design

RED CEDAR MANOR

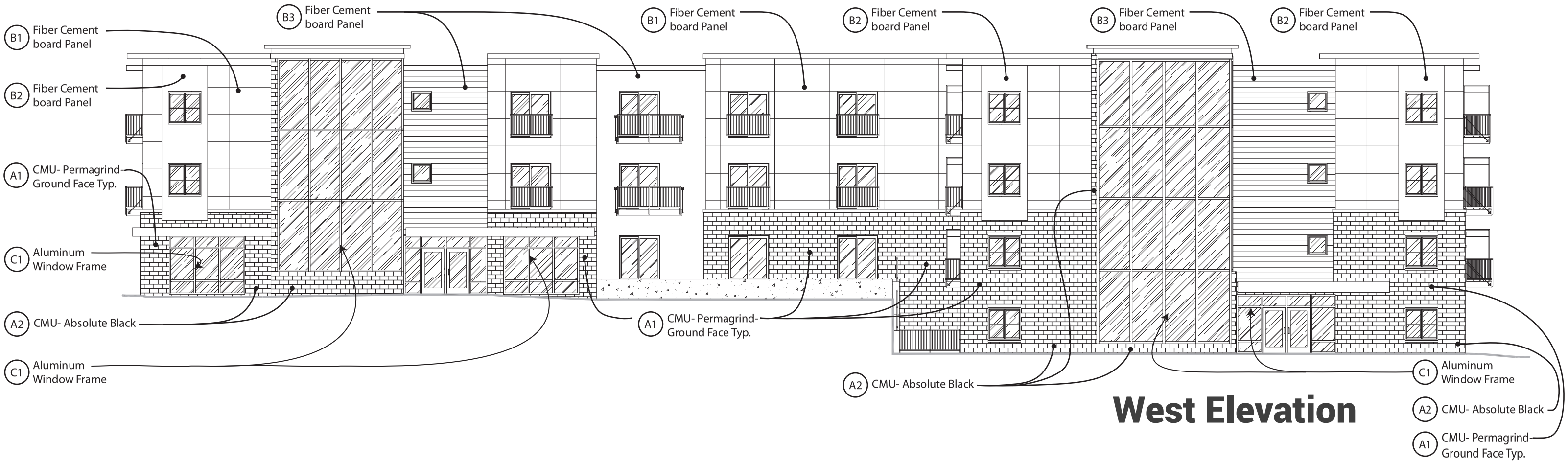


THIRD FLOOR
20,425 S.F.

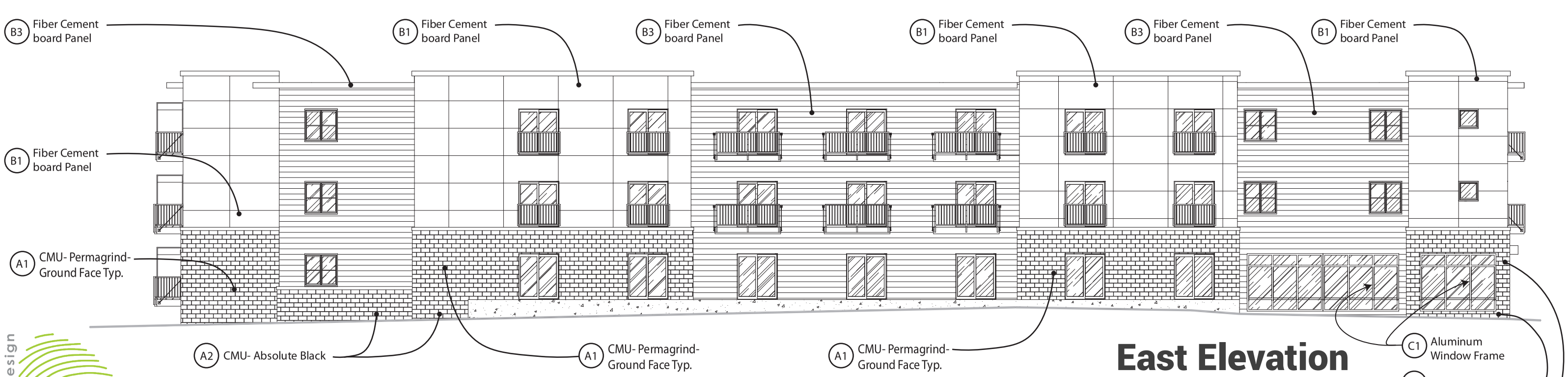
One Bedroom Units: 20
One Bedroom + Den: 1
Two Bedroom Units: 6

TOTAL: 27 UNITS (33 BEDROOMS)

N



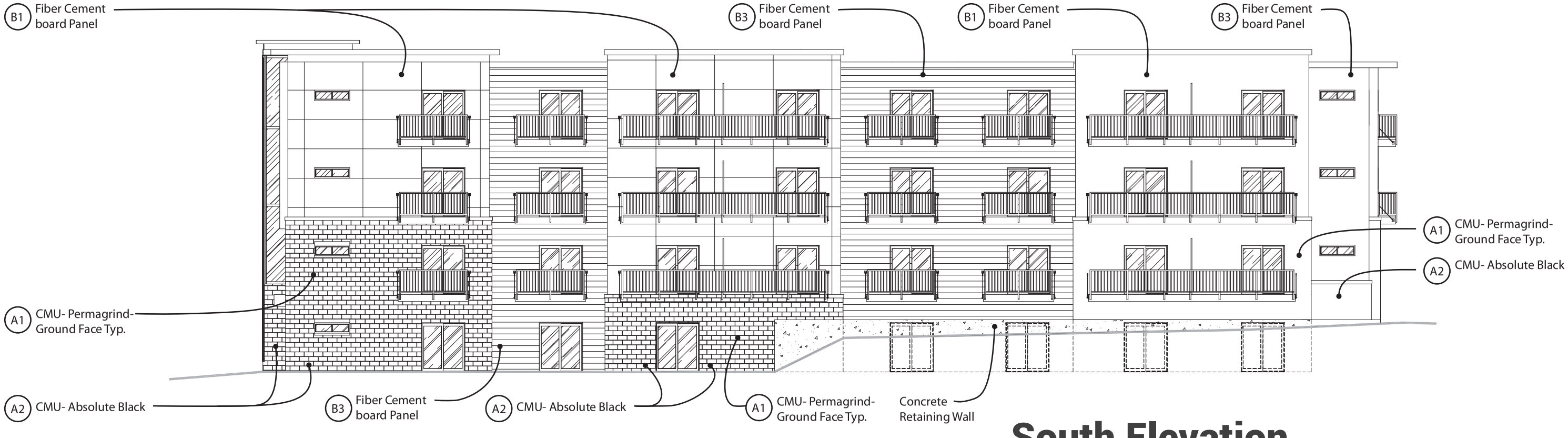
West Elevation



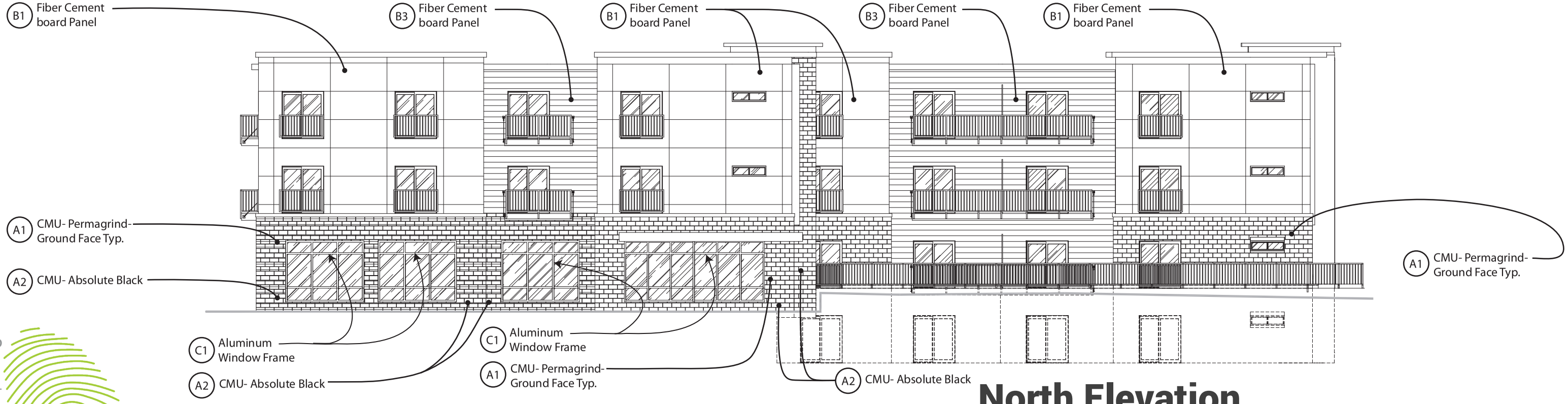
East Elevation

architecture | design

RED CEDAR MANOR



South Elevation

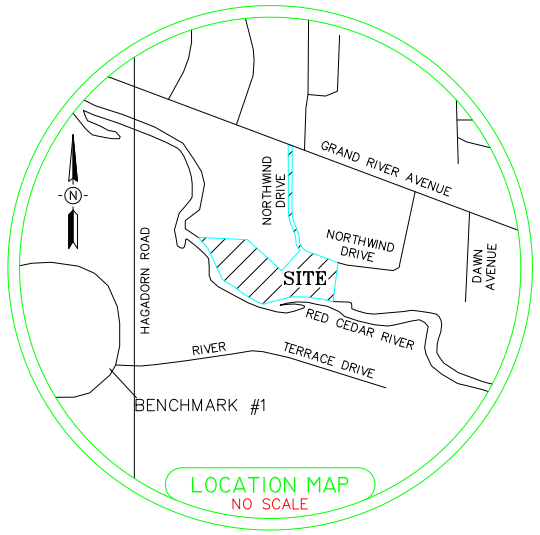


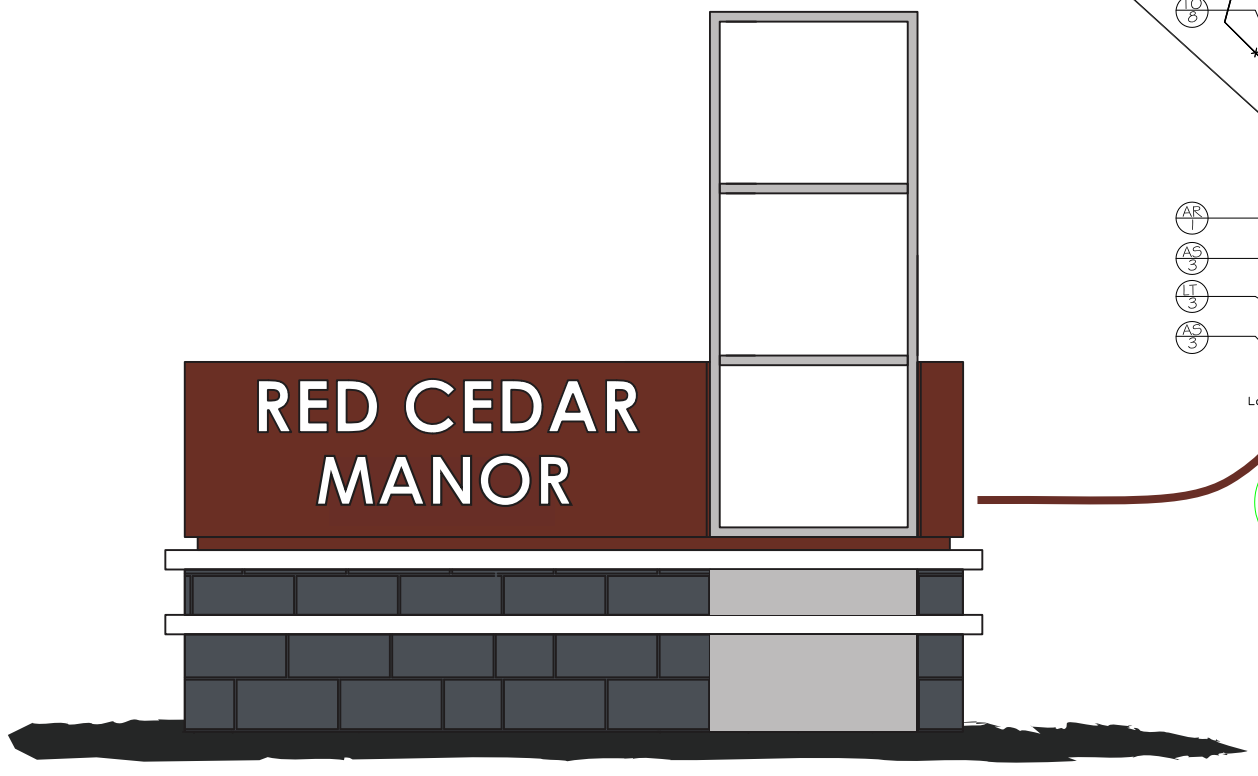
North Elevation

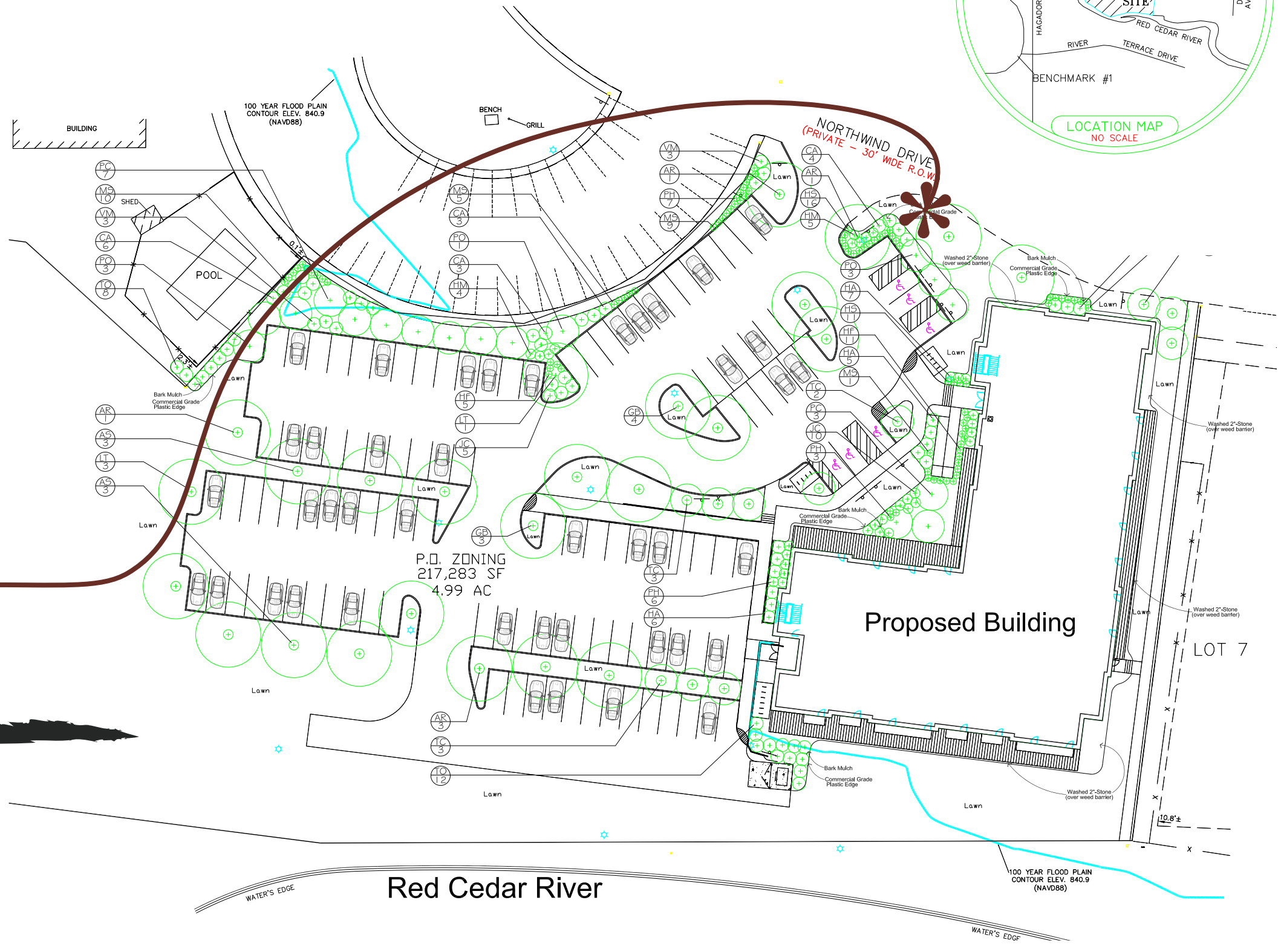
RED CEDAR MANOR

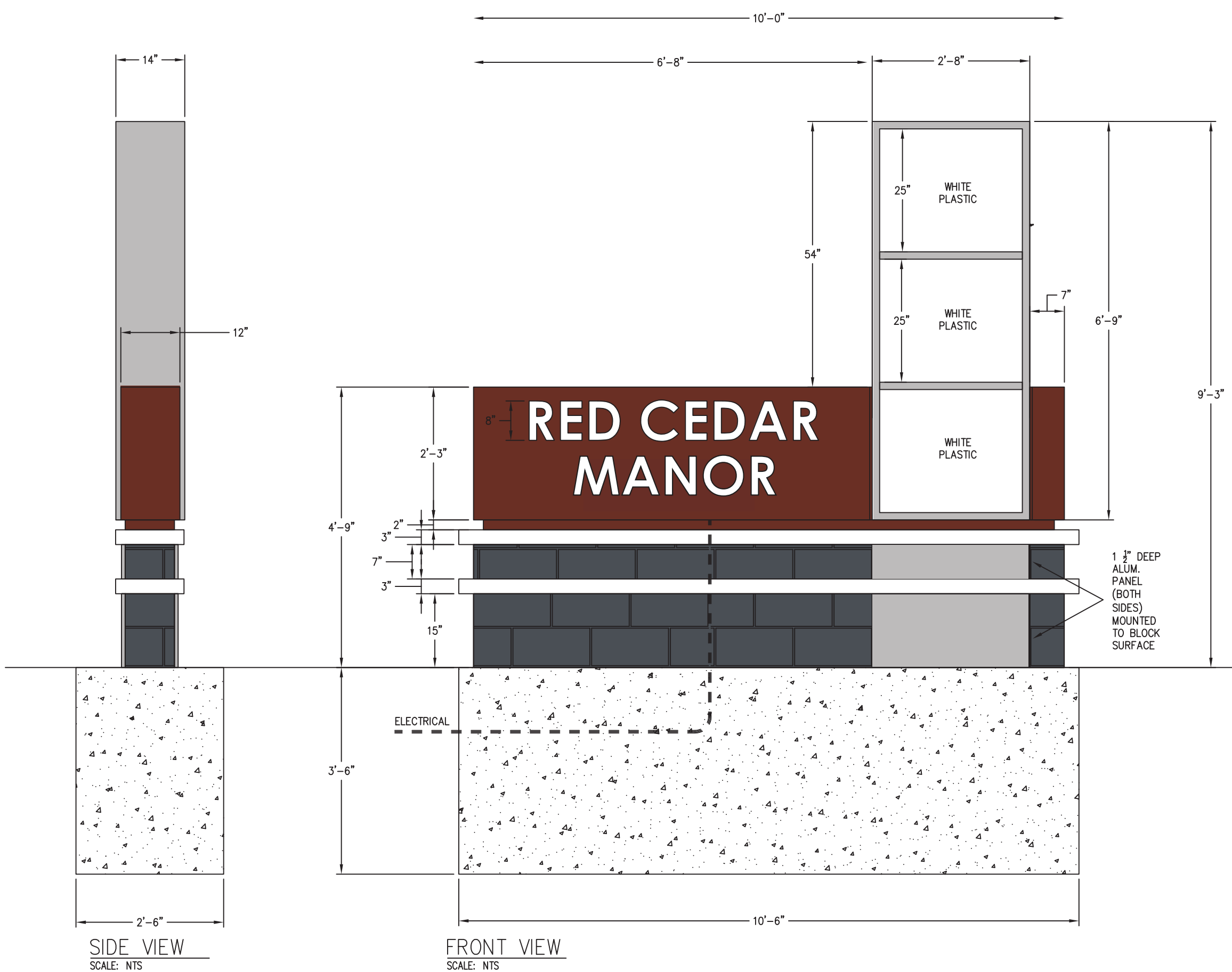
RED CEDAR MANOR - MONUMENT ENTRY SIGN

Location: Monument sign with tenant panels shall be located at the Northwest corner of the project, at the entry from Northwind Dr.









SIDE VIEW
SCALE: NTS

FRONT VIEW
SCALE: NTS

PMS Cool Gray 4 C

PMS 7540 C

PMS 483 C

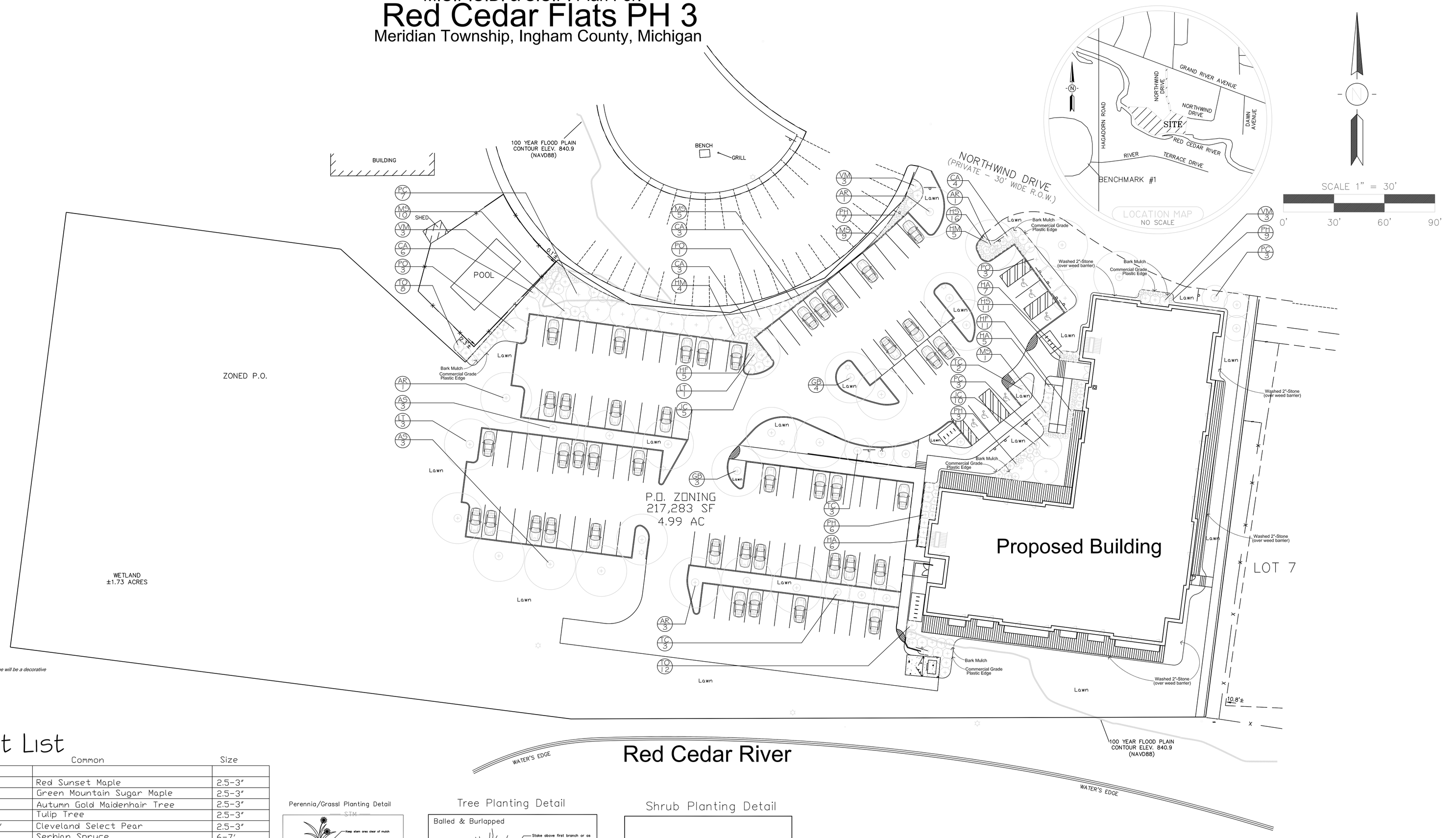
architecture | design

RED CEDAR MANOR

M.U.P.U.D. & S.U.P. Plan For:

Red Cedar Flats PH 3

Meridian Township, Ingham County, Michigan



SCALE 1" = 30'

0' 30' 60' 90'

LANDSCAPE NOTES

1. INSTALL 3"X 12 GA. EDGING TO SEPARATE LAWN FROM PLANTING BED. (Edg-King by Oly-Ola or better)
2. INSTALL 3" DEEP SHREDDED BARK MULCH TO ALL PLANTING AREAS/BEDS AND TREE SAUCERS (NO POLY-FILM).
3. INSTALL A KENTUCKY BLUEGRASS SOD (SUN/SHADE) VARIETY) THAT IS FREE OF WEEDS.

3A. SEED AREAS WITH THE FOLLOWING:
- 25% SYBSPORT KENTUCKY BLUEGRASS
- 25% NASSAM KENTUCKY BLUEGRASS
- 20% BRYISTOL KENTUCKY BLUEGRASS
- 10% PERINNIAL RYE GRASS

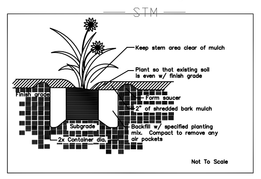
APPLY AT THE RATE OF 5 TO 6 LBS. PER 1,000 SQUARE FOOT.

4. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES, PIPES AND STRUCTURES, AS WELL AS THE LOCATION OF EXISTING TREES AND VEGETATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COST INCURRED DUE TO DAMAGE/REMOVAL OF SAID ELEMENTS.
5. ANY DISCREPANCIES BETWEEN PLANS, NOTES, DETAILS AND EXISTING CONDITIONS SHALL BE IMMEDIATELY REPORTED TO THE OWNER'S AUTHORIZED REPRESENTATIVE FOR REVIEW AND DECISION. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATION.
6. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING MATERIALS/IMPROVEMENTS, DAMAGED DURING CONSTRUCTION.
7. SITE BOUNDARY, TOPOGRAPHY, UTILITIES AND OTHER BASE INFORMATION PROVIDED BY OTHERS.
8. CONTRACTOR SHALL VERIFY QUANTITIES SHOWN ON PLANT SCHEDULES AND THOSE INDICATED ON PLANS. CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF QUANTITIES DRAWN.
9. CONTRACTOR SHALL MAKE MINOR ADJUSTMENTS TO PLANT MATERIAL LOCATIONS IN FIELD, AS NECESSARY. THE LOCATION OF ALL PLANT MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE OWNER'S AUTHORIZED REPRESENTATIVE.
10. ALL PLANT MATERIAL SHALL BE OF THE SIZES CALLED FOR IN THE PLANT SCHEDULES. ANY PLANT MATERIAL NOT MEETING THE SIZED AND/OR QUALITY AS CALLED FOR SHALL BE REMOVED FROM SITE. ALL TREES SHALL BE INSPECTED AND APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE. NO SUBSTITUTIONS OF PLANT MATERIAL SHALL BE MADE WITHOUT APPROVAL FROM THE OWNER'S AUTHORIZED REPRESENTATIVE.
11. ALL PROPOSED TREES OVER 2" CAL. SHALL BY GUYED/STAKED SECURE, SEE EVERGREEN TREE PLANTING/GUYING DETAIL, OR DECIDUOUS TREES PLANTING/STAKING DETAIL WHERE APPLICABLE.
12. ALL PLANTING BEDS TO BE TREATED WITH PRE-EMERGENT HERBICIDE. CONTRACTOR SHALL INSURE THAT PROPOSED PLANT MATERIAL IS RESISTANT TO THE HERBICIDE PROPERTIES AND THAT HERBICIDE APPLICATION FOLLOWS THE MANUFACTURER'S SPECIFICATIONS AND IS APPLIED IN ACCORDANCE WITH SOUND HORTICULTURAL PRACTICES.
13. CONTRACTOR SHALL DETERMINE APPROPRIATE PLANTING BACKFILL MIXES (BASED ON SOILS/SUBSURFACE CONDITIONS) AND REVIEW ALTERNATIVES WITH OWNER'S AUTHORIZED REPRESENTATIVE PRIOR TO INSTALLATION.
14. Install 2"-Washed Stone/weed barrier, 3"-deep (used for maintenance buffer 18" from foundation). Stone will be a decorative inorganic, ignatius rock selected to complement the bldg color.

Plant List

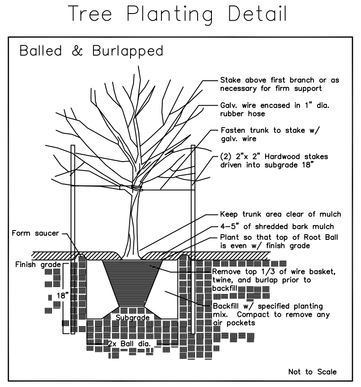
Quantity	Key	Botanical	Common	Size
6	AR	Acer rubrum 'Red Sunset'	Red Sunset Maple	2.5-3"
6	AS	Acer saccharum 'Green Mountain'	Green Mountain Sugar Maple	2.5-3"
7	GB	Ginkgo biloba 'Autumn Gold'	Autumn Gold Maidenhair Tree	2.5-3"
4	LT	Liriodendron tulipifera	Tulip Tree	2.5-3"
13	PC	Pyrus calleryana 'Cleveland Select'	Cleveland Select Pear	2.5-3"
7	PO	Picea omorika	Serbian Spruce	6-7'
8	TC	Tilia cordata "Greenspire"	Greenspire Linden	2.5-3"
16	CA	Cornus a. 'Variegatta'	Variegated Redtwig Dogwood	3 Gal
18	HA	Hydrangea arborescens 'Annabelle'	Annabelle Hydrangea	3 Gal
9	HM	Hydrangea macrophyla 'Endless Summer'	Endless Summer Hydrangea	3 Gal
15	JC	Juniperus chinensis 'Old Gold'	Old Gold Juniper	3 Gal
20	TO	Thuja occidentalis 'Emerald Green'	Emerald Green Arborvitae	4-5'
9	VM	Viburnum plicatum maresii	Doublefile Viburnum	4-5'
27	HS	Hermocallis 'Stella de Oro	Stella de Oro Daylily	2 Gal
16	HF	Hermocallis flava	Lemon Yellow Daylily	2 Gal
25	MS	Miscanthus s. gracillimus	Maiden Hair Grass	2 Gal
25	PH	Pennisetum 'Hameln'	Dwarf Fountain Grass	2 Gal

Perennia/Grassl Planting Detail

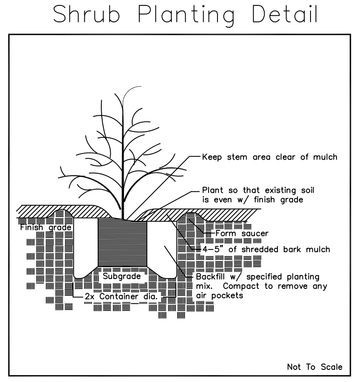


Tree Planting Detail

Balled & Burlapped

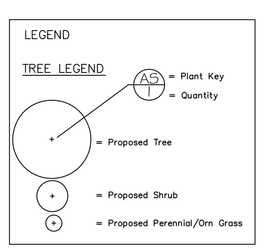


Shrub Planting Detail



LEGEND

TREE LEGEND



Landscape Plan

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

Outdoor Living, Inc.
2720 Alpha Access
Lansing, MI 48810-3608
Phone
(517) 484-0230

STATE OF MICHIGAN — TIMOTHY J. BANFIELD — LANDSCAPE ARCHITECT — No. 859 — REGISTERED LANDSCAPE ARCHITECT

Project: Red Cedar Flats PH 3
Address: 2875 Northwind Dr.
City: East Lansing, MI 48823
Revision:
Drawn By: Tim Banfield LLA ASLA LIC# 3901000859
Client: ASL Architecture Design, 720 E. Michigan Ave., Lansing, MI 48912
Scale: 1"=30'-0"
Date: 2-28-18
File # 18989-C

To: **Planning Commission**

From: **Peter Menser, Principal Planner**

Date: **June 7, 2018**

Re: **Special Use Permit #18031 (Meridian Investment Group, LLC), construct building greater than 25,000 square feet in size at 2875 Northwind Drive.**

Meridian Investment Group, LLC has submitted a mixed use planned unit development (MUPUD #18034) proposal for a project identified as Red Cedar Manor. The proposal includes the demolition of an existing two-story, 40,504 square foot office building at 2875 Northwind Drive and construction of a new three-story, 70,213 square foot mixed use building in approximately the same footprint. The new building will have a total of 88 apartments and 3,115 square feet of commercial space.

In addition to the MUPUD, special use permits (SUP) are required for constructing a building totaling more than 25,000 square feet in gross floor area (SUP #18031) and for grading and fill activities in the floodplain of the Red Cedar River (SUP #18041). The special use permits are being processed concurrently with the MUPUD request. This staff report focuses on the special use permit for construction of a building greater than 25,000 square feet in size. The staff report for MUPUD #18034 should be referenced for a more complete overview of the project.

The construction of any building or group of buildings with a combined gross floor area greater than 25,000 square feet requires a special use permit due to the significant impact such development may have upon adjacent property owners, neighborhoods, and public infrastructure. The Code of Ordinances requires the special use permit to ensure that public utilities, roads, and other infrastructure systems are or will be adequate to support the proposed development.

Staff Analysis

The special use permit review criteria found in Section 86-126 of the Code of Ordinances should be used when evaluating the proposed special use permit. The Planning Commission makes a recommendation on the SUP request and the Township Board has final approval.

Planning Commission Options

The Planning Commission may recommend approval, approval with conditions, or denial of the proposed special use permit. A resolution will be provided at a future meeting.

Attachment

1. Application and attachments.

CHARTER TOWNSHIP OF MERIDIAN
DEPARTMENT OF COMMUNITY PLANNING AND DEVELOPMENT
5151 MARSH ROAD, OKEMOS, MI 48864
PLANNING DIVISION PHONE: (517) 853-4560, FAX: (517) 853-4095

SPECIAL USE PERMIT APPLICATION

Before submitting this application for review, an applicant may meet with the Director of Community Planning and Development to discuss the requirements for a special use permit and/or submit a conceptual plan for review to have preliminary technical deficiencies addressed prior to submittal of the application. If the property or land use is located in the following zoning districts RD, RC, RCC, RN then the applicant must meet with the Planning Director to discuss technical difficulties before filing a formal application.

Part I

A. Applicant MERIDIAN INVESTMENT GROUP, LLC - C/O ECKHARDT & ASSOCIATES
Address of Applicant 2875 NORTHWIND DR, STE 235, EAST LANSING, MI 48823
Telephone - Work 517-664-4114 Home _____ Fax 517-664-4194 Email TOM@C-DEVCO.COM
Interest in property (circle one): (Owner) Tenant Option Other
(Please attach a list of all persons with an ownership interest in the property.)

B. Site address / location / parcel number 2875 NORTHWIND DR / 33-02-02-20-128-003
Legal description (please attach if necessary) SEE ATTACHED
Current zoning PO
Use for which permit is requested / project name BUILDING OVER 25,000 S.F. / REO CEDAR MANOR
Corresponding ordinance number _____

C. Developer (if different than applicant) SAME
Address _____
Telephone – Work _____ Home _____ Fax _____

D. Architect, Engineer Planner or Surveyor responsible for design of project if different from applicant:
Name KEBS INC - JEFF KYES
Address 2116 HASLETT RD. HASLETT, MI 48840
Telephone – Work 517-339-1014 Home _____ Fax 517-339-8047

E. Acreage of all parcels in the project: Gross 4.891 Net 4.891

F. Explain the project and development phases: REDEVELOPMENT - SINGLE PHASE

G. Total number of:
Existing: structures 1 bedrooms ___ offices X parking spaces ___ carports ___ garages ___
Proposed: structures 1 bedrooms 107 offices ___ parking spaces ___ carports ___ garages ___

H. Square footage: existing buildings 40,504 proposed buildings 70,213
Usable Floor area: existing buildings SAME proposed buildings SAME

I. If employees will work on the site, state the number of full time and part time employees working per shift and hours of operation:

J. Existing Recreation: Type NONE Acreage 0
Proposed Recreation: Type SEE ATTACHED PLANS Acreage _____
Existing Open Space: Type LAWN Acreage 2.95 AC
Proposed Open Space: Type LAWN Acreage 3.10 AC

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K. If Multiple Housing:

Total acres of property 4.871

Acres in floodplain _____ Percent of total _____

Acres in wetland (not in floodplain) _____ Percent of total _____

Total dwelling units 88

Dwelling unit mix:

Number of single family detached:	for Rent _____	Condo _____
Number of duplexes:	for Rent _____	Condo _____
Number of townhouses:	for Rent _____	Condo _____
Number of garden style apartments:	for Rent _____	Condo _____
Number of other dwellings:	for Rent 88 (APARTMENTS)	Condo _____

L. The following support materials must be submitted with the application:

1. Nonrefundable Fee.
2. Legal Description of the property.
3. Evidence of fee or other ownership of the property.
4. Site Plan containing the information listed in the attachment to this application.
5. Architectural sketches showing all sides and elevations of the proposed buildings or structures, including the project entrance, as they will appear upon completion. The sketches should be accompanied by material samples or a display board of the proposed exterior materials and colors.
6. A Traffic Study, prepared by a qualified traffic engineer, based on the most current edition of *Evaluating Traffic Impact Studies: A Recommended Practice for Michigan Communities*, published by the State Department of Transportation.
   a. A traffic assessment will be required for the following:
      1) New special uses which could, or expansion or change of an existing special use where increase in intensity would, generate between 50 to 99 directional trips during a peak hour of traffic.
      2) All other special uses requiring a traffic assessment as specified in the Township Code of Ordinances, Chapter 86, Article IV, Division 2.
   b. A traffic impact study will be required for the following:
      1) New special uses which would, or expansion or change of an existing special use where increase in intensity would, generate over 100 directional trips or more during a peak hour of traffic, or over 750 trips on an average day.
      2) All other special uses requiring a traffic assessment as specified in the Township Code of Ordinances, Chapter 86, Article IV, Division 2.
7. Natural features assessment which includes a written description of the anticipated impacts on the natural features at each phase and at project completion that contains the following:
   a. An inventory of natural features proposed to be retained, removed, or modified. Natural features shall include, but are not limited to, wetlands, significant stands of trees or individual trees greater than 12 inches dbh, floodways, floodplains, waterbodies, identified groundwater vulnerable areas, slopes greater than 20 percent, ravines, and vegetative cover types with potential to sustain significant or endangered wildlife.
   b. Description of the impacts on natural features.
   c. Description of any proposed efforts to mitigate any negative impacts.

   The natural features assessment may be waived by the Director of Community Planning and Development in certain circumstances.

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M. Any other information specified by the Director of Community Planning and Development which is deemed necessary to evaluate the application.

N. In addition to the above requirements, for zoning districts, **RD, RC, RCC, RN, and CV** and **Group Housing Residential Developments** the following is required:

1. Existing and proposed contours of the property at two foot intervals based on United States Geological Survey (USGS) data.
2. Preliminary engineering reports in accordance with the adopted Township water and sewer standards, together with a letter of review from the Township Engineer.
3. Ten copies of a report on the intent and scope of the project including, but not limited to: Number, size, volume, and dimensions of buildings; number and size of living units; basis of calculations of floor area and density and required parking; number, size, and type of parking spaces; architectural sketches of proposed buildings.
4. Seven copies of the project plans which the Township shall submit to local agencies for review and comments.

O. In addition to the above requirements, a special use application in zoning district **RP** requires the following material as part of the site plan:

1. A description of the operations proposed in sufficient detail to indicate the effects of those operations in producing traffic congestion, noise, glare, air pollution, water pollution, fire hazards or safety hazards or the emission of any potentially harmful or obnoxious matter or radiation.
2. Engineering and architectural plans for the treatment and disposal of sewerage and industrial waste tailings, or unusable by-products.
3. Engineering and architectural plans for the handling of any excessive traffic congestion, noise, glare, air pollution, or the emission of any potentially harmful or obnoxious matter or radiation.

P. In addition to the above requirements, a special use application for a use in the Floodway Fringe of zoning district **CV** requires the following:

1. A letter of approval from the State Department of Environmental Quality.
2. A location map including existing topographic data at two-foot interval contours at a scale of one inch representing 100 feet.
3. A map showing proposed grading and drainage plans including the location of all public drainage easements, the limits, extent, and elevations of the proposed fill, excavation, and occupation.
4. A statement from the County Drain Commissioner, County Health Department, and Director of Public Works and Engineering indicating that they have reviewed and approved the proposal.

Q. In addition to the above requirements, a special use application for a use in the Groundwater Recharge area or zoning district **CV** requires the following:

1. A location map including existing topographic data at two-foot interval contours.
2. A map showing proposed grading and drainage plans including the location of all public drainage easements, the limits and extent of the proposed fill, excavation, and occupation.
3. A statement from the County Drain Commissioner, County Health Department, and Director of Public Works and Engineering indicating that they have reviewed and approved the proposal.

R. In addition to the above requirements, the Township Code of Ordinances, Article VI, should be reviewed for the following special uses: group housing residential developments, mobile home parks, nonresidential structures and uses in residential districts, planned community and regional shopping center developments, sand or gravel pits and quarries, sod farms, junk yards, sewage treatment and disposal installations, camps and clubs for outdoor sports and buildings greater than 25,000 square feet in gross floor area.

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Part II

SUP REQUEST STANDARDS
Township Code of Ordinances, Section 86-126

Applications for Special Land Uses will be reviewed with the standards stated below. An application that complies with the standards stated in the Township Ordinance, conditions imposed pursuant to the Ordinance, other applicable Ordinances, and State and Federal statutes will be approved. Your responses to the questions below will assist the Planning Commission in its review of your application.

(1) *The project is consistent with the intent and purposes of this chapter.*

(2) The project is consistent with applicable land use policies contained in the Township's Master Plan of current adoption.

(3) The project is designed, constructed, operated, and maintained so as to be harmonious and appropriate in appearance with the existing or intended character of the general vicinity and that such a use will not change the essential character of the same area.

(4) The project will not adversely affect or be hazardous to existing neighboring uses.

(5) The project will not be detrimental to the economic welfare of surrounding properties or the community.

(6) The project is adequately served by public facilities, such as existing roads, schools, stormwater drainage, public safety, public transportation, and public recreation, or that the persons or agencies responsible for the establishment of the proposed use shall be able to provide any such service.

(7) The project is adequately served by public sanitation facilities if so designed. If on-site sanitation facilities for sewage disposal, potable water supply, and storm water are proposed, they shall be properly designed and capable of handling the longterm needs of the proposed project.

(8) The project will not involve uses, activities, processes, materials, and equipment and conditions of operation that will be detrimental to any persons, property, or the general welfare by reason of excessive production of traffic, noise, smoke, fumes, glare, or odors.

(9) The project will not directly or indirectly have a substantial adverse impact on the natural resources of the Township, including, but not limited to, prime agricultural soils, water recharge areas, lakes, rivers, streams, major forests, wetlands, and wildlife areas.

Part III

I (we) hereby grant permission for members of the Charter Township of Meridian's Boards and/or Commissions, Township staff member(s) and the Township's representatives or experts the right to enter onto the above described property (or as described in the attached information) in my (our) absence for the purpose of gathering information including but not limited to the taking and the use of photographs.

☒ Yes ☐ No (Please check one)

By the signature(s) attached hereto, I (we) certify that the information provided within this application and accompanying documentation is, to the best of my (our) knowledge, true and accurate

April 23, 2018

Signature of Applicant: MERIDIAN INVESTMENT GROUP, LLC Date

BY: SCOTT A CHAPPELLE, ITS: AUTHORIZED SIGNATORY
Type/Print Name

Fee: $700 Received by/Date: Peter Menser 5-25-18

APR 25 2018

4/16/18

ECKHARDT & ASSOCIATES, P.C.

ATTORNEYS AT LAW

April 25, 2018

Mr. Mark Kieselbach
Director
Community Planning and Development
Meridian Charter Township
5151 Marsh Road
Okemos, Michigan 48864

RE: 2875 Northwind Drive
MUPUD and SUP Application

Mr. Kieselbach:

This office represents Meridian Investment Group LLC. I have enclosed completed applications and related fees requesting approval of a Mixed Use Planned Unit Development and a Special Use Permit for the above-referenced property. This proposed "redevelopment" contains 4.891 acres and will have 88 dwelling units and approximately 3,100 square feet of office/retail pace.

In addition, the following documents are enclosed: Legal Description, Warranty Deed, Trip generation comparison, Wetlands Verification, Environmental Permits Checklist, Health Impact Assessment, 21 sets of full-size scalable civil drawings and 21 sets of color 11" x 17" architectural drawings, along with a material sample board. A "Natural Features" assessment was not performed as this is a "redevelopment" of an existing developed site. A MDEQ permit application has been filed, for work being performed within the 100 year floodplain.

We understand that a Planning Commission, public hearing will be scheduled for Monday, May 21 at 7:00 p.m. concerning the requested applications.

Sincerely,

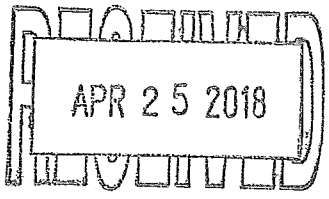
Eckhardt & Associates, PC

Thomas R. Eckhardt

Enclosures

2875 Northwind Drive, Suite 235
East Lansing, MI 48823

TELEPHONE:
(517) 336-6736
FACSIMILE:
(517) 336-4499



To: **Planning Commission**

From: **Peter Menser, Principal Planner**

Date: **June 7, 2018**

Re: **<u>Special Use Permit #18041 (Meridian Investment Group, LLC)</u>, place fill in the floodplain of the Red Cedar River to facilitate parking lot improvements at 2875 Northwind Drive.**

Meridian Investment Group, LLC has submitted a mixed use planned unit development (MUPUD #18034) proposal for a project identified as Red Cedar Manor. The proposal includes the demolition of an existing two-story, 40,504 square foot office building at 2875 Northwind Drive and construction of a new three-story, 70,213 square foot mixed use building in approximately the same footprint. The new building will have a total of 88 apartments and 3,115 square feet of commercial space.

In addition to the MUPUD, special use permits (SUP) are required for constructing a building totaling more than 25,000 square feet in gross floor area (SUP #18031) and for grading and fill activities in the floodplain of the Red Cedar River (SUP #18041). The special use permits are being processed concurrently with the MUPUD request. This staff report focuses on the proposed work in the floodplain of the Red Cedar River. The staff report for MUPUD #18034 should be referenced for a more complete overview of the project.

Floodplain

The property is located in both the floodplain and floodway of the Red Cedar River. The applicant is proposing to place 357 cubic yards of fill in the floodplain to facilitate re-grading of the parking lot to address existing steep slopes related to ADA and Ingham County Road Department standards for parking lots. A 481 cubic yard detention basin is proposed to the west of the parking lot to provide storm water pre-treatment and serve as compensating excavation for the fill in the floodplain.

Section 86-436(l) of Code of Ordinances allows the placement of fill in the floodplain, subject to the provision of an equal or greater compensating cut in the floodplain to maintain flood water impoundment capacity and approval of a special use permit from the Planning Commission. A compensating cut of 481 cubic yards has been provided to maintain the impoundment capacity of the floodplain.

Staff Analysis

The special use permit review criteria found in Section 86-126 of the Code of Ordinances should be used when evaluating the proposed special use permit. Section 86-436(n) of the Code of Ordinances provides additional standards for projects in the floodplain, which are as follows:

1. All new residential structures and residential structures requiring substantial improvement shall have the lowest floor, including basement, elevated to one foot above the level of the base flood elevation.

2. All new nonresidential structures and nonresidential structures requiring substantial improvements shall have the lowest floor, including basement, elevated to one foot above the level of the base flood elevation or shall be floodproofed to one foot above the level of the base flood elevation.

3. Excavation and shaping of the floodway fringe shall be conducted in such a manner as to maintain or improve the natural impoundment capacity of the base flood elevation. In no case shall the impoundment capacity of the floodway fringe be reduced.

Both the existing and proposed building on the property are located outside of the floodplain. The lowest floor of the new building will be located one foot above the floodplain elevation of 840.9. The applicant will be required to demonstrate via elevation survey during and after construction that the building is outside of the floodplain. The placement of 357 cubic yards of fill in the floodplain, when considered along with the compensating cut of 481 cubic yards for the detention basin, will not reduce the impoundment capacity of the floodplain.

In addition to the required special use permit, the applicant has also applied for a Michigan Department of Environmental Quality (MDEQ) permit for the work in the floodplain. If the Planning Commission considers approval of the special use permit, staff suggests conditioning approval on issuance of the MDEQ permit.

Prior to the next Planning Commission discussion of this special use permit request the applicant will submit a revised plan showing the location of the floodway on the property. The site plan submitted by the applicant does not indicate the location of the floodway on the property. The Code of Ordinances does not allow a parking lot related to a residential or commercial development in the floodway. The applicant's engineer has indicated the proposed work on the property is located outside of the floodway; however a revised plan is needed to confirm this statement. Additionally, pending submittal of the revised plan, the Director of Public Works and Engineering will provide a written statement concerning feasibility of the proposal and a recommendation on the project.

Planning Commission Options

The Planning Commission may recommend approval, approval with conditions, or denial of the proposed special use permit. A resolution will be provided at a future meeting.

Attachment

1. Application and attachments.

CHARTER TOWNSHIP OF MERIDIAN
DEPARTMENT OF COMMUNITY PLANNING AND DEVELOPMENT
5151 MARSH ROAD, OKEMOS, MI 48864
PLANNING DIVISION PHONE: (517) 853-4560, FAX: (517) 853-4095

SPECIAL USE PERMIT APPLICATION

Before submitting this application for review, an applicant may meet with the Director of Community Planning and Development to discuss the requirements for a special use permit and/or submit a conceptual plan for review to have preliminary technical deficiencies addressed prior to submittal of the application. If the property or land use is located in the following zoning districts RD, RC, RCC, RN then the applicant must meet with the Planning Director to discuss technical difficulties before filing a formal application.

Part I

A. Applicant MERIDIAN INVESTMENT GROUP, LLC - C/O ECKHARDT & ASSOCIATES
Address of Applicant 2875 NORTHWIND DR. STE 235, EAST LANSING, MI 48823
Telephone - Work 517-664-4119 Home ____ Fax 517-664-4144 Email TONE@C-DEV.COM
Interest in property (circle one) (Owner) Tenant Option Other
(Please attach a list of all persons with an ownership interest in the property.)

B. Site address / location / parcel number 2875 NORTHWIND DR / 33-02-02-20-128-003
Legal description (please attach if necessary) SEE ATTACHED
Current zoning PO
Use for which permit is requested / project name, WORK IN 100 YR FLOOD PLAIN, RED CEDAR MANOR
Corresponding ordinance number

C. Developer (if different than applicant) SAME
Address
Telephone – Work ____ Home ____ Fax ____

D. Architect, Engineer Planner or Surveyor responsible for design of project if different from applicant:
Name KEBS INC - JEFF KYES
Address 2116 HASLETT RD. HASLETT, MI. 48840
Telephone - Work 517-339-1014 Home ____ Fax 517-339-8047

E. Acreage of all parcels in the project: Gross 4.091 Net 4.091

F. Explain the project and development phases: REDEVELOPMENT - SINGLE PHASE

G. Total number of:
Existing: structures 1 bedrooms ____ offices X parking spaces ____ carports ____ garages
Proposed: structures 1 bedrooms 107 offices ____ parking spaces ____ carports ____ garages

H. Square footage: existing buildings 40,301 proposed buildings 70,213
Usable Floor area: existing buildings SAME proposed buildings SAME

I If employees will work on the site, state the number of full time and part time employees working per shift and hours of operation:

J. Existing Recreation: Type NONE Acreage 0
Proposed Recreation: Type SEE ATTACHED PLANS Acreage ____
Existing Open Space: Type LAWN Acreage 2.95 AC
Proposed Open Space: Type LAWN Acreage 3.10 AC

RECEIVED
MAY 17 2018

5/11/18

M. Any other information specified by the Director of Community Planning and Development which is deemed necessary to evaluate the application.

N. In addition to the above requirements, for zoning districts, **RD, RC, RCC, RN, and CV** and **Group Housing Residential Developments** the following is required:

1. Existing and proposed contours of the property at two foot intervals based on United States Geological Survey (USGS) data.
2. Preliminary engineering reports in accordance with the adopted Township water and sewer standards, together with a letter of review from the Township Engineer.
3. Ten copies of a report on the intent and scope of the project including, but not limited to: Number, size, volume, and dimensions of buildings; number and size of living units; basis of calculations of floor area and density and required parking; number, size, and type of parking spaces; architectural sketches of proposed buildings.
4. Seven copies of the project plans which the Township shall submit to local agencies for review and comments.

O. In addition to the above requirements, a special use application in zoning district **RP** requires the following material as part of the site plan:

1. A description of the operations proposed in sufficient detail to indicate the effects of those operations in producing traffic congestion, noise, glare, air pollution, water pollution, fire hazards or safety hazards or the emission of any potentially harmful or obnoxious matter or radiation.
2. Engineering and architectural plans for the treatment and disposal of sewerage and industrial waste tailings, or unusable by-products.
3. Engineering and architectural plans for the handling of any excessive traffic congestion, noise, glare, air pollution, or the emission of any potentially harmful or obnoxious matter or radiation.

P. In addition to the above requirements, a special use application for a use in the Floodway Fringe of zoning district **CV** requires the following:

1. A letter of approval from the State Department of Environmental Quality.
2. A location map including existing topographic data at two-foot interval contours at a scale of one inch representing 100 feet.
3. A map showing proposed grading and drainage plans including the location of all public drainage easements, the limits, extent, and elevations of the proposed fill, excavation, and occupation.
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Q In addition to the above requirements, a special use application for a use in the Groundwater Recharge area or zoning district **CV** requires the following:

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R In addition to the above requirements, the Township Code of Ordinances, Article VI, should be reviewed for the following special uses: group housing residential developments, mobile home parks, nonresidential structures and uses in residential districts, planned community and regional shopping center developments, sand or gravel pits and quarries, sod farms, junk yards, sewage treatment and disposal installations, camps and clubs for outdoor sports and buildings greater than 25,000 square feet in gross floor area.

MAY 17 2018

5/11/18

Part II

SUP REQUEST STANDARDS
Township Code of Ordinances, Section 86-126

Applications for Special Land Uses will be reviewed with the standards stated below. An application that complies with the standards stated in the Township Ordinance, conditions imposed pursuant to the Ordinance, other applicable Ordinances, and State and Federal statutes will be approved. Your responses to the questions below will assist the Planning Commission in its review of your application.

(1) The project is consistent with the intent and purposes of this chapter.

(2) The project is consistent with applicable land use policies contained in the Township's Master Plan of current adoption.

(3) The project is designed, constructed, operated, and maintained so as to be harmonious and appropriate in appearance with the existing or intended character of the general vicinity and that such a use will not change the essential character of the same area.

(4) The project will not adversely affect or be hazardous to existing neighboring uses.

(5) The project will not be detrimental to the economic welfare of surrounding properties or the community.

(6) The project is adequately served by public facilities, such as existing roads, schools, stormwater drainage, public safety, public transportation, and public recreation, or that the persons or agencies responsible for the establishment of the proposed use shall be able to provide any such service.

(7) The project is adequately served by public sanitation facilities if so designed. If on-site sanitation facilities for sewage disposal, potable water supply, and storm water are proposed, they shall be properly designed and capable of handling the longterm needs of the proposed project.

(8) The project will not involve uses, activities, processes, materials, and equipment and conditions of operation that will be detrimental to any persons, property, or the general welfare by reason of excessive production of traffic, noise, smoke, fumes, glare, or odors.

(9) The project will not directly or indirectly have a substantial adverse impact on the natural resources of the Township, including, but not limited to, prime agricultural soils, water recharge areas, lakes, rivers, streams, major forests, wetlands, and wildlife areas.

Part III

I (we) hereby grant permission for members of the Charter Township of Meridian's Boards and/or Commissions, Township staff member(s) and the Township's representatives or experts the right to enter onto the above described property (or as described in the attached information) in my (our) absence for the purpose of gathering information including but not limited to the taking and the use of photographs.

☒ Yes ☐ No (Please check one)

By the signature(s) attached hereto, I (we) certify that the information provided within this application and accompanying documentation is, to the best of my (our) knowledge, true and accurate

April 23, 2018

Signature of Applicant: MERIDIAN INVESTMENT GROUP, LLC Date

BY: SCOTT A CHAPPELLE, ITS: AUTHORIZED SIGNATORY
Type/Print Name

Fee: $700.00

Received by/Date: $700.00 5/17/18

MAY 17 2018

5/11/18

Special Use Permit

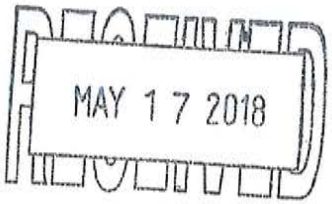
Red Cedar Manor

Meridian Investment Group is requesting a Special Use Permit for 2875 Northwind Drive. Meridian Charter Township ordinance requires a Special Use Permit be obtained for any work that is performed within a 100 year flood plain.

Red Cedar Manor is a redevelopment. The redevelopment consists of the removal of the existing building and a portion of the existing parking, which is located in the 100 year flood plain. The work in the 100 year flood plain is required to regrade a portion of the existing parking lot to conform to Township standards, where grades are steeper than 5%. Concrete curbs and sidewalks will be added around the parking area in the flood plain. The existing parking lot does not comply with current water quality standards, thus a sediment basin will be added to comply with the water quality standards.

As a result of the work in the 100 year flood plain, the flood plain area will be increased in size by about 3500 square feet, thus increasing the existing pervious area of the site.

A Michigan Department of Environmental Quality application has been filed, for the required work. The application shows a net cut in the flood plain of 124 cubic yards. A copy of the application is attached to the Special Use Permit application.



U.S. Army Corps of Engineers
Detroit District Office
Phone: 313-226-2218, Fax: 313-226-6763
Website: www.lre.usace.army.mil

Michigan Department of Environmental Quality
Water Resources Division
See staff map on page iii for contact information
Website: www.mi.gov/jointpermit

Joint Permit Application

For Work in Inland Lakes and Streams, Great Lakes, Wetlands, Floodplains, Dams, High Risk Erosion Areas and Critical Dune Areas

www.mi.gov/jointpermit

What is the purpose of the Joint Permit Application?	This Joint Permit Application was developed to facilitate the state and federal permit application process administered by the Michigan Department of Environmental Quality (DEQ) and the U.S. Army Corps of Engineers (USACE). The Joint Permit Application is a multi-purpose application used to describe and quantify proposed activities regulated by the DEQ and/or the USACE. This application is for those activities regulated by the following Parts of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended by the State of Michigan. • Part 301, Inland Lakes and Streams • Part 325, Great Lakes Submerged Lands • Part 303, Wetlands Protection • Floodplain Regulatory Authority found in Part 31, Water Resources Protection • Part 315, Dam Safety • Part 323, Shorelands Protection and Management (High Risk Erosion Areas) • Part 353, Sand Dunes Protection and Management (Critical Dune Areas) The regulated activities are summarized in Appendix D. The statutes and rules are available at www.mi.gov/jointpermit. This application is also for those activities regulated by the USACE within the waters of the United States under Section 10, Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404, Clean Water Act of 1977 (33 U.S.C. 1344). Preapplication Meeting: This is an optional service available for activities proposed in inland lakes and streams (Part 301), wetlands (Part 303), and critical dune areas (Part 353). A preapplication meeting can answer many questions regarding whether or not a permit is required and the review process. The application form and fee schedule are available at www.mi.gov/jointpermit.
How do I complete the Joint Permit Application? *An accurate and complete application package is required for processing; inaccurate or missing information will delay processing.*	**There are three parts to a complete Joint Permit Application package:** 1. Application Form 2. Maps and Drawings 3. Fee Follow the checklists on the following page for each part of the application package. **When you have questions or need assistance in completing the application package refer to the following information on our website www.mi.gov/jointpermit or you may contact the appropriate district office, page iii, or through the website link "Who to Contact."** • Joint Permit Application Training Manual • EZ Guides for small projects • Acronyms in Appendix A • Sample drawings in Appendix B • Minor Project and General Permit Categories in Appendix C • Fee schedule in Appendix C • State and Federal Authority and Penalties in Appendix D • Glossary in Appendix E RECEIVED MAY 17 2018

Application Checklist

The following website will provide township, range, section, latitude and longitude information:

www.mcgi.state.mi.us /wetlands/

www.geocoder.us

In each section check all boxes that apply to your project.

Show and label property lines on the site plan.

Label existing and proposed contours, dimensions, excavation and/or fill on the site plans and cross sections.

Provide tables for multiple impact areas.

1. Application Form

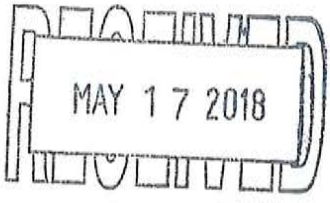
- ☐ Complete Sections 1 through 9 of the application form.
- ☐ An authorization letter from the property owner if someone other than the property owner is signing the application.
- ☐ Complete those Sections 10 through 20 that apply to your project. Follow the instructions at the beginning of each section. For additional information, the instructions for each sample drawing in Appendix B indicate the application sections you will most likely need to complete. Complete the application form as much as possible before adding attachments. Label each attachment with the applicant's name.
- ☐ Stake or flag the area for site inspection including the property corners, proposed road or driveway centerlines, and areas of proposed impacts. The site must be flagged when the application is submitted.

2. Maps and Drawings

- ☐ All maps and drawings must be black and white, legible, reproducible, and sized to 8.5" x 11". Aerial photographs do not substitute for site plans. If larger drawings or blueprints are required to show adequate detail for review, you may also submit one full size copy.
- ☐ Vicinity Map: A map to the proposed project location that includes ALL streets, roads, intersections, highways, or cross-roads to the project. Do not assume review staff knows your project location.
- ☐ Project Site Plan: Overhead drawings to scale or with dimensions, length and width, of the proposed project are required. Show and label property lines on the site plan.
- ☐ Cross-section drawings are required. Provide the cross-sections and profile views to scale or with dimensions, length, width, and height.
- ☐ Elevation data must include a description of the reference point or benchmark used and its corresponding elevation. For projects on the Great Lakes or Section 10 Waters, elevations must be provided in IGLD 85. For observed Great Lake water elevations in IGLD, visit the USACE website under "water levels". If elevations are from still water, provide the observation date and water elevation. On inland sites, elevations can use NGVD 29, NAVD 88, a local datum or an assumed bench mark.
- ☐ Provide descriptive photographs of the proposed work site showing vegetation if wetlands are involved or the shoreline for shore protection projects. All photographs must be labeled with your name and the date of the photograph, indicate what they show, and be referenced to the site plan. Proposed activities or structure(s) may be indicated directly on the photographs using indelible markers or ink pens. Provide aerial photographs 1:400 or larger for major projects.

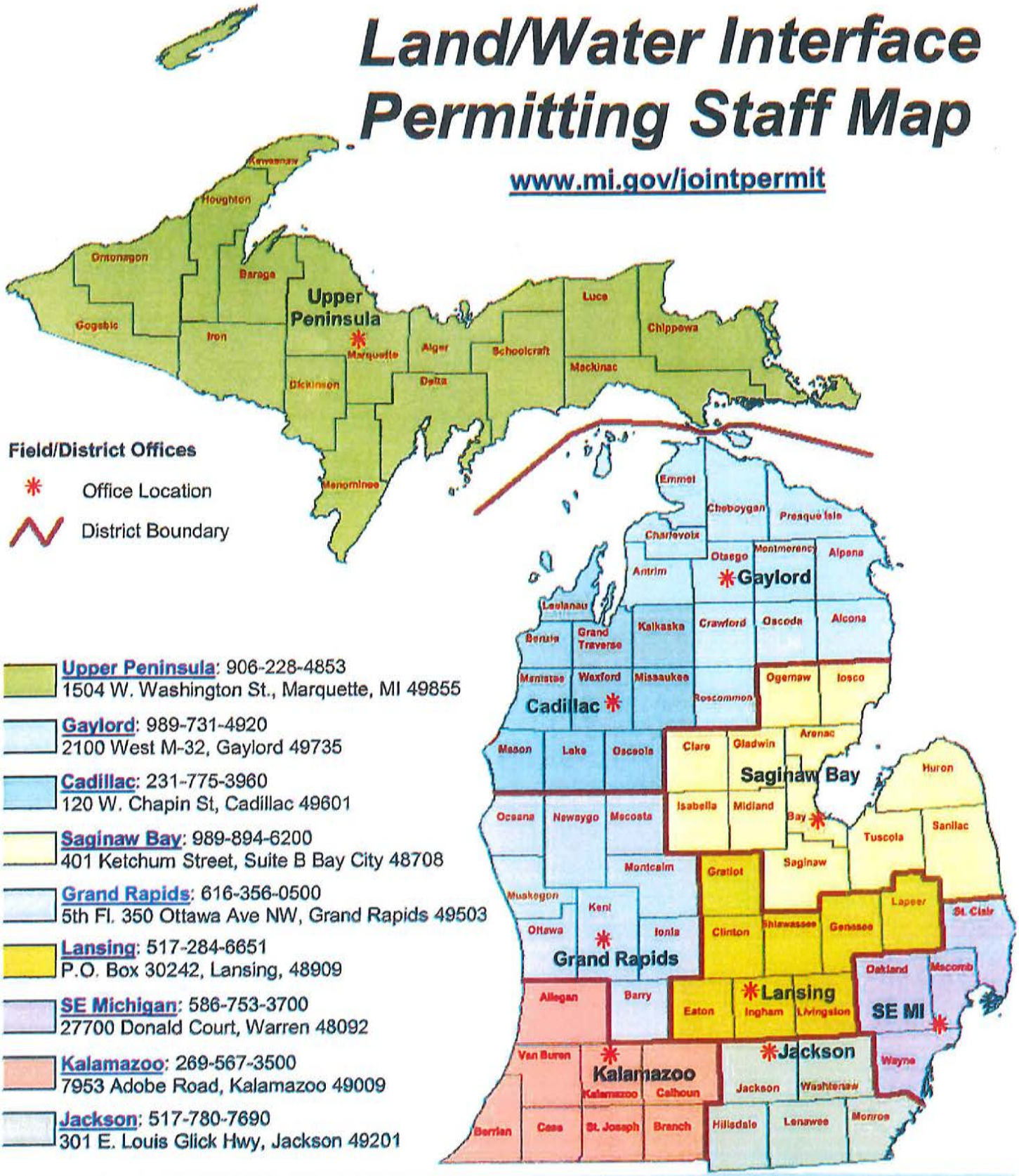
3. Fee

- ☐ Payment to the **State of Michigan.** Fees typically range from $50 to $4,000 depending on the type of project. Refer to Appendix C of the application and/or visit www.mi.gov/jointpermit to determine the appropriate fee for your project and for directions to pay by credit card or electronic fund transfer payment.
- ☐ Applications should be sent directly to the district offices. Please refer to page iii, or refer to www.mi.gov/jointpermit "who to contact" for address and/or phone number. Applications that cross county boundaries should be sent to the district containing the primary work effort.
- ☐ Applications for dams regulated under Part 315 or from public agencies eligible to receive federal and/or state transportation funding for a project involving public roadways, non-motorized paths, airports, or related facilities should be mailed to: DEQ, WRD, P.O. BOX 30458, LANSING, MI 48909-7958.



Land/Water Interface Permitting Staff Map

www.mi.gov/jointpermit



Field/District Offices

- Office Location
- District Boundary

- **Upper Peninsula**: 906-228-4853
  1504 W. Washington St., Marquette, MI 49855
- **Gaylord**: 989-731-4920
  2100 West M-32, Gaylord 49735
- **Cadillac**: 231-775-3960
  120 W. Chapin St, Cadillac 49601
- **Saginaw Bay**: 989-894-6200
  401 Ketchum Street, Suite B Bay City 48708
- **Grand Rapids**: 616-356-0500
  5th Fl. 350 Ottawa Ave NW, Grand Rapids 49503
- **Lansing**: 517-284-6651
  P.O. Box 30242, Lansing, 48909
- **SE Michigan**: 586-753-3700
  27700 Donald Court, Warren 48092
- **Kalamazoo**: 269-567-3500
  7953 Adobe Road, Kalamazoo 49009
- **Jackson**: 517-780-7690
  301 E. Louis Glick Hwy, Jackson 49201

DEQ Water Resources Division 517-284-5567

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APPENDICES

Appendix A: Acronyms and Abbreviations A-1

Appendix B: Sample Drawings

1. General Instructions for all Drawings and Sample Site Location Maps B-1
2. Inland Lake Shore Protection B-2
3. Bulkhead/Seawall B-2
4. Pond Construction B-3
5. Floodplain Fill B-3
6. Wetland Boardwalk B-4
7. Dredging B-4
8. Driveway Across Wetland B-5
9. Residential Wetland Fill and Boardwalk Construction B-5
10. Docks - Piers - Mooring Piles B-6
11. Beach Sanding B-6
12. Pipe/Utility Crossings in a Trench B-7
13. Pipe/Utility Crossings using Directional Bore B-7
14. Bridge or Culvert (4 drawings) B-8
15. Dam Construction B-12
16. Water Intake B-12
17. Great Lakes Shore Protection B-13
18. Maintenance Dredge Channel B-13
19. Proposed Residence in a High Risk Erosion Area B-14
20. Proposed Residence in a Critical Dune Area B-14
21. Marina Site Plan B-15
22. Outlet Pipe B-16
23. Temporary Logging Road Crossing B-16

Appendix C: Fees and Categories for Minor Project and General Permit for Minor Activities C-1

Appendix D: State Authority, Federal Authority, Privacy Act Statement, and State and Federal Penalties D-1

Appendix E: Glossary (listed words are italicized in the application package) E-1

Application status can be viewed on the Water Resources Division (WRD) website at www.deq.state.mi.us/CIWPIS. During the application period, if any information is missing from the application or if any clarification is needed regarding materials provided, the application is incomplete and staff will request the information from the applicant/agent by letter, email, fax or phone call. If a complete response is not provided within 30 days, the application will be closed. Some regulatory parts allow extensions if requested within the 30 day time frame. Once the WRD has received the information necessary for review of the project, including a thoroughly completed application, consistent drawings that have adequate detail for review and the full application fee, the file will be reviewed for final processing. A mailed postcard or a public notice will provide the file number and the telephone number of the office where the application is being processed. The review time to determine if an application is complete for processing ranges from 15 to 30 days. Technical processing times, after the application is administratively complete, may range from 60 to 90 days. Processing times will be longer if a public hearing is held. Staff from your local District/Field Office may visit the project site and may request additional information prior to a decision on the application. Application fees are not refundable or transferable.

If a federal permit will also be required, a copy of the permit application will be sent to the Detroit District Office, USACE, for processing at the federal level. Additional copies of this application form can be downloaded from the WRD website at www.mi.gov/jointpermit or can be photocopied from the original. If you have any questions about the permitting process or if you need to modify your application, you can contact the WRD by phone or fax at the addresses on the previous page, or email at DEQ-WRD-jointpermit@michigan.gov.

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U.S. Army Corps of Engineers www.lre.usace.army.mil Michigan Department of Environmental Quality www.mi.gov/jointpermit DEQ

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.mcgi.state.mi.us/wetlands/*

Project Address (road, if no street address)	Zip Code	Municipality (Township/Village/City)	County
2875 NORTHWIND DRIVE	48823	MERIDIAN CHARTER TOWNSHIP	INGHAM

Property Tax Identification Number(s)	Latitude	Township/Range/Section (TRS)
33-02-02-20-128-003	42.7248 N	T 4 N or S; R 1 E or W; Sec 20
Subdivision/Plat and Lot Number	Longitude - 84.4560 W	OR Private Claim # ____

2 Applicant and Agent Information

Owner/Applicant (individual or corporate name)	Agent/Contractor (firm name and contact person)
MERIDIAN INVESTMENT GROUP, LLC	KEBS, INC. - JEFF KYES
Mailing Address 5000 NORTHWIND DRIVE, SUITE 120	Mailing Address 2116 HASLETT ROAD
City EAST LANSING State MI Zip Code 48823	City HASLETT State MI Zip Code 48840
Contact Phone Number 517-664-1411 Fax 517-664-4151	Contact Phone Number 517-339-1014 Fax 517-339-8047
Email scottc@c-devco.com	E-mail jkyes@kebs.com

☐ No ☒ 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 RED CEDAR MANOR	Preapplication File Number – – –P
Name of Water body RED CEDAR RIVER	Date project staked/flagged

The proposed project is on, within, or involves (check all that apply)

☐ an inland lake (5 acres or more)
☐ a pond (less than 5 acres)
☒ a stream, river, ditch or drain
☐ a legally established County Drain
Date Drain was established
☐ a channel/canal
☒ 500 feet of an existing water body
☐ a Great Lake or Section 10 Waters
☐ a wetland
☒ a 100-year floodplain
☐ a dam
☐ a designated high risk erosion area
☐ a designated critical dune area
☐ a designated environmental area

Project Use

☐ private
☒ commercial
☐ public/government
☐ project is receiving federal/state transportation funds
☐ Wetland Restoration
☐ other

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 *REMOVE EXISTING BUILDING AND PART OF EXISTING ASPHALT PARKING. CONSTRUCT NEW BUILDING , REGRADE PORTION OF PARKING AREA AS NEEDED TO ELIMINATE GRADES IN EXCESS OF 5% FOR TOWNSHIP STANDANDS, ADD WALKS AND CURBS. ADD SEDIMENT BASIN FOR WATER QUALITY STANDARDS AND PROVIDE COMPENSATING CUT FOR FILL IN FLOOD PLAIN.*

Construction Sequence and Methods *INSTALL SOIL EROSION MEASURES, REMOVE EXISTING BUILDING, CONSTRUCT NEW BUILDING, REGRADE PARKING AND ADD CURB AND WALKS WHERE REQUIRED. REVEGETATE DISTURBED AREAS.*

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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.

REMOVE EXISTING BUILDING AND PARKING AREAS TO PROVIDE FOR NEW BUILDING ANDD PARKING AREA. IMPROVE PUBLIC SAFETY BY ELIMITATING ELIMINATING PARKING AND SIDEWALK GRADES THAT ARE CUUERNTLY OVER 5%

Describe the alternatives considered to avoid or minimize resource impacts. Include factors such as, but to limited to, alternative locations, project layout and design, and construction technologies. For utility crossings include alternative routes and construction methods.

IT WAS ORIGINALLY CONSIDERED TO LEAVE THE EXISTING PARKING LOT IN PLACE AND ONLY RECONSTRUCT THE BUILDING; HOWEVER, THE EXISTING PARKING LOT HAS TOO STEEP A GRADE TO MEET CURRENT ADA AND TOWNSHIP SLOPE REQUIREMENTS. THE EXISTING SITE ALSO DIRECTLY DISCHARGES PARKING LOT DRAINAGE TO THE RIVER AND EXISTING WETLAND WITHOUT ANY TREATMENT. THE PROPOSED DESIGN ALLOWS THE PARKING LOT TO BE RECONSTRUCTED TO MEET SLOPE STANDARDS, REDUCES IMPERVIOUS AREA ON THE SITE, AND ALLOWS FOR CONSTRUCTION OF AN OUTLET CONTROLLED DETENTION AREA FOR PRETREATMENT PRIOR TO DISCHARGE.

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

Names of roads of closest intersection HAGADORN RD AND GRAND RIVER AVE

Directions from main intersection to the project site, with distances from the best and nearest visible landmark and water body EAST ON GRAND RIVER AVE ±1/4 MILE TO NORTHWIND DRIVE, SOUTH ON NORTHWIND DR ±1,000 FT TO CUL-DE-SAC PARKING AREA. PROPERTY IS SOUTH OF CUL-DE-SAC PARKING AREA.

Description of buildings on the site *(color; 1 or 2 story, other)*	Description of adjacent landmarks or buildings *(address; color; etc)*
EXISTING 2-STORY WHITE OFFICE BUILDING	TOWER AT CAMPUS VIEW (7-STORY) RESIDENTIAL BUILDING ON WEST SIDE OF PARKING CUL-DE-SAC

How can your site be identified if there is no visible address? BUILDING AND PARKING AREA DIRECTLY SOUTH OF PARKING CUL-DE-SAC AT SOUTH END OF NORTHWIND DRIVE

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
MERIDIAN CHARTER TOWNSHIP	SPECIAL USE PERMIT FOR WORK IN FLOODPLAIN		TO BE APPLIED FOR		
INGHAM COUNTY DRAIN COMMISSIONER	SOIL EROSION PERMIT		TO BE APPLIED FOR		

7 Compliance

If a permit is issued, when will the activity begin? (M/D/Y) AUGUST 2018 | Proposed completion date (M/D/Y) OCTOBER 2019

☒ 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.*

☐ Established Lake Board ☐ Lake Association	Contact Person	Mailing Address	City	State and Zip Code

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.

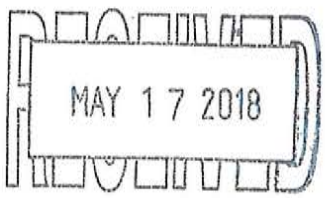
Property Owner's Name	Mailing Address	City	State and Zip Code
2900 PLACE APARTMENTS MJW, LLC & 2900 PLACE APPARTMENTS INVESTORS LLC	1640 5TH STREET,	SANTA MONICA	CA. 90401
LANSING HEALTH CARE CENTER, INC. C/O MIDWEST PROPERTY TAX ASSOC.	744 CARLE AVE.	LEWIS CENTER	OH. 43035
RED CEDAR FLATS LLC	5000 NORTHWIND #120	EAST LANSNG	MI. 48823

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2751 STADIUM PLAZA LLC	525 w. WARWICK DRIVE	ALMA	MI. 48801

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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.			
☒ Property Owner ☐ Agent/Contractor ☐ Corp. or Public Agency / Title	Printed Name	Signature	Date



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) 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 *REGRADE PARKING*

Dimensions of fill (ft) Length Width Maximum Depth *SEE ATTACHED TABLE*	Total volume (cubic yards) *357*	Volume below OHWM (cubic yards) *0*
Maximum water depth in fill area (ft) *0*	Area filled (sq ft) *23524*	Will filter fabric be used under proposed fill? ☒ No ☐ Yes (If Yes, type)

Fill will extend *0* feet into the water from the shoreline and upland feet out of the water.

Type of clean fill ☐ peastone % ☐ sand % ☐ gravel % ☒ other *COMMERCIAL*

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.

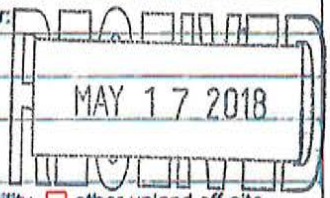
➡Attach a site plan and cross-section views to scale showing maximum and average dredge or excavation dimensions with calculations.

➡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 *REGRADING SITE, DETENTION BASIN*

Dimensions (ft) Length Width Maximum Depth *SEE ATTACHED TABLE*	Total volume (cu yds) *481*	Volume below OHWM (cu yds) *0*

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 ☐ on-site ☒ landfill ☐ USACE confined disposal facility ☐ 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?

☒ No ☐ 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 *7.0* width *4* depth *0.5*	Volume(cu yd) *0.5*
Riprap landward of the ordinary high water mark: dimensions (ft) length width depth	Volume(cu yd)

Type and size of riprap (inches)	Will filter fabric or pea stone be used under proposed riprap?
☐ field stone ☒ angular rock *.50* ☒ other *.50*	☐ No ☒ Yes, Type *AMOCO 4551*

☐ **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) ☐ bioengineering (ft) ☐ revetment (ft) ☐ riprap (ft) ☐ seawall/bulkhead (ft)	
Structure is ☐ new ☐ repair ☐ replacement of an existing structure	Will the existing structure be removed? ☐ No ☐ 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 ☐ brush bundles ☐ coir log ☐ live stakes ☐ tree revetment ☐ other	

☐ **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 ☐ open pile ☐ filled ☐ crib ☐ floating ☐ cantilevered ☐ spring piles ☐ piling clusters ☐ other	
Is the structure within the applicant's riparian area interest area? ☐ No ☐ Yes ➡ Show parcel property lines on the site plan.	
Proposed structure dimensions (ft) length width	Use ☐ private ☐ public ☐ commercial
Dimensions of nearest adjacent structures (ft) length width	Distance of dock from adjacent property lines (ft)

☐ **F. BOAT WELL** (See EZ Guide. Complete Sections 10A and 10B)

Dimensions (ft) length width depth	Number of boats
Type of sidewall stabilization ☐ concrete ☐ riprap ☐ steel ☐ vinyl ☐ wood ☐ other	
Volume of backfill behind sidewall stabilization (cu yd)	Distance of boat well from adjacent property lines (ft)

☐ **G. BOAT RAMP** (See EZ Guide. Complete sections 10A, 10B, and 10C for mattress and pavement fill, dredge, and riprap)

Type ☐ new ☐ existing ☐ maintenance/improvement		Use ☐ private ☐ public ☐ commercial
Existing overall boat ramp dimensions (ft) length width depth		Type of construction material ☐ concrete ☐ wood ☐ stone ☐ 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)

☐ **H. BOAT HOIST – ROOFS** (See EZ Guide)

Type ☐ cradle ☐ side lifter ☐ other	Located on ☐ seawall ☐ dock ☐ bottomlands
Hoist dimensions, including catwalks (ft) length width	
Area occupied, including cat walks (sq ft)	Distance of hoist from adjacent property lines (ft)
Permanent Roof ☐ No ☐ Yes ➡ If Yes, how is the roof supported?	Maximum Roof Dimensions (ft): length width height

☐ **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 ☐ on pilings ☐ on fill Dimensions (ft) length width	Deck ☐ on pilings ☐ on fill Dimensions (ft) length width	Boardwalk ☐ on pilings ☐ on fill Dimensions (ft) length width	Deck ☐ on pilings ☐ on fill Dimensions (ft) length width

☐ **J. INTAKE PIPES** (See Sample Drawing 16) or **OUTLET PIPES** (See Sample Drawing 22)

If outlet pipe, discharge is to ☐ inland lake ☐ stream, drain or river ☐ overland flow ☐ Great Lake ☐ wetland ☐ other			
Number of pipes	Pipe diameters and invert elevations	Does pipe discharge below the OHWM?	☐ No ☐ Yes
		Is the water treated before discharge?	☐ No ☐ Yes
Type ☐ headwall ☐ end section ☐ other		Dimensions of headwall OR end section (ft) length width height	

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☐ **K. MOORING and NAVIGATION BUOYS** (See EZ Guide for Sample Drawing)
➡Provide a site plan showing the distances between each buoy and from the shore to each buoy, and depth (ft) of water at each location.
➡Provide cross-section drawing(s) showing anchoring system(s) and dimensions.

Purpose of buoy ☐ mooring ☐ navigation ☐ scientific structures ☐ swimming ☐ other

Number of buoys	Dimensions of buoys (ft) width height swing radius chain length	Boat Lengths	Type of anchor system

Buoy Location: Latitude . N Longitude - . W. ➡ Provide a table for multiple buoys.

Do you own the property along the shoreline?	☐ No ☐ Yes	➡ If No, attach an authorization letter from the property owner(s).
Do you own the bottomlands?	☐ No ☐ Yes	➡ If No, attach an authorization letter from the property owner(s).

☐ **L. FENCES**
➡Provide an overall site plan showing the proposed fencing through streams, wetlands or floodplains.
➡Provide a drawing of fence profile showing the design, dimension, post spacing, mesh, and distance from ground to bottom of fence.

Purpose of fence ☐ Airport ☐ Cervidae ☐ Livestock ☐ Residential ☐ Security ☐ Other

Total length (ft) of fence through streams wetlands floodplains	Fence height (ft)	Fence type and material

☐ **M. OTHER** - e.g., structure removal, maintenance or repair, aerator, dry fire hydrant, gold prospecting, habitat structures, scientific measuring devices, soil borings, or survey activities.

Structure description, dimensions and volumes. Complete Sections 10A-C as applicable.

11 Expansion of an Existing or Construction of a New Lake or Pond (See Sample Drawings 4 and 15)
➡Complete Section 10J for outlets and Section 17 for water control structures.
➡Provide elevations, cross-sections and profiles of outlets, dams, dikes, water control structures and emergency spillways to nearest water bodies.

Which best describes your proposed water body use (check all that apply)
☐ mining ☐ recreation ☐ storm water retention basin ☐ wastewater basin ☐ wildlife ☐ other

Water source for lake/pond
☐ groundwater ☐ natural springs ☐ Inland Lake or Stream ☐ storm water runoff ☐ pump ☐ sewage ☐ other

Location of the lake/basin/pond ☐ floodplain ☐ wetland ☐ stream (inline) ☐ upland

Maximum dimensions (ft) length width depth	Maximum Area: ☐ acres ☐ sq ft

Has the there been a hydrologic study performed on the site?	☐ No ☐ Yes	➡ If Yes, provide a copy.
Has the DEQ conducted a wetland assessment for this parcel?	☐ No ☐ Yes	➡ If Yes, provide a copy or WIP number:
Has a professional wetland delineation been conducted for this parcel?	☐ No ☐ Yes	➡ If Yes, provide a copy with data sheets.

Spoils Disposal

Dredged or excavated spoils will be placed ☐ on-site ☐ landfill ☐ USACE confined disposal facility ☐ 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.

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12 Activities That May Impact Wetlands (See Sample Drawings 8 & 9). Complete other Sections as applicable.

- 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.
  - ➡ 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?	☒ No ☐ Yes	➡ If Yes, provide a copy or WIP number:
Has a professional wetland delineation been conducted for this parcel?	☐ No ☒ Yes	➡ If Yes, provide a copy with data sheets
Is there a recorded DEQ easement on the property?	☒ No ☐ Yes	➡ If Yes, provide the easement number
Did the applicant purchase the property before October 1, 1980?	☒ No ☐ Yes	➡ If Yes, provide documentation.
Is any grading or mechanized land clearing proposed?	☒ No ☐ Yes	➡ If Yes, label the locations on the site plan.
Has any of the proposed grading or mechanized land clearing been completed?	☒ No ☐ Yes	➡ If Yes, label the locations on the site plan

Proposed Activity

☐ boardwalk or deck (Section 10I)	☐ bridges and culverts (Section 14)	☐ designated environmental area
☐ dewatering	☐ draining surface water	☐ driveway / road
☐ fences (Section 10L)	☐ fill or dredge	☐ restoration
☐ septic system	☐ stormwater discharge (Section 10J)	☐ other

FILL	Dimensions maximum length (ft) maximum width (ft)	Area ☐ acres ☐ sq ft	Average depth (ft)	Volume (cu yd)
DREDGE	Dimensions maximum length (ft) maximum width (ft)	Area ☐ acres ☐ sq ft	Average depth (ft)	Volume (cu yd)

Spoils Disposal

Dredged or excavated spoils will be placed ☐ on-site ☐ landfill ☐ USACE confined disposal facility ☐ 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:
☒ public sewer ☐ private septic system
➡ Show system on plans.

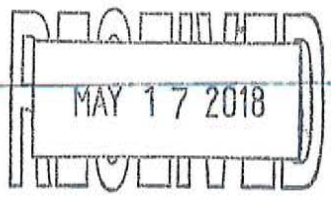
If a private septic system is proposed, has an application for a permit been made to the County Health Department? ☐ No ☐ Yes
If Yes, has a permit been issued? ☐ No ☐ Yes ➡ Provide a copy of the permit.

Describe the wetland impacts, the proposed use or development, and the alternatives considered:

Does the project impact more than 1/3 acre of wetland? ☐ No ☐ 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:

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.



13 Floodplain Activities (See Sample Drawing 5 and others. Complete other applicable sections.)

- For more information go to www.mi.gov/floodplainmanagement. This site also lists the projects and requirements for an expedited floodplain review under "Expedited Review Information for Minor Floodplain Projects."
- Examples of projects proposed within the non-floodway portions of the 100-year-floodplain which may qualify for an expedited review: Open pile decks and boardwalks; residences, commercial/industrial facilities, garages and accessory structures; parking lots; pavilions, gazebos, large community playground structures; residential swimming pools
- Examples of projects proposed within the floodway portions of the floodplain which may qualify for an expedited review: Open pile decks and boardwalks, (non-enclosed) that are anchored to prevent floatation and that do not extend over the bed and bank of a watercourse; parking lots constructed at grade or resurfacing that is no more than 4 inches above the existing grade; dry hydrants that do not require fill placement; scientific structure such as staff gauges, water monitoring devices, water quality testing devices, and core sampling devices which meet specific design criteria and fish structures that meet specific design criteria.
- For expedited review include:
  - ➡ Photographs of the work site labeled to identify what is being shown and with the direction of the photo clearly indicated. Include photographs of any river or stream adjacent to the project.
  - ➡ A letter or statement from the local unit of government acknowledging your proposed application. See the website for sample wording.
- A hydraulic analysis or hydrologic analysis may be required to fully assess floodplain impacts.
- The state building code requires an Elevation Certificate for any building construction or addition in a floodplain. A sample form can be found at www.fema.gov/nfip/elvinst.shtm.
  - ➡ Attach additional sheets or tables for multiple proposed floodplain activities and provide hydraulic calculations.
  - ➡ Show reference datum used on plans.

Proposed Activity ☒ fill ☒ excavation or cut ☐ other	100-year floodplain elevation (ft) (if known) *840.90* Datum ☐ NGVD 29 ☒ NAVD 88 ☐ other
Site is 5 feet above ☐ ordinary high water mark (OHWM) OR ☒ observed water level. Date of observation (M/D/Y) *03/24/17*	
Fill volume below the 100-year floodplain elevation (cu yds) *357*	Compensating cut volume below the 100-year floodplain elevation (cu yds) *481*

Buildings and/or Additions

Type of construction is ☐ residential ☐ garage/pole barn ☒ non residential ☐ other

Construction is ☒ new ☐ addition AND Serviced by ☒ public sewer ☐ private septic ☐ other

Lowest adjacent grade (ft): existing *841.00* proposed *842.00*
datum ☐ NGVD 29 ☒ NAVD 88 ☐ other

Existing Structure Information		Proposed Structure Information	
Foundation type	☐ basement	Foundation type	☐ basement
☒ concrete slab on grade	☐ pilings	☒ concrete slab on grade	☐ pilings
☐ crawl space	☐ other	☐ crawl space	☐ other
Foundation floor elevation (ft) *842.22*		Foundation floor elevation (ft) *842.00*	
Height of crawl space/basement from finished foundation floor to bottom of floor joists (ft) *NA*		Height of crawl space/basement from finished foundation floor to bottom of floor joists (ft) *NA*	
Elevation of 1st floor above basement floor/crawl space (ft)		Elevation of 1st floor above basement floor/crawl space (ft)	

For enclosed areas below the flood elevation, such as a crawl space, garages and accessory structures:
Area of proposed foundation (sq ft) *N/A*
Elevation of proposed enclosed area (ft) *N/A* datum ☐ NGVD 29 ☐ NAVD 88 ☐ other

Number of flood vents *N/A* net opening of each vent (sq inches) lowest elevation of flood vents (ft)

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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) ☐ above or ☐ below the Reference Point of Date observed		
Reference datum used ☐ NGVD 29 ☐ NAVD 88 ☐ IGLD 85 (Great Lakes coastal areas) ☐ 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? ☐ No ☐ 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.		Existing	Proposed
Bridge			
Number of bridge spans			
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			
Culvert type (arch, bottomless, box, circular, elliptical, etc.)			
Culvert material (concrete, corrugated metal, plastic, etc.)			
Culvert length (ft)			
Culvert ☐ width ☐ diameter (ft)			
Culvert height prior to any burying (ft)			
Depth culvert will be buried (ft)			
Elevation of culvert crown (ft)	Upstream		
	Downstream		
Higher elevation of ☐ culvert invert OR ☐ streambed within culvert (ft)	Upstream		
	Downstream		
Complete for both Bridges and Culverts			
Entrance design (mitered, projecting, wingwalls, etc.)			
Total structure waterway opening above streambed (sq ft)			
Total structure waterway area below the 100-year elevation (sq ft) (if known)			
Elevation of road grade at structure (ft)			
Elevation of low point in road (ft)			
Distance from low point of road to mid-point of bridge crossing (ft)			
Length of approach fill from edge of bridge/culvert to existing grade (ft)			

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? ☐ No ☐ Yes

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15 Stream, River, or Drain Construction , Relocation and Enclosure Activities

- Complete Section 10C for riprap activities.
- If side casting or other proposed activities will impact wetlands or floodplains, complete Sections 12 and 13, respectively.
  - ➡Provide a scaled overall site plan showing existing lakes, streams, wetlands, and other water features; existing structures; and the location of all proposed structures and land change activities.
  - ➡Provide scaled cross-section (elevation) drawings necessary to clearly show existing and proposed conditions.
  - ➡For activities on legally established county drains, provide original design and proposed dimensions and elevations.

Stream Information

Water elevation (ft) datum ☐ NGVD 29 ☐ NAVD 88 ☐ IGLD 85 (Great Lakes coastal areas) ☐ other
➡ Show elevation on plans with description.

Dimensions (ft) of existing stream/drain channel (ft) length width depth

Existing channel average water depth in a normal year (ft)

Proposed Activity ☐ enclosure ☐ improvement ☐ maintenance ☐ new drain ☐ relocation ☐ wetlands ☐ other

If an enclosed structure is proposed, check material type ☐ concrete ☐ corrugated metal ☐ plastic ☐ other

Dimensions (ft) of the structure: diameter length	Volume of fill (cu yds)
Will old/enclosed stream channel be backfilled to top of bank grade? ☐ No ☐ Yes	
Length of channel to be abandoned (ft)	Volume of fill (cu yds)
Dimensions (ft) of improved, maintained, new, relocated or wetland stream/drain channel. length width depth	Volume of dredge/excavation (cu yds)
How will slopes and bottom be stabilized?	Proposed side slopes (vertical / horizontal)

Spoils Disposal

Dredged or excavated spoils will be placed ☐ on-site ☐ landfill ☐ USACE confined disposal facility ☐ 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.

16 Drawdown of an Impoundment

- If wetlands will be impacted, complete Section 12.

Type of drawdown ☐ over winter ☐ temporary ☐ one-time event ☐ annual event ☐ permanent (dam removal) ☐ other

Reason for drawdown

Has there been a previous drawdown? ☐ No ☐ Yes If Yes, provide date (M/D/Y)		Previous DEQ permit number, if known
Does waterbody have established legal lake level? ☐ No ☐ Yes ☐ Not Sure		Dam ID Number, if known
Extent of vertical drawdown (ft)	Impoundment design head (ft)	Number of adjoining or impacted property owners
Date drawdown would start (M/D/Y)	Date drawdown would stop (M/D/Y)	Rate of drawdown (ft/day)
Date refilling would start (M/D/Y)	Date refill would end (M/D/Y)	Rate of refill (ft/day)
Type of outlet discharge structure to be used ☐ surface ☐ bottom ☐ mid-depth	Impoundment area at normal water level (acres)	Sediment depth behind impoundment discharge structure (ft)

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17 Dam, Embankment, Dike, Spillway, or Control Structure Activities (See Sample Drawing 15)

- For more information go to www.mi.gov/damsafety. If wetlands will be impacted, complete Section 12.
- Information on removing a dam is available at www.mi.gov/damsafety and following the Related Link –Dam Management.

➡➡Attach detailed signed and sealed engineering plans for a Part 315 dam repair, dam alteration, dam abandonment, or dam removal.
➡Part 315 Dam Safety application fees are added to all other application fees.
➡Mail applications for dams regulated under Part 315 to DEQ, WRD, P.O. BOX 30458, LANSING, MI 48909-7958, attention Dam Safety.

Proposed Activity	☐ abandonment	☐ alteration	☐ enlargement of an existing dam
	☐ removal	☐ repair	☐ reconstruction of a failed dam
	☐ new dam construction	☐ other	

Dam ID Number, if known	Type of outlet discharge structure ☐ surface ☐ bottom ☐ mid-depth

Will proposed activities require a drawdown of the waterbody to complete the work? ☐ No ☐ Yes ➡ If Yes, complete Section 16.

Structural height (difference between embankment top elevation and streambed elevation at downstream embankment toe) (ft) _____

Hydraulic Height (difference between design flood elevation and streambed elevation at downstream embankment toe) (ft) _____	Impoundment size at design flood elevation (acres)

Does dam meet the criteria for regulation under Part 315? (i.e. hydraulic height of 6 feet or more and an impoundment size at the design flood of 5 surface acres or more) ☐ No ☐ Yes

Dredging/excavation volume (cu yd)	Fill volume (cu yd)	Riprap volume (cu yd)

Will a water diversion during construction be required? ☐ No ☐ Yes

If Yes, describe how the stream flow will be controlled through the dam construction area during the proposed project activities:

Complete the following for a new dam, reconstruction of a failed dam or enlargement of an existing dam

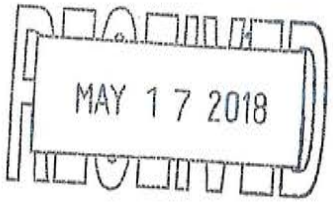
For Part 315 regulated dams, the following must be attached:
➡ Site-specific conceptual plans of the dam for resource impact review (An engineering report and detailed engineering plans are not required until the project has been determined to be permitable).
➡ A description and evaluation of the loss of natural resources associated with the project.
➡ A description of the natural resources that are associated with or created by the impoundment and how they offset the natural resources lost by the creation of the impoundment.
➡ An assessment of all known existing and potential adverse effects within the scope of the project.

Embankment dimensions	length (ft)	top width (ft)	bottom width (ft)	slopes (vertical / horizontal)	Upstream Downstream

Have soil borings been taken at dam location?	☐ No ☐ Yes	➡ If Yes, attach results.
Do you have flowage rights to all proposed flooded property at the design flood elevation?	☐ No ☐ Yes	➡ If No, provide a letter of authorization from the property owner.

Applications for Part 315 regulated dam removal projects must also include the following:

An evaluation of the capacity of the remaining structure to pass flood flows.
An evaluation of the quantity and quality of the sediments behind the impoundment.
A description of the methods to be employed to control sediments.
An assessment of all known existing and potential adverse impacts within the scope of the project.



18 Utility Crossings (See Sample Drawings 12 and 13, and EZ Guide)

- If side casting is proposed, complete Sections 10A and 10B. If spoils will be placed in or impact wetlands, complete Section 12.
  - ➧Attach additional sheets or tables with the requested information as needed for multiple crossings.
  - ➧For wetland crossings using the open trench method show clay plugs at the wetland/upland boundaries on the plans.

Crossing of ☐ Inland Lake or Stream ☐floodplain ☐ Great Lake ☐ wetlands (also complete Section 12)

What method will be used to construct the crossings? ☐ directional boring ☐ jack and bore ☐ open trench ☐ plow / knife ☐ flume

Utility Type	Number of lake or stream crossings	Number of wetland crossings	Pipe diameter with casing (in)	Pipe length per crossing (ft)	Distance below streambed or wetland (in)	Trench width (ft)
☐ sanitary sewer						
☐ storm sewer						
☐ watermain						
☐ cable						
☐ electric						
☐ fiber optic cable						
☐ oil/gas pipeline						

19 Marina Construction, Expansion and Reconfiguration (See Sample Drawing 21)

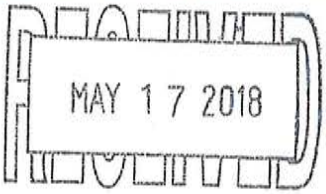
- For more information go to www.mi.gov/marinas
- Marinas located on the Great Lakes, including Lake St. Clair, may be required to secure leases or conveyances from the state of Michigan to place structures on the bottomlands. If a conveyance is necessary, an application must be submitted before the Joint Permit Application can be determined complete.
  - ➧Fully complete Section 10 E. For multiple structures provide a table with the requested information.
  - ➧Enclose a copy of any current pump-out agreement with another marina facility, if on-site sanitary pump out facilities are not available.
  - ➧Attach a copy of the property legal description, mortgage survey, or a property boundary survey to your application.
  - ➧ The WRD may require a riparian interest area (RIA) estimate survey, sealed by a licensed surveyor, in order to determine whether the proposed project will adversely impact riparian rights. Include any available sealed RIA estimate survey and/or written authorizations from affected adjoining riparian owners with your application.

Proposed Marina Activity ☐ New construction ☐ Expansion ☐ Reconfiguration

Do you have an existing Great Lake Conveyance? ☐ No ☐ Yes For more information visit www.mi.gov/deqgreatlakes.

Are sanitary pump-out facilities available? ☐ No ☐ Yes | Is there a pump out agreement? ☐ No ☐ Yes If Yes, provide a copy.

Marina Description	Current Count	Final Count
Number of boat slips/wells (do not include broadside dockage or mooring buoys)		
Lineal feet of broadside dockage		
Maximum number of boats at broadside dockage		
Number of mooring buoys		
Number of launch ramps/lanes		



20 Critical Dune Areas and High Risk Erosion Areas (See Sample Drawings 19 and 20)

Critical Dune Areas (See Sample Drawing 20)

- **Although not required, submitting PHOTOGRAPHS of the site may provide for a faster application review.**
- For more information go to www.mi.gov/jointpermit, select "Sand Dune Protection" under "Related Links."
- All property boundaries and proposed structure corners, including decks, septic systems, water wells, driveways, grading, and terrain alteration locations must be staked before the WRD site inspection.
- Scaled overhead and cross-section plans must include all property boundaries, locations, and dimensions of all existing structures and impacted areas, and all proposed structures, terrain alterations, and construction access. Cross-sections must show existing and proposed grades, including foundations.
- Construction in critical dune areas on slopes greater than 33 percent (1 vertical: 3 horizontal) is prohibited without a special exception.
- Construction in critical dune areas on slopes that measure from 25 percent (1 vertical: 4 horizontal) to less than 33 percent requires sealed plans prepared by a registered architect or licensed professional engineer.

High Risk Erosion Areas (See Sample Drawing 19)

- For more information go to www.mi.gov/jointpermit, select "HREA" under "Related Links."
- All property boundaries, proposed structure corners, and septic system locations must be staked before the WRD site inspection.
- Scaled overhead plans must include all property boundaries, and the location and dimensions of all structures and septic systems must be included.
- Additional information, including the building construction plans, may be required to complete the application review.

Critical Dune Areas

Parcel dimensions (ft) width depth	Date project staked (M/D/Y)
Property is a ☐ platted lot ☐ unplatted parcel	Year current property boundaries created

Dune habitat present in Building Site and access route (check all that apply): ☐Wooded ☐Open Dune ☐Shrubs ☐Bare Sand ☐Lakefront Lot ☐MNFI Community if known:_____

Type of construction activities ☐ addition ☐ driveway ☐ garage ☐ new home ☐ renovation ☐ septic ☐ deck(s) ☐ other

☐ Provide a sand relocation plan with location and dimensions of disposal area. Indicate ☐ on-site OR ☐ off-site

If on-site show location and how the disposal site will be accessed on the plans. Indicate the depth of the disposed sand on the plans.

☐ Provide the permit or letter from the County Enforcing Agent stating the project complies with Part 91 (Soil Erosion and Sedimentation Control).

The proposed project will be serviced by ☐ public sewer ☐ private septic system.

➡ On the plans, show the location and dimensions of the private septic system.

If a private septic system is proposed, has a permit been issued by the health department? ☐ No ☐ Yes

➡ If Yes, provide a copy of the permit for all Critical Dune Area projects.

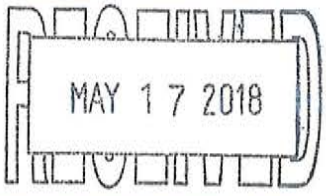
☐ Provide a copy of the vegetation assurance letter.

☐ Provide a re-vegetation plan, including #_____ of trees to be removed and #_____ of trees to be replanted.

Proposed Utility Installation	Proposed New Construction
Utility Installation Method	Foundation type ☐ basement
☐ directional bore ☐ plowing in	☐ concrete slab ☐ pilings
☐ open trench ☐ other	☐ crawl space ☐ other
➡Show utility locations and dimensions on the site plan.	Area of existing structure (sq ft)
➡Show construction access route on the site plan.	Area of proposed structure (sq ft)
➡Show existing and proposed grades on the cross-section.	Area of existing deck (sq ft)
➡Show locations of vegetation to be removed on the site plan.	Area of proposed deck (sq ft)

Provide the following information for special use projects:

(a) Lot size, width, density, and front and side setbacks.
(b) Storm water drainage that provides for disposal of drainage water without serious erosion.
(c) Methods for controlling erosion from wind and water.
(d) Re-stabilization plan.
(e) Environmental Impact Statement.



High Risk Erosion Areas

Parcel dimensions (ft) width depth Date project staked (M/D/Y)

Existing Structure Information	Proposed New Construction
Foundation type ☐ basement ☐ concrete slab ☐ pilings ☐ crawl space ☐ other	Foundation type ☐ basement ☐ concrete slab ☐ pilings ☐ crawl space ☐ other
Material above foundation wall ☐ block ☐ log ☐ stud frame ☐ other	Material above foundation wall ☐ block ☐ log ☐ stud frame ☐ other
Siding material ☐ block ☐ vinyl ☐ wood ☐ other	Siding material ☐ block ☐ vinyl ☐ wood ☐ other
Area of the foundation, excluding attached garage (sq ft)	Area of the foundation, excluding attached garage (sq ft)
Area of the garage foundation (sq ft)	Area of the garage foundation (sq ft)

If renovating or restoring an existing structure, indicate the renovation or restoration cost $

Current structure replacement value $

Tax assessed value of existing structure excluding land value $ Assessment Year

Provide the number of individual living units in the proposed building

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-----Original Message-----
From: deq-wrd-financialinstruments@michigan.gov <deq-wrd-financialinstruments@michigan.gov>
Sent: Wednesday, May 09, 2018 11:58 AM
To: Scott A Chappelle <scottc@c-devco.com>
Subject: Payment Confirmation

Thank you for your recent payment to MiWaters Water Resources.

Payment Application: MiWaters Water Resources Payment Status: Payment completed successfully.
Confirmation Number: 18050953320814
Payment Date: 05/09/2018

Billing Address: Scott A. Chappelle
2875 Northwind Drive
Suite 235
East Lansing, MI 48823
5176644111

Card Type: VISA
Card Number: x1642

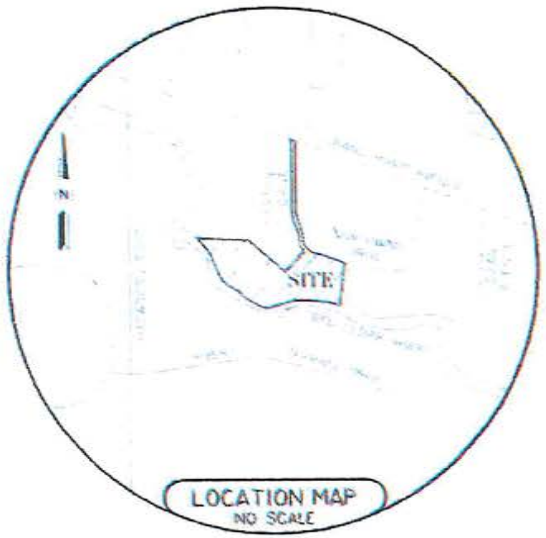
Payment Amount: 500.00 USD
Convenience Fee: 10.00 USD
Total Amount: 510.00 USD

DO NOT REPLY DIRECTLY TO THIS EMAIL.

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Red Cedar Manor

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN



LEGAL DESCRIPTION:

A parcel of land in the Southwest 1/4 of Section 17 and the Northwest 1/4 of Section 20 T4N R1W, Meridian Township, Ingham County, Michigan, the surveyed boundary of said parcel described as: Commencing at the South 1/4 corner of said Section 17; thence N00°11'57"W along the North-South 1/4 line of said Section 17 a distance of 174.04 feet to the centerline of Grand River Avenue; thence N68°26'46"W along said centerline 1359.73 feet; thence Northwesterly 43.73 feet along said centerline and a curve to the left, said curve having a radius of 9663.27 feet, a delta angle of 0°25'20" and a chord of 43.73 feet bearing N68°37'16"W; thence S21°10'04"W perpendicular to said centerline 60.00 feet to the Northeast corner of Supervisor's Replat of Lots 105-106 & 107 Of Supervisor's Plat No 2 Meridian Town hip, Ingham County, Michigan, as recorded in Liber 13 of Plats, Page 10 Ingham County Records, and the Southerly right of way line of Grand River Avenue, and the point of beginning of the description; thence Southeasterly 36.40 feet along said Southerly right of way line and a curve to the right, said curve having a radius of 5603.27 feet, a delta angle of 0°22'20", and a chord of 36.40 feet bearing S68°38'46"E to the Easterly line of private Northwind Drive; thence along the Easterly and Northerly line of said Northwind Drive the following nine courses: S00°11'33"W 571.70 feet, S10°45'37"E 63.97 feet, S22°13'32"E 72.15 feet, S18°55'07"E 57.81 feet, S06°20'17"E 72.33 feet, S33°22'37"E 43.42 feet, S56°50'07"E 44.21 feet, S71°46'27"E 68.85 feet, and S81°43'19"E 212.36 feet to the Westerly line of plat of Northwind Meridian Township Ingham County, Michigan, as recorded in Liber 26 of plats Pages 25-27, Ingham County Michigan, Records; thence S07°18'10"W along said Westerly line 45.09 feet to the Northwest corner of Lot 7 of said plat of Northwind; thence S07°15'41"W along the West line of said Lot 7 a distance of 275.84 feet to a point on an intermediate traverse line, said point being N07°15'41"E 11.4 feet from the water's edge of Red Cedar River; thence along said traverse line the following six courses: N80°41'30"W 211.94 feet, N87°44'45"W 157.18 feet, S74°22'41"W 226.85 feet, N59°06'41"W 401.71 feet, N74°40'04"W 281.37 feet, and N43°56'08"W 125.22 feet to a point S87°25'56"E 5.0 feet from said water's edge of Red Cedar River; thence S87°25'56"E 410.32 feet, thence S47°48'14"E 590.00 feet; thence N42°09'05"E 229.94 feet to the Westerly line of said Northwind Drive; thence along the Westerly line of said Northwind Drive the following five courses: N33°22'37"W 55.74 feet, N05°20'17"W 76.24 feet, N15°51'04"W 53.84 feet, N22°13'32"W 74.81 feet, and N10°45'37"W 69.89 feet to the Southeast corner of said Supervisor's Replat of Lots 105-106 & 107 Of Supervisor's Plat No 2; thence N00°11'29"W along the East line of said Supervisor's Replat of Lots 105-106 & 107 Of Supervisor's Plat No 2 a distance of 587.70 feet to the point of beginning of the description said parcel containing 9.19 acres more or less within said traverse line, and also including all lands lying between said traverse line and Red Cedar River; said parcel subject to all easements and restrictions if any.

Red Cedar Manor

FLOOD PLAIN CUT & FILL

JOB # 90403

DRAWN B. SEB-BP

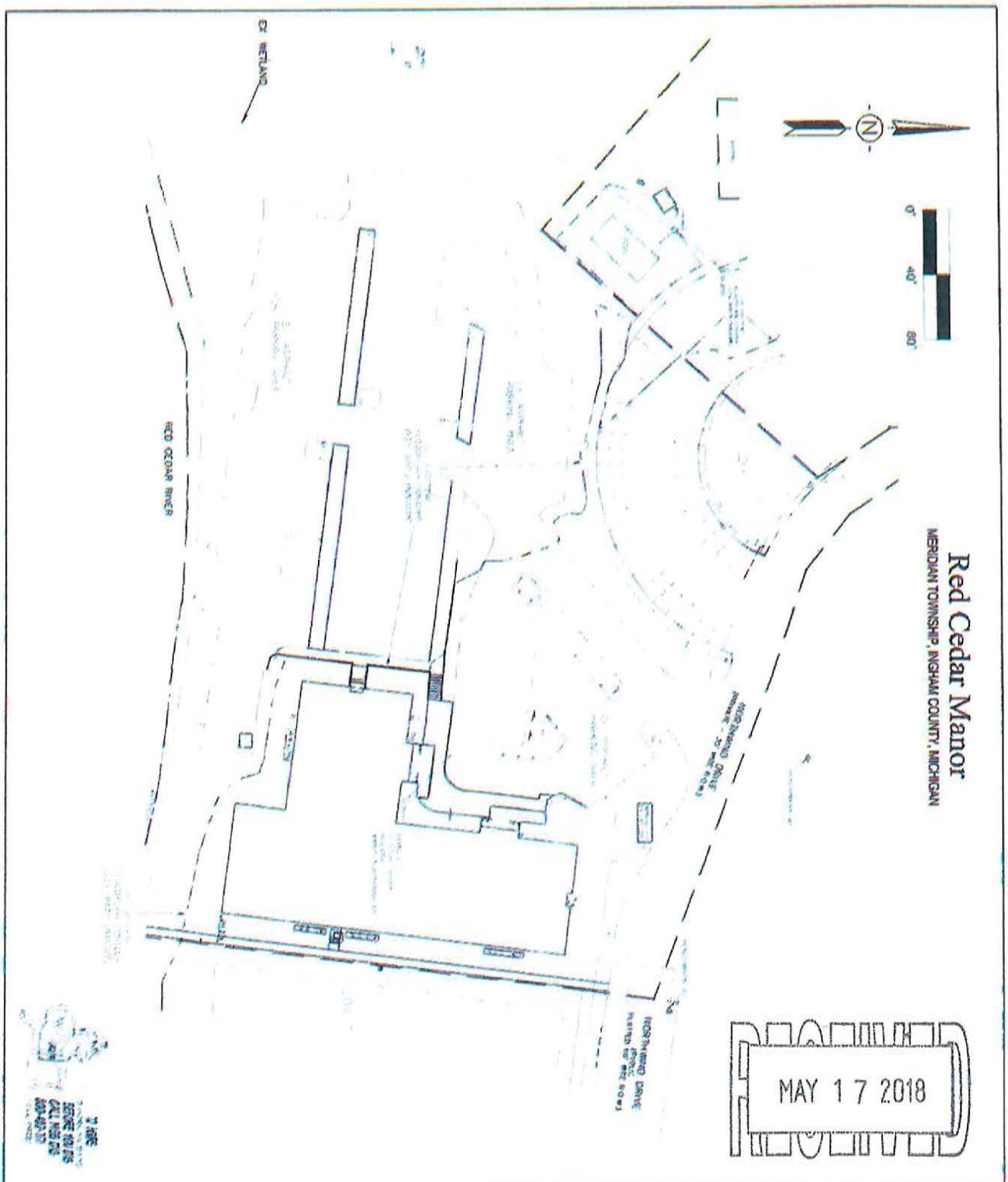
APPROVED BY JMC

KEBS, INC.

2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047

Marshall Office
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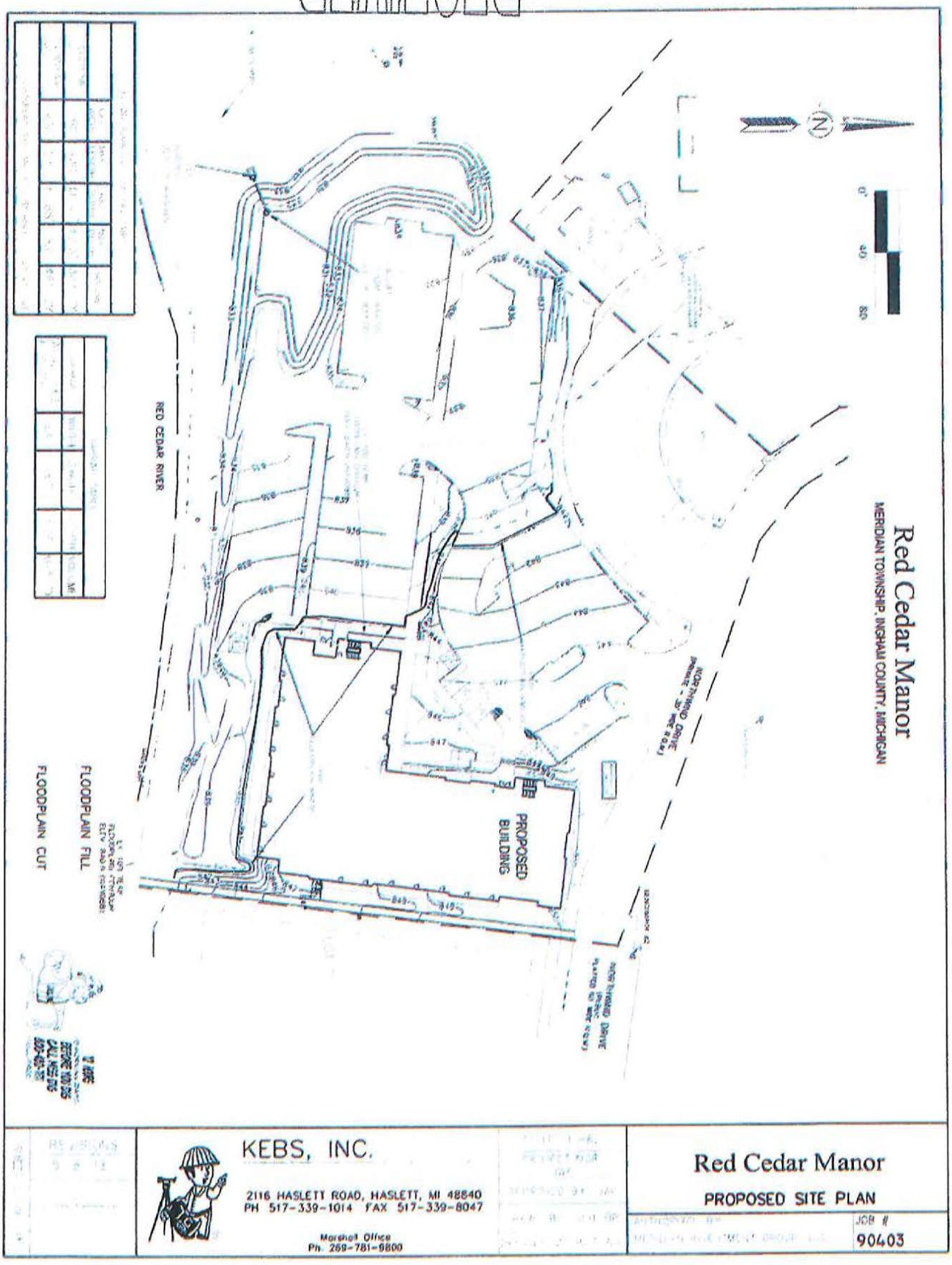
Marshall Office
Ph. 269-781-9200

Red Cedar Manor

EXISTING SITE

JOB #
90403

MAY 17 2018

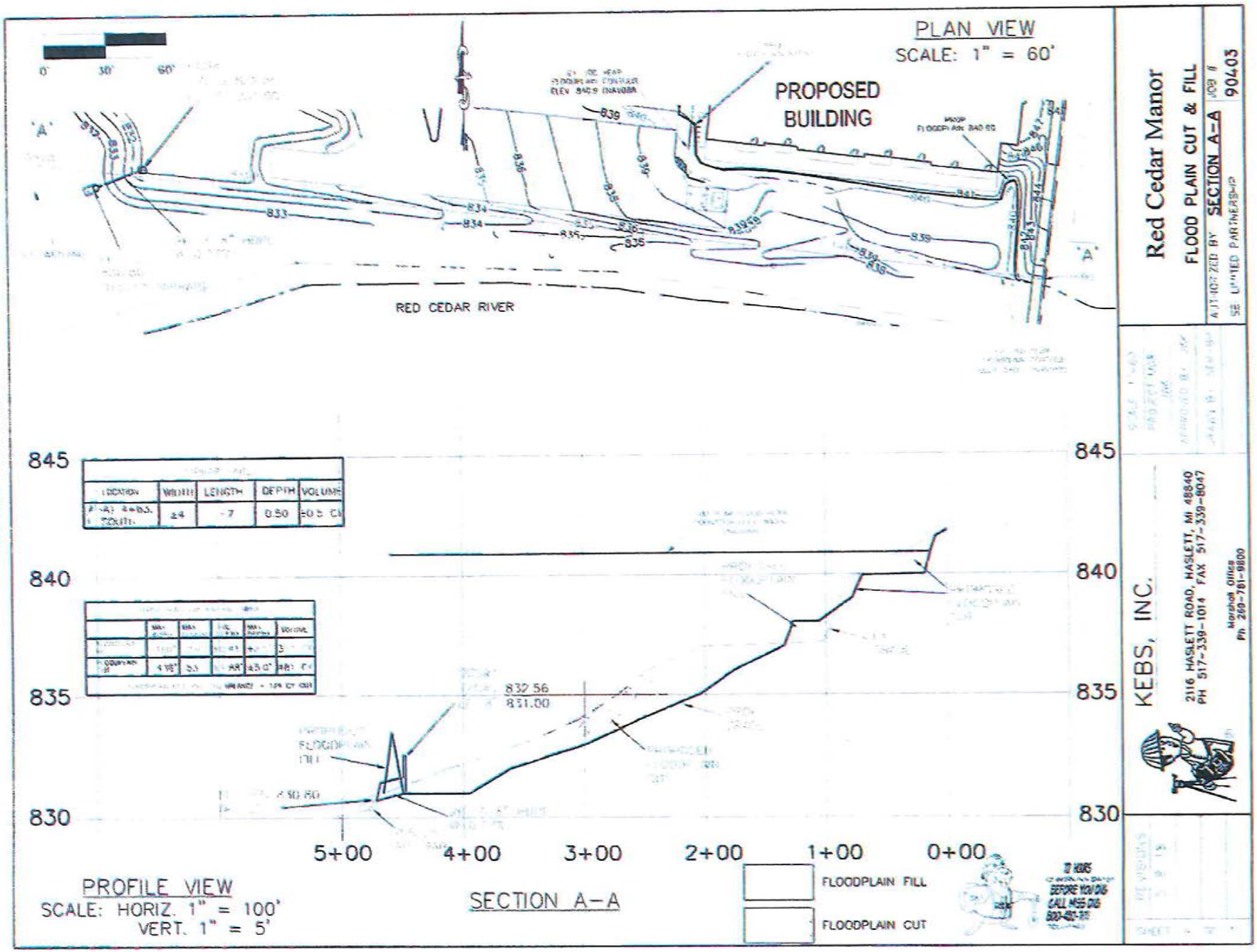


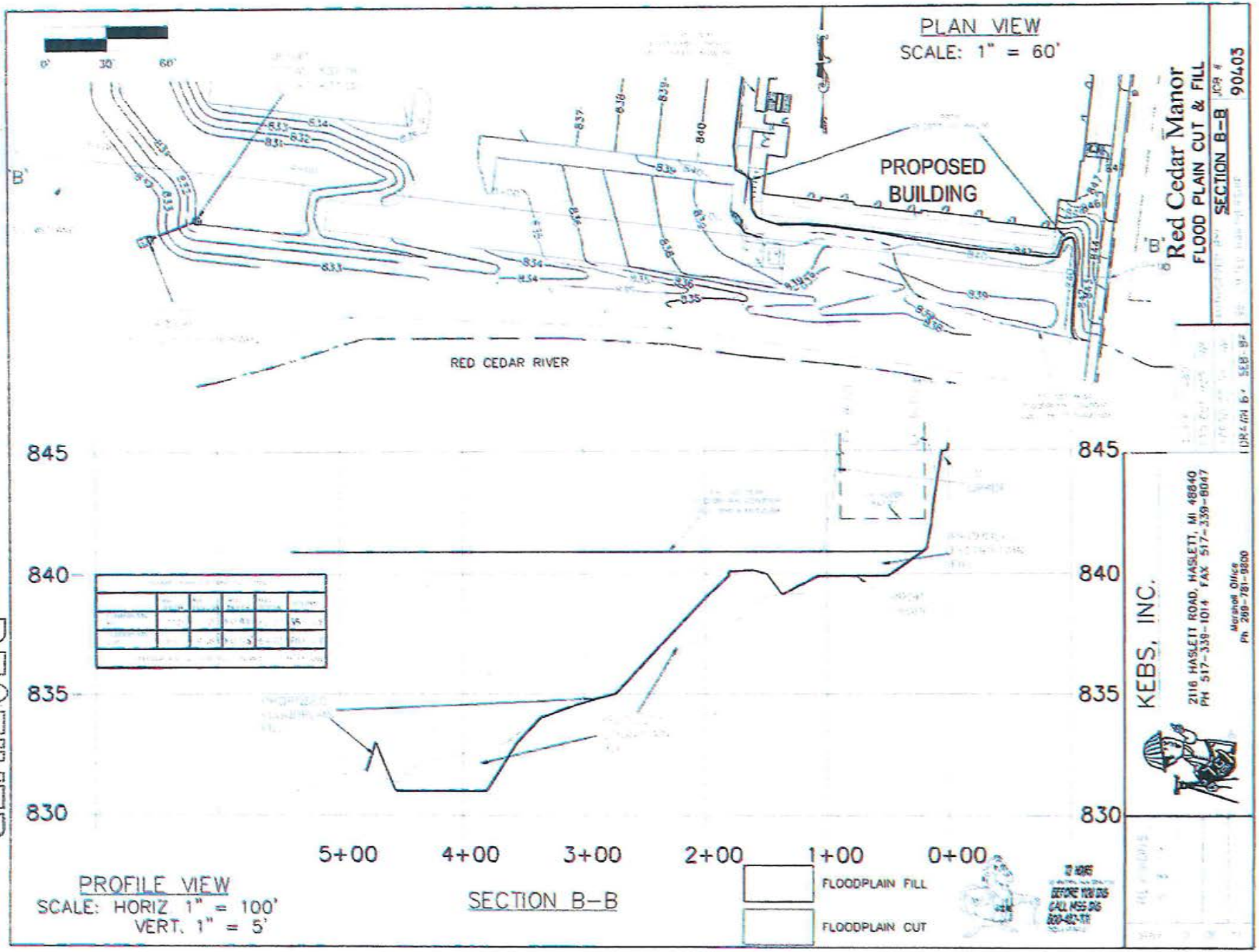
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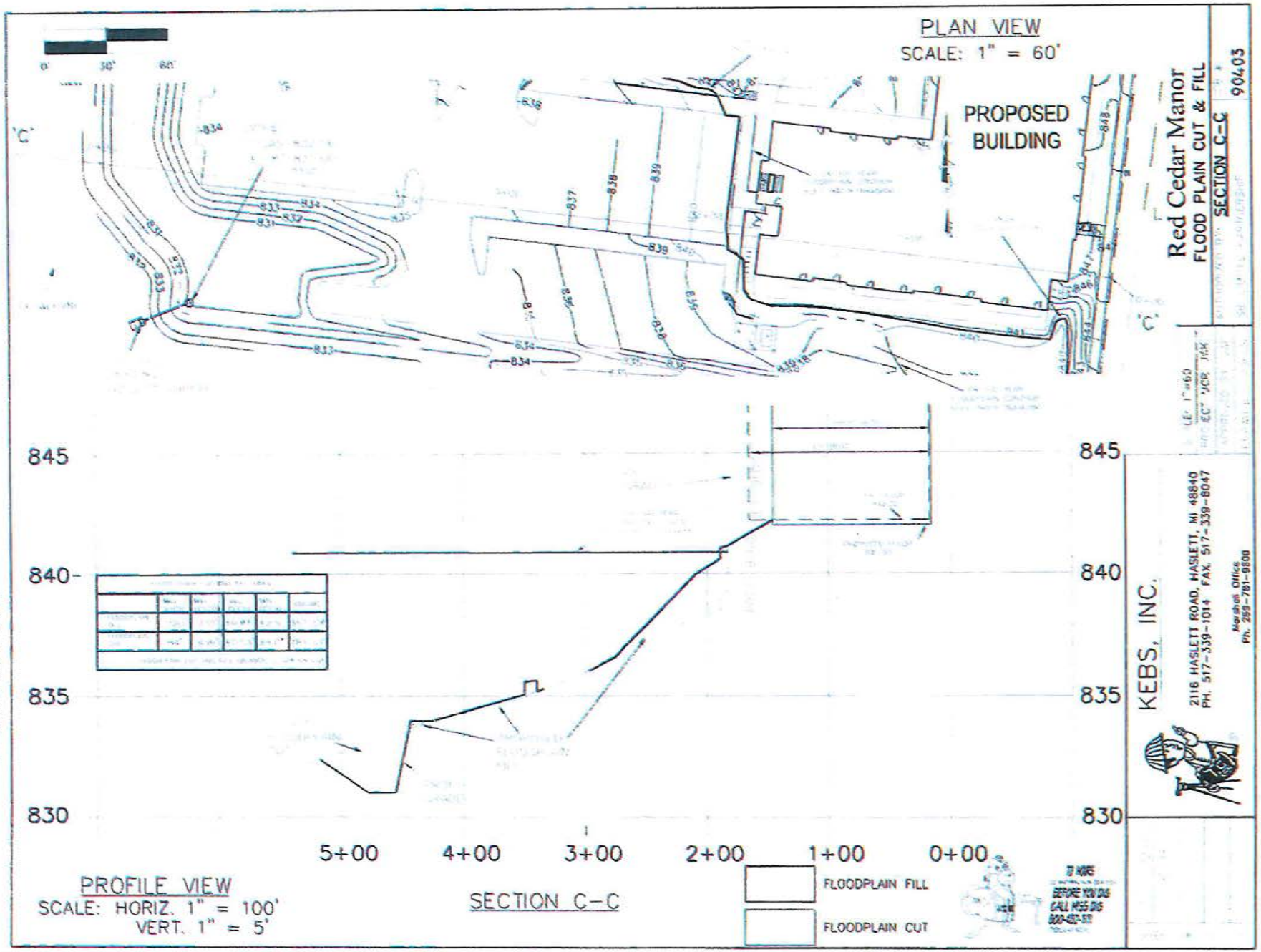
PROPOSED SITE PLAN

JOB # 90403

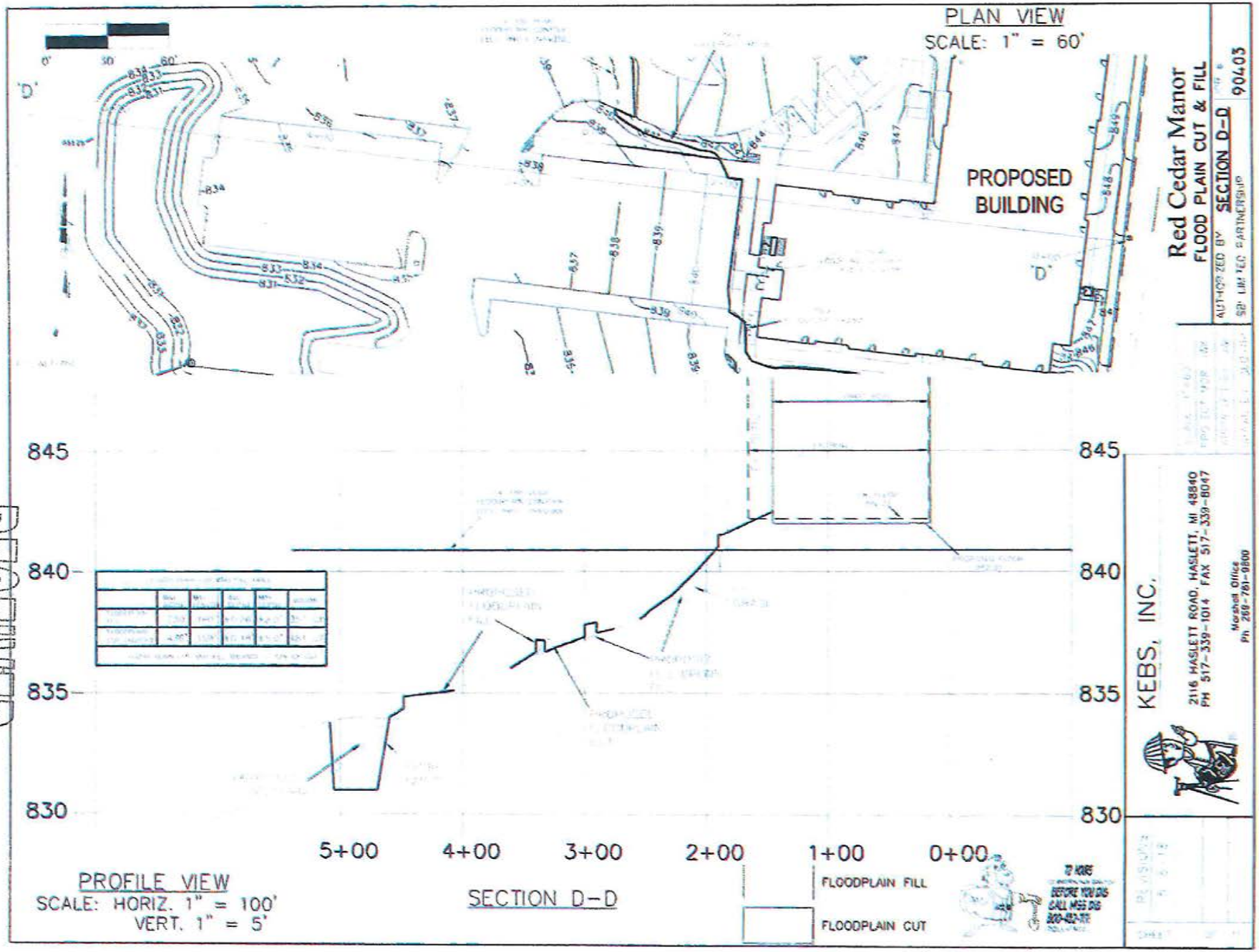

PLAN VIEW
SCALE: 1" = 60'
0' 30' 60'
PROPOSED BUILDING
RED CEDAR RIVER
'A'
'A'
833
834
835
836
837
838
839
840
841
842
843
844
845
PROFILE VIEW
SCALE: HORIZ. 1" = 100'
VERT. 1" = 5'
SECTION A-A
5+00
4+00
3+00
2+00
1+00
0+00
832.56
851.00
LOCATION
WIDTH
LENGTH
DEPTH
VOLUME
±4
7
0.50
FLOODPLAIN FILL
FLOODPLAIN CUT
Red Cedar Manor
FLOOD PLAIN CUT & FILL
SECTION A-A
90403
KEBS, INC.
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PH 517-339-1014 FAX 517-339-8047
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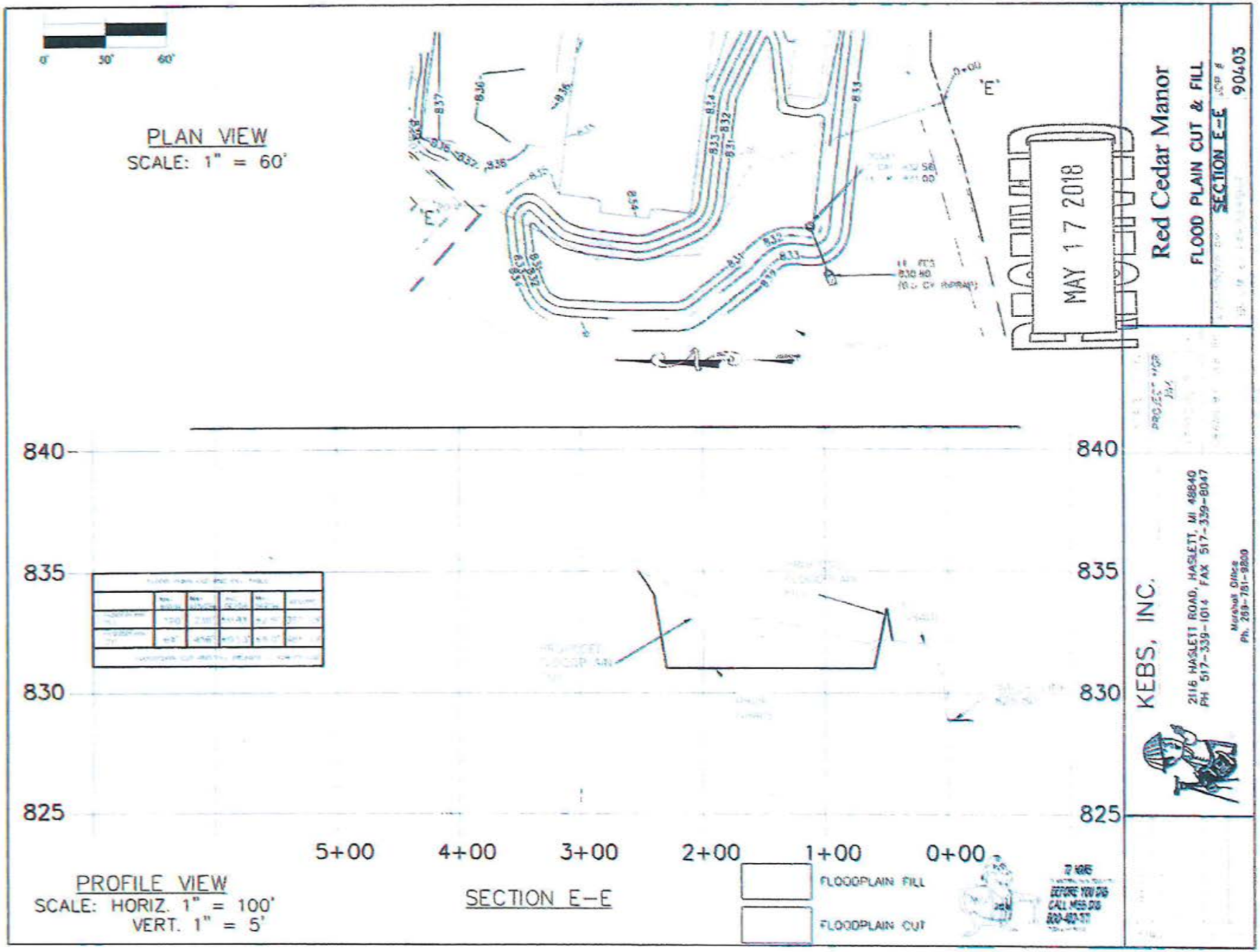
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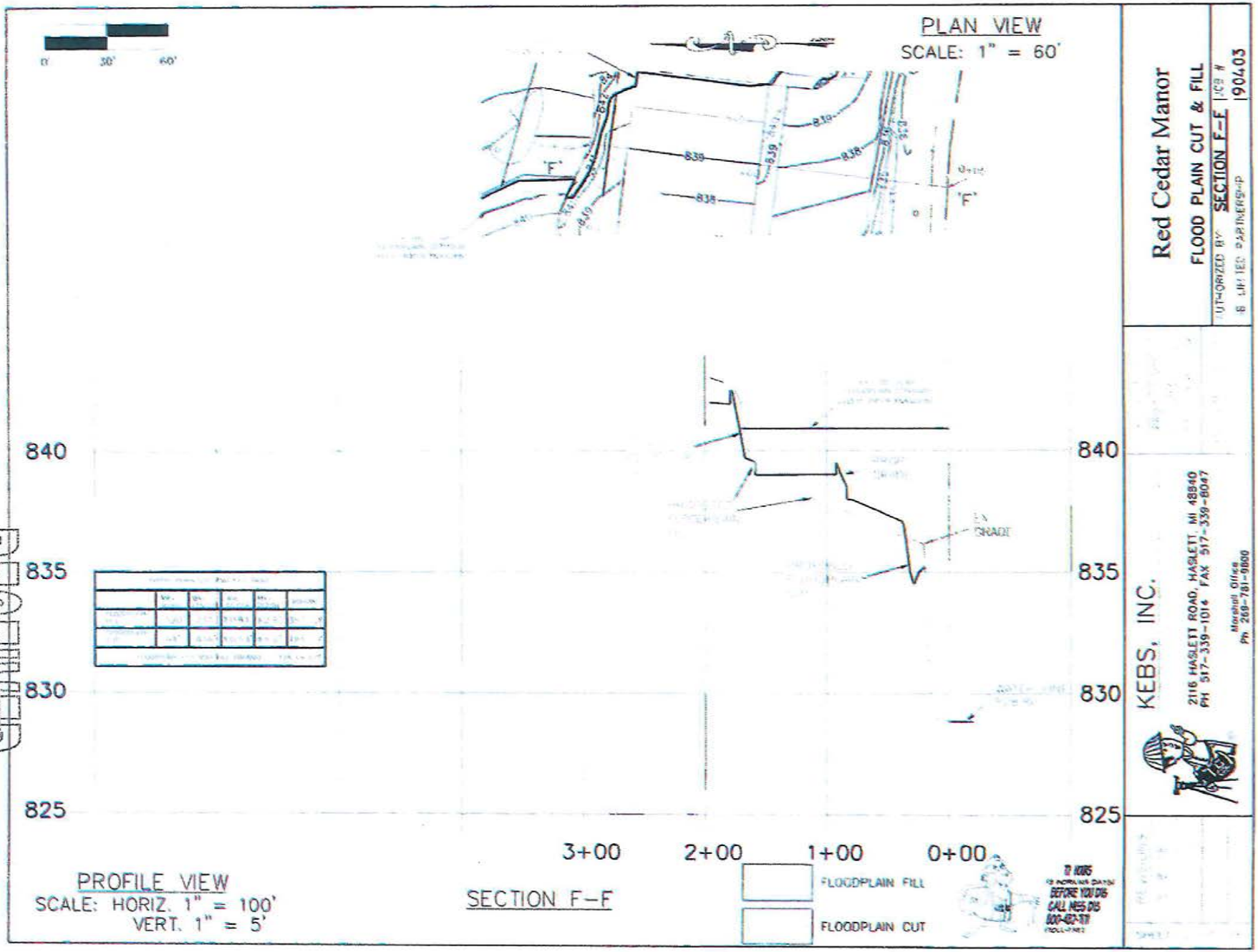


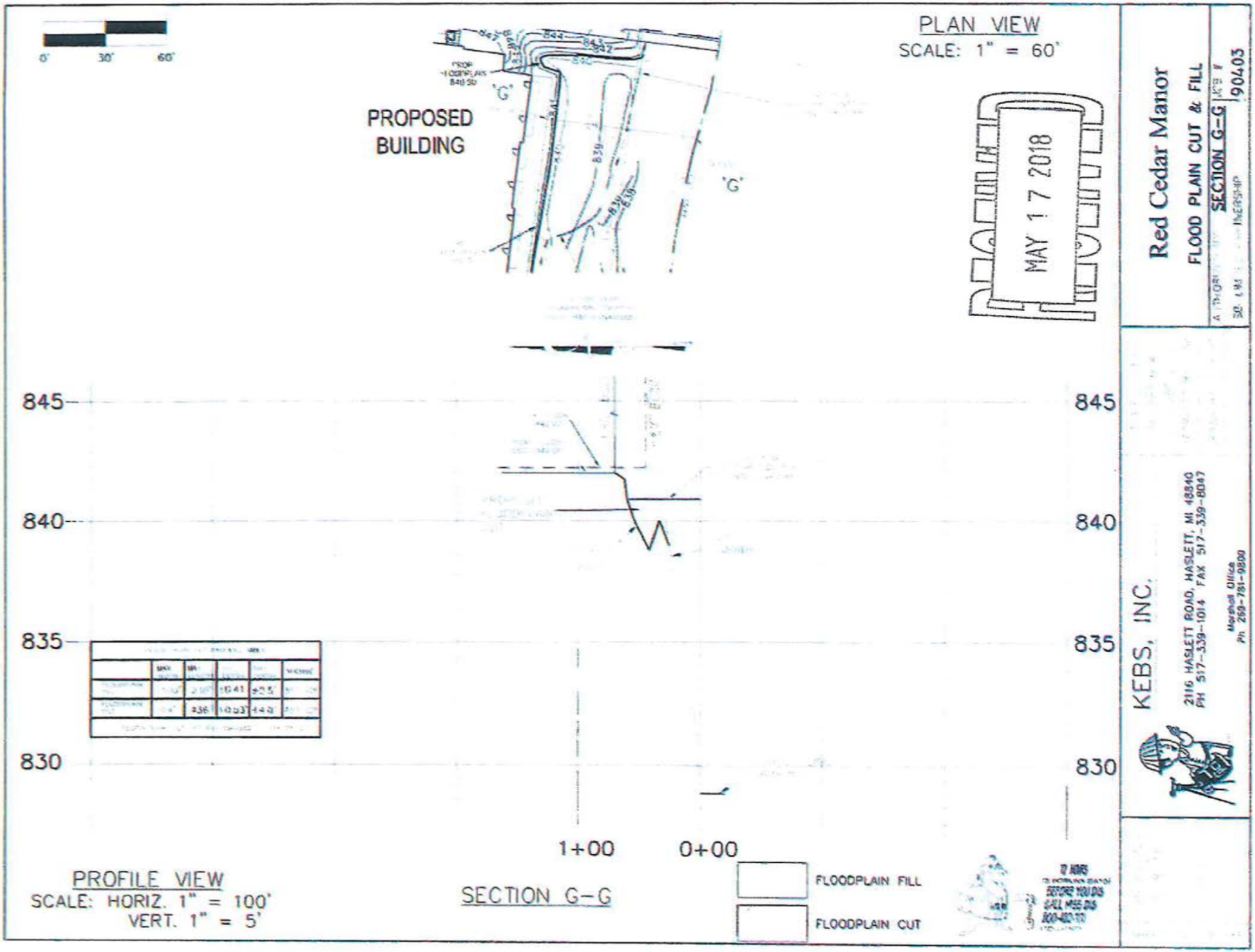
RECEIVED
MAY 17 2018



RECEIVED
MAY 17 2018


0'
30'
60'
PLAN VIEW
SCALE: 1" = 60'
E'
E'
0+00
MAY 17 2018
RECEIVED
Red Cedar Manor
FLOOD PLAIN CUT & FILL
SECTION E-E
90403
840
835
830
825
840
835
830
825
5+00
4+00
3+00
2+00
1+00
0+00
PROFILE VIEW
SCALE: HORIZ. 1" = 100'
VERT. 1" = 5'
SECTION E-E
FLOODPLAIN FILL
FLOODPLAIN CUT
KEBS, INC.
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PH 517-339-1014 FAX 517-339-8047
Marshall Office
Ph. 269-781-9800


PLAN VIEW
SCALE: 1" = 60'
0'
30'
60'
F
F'
839
838
840
835
830
825
3+00
2+00
1+00
0+00
PROFILE VIEW
SCALE: HORIZ. 1" = 100'
VERT. 1" = 5'
SECTION F-F
FLOODPLAIN FILL
FLOODPLAIN CUT
Red Cedar Manor
FLOOD PLAIN CUT & FILL
SECTION F-F
190403
KEBS, INC.
2116 HASLETT ROAD, HASLETT, MI 48840
PH 517-339-1014 FAX 517-339-8047
Marshall Office
Ph 269-781-9800
MAY 17 2018


0'
30'
60'
PROPOSED BUILDING
PLAN VIEW
SCALE: 1" = 60'
MAY 17 2018
Red Cedar Manor
FLOOD PLAIN CUT & FILL
SECTION G-G
90403
845
840
835
830
1+00
0+00
PROFILE VIEW
SCALE: HORIZ. 1" = 100'
VERT. 1" = 5'
SECTION G-G
FLOODPLAIN FILL
FLOODPLAIN CUT
KEBS, INC.
2116 HASLETT ROAD, HASLETT, MI 48840
PH 517-339-1014 FAX 517-339-8047
Marshall Office
Ph 269-781-9800

KEBS, INC.
2116 HASLETT ROAD, HASLETT MI 48840
PH 517-339-1014 FAX 517-339-8047
Midland Office
PH 989-631-0009

Red Cedar Manor

OUTLET DETAIL

90403

OUTLET RISER DETAIL

M.U.P.U.D. & S.U.P. PLAN FOR:

Red Cedar Manor

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

SCALE 1" = 30'

0' 30' 60' 90'

SEWER INVENTORIES

CATCH BASIN #100
RIM ELEV. = 839.94
12" HDPE N INV. = 832.84
12" HDPE NE INV. = 831.57
12" HDPE SW INV. = 831.52

STORM MANHOLE #101
RIM ELEV. = 840.53
12" RCP N INV. = 831.23
18" RCP NE INV. = 831.29
12" RCP SE INV. = 831.37
18" RCP SW INV. = 831.11

STORM MANHOLE #102
RIM ELEV. = 833.14
18" RCP NE INV. = 829.44
18" RCP SW INV. = 829.34

SANITARY MANHOLE #200
RIM ELEV. = 848.48
4" PVC E INV. = 845.18
4" PVC SE INV. = 845.10
6" PVC NW INV. = 845.07

SANITARY MANHOLE #201
RIM ELEV. = 844.44
6" RCP SE INV. = 834.33
6" RCP NW INV. = 834.31

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

EX. LEGEND

- = SET 1/2" BAR WITH CAP
- = FOUND IRON AS NOTED
- = DEED LINE
- = DISTANCE NOT TO SCALE
- = FENCE
- = ASPHALT
- = CONCRETE
- = GRAVEL
- +8800 = EXISTING SPOT ELEVATION
- 850 = EXISTING CONTOUR ELEVATION
- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = ELECTRIC MANHOLE
- = TELEPHONE MANHOLE
- = CATCHBASIN
- = SANITARY CLEANOUT
- = FIRE HYDRANT
- = VALVE
- = UTILITY POLE
- = LIGHT POLE
- = GUY POLE
- = GUY WIRE
- = UTILITY PEDESTAL
- = TRANSFORMER
- = HANDHOLE
- = ELECTRIC METER
- = GAS METER
- = WATER METER
- = SIGN
- = POST
- = AIR CONDITIONING UNIT
- = GAS LINE
- = UNDERGROUND TELEPHONE
- = UNDERGROUND TELEVISION
- = UNDERGROUND ELECTRIC
- = OVERHEAD WIRES
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH



BENCHMARKS

BENCHMARK #1 ELEV. = 850.21 (NAVD88)
SOUTH FLANGE BOLT, UNDER "M" IN "MADE IN USA", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, ACROSS FROM ENTRANCE DRIVE TO #2875 NORTHWIND DRIVE.

BENCHMARK #2 ELEV. = 852.56 (NAVD88)
NORTH FLANGE BOLT, UNDER "6" IN "1962", FIRE HYDRANT, NORTH OF NORTHWIND DRIVE, 70' NORTH AND 25' EAST OF NORTHEAST CORNER OF #2875 NORTHWIND DRIVE.

LEGEND

- EXT. CONTOURS
- EXT. WATER MAIN
- EXT. SANITARY SEWER
- EXT. STORM SEWER
- 850.0 EXT. ELEVATIONS
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B.
- MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- ▲T/C 800.00 PROPOSED TOP OF CURB ELEV.

E-90403-MUPUD-SUP
SURVEY# 90403.BND

REVISIONS
3-9-18 MUPUD & SUP SUBMITTAL

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

Red Cedar Manor
GRADING & FLOODPLAIN PLAN

SCALE: 1"= 30'	DESIGNER: JWK	APPROVED BY: JWK
DATE: 5-5-17	PROJECT MGR. JWK	SHEET 3 OF 7
AUTHORIZED BY: MERIDIAN INVESTMENT GROUP, LLC		JOB #: 90403

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