AGENDA

CHARTER TOWNSHIP OF MERIDIAN
PLANNING COMMISSION – REGULAR MEETING
January 22, 2024 6:30 PM

1. CALL MEETING TO ORDER

2. ROLL CALL

3. PUBLIC REMARKS

4. APPROVAL OF AGENDA

5. APPROVAL OF MINUTES
   A. January 8, 2024

6. COMMUNICATIONS
   A. None

7. PUBLIC HEARINGS
   A. SUP #24001 – 2731 Grand River
   B. SUP #24002 – 1614 West Grand River

8. UNFINISHED BUSINESS
   A. None

9. OTHER BUSINESS
   A. Resolution of Appreciation – Jerry Richards
   B. Election of Officers
   C. Planning Commission Liaison Assignments

10. REPORTS AND ANNOUNCEMENTS
    A. Township Board update.
    B. Liaison reports.

11. PROJECT UPDATES
    A. Project Report

12. PUBLIC REMARKS

13. COMMISSIONER COMMENTS

14. ADJOURNMENT

TENTATIVE PLANNING COMMISSION AGENDA
February 12, 2024

1. PUBLIC HEARINGS
   A. None

2. UNFINISHED BUSINESS
   A. SUP #24001 – 2731 Grand River
   B. SUP #24002 – 1614 West Grand River

3. OTHER BUSINESS
   A. Work Plan Discussion

CHARTER TOWNSHIP OF MERIDIAN
REGULAR MEETING PLANNING COMMISSION
5151 Marsh Road, Okemos MI 48864-1198
517.853.4000, Township Hall Room
MONDAY, January 8th, 2024, 6:30 pm

PRESENT: Chair Blumer, Vice-Chair Trezise, Commissioners Snyder, Brooks, McConnell, Shrewsbury, Scales (arrived 6:35)

ABSENT: Commissioners McCurtis

STAFF: Senior Planner Brian Shorkey

1. CALL MEETING TO ORDER
   Chair Blumer called the January 8, 2024 regular meeting for the Meridian Township Planning Commission to order at 6:30pm.

2. ROLL CALL
   Chair Blumer called the roll of the Board. Commissioner Scales and Commissioner McCurtis absent, all other board members present.

3. PUBLIC REMARKS
   Robert Schroeder spoke about the golf driving range on Grand River Avenue and asked the Planning Commission to show it as Commercial in the Master Plan update. Mr. Schroeder spoke about the potential future development of the property

   Commissioner Scales arrived at 6:35 PM.

   Vice-Chair Trezise addressed Mr. Schroeder and said that the Planning Commission had already recommended changing the future land use map in the Master Plan to reflect Mr. Schroeder's request. Senior Planner Shorkey said that he would talk to Mr. Shroeder more after the meeting.

4. APPROVAL OF AGENDA
   Commissioner McConnell moved to approve the January 8, 2024 regular Planning Commission meeting agenda. Seconded by Commissioner Brooks.

   VOICE VOTE **YEAS: Chair Blumer, Vice-Chair Trezise, Commissioners Snyder, Brooks, McConnell, Shrewsbury, and Scales**

   NAYS: None

   Motion carried: 7-0

5. APPROVAL OF MINUTES
   Vice-Chair Trezise moved to approve the Minutes of the December 11, 2023 Planning Commission Regular Meeting as amended. Seconded by Commissioner Brooks.

   VOICE VOTE **YEAS: Chair Blumer, Vice-Chair Trezise, Commissioners Snyder, Brooks, McConnell, Shrewsbury, and Scales**

NAYS: None

Motion carried: 7-0

6. COMMUNICATIONS
   A. None

7. PUBLIC HEARINGS
   A. None

8. UNFINISHED BUSINESS
   A. REZ #23036 – 5681 Shaw Street, PO, Professional and Office, to RC, Multiple-Family Residential

Senior Planner Shorkey outlined his memo and described the application for the rezoning. Senior Planner Shorkey pointed out the resolution of support in the packet.

Vice-Chair Trezise moved to approve the resolution to recommend approval of REZ #23036 to rezone the subject property from PO, Professional Office to RC, Multiple-Family Residential. Seconded by Commissioner Scales.

VOICE VOTE **YEAS: Chair Blumer, Vice-Chair Trezise, Commissioners Snyder, Brooks, McConnell, Shrewsbury, and Scales**

NAYS: None

Motion carried: 7-0

9. OTHER BUSINESS
   A. 2024 Planning Commission Annual Report

Senior Planner Shorkey explained the report and suggested that the Planning Commission vote to accept the report.

Vice-Chair Trezise moved to accept the 2023 Planning Commission Annual Report. Seconded by Commissioner Scales.

VOICE VOTE **YEAS: Chair Blumer, Vice-Chair Trezise, Commissioners Snyder, Brooks, McConnell, Shrewsbury, and Scales**

NAYS: None

Motion carried: 7-0

10. REPORTS AND ANNOUNCEMENTS
    A. Township Board Update

Senior Planner Shorkey said that the Board was having a special meeting on January 9, 2024 to interview candidates to fill the vacant Board seat.

B. Liaison Reports

Chair Blumer said that he was supposed to have a DDA meeting that morning, but they did not have a quorum.

11. PROJECT UPDATES

A. Project Report

Senior Planner Shorkey said that there was no change to the last project report and that an updated report would be in the next packet.

12. PUBLIC REMARKS

None

13. COMMISSIONER COMMENTS

Commissioner McConnell said that he appreciated the level of detail in the annual report and that the Planning Commission should start discussing what they wanted to accomplish in the new year. Senior Planner Shorkey said that discussion was going to be on the next Planning Commission agenda.

14. ADJOURNMENT

Chair Blumer asked for a motion to close the meeting.

Commissioner Scales moved to close the meeting. Seconded by Commissioner McConnell.

VOICE VOTE **YEAS: Chair Blumer, Vice-Chair Trezise, Commissioners Snyder, Brooks, McConnell, Shrewsbury, and Scales**

NAYS: None

Motion carried: 7-0

Meeting adjourned at 6:45 pm.

To: **Planning Commission**

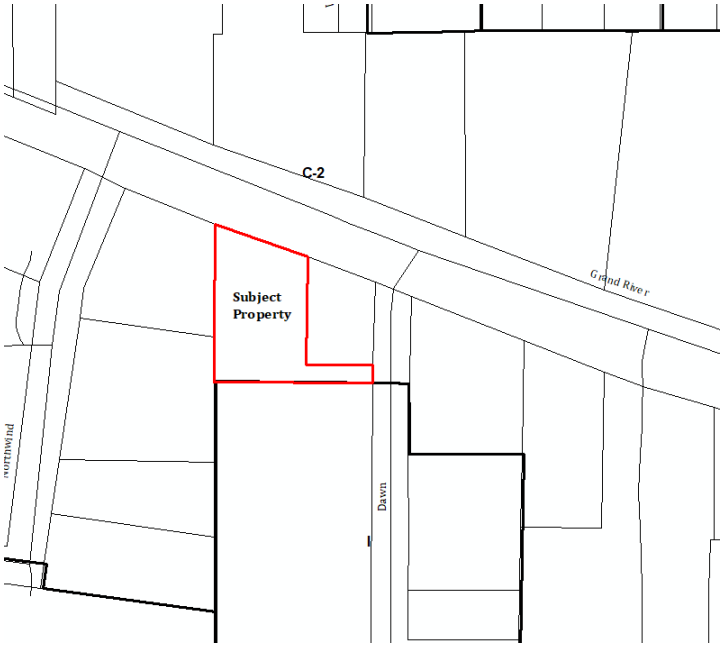
From: **Brian Shorkey, Senior Planner**

Date: **January 22, 2024**

Re: **<u>Special Use Permit #24001 (Meridian Retail Management II LLC)</u>, to construct a restaurant with a drive-through at 2731 Grand River.**

Meridian Retail Management II LLC (Applicant) has submitted a Special Use Permit (SUP) application for the construction of a 2,560 square foot restaurant with a drive-through at 2731 Grand River Avenue (Subject Property). The property currently contains a former bank building which is being proposed to be torn down and replaced with the proposed restaurant.

A single building is proposed with parking proposed on the west and north sides. A single lane drive-through is proposed to enter from the southern side of the building to the east side. Two entry points exist, and both are being maintained by the Applicant. The main entry point is located on Grand River Avenue. This entry point is proposed to be redesigned. There is also a secondary entrance to the site from Dawn Avenue to the east.



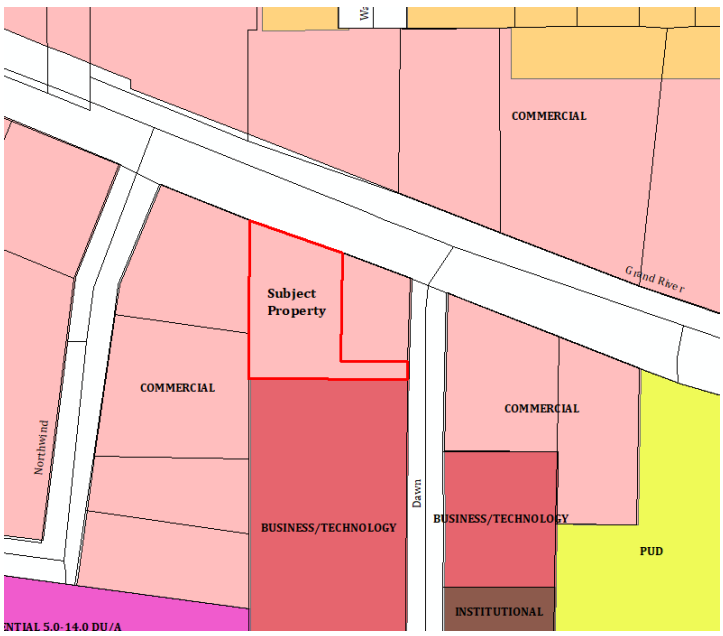
ZONING MAP

Zoning and Future Land Use

The Subject Property is located in the C-2 – Commercial zoning district. The property immediately adjacent to the west is similarly zoned C-2 and was approved as a specialty grocery store in 2022. The property to the north, on the

opposite side of Grand River Avenue, and the property to the east are zoned C-2 as well. The property to the south is zoned I – Industrial.

The 2017 Master Plan's Future Land Use map designates the subject site as Commercial. The Commercial designation applies to all of the surrounding properties to the west, north, and east. The property to the south is designated as Business/Technology.



FUTURE LAND USE MAP

Staff Analysis
Applications for special land use permits are reviewed under Sec. 86-126 in the Zoning Ordinance. Based on that review, Staff has the following comments:

1. Although the drive-through requires a special use permit, the restaurant is a use by right in the C-2 district and conforms to both the Zoning Ordinance and the Master Plan.
2. Municipal water and sanitary sewer are available in the vicinity to serve the subject site. The location and capacity of utilities will be reviewed in detail during site plan review if the special use permit is approved, although there are no indications that the current system cannot handle the proposed restaurant.
3. An original traffic study was prepared by the Applicant's traffic engineer. The traffic study takes the adjacent specialty grocery store adjacent to the west into account, as well as the proposed restaurant. According to the study, all of the approaches and movements in the study's intersections are expected to operate in an acceptable manner and future conditions and movements at nearby intersection approaches will continue to operate acceptably. In addition, the study indicates that the proposed driveway will operate acceptably. The traffic study will be required to be accepted by MDOT during site plan review.
4. The Flood Insurance Rate Map (FIRM) for Meridian Township indicates the property is not located in a floodplain. The Township Greenspace Plan shows no special designation on the site.
5. If the SUP is approved by the Planning Commission, the next step will be site plan approval, which is an administrative process. The site plan will be required to be approved by MDOT, as well as the IDCD office.

If the SUP is approved by the Planning Commission, the applicant will be required to submit for Site Plan Review and building permits before work on the project can begin. Site Plan Review is a detailed staff-level analysis of the project which includes reviews of storm water, utilities, landscaping, grading,

and other issues to ensure compliance with all applicable ordinances as well as confirmation of approvals from local agencies such as the Ingham County Drain Commissioner's Office, the Ingham County Road Department, and in this case, MDOT.

Planning Commission Options
The Planning Commission has the option to approve, approve with conditions, or deny Special Use Permit #24001. A resolution will be provided at a future meeting.

Attachments
1. SUP permit application, dated September 21, 2023 and received by the Township on December 18, 2023.
2. Site Development Plans prepared by Stonefield, dated September 22, 2023 and received by the Township on September 25, 2023.
3. Architectural Plans prepared by DAG, dated August 9, 2023 and received by the Township on September 25, 2023.
4. Traffic Analysis prepared by Fleis & Vandenbrink, dated December 5, 2023 and received by the Township on December 18, 2023.

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 Retail Management II LLC
Address of Applicant 30200 Telegraph RD suite 205
Telephone - Work 248-646-9999 Home _____ Fax _____ Email _____
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 2731 East Grand River Ave, East Lansing (PID: 33-02-02-20-202-001)
Legal description (please attach if necessary) Attached
Current zoning C-2
Use for which permit is requested / project name Proposed Restaurant With Drive-Through
Corresponding ordinance number Section - 86-404, e (13)

C. Developer (if different than applicant) Same as applicant
Address _____
Telephone – Work _____ Home _____ Fax _____

D. Architect, Engineer Planner or Surveyor responsible for design of project if different from applicant:
Name Stonefield Engineering - Mitchell Harvey
Address 607 Shelby Suite 200 Detroit MI 48226
Telephone – Work 248-247-1115 Home _____ Fax _____

E. Acreage of all parcels in the project: Gross 0.88 Net 0.88

F. Explain the project and development phases:

G. Total number of:
Existing: structures 1 bedrooms____ offices____ parking spaces 33 carports ___ garages_____
Proposed: structures 1 bedrooms____ offices____ parking spaces 22 carports ___ garages_____

H. Square footage: existing buildings 6,296 proposed buildings 2,560
Usable Floor area: existing buildings____ proposed buildings____

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: 5-7 Employees per shift

J. Existing Recreation: Type _____ Acreage _____
Proposed Recreation: Type _____ Acreage _____
Existing Open Space: Type Landscaping & Gavel Acreage 0.13 AC
Proposed Open Space: Type Landscaping Acreage 0.20 AC

K. If Multiple Housing:

Total acres of property _____

Acres in floodplain _____ Percent of total _____

Acres in wetland (not in floodplain) _____ Percent of total _____

Total dwelling units _____

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 _____	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.

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.

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.

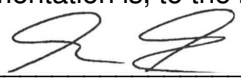
(9) The project will not directly or indirectly have a substantial adverse impact on the natural resources of the Township, including, but not limited to, prime agricultural soils, water recharge areas, lakes, rivers, streams, major forests, wetlands, and wildlife areas.

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



_____ _9/21/2023_ Date

Signature of Applicant

____Gabriel Schuchman_____

Fee: _____ Received by/Date: _____

Special Use Permit Application Attachment
Site Plan Requirements Per Section 86-124(c)(4)

A site plan, drawn to a legible scale, containing the following information where applicable:

a. Boundaries of the subject property.

b. Total area of the subject property.

c. Location of all existing and proposed structures.

d. Approximate location and distance of all structures within 100 feet of the subject property.

e. Uses of existing and proposed buildings, on the subject site.

f. Proposed means of vehicular and pedestrian ingress and egress to the subject property.

g. Public and private roads and streets, rights-of-way, and easements, indicating names and widths, which abut or cross the site.

h. Existing and proposed parking spaces, and vehicular and pedestrian circulation patterns.

i. The buildable area of the subject property indicating all required setbacks, yards and open space.

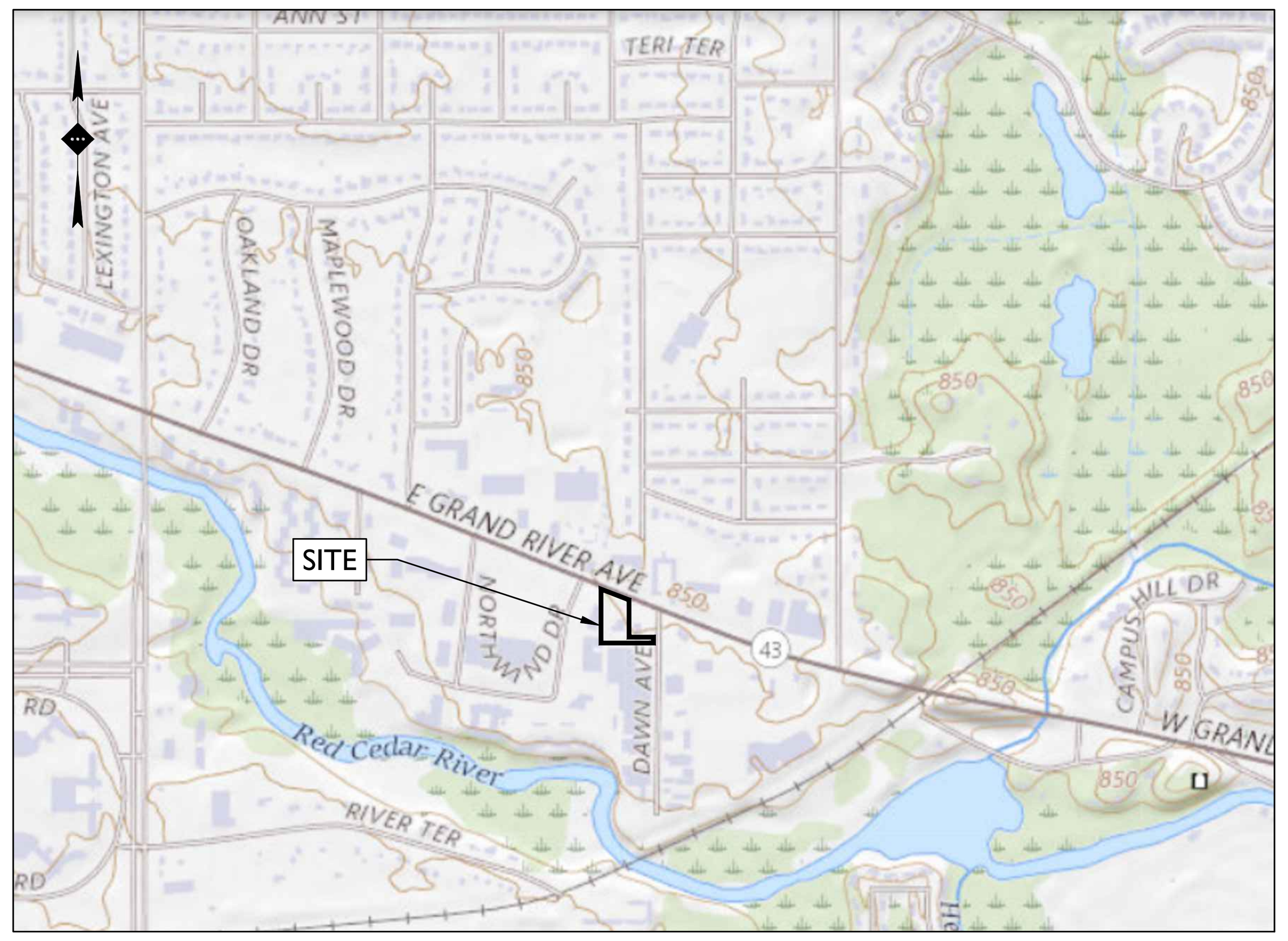
j. Zoning classification of the subject and adjacent properties.

k. Existing and proposed fencing, screening, landscaping, and buffers.

l. Location and sizes of existing utilities including power lines and towers, both above and below the ground.

m. Amount and location of all impervious surfaces.

n. The verified boundaries of all natural water features and required setback lines.



SOURCE: USGS ONLINE MAPS

LOCATION MAP

SCALE: 1" = 1,000'±

SITE DEVELOPMENT PLANS

FOR

2731 EAST GRAND RIVER

PROPOSED RESTAURANT WITH DRIVE-THROUGH

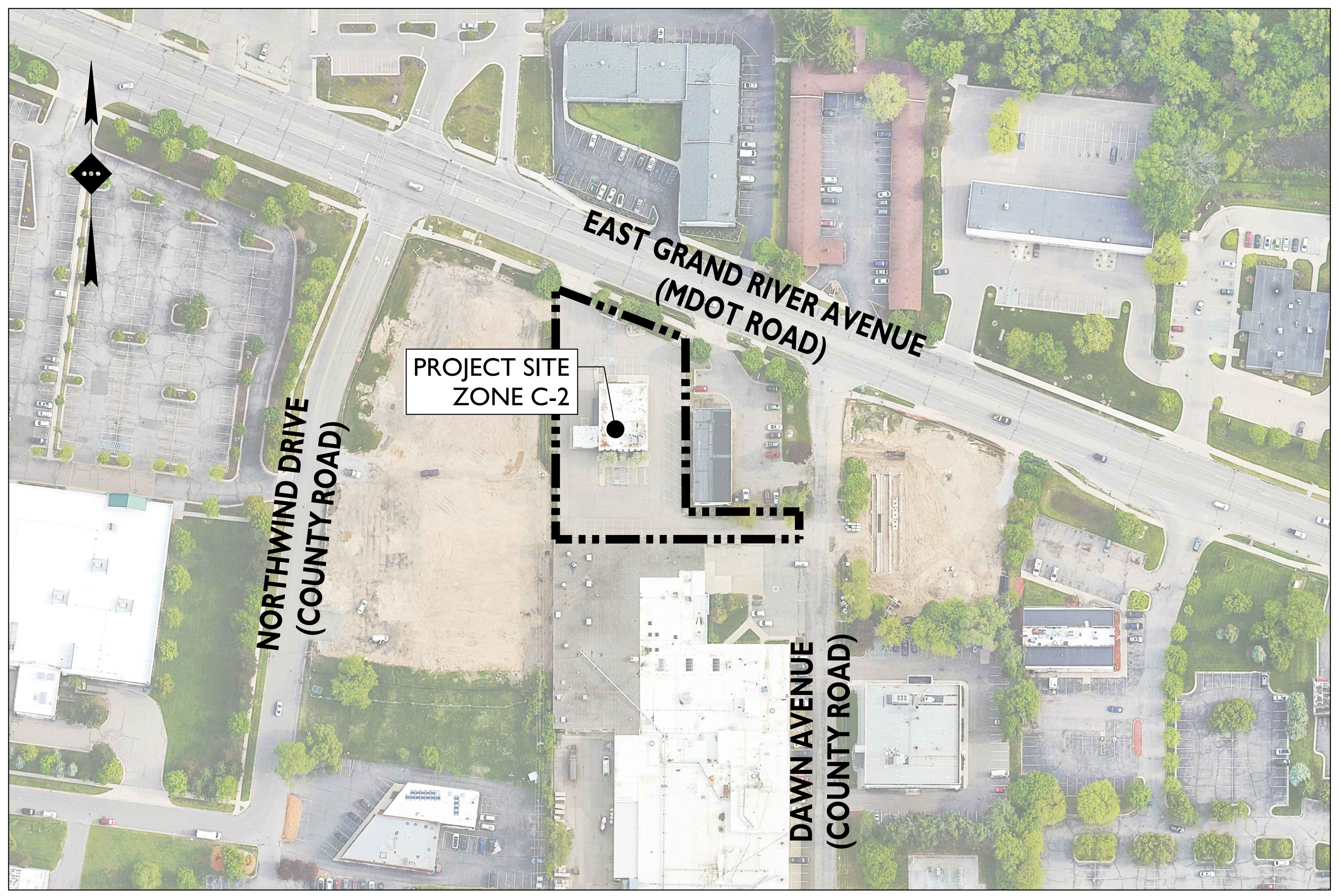
PARCEL ID: 33-02-02-20-202-001

2731 EAST GRAND RIVER AVENUE, MERIDIAN CHARTER TOWNSHIP

INGHAM COUNTY, MICHIGAN 48823

APPLICANT

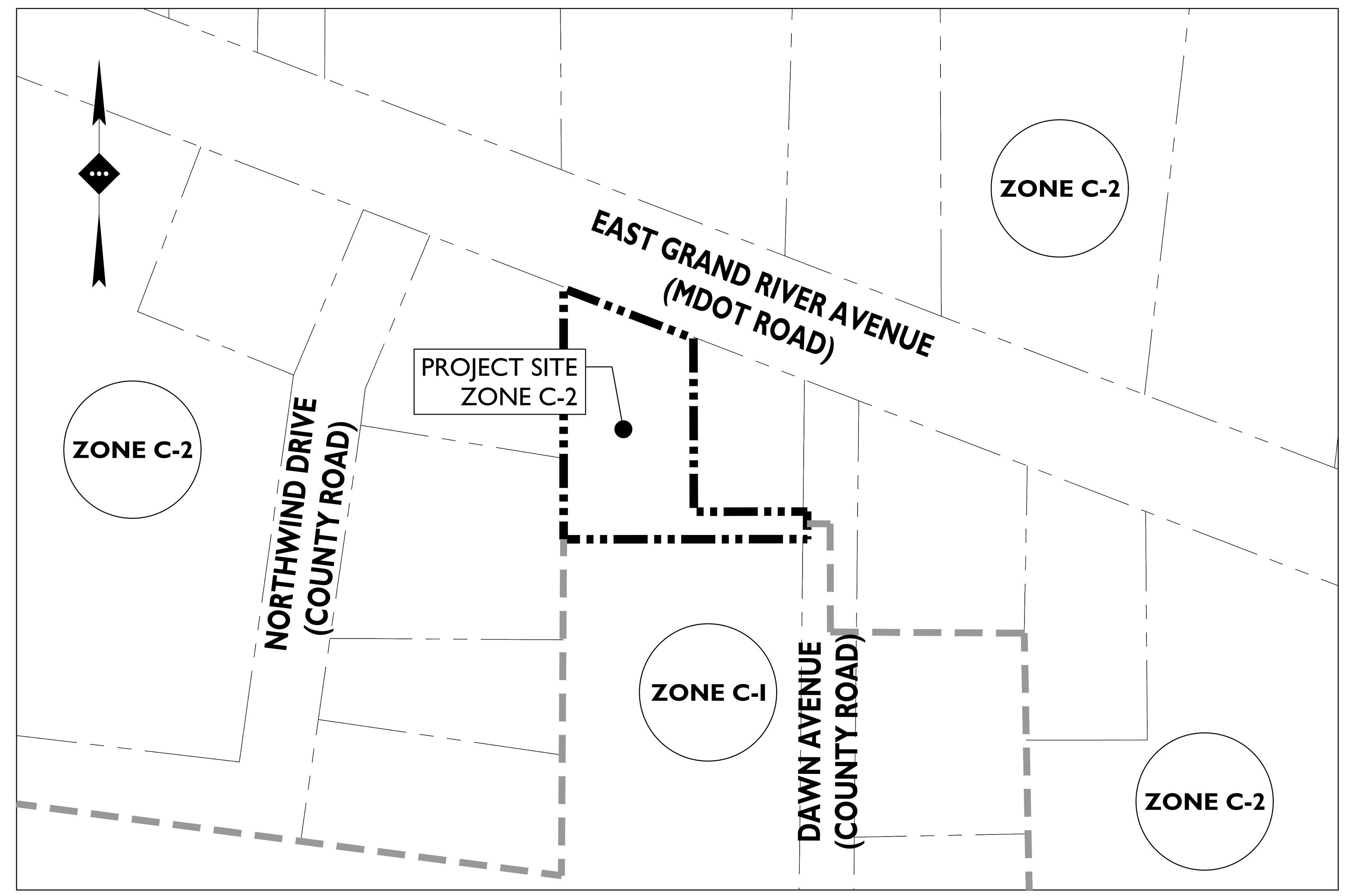
MERIDIAN RETAIL MANAGEMENT II LLC
30200 TELEGRAPH ROAD SUITE 205
BINGHAM FARMS, MICHIGAN 48025
(248) 649-9999
RACHEL@ALRIGUSA.COM



SOURCE: GOOGLE EARTH PRO

AERIAL MAP

SCALE: 1" = 120'±



SOURCE: MERIDIAN TOWNSHIP ZONING ORDINANCE

ZONING MAP

SCALE: 1" = 120'±

PLANS PREPARED BY:

STONEFIELD
engineering & design

Detroit, MI · Rutherford, NJ · New York, NY
Boston, MA · Princeton, NJ · Tampa, FL
www.stonefieldeng.com

607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

PLAN REFERENCE MATERIALS:

1. THIS PLAN SET REFERENCES THE FOLLOWING DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
   - SURVEY PREPARED BY KEM-TEC ASSOCIATES, DATED 09/20/2023
   - ARCHITECTURAL PLANS PREPARED BY DETROIT ARCHITECTURAL GROUP, DATED 08/09/2023
   - GEOTECHNICAL REPORT
   - AERIAL MAP OBTAINED FROM GOOGLE EARTH PRO
   - LOCATION MAP OBTAINED FROM USGS ONLINE MAPS
2. ALL REFERENCE MATERIAL LISTED ABOVE SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THESE MATERIALS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF EACH REFERENCE AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.

SHEET INDEX

DRAWING TITLE	*SHEET #*
COVER SHEET	C-1
DEMOLITION PLAN	C-2
SITE PLAN	C-3
GRADING & STORMWATER MANAGEMENT PLAN	C-4
PRE VS POST DEVELOPMENT PLAN	C-5
UTILITY PLAN	C-6
LIGHTING PLAN	C-7
LANDSCAPING PLAN	C-8
CONSTRUCTION DETAILS	C-9 TO C-11

ADDITIONAL SHEET INDEX

DRAWING TITLE	*SHEET #*
ALTA / NSPS LAND TITLE SURVEY	1 OF 1

Know what's **below**
Call before you dig.

ISSUE	DATE	BY	DESCRIPTION
1	09/22/2023	VF & AF	FOR SPECIAL LAND USE APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design
Detroit, MI · New York, NY · Boston, MA
Princeton, NJ · Tampa, FL · Rutherford, NJ
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

2731 EAST GRAND RIVER

PROPOSED RESTAURANT WITH DRIVE-THROUGH

PARCEL ID: 33-02-02-20-202-001
2731 EAST GRAND RIVER AVENUE
MERIDIAN CHARTER TOWNSHIP
INGHAM COUNTY, MI 48823

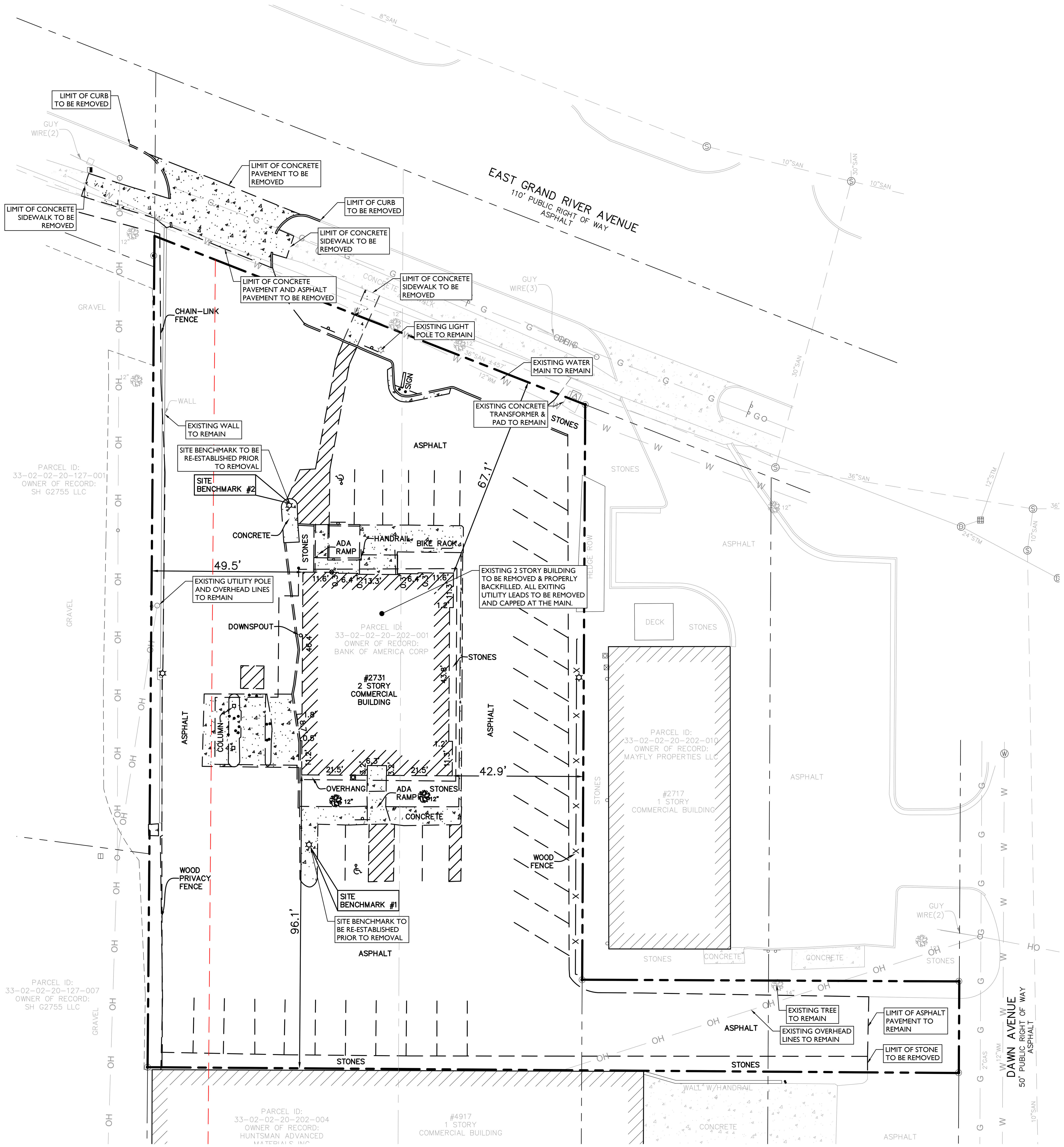
MICHIGAN LICENSE No. 6201311615
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: AS SHOWN | PROJECT ID: DET-230027

TITLE: COVER SHEET

DRAWING: C-1



SYMBOL	DESCRIPTION
— — — — —	FEATURE TO BE REMOVED / DEMOLISHED

ALL SITE FEATURES WITHIN THE LIMIT OF THE PROPERTY INDICATED ON THIS PLAN ARE TO BE REMOVED / DEMOLISHED UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IF SIGNIFICANT DISCREPANCIES ARE DISCERNED BETWEEN THIS PLAN AND FIELD CONDITIONS

ALL SITE FEATURES OUTSIDE THE LIMIT OF THE PROPERTY INDICATED ON THIS PLAN ARE TO REMAIN UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IF SIGNIFICANT DISCREPANCIES ARE DISCERNED BETWEEN THIS PLAN AND FIELD CONDITIONS

811
Know what's **below**
Call before you dig.

DEMOLITION NOTES

1. THE WORK REFLECTED ON THE DEMOLITION PLAN IS TO PROVIDE GENERAL INFORMATION TOWARDS THE EXISTING ITEMS TO BE DEMOLISHED AND/OR REMOVED. THE CONTRACTOR IS RESPONSIBLE TO REVIEW THE ENTIRE PLAN SET AND ASSOCIATED REPORTS/REFERENCE DOCUMENTS INCLUDING ALL DEMOLITION ACTIVITIES AND INCIDENTAL TASKS NECESSARY TO COMPLETE THE SITE IMPROVEMENTS.
2. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF DEMOLITION ACTIVITIES.
3. EXPLOSIVES SHALL NOT BE USED UNLESS WRITTEN CONSENT FROM BOTH THE OWNER AND ANY APPLICABLE GOVERNING AGENCY IS OBTAINED. BEFORE THE START OF ANY EXPLOSIVE PROGRAM, THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL LOCAL, STATE, AND FEDERAL PERMITS. ADDITIONALLY, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL SEISMIC TESTING AS REQUIRED AND ANY DAMAGES AS THE RESULT OF SAID DEMOLITION PRACTICES.
4. ALL DEMOLITION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL CODES. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL UTILITIES ARE DISCONNECTED IN ACCORDANCE WITH THE UTILITY AUTHORITY'S REQUIREMENTS PRIOR TO STARTING THE DEMOLITION OF ANY STRUCTURE. ALL EXCAVATIONS ASSOCIATED WITH DEMOLISHED STRUCTURES OR REMOVED TANKS SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO SUPPORT SITE AND BUILDING IMPROVEMENTS. A GEOTECHNICAL ENGINEER SHOULD BE PRESENT DURING BACKFILLING ACTIVITIES TO OBSERVE AND CERTIFY THAT BACKFILL MATERIAL WAS COMPACTED TO A SUITABLE CONDITION.
5. DEMOLISHED DEBRIS SHALL NOT BE BURIED ON SITE. ALL WASTE/DEBRIS GENERATED FROM DEMOLITION ACTIVITIES SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN ALL RECORDS OF THE DISPOSAL TO DEMONSTRATE COMPLIANCE WITH THE ABOVE REGULATIONS.

20' 0' 20' 40'
GRAPHIC SCALE IN FEET
1" = 20'

ISSUE	DATE	BY	DESCRIPTION
1	09/22/2023	VF & AF	FOR SPECIAL LAND USE APPROVAL

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SITE DEVELOPMENT PLANS

2731 EAST GRAND RIVER

PROPOSED RESTAURANT WITH DRIVE-THROUGH

PARCEL ID : 33-02-02-20-202-001
2731 EAST GRAND RIVER AVENUE
MERIDIAN CHARTER TOWNSHIP
INGHAM COUNTY, MI 48823

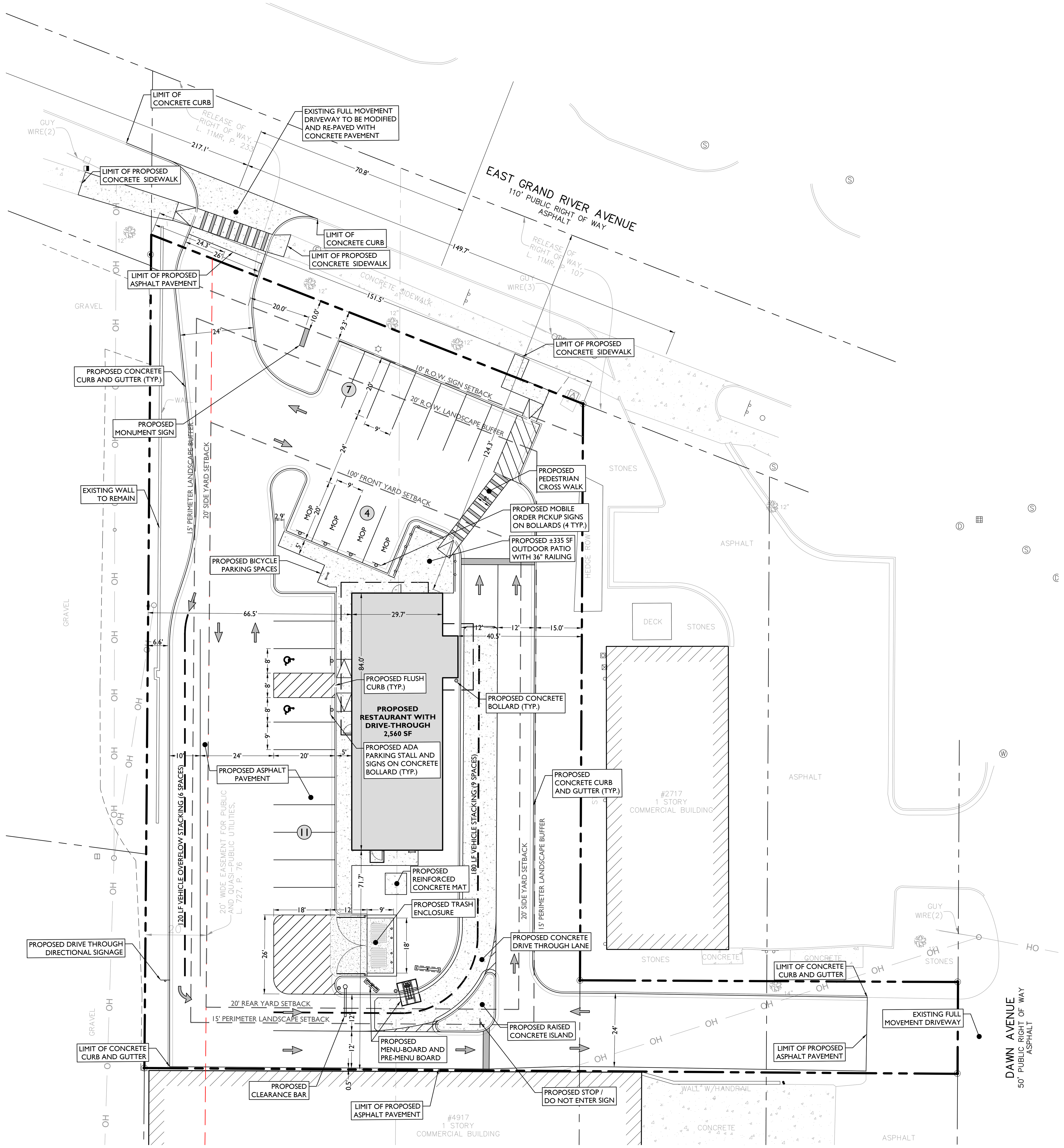
STATE OF MICHIGAN
PROFESSIONAL ENGINEER
NO. 6201311615
MICHIGAN LICENSE No. 6201311615
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

SCALE: 1" = 20' PROJECT ID: DET-230027

TITLE:
DEMOLITION PLAN

DRAWING:
C-2



LAND USE AND ZONING

PARCEL ID : 33-02-02-20-202-001

COMMERCIAL DISTRICT (C-2)

PROPOSED USE

RESTAURANT WITH DRIVE-THROUGH — SPECIAL PERMITTED USE

ZONING REQUIREMENT	REQUIRED	EXISTING	PROPOSED
MINIMUM LOT AREA	4,000 SF	38,436 SF (± 0.88 AC)	-
MINIMUM LOT WIDTH	100 FT	151.5 FT	-
MAXIMUM BUILDING HEIGHT	35 FT	-	20.3 FT
MAXIMUM IMPERVIOUS COVERAGE	70%(26,906 SF)	85.1% (32,693 SF) (EN)	76.3% (29,342 SF) (W)
MINIMUM FRONT YARD SETBACK	100 FT (1)	117.1 FT	124.3 FT
MINIMUM SIDE YARD SETBACK	20 FT	42.9 FT	40.5 FT
MINIMUM REAR YARD SETBACK	20 FT	96.1 FT	71.7 FT
MINIMUM FRONTAGE ROAD WIDTH	25 FT (2)	NOT PROVIDED (EN)	NOT PROVIDED (EN)
MINIMUM R.O.W. LANDSCAPE BUFFER	20 FT	8.8 FT (EN)	9.3 (EN)
MINIMUM PERIMETER LANDSCAPE BUFFER	15 FT	2.3 FT (EN)	0.5 FT (V)
MINIMUM PARKING LOT LANDSCAPING	440 SF (3)	1,029 SF	1,679 SF
MINIMUM LANDSCAPE ISLAND AREA	200 SF	-	350 SF
MINIMUM LANDSCAPE ISLAND WIDTH	10 FT	-	2.9 FT (V)
MINIMUM PERIMETER BUILDING LANDSCAPE WIDTH	4 FT	0.9 (EN)	0.0 FT (V)
MINIMUM DRIVEWAY/STREET SIGHT TRIANGLE	35 FT	PROVIDED	PROVIDED
MINIMUM DRIVEWAY SPACING (45 MPH)	350 FT	158.3 FT (EN)	149.7 FT (W)(4)
MINIMUM OPPOSING DRIVEWAY SPACING (45 MPH)	630 FT	72.1 FT (EN)	70.8 FT (W)(4)
MINIMUM DRIVEWAY ADJACENT TO PROPERTY LINE	20 FT	17.1 FT (EN)	24.3 FT
MINIMUM DRIVEWAY SPACING FROM INTERSECTION	300 FT	211.1 FT (EN)	217.1 FT (W)(4)

(W) WAIVER

(V) VARIANCE

(EN) EXISTING NON-CONFORMITY

(1) § 86-367 : MEASURED FROM CENTER OF R.O.W

(2) § 86-757 : FRONTAGE ROADS - MINIMUM 25 FT WIDE SERVICE DRIVE REQUIRED ALONG GRAND RIVER AVENUE

(3) § 86-758 : MINIMUM PARKING LOT LANDSCAPING IS EQUAL TO 200 SF PER 10 PARKING SPACES (200 SF)(22 SPACES / 10 SPACES) = 440 SF

(4) § 86-402.5.J : THE DIRECTOR OF COMMUNITY PLANNING MAY WAIVE SPECIFIC ACCESS REQUIREMENTS WHEN EVERY EFFORT HAS BEEN MADE TO ACHEIVE THE OBJECTIVES OF THE CHAPTER AND THE STANDARDS PRECLUDE USE OF THE PROPERTY AS ZONED

OFF-STREET PARKING REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ 86-755	RESTAURANT DRIVE IN 1 SPACE FOR EVERY 3 PATRON SEATS (42 SEATS)(1 SPACE / 3 SEATS)= 14 SPACES 1 SPACE PER EMPLOYEE (8 EMPLOYEES)(1 SPACE / 1 EMPLOYEE)= 8 SPACES **TOTAL = 14 + 8 - 1 = 21 SPACES (1)**	18 SPACES (REG.) 4 SPACES (MOP) **TOTAL: 22 SPACES**
§ 86-756.5	ACCESS DRIVE MINIMUM 25 FT WIDE	26 FT
§ 86-756.2	90° PARKING 9 FT X 20 FT W/ 24 FT AISLE	9 FT X 20 FT W/ 24 FT AISLE
§ 86-760.G.1	BICYCLE PARKING 1 SPACE PER 10 VEHICLE PARKING SPACES (22 SPACES)(1 BIKE SPACE /10 SPACES) = 2 SPACES	2 SPACES
§ 86-721	LOADING 12 FT X 25 FT W/14 FT HEIGHT	18 FT X 26 FT

(1) § 86-760.H : MOTOR VEHICLE PARKING SPACES MAY BE REDUCED 1 SPACE PER 2 BICYCLE SPACES PROVIDED

SIGNAGE REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ 86-687.4.G	SIGN R.O.W. SETBACK: 10 FT	10 FT
§ 86-687.4.H	SIGN ACCESS SETBACK: 20 FT	20 FT
§ 86-687.14.A	MAXIMUM PARKING SIGNS : 4 SIGNS *	4 SIGNS

(*) § 86-687.14.A : MAXIMUM NUMBER OF SIGNS RESERVED FOR SPECIFIC PURPOSES SHALL BE BASED ON THE AMOUNT OF USABLE FLOOR AREA

USABLE FLOOR AREA = 2,501 TO 5,000 SF, 4 PARKING SIGNS PERMITTED

SYMBOL	DESCRIPTION
	PROPERTY LINE
	SETBACK LINE
	PROPOSED CURB AND GUTTER
	PROPOSED FLUSH CURB
	PROPOSED SIGNS
	PROPOSED BUILDING
	PROPOSED CONCRETE
	PROPOSED BUILDING DOORS

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. PRIOR TO THE START OF CONSTRUCTION.
2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENSURE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
3. ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC. AND IT'S SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEES ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
4. THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC.
5. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
6. THE CONTRACTOR SHALL NOT PERFORM ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
7. THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTORS EXPENSE.
8. CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW. STONEFIELD ENGINEERING & DESIGN, LLC. WILL REVIEW THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
9. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
10. THE CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
11. THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION & DEMOLITION ACTIVITIES.
12. SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC. BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.

20' 0' 20' 40'

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SITE DEVELOPMENT PLANS

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MERIDIAN CHARTER TOWNSHIP
INGHAM COUNTY, MI 48823

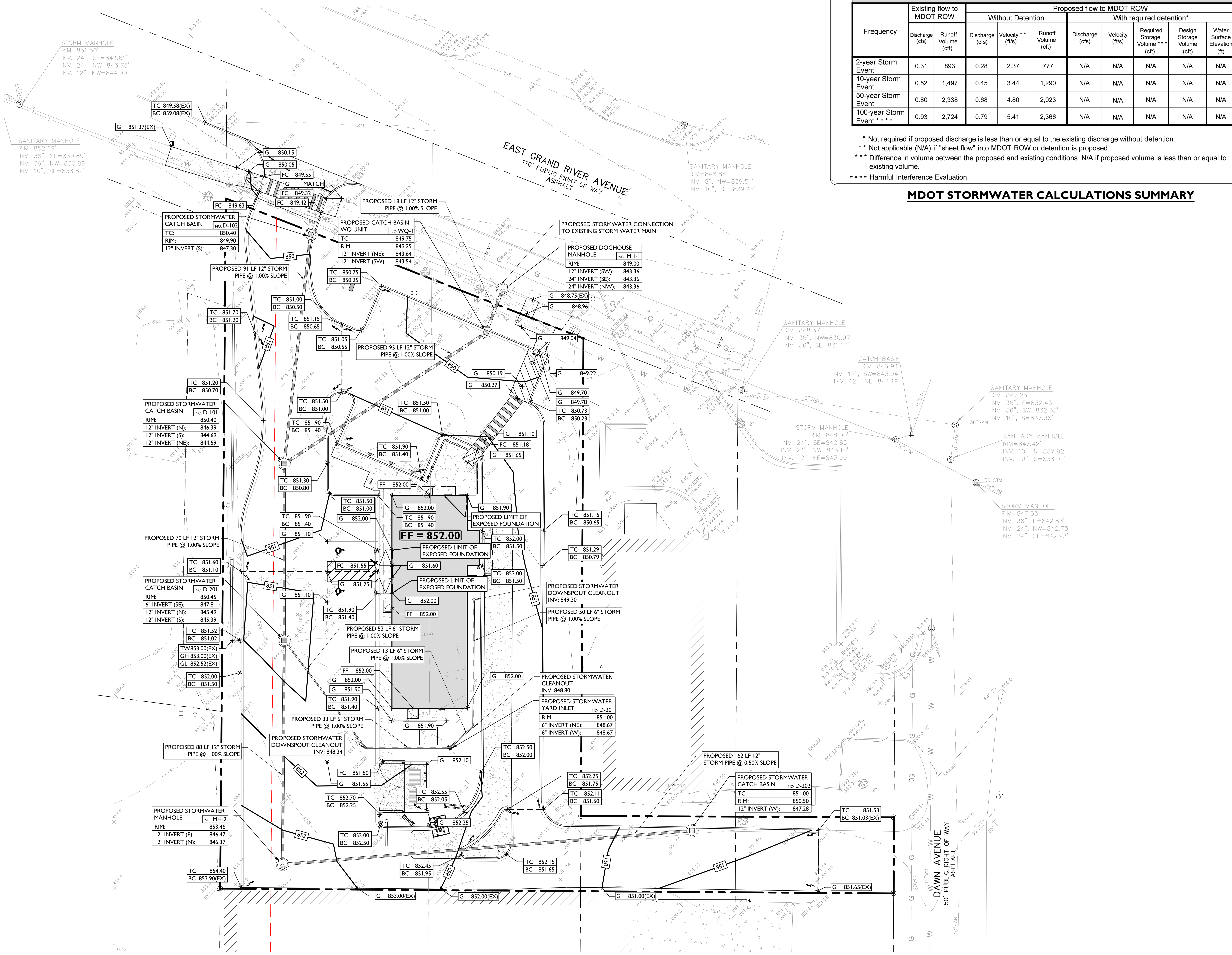
STATE OF MICHIGAN ... PROFESSIONAL ENGINEER ... 6201311615
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 20' | PROJECT ID: DET-230027

TITLE: SITE PLAN

DRAWING: C-3



MDOT 2484 (11/2022) Page 2 of 2

DRAINAGE DESIGN CHECKLIST FOR ACCESSING STATE TRUNKLINE DRAINAGE SYSTEMS

ALL FIELDS SHALL BE COMPLETED BY THE APPLICANT

Data Summary

Site Information	Existing	Proposed
Drainage Area (Acres)	0.88	0.88
Site % Impervious	85.06% (32,693 sf)	76.25% (29,306 sf)

Frequency	Existing flow to MDOT ROW		Proposed flow to MDOT ROW							
			Without Detention			With required detention*				
	Discharge (cfs)	Runoff Volume (cft)	Discharge (cfs)	Velocity * * (ft/s)	Runoff Volume (cft)	Discharge (cfs)	Velocity (ft/s)	Required Storage Volume * * * (cft)	Design Storage Volume (cft)	Water Surface Elevation (ft)
2-year Storm Event	0.31	893	0.28	2.37	777	N/A	N/A	N/A	N/A	N/A
10-year Storm Event	0.52	1,497	0.45	3.44	1,290	N/A	N/A	N/A	N/A	N/A
50-year Storm Event	0.80	2,338	0.68	4.80	2,023	N/A	N/A	N/A	N/A	N/A
100-year Storm Event * * * *	0.93	2,724	0.79	5.41	2,366	N/A	N/A	N/A	N/A	N/A

* Not required if proposed discharge is less than or equal to the existing discharge without detention.
* * Not applicable (N/A) if "sheet flow" into MDOT ROW or detention is proposed.
* * * Difference in volume between the proposed and existing conditions. N/A if proposed volume is less than or equal to existing volume.
* * * * Harmful Interference Evaluation.

MDOT STORMWATER CALCULATIONS SUMMARY

SYMBOL	DESCRIPTION
	PROPERTY LINE
100	PROPOSED GRADING CONTOUR
	PROPOSED GRADING RIDGELINE
	PROPOSED DIRECTION OF DRAINAGE FLOW
G 100.00	PROPOSED GRADE SPOT SHOT
TC 100.50 / BC 100.00	PROPOSED TOP OF CURB / BOTTOM OF CURB SPOT SHOT
FC 100.00	PROPOSED FLUSH CURB SPOT SHOT
TW 102.00 / BW 100.00	PROPOSED TOP OF WALL / BOTTOM OF WALL SPOT SHOT

GRADING NOTES

1. ALL SOIL AND MATERIAL REMOVED FROM THE SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS. ANY GROUNDWATER DE-WATERING PRACTICES SHALL BE PERFORMED UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL. THE CONTRACTOR IS REQUIRED TO OBTAIN ALL NECESSARY PERMITS FOR THE DISCHARGE OF DE-WATERED GROUNDWATER. ALL SOIL IMPORTED TO THE SITE SHALL BE CERTIFIED CLEAN FILL. CONTRACTOR SHALL MAINTAIN RECORDS OF ALL FILL MATERIALS BROUGHT TO THE SITE.
2. THE CONTRACTOR IS REQUIRED TO PROVIDE TEMPORARY AND/OR PERMANENT SHORING WHERE REQUIRED DURING EXCAVATION ACTIVITIES, INCLUDING BUT NOT LIMITED TO UTILITY TRENCHES, TO ENSURE THE STRUCTURAL INTEGRITY OF NEARBY STRUCTURES AND STABILITY OF THE SURROUNDING SOILS.
3. PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 4 INCHES TO 7 INCHES ABOVE EXISTING GRADES UNLESS OTHERWISE NOTED. THE CONTRACTOR WILL SUPPLY ALL STAKEOUT CURB GRADE SHEETS TO STONEFIELD ENGINEERING & DESIGN, LLC. FOR REVIEW AND APPROVAL PRIOR TO POURING CURBS.
4. THE CONTRACTOR IS RESPONSIBLE TO SET ALL PROPOSED UTILITY COVERS AND RESET ALL EXISTING UTILITY COVERS WITHIN THE PROJECT LIMITS TO PROPOSED GRADE IN ACCORDANCE WITH ANY APPLICABLE MUNICIPAL, COUNTY, STATE AND/OR UTILITY AUTHORITY REGULATIONS.
5. MINIMUM SLOPE REQUIREMENTS TO PREVENT PONDING SHALL BE AS FOLLOWS:
   - CURB GUTTER: 0.50%
   - CONCRETE SURFACES: 1.00%
   - ASPHALT SURFACES: 1.00%
6. A MINIMUM SLOPE OF 1.00% SHALL BE PROVIDED AWAY FROM ALL BUILDINGS. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE FROM THE BUILDING IS ACHIEVED AND SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IF THIS CONDITION CANNOT BE MET.
7. FOR PROJECTS WHERE BASEMENTS ARE PROPOSED, THE DEVELOPER IS RESPONSIBLE TO DETERMINE THE DEPTH TO GROUNDWATER AT THE LOCATION OF THE PROPOSED STRUCTURE. IF GROUNDWATER IS ENCOUNTERED WITHIN THE BASEMENT AREA, SPECIAL CONSTRUCTION METHODS SHALL BE UTILIZED AND REVIEWED/APPROVED BY THE CONSTRUCTION CODE OFFICIAL. IF SUMP PUMPS ARE UTILIZED, ALL DISCHARGES SHALL BE CONNECTED DIRECTLY TO THE PUBLIC STORM SEWER SYSTEM WITH APPROVAL FROM THE GOVERNING STORM SEWER SYSTEM AUTHORITY.

ADA NOTES

1. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION WITHIN THE ADA PARKING SPACES AND ACCESS AISLES.
2. THE CONTRACTOR SHALL PROVIDE COMPLIANT SIGNAGE AT ALL ADA PARKING AREAS IN ACCORDANCE WITH STATE GUIDELINES.
3. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 5.00% RUNNING SLOPE AND A MAXIMUM OF 2.00% CROSS SLOPE ALONG WALKWAYS WITHIN THE ACCESSIBLE PATH OF TRAVEL (SEE THE SITE PLAN FOR THE LOCATION OF THE ACCESSIBLE PATH). THE CONTRACTOR IS RESPONSIBLE TO ENSURE THE ACCESSIBLE PATH OF TRAVEL IS 36 INCHES WIDE OR GREATER UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
4. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION AT ALL LANDINGS. LANDINGS INCLUDE, BUT ARE NOT LIMITED TO, THE TOP AND BOTTOM OF AN ACCESSIBLE RAMP, AT ACCESSIBLE BUILDING ENTRANCES, AT AN AREA IN FRONT OF A WALK-UP ATM, AND AT TURNING SPACES ALONG THE ACCESSIBLE PATH OF TRAVEL. THE LANDING AREA SHALL HAVE A MINIMUM CLEAR AREA OF 60 INCHES BY 60 INCHES UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
5. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 8.33% RUNNING SLOPE AND A MAXIMUM 2.00% CROSS SLOPE ON ANY CURB RAMPS ALONG THE ACCESSIBLE PATH OF TRAVEL. WHERE PROVIDED, CURB RAMP FLARES SHALL NOT HAVE A SLOPE GREATER THAN 10.00% IF A LANDING AREA IS PROVIDED AT THE TOP OF THE RAMP. FOR ALTERATIONS, A CURB RAMP FLARES SHALL NOT HAVE A SLOPE GREATER THAN 8.33% IF A LANDING AREA IS NOT PROVIDED AT THE TOP OF THE RAMP. CURBS RAMPS SHALL NOT RISE MORE THAN 6 INCHES IN ELEVATION WITHOUT A HANDRAIL. THE CLEAR WIDTH OF A CURB RAMP SHALL BE NO LESS THAN 36 INCHES WIDE.
6. ACCESSIBLE RAMPS WITH A RISE GREATER THAN 6 INCHES SHALL CONTAIN COMPLIANT HANDRAILS ON BOTH SIDES OF THE RAMP AND SHALL NOT RISE MORE THAN 30" IN ELEVATION WITHOUT A LANDING AREA IN BETWEEN RAMP RUNS. LANDING AREAS SHALL ALSO BE PROVIDED AT THE TOP AND BOTTOM OF THE RAMP.
7. A SLIP RESISTANT SURFACE SHALL BE CONSTRUCTED ALONG THE ACCESSIBLE PATH AND WITHIN ADA PARKING AREAS.
8. THE CONTRACTOR SHALL ENSURE A MAXIMUM OF ¼ INCHES VERTICAL CHANGE IN LEVEL ALONG THE ACCESSIBLE PATH. WHERE A CHANGE IN LEVEL BETWEEN ¼ INCHES AND ½ INCHES EXISTS, CONTRACTOR SHALL ENSURE THAT THE TOP ¼ INCH CHANGE IN LEVEL IS BEVELED WITH A SLOPE NOT STEEPER THAN 1 UNIT VERTICAL AND 2 UNITS HORIZONTAL (2:1 SLOPE).
9. THE CONTRACTOR SHALL ENSURE THAT ANY OPENINGS (GAPS OR HORIZONTAL SEPARATION) ALONG THE ACCESSIBLE PATH SHALL NOT ALLOW PASSAGE OF A SPHERE GREATER THAN ½ INCH.

20' 0' 20' 40'
GRAPHIC SCALE IN FEET
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INGHAM COUNTY, MI 48823

MICHIGAN LICENSE No. 6201311615
LICENSED PROFESSIONAL ENGINEER

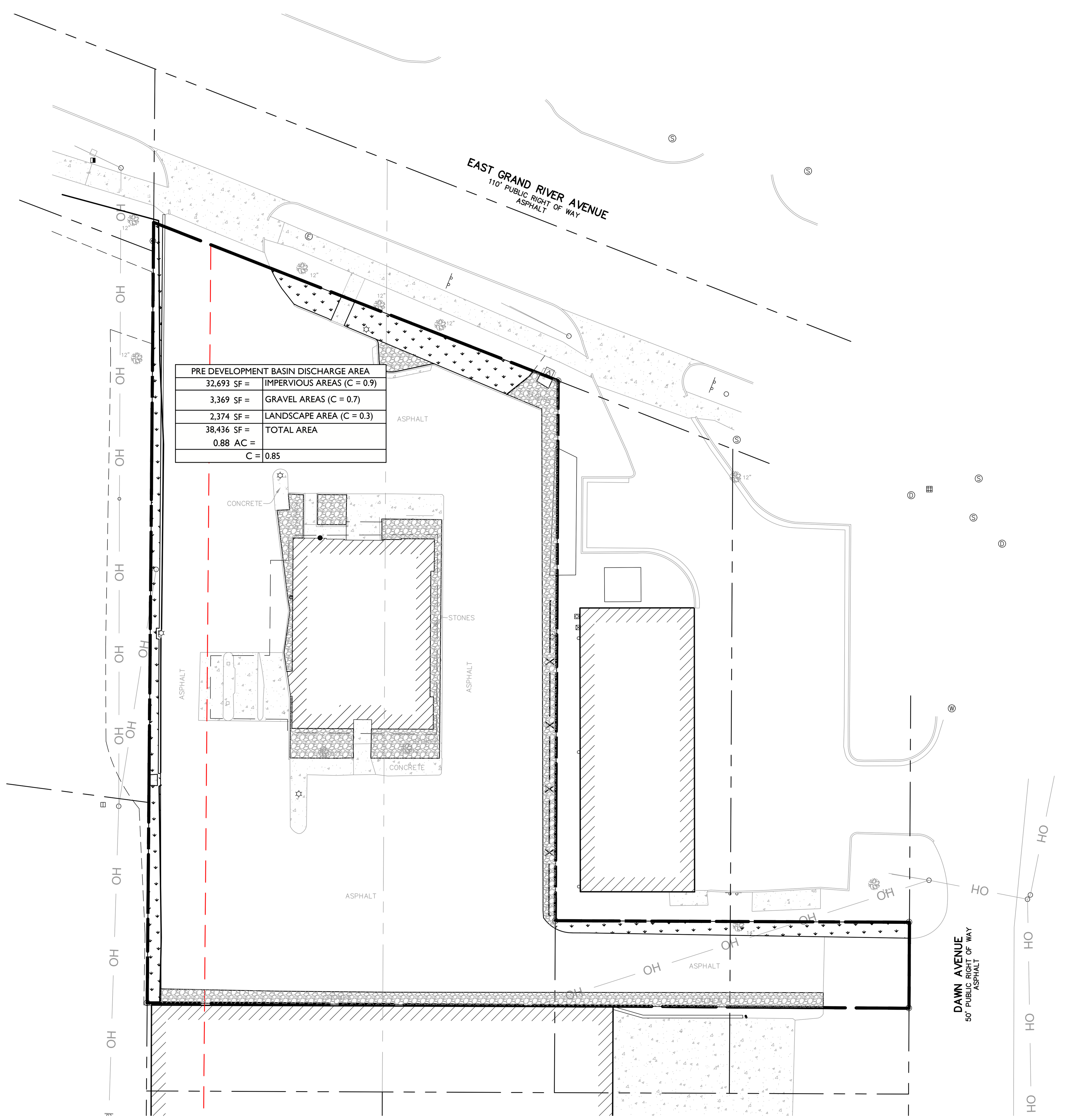
STONEFIELD engineering & design

SCALE: 1" = 20' PROJECT ID: DET-230027

TITLE: **GRADING & STORMWATER MANAGEMENT PLAN**

DRAWING: **C-4**

SYMBOL	DESCRIPTION
— - - —	PROPERTY LINE
- - - -	DETENTION BASIN DRAINAGE AREA
(dotted box)	EXISTING PERVIOUS AREA

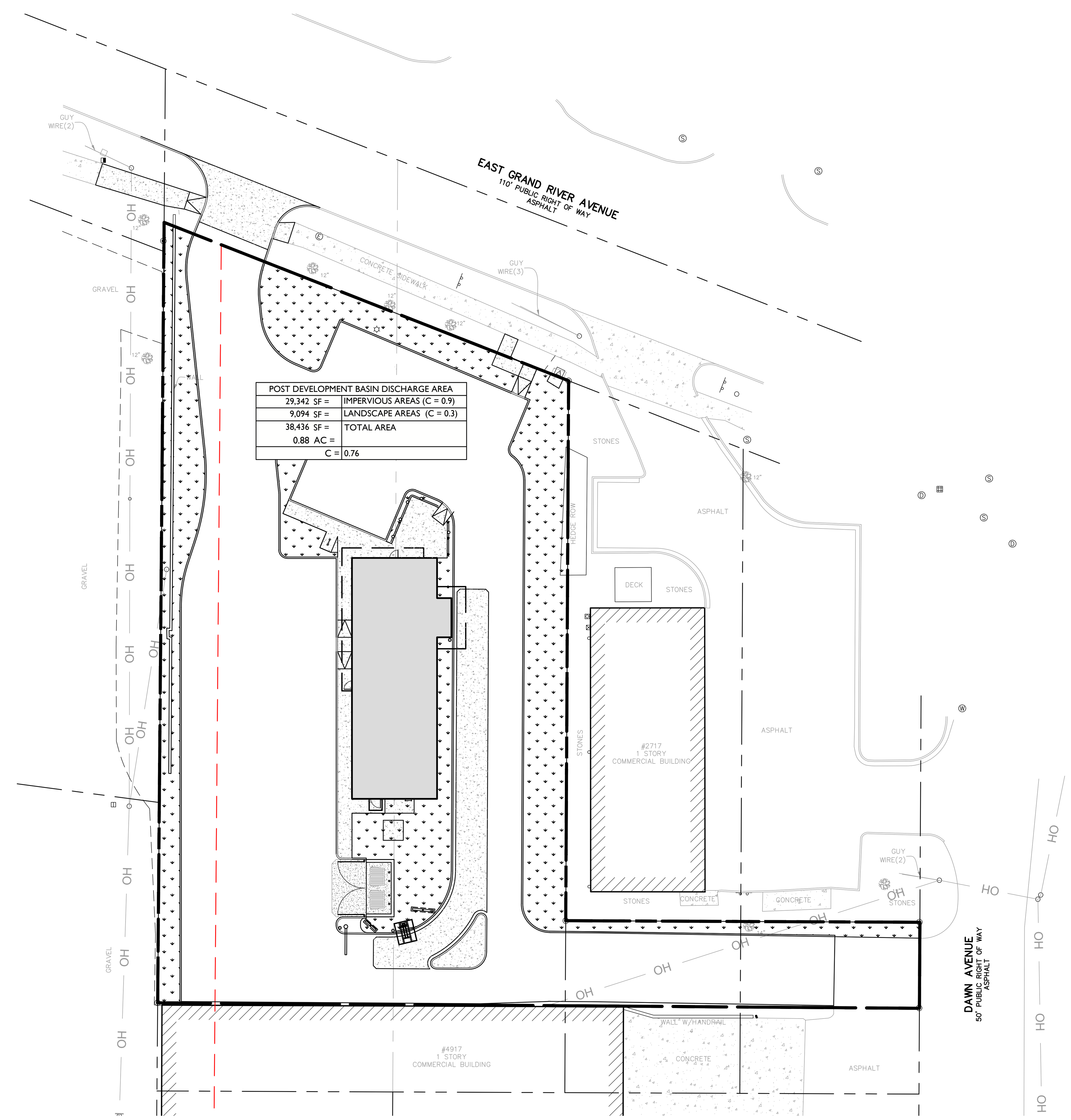


PRE DEVELOPMENT BASIN DISCHARGE AREA	
32,693 SF =	IMPERVIOUS AREAS (C = 0.9)
3,369 SF =	GRAVEL AREAS (C = 0.7)
2,374 SF =	LANDSCAPE AREA (C = 0.3)
38,436 SF = 0.88 AC =	TOTAL AREA
C =	0.85

PRE-DEVELOPMENT

GRAPHIC SCALE IN FEET
1" = 30'

SYMBOL	DESCRIPTION
— - - —	PROPERTY LINE
- - - -	DETENTION BASIN DRAINAGE AREA
(dotted box)	PROPOSED PERVIOUS AREA



POST DEVELOPMENT BASIN DISCHARGE AREA	
29,342 SF =	IMPERVIOUS AREAS (C = 0.9)
9,094 SF =	LANDSCAPE AREAS (C = 0.3)
38,436 SF = 0.88 AC =	TOTAL AREA
C =	0.76

POST-DEVELOPMENT

GRAPHIC SCALE IN FEET
1" = 30'

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STONEFIELD
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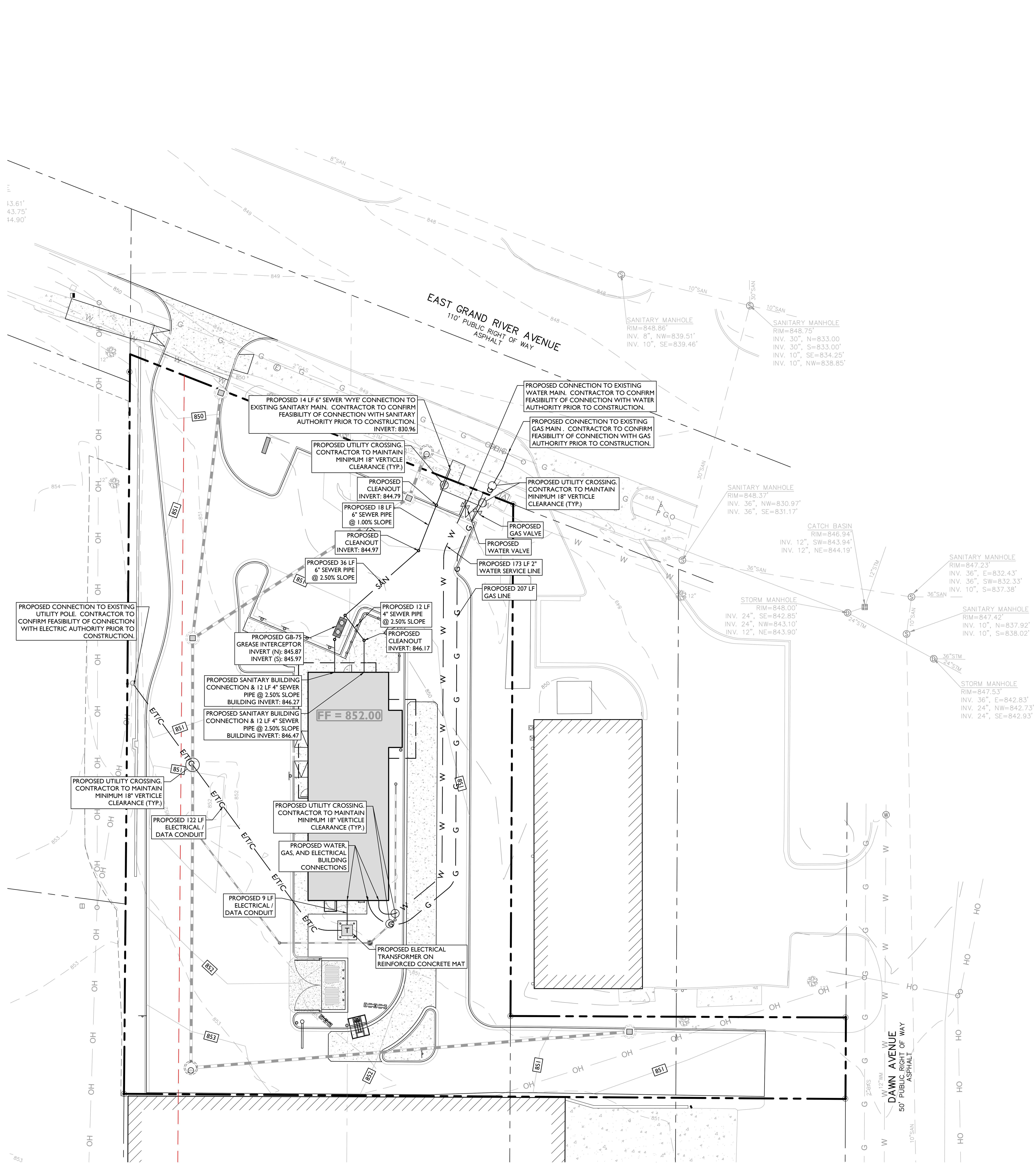
SCALE: 1" = 30' PROJECT ID: DET-230027

TITLE:

PRE VS POST DEVELOPMENT PLAN

DRAWING:

C-5



SYMBOL	DESCRIPTION
— — —	PROPERTY LINE
—— SAN ——	PROPOSED SANITARY LATERAL
—— W ——	PROPOSED DOMESTIC WATER SERVICE
—— E/T/C ——	PROPOSED ELECTRICAL/DATA CONDUITS
—— G ——	PROPOSED GAS LINE
o	PROPOSED SANITARY CLEANOUT
T	PROPOSED TRANSFORMER ON CONCRETE PAD WITH BOLLARDS

DRAINAGE AND UTILITY NOTES

1. THE CONTRACTOR IS REQUIRED TO CALL THE APPROPRIATE AUTHORITY FOR NOTICE OF CONSTRUCTION/EXCAVATION AND UTILITY MARK OUT PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH STATE LAW. CONTRACTOR IS REQUIRED TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES IN THE FIELD. SHOULD A DISCREPANCY EXIST BETWEEN THE FIELD LOCATION OF A UTILITY AND THE LOCATION SHOWN ON THE PLAN SET OR SURVEY, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IMMEDIATELY IN WRITING.
2. THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN IN OPERATION ALL UTILITIES NOT DESIGNATED TO BE REMOVED.
3. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO ANY EXISTING UTILITY IDENTIFIED TO REMAIN WITHIN THE LIMITS OF THE PROPOSED WORK DURING CONSTRUCTION.
4. A MINIMUM HORIZONTAL SEPARATION OF 10 FEET IS REQUIRED BETWEEN ANY SANITARY SEWER SERVICE AND ANY WATER LINES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASEMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
5. ALL WATER LINES SHALL BE VERTICALLY SEPARATED ABOVE SANITARY SEWER LINES BY A MINIMUM DISTANCE OF 18 INCHES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASEMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
6. THE CONTRACTOR TO PERFORM A TEST PIT PRIOR TO CONSTRUCTION (RECOMMEND 30 DAYS PRIOR) AT LOCATIONS OF EXISTING UTILITY CROSSINGS FOR WATER AND SANITARY SEWER CONNECTION IMPROVEMENTS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IN WRITING.
7. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING GAS, ELECTRIC AND TELECOMMUNICATION CONNECTIONS WITH THE APPROPRIATE GOVERNING AUTHORITY.
8. CONTRACTOR SHALL START CONSTRUCTION OF ANY GRAVITY SEWER AT THE LOWEST INVERT AND WORK UP-GRADIENT.
9. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD SET OF PLANS REFLECTING THE LOCATION OF EXISTING UTILITIES THAT HAVE BEEN CAPPED, ABANDONED, OR RELOCATED BASED ON THE DEMOLITION/REMOVAL ACTIVITIES REQUIRED IN THIS PLAN SET. THIS DOCUMENT SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.
10. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD OF THE AS-BUILT LOCATIONS OF ALL PROPOSED UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN THE AS-BUILT LOCATIONS AND THE LOCATIONS DEPICTED WITHIN THE PLAN SET. THIS RECORD SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.

20' 0' 20' 40'
GRAPHIC SCALE IN FEET
1" = 20'

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NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design
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www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

2731 EAST GRAND RIVER

PROPOSED RESTAURANT WITH DRIVE-THROUGH

PARCEL ID : 33-02-02-20-202-001
2731 EAST GRAND RIVER AVENUE
MERIDIAN CHARTER TOWNSHIP
INGHAM COUNTY, MI 48823

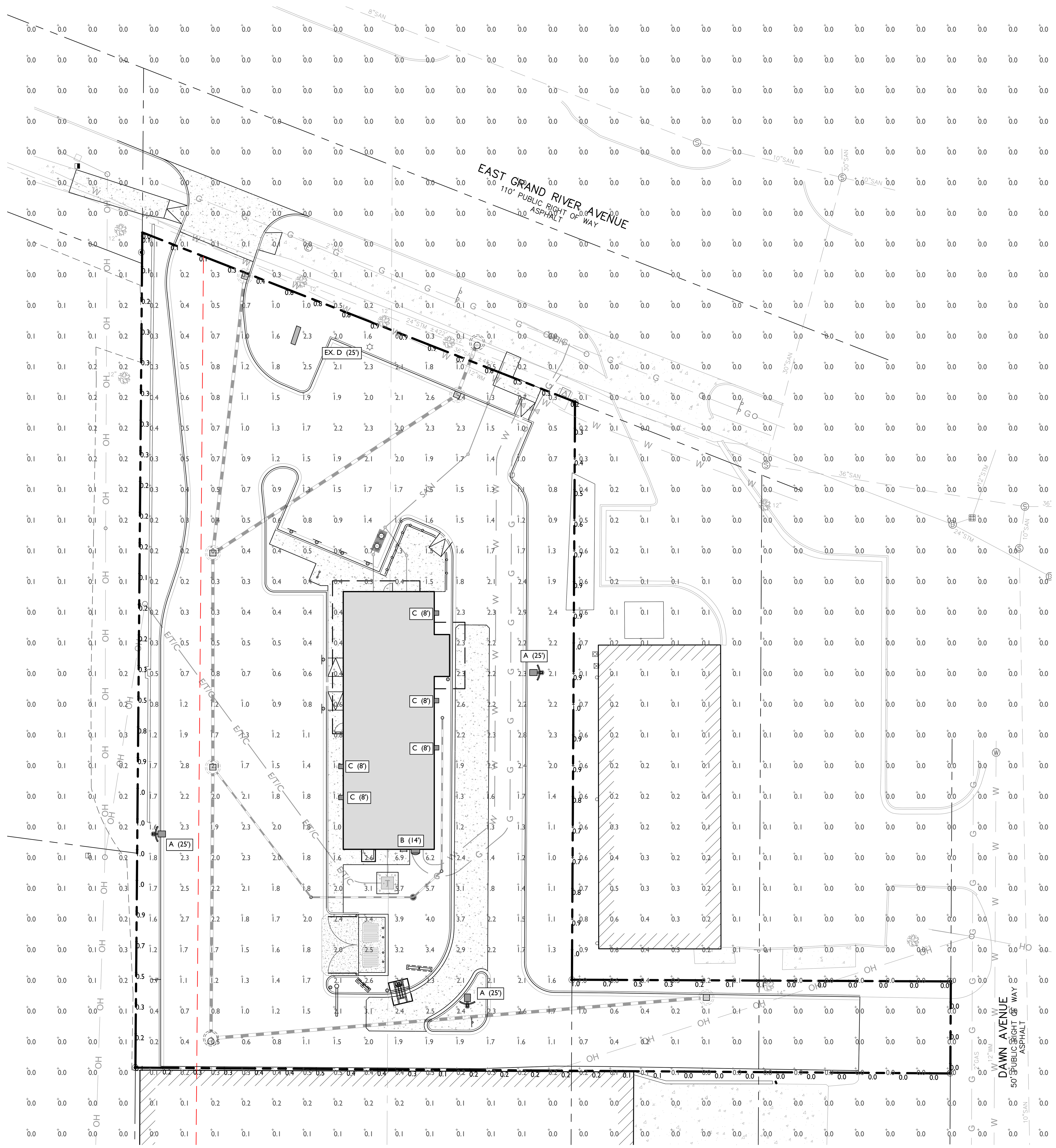
MICHIGAN LICENSE No. 6201311615
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 20' PROJECT ID: DET-230027

TITLE: UTILITY PLAN

DRAWING: C-6



SYMBOL	DESCRIPTION
EX. A (XX')	EXISTING LIGHTING FIXTURE (MOUNTING HEIGHT)
A (XX')	PROPOSED LIGHTING FIXTURE (MOUNTING HEIGHT)
+ X.X	PROPOSED LIGHTING INTENSITY (FOOTCANDLES)

GENERAL LIGHTING NOTES

1. THE LIGHTING LEVELS DEPICTED WITHIN THE PLAN SET ARE CALCULATED UTILIZING DATA OBTAINED FROM THE LISTED MANUFACTURER. ACTUAL ILLUMINATION LEVELS AND PERFORMANCE OF ANY PROPOSED LIGHTING FIXTURE MAY VARY DUE TO UNCONTROLLABLE VARIABLES SUCH ARE WEATHER, VOLTAGE SUPPLY, LAMP TOLERANCE, EQUIPMENT SERVICE LIFE AND OTHER VARIABLE FIELD CONDITIONS.
2. WHERE APPLICABLE, THE EXISTING LIGHT LEVELS DEPICTED WITHIN THE PLAN SET SHALL BE CONSIDERED APPROXIMATE. THE EXISTING LIGHT LEVELS ARE BASED ON FIELD OBSERVATIONS AND THE MANUFACTURER'S DATA OF THE ASSUMED OR MOST SIMILAR LIGHTING FIXTURE MODEL.
3. UNLESS NOTED ELSEWHERE WITHIN THIS PLAN SET, THE LIGHT LOSS FACTORS USED IN THE LIGHTING ANALYSIS ARE AS FOLLOWS:
   - LIGHT EMITTING DIODES (LED): 0.90
   - HIGH PRESSURE SODIUM: 0.72
   - METAL HALIDE: 0.72
4. THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IN WRITING, PRIOR TO THE START OF CONSTRUCTION, OF ANY PROPOSED LIGHTING LOCATIONS THAT CONFLICT WITH EXISTING/ PROPOSED DRAINAGE, UTILITY, OR OTHER IMPROVEMENTS.
5. THE CONTRACTOR IS RESPONSIBLE TO PREPARE A WIRING PLAN AND PROVIDE ELECTRIC SERVICE TO ALL PROPOSED LIGHTING FIXTURES. THE CONTRACTOR IS REQUIRED TO PREPARE AN AS-BUILT PLAN OF WIRING AND PROVIDE COPIES TO THE OWNER AND STONEFIELD ENGINEERING & DESIGN, LLC.

LIGHTING REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ 38-379	MAXIMUM POLE HEIGHT : 30 FT	25 FT
§ 38-380	SITE MAXIMUM : 10 FC	6.9 FC
	DRIVEWAY MAXIMUM : 3 FC	1.2 FC
	NON-RESIDETIAL PROPERTY LINE MAXIMUM : 1 FC	1.0 FC

PROPOSED / EXISTING LUMINAIRE SCHEDULE

SYMBOL	LABEL	QUANTITY	SECURITY LIGHTING	DISTRIBUTION	LLF	MANUFACTURER	IES FILE
	A	3	PREVAIL LED AREA LIGHT POLE & FIXTURE COMBO WITH HOUSE SIDE SHIELD C40 - 4000K	TYPE IV	0.9	EATON	PRV-C40-D-UNV-T4-BZ-7030-HSS.ies
	B	1	LUMARK CROSSTOUR MAXX LED - 4000K	TYPE FT	0.9	EATON	XTOR6BRL-Y.ies
	C	5	LEDA OUTDOOR ARCHITECTURAL SCONCE - 4000K	TYPE FT	0.9	OXYGEN	3-712-222 LEDA.ies
	EX. D	1	PREVAIL LED AREA LIGHT POLE & FIXTURE COMBO WITH HOUSE SIDE SHIELD C40 - 4000K	TYPE IV	0.9	EATON	PRV-C40-D-UNV-T4-BZ-7030-HSS.ies


FIXTURE A & D


FIXTURE B


FIXTURE C

20' 0' 20' 40'
GRAPHIC SCALE IN FEET
1" = 20'

ISSUE	DATE	BY	DESCRIPTION
1	09/22/2023	VF & AF	FOR SPECIAL LAND USE APPROVAL

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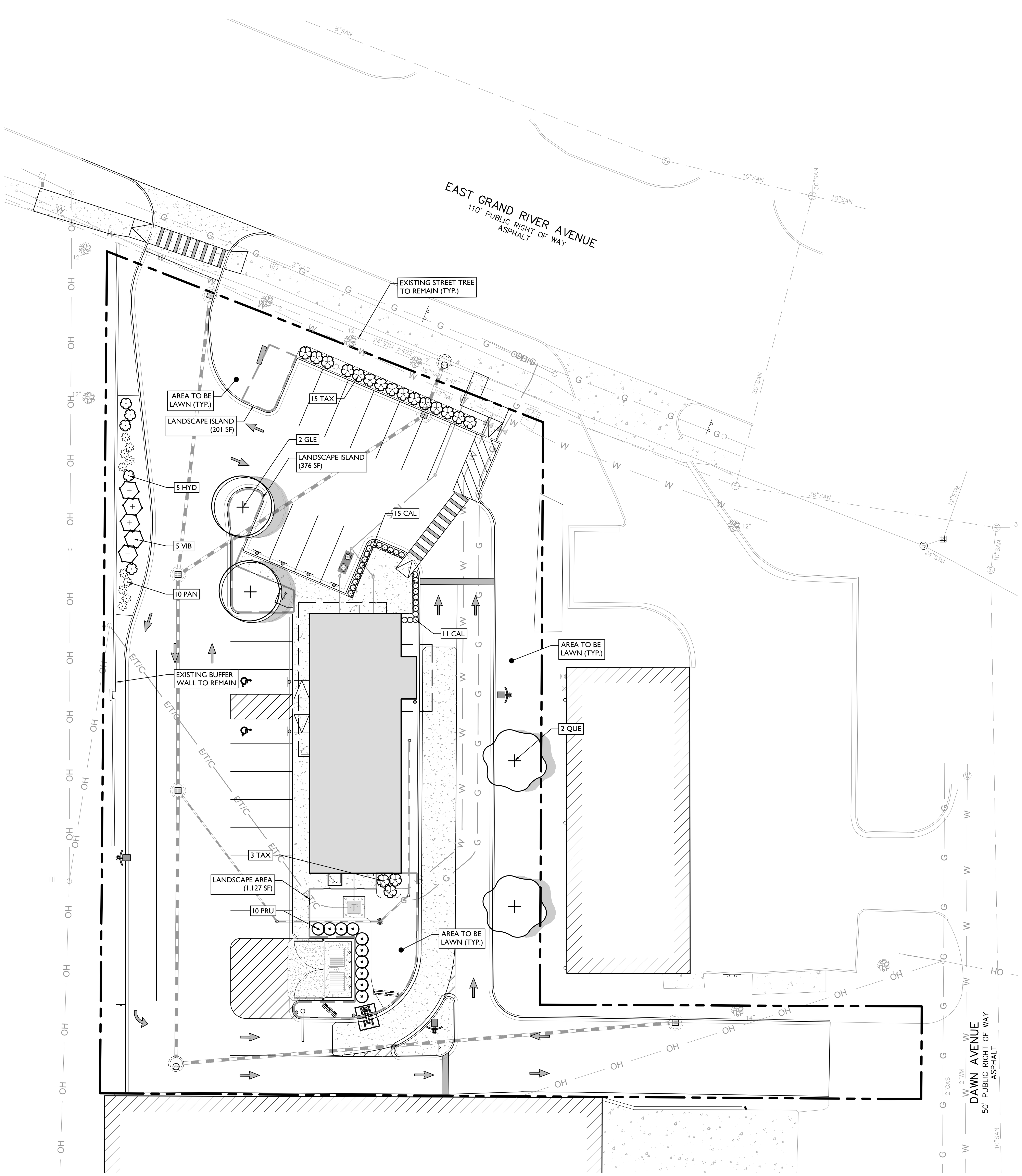
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

SCALE: 1" = 20' PROJECT ID: DET-230027

TITLE: LIGHTING PLAN

DRAWING: C-7



LANDSCAPING AND BUFFER REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
	BUILDING PERIMETER LANDSCAPING	
§ 86-402(13)	AN AREA EQUAL TO 4 FT MULTIPLIED BY THE PERIMETER OF THE BUILDING SHALL BE PLANTED	
	(237 LF) * (4 FT) = 948 SF	1,127 SF PROVIDED
	STREET TREES	
§ 62-64(2)(a)	150 LF OF FRONTAGE = 2 REQUIRED TREES	2 EXISTING TREES TO REMAIN
	PERIMETER LANDSCAPING	
§ 86-756.14	NONRESIDENTIAL USE BORDERING SAME DISTRICT:	
	15 FT WIDE LANDSCAPE BUFFER	0.50 FT PROVIDED (V)
	WALL, PLANTINGS, OR BERM REQUIRED 36" HT	DOES NOT COMPLY (V)
	INTERIOR LANDSCAPING	
§ 86-758(1)a	ISLANDS TO BE MINIMUM WIDTH OF 10 FT	10 FT PROVIDED
§ 86-758(1)b	200 SF OF LANDSCAPE AREA FOR EACH 10 PARKING SPACES	
	(22 SPACES) * (200 SF / 10 SPACES) = 440 SF	577 SF PROVIDED
	MINIMUM SIZE: 200 SF	COMPLIES
§ 86-758(1)c	2 CANOPY TREES PER 10 PARKING SPACES	
	(22 SPACES) * (2 TREES / 10 SPACES) = 4 TREES	4 TREES PROPOSED

(V) VARIANCE

PLANT SCHEDULE

DECIDUOUS TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
	GLE	2	GLEDITSIA TRIACANTHOS `SKYLINE`	SKYLINE HONEY LOCUST	3" - 3.5" CAL	B&B
	QUE	2	QUERCUS PALUSTRIS	PIN OAK	3" - 3.5" CAL	B&B
SHRUBS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
	HYD	5	HYDRANGEA MACROPHYLLA `ENDLESS SUMMER`	BAILMER HYDRANGEA	18" - 24"	POT
	VIB	5	VIBURNUM DENTATUM	VIBURNUM	18" - 24"	POT
EVERGREEN SHRUBS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
	PRU	10	PRUNUS LAUROCERASUS 'SCHIPKAENSIS'	SCHIPKA ENGLISH LAUREL	36" - 42"	POT
	TAX	19	TAXUS X MEDIA 'DENSIFORMIS'	DENSE ANGLO-JAPANESE YEW	18" - 24"	POT
GRASSES	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
	CAL	26	CALAMAGROSTIS X ACUTIFLORA	FEATHER REED GRASS	1 GAL.	POT
	PAN	10	PANICUM VIRGATUM `SHENANDOAH`	SHENANDOAH SWITCH GRASS	1 GAL.	POT

NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN AMOUNTS SHOWN ON THE LANDSCAPE PLAN AND WITHIN THE PLANT LIST, THE PLAN SHALL DICTATE.

811
Know what's **below**
Call before you dig.

IRRIGATION NOTE:

IRRIGATION CONTRACTOR TO PROVIDE A DESIGN FOR AN IRRIGATION SYSTEM SEPARATING PLANTING BEDS FROM LAWN AREA. PRIOR TO CONSTRUCTION, DESIGN IS TO BE SUBMITTED TO THE PROJECT LANDSCAPE DESIGNER FOR REVIEW AND APPROVAL. WHERE POSSIBLE, DRIP IRRIGATION AND OTHER WATER CONSERVATION TECHNIQUES SUCH AS RAIN SENSORS SHALL BE IMPLEMENTED. CONTRACTOR TO VERIFY MAXIMUM ON SITE DYNAMIC WATER PRESSURE AVAILABLE MEASURED IN PSI. PRESSURE REDUCING DEVICES OR BOOSTER PUMPS SHALL BE PROVIDED TO MEET SYSTEM PRESSURE REQUIREMENTS. DESIGN TO SHOW ALL VALVES, PIPING, HEADS, BACKFLOW PREVENTION, METERS, CONTROLLERS, AND SLEEVES WITHIN HARDSCAPE AREAS.

LANDSCAPING NOTES

1. THE CONTRACTOR SHALL RESTORE ALL DISTURBED GRASS AND LANDSCAPED AREAS TO MATCH EXISTING CONDITIONS UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
2. THE CONTRACTOR SHALL RESTORE ALL DISTURBED LAWN AREAS WITH A MINIMUM 4 INCH LAYER OF TOPSOIL AND SEED.
3. THE CONTRACTOR SHALL RESTORE MULCH AREAS WITH A MINIMUM 3 INCH LAYER OF MULCH .
4. THE MAXIMUM SLOPE ALLOWABLE IN LANDSCAPE RESTORATION AREAS SHALL BE 3 FEET HORIZONTAL TO 1 FOOT VERTICAL (3:1 SLOPE) UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
5. THE CONTRACTOR IS REQUIRED TO LOCATE ALL SPRINKLER HEADS IN AREA OF LANDSCAPING DISTURBANCE PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL RELOCATE SPRINKLER HEADS AND LINES IN ACCORDANCE WITH OWNER'S DIRECTION WITHIN AREAS OF DISTURBANCE.
6. THE CONTRACTOR SHALL ENSURE THAT ALL DISTURBED LANDSCAPED AREAS ARE GRADED TO MEET FLUSH AT THE ELEVATION OF WALKWAYS AND TOP OF CURB ELEVATIONS EXCEPT UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET. NO ABRUPT CHANGES IN GRADE ARE PERMITTED IN DISTURBED LANDSCAPING AREAS.
7. TO PROTECT VEGETATION, INTERIOR LANDSCAPED ISLANDS LESS THAN 20 FEET IN EACH DIMENSION SHALL NOT BE USED FOR SNOW STORAGE.

20' 0' 20' 40'
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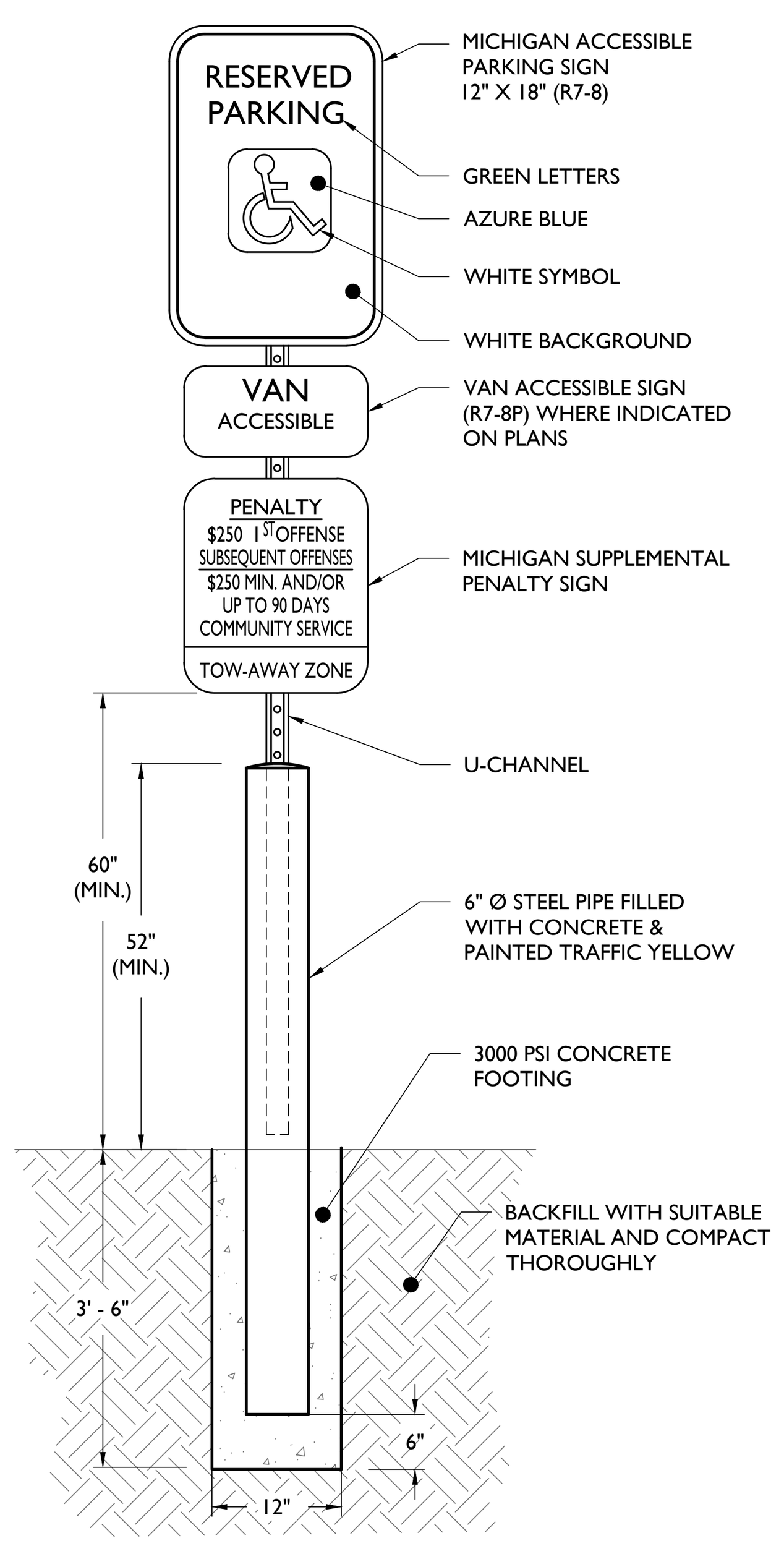
STATE OF MICHIGAN MICHAEL COLE ENGINEER NO. 6201311615 LICENSED PROFESSIONAL ENGINEER
MICHIGAN LICENSE No. 6201311615
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 20' PROJECT ID: DET-230027

TITLE: LANDSCAPING PLAN

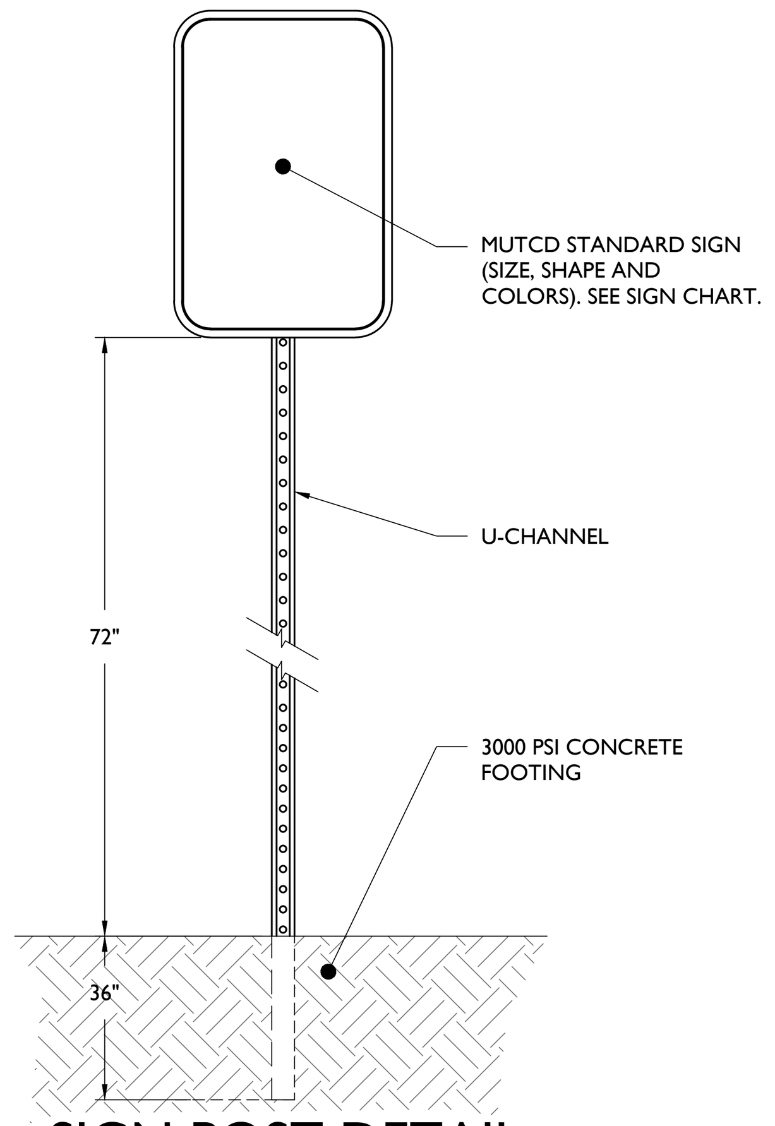
DRAWING: **C-8**



ACCESSIBLE PARKING SIGN WITH BOLLARD DETAIL

NOT TO SCALE

1



SIGN POST DETAIL

NOT TO SCALE

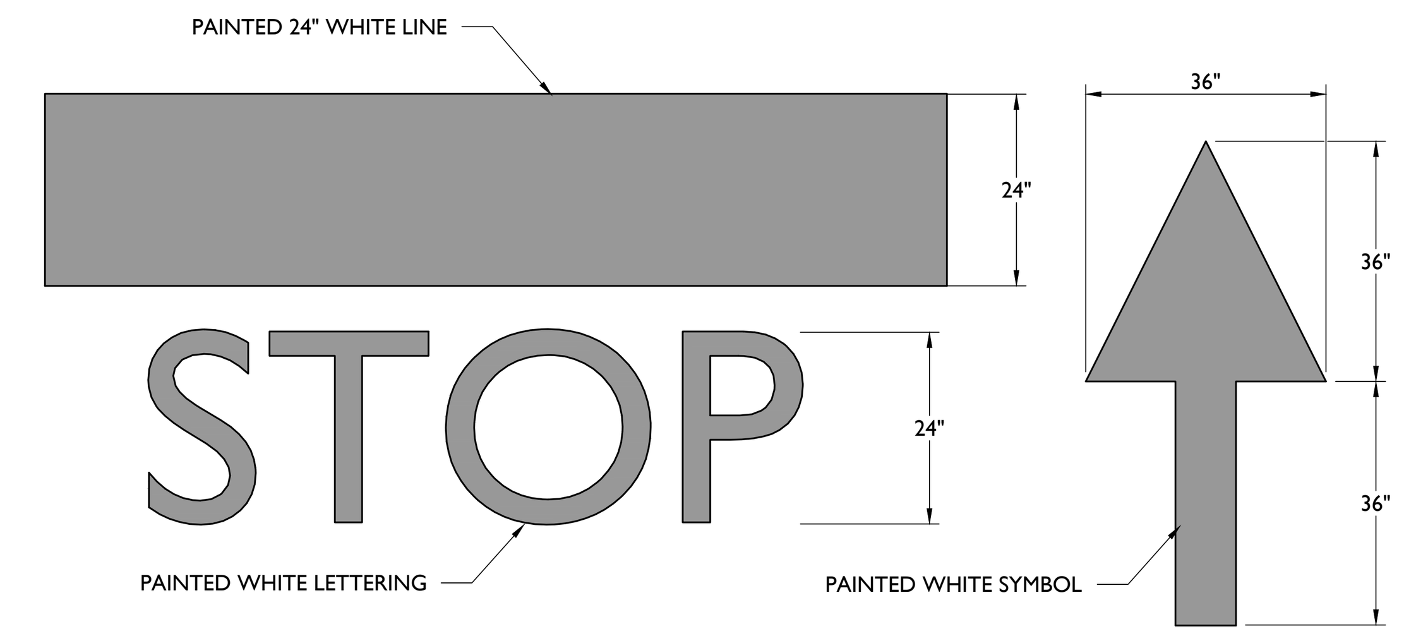
M.U.T.C.D. NUMBER	TEXT	COLOR		SIZE OF SIGN (WIDTH X HEIGHT)	TYPE OF MOUNT
		LEGEND	BACKGROUND		
STOP SIGN (R1-1)	STOP	RED	WHITE	36"x36"	GROUND
DO NOT ENTER (R5-1)	DO NOT ENTER	RED	WHITE	30"x30"	GROUND

NOTE:
1. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), EXCEPT AS NOTED.
2. ALL SIGNS SHALL BE MOUNTED AS TO NOT OBSTRUCT THE SHAPE OF "STOP" (R1-1) AND "YIELD" (R1-2) SIGNS.

SIGN DATA TABLE

NOT TO SCALE

2

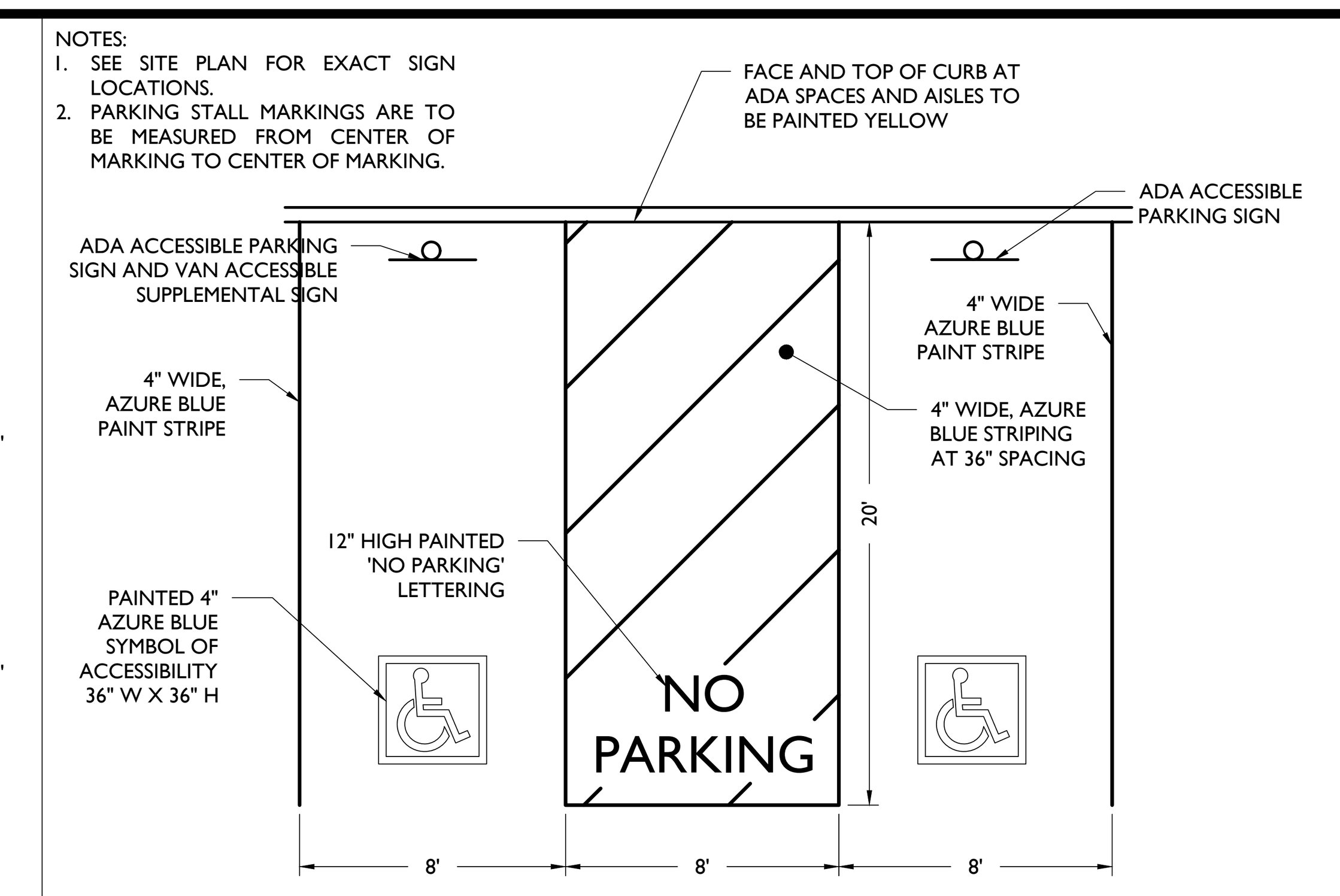


STOP BAR & ARROW DETAILS

NOT TO SCALE

3

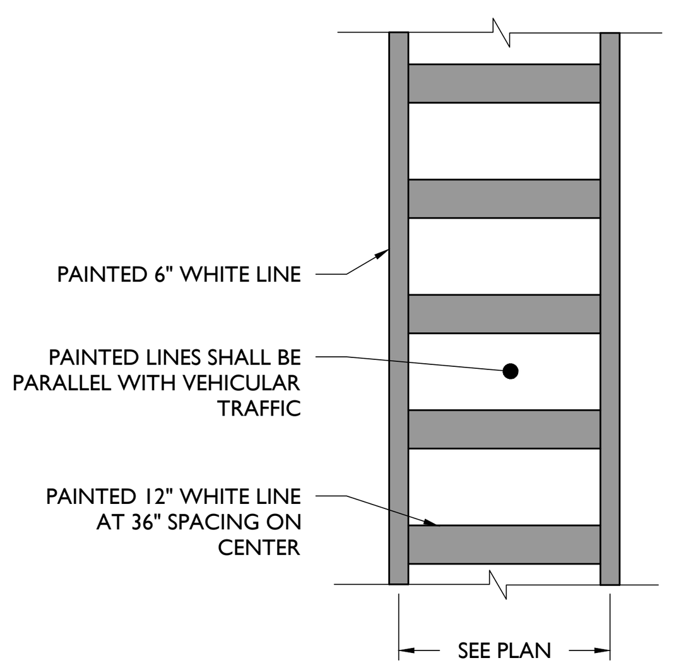
NOTES:
1. SEE SITE PLAN FOR EXACT SIGN LOCATIONS.
2. PARKING STALL MARKINGS ARE TO BE MEASURED FROM CENTER OF MARKING TO CENTER OF MARKING.



ACCESSIBLE PARKING STALL MARKINGS

NOT TO SCALE

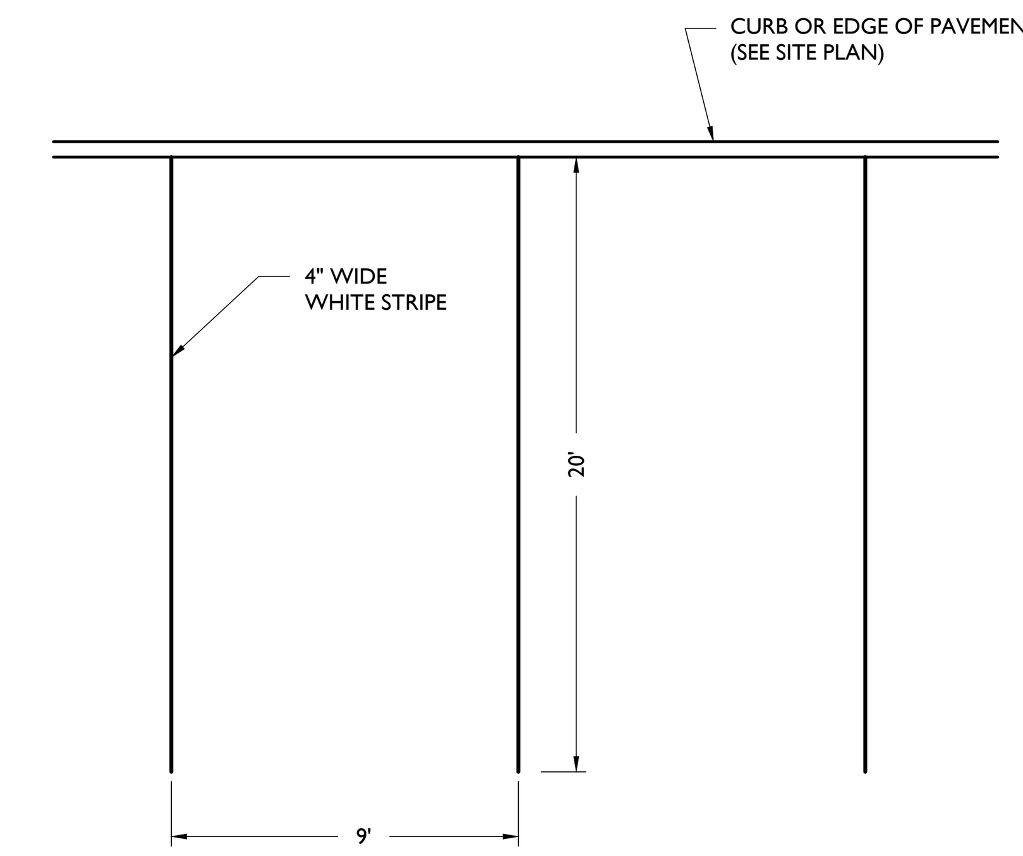
4



CROSSWALK DETAIL

NOT TO SCALE

5

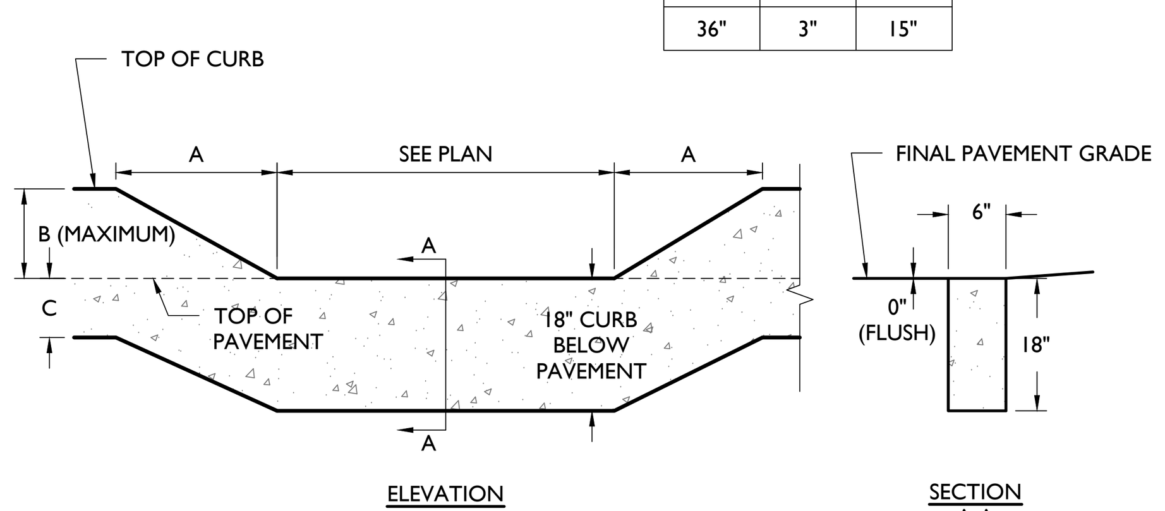


PARKING STALL MARKINGS

NOT TO SCALE

6

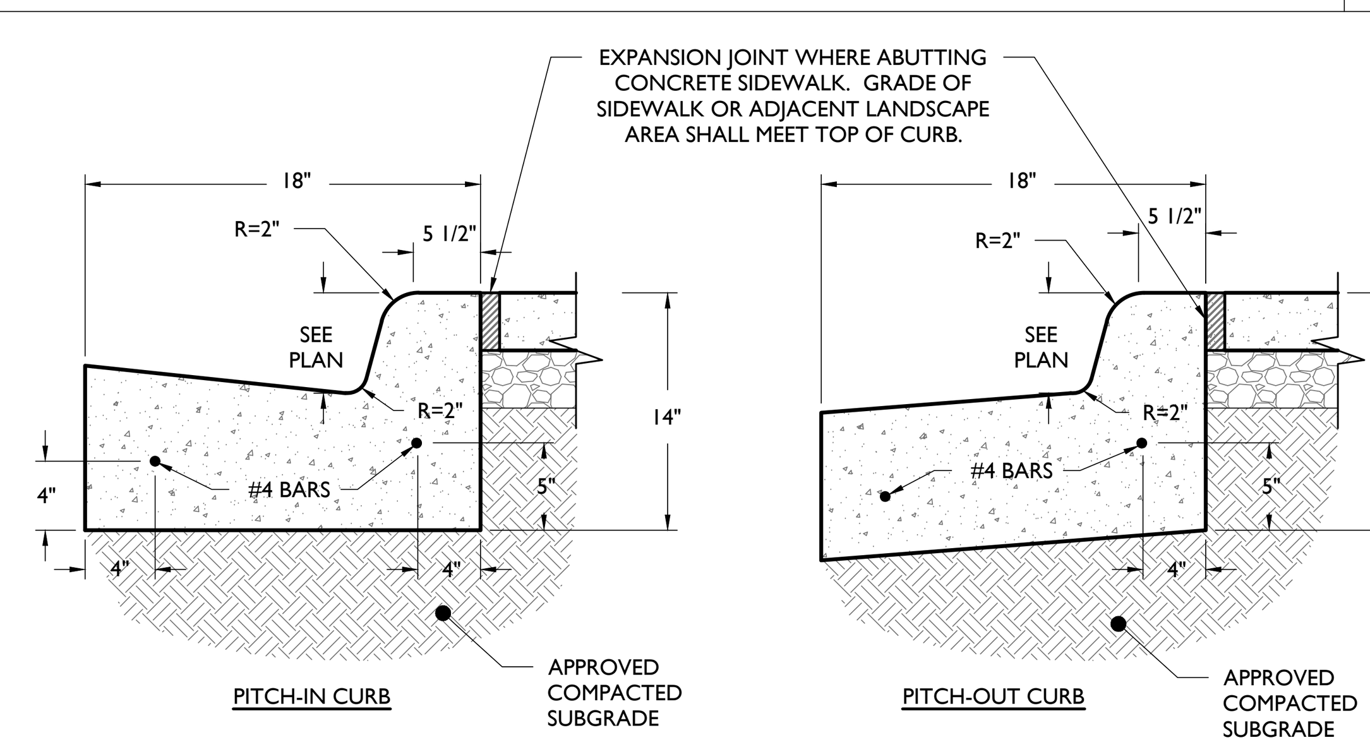
FLUSH CURB DIMENSIONS		
A	B	C
72"	6"	12"
60"	5"	13"
48"	4"	14"
36"	3"	15"



FLUSH CURB DETAIL

NOT TO SCALE

7



CONCRETE CURB AND GUTTER DETAIL

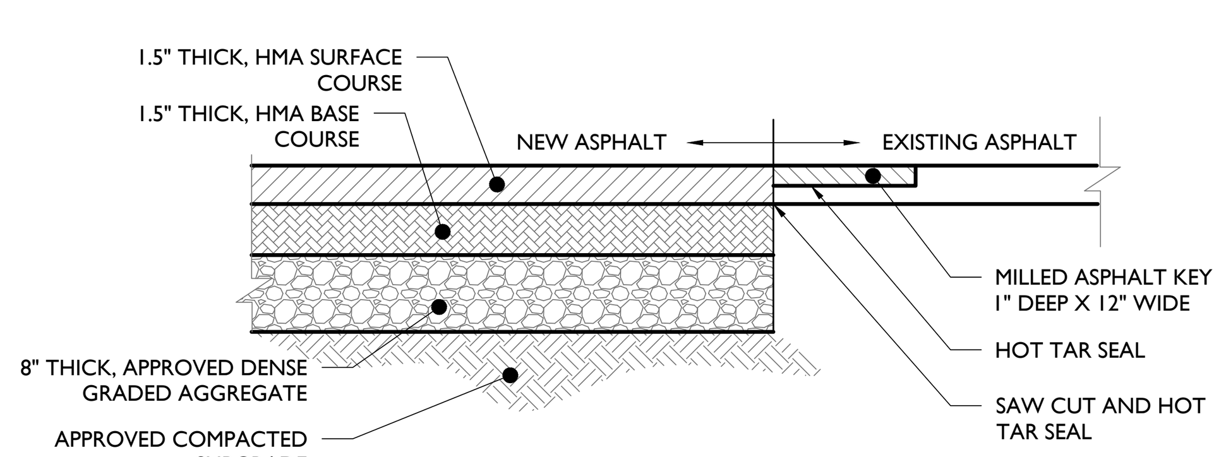
NOT TO SCALE

NOTES:
1. CONCRETE SHALL BE 3500 PSI AT 28 DAYS, AIR-ENTRAINED.
2. TRANSVERSE EXPANSION JOINTS SHALL BE PROVIDED AT 20 FOOT INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED ¼" FROM SURFACE.
3. HALF DEPTH CONTRACTION JOINTS SHALL BE PROVIDED AT 10 FOOT INTERVALS.
4. 14" CURB DEPTH SHALL BE MAINTAINED AT DEPRESSED OR FLUSH CURBED AREAS.

8

PAVEMENT STRIPING & MARKINGS NOTES:
1. ALL SIGNING AND STRIPING IN EXISTING CONDITION IN CONFLICT WITH THE PROPOSED DESIGN PLAN SHALL BE REMOVED.
2. ALL PROPOSED SIGNING AND STRIPING SHALL CONFORM TO THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
3. PAVEMENT STRIPING AND MARKINGS SHALL BE INSTALLED IN CONFORMANCE WITH ALL APPLICABLE LOCAL, COUNTY AND STATE REQUIREMENTS.
4. UNLESS OTHERWISE SPECIFIED, ALL STRIPING AND MARKINGS IN THE PUBLIC RIGHT-OF-WAY SHALL BE OF THERMOPLASTIC PAINT OR PREFORMED THERMOPLASTIC MARKINGS.
5. UNLESS OTHERWISE SPECIFIED, ON SITE PARKING STALL STRIPING, FIRE LANE STRIPING AND DIRECTIONAL ARROWS SHALL BE EPOXY PAINT. ON SITE STOP BARS, "DO NOT ENTER" BARS, AND ASSOCIATED LETTERING SHALL BE THERMOPLASTIC PAINT OR PREFORMED THERMOPLASTIC MARKINGS.

9

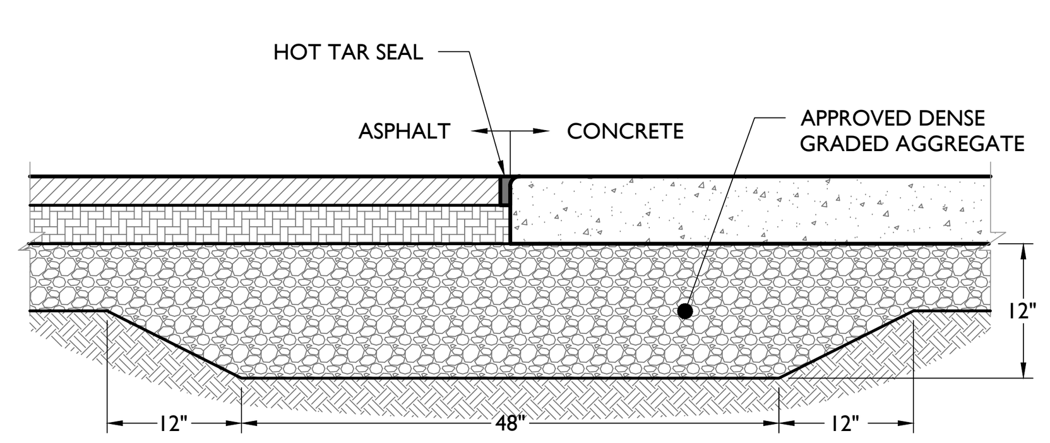


FULL DEPTH ASPHALT PAVEMENT DETAIL

NOT TO SCALE

NOTE:
HMA MIX AND DENSE GRADED AGGREGATE SHALL CONFORM TO STATE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.

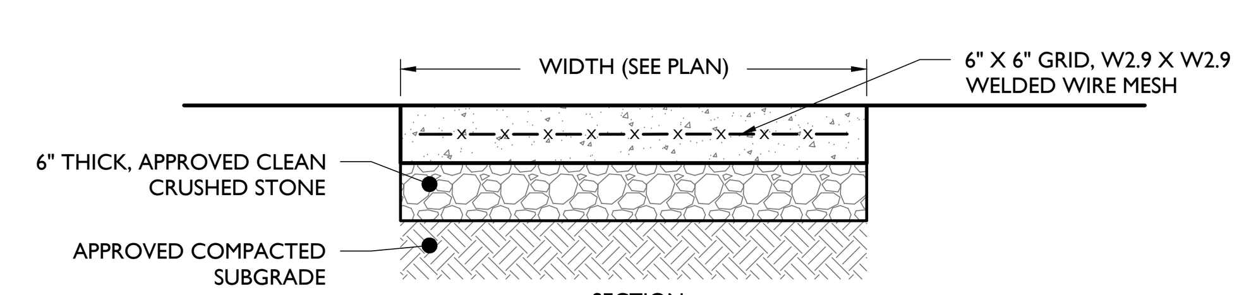
10



CONCRETE TO ASPHALT TRANSITION DETAIL

NOT TO SCALE

11

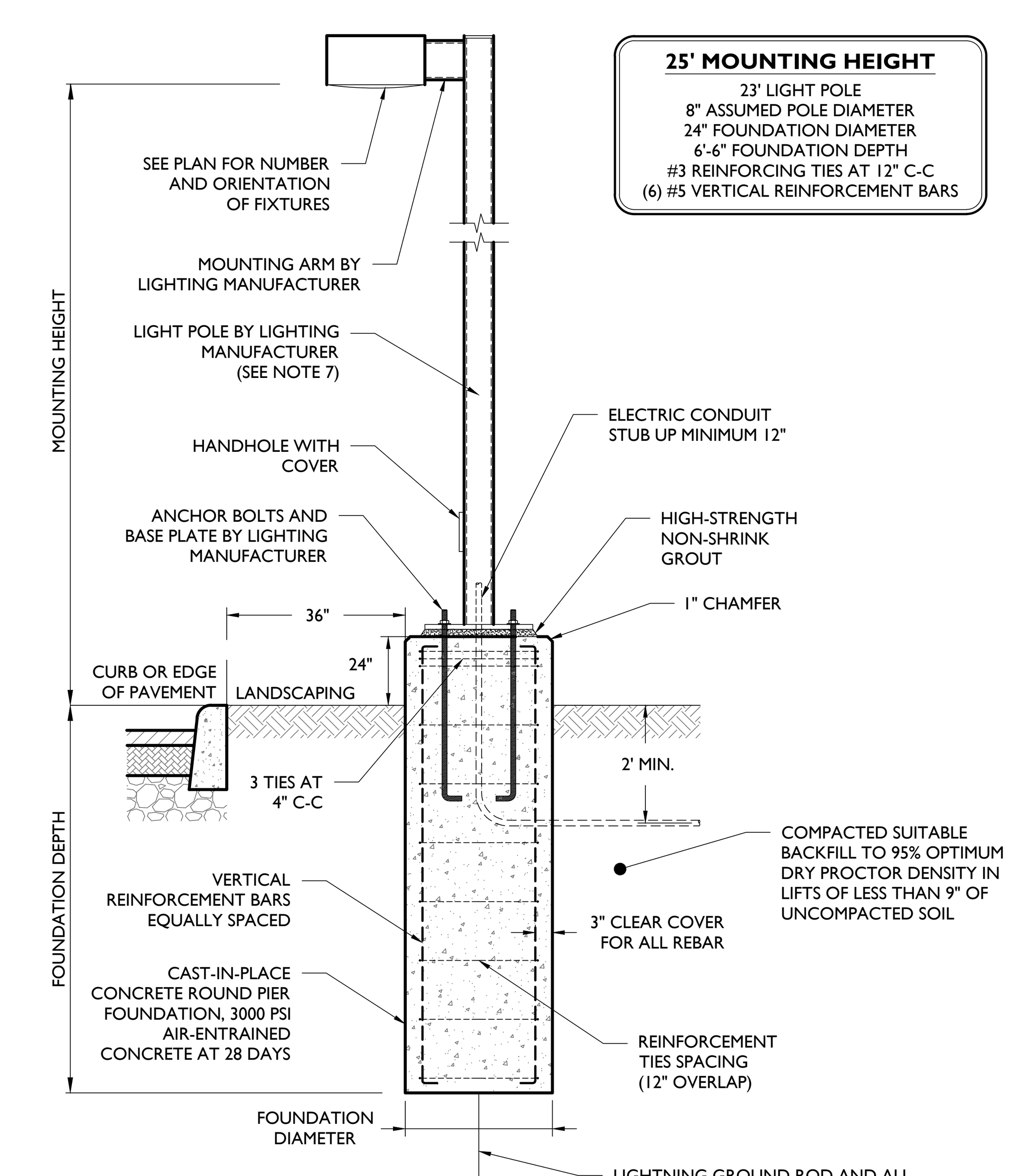


REINFORCED 6" CONCRETE MAT

NOT TO SCALE

NOTES:
1. ½" EXPANSION JOINTS WITH WATER SEAL SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED ¼" FROM THE SURFACE. LONGITUDINAL REBAR TO BE CUT AT EXPANSION JOINTS.
2. 1" DEEP BY ¼" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT MID-POINT BETWEEN EXPANSION JOINTS OR 6' INTERVALS MAX.
3. CONCRETE SHALL RECEIVE BROOM FINISH.
4. ALL EXPOSED CORNERS TO HAVE 12" CHAMFER.

12



LIGHT POLE INSTALLATION DETAIL

NOT TO SCALE

NOTES:
1. MINIMUM SOIL BEARING PRESSURE OF 1500 PSF, SOIL FRICTION ANGLE OF 30 DEGREES, AND SOIL DRY UNIT WEIGHT OF 120 PCF SHALL BE CONFIRMED IN THE FIELD BY A QUALIFIED PROFESSIONAL.
2. CAST-IN-PLACE CONCRETE SHALL BE CONSOLIDATED USING VIBRATOR.
3. ALL REBAR TO BE NEW GRADE 60 STEEL.
4. PRE-CAST PIERS ACCEPTABLE UPON WRITTEN APPROVAL OF SHOP DRAWING BY ENGINEER.
5. CONCRETE TO BE INSTALLED A MINIMUM OF 7 DAYS PRIOR TO INSTALLING LIGHT POLE. POURED CONCRETE MIX REQUIRED TO OBTAIN 80% OF DESIGN STRENGTH PRIOR TO INSTALLING LIGHT POLE.
6. CONCRETE SHALL HAVE A MAXIMUM SLUMP OF 4" (WITHIN 1" TOLERANCE).
7. POLE SHALL BE RATED FOR 10 MPH HIGHER THAN MAXIMUM WIND SPEED 33FT ABOVE GROUND FOR THE AREA BASED ON ANSI/ASCE 7-93.
8. POUR TO BE TERMINATED AT A FORM.
9. WORK SHALL CONFORM TO ACI BEST PRACTICES FOR APPROPRIATE TEMPERATURE AND WEATHER CONDITIONS.
10. CONTRACTOR TO TEMPORARILY SUPPORT ADJACENT SOIL AND STRUCTURES DURING EXCAVATION IF REQUIRED.

13

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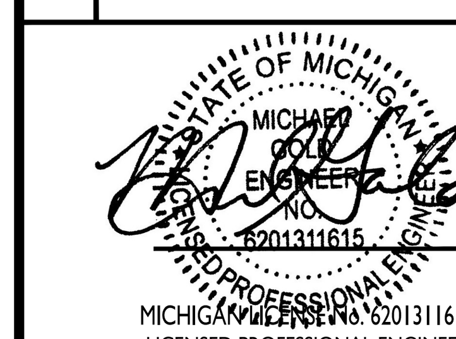


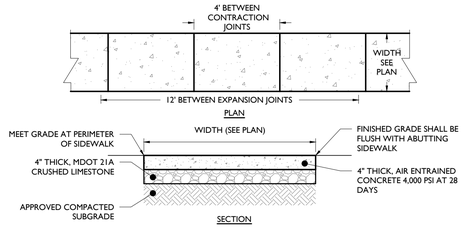
MICHIGAN LICENSE No. 6201311615
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: AS SHOWN | PROJECT ID: DET-230027

TITLE: CONSTRUCTION DETAILS

DRAWING: C-9

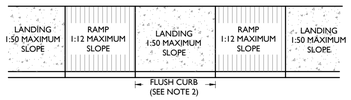


CONCRETE WALKWAY DETAIL

NOT TO SCALE

NOTES:
1. MAXIMUM CROSS SLOPE SHALL BE ¼" PER FOOT.
2. ½" EXPANSION JOINTS SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED ½" FROM THE SURFACE.
3. 1" DEEP BY ¼" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT 4' INTERVALS.
4. EXPANSION JOIN SHALL BE PROVIDED WHERE ADJACENT TO A BUILDING.

1

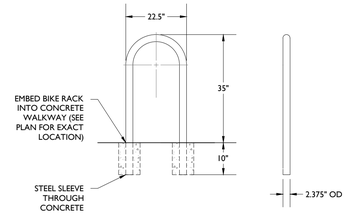


TRANSITION RAMP DETAIL

NOT TO SCALE

NOTES:
1. CROSS SLOPE ON RAMP SHALL NOT EXCEED 2%
2. A FLUSH CURB SHALL HAVE A MINIMUM WIDTH OF 36". SEE PLAN FOR EXACT WIDTH.
3. RAMP SHALL HAVE A MAXIMUM RISE OF 6" WITHOUT A HANDRAIL

2



HOOP RACK HD IN GROUND MOUNTED BIKE RACK DETAIL

NOT TO SCALE

NOTES:
1. BIKE RACK TO BE MANUFACTURED BY DERO BIKE RACKS OR APPROVED EQUAL.
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS

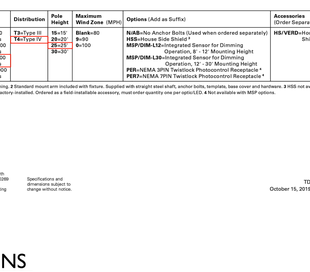
3

CURB RAMP DETAIL

NOT TO SCALE

NOTES:
1. CROSS SLOPE ON RAMP SHALL NOT EXCEED 2%
2. A FLUSH CURB SHALL HAVE A MINIMUM WIDTH OF 36". SEE PLAN FOR EXACT WIDTH.
3. RAMP SHALL HAVE A MAXIMUM RISE OF 6" WITHOUT A HANDRAIL

4



BOLLARD DETAIL

NOT TO SCALE

5

CONCRETE PAVEMENT

NOT TO SCALE

NOTES:
1. ½" EXPANSION JOINTS WITH WATER SEAL SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED ½" FROM THE SURFACE. LONGITUDINAL REBAR TO BE CUT AT EXPANSION JOINTS.
2. 1" DEEP BY ½" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT MID-POINT BETWEEN EXPANSION JOINTS OR 6' INTERVALS MAX.
3. CONCRETE SHALL RECEIVE BROOM FINISH.
4. ALL EXPOSED CORNERS TO HAVE 12" CHAMFER.

6

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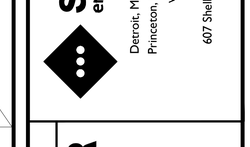
MERIDIAN CHARTER TOWNSHIP
INGHAM COUNTY, MI 48823



STONEFIELD engineering & design

SCALE: AS SHOWN | PROJECT ID: DET-230027

TITLE: CONSTRUCTION DETAILS

DRAWING: C-10

Lumark

DESCRIPTION

The Prevail™ LED pole and fixture combination makes selection and installation of poles and fixtures simple. Included is the die-cast Prevail area, site and roadway luminaire with standard mounting arm, square straight steel pole, anchor bolts, base cover, template and hardware. Stock configurations are available in single and dual fixture combinations. The Prevail luminaire delivers a new level of versatility and value in patent pending, architectural design that delivers energy savings greater than 85% and replaces 150-450W metal halide fixtures. The Prevail fixture and pole combo is ideal for general area/site lighting applications.

Catalog #		Type
Project		
Comments		Date
Prepared by		

SPECIFICATION FEATURES

Construction
Construction is comprised of a heavy-duty, single-piece die-cast aluminum housing in dark bronze polyester powder paint. The die-cast aluminum door is tethered to provide easy access to the driver if replacement is required. The optics is mounted on a versatile, aluminum plate that dissipates heat from the LEDs resulting in longer life of the fixture. The fixture is IP66 and 3G vibration rated (ANSI C136.31).

Optics
Available in Type III and IV distributions with lumen packages ranging from 7,000 to 20,000 nominal lumens. Light engine configurations consist of 1 or 2 high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to 1,91,50,000 hours at 25°C) per IESNA TM-21. For the ultimate level of spill light control, an optional house side shield accessory can be field or factory installed.

Electrical
Available in 120-277V 50/60Hz. 10kV/10kA surge protection standard. 0-10V dimming driver is standard with leads external to the fixture to accommodate controls capability such as dimming and occupancy. Suitable for ambient temperatures from -40°C to 40°C.

Mounting
The versatile, patent pending, standard mount arm accommodates multiple drill patterns ranging from 1-1/2" to 4-7/8". Removal of the door on the standard mounting arm enables wiring of the fixture without having to access the driver compartment. A knock-out on the standard mounting arm enables round pole mounting.

Pole
Shaft is one-piece construction ASTM A500 grade "B" steel, shot blasted and finished in dark bronze polyester powder coat. Anchor base is fabricated from ASTM grade steel. ASTM A366 steel full base cover is provided to enclose base plate and anchor bolts. Anchor bolts are per ASTM A576 with two nuts, two flat washers, and one lock washer. Hardware and threaded portion of bolt are hot dip galvanized. 3" hook for 3/4" bolt. 4" hook for 1" bolt.

Finish
Housing and cast parts finished in five-stage super TGIC polyester bronze powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear.

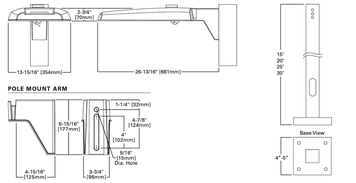
Warranty
Five-year warranty.

PFPRV PREVAIL POLE AND FIXTURE COMBO

LED

POLE AND FIXTURE COMBO

DIMENSIONS



CERTIFICATION DATA
UL and cUL Wet Location Listed
IP66 Rated
3G Vibration Rated
ISO 9001

ENERGY DATA
Electronic LED Driver
0.9 Power Factor
<20% Total Harmonic Distortion
120-277VAC and 60Hz,
347V/60Hz, 480V/60Hz
-40°C Minimum Temperature Rating
+40°C Ambient Temperature Rating

EPA
Effective Projected Area (Sq. Ft.): 0.75 (1 fixture)

SHIPPING DATA
Approximate Net Weight:
20lbs. (9.09 kgs.) **(1 fixture)**

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October 15, 2019 11:09 AM

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page 2 — **PFPRV** PREVAIL POLE AND FIXTURE COMBO

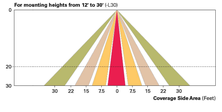
CONTROL OPTIONS

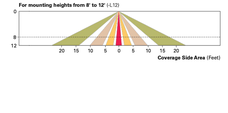
0-10V (D)
This fixture is offered standard with 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (PER and PER7)
Photocontrol receptacles provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PER7 receptacle.

Dimming Occupancy Sensor (MSP/DIM-LXX)
These sensors are factory installed in the luminaire housing. When a sensor for dimming operation (/DIM) is selected, the luminaire will dim down to approximately 50 percent power after five minutes of no activity detected. When activity is detected, the luminaire returns to full light output.

These occupancy sensors include an integral photocell that can be activated or inactivated with the programming remote / configuration tool for "dusk-to-dawn" control or "daylight harvesting". Note: For MSP sensors, the factory preset is ON (Enabled). The programming remote / tool is a wireless tool that can be utilized to change the dimming level, time delay, sensitivity and other parameters. A variety of sensor lenses are available to optimized the coverage pattern for mounting heights from 8'-30'.





POWER AND LUMENS

Light Engine		C15	C25	C40	C60
Nominal Power (Watts)		57W	87W	143W	183W
Input Current @ 120V (A)		0.43	0.80	1.09	1.32
Input Current @ 277V (A)		0.19	0.35	0.48	0.57
Type III	Lumens	7,111	13,183	17,144	20,050
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4
Type IV	Lumens	7,088	13,140	17,087	19,984
	BUG Rating	B1-U0-G3	B2-U0-G4	B2-U0-G4	B3-U0-G5

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (50,000 Hours)	Theoretical L70 (Hours)
25°C	> 91.30%	> 194,000
40°C	> 87.59%	> 134,000

LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99

ORDERING INFORMATION

Sample Number: PFPRV-1-C25-T3-15-NAB

Series 1, 7	Number of Fixtures	Light Engine	Distribution	Pole Height	Maximum Wind Zone (MPH)	Options (Add as Suffix)	Accessories (Order Separately)
PFPRV=Prevail Pole and Fixture Combo	1=1 2=2 3=3 4=4	C15=(1 LED) 7,100 Nominal Lumens C25=(2 LED) 13,100 Nominal Lumens C40=(2 LED) 17,100 Nominal Lumens C60=(2 LED) 20,000 Nominal Lumens	T3=Type III T4=Type IV	15=15' 20=20' 25=25' 30=30'	Blank=80 B=90 B=100	NAB=No Anchor Bolts (Used when ordered separately) HSS=House Side Shield 8 MSP/DIM-L12=Integrated Sensor for Dimming Operation, 8' - 12' Mounting Height MSP/DIM-L30=Integrated Sensor for Dimming Operation, 12' - 30' Mounting Height PER=NEMA 7PIN Twistlock Photocontrol Receptacle 9 PER7=NEMA 7PIN Twistlock Photocontrol Receptacle 9	HS/VERD=House Side Shield 8

NOTES: 1 4000K CCT, standard bronze, 120-277V, 0-10V dimming. 2 Standard mount arm included with fixture. Supplied with straight steel shaft, anchor bolts, template, base cover and hardware. 3 HSS not available with C60 lumen package. Ordered as an option, it will come factory installed. Ordered as a field installable accessory, must order quantity one per optic/LED. 4 Not available with MSP options.

Eaton
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.eaton.com/lighting

Specifications and dimensions subject to change without notice.

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Lumark

DESCRIPTION

The patented Lumark Crosstour™ MAXX LED wall pack series of luminaries provides low-profile architectural style with super bright, energy-efficient LEDs. The rugged die-cast aluminum construction, back box with secure lock hinges, stainless steel hardware along with a sealed and gasketed optical compartment make Crosstour impervious to contaminants. The Crosstour MAXX wall luminaire is ideal for wall/surface, inverted mount for facade/canopy illumination, perimeter and site lighting. Typical applications include pedestrian walkways, building entrances, multi-use facilities, industrial facilities, perimeter parking areas, storage facilities, institutions, schools and loading docks.

Catalog #		Type
Project		
Comments		Date
Prepared by		

SPECIFICATION FEATURES

Construction
Low-profile LED design with rugged one-piece, die-cast aluminum back box and hinged removable door. Matching housing styles incorporate both a full cutoff and refractive lens design. Full cutoff and refractive lens models are available in 58W, 81W and 102W. Patent pending secure lock hinge feature allows for safe and easy tool-less electrical connections with the supplied push-in connectors. Back box includes four 1/2" NPT threaded conduit entry points. The back box is secured by four lag bolts (supplied by others). External fin design extracts heat from the fixture surface. One-piece silicone gasket seals door and back box. Not recommended for car wash applications.

Optical
Silicone sealed optical LED chamber incorporates a custom engineered reflector providing high-efficiency illumination. Full cutoff models integrate an impact-resistant molded refractive prism optical lens assembly meeting requirements for Dark Sky compliance. Refractive lens models incorporate a molded lens assembly designed for maximum forward throw. Solid state LED Crosstour MAXX luminaries are thermally optimized with eight lumen ranges in cool 5000K, neutral 4000K, or warm 3000K LED color temperature (CCT).

Electrical
LED driver is mounted to the die-cast aluminum housing for optimal heat sinking. LED thermal management system incorporates both conduction and natural convection to transfer heat rapidly away from the LED source. 58W, 81W and 102W models operate in -40°C to 40°C [-40°F to 104°F]. High ambient 50°C [122°F] models available in 58W and 81W models only. Crosstour MAXX luminaires maintain greater than 89% of initial light output after 72,000 hours of operation. Four half-inch NPT threaded conduit entry points allow for thru-branch wiring. Back box is an authorized electrical wiring compartment. Integral LED electronic driver incorporates surge protection. 120-277V 50/60Hz, 480V 60Hz, or 347V 60Hz electrical operation. 480V is compatible for use with 480V Wye systems only.

Emergency Egress
Optional integral cold-weather battery emergency egress includes emergency operation test switch (available in 58W and 81W models only), an AC-ON indicator light and a premium extended rated sealed maintenance-free nickel-metal hydride battery pack. The separate emergency lighting LEDs are wired to provide redundant emergency lighting. Listed to UL Standard 924, Emergency Lighting.

Area and Site Pole Mounting
Optional extruded aluminum 6-1/2" arm features internal bolt guides for supplied twin support rods, allowing for easy positioning of the fixture during installation to pole. Supplied with round plate adapter plate. Optional tenon adapter fits 2-3/8" or 3-1/2" O.D. Tenon.

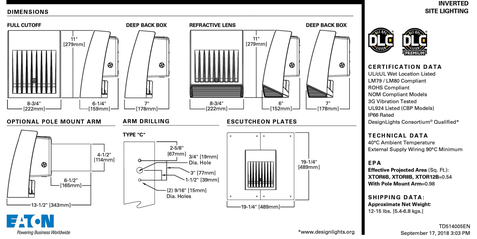
Finish
Crosstour MAXX is protected with a super TGIC carbon bronze or summit white polyester powder coat paint. Super TGIC powder coat paint finishes withstand extreme climate conditions while providing optimal color and gloss retention of the installed life.

Warranty
Five-year warranty.

XTOR CROSSTOUR MAXX LED

APPLICATIONS:
WALL / SURFACE
INVERTED
SITE LIGHTING

DIMENSIONS



CERTIFICATION DATA
UL/cUL Wet Location Listed
LM79 / LM80 Compliant
ROHS Compliant
NOM Compliant Models
3G Vibration Tested
UL924 Listed (CSP Models)
IP66 Rated
DesignLights Consortium® Qualified*

TECHNICAL DATA
40°C Ambient Temperature
External Supply Wiring 90°C Minimum

EPA
Effective Projected Area (Sq. Ft.):
XTORB8, XTORB8, XTOR12B=0.54
With Pole Mount Arm=0.98

SHIPPING DATA:
Approximate Net Weight:
12-15 lbs. (5.4-6.8 kgs.)

*www.designlights.org

TD514005EN
September 17, 2018 3:03 PM

9

LEDA Outdoor
120v : **3-712-2xx**
277v : **37-712-2xx**

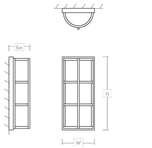
oxygen

FIXTURE TYPE _____ LOCATION _____
PROJECT _____ DATE _____

-24 Satin Nickel

-22 Oiled Bronze

LIGHT SOURCE	1 x 10.1W LED, 3000K, CRI 90
LUMINAIRE POWER	13.0W at 120V
RATED LIFE	60000 hr RL
OPTIONAL COLOR TEMPERATURES	2700K, 3500K, 4000K
LUMEN OUTPUT	Delivered: 680 lm (LM-79)
INPUT VOLTAGE	120V or 277V
DRIVER OUTPUT	350 mA, 12W
DIMMING	0-10v &Phase (ELV) Dimming - 50/60Hz 100% to 10% Dimming
CONSTRUCTION	Cast Aluminum and Acrylic
DIFFUSER	-2 Matte White Acrylic
FINISHES	Oiled Bronze (-22), Satin Nickel (-24)
MOUNTING	4" Octagonal J-Box [Installer must provide a bead of caulk between fixture housing and mounting surface]
STANDARDS	ETL Wet, Conforms to UL STD 1598, Certified CAN/CSA, STD C22.2 No 250.0.



DIMENSIONS
W: 7.25"
H: 16.50"
Ext: 4.75"
M.C: 8.25" From top of fixture

Order example for standard fixture:
3-712-224 (x- Voltage - xxx-Sequence # - x-Diffuser - xx-Finish)
3: 120v, 37: 277v
Order example for optional color temperatures: **3-712-22724**
27: 2700K, 35: 3500K, 40: 4000K

201 Railhead Road, Fort Worth, TX 76106 - Tel. (877) 607-0202 - www.oxygenlighting.com

WET Intertek

10

Project: 2731 East Grand River
Location: Meridian Township, MI

CONTECH ENGINEERED SOLUTIONS

Purpose: To calculate the first flush runoff flow rate (WQF) over a given site area. In this situation the WQV to be analyzed is the runoff produced by the first 0.91" of rainfall.

Reference: United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual.

Given:

Structure Name	A (acres)	A ($miles^2$)	Runoff Coefficient	Percent Imp. (%)*	t_c (min)	t_c (hr)
WQ-1	0.88	0.00138	0.76	76.67	10.0	0.167

* Assumes runoff coefficient of 0.3 for pervious areas and 0.9 for impervious areas.

Procedure: The Water Quality Flow (WQF) is calculated using the Water Quality Volume (WQV). This WQV, converted to watershed inches, is substituted for the runoff depth (Q) in the Natural Resources Conservation Service (formerly Soil Conservation Service), TR-55 Graphical Peak Discharge Method.

1. Compute WQV in watershed inches using the following equation:

WQV = P * R

where: WQV = water quality volume (watershed inches)
P = design precipitation (inches)
R = volumetric runoff coefficient = 0.05 + 0.009(I)
I = percent impervious cover

Structure Name	Percent Imp. (%)	R	P (in)	WQV (in)	WQV (cf)
WQ-1	76.67	0.740	0.91	0.673	2151

2. Compute the NRCS Runoff Curve Number (CN) using the following equation, or graphically using Figure 2-1 from TR-55 (USDA, 1986):

$$CN = 1000 / [10+5P+10Q-10(Q^2+1.25QP)^{1/2}]$$

where: CN = Runoff Curve Number
P = design precipitation (inches)
Q = runoff depth (watershed inches)

Structure Name	Q (in)	CN
WQ-1	0.673	97.65

First Flush Calculation (Page 1 of 2)
9/20/2023

Project: 2731 East Grand River
Location: Meridian Township, MI

CONTECH ENGINEERED SOLUTIONS

3. Using computed CN, read initial abstraction (I_a) from Table 4-1 in Chapter 4 of TR-55; compute I_a/P, interpolating when appropriate.

Structure Name	I_a (in)	I_a/P
WQ-1	0.041	0.045054945

4. Compute the time of concentration (t_c) in hours and the drainage area in square miles. A minimum t_c of 0.167 hours (10 minutes) should be used.

Structure Name	t_c (hr)	A ($miles^2$)
WQ-1	0.167	0.00138

5. Read the unit peak discharge (q_u) from Exhibit 4-II in Chapter 4 of TR-55 for appropriate t_c for type II rainfall distribution.

Structure Name	t_c (hr)	I_a/P	q_u (csm/in)
WQ-1	0.167	0.045054945	856

6. Substituting WQV (watershed inches) for runoff depth (Q), compute the water quality flow (WQF) from the following equation:

$$WQF = (q_u)*(A)*(Q)$$

where: WQF = water quality flow (cfs)
q_u = unit peak discharge ($cfs/mi^2/inch$)
A = drainage area (mi^2)
Q = runoff depth (watershed inches)

Structure Name	q_u (csm/in)	A ($miles^2$)	Q (in)	WQF (cfs)
WQ-1	856	0.00138	0.673	0.79

First Flush Calculation (Page 2 of 2)
9/20/2023

Estimated Net Annual Solids Load Reduction
Based on the Rational Rainfall Method

2731 East Grand River
Meridian Township, MI
WQ-1

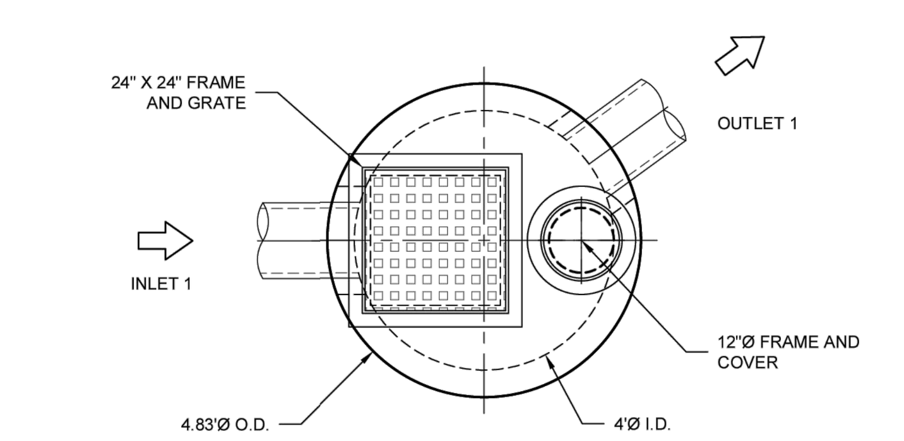
CONTECH ENGINEERED SOLUTIONS — CDS

AREA (acres): 0.88
WEIGHTED C: 0.76
Tc (minutes): 10

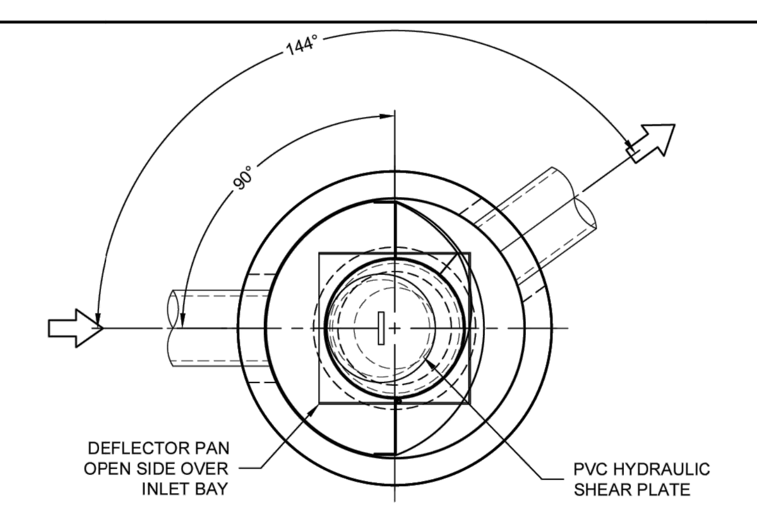
CDS MODEL: 2015
PARTICLE SIZE (µm): 110

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Removal Efficiency (%)	Incremental Removal (%)
0.02	13.5%	13.5%	0.01	100.0	13.5
0.04	10.3%	23.8%	0.03	100.0	10.3
0.06	10.0%	33.7%	0.04	100.0	10.0
0.08	7.6%	41.3%	0.05	99.6	7.6
0.10	7.3%	48.6%	0.07	99.1	7.2
0.12	4.4%	53.0%	0.08	98.7	4.3
0.14	4.4%	57.4%	0.09	98.2	4.3
0.16	3.9%	61.3%	0.11	97.7	3.8
0.18	3.6%	64.8%	0.12	97.3	3.5
0.20	2.6%	67.4%	0.13	96.8	2.5
0.25	5.1%	72.5%	0.17	95.7	4.9
0.30	4.2%	76.8%	0.20	94.6	4.0
0.35	3.2%	79.9%	0.23	93.4	3.0
0.40	3.5%	83.5%	0.27	92.3	3.3
0.45	2.1%	85.6%	0.30	91.2	1.9
0.50	2.0%	87.6%	0.33	90.0	1.8
0.75	7.9%	95.5%	0.50	84.4	6.6
1.00	1.5%	97.0%	0.67	78.7	1.2
1.50	2.5%	99.5%	1.00	54.2	1.3
2.00	0.5%	100.0%	1.34	40.6	0.2
0.00	0.0%	100.0%	0.00	#DIV/0!	0.0
					95.2
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	92.5%
				Predicted Net Annual Load Removal Efficiency =	**88.7%**

1 - Based on 11 years of hourly precipitation data from NCDC station 464, Lansing WSO Airport, Clinton County, MI
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.



PLAN VIEW
INTERNALS NOT SHOWN

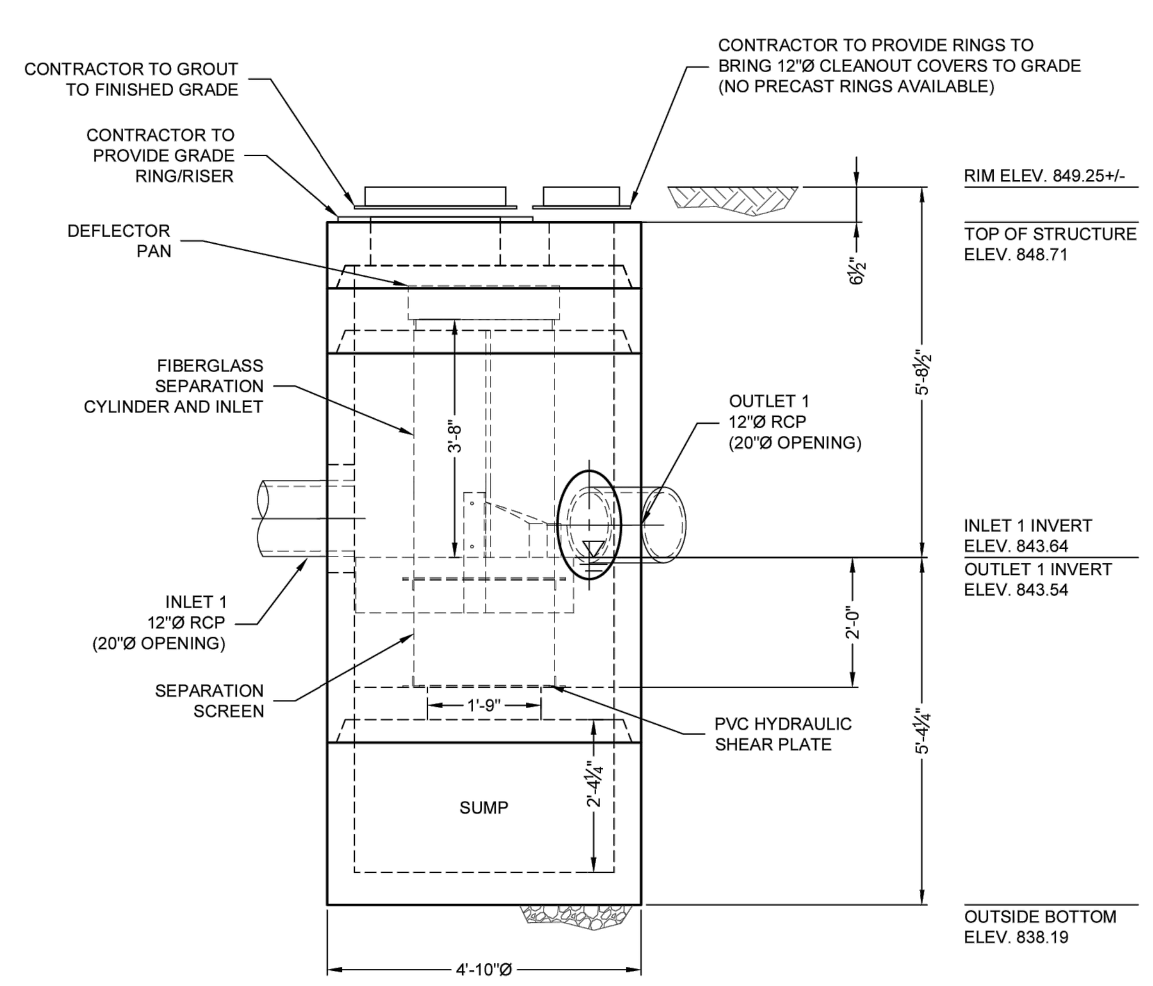


PLAN VIEW FOR PIPE ORIENTATION
TOP SLAB NOT SHOWN

MATERIAL LIST (PROVIDED BY CONTECH)

COUNT	DESCRIPTION	INSTALLED BY
1	2015-4 CONCENTRIC FIBERGLASS INSERT	CONTECH
1	2015, 2400 micron, 2.17' O.D. x 1.67' SCREEN, GREEN FLANGE UP	CONTECH
1	20, 30, 40 SERIES HARDWARE KIT	CONTECH
1	20 SERIES PVC HYDRAULIC SHEAR PLATE*	CONTECH
1	20 SERIES DEFLECTOR PAN	CONTRACTOR
1	SEALANT FOR JOINTS	CONTRACTOR
1	24" X 24" FRAME AND GRATE, EJ #45624050A01, OR EQUIV.	CONTRACTOR
1	12"Ø X 4" FRAME AND COVER, EJ #41610201, OR EQUIV.	CONTRACTOR

* SEE HYDRAULIC SHEAR PLATE DETAIL



ELEVATION VIEW

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 6500 LBS.
STRUCTURE IS DELIVERED IN 4 PIECES

MAX FOOTPRINT = 4.83'Ø

CONTECH **PROPOSAL** DRAWING

NCI
LAYOUT 1A

CDS2015-4-C - 772923-10
2731 EAST GRAND RIVER
EAST LANSING, MI
SITE DESIGNATION: WQ-1

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com

DATE: 9/22/23
DESIGNED: MSB
DRAWN: MSB
CHECKED: ----
APPROVED: MSB
PROJECT No.: 772923
SEQUENCE No.: 10
SHEET: 1 of 1

WATER QUALITY UNIT SPECIFICATION

1

ISSUE	DATE	BY	DESCRIPTION
1	09/22/2023	VF & AF	FOR SPECIAL LAND USE APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design
Detroit, MI · New York, NY · Boston, MA
Princeton, NJ · Tampa, FL · Rutherford, NJ
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS
2731 EAST GRAND RIVER
PROPOSED RESTAURANT WITH DRIVE-THROUGH
PARCEL ID : 33-02-02-20-202-001
2731 EAST GRAND RIVER AVENUE
MERIDIAN CHARTER TOWNSHIP
INGHAM COUNTY, MI 48823

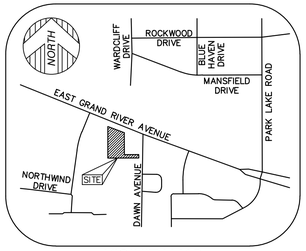
STATE OF MICHIGAN ENGINEER NO. 6201311615 PROFESSIONAL ENGINEER
MICHIGAN LICENSE No. 6201311615
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: AS SHOWN | PROJECT ID: DET-230027

TITLE: CONSTRUCTION DETAILS

DRAWING: **C-11**



VICINITY MAP

(NOT TO SCALE)

PARKING

HANDICAP PARKING = 2 STALLS
STANDARD PARKING = 31 STALLS

PARCEL AREA

38,436± SQUARE FEET = 0.88± ACRES

BASIS OF BEARING

SOUTH 70°00'00" EAST, BEING THE SOUTHERLY RIGHT OF WAY LINE OF GRAND RIVER AVENUE, AS PLATTED.

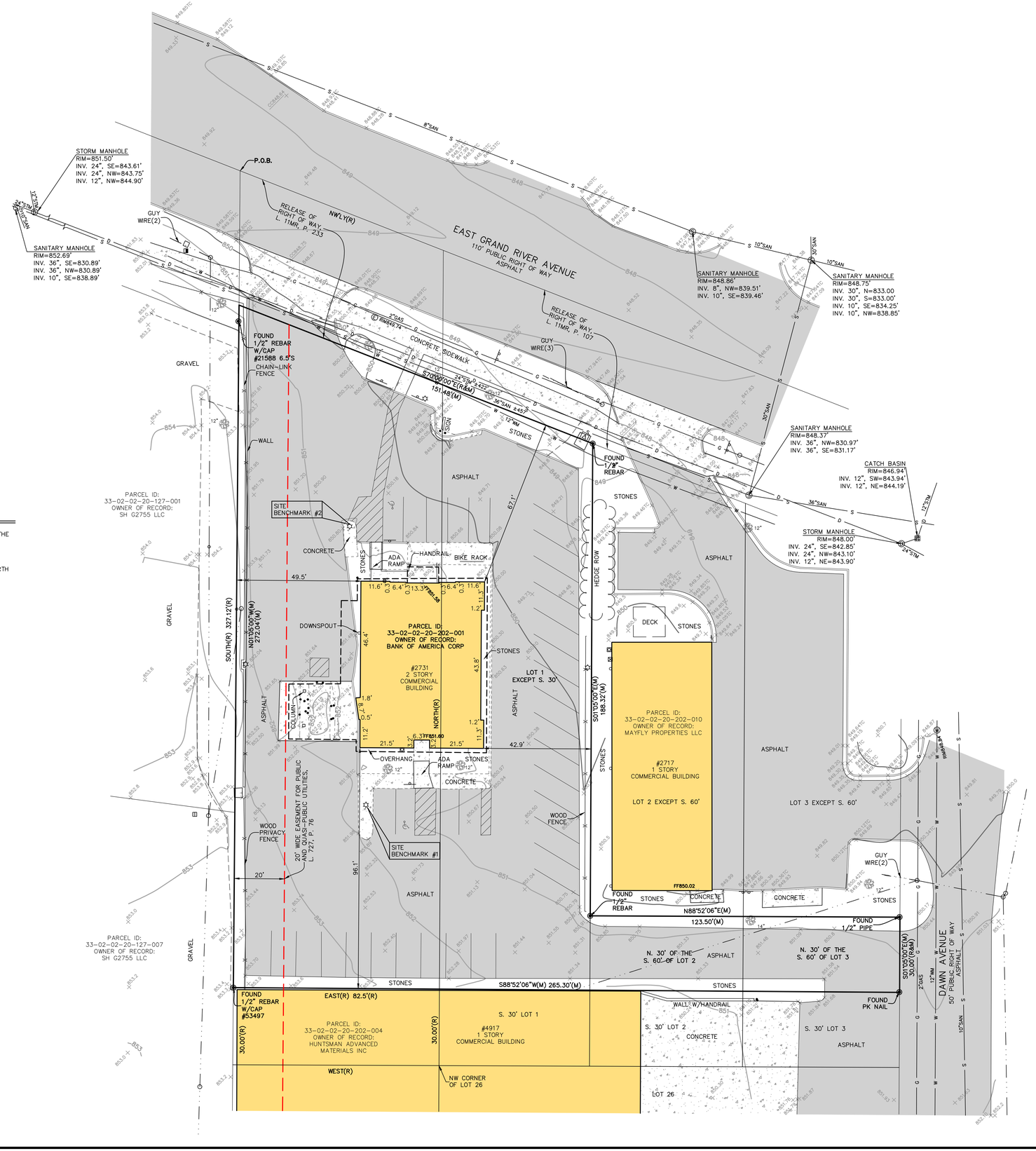
BENCHMARK

SITE BENCHMARK #1
CHISEL MARK ON TOP OF CONCRETE LIGHT POLE BASE, ±21' SOUTH OF THE SOUTHWEST CORNER OF BUILDING.
ELEVATION = 854.43' (NAVD 88)

SITE BENCHMARK #2
CHISEL MARK ON NORTH SIDE OF CONCRETE LIGHT POLE BASE, ±23' NORTH OF NORTHWEST CORNER OF BUILDING.
ELEVATION = 853.61' (NAVD 88)

LEGEND

- FOUND MONUMENT (AS NOTED)
- (R&M) RECORD AND MEASURED DIMENSION
- (R) RECORD DIMENSION
- (M) MEASURED DIMENSION
- 0.00 GROUND ELEVATION
- (E) ELECTRIC MANHOLE
- ELECTRIC METER
- ELECTRIC PANEL
- UTILITY POLE
- GAS METER
- TELEPHONE RISER
- CLEANOUT
- (S) SANITARY MANHOLE
- (D) STORM DRAIN MANHOLE
- (W) WATER GATE MANHOLE
- BOLLARD
- LIGHTPOST/LAMP POST
- SINGLE POST SIGN
- DOUBLE POST SIGN
- HANDICAP PARKING
- DECIDUOUS TREE (AS NOTED)
- PARCEL BOUNDARY LINE
- PLATTED LOT LINE
- ADJOINER PARCEL LINE
- EASEMENT (AS NOTED)
- BUILDING
- BUILDING OVERHANG
- CONCRETE CURB
- RAISED CONCRETE
- PARKING
- EDGE OF CONCRETE (CONC.)
- EDGE OF ASPHALT (ASPH.)
- EDGE OF GRAVEL
- FENCE (AS NOTED)
- WALL (AS NOTED)
- TREE / BRUSH LINE (AS NOTED)
- OVERHEAD UTILITY LINE
- G GAS LINE
- D STORM LINE
- S SANITARY LINE
- W WATER LINE
- MINOR CONTOUR LINE
- MAJOR CONTOUR LINE
- BUILDING AREA
- ASPHALT
- CONCRETE



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROPERTY DESCRIPTION

THE LAND SITUATED IN THE TOWNSHIP OF MERIDIAN, COUNTY OF INGHAM, STATE OF MICHIGAN, IS DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE CENTER OF GRAND RIVER AVENUE (M-43, FORMERLY US-16) ON THE NORTH AND SOUTH 1/4 LINE OF SECTION 17, TOWN 4 NORTH, RANGE 1 WEST, MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN, THENCE SOUTH ALONG SAID 1/4 LINE (AND ALONG SAID 1/4 LINE, PROJECTED SOUTH), 327.12 FEET, MORE OR LESS, TO A POINT 30 FEET NORTH OF A POINT DUE WEST OF THE NORTHWEST CORNER OF LOT 26 OF THE PLAT OF CEDAR RIVER HOMES, ACCORDING TO THE RECORDED PLAT THEREOF, THENCE EAST 82.5 FEET TO A POINT ON THE WEST BOUNDARY OF SAID PLAT 30 FEET NORTH OF THE NORTHWEST CORNER OF SAID LOT 26, THENCE NORTH ALONG THE WEST BOUNDARY OF SAID PLAT (AND ALONG SAID WEST BOUNDARY, PROJECTED NORTH) TO THE CENTER OF SAID GRAND RIVER AVENUE, THENCE NORTHWESTERLY ALONG THE CENTER OF SAID GRAND RIVER AVENUE TO THE POINT OF BEGINNING; AND

LOT 1 OF SAID PLAT OF CEDAR RIVER HOMES, EXCEPT THE SOUTH 30 FEET THEREOF; AND

THE NORTH 30 FEET OF THE SOUTH 60 FEET OF LOTS 2 AND 3 OF CEDAR RIVER HOMES, ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 11, PAGE 30, INGHAM COUNTY RECORDS.

TITLE REPORT NOTE

ONLY THOSE EXCEPTIONS CONTAINED WITHIN THE FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. TC13-109357, DATED 07/18/2023, AND RELISTED BELOW WERE CONSIDERED FOR THIS SURVEY. NO OTHER RECORDS RESEARCH WAS PERFORMED BY THE CERTIFYING SURVEYOR.

15. SUBJECT TO THE EASEMENTS, RESTRICTIONS AND RESERVATIONS CONTAINED IN THE CEDAR RIVER HOMES PLAT RECORDED AT LIBER 11, PAGE(S) 30, INGHAM COUNTY RECORDS. (SEE DOCUMENT FOR TERMS AND CONDITIONS)

16. TERMS, CONDITIONS AND PROVISIONS CONTAINED IN RELEASE OF RIGHT OF WAY RECORDED IN LIBER 11MR, PAGE 107. (AS SHOWN)

17. TERMS, CONDITIONS AND PROVISIONS CONTAINED IN RELEASE OF RIGHT OF WAY RECORDED IN LIBER 11MR, PAGE 233. (AS SHOWN)

18. TERMS, CONDITIONS AND PROVISIONS CONTAINED IN RIGHT OF WAY IN FAVOR OF CONSUMERS POWER COMPANY RECORDED IN LIBER 58MR, PAGE 311. (SEE DOCUMENT FOR TERMS AND CONDITIONS)

19. TERMS, CONDITIONS, PROVISIONS AND EASEMENTS CONTAINED IN DEED RECORDED IN LIBER 727, PAGE 76. (AS SHOWN)

20. EASEMENT IN FAVOR OF MICHIGAN BELL TELEPHONE COMPANY, AND THE TERMS, CONDITIONS AND PROVISIONS CONTAINED THEREIN, RECORDED IN LIBER 1655, PAGE 1167. ("ATTACHMENT A" OF DOCUMENT NOT PROVIDED, UNABLE TO DETERMINE LOCATION, SEE DOCUMENT FOR TERMS AND CONDITIONS)

21. TERMS, CONDITIONS AND PROVISIONS CONTAINED IN APPLICATION FOR LAYING OUT AND ENLARGING A COUNTY DRAINAGE DISTRICT PURSUANT TO SECTION 425 OF ACT 40, PUBLIC ACTS OF MICHIGAN, 1956, AS AMENDED, RECORDED IN LIBER 1873, PAGE 728. (SEE DOCUMENT FOR TERMS AND CONDITIONS)

22. TERMS, CONDITIONS AND PROVISIONS CONTAINED IN ORDER LAYING OUT AND DESIGNATING A DRAINAGE DISTRICT RECORDED IN LIBER 1873, PAGE 731. (SEE DOCUMENT FOR TERMS AND CONDITIONS)

23. TERMS, CONDITIONS AND PROVISIONS CONTAINED IN FINAL ORDER OF DETERMINATION RECORDED IN LIBER 1873, PAGE 734. (SEE DOCUMENT FOR TERMS AND CONDITIONS)

SURVEYOR'S NOTE

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES OTHER THAN THE STRUCTURE INVENTORY SHOWN HEREON.

SURVEYOR'S CERTIFICATION

TO SOUTHERN MICHIGAN BANK & TRUST; TITLE CONNECT, LLC; FIRST AMERICAN TITLE INSURANCE COMPANY; AND ALRIG USA:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 4, 5, 7A, 8, 9, 11A, AND 11B OF TABLE A, THEREOF. THE FIELD WORK WAS COMPLETED ON 08/21/23.

DATE OF PLAT OR MAP: 08/29/23

DRAFT

ANTHONY T. SYCKO, JR., P.S.
PROFESSIONAL SURVEYOR
MICHIGAN LICENSE NO. 47976
22556 GRATIOT AVE., EASTPOINTE, MI 48021
TSycko@kemtec-survey.com

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PROFESSIONAL ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES
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Ann Arbor (734) 994.0888
Detroit (313) 755.0677
Grand Blanc (888) 694.0001
www.kemtecgroupofcompanies.com

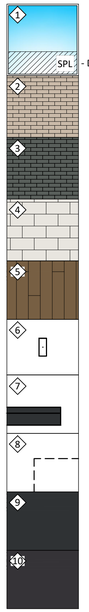
ALTA / NSPS LAND TITLE SURVEY

PREPARED FOR: ALRIG USA
27731 EAST GRAND RIVER AVENUE, EAST LANSING, MICHIGAN,
PART OF SECTION 17,
TOWN 4 NORTH, RANGE 1 WEST

REVISION	DATE	BY	DESCRIPTION
2	09/20/23	MRJ	REVISED UTILITIES
1	09/05/23	MRJ	REVISED UTILITIES

DRAWN BY:	GST
CHECKED BY:	ATS
DATE:	AUGUST 29, 2023
PROJECT NO:	23-01756
DATE:	08/26/23
DATE:	08/29/23
SCALE:	1" = 20'

EXTERIOR FINISH KEY



STOREFRONT
THERMALLY BROKEN ALUM. FRAME
W/INSULATED GLAZING
MFR: TBD COLOR: DARK BRONZE
SPL - DENOTES SPANDREL GLAZING

MODULAR BRICK VENEER
MFR: MUTUAL MATERIALS
OR EQUAL TO MATCH
COLOR: PEWTER MISSION

MODULAR BRICK VENEER
MFR: T.B.D.
COLOR: DARK GREY

SPLIT-FACE CMU
MFR: T.B.D.
COLOR: WHITE

FIBER CEMENT SIDING
MFR: NICHIHA (VERTICAL)
STYLE: VINTAGEWOOD - WOOD SERIES
COLOR: CEDAR

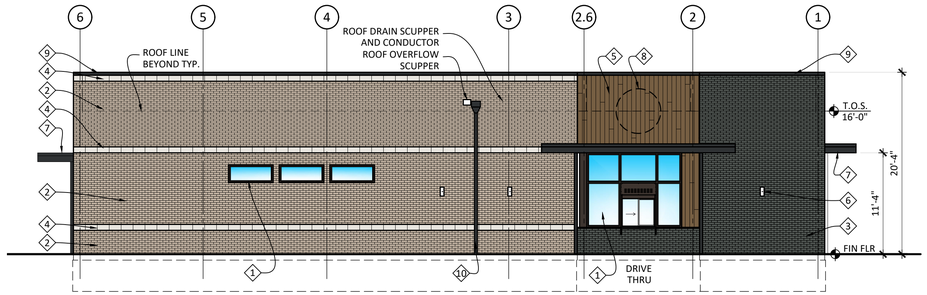
LIGHTING
WALL SCONCE FIXTURE
(KICHLER - 11251BKT30)

METAL CANOPY
COLOR: MATTE BLACK (RAL#7021)
(LIGHTING PER TENANT PLANS & SPECS)
* NICHIHA @ UNDERSIDE

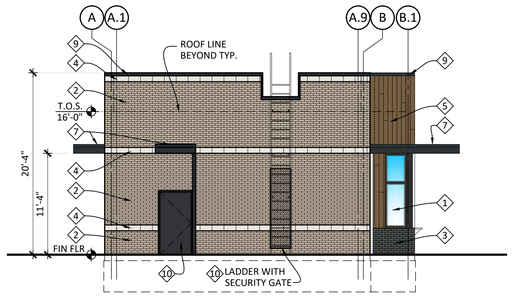
SIGNAGE
SIGNAGE ALLOWED: VERIFY MAX. SQ FT
SIGNAGE SHALL BE SUBMITTED PER TENANT.

PREFINISHED METAL COPING
MFR: FIRESTONE
COLOR: (MATCH) MATTE BLACK (RAL#7021)

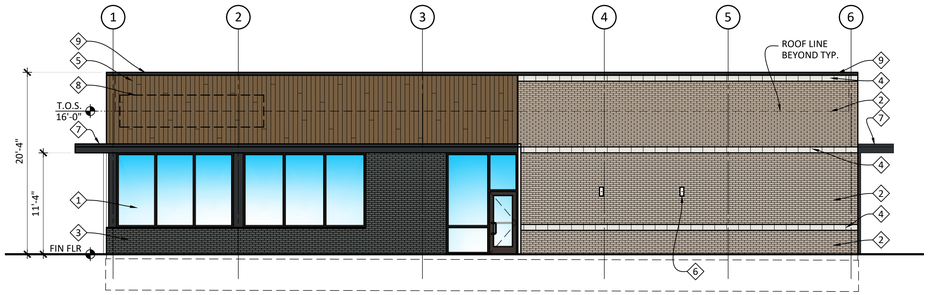
PAINT
MFR: SHERWIN WILLIAMS
COLOR: SW 6989 "DOMINO"



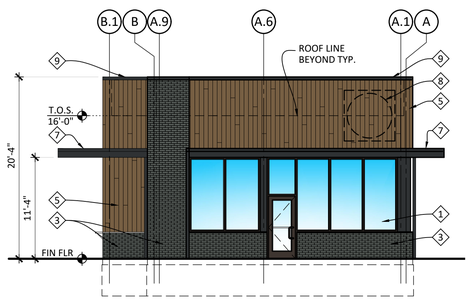
PRELIMINARY EAST ELEVATION 5
SCALE: 1/8" = 1'-0"



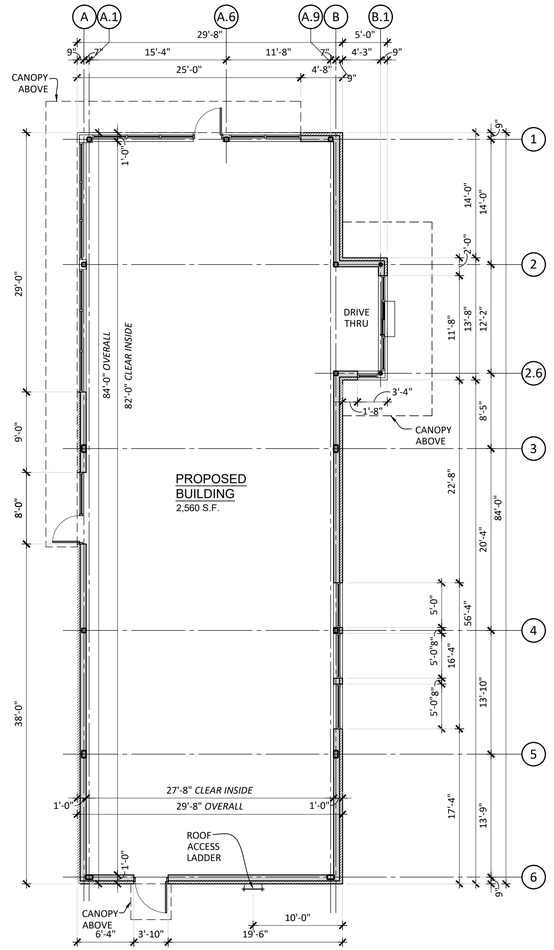
PRELIMINARY SOUTH ELEVATION 4
SCALE: 1/8" = 1'-0"



PRELIMINARY WEST ELEVATION 3
SCALE: 1/8" = 1'-0"



PRELIMINARY NORTH ELEVATION 2
SCALE: 1/8" = 1'-0"



PRELIMINARY FLOOR PLAN 1
SCALE: 1/8" = 1'-0"

DETROIT ARCHITECTURAL GROUP
1644 Ford Avenue Wyandotte, MI 48192
734.556.3269 O.
www.detroitarch.com

Proposed

RESTAURANT SHELL BUILDING

2731 E. GR. RIVER AVE,
EAST LANSING, MI 48823
(MERIDIAN TWP.)

REV	DATE	ISSUED
	08-09-23	FOR REVIEW

SEAL:

DRAWN BY: TJG
CHECKED BY: VW/JMR
IN CHARGE: XXX

SHEET NAME:
PRELIMINARY PLANS AND ELEVATIONS

JOB NO:
23-111

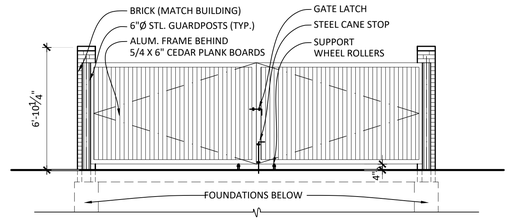
SHEET NO:
PP-1

DETROIT ARCHITECTURAL GROUP
1644 Ford Avenue Wyandotte, MI 48192
734.556.3259 O.
www.detroitarch.com

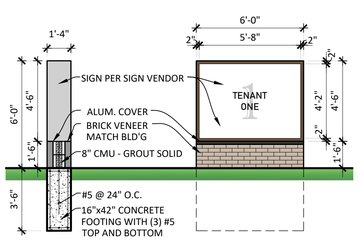
Proposed

RESTAURANT SHELL BUILDING

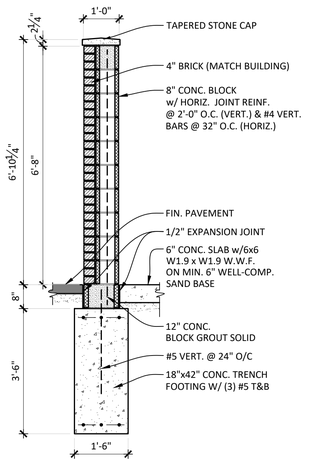
2731 E. GR. RIVER AVE,
EAST LANSING, MI 48823
(MERIDIAN TWP.)



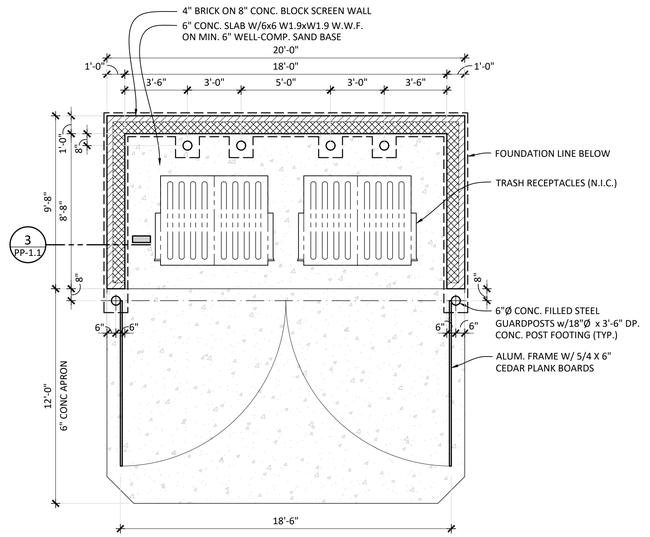
TRASH ENCLOSURE ELEVATION — 2
SCALE: 1/4" = 1'-0"



FREE-STANDING SIGN — 4
SCALE: 1/4" = 1'-0"



TRASH ENCLOSURE DETAIL — 3
SCALE: 1/2" = 1'-0"



TRASH ENCLOSURE PLAN — 1
SCALE: 1/4" = 1'-0"

REV	DATE	ISSUED
	08-09-23	FOR REVIEW

SEAL:

DRAWN BY: TJG
CHECKED BY: VW/JMR
IN CHARGE: XXX

SHEET NAME:
MISC. SITE DETAILS

JOB NO:
23-111

SHEET NO:
PP-1.1

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

MEMO

VIA EMAIL: rachel@alrigusa.com

To:	**Rachel Miller** **Meridian Retail Management II LLC**
From:	**Jacob Swanson, PE** **Mason Gamble, EIT** **Fleis & VandenBrink**
Date:	**December 5, 2023**
Re:	**2731 E. Grand River Development** **Meridian Township, Michigan** **Traffic Impact Study**

1 INTRODUCTION

This memorandum presents the results of the Traffic Impact Study (TIS) for the proposed commercial development located at 2731 E. Grand River Avenue (M-43) in Meridian Township, Michigan, as shown on the attached **Figure 1**. The proposed development is adjacent to the south side of Grand River Avenue (M-43), between Northwind Drive and Dawn Avenue. The proposed project includes the construction of a coffee-shop restaurant with a drive-through. The site was previously occupied by a financial institution, which will be razed as part of this project. Site access is currently provided via one (1) full access driveway on Grand River Avenue (M-43) and shared access driveway that leads to Dawn Avenue. No changes to the site access locations are proposed with the development plan.

Meridian Charter Township has required the completion of a TIS as part of the site plan approval process. Additionally, this TIS has been completed pursuant to the requirements of the Michigan Department of Transportation (MDOT) and the Ingham County Road Department (ICRD) for the for the permitting of site access on Grand River Avenue (M-43) and Dawn Avenue, respectively.

The scope of work for this study was developed based on the requirements of Meridian Township, Fleis & VandenBrink's (F&V) knowledge of the study area, understanding of the development program, accepted traffic engineering practices, and information published by the Institute of Transportation Engineers (ITE). The study analyses were completed using Synchro/SimTraffic (Version 11). Sources of data for this study include F&V subconsultant Quality Counts, LLC (QC), Meridian Township, ICRD, ITE and MDOT.

2 BACKGROUND

2.1 EXISTING ROAD NETWORK

Lane uses and traffic control at the study intersections are shown on the attached **Figure 2** and the study roadways are further described below. For the purposes of this study site driveways, exit-ramps, and minor streets were assumed to have an operating speed of 25 miles per hour (mph), unless otherwise noted.

Grand River Avenue (M-43) generally runs in the east and west directions, adjacent to the north side of the project site. The study section of Grand River Avenue (M-43) is classified as an *Other Principal Arterial*, is under the jurisdiction of MDOT, has a posted speed limit of 45-mph, and has an Average Annual Daily Traffic (AADT) volume of approximately 21,827 vehicles per day (MDOT 2021). The study section of roadway has a typical five-lane cross-section, with two (2) lanes of travel in each direction and a center two-way left-turn lane (TWLTL). Additionally, Grand River Avenue (M-43) widens at the intersection with Northwind Drive to provide exclusive right-turn lanes in both the eastbound and westbound directions.

2960 Lucerne Drive SE
Grand Rapids, MI 49546
P: 616.977.1000
F: 616.977.1005
www.fveng.com

Dawn Avenue generally runs in the north and south directions, terminating at the intersection with Grand River Avenue (M-43), to the east of the project site. Northwind Drive is classified as a *Local Road*, is under the jurisdiction of ICRD, and has an assumed prima-facie residential speed limit of 25-mph. The study section of roadway has a typical two-lane cross-section, with one (1) lane of travel in each direction.

Northwind Drive generally runs in the north and south directions, to the west of the project site. The roadway terminates at the intersection with Grand River Avenue (M-43), opposite the Whole Foods store driveway. Northwind Drive is classified as a *Local Road*, has a posted speed limit of 25-mph, and is under the jurisdiction of ICRD. The study section of roadway has a typical two-lane cross-section, with one (1) lane of travel in each direction. The intersection with Grand River Avenue (M-43) is signalized, and Northwind Drive widens to provide exclusive left-turn lane and shared through/right lanes and is in both the northbound and southbound directions. Additionally, at the intersection of Grand River Avenue (M-43) & Northwind Drive, the north leg of the signal is the Whole Foods driveway and parking lot.

2.2 Existing Traffic Volumes

F&V subconsultant QC collected existing Turning Movement Count (TMC) data on Tuesday, October 10th, 2023, during the AM (7:00 AM to 9:00 AM), MD (11:00 AM to 1:00 PM), and PM (4:00 PM to 6:00 PM) peak hours at the following study intersections:

- Grand River Avenue (M-43) & Northwind Drive, and
- Grand River Avenue (M-43) & Dawn Avenue / Apartment Drive

Additional TMC data was collected at the following intersections / driveways for modeling purposes only:

- Grand River Avenue (M-43) & Park Lake Road, and
- Grand River Avenue (M-43) & Tuffy Tire / Clarion Pointe Hotels (3 driveways)

During collection of the turning movement counts, Peak Hour Factors (PHFs), pedestrian and bicyclist volumes, and commercial truck percentages were recorded and used in the traffic analysis. The peak hours of the study intersections were utilized and the through volumes were carried through the roadway network and balanced upwards through the study roadway network. Additionally, 'dummy nodes' were also utilized in the Synchro models to account for sink and source locations; therefore, raw traffic volumes shown in the data collection may not match the traffic volumes used in the analysis and shown on the attached traffic volume figures. The morning (AM), midday (MD), and evening (PM) peak hours for the adjacent roadway network were observed to generally occur between 8:00 AM to 9:00 AM, 11:45 AM to 12:45 PM, and 4:45 PM to 5:45 PM, respectively.

F&V collected an inventory of existing lane use and traffic controls, as shown on the attached **Figure 2**. Additionally, F&V obtained the current signal timing permits from MDOT for the signalized intersection of Grand River Avenue (M-43) & Northwind Drive / Whole Foods and Grand River Avenue (M-43) & Park Lake Road. The existing peak hour traffic volumes used in the analysis are shown on the attached **Figure 3**. All applicable background data referenced in this memorandum is attached.

3 Existing Conditions

Existing peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro/SimTraffic (Version 11) traffic analysis software. This analysis was based on the existing lane use and traffic control shown on the attached **Figure 2**, existing peak hour traffic volumes shown on the attached **Figure 3**, and methodologies presented in the *Highway Capacity Manual, 6th Edition (HCM6)*.

Descriptions of LOS "A" through "F" as defined in the HCM6, are attached. Typically, LOS D is considered acceptable, with LOS A representing minimal delay and LOS F indicating failing conditions. The results of the existing conditions analysis are attached and summarized in **Table 1**.

The results of the existing conditions analysis indicate all approaches and movements at the study intersections are currently operating acceptably at LOS D or better during the AM, MD, and PM peak hours with the exception of the following:

Grand River Avenue (M-43) & Dawn Avenue / Apartment Drive

- During the MD peak hour: The southbound (Apartment Drive) approach is currently operating at LOS E.
- During the PM peak hour: The northbound approach is currently operating at LOS E.

Although Synchro intersection LOS analysis indicates poor operations for the minor street approaches, a review of SimTraffic network simulations indicates acceptable operations for both the northbound and southbound approaches during all the peak periods. The 95th percentile queue length reported for these poor/failing approaches was approximately 55 feet (2-3 vehicles) or less during all peak periods which is not significant. Additionally, vehicles were observed to find adequate gaps within the through traffic along Grand River Avenue (M-43) without experiencing significant delays or excessive vehicle queueing.

Review of SimTraffic network simulations for the remaining study intersections indicates acceptable operations during all peak periods. Occasional periods of vehicle queues were observed at the signalized study intersection of Grand River Avenue (M-43) & Northwind Drive; however, these queues were typically observed to be serviced within each cycle length. Additionally, any remaining vehicle queues were observed to dissipate and were not present throughout the peak periods.

Table 1: Existing Intersection Operations

Intersection		Control	Approach	Existing Conditions					
				AM Peak		MD Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1	Grand River Avenue (M-43) & Northwind Drive	Signalized	EBL	2.0	A	4.7	A	4.7	A
			EBT	2.3	A	5.8	A	6.7	A
			EBR	2.0	A	4.1	A	3.9	A
			WBL	0.2	A	1.7	A	3.1	A
			WBT	0.3	A	0.5	A	0.4	A
			WBR	0.0	A	0.1	A	0.2	A
			NBL	47.9	D	45.4	D	43.7	D
			NBTR	44.3	D	38.9	D	38.5	D
			SBL	45.4	D	43.9	D	45.4	D
			SBTR	46.0	D	38.6	D	38.9	D
			Overall	**4.1**	**A**	**8.3**	**A**	**8.4**	**A**
2	Grand River Avenue (M-43) & Dawn Avenue / Apartment Drive	Stop (Minor)	EBL	8.5	A	8.6	A	8.6	A
			EBTR	Free					
			WBL	7.7	A	8.6	A	9.7	A
			WBTR	Free					
			NB	10.6	B	22.4	C	41.2	E
			SB	10.8	B	35.5	E	10.4	B

4 BACKGROUND (2024) CONDITIONS

Census population data and historic traffic volumes from MDOT were obtained for Meridian Township to calculate a background growth rate to project the existing 2023 traffic volumes to the buildout year of 2024. Historical traffic volumes indicate a negative growth; however, population data showed an average annual growth rate of approximately 1% per year. Therefore, an annual background growth rate of **1.0%** per year was applied to the existing peak hour traffic volumes to forecast the 2024 traffic volume.

It is also important to account for background developments and road improvement projects within the vicinity of the project site, which are currently under construction or will be complete prior to the buildout year of the proposed development. The following background developments were identified and were included as background traffic.

- Specialty Grocery Store – 5030 Northwind Drive, and
- Consumers Credit Union – 2763 E. Grand River Avenue.

Therefore, the trip generation for these background developments was calculated and added to the study roadway network. Therefore, the existing peak hour traffic volumes were combined with the background development site-generated trips, after applying the calculated background growth rate, in order to forecast the background (2024) traffic volumes ***without the proposed development***, as shown on the attached **Figure 4**.

Background peak hour vehicles delays and LOS ***without the proposed development*** were calculated at the study intersections based on the existing lane use and traffic control shown on the attached **Figure 2**, the background peak hour traffic volumes shown on the attached **Figure 4**, and the methodologies presented in the HCM. The results of the background conditions analysis are attached and summarized in **Table 2**.

Table 2: Background Intersection Operations

Intersection		Control	Approach	Existing Conditions						Background Conditions						Difference					
				AM Peak		MD Peak		PM Peak		AM Peak		MD Peak		PM Peak		AM Peak		MD Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1	Grand River Avenue (M-43) & Northwind Drive	Signal	EBL	2.0	A	4.7	A	4.7	A	2.1	A	6.2	A	5.4	A	0.1	-	1.5	-	0.7	-
			EBT	2.3	A	5.8	A	6.7	A	2.4	A	7.8	A	7.8	A	0.1	-	2.0	-	1.1	-
			EBR	2.0	A	4.1	A	3.9	A	2.2	A	5.8	A	4.8	A	0.2	-	1.7	-	0.9	-
			WBL	0.2	A	1.7	A	3.1	A	0.2	A	3.5	A	5.6	A	0.0	-	1.8	-	2.5	-
			WBT	0.3	A	0.5	A	0.4	A	0.3	A	0.6	A	0.4	A	0.0	-	0.1	-	0.0	-
			WBR	0.0	A	0.1	A	0.2	A	0.0	A	0.1	A	0.2	A	0.0	-	0.0	-	0.0	-
			NBL	47.9	D	45.4	D	43.7	D	47.7	D	43.9	D	44.4	D	-0.2	-	-1.5	-	0.7	-
			NBTR	44.3	D	38.9	D	38.5	D	44.4	D	36.2	D	37.7	D	0.1	-	-2.7	-	-0.8	-
			SBL	45.4	D	43.9	D	45.4	D	45.4	D	42.1	D	45.4	D	0.0	-	-1.8	-	0.0	-
			SBTR	46.0	D	38.6	D	38.9	D	45.1	D	34.5	D	36.9	D	-0.9	-	-4.1	-	-2.0	-
			Overall	**4.1**	**A**	**8.3**	**A**	**8.4**	**A**	**4.5**	**A**	**9.9**	**A**	**9.8**	**A**	**0.4**	-	**1.6**	-	**1.4**	-
2	Grand River Avenue (M-43) & Dawn Avenue	Stop (Minor)	EBL	8.5	A	8.6	A	8.6	A	8.7	A	8.7	A	8.7	A	0.2	-	0.1	-	0.1	-
			EBTR	Free						Free						N/A					
			WBL	7.7	A	8.6	A	9.7	A	7.7	A	8.8	A	10.1	B	0.0	-	0.2	-	0.4	A→B
			WBTR	Free						Free						N/A					
			NB	10.6	B	22.4	C	41.2	E	10.6	B	25.4	D	55.4	F	0.0	-	3.0	C→D	14.2	E→F
			SB	10.8	B	35.5	E	10.4	B	11.3	B	43.3	E	10.6	B	0.5	-	7.8	-	0.2	-

The results of the background conditions analysis indicate that all approaches and movements at the study intersections will continue to operate in an acceptable manner, similar to the existing conditions analysis, with the exception of the following:

Grand River Avenue (M-43) & Dawn Avenue / Apartment Drive

- <u>During the PM peak hour:</u> The northbound approach is expected to operate at LOS F.

  Although Synchro intersection LOS analysis indicates poor operations for the minor street approaches, review of SimTraffic microsimulations indicates acceptable operations, similar to the existing conditions analysis. The 95th percentile queue length reported for the poor/failing approaches was approximately 60-feet (2-3 vehicles) or less during all peak periods, which is not significant.

Review of SimTraffic network simulations for the remaining study intersections indicates acceptable operations during all peak periods. Occasional periods of vehicle queues were observed at the signalized study intersection of Grand River Avenue (M-43) & Northwind Drive; however, these queues were typically observed to be serviced within each cycle length.

5 Site Trip Generation

The number of weekday peak hour (AM, MD, and PM) and daily vehicle trips that would be generated by the proposed development was forecast based on the rates published by ITE in the *Trip Generation Manual, 11th Edition*. ITE does not provide MD peak hour trip generation information for the Coffee Shop with Drive-Through land use for the; therefore, the MD peak hour trip generation was determined by utilizing the ITE "time of day distributions", based on a ratio from the AM peak hour trip generation to the highest MD peak hour. The site trip generation forecast utilized for the proposed development is summarized in **Table 3**.

Table 3: Trip Generation Summary

Land Use	ITE Code	Amount	Units	Average Daily Traffic (vpd)	AM Peak Hour (vph)			MD Peak Hour (vph)			PM Peak Hour (vph)		
					In	Out	Total	In	Out	Total	In	Out	Total
Coffee Shop with Drive-Through	937	2,560	SF	1,366	112	108	220	76	76	152	50	50	100
Pass-By (50% AM, 55% MD & 55% PM)				*485*	*55*	*55*	*110*	*42*	*42*	*84*	*27*	*27*	*54*
New Trips				881	57	53	110	34	34	68	23	23	46

As is typical of commercial developments, a portion of the trips generated by the proposed developments are from vehicles on the adjacent roadway that will pass the site on the way from an origin to their ultimate destination. Therefore, not all traffic at the site driveways is necessarily new traffic added to the street system. This percentage of the trips generated are considered "pass-by" trips and do not add new traffic to the adjacent street system. These trips are therefore reduced from the total external trips generated by a study site. The percentage of pass-by trips used in this analysis was determined based on the rates published by ITE in the *Trip Generation Manual, 11th Edition.*

6 SITE TRIP DISTRIBUTION

The vehicular trips that would be generated by the proposed development were assigned to the study roads based on the proposed site access plan and driveway configurations, the existing peak hour traffic patterns in the adjacent roadway network, and the methodologies published by ITE. The ITE trip distribution methodology assumes new trips will enter the network and access the development, then leave the development and return to their direction of origin, whereas pass-by trips will enter and exit the development and return to their original direction of travel. The site trip distributions utilized in the analysis are summarized in **Table 4**.

Table 4: Site Trip Distribution

New Trips						Pass-By Trips		
AM	MD	PM	To/From	Via	Direction	AM	MD	PM
65%	48%	43%	East	Grand River Avenue (M-43)	Eastbound	32%	50%	56%
32%	46%	52%	West	Grand River Avenue (M-43)	Westbound	68%	50%	44%
3%	6%	5%	South	Northwind Drive		N/A		
100%	**100%**	**100%**	**Total**			**100%**	**100%**	**100%**

The vehicular traffic volumes shown in **Table 3** were distributed to the roadway network according to the distribution shown in **Table 4**. The site-generated trips shown on the attached **Figure 5** were added to the background peak hour traffic volumes shown on the attached **Figure 4**, in order to calculate the future peak hour traffic volumes, with the addition of the proposed development. Future peak hour traffic volumes are shown on the attached **Figure 6**.

7 FUTURE (2024) CONDITIONS

Future peak hour vehicle delays and LOS ***with the proposed development*** were calculated based on the future lane use and traffic control shown on the attached **Figure 2**, the future peak hour traffic volumes shown on the attached **Figure 6**, and the methodologies presented in the *HCM*. The results of the future conditions analysis are attached and are summarized in **Table 5**.

The results of the future conditions analysis indicates that all study intersection approaches and movements will continue to operate acceptably, in a manner similar to the background conditions analysis. Additionally, results of the future conditions analysis indicates that the proposed site driveway will operate acceptably, at LOS D or better during all peak periods. Minor additional delays are anticipated at the intersection of Grand River Avenue (M-43) & Dawn Avenue / Apartment Drive; however, the 95th percentile queue length reported was approximately 60-feet (2-3 vehicles) or less during all peak periods, which is not significant.

Review of SimTraffic network simulations indicates acceptable operations, similar to those observed during background conditions. Occasional periods of vehicle queues were observed throughout the study roadway network; however, these vehicle queues were observed to dissipate and were not present throughout the peak

periods. Furthermore, SimTraffic microsimulations observations indicate that the ingress westbound left-turn traffic entering the site from the center two-way left-turn lane are not expected to block the nearby Clarion Point Hotel driveways during the peak periods.

Table 5: Future Intersection Operations

Intersection		Control	Approach	Background Conditions						Future Conditions						Difference					
				AM Peak		MD Peak		PM Peak		AM Peak		MD Peak		PM Peak		AM Peak		MD Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1	Grand River Avenue (M-43) & Northwind Drive	Signal	EBL	2.1	A	6.2	A	5.4	A	2.2	A	6.2	A	5.4	A	0.1	-	0.0	-	0.0	-
			EBT	2.4	A	7.8	A	7.8	A	2.5	A	7.9	A	7.9	A	0.1	-	0.1	-	0.1	-
			EBR	2.2	A	5.8	A	4.8	A	2.2	A	5.8	A	4.8	A	0.0	-	0.0	-	0.0	-
			WBL	0.2	A	3.5	A	5.6	A	0.2	A	3.8	A	5.9	A	0.0	-	0.3	-	0.3	-
			WBT	0.3	A	0.6	A	0.4	A	0.3	A	0.6	A	0.4	A	0.0	-	0.0	-	0.0	-
			WBR	0.0	A	0.1	A	0.2	A	0.0	A	0.1	A	0.2	A	0.0	-	0.0	-	0.0	-
			NBL	47.7	D	43.9	D	44.4	D	47.7	D	43.9	D	44.4	D	0.0	-	0.0	-	0.0	-
			NBTR	44.4	D	36.2	D	37.7	D	44.6	D	36.3	D	37.6	D	0.2	-	0.1	-	-0.1	-
			SBL	45.4	D	42.1	D	45.4	D	45.6	D	42.2	D	45.4	D	0.2	-	0.1	-	0.0	-
			SBTR	45.1	D	34.5	D	36.9	D	45.1	D	34.5	D	36.8	D	0.0	-	0.0	-	-0.1	-
			Overall	**4.5**	**A**	**9.9**	**A**	**9.8**	**A**	**4.5**	**A**	**9.9**	**A**	**9.8**	**A**	**0.0**	-	**0.0**	-	**0.0**	-
2	Grand River Avenue (M-43) & Dawn Avenue	Stop (Minor)	EBL	8.7	A	8.7	A	8.7	A	8.7	A	8.7	A	8.7	A	0.0	-	0.0	-	0.0	-
			EBTR	Free						Free						N/A					
			WBL	7.7	A	8.8	A	10.1	B	7.9	A	8.8	A	9.9	A	0.2	-	0.0	-	-0.2	B→A
			WBTR	Free						Free						N/A					
			NB	10.6	B	25.4	D	55.4	F	10.8	B	27.2	D	61.3	F	0.2	-	1.8	-	5.9	-
			SB	11.3	B	43.3	E	10.6	B	11.4	B	46.4	E	10.6	B	0.1	-	3.1	-	0.0	-
3	Grand River Avenue & Site Drive	Stop (Minor)	EB	N/A						Free						N/A					
			WBL							8.1	A	9.1	A	11.3	B						
			NB							11.2	B	12.5	B	17.7	C						

8 ACCESS MANAGEMENT

8.1 DRIVEWAY SPACING AND CORNER CLEARANCE

The Meridian Township Access Management criteria and the MDOT intersection corner clearance guidelines were utilized to evaluate the location of the proposed Site Drive, in relation to nearby intersections and driveways within close proximity to the project site. The desirable access spacing and intersection corner clearance criteria were evaluated for the 45-mph section of Grand River Avenue (M-43). The distance of the proposed Site Drive from nearby access points and the warranting criteria are summarized in **Table 6** and displayed in **Exhibit 1**.

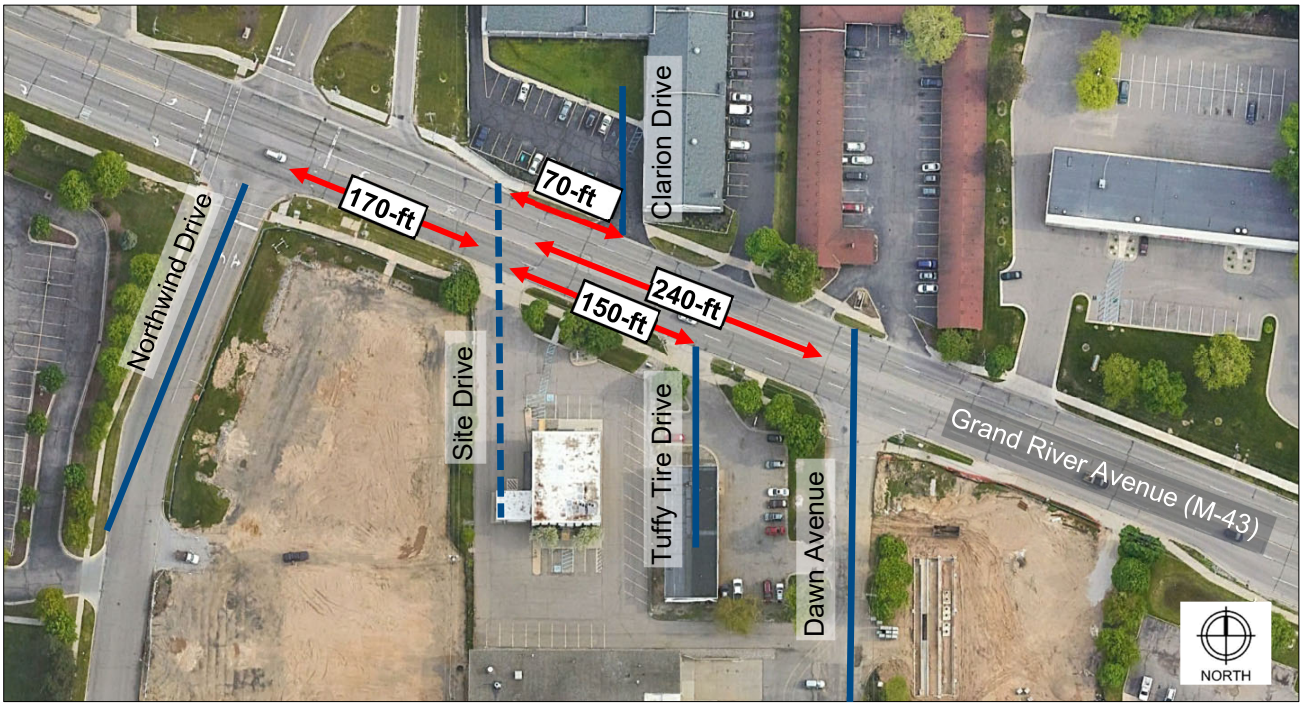
Table 6: Desirable Clearance Summary

Adjacent Driveways & Intersections			Distance	Criteria (45 mph)	Meets
Site Drive	To	Northwind Drive	170 feet	460 feet	**NO**
Site Drive	To	Clarion Drive	70 feet	630 feet	**NO**
Site Drive	To	Tuffy Tire Drive	150 feet	350 feet	**NO**
Site Drive	To	Dawn Avenue	240 feet	230 feet	**YES**

The results of the analysis indicates that the proposed Site Drive is not expected to meet the desirable corner clearance from Northwind Drive, nor the driveway spacing criteria for the nearby Clarion and Tuffy Tire driveways. However, there is limited property frontage (~150 feet) along Grand River Avenue (M-43); therefore, the proposed site driveway will be located where the existing curb cut is already present, as it is not possible to meet the recommended spacing criteria within the available site property. Additionally, the applicant is unable to obtain shared access with the adjacent land uses at this time to consider driveway consolidation.

The SimTraffic network simulations were reviewed to determine if there are center left-turn lane conflicts that would impact the operations of the proposed site driveway location. The results of the review indicate that the adjacent signalized intersection at Northwind Drive was observed to meter traffic along Grand River Avenue (M-43) and create gaps in traffic to allow adequate ingress/egress operations, without impacting the adjacent driveway operations on Grand River Avenue (M-43).

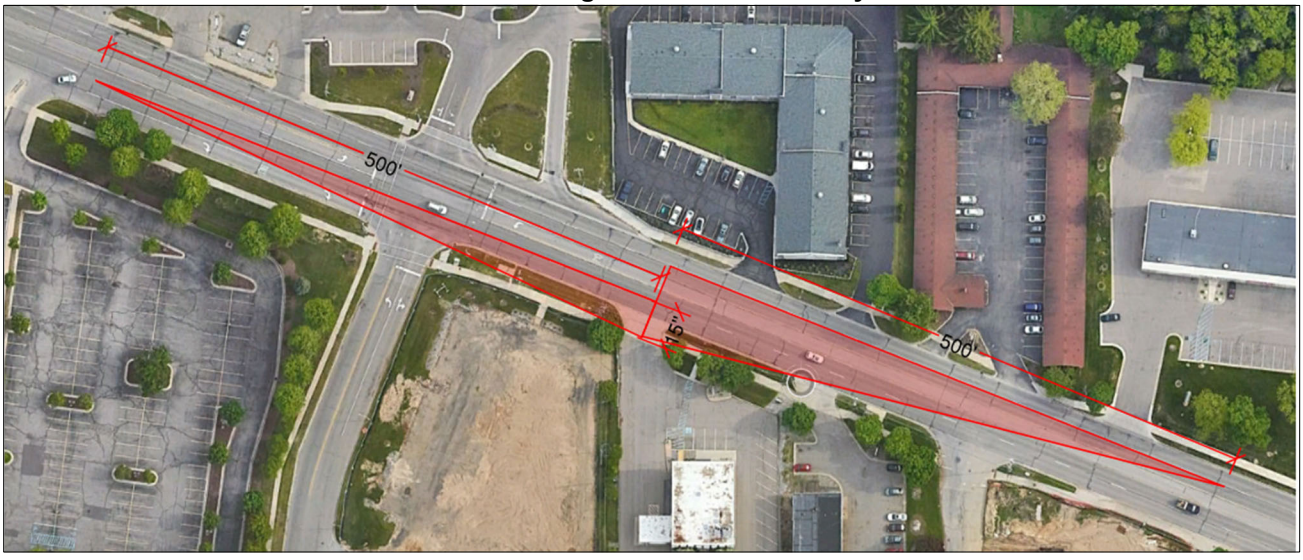
Exhibit 1: Access Spacing



8.2 Intersection Sight Distance

An evaluation was performed reviewing the sight distance at the proposed Site Drive along Grand River Avenue (M-43), based on the AASHTO intersection sight distance guidelines for a posted speed limit of 45-mph. The results of the sight distance evaluation are shown on **Exhibit 2**. Review of the sight distance to the east and west of the project site, along Grand River Avenue (M-43), indicates that there is adequate intersection sight distance at the proposed site driveway location, assuming the shoulder ROW area remains clear of any vegetation and/or obstructions.

Exhibit 2: Sight Distance Summary



8.3 AUXILIARY TURN LANE EVALUATION

There is an existing center two-way left-turn lane (TWLTL) on Grand River Avenue (M-43) adjacent to the project site; therefore, only the right-turn treatment criteria was evaluated. MDOT warranting criteria was utilized in order to determine the need for an auxiliary right-turn deceleration lane at the proposed Site Drive on Grand River Avenue (M-43). The results of the analysis are shown on the attached MDOT auxiliary lane charts and summarized in **Table 7**.

Table 7: Auxiliary Right-Turn Lane Analysis

Intersection	Right-turn Treatment			Recommendation
	AM Peak	MD Peak	PM Peak	
Grand River Avenue (M-43) & Site Drive	Right-Turn Taper	Right-Turn Taper	Right-Turn Taper	**Right-Turn Taper**

The results of the analysis indicates that right-turn taper is warranted on Grand River Avenue (M-43) at the proposed Site Drive location. However, review of the study area indicates that right-turn deceleration tapers are not provided for the adjacent commercial properties along Grand River Avenue (M-43); therefore, an auxiliary right-turn taper may not be desirable along this section of roadway. Additionally, the construction of a deceleration taper is not feasible for the project site, due to constructability issues.

9 SITE CIRCULATION

The projected drive-through vehicle queuing was reviewed to determine if the proposed on-site drive-through storage is adequate to accommodate the projected operations. Typical coffee-shop restaurants with drive-throughs have an average service rate of approximately 80 vehicles/hour; additionally, it was assumed during the AM peak hour that approximately 80% of customers will utilize the drive-through. Therefore, from the total of 112 vehicles generated by the coffee shop during the AM peak hour, it is estimated that approximately 90 vehicles will use the drive-through facility during the AM peak hour, with the remaining 22 vehicles utilizing the walk-in services. The evaluation of the queue length included two criteria:

1) A queuing analysis was performed to determine if the projected demand of the site exceeds the service rate and calculate the projected queuing. The projected demand (90 veh/hr) is greater than the service rate (80 veh/hr) of the site; therefore, there is a potential for vehicles to queue past the pickup window, as the demand exceeds the capacity.

2) A Poisson Distribution was performed to determine the probability of random arrivals; the results indicate a maximum potential of five (5) vehicles arriving at any given time.

The queueing analysis shows that ten (10) spaces between the pick-up window and order board and five (5) spaces past the order board for a total 15 queueing spaces are recommended for this site. The projected vehicle queueing is summarized in **Table 8**.

The proposed drive-through provides vehicle queueing storage, at 20-ft per each vehicle, for nine (9) vehicles adjacent to the building within the drive-through lane and an additional six (6) vehicles adjacent to the west side of the property, for a total queue length of 300 feet (15 veh) on site. Therefore, the proposed vehicle queueing storage for this project site is expected to accommodate the projected vehicle queue lengths for the proposed development.

Table 8: Vehicle Queuing Analysis

DRIVE-THROUGH STACKING SPACE CALCULATOR	
Number of Arrivals	90
Time per Vehicle (s)	45
Service Rate (veh/hr)	80
Drive-Through Queue (veh)	10
Peak Arrival (veh)	5
Vehicle Length	20
TOTAL QUEUE (ft)	**300**

10 PARKING ANALYSIS

The proposed development plan for the site was evaluated to determine the recommended number of parking spaces for the commercial use proposed for the site. The Meridian Township parking ordinances was utilized for this analysis. The results of this analysis are summarized in **Table 9** and indicates that the proposed parking supply meets the Township ordinance requirements for this site.

Table 9: Peak Hour Parking Analysis Summary

Land Use	Independent Variable	Unit	Meridian Township Zoning Ordinance		Proposed Parking Supply
			Parking Requirements	Parking Required (spaces)	
Coffee Shop with Drive-Through	5	Employee	1 Veh Space / Employee	5	5
	50	Seats	1 Veh Space / 3 Seats	17	17
	22	Veh Space	1 Bike Space / 10 Veh Space	2 Bike	2 Bike
	2	Bike Space	1 Veh Space Reduced / 2 Bike Space	-1	0
			Peak Parking Demand	**21**	**22**
			Projected Parking Surplus	**1**	**0**
			Total Parking Percent Occupancy	*95%*	*100%*

11 CONCLUSIONS

The conclusions of this TIS are as follows:

1. **Existing (2023) Conditions**

   - The results of the existing conditions analysis indicates that all approaches and movements at the study intersection are currently operating acceptably, at LOS D or better the AM, MD, and PM peak periods, with the exception of the following:
     - Grand River Avenue (M-43) & Dawn Avenue / Apartment Drive: The northbound and southbound (apartment drive) approaches are currently operating at LOS E during the PM and MD peak hours, respectively.

   Although Synchro LOS analysis indicates poor operations, review of SimTraffic network simulations indicates acceptable operations during all the peak periods. The 95th percentile queue length reported was approximately 55-feet (2-3 vehicles) or less, which is not significant. Additionally, vehicles were observed to find adequate gaps within the through traffic along Grand River Avenue (M-43), without experiencing significant delays or excessive vehicle queueing.

2. **Background (2024) Conditions**

   - A **1.0%** annual background growth rate was utilized to project the existing 2023 traffic volumes to the buildout year of 2024. Additionally, the following background developments were identified within the vicinity of the project site and were included as background traffic:
     - Specialty Grocery Store-5030 Northwind Drive
     - Consumers Credit Union-2763 E. Grand River Avenue.
   - The results of the background conditions analysis indicates that all approaches and movements at the study intersections will continue to operate in an acceptable manner, similar to the existing conditions analysis, with additional delays along the northbound Dawn Avenue approach. However, the projected increase in vehicle queue lengths will be less than one (1) vehicle, which is not significant.

3. **Future (2024) Conditions**

   - Results of the future conditions analysis indicate that all study intersection approaches and movements will continue to operate acceptably, in a manner similar to the background conditions analysis. Minor additional delays are anticipated at the intersection of Grand River Avenue (M-43) & Dawn Avenue / Apartment Drive; however, the 95th percentile queue length reported was approximately 60-feet (2-3 vehicles) or less during all peak periods, which is not significant. Additionally, results of the future conditions analysis indicates that the proposed site driveway will operate acceptably, at LOS D or better during all peak periods.
   - Review of SimTraffic network simulations indicates acceptable operations throughout the study roadway network, similar to those observed during background conditions. Occasional periods of vehicle queues were observed; however, these vehicle queues were observed to dissipate and were not present throughout the peak periods.

4. **Access Management**

   - Results of the analysis indicate that the proposed Site Drive is not expected to meet the desirable corner clearance from Northwind Drive, nor the driveway spacing criteria for the nearby Clarion and Tuffy Tire driveways. Key findings of this review include:
     - There is limited property frontage (~150-feet) along Grand River Avenue (M-43); therefore, the proposed site driveway will be located where the existing curb cut is already present, as it is not possible to meet the recommended spacing criteria within the available site property.
     - The applicant is unable to obtain shared access with the adjacent land uses at this time to consider driveway consolidation.
     - The SimTraffic network simulations show that the adjacent signalized intersection of Grand River Avenue (M-43) & Northwind Drive / Whole Foods Driveway was observed to meter traffic

and create gaps in traffic to allow ingress/egress operations without impacting the adjacent driveway operations on Grand River Avenue (M-43).

- Review of the sight distance to the east and west of the project site, along Grand River Avenue (M-43), indicates that there is adequate intersection sight distance at the proposed site driveway location, assuming the shoulder ROW area remains clear of any vegetation and/or obstructions.
- The MDOT auxiliary right-turn lane criteria were evaluated at Grand River Avenue (M-43) & Site Drive. Results of the analysis indicate that a right-turn deceleration taper is warranted on Grand River Avenue (M-43) at the proposed Site Drive.
    - However, review of the study area indicates that right-turn tapers are not provided for the adjacent commercial properties along Grand River Avenue (M-43); therefore, an auxiliary right-turn taper may not be desirable along this section of roadway. Additionally, the construction of a right-turn deceleration taper is not feasible for the project site, due to constructability issues.

5. Site Circulation

- The proposed drive-through provides vehicle queueing storage for nine (9) vehicles adjacent to the building within the drive-through lane and an additional six (6) vehicles adjacent to the west side of the property, for a total queue length of 300 feet (15 veh) on site. Therefore, the proposed vehicle queueing storage for this project site is expected to accommodate the projected vehicle queue lengths for the proposed development.

6. Parking Analysis

- The proposed parking supply for this site meets the Meridian Township Ordinance requirements.

Any questions related to this memorandum, study, analysis, and results should be addressed to Fleis & VandenBrink.

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Michigan.

Attachments: Figures 1-6
Proposed Site Plan
Traffic Volume Data
Signal Timing Permit
US Census Data
Background TripGen
Synchro / SimTraffic
Auxiliary Right-Turn Warrant

FIGURE 1

SITE LOCATION

2731 GRAND RIVER TIS - MERIDIAN TOWNSHIP, MI

LEGEND

SITE SITE LOCATION

NORTH

SCALE: NOT TO SCALE

To: **Planning Commission**

From: **Brian Shorkey, Senior Planner**

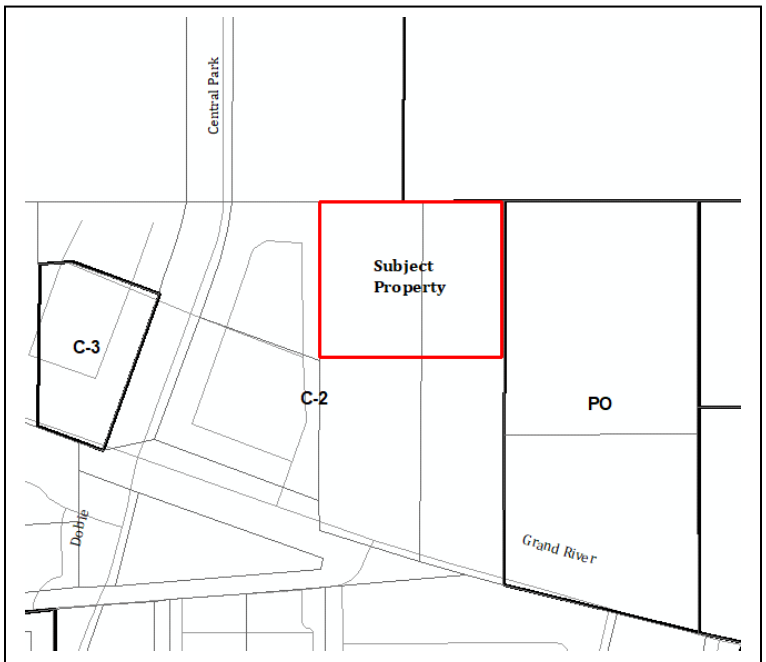
Date: **January 22, 2024**

Re: **<u>Special Use Permit #24002 (The W. Investment Holdings)</u>, to construct a storage facility greater than 25,000 square feet at 1614 West Grand River.**

W. Investment Holdings (Applicant) has submitted a Special Use Permit (SUP) application for the construction of a climate controlled self-storage facility, proposed to be three stories tall, 127,500 square feet, and consisting of 977 units. The location is 1614 West Grand River Avenue (Subject Property) and is the first phase of a multiuse development that will include a marijuana facility that was approved in 2023 (SUP #23-012). A third building is proposed, which will be reviewed in the future.

The entire site is made up of three parcels, located at 1614 and 1622 West Grand River, as well as a northern parcel that fronts on Central Park Drive. The three parcels will have to have their lines redrawn to accommodate the storage facility. The entire site is approximately 8.7 acres in size. There is a third proposed building shown on the site plan (Building A) that is not part of this application and will require separate approvals in the future.

Two separate SUP approvals are required for this application. First, the Planning Commission must approve the SUP for a climate controlled self-storage facility in the C-2 district. Second, the Township Board must approve an SUP for a building greater than 25,000 square feet in size after receiving a recommendation from the Planning Commission.



ZONING MAP

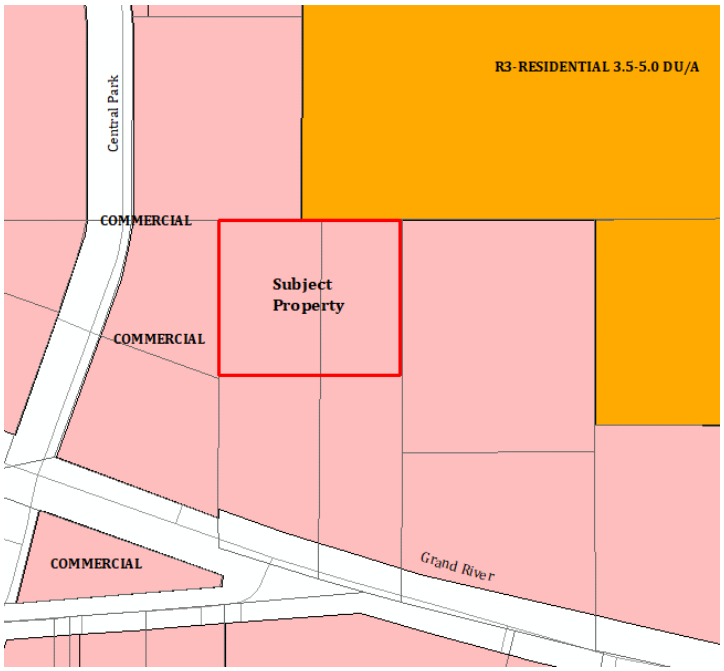
Zoning and Future Land Use

The proposed project is located in the C-2 – Commercial zoning district. A climate controlled indoor storage facility is permitted subject to approval of a special use permit reviewed by the Planning Commission. A separate SUP must also be approved by the Township Board since it is over 25,000 square feet in size.

The property immediately adjacent to the west is similarly zoned C-2 and developed as a mix of commercial uses. The C-2 zoning extends to the remaining part of the property to the south, as well as to the northwest. The property to the north and northeast is zoned as RD and was recently approved as the Grand Reserve residential development in 2022. The property to the east is zoned PO – Professional Office and has been developed as the Sparrow Medical Building.

The C-2 district requires a minimum of 100 feet of lot frontage and 4,000 square feet of lot area. The storage building has a required setback from any residential zoned area of 200 feet. Buildings in the C-2 zoning are limited to 35 feet in height. The proposed storage facility meets most of these requirements but will require a 50-foot variance for the residential setback prior to site plan approval.

The 2017 Master Plan Future Land Use map designates the subject site as Commercial. This designation applies to the properties adjacent to the west, south, and east. The property to the north is shown as R3 – Single-Family Residential and is part of the Grand Reserve project that was approved by the Township in 2022.



FUTURE LAND USE MAP

Staff Analysis
The site is currently undeveloped. The site was previously occupied by a single-family house that was demolished in early 2019.

Applications for special land use permits are reviewed under Sec. 86-126 in the Zoning Ordinance. Based on that review, Staff has the following comments:

1. Municipal water and sanitary sewer are available in the vicinity to serve the subject site. The location and capacity of utilities will be reviewed in detail during site plan review if the special use permit is approved, although there are no indications that the current system cannot handle the proposed storage facility.
2. The original traffic study was reevaluated by the Applicant's traffic engineer and found to still be valid, as shown in the attached traffic study. The traffic study indicated that the existing roads are capable of handling the expected traffic, although it did suggest an optimization of traffic signal timing at the intersection of Grand River Avenue and Central Park Drive. This will be reviewed by the Michigan Department of Transportation (MDOT) during the site plan review phase.

3. The applicant is proposing to close an existing driveway and create a new driveway along Grand River Avenue to access the site. In accordance with MDOT, the Township has developed access management criteria for use in evaluating proposed access driveways along Grand River Avenue. The access management criteria for the proposed driveway are summarized in the study provided by the applicant's traffic consultant. Based on the study, the traffic consultant noted that waivers for the spacing between adjacent driveways will be required to facilitate the development of the proposed provisioning center. This criteria will be reviewed during the site plan review process and all curb cuts on Grand River are subject to MDOT review and approval.
4. The Flood Insurance Rate Map (FIRM) for Meridian Township indicates the property is not located in a floodplain. The Township Greenspace Plan shows no special designation on the site.
5. There are two wetlands located on the Subject Property. Both wetlands are located within 30 feet of a 2-acre pond and are therefore regulated by the State of Michigan and Meridian Township. Based on the submitted plans, the Applicant is not proposing any impacts to the wetlands and the 20-foot wetland buffer is being observed.
6. If the SUP for the self-storage facility is approved by the Planning Commission, and the size of the self-storage facility is approved by the Board, the next step will be site plan approval, which is an administrative process. The site plan will be required to be approved by MDOT, as well as the IDCD office.

Based on the information provided by the Applicant, Staff has identified wetlands, traffic, and access management as potential concerns while reviewing the proposed Special Use Permit. The attached site drawings show that the Applicant is aware of the wetlands and is working around them in accordance with the Township's wetland ordinances. The traffic study and the proposed driveway relocation will be reviewed in detail during the site plan review phase. In addition, final site plan approval will depend on the approval of the 50-foot variance from the northern residential district, as well as MDOT acceptance of the proposed driveway location.

If Special Use Permits are approved by the Planning Commission and the Township Board, the applicant will be required to submit for Site Plan Review and building permits before work on the project can begin. Site Plan Review is a detailed staff-level analysis of the project which includes reviews of storm water, utilities, landscaping, grading, and other issues to ensure compliance with all applicable ordinances as well as confirmation of approvals from local agencies such as the Ingham County Drain Commissioner's Office, the Ingham County Road Department, and in this case, MDOT.

Planning Commission Options
The Planning Commission has the option to approve, approve with conditions, or deny Special Use Permit #24002. A resolution will be provided at a future meeting.

Attachments
1. SUP permit application with attachments, dated March 23, 2023 and received by the Township on April 28, 2023.

2. Site concept drawing, prepared by NF Engineers, dated September 18, 2023 and received by the Township on December 18, 2023.
3. Natural Features Assessment, prepared by NF Engineers, dated November 21, 2023 and received by the Township on December 18, 2023.
4. Traffic Impact Study – Cover Memo, prepared by Fleis & Vandenbrink Engineering, Inc., dated December 12, 2023, and received by the Township on December 18, 2023.
5. Original Traffic Study – Executive Summary, prepared by Fleis & Vandenbrink Engineering, Inc., dated January 21, 2020, and received by the Township on March 24, 2023.

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 Okemos Gateway LLC
Address of Applicant 2980 Northwestern Hwy., Suite 100, Southfield, MI 48034
Telephone - Work 248-559-5555 Home _____ Fax _____ Email _____
Interest in property (circle one): x Owner Tenant Option Other
(Please attach a list of all persons with an ownership interest in the property.)

B. Site address / location / parcel number Central Park, 1622 W Grand River and 1614 W Grand River
Legal description (please attach if necessary) See included plans
Current zoning C2
Use for which permit is requested / project name _____
Corresponding ordinance number 86-404

C. Developer (if different than applicant) _____
Address _____
Telephone – Work _____ Home _____ Fax _____

D. Architect, Engineer Planner or Surveyor responsible for design of project if different from applicant:
Name Nowak and Fraus Engineers, Michael D. Peterson, P.E.
Address 46777 Woodward Ave., Pontiac, MI 48342
Telephone – Work 248-332-7931 Home _____ Fax _____

E. Acreage of all parcels in the project: Gross 8.665 Net 8.665 Acres

F. Explain the project and development phases: Retail, Dispensary, and Storage Building

G. Total number of:
Existing: structures____ bedrooms____ offices____ parking spaces____ carports ___ garages____
Proposed: structures____ bedrooms____ offices____ parking spaces____ carports ___ garages____

H. Square footage: existing buildings____ proposed buildings 127,500 S.F., 7,254 S.F. and 3,996 S.F.
Usable Floor area: existing buildings____ proposed buildings____

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 _____ Acreage _____
Proposed Recreation: Type _____ Acreage _____
Existing Open Space: Type _____ Acreage _____
Proposed Open Space: Type _____ Acreage _____

K. If Multiple Housing:

Total acres of property _____

Acres in floodplain _____ Percent of total _____

Acres in wetland (not in floodplain) _____ Percent of total _____

Total dwelling units _____

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 _____	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.

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.

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

Signature of Applicant

12/12/23
Date

Ammar Alkhafaji
Type/Print Name

Fee: _____

Received by/Date: _____

Special Use Permit Application Attachment
Site Plan Requirements Per Section 86-124(c)(4)

A site plan, drawn to a legible scale, containing the following information where applicable:

a. Boundaries of the subject property.

b. Total area of the subject property.

c. Location of all existing and proposed structures.

d. Approximate location and distance of all structures within 100 feet of the subject property.

e. Uses of existing and proposed buildings, on the subject site.

f. Proposed means of vehicular and pedestrian ingress and egress to the subject property.

g. Public and private roads and streets, rights-of-way, and easements, indicating names and widths, which abut or cross the site.

h. Existing and proposed parking spaces, and vehicular and pedestrian circulation patterns.

i. The buildable area of the subject property indicating all required setbacks, yards and open space.

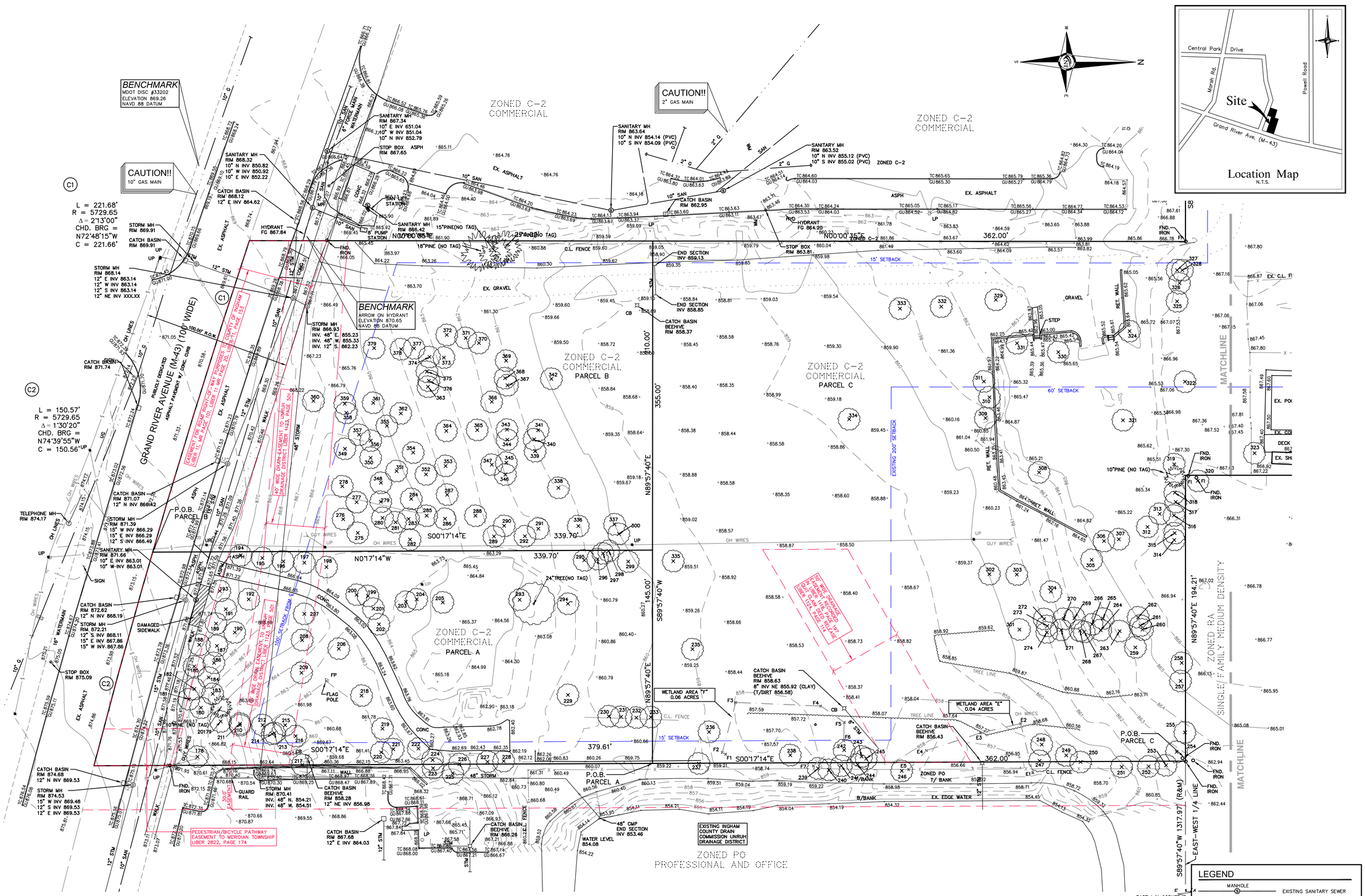
j. Zoning classification of the subject and adjacent properties.

k. Existing and proposed fencing, screening, landscaping, and buffers.

l. Location and sizes of existing utilities including power lines and towers, both above and below the ground.

m. Amount and location of all impervious surfaces.

n. The verified boundaries of all natural water features and required setback lines.



TOPOGRAPHIC SURVEY NOTES

ALL ELEVATIONS ARE EXISTING ELEVATIONS, UNLESS OTHERWISE NOTED.

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LEGEND

- MANHOLE — EXISTING SANITARY SEWER
- HYDRANT — EXISTING SAN. CLEAN OUT
- GATE VALVE — EXISTING WATER MAIN
- MANHOLE / CATCH BASIN — EXISTING STORM SEWER
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- SIGN — EXISTING GAS MAIN

NF ENGINEERS
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LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL

STATE OF MICHIGAN — JEFFREY J. HUHTA — PROFESSIONAL SURVEYOR NO. 62458 — LICENSED PROFESSIONAL SURVEYOR

PROJECT
1614 W. Grand River

CLIENT
W Investment Holdings
29580 Northwestern Hwy.
Suite 100.
Southfield, MI 48034

Contact:
Ammar W. Alkhafaji
Phone: (248) 559-5555

PROJECT LOCATION
No. 1614 & 1622
W. Grand River Ave.
Part of the NE. 1/4 of
Section 22, T4N., R.1W.,
Township of Meridian,
Ingham County, MI

SHEET
Boundary / Topographic / Tree Survey - South

811 Know what's below Call before you dig.

REVISIONS
10-19-2017 – ISSUED FOR CLIENT REVIEW
03-05-2018 – ISSUED FOR CLIENT REVIEW
05-01-2020 – REMOVE DEMOLISHED AREA AND ADD 48" STORM
09-18-2023 PARCEL BOUNDARY UPDATE

DRAWN BY:
C. Ellison /N. Naoum

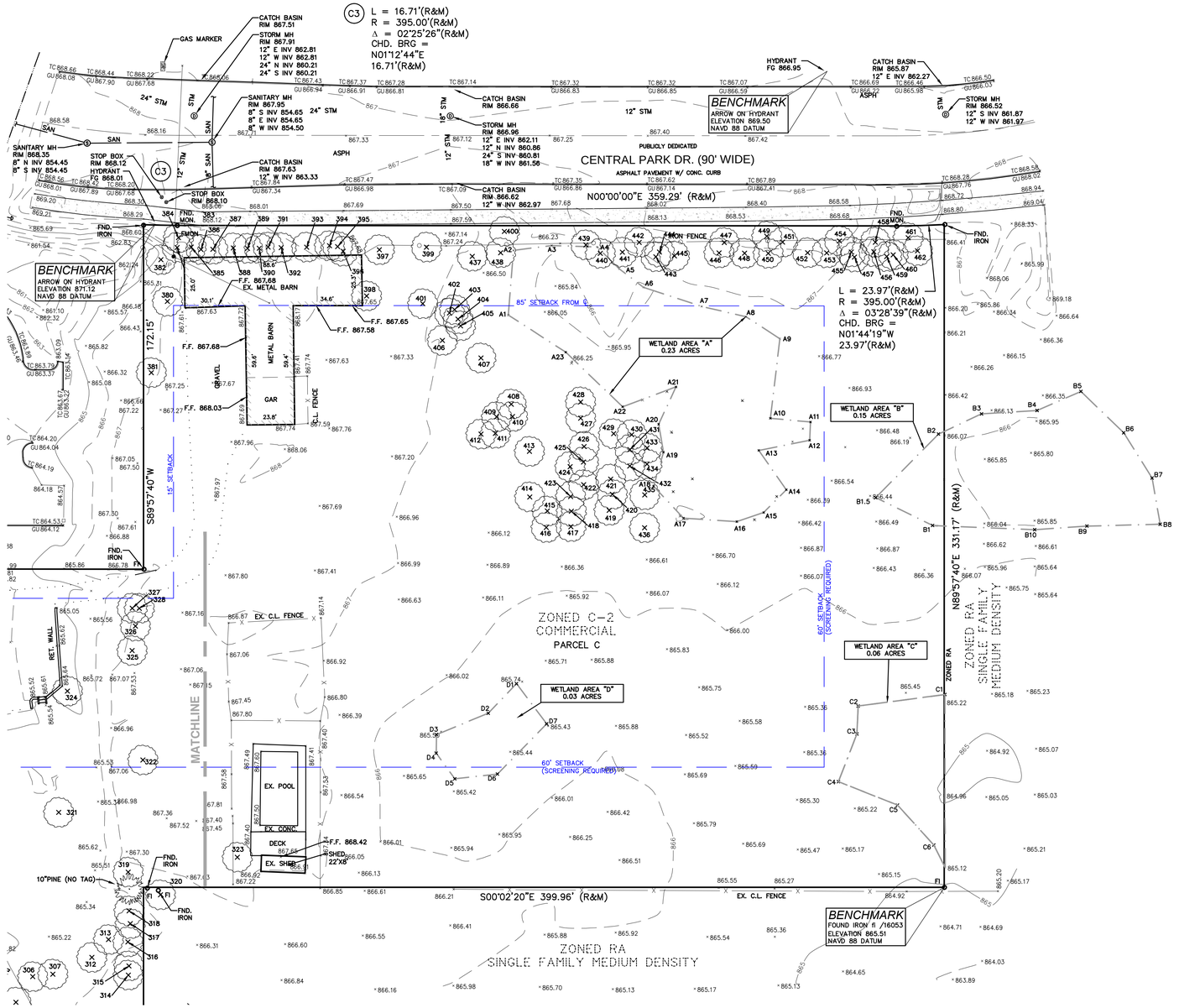
DESIGNED BY:

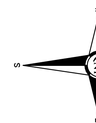
APPROVED BY:
J. Huhta

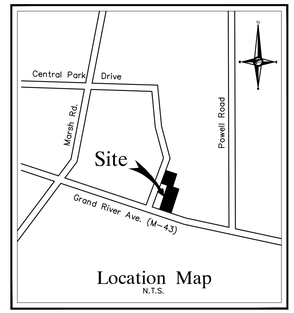
DATE:
March 5, 2018

SCALE: 1" = 30'
30 15 0 15 30 45

NFE JOB NO. J987-03
SHEET NO. C1







LEGAL DESCRIPTIONS:

PARCEL A

PART OF THE NE. 1/4 OF SECTION 22, T.4N., R.1W., MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE EAST 1/4 CORNER OF SAID SECTION 22; THENCE S. 89°57'40" W., 1317.97 FEET ALONG THE EAST–WEST 1/4 LINE OF SAID SECTION 22; THENCE S. 00° 17' 14" E., 362.00 FEET TO THE POINT OF BEGINNING; THENCE S. 00° 17' 14" E., 379.61 FEET; THENCE ALONG THE CENTER OF GRAND RIVER (100.00 FEET WIDE) 150.57 FEET ALONG AN ARC OF A CURVE TO THE RIGHT, (RADIUS 5729.65 FEET, CENTRAL ANGLE 01°30'20", CHORD BEARS N. 74° 39' 55" W., 150.56 FEET); THENCE N. 00° 17' 14" W., 339.70 FEET; THENCE N89° 57' 40"E., 145.00 FEET TO THE POINT OF BEGINNING. CONTAINING 52,199 SQUARE FEET OR 1.198 ACRES. AND SUBJECT TO EASEMENTS OF RECORD.

ADDRESS: 1614 GRAND RIVER AVE, OKEMOS, MI 48864

PARCEL NO. 22–426–001

PARCEL B

PART OF THE NE. 1/4 OF SECTION 22, T.4N., R.1W., MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE EAST 1/4 CORNER OF SAID SECTION 22; THENCE S. 89°57'40" W., 1317.97 FEET ALONG THE EAST–WEST 1/4 LINE OF SAID SECTION 22; THENCE S. 00° 17' 14" E., 741.61 FEET; THENCE ALONG THE CENTER OF GRAND RIVER (100.00 FEET WIDE) 150.57 FEET ALONG AN ARC OF A CURVE TO THE RIGHT, (RADIUS 5729.65 FEET, CENTRAL ANGLE 01°30'20", CHORD BEARS N. 74° 39' 55" W., 150.56 FEET) TO THE POINT OF BEGINNING; THENCE 221.68 FEET ALONG AN ARC OF A CURVE TO THE RIGHT, (RADIUS 5729.65 FEET, CENTRAL ANGLE 02°13'00", CHORD BEARS N. 72° 48' 15" W., 221.66 FEET); THENCE N. 00° 00' 35" E., 274.02 FEET; THENCE N. 89° 57' 40" E., 210.00 FEET; THENCE S. 00° 17' 14" E., 339.70 FEET TO THE POINT OF BEGINNING. CONTAINING 64,841 SQUARE FEET OR 1.489 ACRES. AND SUBJECT TO EASEMENTS OF RECORD.

ADDRESS: 1622 GRAND RIVER AVE, OKEMOS, MI 48864

PARCEL NO. 22–401–003

PARCEL C

PART OF THE NE. 1/4 OF SECTION 22, T.4N., R.1W., MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE EAST 1/4 CORNER OF SAID SECTION 22; THENCE S. 89°57'40" W., 1317.97 FEET ALONG THE EAST–WEST 1/4 LINE OF SAID SECTION 22 TO THE POINT OF BEGINNING; THENCE S. 00° 17' 14" E., 362.00 FEET; THENCE S. 89° 57' 40" W., 355.00 FEET; THENCE N. 00° 00' 35" E., 362.00 FEET; THENCE S. 89° 57' 40" W., 172.15 FEET; THENCE 16.71 FEET ALONG AN ARC OF A CURVE TO THE LEFT, (RADIUS 395.00 FEET, CENTRAL ANGLE 02°25'26", CHORD BEARS N. 01° 12' 44" E., 16.71 FEET; THENCE N. 00° 00' 00" W., 359.29 FEET; THENCE 23.97 FEET ALONG AN ARC TO THE LEFT, (RADIUS 395.00 FEET, CENTRAL ANGLE 03°28'39", CHORD BEARS N. 01° 44' 19" W., 23.97 FEET; N. 89° 57' 40" E., 331.17 FEET; THENCE S. 00° 02' 20" E., 399.96 FEET; THENCE N. 89° 57' 40" E., 194.21 FEET TO THE POINT OF BEGINNING. CONTAINING 260,397 SQUARE FEET OR 5.978 ACRES. AND SUBJECT TO EASEMENTS OF RECORD.

ADDRESS: CENTRAL PARK DRIVE

PARCEL NO.: 22–252–003

BASIS OF BEARING NOTE
The basis of bearing for this survey was established by the East–West 1/4 line of Section 22 as described in the recorded legal description. Record Bearing: S.89°57'40"W.

FLOOD HAZARD NOTE
The Property described on this survey does not lie within a Special Flood Hazard Area as defined by the Federal Emergency Management Agency Flood Insurance Rate Map identified as Map No. 26065C0158D bearing an effective date of August 16, 2011.

SITE DATA
Gross Land Area: Parcel A: 52,199 S.F. or 1.198 Acres
Parcel B: 64,841 S.F. or 1.489 Acres
Parcel C: 260,397 S.F. or 5.978 Acres

Zoned: C–2 (Commercial District) Section 86–404

C–2 Building Setbacks:

Front= 100' from centerline of W. Grand River Avenue
Side and rear setback adjacent to a residential district. No building, parking, access drive, or other structure shall be less than 100 feet from a residential district line, except a sixty–foot setback shall be required if screening that incorporates a double row of interlocking trees, primarily evergreens, or the equivalent in addition to general screening standards.

Required Storage Building setback from residential: 200'

Proposed: Rear of building 150' with double row of interlocking trees.

Max. Building Height permitted: 2.5 stories/35'

The above setback & height requirements were obtained from the Meridian Township Zoning Ordinance.

MISS DIG / UTILITY DISCLAIMER NOTE

A MISS DIG TICKET NUMBER A72300077–00A, PURSUANT TO MICHIGAN PUBLIC ACT 174 WAS ENTERED FOR THE SURVEYED PROPERTY. DUE TO THE EXTENDED REPORTING PERIOD FOR UNDERGROUND FACILITY OWNERS TO PROVIDE THEIR RECORDS, THE SURVEY MAY NOT REFLECT ALL THE UTILITIES AT THE TIME THE SURVEY WAS ISSUED ON SEPTEMBER 20, 2017. THE SURVEY ONLY REFLECTS THOSE UTILITIES WHICH COULD BE OBSERVED BY THE SURVEYOR IN THE FIELD OR AS DEPICTED BY THE UTILITY COMPANY RECORDS FURNISH PRIOR TO THE DATE THIS SURVEY WAS ISSUED. THE CLIENT AND/OR THEIR AUTHORIZED AGENT SHALL VERIFY WITH THE FACILITY OWNERS AND/OR THEIR AUTHORIZED AGENTS, THE COMPLETENESS AND EXACTNESS OF THE UTILITIES LOCATION.

TOPOGRAPHIC SURVEY NOTES

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Boundary / Topographic / Tree Survey - North

811 Know what's below Call before you dig.

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05–01–2020 – REMOVE DEMOLISHED AREA AND ADD 48" STORM
09–18–2023 PARCEL BOUNDARY UPDATE

DRAWN BY: C. Ellison / N. Naoum
DESIGNED BY:
APPROVED BY: J. Huhta
DATE: March 5, 2018
SCALE: 1" = 30'
30 15 0 15 30 45

NFE JOB NO. J987-03
SHEET NO. C2

Tree Inventory List

Job Number: J987 TS
Job Location: 1614 West Grand River, Meridian Twp., Okemos
Client: LaFontaine

Condition Description Notes:
"Good" - no observed structural defects*
"Fair" - minor structural defects, marginal form, some insect activity noted*
"Poor" - major structural defects, poor form, insect infested*

**Structural defects may include decayed wood, cracks, root problems, weak branch unions cankers, poor tree architecture, dead/failed branches due to various causes.*

Tree #	Botanical Name	Common Name	Dia.	Type	Other Dia.	Condition	Comments
178	Malus spp.	Crabapple spp.	9	Twin	8	Good	
179	Pinus nigra	Austrian Pine	14			Dead	
180	Pinus sylvestris	Scotch Pine	12			Poor	Insect damage, extensive crown deadwood
181	Picea pungens	Colorado Blue Spruce	10			Poor	90% dead
182	Picea pungens	Colorado Blue Spruce	18			Poor	Unidentified needle disease
183	Picea pungens	Colorado Blue Spruce	13			Poor	Unidentified needle disease
184	Picea pungens	Colorado Blue Spruce	10			Poor	Unidentified needle disease
185	Pinus sylvestris	Scotch Pine	22			Fair	Trunk has been girdled by old fencing
186	Picea pungens	Colorado Blue Spruce	14			Fair	Unidentified needle disease
187	Picea pungens	Colorado Blue Spruce	9			Fair	Unidentified needle disease
188	Pinus sylvestris	Scotch Pine	14			Good	
189	Acer saccharum	Sugar Maple	15			Poor	40% dead
190	Pinus sylvestris	Scotch Pine	12			Good	
191	Picea pungens	Colorado Blue Spruce	8			Good	
192	Acer platanoides	Norway Maple	13			Fair	Delining, low vigor, small branch deadwood
193	Picea pungens	Colorado Blue Spruce	15			Fair	Unidentified needle disease
194	Pinus sylvestris	Scotch Pine	16			Fair	Unidentified needle disease
195	Picea pungens	Colorado Blue Spruce	22			Fair	Unidentified needle disease
196	Acer platanoides	Norway Maple	13			Good	
197	Acer platanoides	Norway Maple	19			Good	
198	Acer platanoides	Norway Maple	9			Good	
199	Pinus strobus	Eastern White Pine	17			Good	
200	Pinus strobus	Eastern White Pine	15			Dead	
201	Pinus strobus	Eastern White Pine	16			Good	
202	Pinus resinosa	Red Pine	18			Good	
203	Pinus strobus	Eastern White Pine	18			Good	
204	Pinus strobus	Eastern White Pine	26			Good	
205	Pinus strobus	Eastern White Pine	24			Poor	Trunk hollow detected
206	Acer platanoides	Norway Maple	21			Fair	Small basal trunk injury, wood exposed, some decay
207	Acer platanoides	Norway Maple	14			Good	
208	Juglans nigra	Black Walnut	22			Good	
209	Juglans nigra	Black Walnut	20			Good	
210	Acer negundo	Boxelder	15			Poor	Excesive trunk lean
211	Picea glauca	White Spruce	8			Poor	Unidentified needle disease
212	Pinus sylvestris	Scotch Pine	14			Fair	Being choked by grape vines
213	Pinus sylvestris	Scotch Pine	15			Poor	Being choked by vines
214	Pinus sylvestris	Scotch Pine	14			Fair	Being choked by vines
215	Pinus sylvestris	Scotch Pine	9			Dead	
216	Pinus sylvestris	Scotch Pine	8			Dead	
217	Ulmus americana	American Elm	10			Good	
218	Pinus sylvestris	Scotch Pine	15			Dead	
219	Acer saccharum	Sugar Maple	14			Fair	Basal trunk injury, wood exposed, some deadwood
220	Platanus occidentalis	Sycamore	26			Good	
221	Acer platanoides	Norway Maple	14			Good	
222	Betula populifolia	Gray Birch	13	Multiple	12, 11	Good	
223	Morus alba	White Mulberry	10			Good	
224	Ulmus americana	American Elm	17			Good	
225	Juglans nigra	Black Walnut	10			Good	
226	Juniperus virginiana	Eastern Red-cedar	8			Good	
227	Juniperus virginiana	Eastern Red-cedar	8			Good	
228	Juniperus virginiana	Eastern Red-cedar	8			Good	
229	Acer platanoides	Norway Maple	26			Poor	Extensive trunk decay
230	Acer platanoides	Norway Maple	15			Good	
231	Acer saccharinum	Silver Maple	30	Twin	8	Good	
232	Acer saccharinum	Silver Maple	30	Multiple	28, 10	Fair	Weak trunk union with included bark, decay suspected
233	Acer saccharinum	Silver Maple	30			Fair	Unbalanced crown, large bow in trunk
234	Acer platanoides	Norway Maple	20	Twin	17	Poor	Basal trunk decay
235	Malus spp.	Crabapple spp.	10	Multiple	6, 4	Good	
236	Salix spp.	Willow spp.	48	Twin	36	Poor	Poor structure
237	Morus alba	White Mulberry	8			Fair	
238	Acer negundo	Boxelder	26			Fair	Limb deadwood, weak branch attachments
239	Acer negundo	Boxelder	8			Poor	Excesive trunk lean
240	Acer negundo	Boxelder	9			Poor	Leaning & growing into cyclone fence
241	Acer negundo	Boxelder	18	Twin	15	Poor	Excesive trunk lean
242	Acer negundo	Boxelder	15			Poor	Excesive trunk lean
243	Picea abies	Norway Spruce	30			Good	
244	Acer negundo	Boxelder	10			Poor	Trunk decay, growing into fence, poor structure
245	Prunus avium	Sweet Black Cherry	9			Good	
246	Celtis occidentalis	Northern Hackberry	17			Good	
247	Rhamnus cathartica	Common Buckthorn	10			Fair	Poor structure, being choked by vines
248	Acer negundo	Boxelder	15			Fair	
249	Juglans nigra	Black Walnut	9			Good	
250	Acer negundo	Boxelder	9			Poor	Basal trunk decay, leaning, poor structure
251	Morus alba	White Mulberry	8	Twin	6	Poor	Weak trunk union, slime flux
252	Acer platanoides	Norway Maple	18			Good	
253	Acer platanoides	Norway Maple	20			Good	
254	Prunus serotina	Black Cherry	9			Good	
255	Prunus serotina	Black Cherry	28			Good	
256	Prunus avium	Sweet Black Cherry	11			Good	
257	Acer platanoides	Norway Maple	13			Good	
258	Acer platanoides	Norway Maple	15			Good	
259	Abies concolor	White Fir	16			Good	
260	Morus alba	White Mulberry	14			Poor	Basal trunk decay, 50% of tree is missing
261	Abies concolor	White Fir	18			Good	
262	Picea pungens	Colorado Blue Spruce	26			Good	
263	Abies concolor	White Fir	12			Good	
264	Pinus sylvestris	Scotch Pine	28	Twin	24	Good	
265	Abies concolor	White Fir	8			Good	
266	Abies concolor	White Fir	14			Good	
267	Abies concolor	White Fir	9			Good	
268	Pinus sylvestris	Scotch Pine	16	Multiple	13, 10	Poor	Insect damage, crown deadwood
269	Abies concolor	White Fir	14			Good	
270	Abies concolor	White Fir	16			Good	
271	Pinus sylvestris	Scotch Pine	18			Poor	90% dead
272	Abies concolor	White Fir	17			Good	
273	Abies concolor	White Fir	9			Good	
274	Pinus sylvestris	Scotch Pine	13			Poor	Limb deadwood, insect damage
275	Pseudotsuga menziesii	Douglas-fir	26			Good	
276	Pseudotsuga menziesii	Douglas-fir	14			Good	
277	Tilia americana	Basswood	8	Twin	6	Good	
278	Picea pungens	Colorado Blue Spruce	18			Good	
279	Acer saccharum	Sugar Maple	9			Good	
280	Malus spp.	Crabapple spp.	12			Fair	
281	Acer platanoides	Norway Maple	12			Good	
282	Gleditsia triacanthos	Honeylocust	20			Good	
283	Gleditsia triacanthos	Honeylocust	14			Good	
284	Acer saccharum	Sugar Maple	16			Good	
285	Ulmus americana	American Elm	14	Twin	9	Good	
286	Acer platanoides	Norway Maple	10			Good	
287	Juglans nigra	Black Walnut	11			Good	
288	Acer platanoides	Norway Maple	11	Multiple	9, 9, 8, 6	Poor	Large in-rolled trunk seam, extensive decay probabable
289	Pseudotsuga menziesii	Douglas-fir	11			Dead	
290	Juniperus virginiana	Eastern Red-cedar	9			Fair	
291	Pseudotsuga menziesii	Douglas-fir	15			Good	
292	Juniperus virginiana	Eastern Red-cedar	9			Good	
293	Acer platanoides	Norway Maple	38			Poor	Some insect damage, basal trunk decay
294	Acer platanoides	Norway Maple	16			Good	
295	Juniperus virginiana	Eastern Red-cedar	9			Dead	
296	Juniperus virginiana	Eastern Red-cedar	9	Twin	8	Fair	
297	Juniperus virginiana	Eastern Red-cedar	14			Fair	
298	Juniperus virginiana	Eastern Red-cedar	15			Fair	
299	Malus spp.	Crabapple spp.	22			Poor	Extensive basal trunk decay
300	Picea pungens	Colorado Blue Spruce	14			Fair	Unidentified needle disease
301	Prunus serotina	Black Cherry	18			Good	
302	Pyrus spp.	Pear	15	Multiple		Good	
303	Pyrus spp.	Pear	15			Good	
304	Malus spp.	Crabapple spp.	8	Multiple		Fair	
305	Malus spp.	Crabapple spp.	9	Multiple		Fair	
306	Pseudotsuga menziesii	Douglas-fir	18			Good	
307	Abies concolor	White Fir	20			Good	
308	Acer saccharum	Sugar Maple	26			Fair	Declining
309	Picea pungens	Colorado Blue Spruce	12			Fair	Unidentified needle disease
310	Malus spp.	Crabapple spp.	15			Fair	
311	Picea pungens	Colorado Blue Spruce	15			Fair	
312	Picea glauca	White Spruce	14			Good	
313	Picea glauca	White Spruce	15			Good	
314	Pseudotsuga menziesii	Douglas-fir	16			Good	
315	Pseudotsuga menziesii	Douglas-fir	15			Good	
316	Pseudotsuga menziesii	Douglas-fir	14			Good	
317	Pseudotsuga menziesii	Douglas-fir	14			Good	
318	Pseudotsuga menziesii	Douglas-fir	16			Good	
319	Pseudotsuga menziesii	Douglas-fir	30			Good	
320	Acer negundo	Boxelder	16			Poor	Poor structure, large bow in strunk
321	Malus spp.	Crabapple spp.	14	Multiple		Fair	
322	Acer saccharinum	Silver Maple	41			Good	
323	Malus spp.	Crabapple spp.	18	Multiple		Fair	
324	Malus spp.	Crabapple spp.	13			Poor	Extensive trunk decay
325	Pinus strobus	Eastern White Pine	34			Fair	Trunk hollow detected
326	Pinus strobus	Eastern White Pine	18			Good	
327	Pinus strobus	Eastern White Pine	15			Good	
328	Pinus strobus	Eastern White Pine	26			Poor	In-rolled trunk seam, extensive basal trunk decay
329	Picea pungens	Colorado Blue Spruce	13			Good	
330	Gleditisia triacanthos	Honeylocust	24			Good	
331	Cercis canadensis	Redbud	16			Poor	Extensive trunk decay
332	Acer saccharum	Sugar Maple	18			Fair	Declining
333	Acer saccharum	Sugar Maple	20			Good	
334	Malus spp.	Crabapple spp.	9	Multiple		Poor	Insect damage, basal trunk decay
335	Acer platanoides	Norway Maple	12			Poor	Limb deadwood, dieback & decay
336	Juniperus virginiana	Eastern Red-cedar	14			Fair	
337	Juniperus virginiana	Eastern Red-cedar	11			Good	
338	Ulmus americana	American Elm	28			Good	
339	Pyrus spp.	Pear	11	Multiple	5, 3	Fair	
340	Pyrus spp.	Pear	10			Poor	Extensive trunk deadwood
341	Pyrus spp.	Pear	12	Twin	5	Fair	
342	Malus spp.	Crabapple spp.	14	Twin	10	Poor	
343	Acer platanoides	Norway Maple	8			Good	
344	Acer platanoides	Norway Maple	8			Good	
345	Acer platanoides	Norway Maple	9			Good	
346	Acer platanoides	Norway Maple	8			Good	
347	Acer platanoides	Norway Maple	8			Good	
348	Acer platanoides	Norway Maple	9			Good	
349	Picea pungens	Colorado Blue Spruce	22			Good	
350	Acer saccharum	Sugar Maple	12			Good	
351	Acer saccharum	Sugar Maple	12			Good	
352	Acer saccharum	Sugar Maple	14			Good	
353	Acer saccharum	Sugar Maple	8			Good	
354	Picea glauca	White Spruce	8			Fair	
355	Pseudotsuga menziesii	Douglas-fir	8			Fair	
356	Acer saccharum	Sugar Maple	12			Good	
357	Acer saccharum	Sugar Maple	14			Good	
358	Picea pungens	Colorado Blue Spruce	9			Fair	Unidentified needle disease
359	Picea pungens	Colorado Blue Spruce	14			Fair	Unidentified needle disease
360	Pseudotsuga menziesii	Douglas-fir	22			Poor	Terminal leader has failed
361	Acer saccharum	Sugar Maple	13			Good	
362	Acer saccharum	Sugar Maple	16			Good	
363	Acer saccharum	Sugar Maple	15			Good	
364	Liquidambar styraciflua	Sweetgum	11			Good	
365	Acer saccharum	Sugar Maple	11			Good	
366	Juglans nigra	Black Walnut	12			Good	
367	Acer platanoides	Norway Maple	11			Good	
368	Acer platanoides	Norway Maple	8			Fair	Small trunk injury, wood exposed, some decay
369	Gleditisia triacanthos	Honeylocust	12			Good	
370	Acer platanoides	Norway Maple	9			Good	
371	Platanus occidentalis	Sycamore	30			Good	
372	Acer platanoides	Norway Maple	28			Good	
373	Picea pungens	Colorado Blue Spruce	8			Fair	
374	Picea pungens	Colorado Blue Spruce	8			Dead	
375	Acer saccharum	Sugar Maple	13			Good	
376	Acer platanoides	Norway Maple	13			Good	
377	Picea pungens	Colorado Blue Spruce	9			Fair	
378	Acer platanoides	Norway Maple	9			Good	
379	Malus spp.	Crabapple spp.	9	Multiple		Fair	
380	Prunus avium	Sweet Black Cherry	9			Good	
381	Robinia pseudoacacia	Black Locust	12			Good	
382	Juglans nigra	Black Walnut	9			Good	
383	Juniperus virginiana	Eastern Red-cedar	13			Good	
384	Robinia pseudoacacia	Black Locust	15			Good	
385	Juniperus virginiana	Eastern Red-cedar	8			Good	
386	Juniperus virginiana	Eastern Red-cedar	14			Good	
387	Juniperus virginiana	Eastern Red-cedar	15			Good	
388	Juniperus virginiana	Eastern Red-cedar	13			Good	
389	Juniperus virginiana	Eastern Red-cedar	14	Twin	8	Good	
390	Juniperus virginiana	Eastern Red-cedar	13	Twin	9	Good	
391	Juniperus virginiana	Eastern Red-cedar	8	Multiple	7, 3	Good	
392	Juniperus virginiana	Eastern Red-cedar	11	Twin	10	Good	
393	Acer saccharum	Sugar Maple	16	Twin	11	Good	
394	Acer saccharum	Sugar Maple	18			Good	
395	Juglans nigra	Black Walnut	12			Good	
396	Celtis occidentalis	Northern Hackberry	8			Good	
397	Acer platanoides	Norway Maple	14	Twin	10	Fair	Weak trunk union, included bark, some decay
398	Acer negundo	Boxelder	12	Multiple	5, 3	Fair	
399	Acer saccharum	Sugar Maple	15			Good	
400	Acer saccharinum	Silver Maple	9	Multiple		Good	
401	Quercus bicolor	Swamp White Oak	8			Good	
402	Populus deltoides	Eastern Cottonwood	13			Good	
403	Populus deltoides	Eastern Cottonwood	9			Good	
404	Populus deltoides	Eastern Cottonwood	12			Good	
405	Populus deltoides	Eastern Cottonwood	16			Good	
406	Pinus sylvestris	Scotch Pine	10			Good	
407	Acer platanoides	Norway Maple	17			Poor	Large in-rolled trunk seam, decay
408	Acer saccharum	Sugar Maple	12			Good	
409	Acer saccharum	Sugar Maple	15			Good	
410	Acer saccharum	Sugar Maple	9			Good	
411	Acer saccharum	Sugar Maple	11			Good	
412	Acer saccharum	Sugar Maple	15			Good	
413	Acer saccharum	Sugar Maple	9			Good	
414	Acer saccharum	Sugar Maple	12			Good	
415	Acer saccharum	Sugar Maple	8			Poor	Extensive trunk decay
416	Gleditisia triacanthos	Honeylocust	20			Good	
417	Gleditisia triacanthos	Honeylocust	16			Good	
418	Gleditisia triacanthos	Honeylocust	12			Good	
419	Pseudotsuga menziesii	Douglas-fir	12			Good	
420	Picea pungens	Colorado Blue Spruce	8			Fair	
421	Picea pungens	Colorado Blue Spruce	9			Fair	
422	Pinus nigra	Austrian Pine	14			Good	
423	Acer saccharum	Sugar Maple	9			Good	
424	Acer saccharum	Sugar Maple	10			Good	
425	Pinus nigra	Austrian Pine	14			Good	
426	Pinus nigra	Austrian Pine	11			Good	
427	Pinus nigra	Austrian Pine	14	Multiple	12, 10	Good	
428	Pinus nigra	Austrian Pine	15	Multiple	13, 7	Good	
429	Picea pungens	Colorado Blue Spruce	9			Poor	Unidentified needle disease
430	Pinus nigra	Austrian Pine	10			Fair	Some diplodia disease
431	Pinus nigra	Austrian Pine	9			Fair	Some diplodia disease
432	Pinus nigra	Austrian Pine	9			Fair	Some diplodia disease
433	Pinus nigra	Austrian Pine	10	Twin	9	Fair	Some diplodia disease
434	Pinus nigra	Austrian Pine	11			Fair	Some diplodia disease
435	Pinus nigra	Austrian Pine	13			Fair	Some diplodia disease
436	Pinus nigra	Austrian Pine	13			Dead	
437	Pinus nigra	Austrian Pine	15			Poor	Some diplodia disease
438	Acer saccharinum	Silver Maple	24			Good	
439	Pinus nigra	Austrian Pine	15			Poor	Some diplodia disease
440	Pinus nigra	Austrian Pine	12			Poor	Some diplodia disease
441	Pinus sylvestris	Scotch Pine	28			Good	
442	Ulmus americana	American Elm	9			Good	
443	Pinus sylvestris	Scotch Pine	14			Good	
444	Acer saccharinum	Silver Maple	18			Good	
445	Pinus sylvestris	Scotch Pine	22			Fair	Insect damage
446	Pinus sylvestris	Scotch Pine	28			Good	
447	Acer saccharinum	Silver Maple	15	Multiple		Good	
448	Pinus sylvestris	Scotch Pine	16			Good	
449	Pinus sylvestris	Scotch Pine	15			Good	
450	Pinus sylvestris	Scotch Pine	16			Good	
451	Acer saccharinum	Silver Maple	8			Good	
452	Pinus sylvestris	Scotch Pine	28			Good	
453	Pinus sylvestris	Scotch Pine	18			Good	
454	Acer saccharinum	Silver Maple	11			Good	
455	Pinus sylvestris	Scotch Pine	15			Good	
456	Pinus sylvestris	Scotch Pine	13			Good	
457	Acer saccharinum	Silver Maple	9			Good	
458	Pinus sylvestris	Scotch Pine	14			Good	
459	Malus spp.	Crabapple spp.	9	Twin	8	Good	

NF ENGINEERS
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LAND SURVEYORS
LAND PLANNERS

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PONTIAC, MI 48342-5032
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FAX. (248) 332-8257

SEAL

ANTHONY J. DOMBROWSKI
Registered Forester
State of Michigan ID #3301000669

PROJECT
1614 W. Grand River

CLIENT
W Investment Holdings
29580 Northwestern Hwy.
Suite 100.
Southfield, MI 48034

Contact:
Ammar W. Alkhafaji
Phone: (248) 559-5555

PROJECT LOCATION
No. 1614 & 1622
W. Grand River Ave.
Part of the NE. 1/4 of
Section 22, T4N., R.1W.,
Township of Meridian,
Ingham County, MI

SHEET
Tree Survey

Know what's **below**
Call before you dig.

REVISIONS
10-19-2017 - ISSUED FOR CLIENT REVIEW
03-05-2018 - ISSUED FOR CLIENT REVIEW
05-01-2020 - REMOVE DEMOLISHED AREA AND ADD 48" STORM
09-18-2023 PARCEL BOUNDARY UPDATE

DRAWN BY:
C. Ellison

DESIGNED BY:

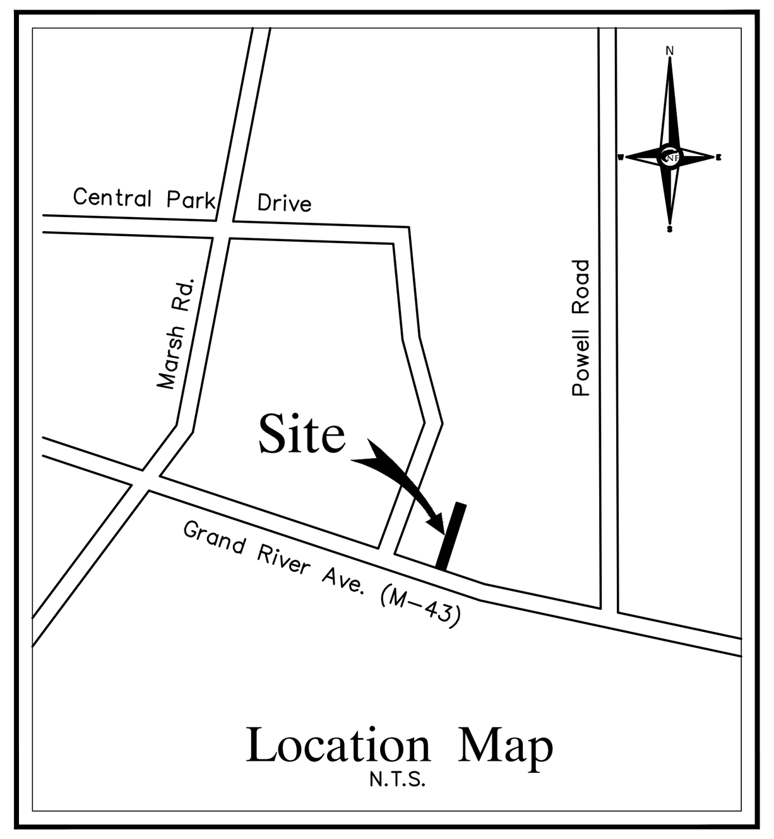
APPROVED BY:
J. Huhta

DATE:
March 5, 2018

SCALE: N.T.S.

NFE JOB NO. **J987-03**

SHEET NO. **C3**



SITE DATA

GROSS LAND AREA: PARCEL A: 52,199 S.F. OR 1.198 ACRES
PARCEL B: 64,841 S.F. OR 1.489 ACRES
PARCEL C: 260,397 S.F. OR 5.978 ACRES

ZONED: C–2 (COMMERCIAL DISTRICT) SECTION 86–404

C–2 BUILDING SETBACKS:

FRONT= 100' FROM CENTERLINE OF W. GRAND RIVER AVENUE
SIDE AND REAR SETBACK ADJACENT TO A RESIDENTIAL DISTRICT. NO BUILDING, PARKING, ACCESS DRIVE, OR OTHER STRUCTURE SHALL BE LESS THAN 100 FEET FROM A RESIDENTIAL DISTRICT LINE, EXCEPT A SIXTY–FOOT SETBACK SHALL BE REQUIRED IF SCREENING THAT INCORPORATES A DOUBLE ROW OF INTERLOCKING TREES, PRIMARILY EVERGREENS, OR THE EQUIVALENT IN ADDITION TO GENERAL SCREENING STANDARDS.

STORAGE BUILDING SETBACK FROM RESIDENTIAL= 200'

PROPOSED SETBACK: REAR OF BUILDING 150'
(WITH DOUBLE ROW OF EVERGREENS FOR SCREENING, PER ORD. NO. 86–404)

MAX. BUILDING HEIGHT PERMITTED: 2.5 STORIES/35'

THE ABOVE SETBACK & HEIGHT REQUIREMENTS WERE OBTAINED FROM THE MERIDIAN TOWNSHIP ZONING ORDINANCE.

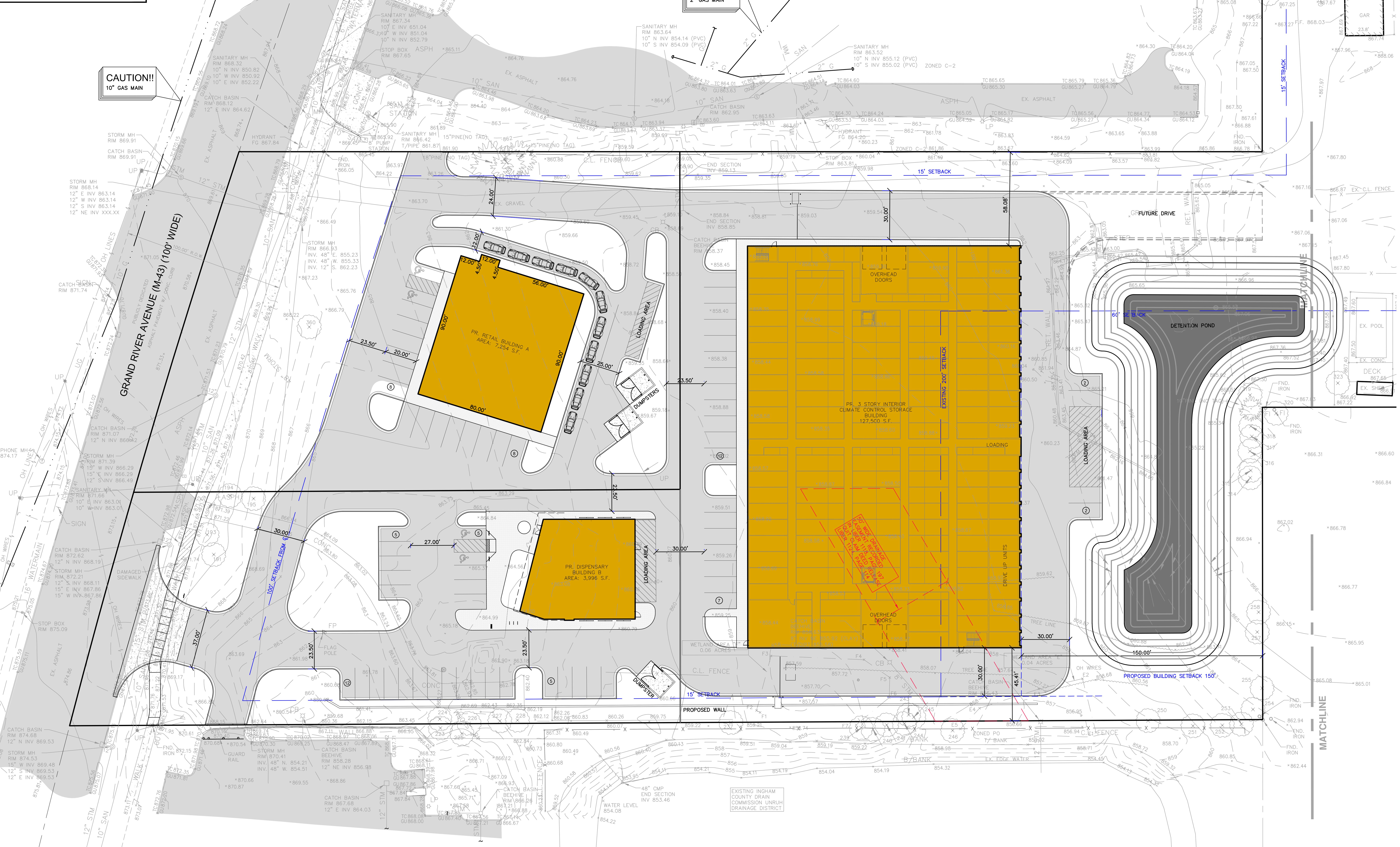
SITE PLAN NOTES

INSTALL 6" CURB & GUTTER AT ALL AREAS WHERE HARD SURFACE ABUTS LANDSCAPING (TYP)

ADA ACCESS SHALL BE PROVIDED TO ALL PORTIONS OF THE PROPOSED BUILDING, RAMPS TO BE INSTALLED AS REQUIRED.
GRADING DETAILS PROVIDED DURING ENGINEERING REVIEW PROCESS.

EARTH BALANCE / GRADING

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE WHETHER THE SITE EARTHWORK BALANCES OR NOT. ANY EXCESS CUT MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR. IN A LIKE MANNER, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO IMPORT APPROVED FILL MATERIAL AND PLACE IT AS REQUIRED TO ATTAIN THE SITE GRADE AND COMPACTION REQUIREMENTS PER THE ENGINEER'S PLAN AND ALL APPLICABLE GOVERNMENTAL STANDARDS. THE ENGINEER AND OWNER MAKE NO REPRESENTATION AS TO THE QUANTITIES THAT MAY BE NEEDED TO CREATE A BALANCED EARTHWORK CONDITION OR THAT THE SITE EARTHWORK IS BALANCED.



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SEAL

PROJECT
No. 1614
W. Grand River Ave.

CLIENT
W Investment Holdings
29580 Northwestern Hwy.
Suite 100.
Southfield, MI 48034

Contact:
Ammar W. Alkhafaji

Phone: (248) 559-5555

PROJECT LOCATION
Part of the NE. 1/4 of
Section 22
T4N., R.1W.
Township of Meridian
Ingham County, MI

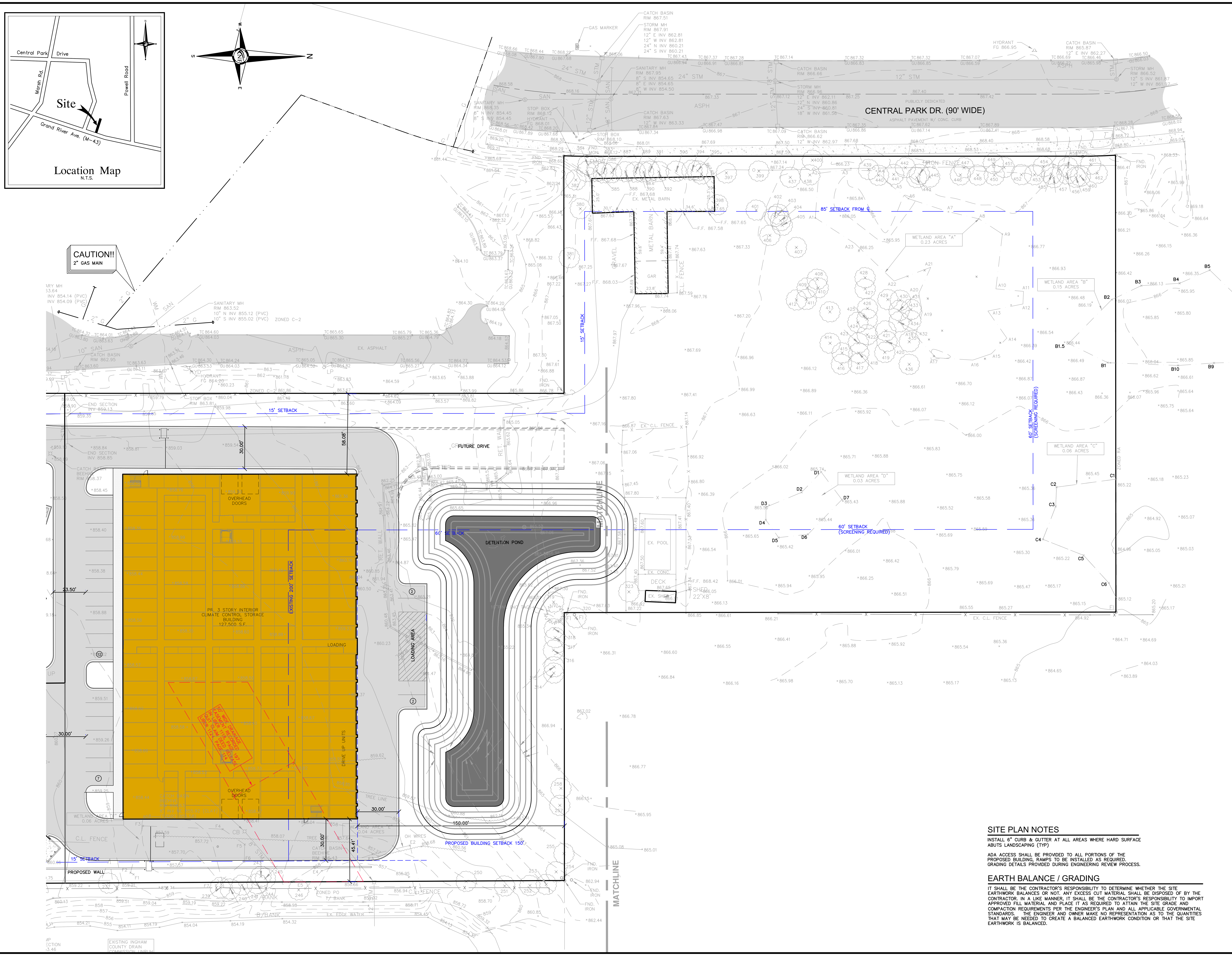
SHEET
Site Plan

Know what's below
Call before you dig.

DATE	ISSUED/REVISED
05-17-23	REVISED LAYOUT PER CLIENT
11-13-2023	SETBACK VARIANCE

DRAWN BY: N. Naoum
DESIGNED BY: M. Kurmas
APPROVED BY: M. Peterson
DATE: 09-18-2023
SCALE: 1" = 30'

NFE JOB NO. J987-03
SHEET NO. C4



SITE PLAN NOTES

INSTALL 6" CURB & GUTTER AT ALL AREAS WHERE HARD SURFACE ABUTS LANDSCAPING (TYP)

ADA ACCESS SHALL BE PROVIDED TO ALL PORTIONS OF THE PROPOSED BUILDING, RAMPS TO BE INSTALLED AS REQUIRED. GRADING DETAILS PROVIDED DURING ENGINEERING REVIEW PROCESS.

EARTH BALANCE / GRADING

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SEAL

PROJECT
No. 1614
W. Grand River Ave.

CLIENT
W Investment Holdings
29580 Northwestern Hwy.
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Southfield, MI 48034

Contact:
Ammar W. Alkhafaji

Phone: (248) 559-5555

PROJECT LOCATION
Part of the NE. 1/4 of Section 22
T4N., R.1W.
Township of Meridian
Ingham County, MI

SHEET
Site Plan

Know what's below
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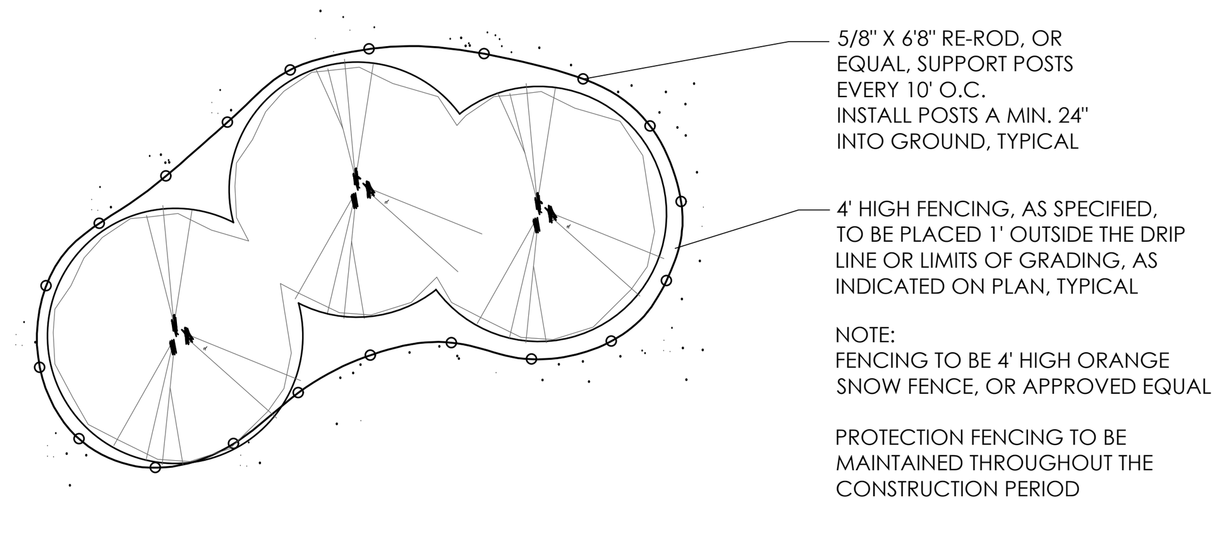
DATE	ISSUED/REVISED
05-17-23	REVISED LAYOUT PER CLIENT
11-13-2023	SETBACK VARIANCE

DRAWN BY: N. Naoum
DESIGNED BY: M. Kurmas
APPROVED BY: M. Peterson
DATE: 09-18-2023
SCALE: 1" = 30'

NFE JOB NO. J987-03
SHEET NO. C5

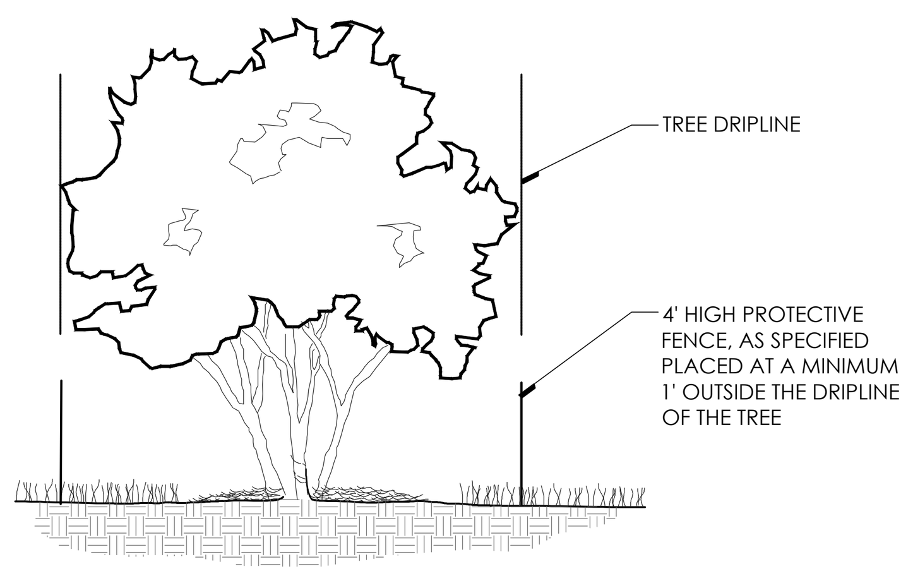
GENERAL TREE PROTECTION NOTES

1. APPROVED TREE PROTECTION SHALL BE ERECTED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES, AND SHALL REMAIN IN PLACE UNTIL THE IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
2. ALL UNDERSTORY VEGETATION WITHIN THE LIMITS OF PROTECTIVE FENCING SHALL BE PRESERVED.
3. NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE DRIP LINE OF ANY TREE DESIGNATED TO REMAIN, INCLUDING BUT NOT LIMITED TO, PLACING SOLVENTS, BUILDING MATERIALS, CONSTRUCTION EQUIPMENT, OR SOIL DEPOSITS WITHIN THE DRIP LINE.
4. WHERE GROUPINGS OF TREES ARE TO REMAIN, TREE FENCING SHALL BE PLACED AT THE LIMITS OF GRADING LINE.
5. DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY DEVICE OR WIRE TO ANY TREE, SCHEDULED TO REMAIN.
6. ALL UTILITY SERVICE REQUESTS MUST INCLUDE NOTIFICATION TO THE INSTALLER THAT PROTECTED TREES MUST BE AVOIDED. ALL TRENCHING SHALL OCCUR OUTSIDE OF THE PROTECTIVE FENCING.
7. SWALES SHALL BE ROUTED TO AVOID THE AREA WITHIN THE DRIP LINES OF PROTECTED TREES.
8. TREES LOCATED ON ADJACENT PROPERTIES THAT MAY BE AFFECTED BY CONSTRUCTION ACTIVITIES MUST BE PROTECTED.
9. ROOT ZONES OF PROTECTED TREES SHOULD BE SURROUNDED WITH RIGIDLY STAKED FENCING.
10. THE PARKING OF IDLE AND RUNNING EQUIPMENT SHALL BE PROHIBITED UNDER THE DRIP LINE OF PROTECTED TREES.
11. THE STRIPPING OF TOPSOIL FROM AROUND PROTECTED TREES SHALL BE PROHIBITED.
12. ALL TREES TO BE REMOVED SHALL BE CUT AWAY FROM TREES TO REAMIN.
13. THE GRUBBING OF UNDERSTORY VEGETATION WITHIN CONSTRUCTION AREAS SHOULD BE CLEARED BY CUTTING VEGETATION AT THE GROUND WITH A CHAIN SAW OR MINIMALLY WITH A HYDRO-AXE.
14. THE CONTRACTOR IS RESPONSIBLE FOR THE REPLACEMENT PER ORDINANCE GUIDELINES, FOR THE DAMAGE OR REMOVAL OF ANY TREE DESIGNATED TO REMAIN.
15. TREES TO BE REMOVED SHALL BE FIELD VERIFIED, EVALUATED AND FLAGGED FOR REMOVAL, BY THE LANDSCAPE ARCHITECT OR FORESTER, ONLY AS DIRECTED BY THE OWNER OR OWNERS REPRESENTATIVE.



TREE PROTECTION DETAIL-PLAN

NTS

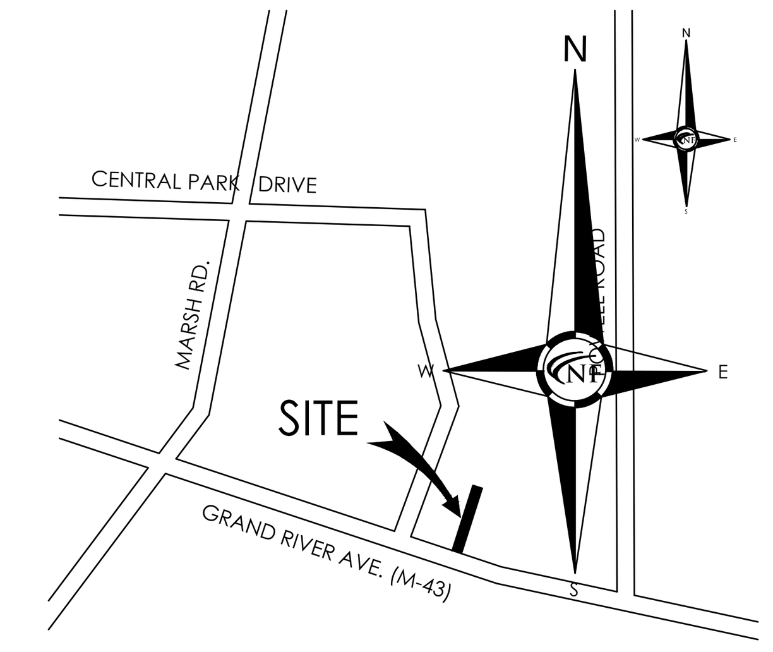


TREE PROTECTION DETAIL-SECTION

NTS

LEGEND:

- TREES TO BE REMOVED
- TREES TO REMAIN
- TREE PROTECTION FENCING



LOCATION MAP

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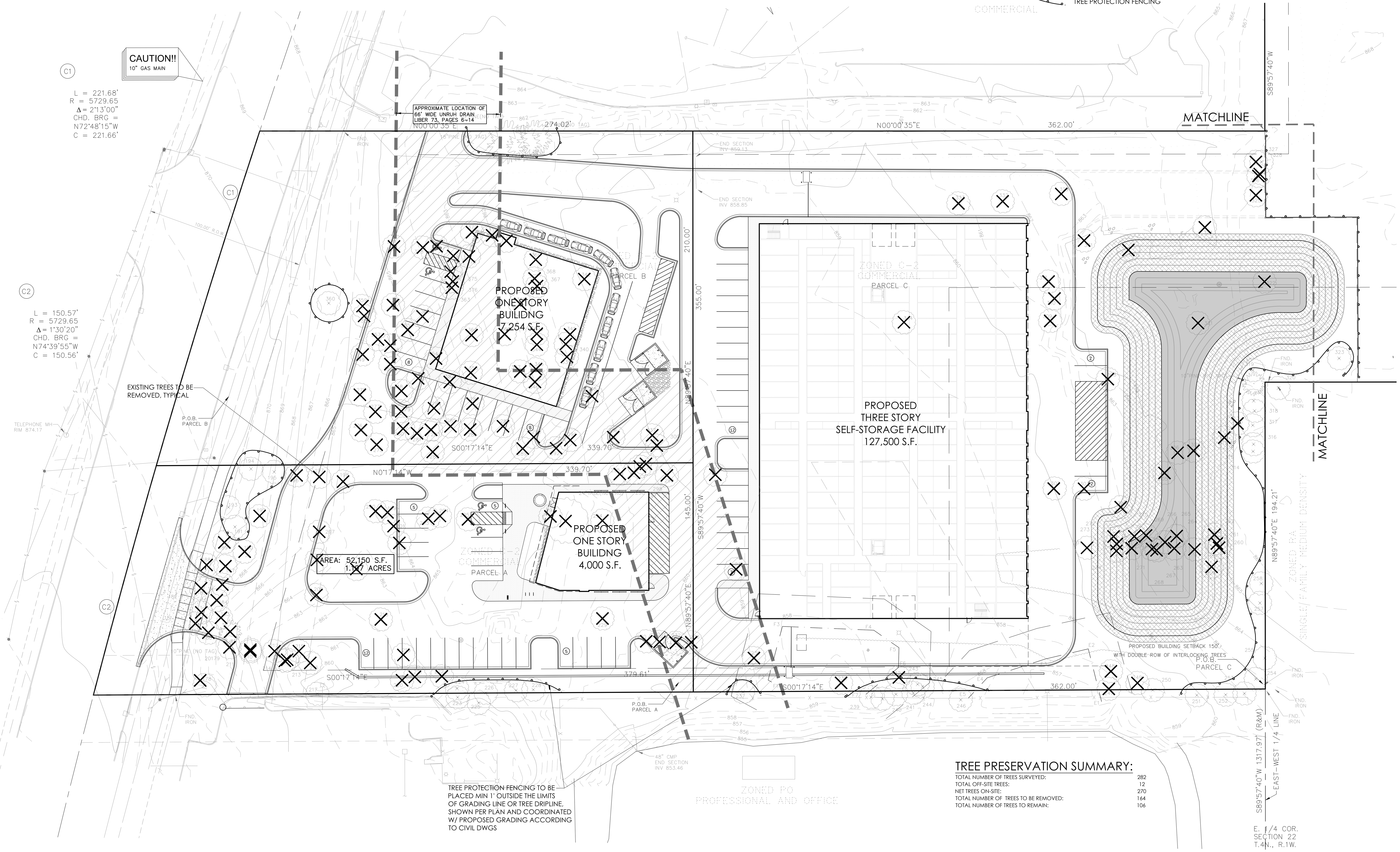


TREE PRESERVATION SUMMARY:

TOTAL NUMBER OF TREES SURVEYED:	282
TOTAL OFF-SITE TREES:	12
NET TREES ON-SITE:	270
TOTAL NUMBER OF TREES TO BE REMOVED:	164
TOTAL NUMBER OF TREES TO REMAIN:	106

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL

STATE OF MICHIGAN

PROJECT
No. 1614
W. Grand River Ave.

CLIENT
W Investment Holdings
29580 Northwestern Hwy.
Suite 100.
Southfield, MI 48034

Contact:
Ammar W. Alkhafaji

Phone: (248) 559-5555

PROJECT LOCATION
Part of the NE. 1/4 of Section 22
T4N., R.1W.
Township of Meridian
Ingham County, MI

SHEET
Tree Preservation Plan

811
Know what's **below**
Call before you dig.

REVISIONS

DRAWN BY:
G. Ostrowski

DESIGNED BY:
G. Ostrowski

APPROVED BY:
G. Ostrowski

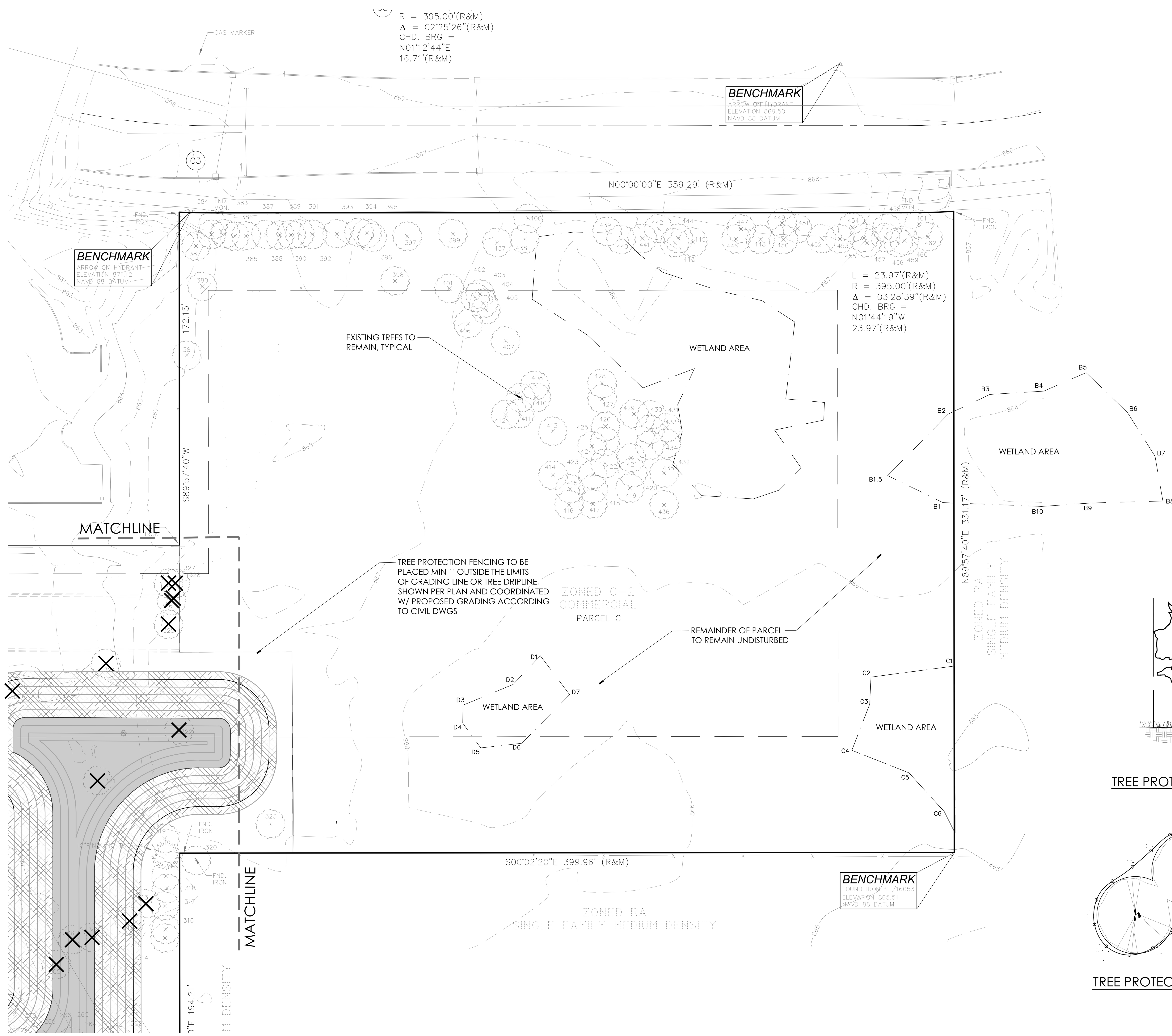
DATE:
11-20-2023

SCALE: 1" = 30'

30 15 0 15 30 45

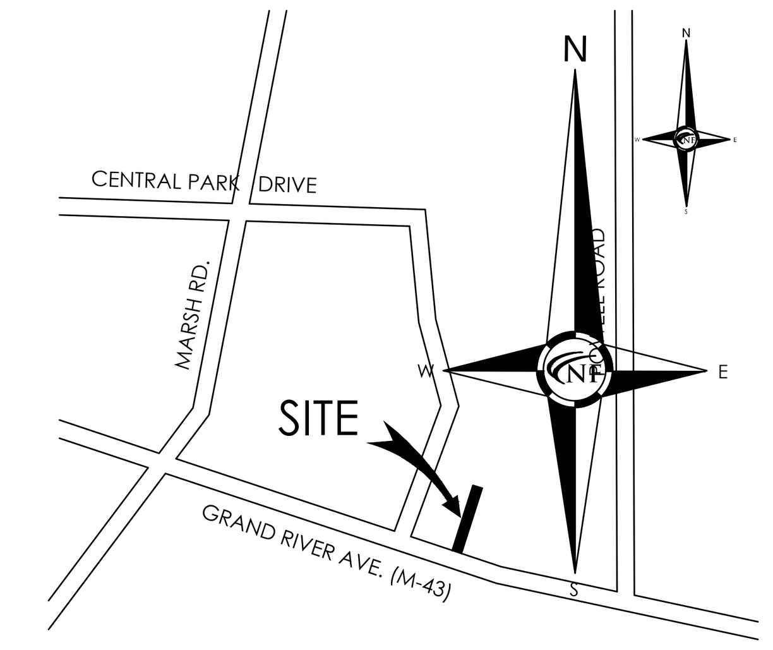
NFE JOB NO.
J987-03

SHEET NO.
L1

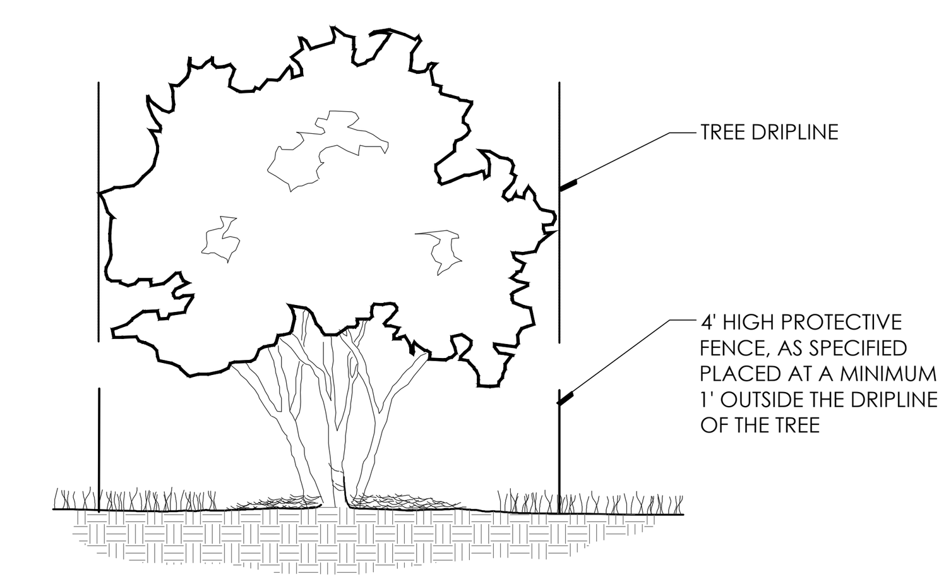


LEGEND:

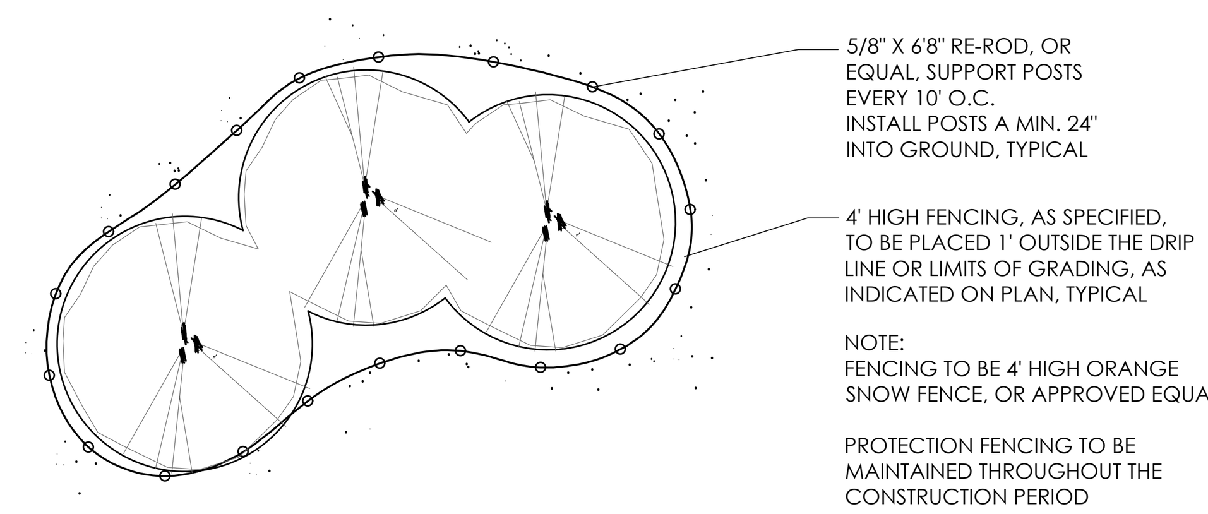
- ✕ TREES TO BE REMOVED
- TREES TO REMAIN
- TREE PROTECTION FENCING



LOCATION MAP
N.T.S.



TREE PROTECTION DETAIL-SECTION
NTS



TREE PROTECTION DETAIL-PLAN
NTS

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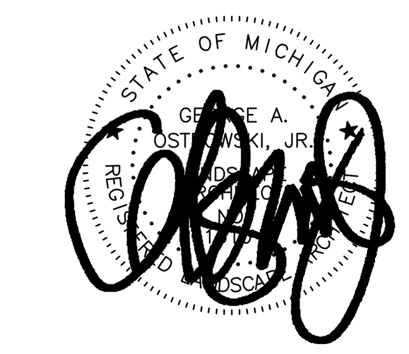

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Southfield, MI 48034

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Ingham County, MI

SHEET
Tree Preservation Plan

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G. Ostrowski
DESIGNED BY:
G. Ostrowski
APPROVED BY:
G. Ostrowski
DATE:
11-20-2023
SCALE: 1" = 30'
30 15 0 15 30 45

NFE JOB NO.
J987-03
SHEET NO.
L2

GENERAL SOD NOTE:

ALL LAWN AREAS DESIGNATED TO BE SODDED, SHALL BE SODDED WITH A BLENDED DURABLE BLUEGRASS SOD, TYPICALLY GROWN IN THE REGION. ALL TURF SHALL BE PLACED ON A MINIMUM 3" PREPARED TOPSOIL, AND WATERED DAILY UNTIL ESTABLISHMENT. IN AREAS SUBJECT TO EROSION, SODDED LAWN SHALL BE STABILIZED WHERE NECESSARY, AND LAID PERPENDICULAR TO SLOPES SOD INSTALLATION SHALL OCCUR ONLY:
SPRING: APRIL1 TO JUNE1
FALL: AUGUST 15 TO OCTOBER 15

GENERAL SEED NOTE:

ALL LAWN AREAS DESIGNATED TO BE SEEDED, SHALL BE HYDRO-SEEDED WITH SPECIFIED BLENDS, AND STABILIZED WITH WOOD CELLULOSE FIBER MULCH (2,000 LBS PER ACRE) . IN AREAS SUBJECT TO EROSION, SEEDED LAWN SHALL BE FURTHER STABILIZED WHERE NECESSARY WITH BIODEGRADABLE EROSION BLANKET AND STAKED UNTIL ESTABLISHED. ALL SEED SHALL BE APPLIED OVER A MINIMUM 3" PREPARED TOPSOIL, AND SHALL BE KEPT MOIST AND WATERED DAILY UNTIL ESTABLISHED.
SEEDING INSTALLATION SHALL OCCUR ONLY:
SPRING: APRIL1 TO JUNE1
FALL: AUGUST 15 TO OCTOBER 15

PLANT SCHEDULE

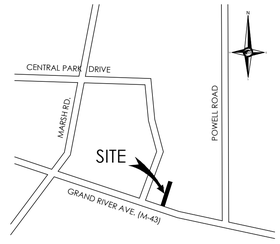
KEY	QTY	BOTANICAL/COMMON NAME	SIZE	SPACING	ROOT	COMMENT
TREES						
AR	8	Acer rubrum 'Bowhall' Bowhall Red Maple	2.5" CAL	SEE PLAN	B&B	FULLY BRANCHED HEADS
BN	8	Betula nigra River Birch	12' HT	SEE PLAN	B&B	CLUMP FORM, 3 CANES
GT	9	Gleditsia triacanthos 'Skyline' Skyline Honey Locust	2.5" CAL	SEE PLAN	B&B	FULLY BRANCHED HEADS
NS	6	Nyssa sylvatica 'Red Rage' Red Rage Black Tupelo	2.5" CAL	SEE PLAN	B&B	FULLY BRANCHED HEADS
PS	7	Prunus sargentii 'Pink Flair' Pink Flair Flowering Cherry	2" CAL	SEE PLAN	B&B	FULLY BRANCHED HEADS
TA	9	Tilia americana 'McSentry' American Sentry Linden	2.5" CAL	SEE PLAN	B&B	FULLY BRANCHED HEADS
SHRUBS						
SB	12	Spiraea x bumalda 'Anthony Waterer' Anthony Waterer Spiraea	24" HT	30" OC	CONT	
TO	22	Thuja occidentalis 'Techny' Mission Arborvitae	5' HT	5' OC	B&B	
GROUNDCOVERS/PERENNIALS						
CA	17	Calamagrostis a. 'Karl Foerster' Karl Foerster Feather Reed Grass	3 GAL	30" OC	CONT	
HS	32	Hemerocallis 'Stella D'Oro' Stella D'Oro Daylily	2 GAL	24" OC	CONT	
LM	16	Liriope muscari 'Big Blue' Big Blue Liriope	1 GAL	15" OC	CONT	

LANDSCAPE REQUIREMENTS

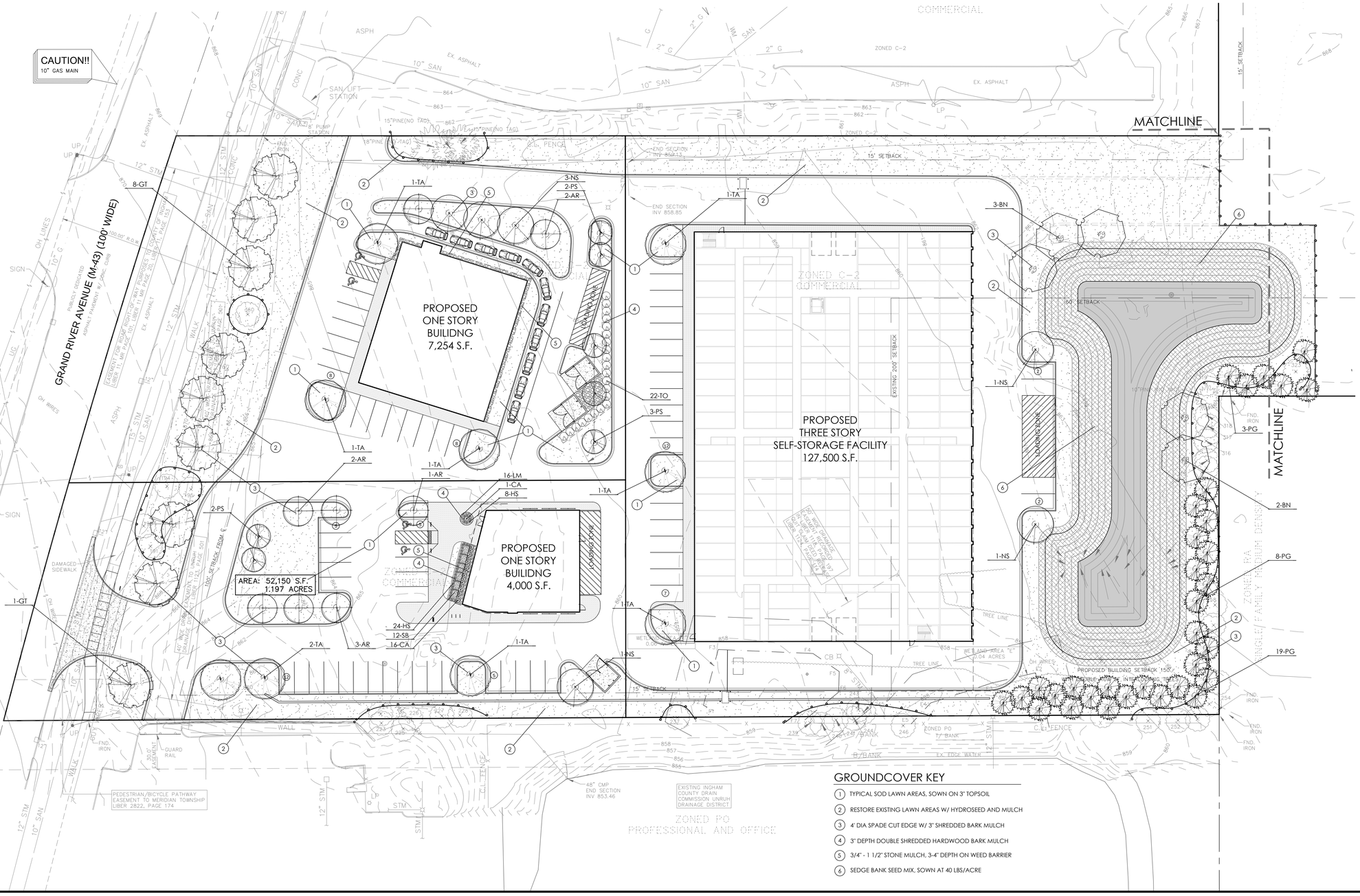
EXISTING SITE ZONING: C-2, COMMERICAL DISTRICT
EXISTING SITE AREA: 358,890 S.F. OR 8.24 ACRES

PARKING LOT LANDSCAPE REQUIREMENTS
2 TREES PER EACH 10 PKG SPACES
200 S.F. OF ISLAND AREA PER 10 SPACES
66 SPACES / 10 = 6.6 X 200 = 1,320 S.F. REQUIRED
AREA PROVIDED:
REQUIRED TREES:
66 SPACES / 10 X 2 = 13.2 OR 13 TREES REQUIRED
PROVIDED: 12,821.21 TREES PROVIDED

BUILDING PERIMETER REQUIREMENTS
BUILDING PERIMETER X 4 S.F.
BUILDING A: 349 L.F. X 4 = 1,396 S.F. REQUIRED
BUILDING B: 252 L.F. X 4 = 1,008 S.F. REQUIRED
BUILDING C: 840 L.F. X 4 = 3,360 S.F. REQUIRED
TOTAL REQUIRED AREA: 5,764 S.F.
TOTAL AREA PROVIDED: 165,320.75 S.F.



LOCATION MAP
N.T.S.



GROUNDCOVER KEY

1. TYPICAL SOD LAWN AREAS, SOWN ON 3" TOPSOIL
2. RESTORE EXISTING LAWN AREAS W/ HYDROSEED AND MULCH
3. 4" DIA SPADE CUT EDGE W/ 3" SHREDDED BARK MULCH
4. 3" DEPTH DOUBLE SHREDDED HARDWOOD BARK MULCH
5. 3/4" - 1 1/2" STONE MULCH, 3-4" DEPTH ON WEED BARRIER
6. SEDGE BANK SEED MIX, SOWN AT 40 LBS/ACRE

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NFE JOB NO. J987-03
SHEET NO. L3

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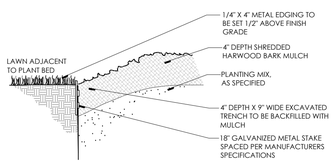
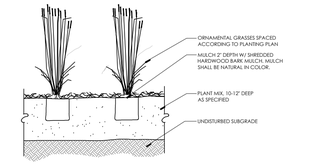


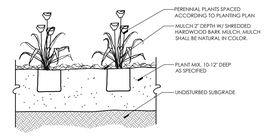
METAL EDGING DETAIL

NTS



ORNAMENTAL GRASS PLANTING DETAIL

NTS



PERENNIAL PLANTING DETAIL

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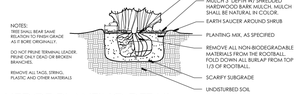

HEDGE PLANTING DETAIL

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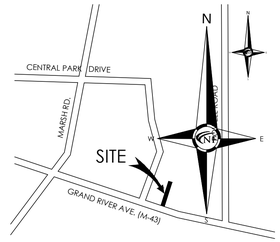
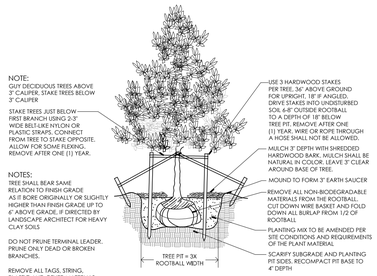


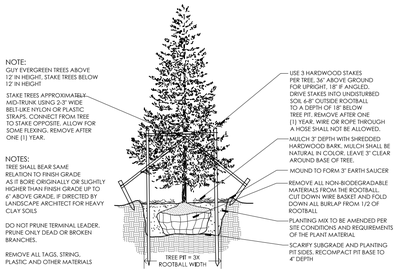
LOCATION MAP

N.T.S.



DECIDUOUS TREE PLANTING DETAIL

NTS



EVERGREEN TREE PLANTING DETAIL

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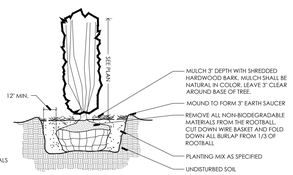
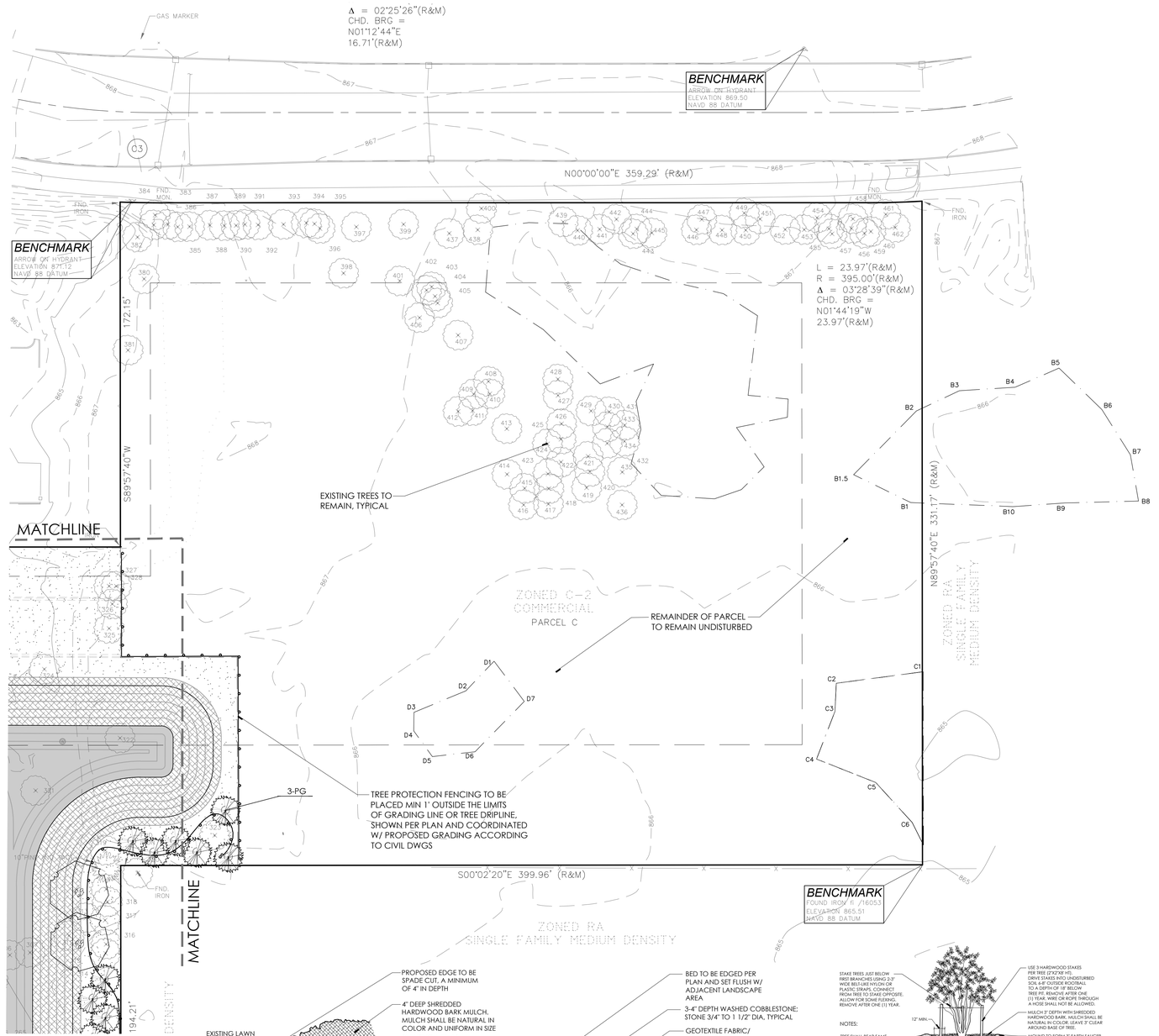


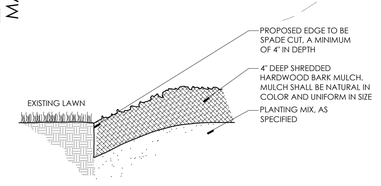
UPRIGHT EVERGREEN SHRUB PLANTING DETAIL

NTS

GENERAL LANDSCAPE NOTES

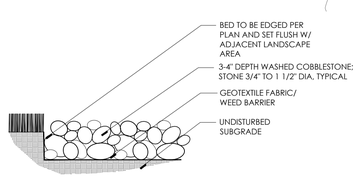
1. LANDSCAPE CONTRACTOR SHALL VISIT SITE, INSPECT EXISTING CONDITIONS AND REVIEW PROPOSED PLANTING AND RELATED WORK. IN CASE OF DISCREPANCY BETWEEN PLAN AND PLANT LIST, THE PLAN SHALL GOVERN QUANTITIES. CONTACT THE LANDSCAPE ARCHITECT WITH ANY CONCERNS.
2. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL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





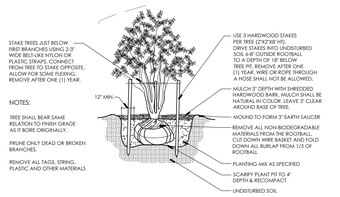
SPADE CUT EDGE DETAIL

NTS



COBBLESTONE MULCH DETAIL

NTS



MULTI-STEM TREE PLANTING DETAIL

NTS

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SHEET

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DESIGNED BY:
G. Ostrowski

APPROVED BY:
G. Ostrowski

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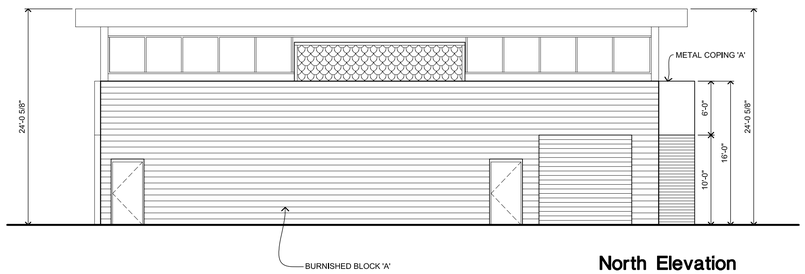
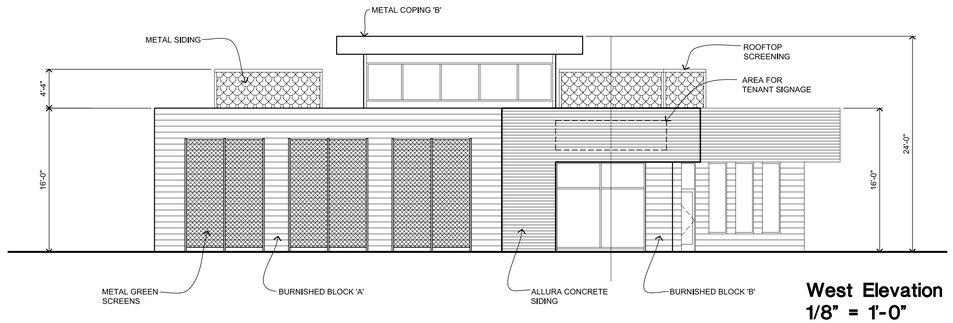
30 15 0 15 30 45

NFE JOB NO. J987-03

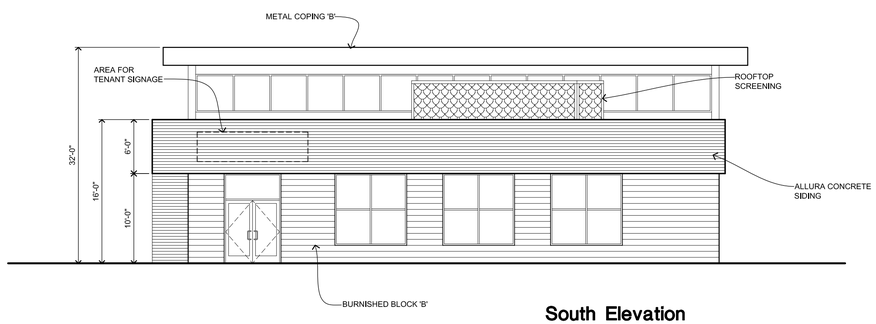
SHEET NO. L4



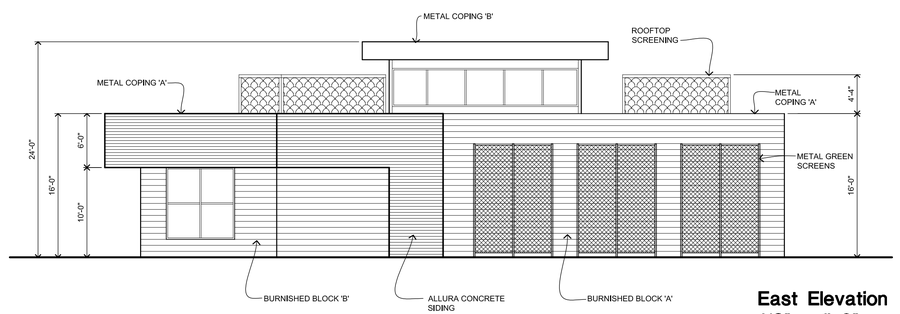
North Elevation
1/8" = 1'-0"



West Elevation
1/8" = 1'-0"



South Elevation
1/8" = 1'-0"



East Elevation
1/8" = 1'-0"

issued for:
OWNER REVIEW: 08 NOVEMBER 2019
OWNER REVIEW: 11 NOVEMBER 2019
SPECIAL LAND USE: 11 NOVEMBER 2019
OWNER REVIEW: 23 JAN. 2020

project:

Proposed for
Commercial Development
Grand River Ave.
Meridian, MI

ROGVOY
ARCHITECTS

32500 TELEGRAPH ROAD
SUITE 250
BINGHAM FARMS, MICHIGAN
48025-2404

PH 248.540.7700 FX 248.540.2710
www.rogvoy.com

drawing:

Conceptual Floor Plan

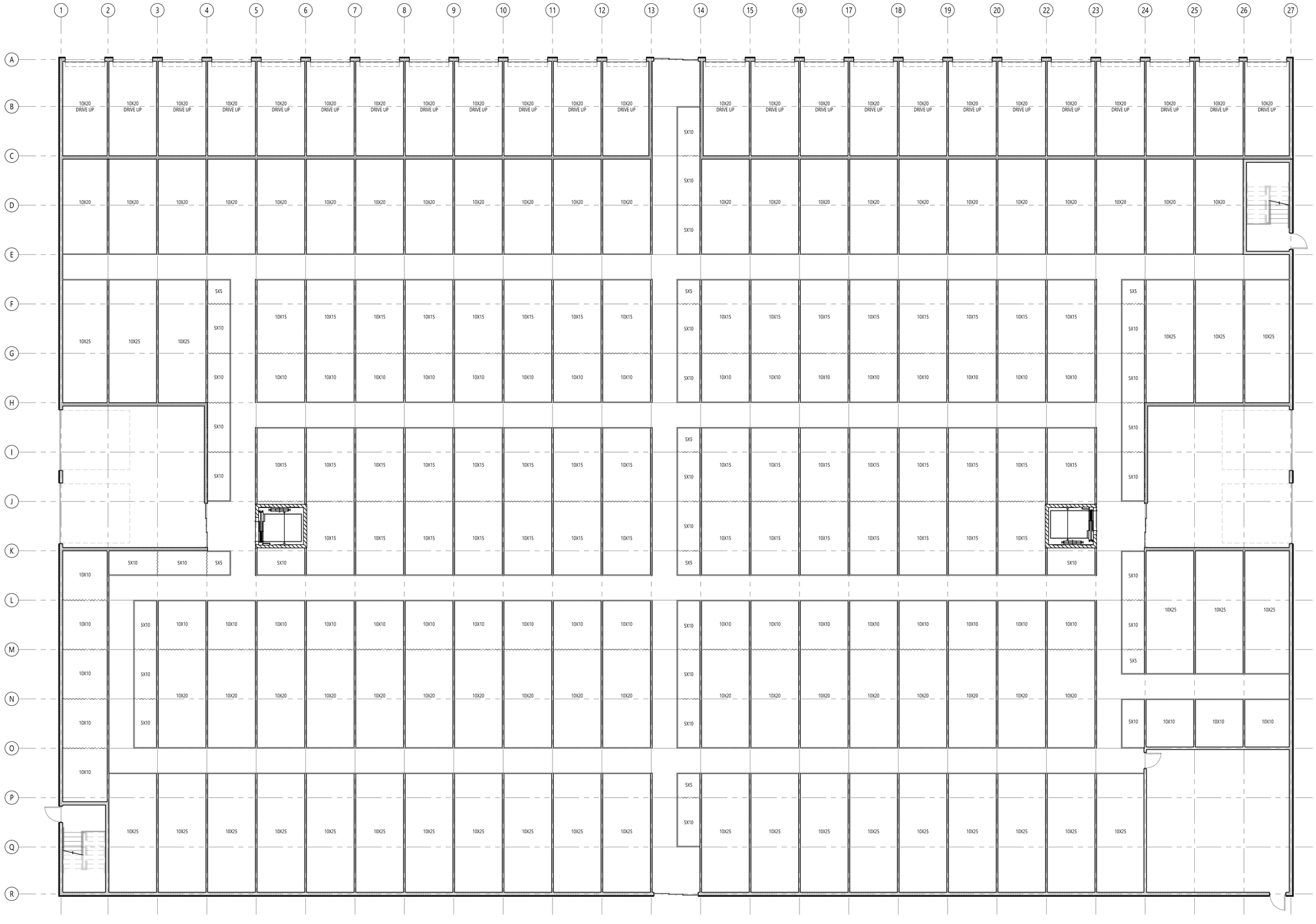
DO NOT SCALE DRAWING

issue date: 02 AUG. 2019
drawn: BDB
checked: MD
approved: MD

file number: 19030

sheet:

ELEV



N

1 FIRST FLOOR PLAN

SCALE: 1/8" = 1'-0"

FRANK G. RELF ARCHITECT, P.C.
35 PINELAWN ROAD, SUITE 207W
MELVILLE, N.Y. 11747
tel 631.271.4432
fax 631.271.4532
www.fgrelf.com

CONSULTANTS:

FRANK G. RELF ARCHITECT, P.C.

REVISIONS :

#	DATE	COMMENT

ISSUE:

#	DATE	COMMENT

CLIENT:
BACALL GROUP, LLC
7091 ORCHARD LAKE RD, SUITE 260
WEST BLOOMFIELD, MI 48322

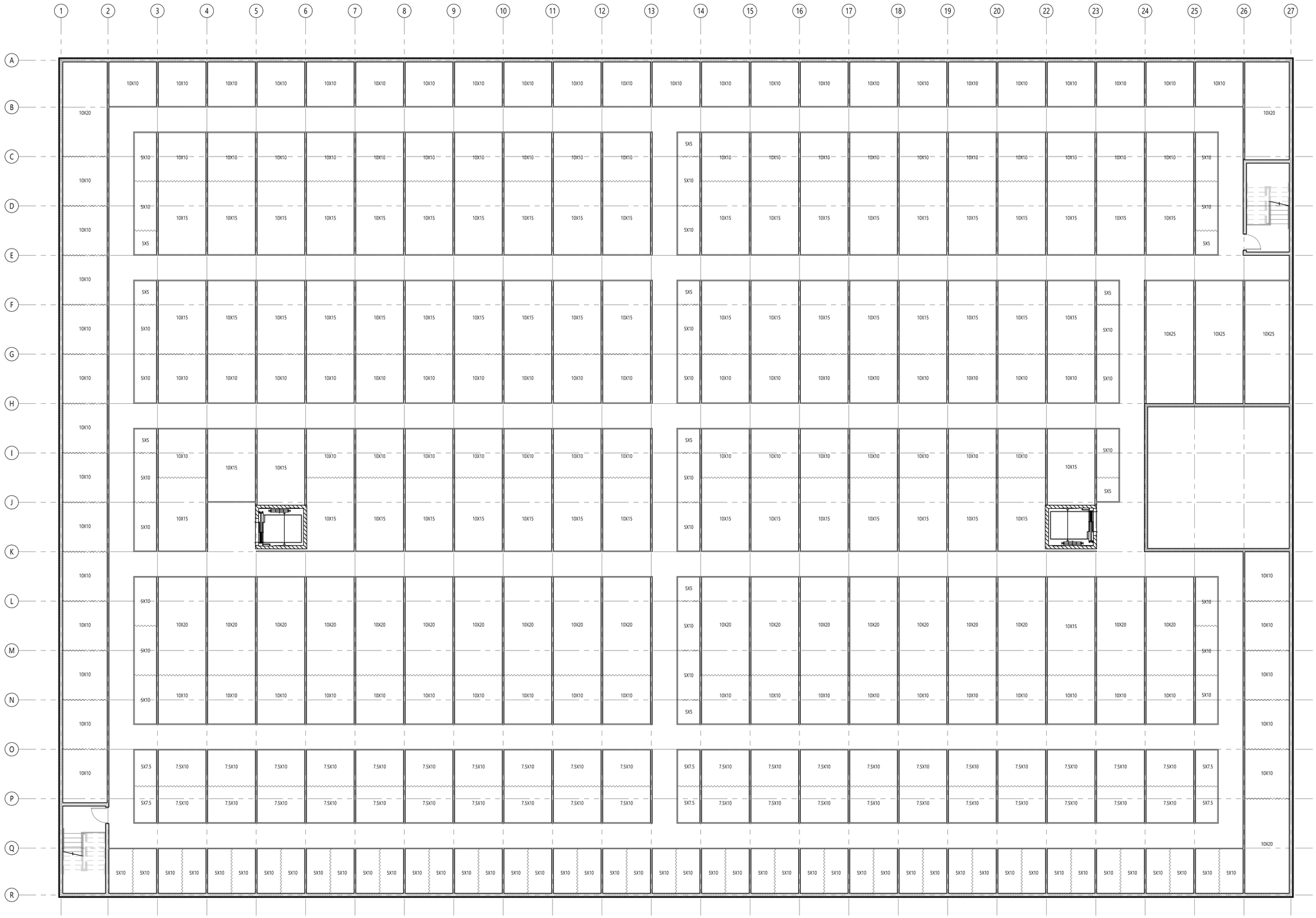
PROJECT:
1614 &1622 GRAND RIVER AVE
OKEMOS, MI 48864

TITLE DRAWING:
FIRST FLOOR PLAN

SEAL & SIGNATURE

DATE:	02/27/23
PROJECT No.	23004
DRAWING BY:	J.R.
CHK BY:	W.V.
DWG. No.:	A-100.00
	NB

DOB JOB NUMBER:



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1 SECOND FLOOR PLAN

SCALE: 1/8" = 1'-0"

FRANK G. RELF ARCHITECT, P.C.
35 PINELAWN ROAD, SUITE 207W
MELVILLE, N.Y. 11747
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fax 631.271.4532
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CONSULTANTS:

REVISIONS :

#	DATE	COMMENT

ISSUE:

#	DATE	COMMENT

CLIENT:
BACALL GROUP, LLC
7091 ORCHARD LAKE RD, SUITE 260
WEST BLOOMFIELD, MI 48322

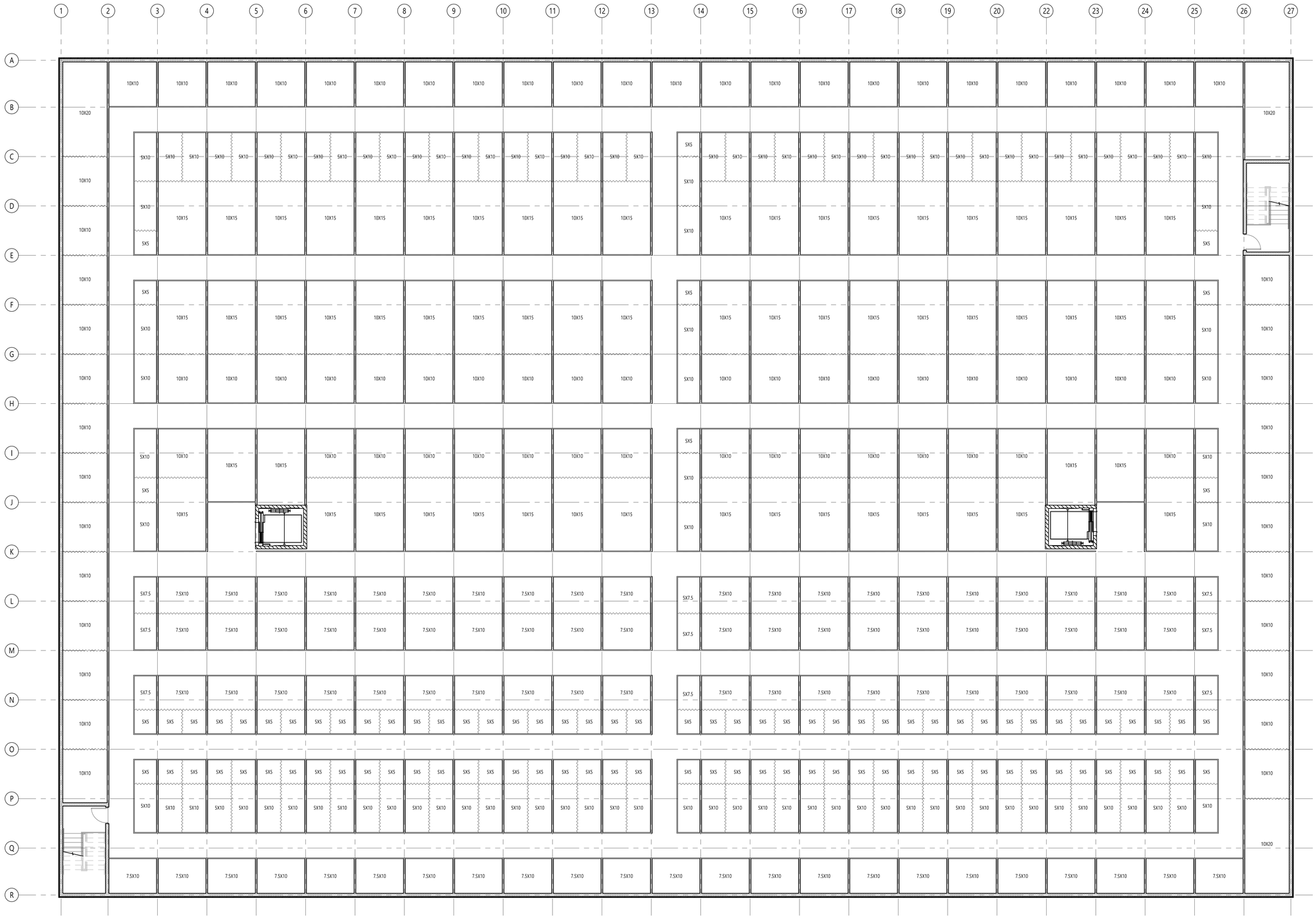
PROJECT:
1614 &1622 GRAND RIVER AVE
OKEMOS, MI 48864

TITLE DRAWING:
SECOND FLOOR PLAN

SEAL & SIGNATURE

DATE:	02/27/23
PROJECT No.	23004
DRAWING BY:	J.R.
CHK BY:	W.V.
DWG. No.:	A-101.00
	NB

DOB JOB NUMBER:



N

1 THIRD FLOOR PLAN

SCALE: 1/8" = 1'-0"

FRANK G. RELF ARCHITECT, P.C.
35 PINELAWN ROAD, SUITE 207W
MELVILLE, N.Y. 11747
tel 631.271.4432
fax 631.271.4532
www.fgrelf.com

CONSULTANTS:

REVISIONS :

#	DATE	COMMENT

ISSUE:

#	DATE	COMMENT

CLIENT:
BACALL GROUP, LLC
7091 ORCHARD LAKE RD, SUITE 260
WEST BLOOMFIELD, MI 48322

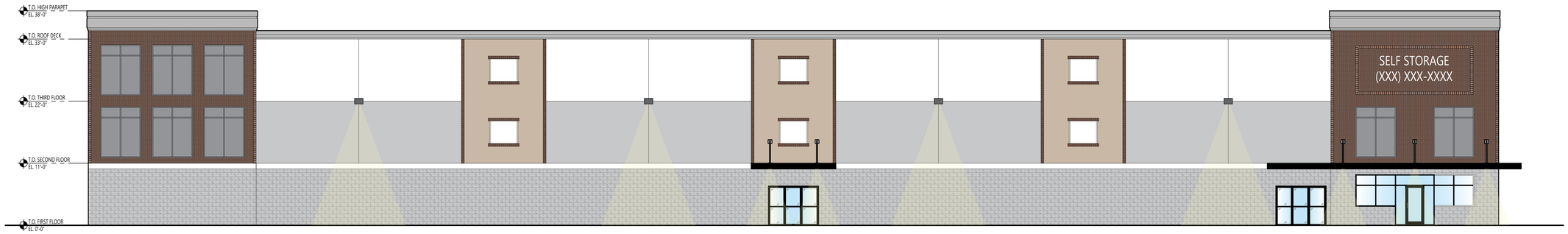
PROJECT:
1614 &1622 GRAND RIVER AVE
OKEMOS, MI 48864

TITLE DRAWING:
THIRD FLOOR PLAN

SEAL & SIGNATURE

DATE:	02/27/23
PROJECT No.	23004
DRAWING BY:	J.R.
CHK BY:	W.V.
DWG. No.:	A-102.00
	NB

DOB JOB NUMBER:



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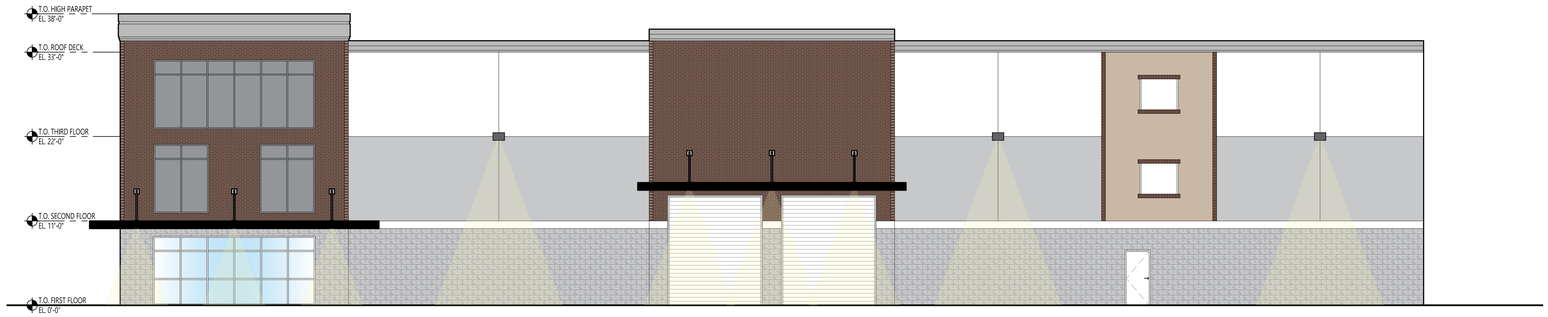

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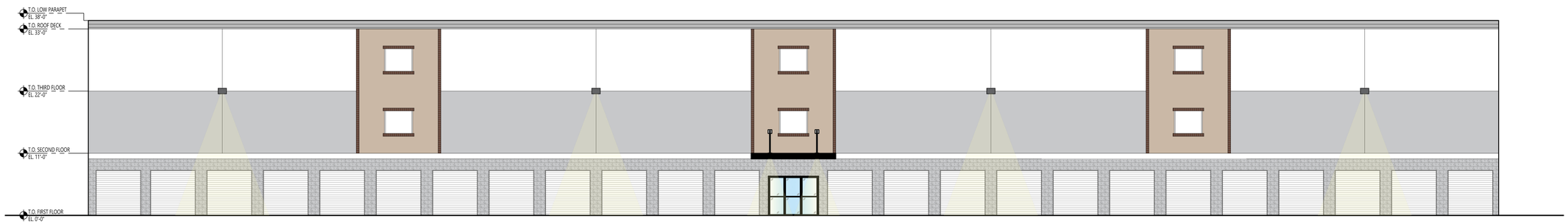

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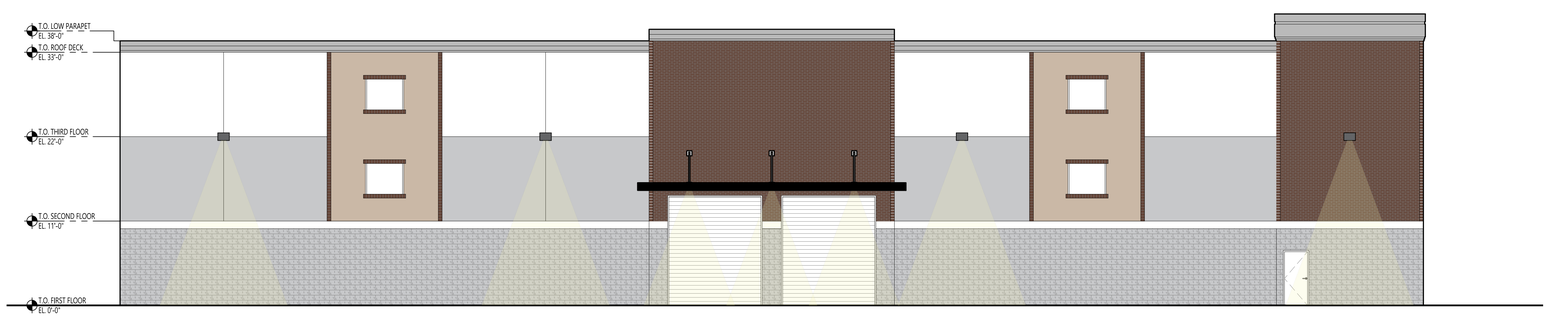

4 WEST ELEVATION
SCALE: 1/8" = 1'-0"

FRANK G. RELF ARCHITECT, P.C.
35 PINELAWN ROAD, SUITE 207W
MELVILLE, N.Y. 11747
tel 631.271.4432
fax 631.271.4532
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CONSULTANTS:

REVISIONS :

#	DATE	COMMENT

ISSUE:

#	DATE	COMMENT

CLIENT:
BACALL GROUP, LLC
7091 ORCHARD LAKE RD, SUITE 260
WEST BLOOMFIELD, MI 48322

PROJECT:
1614 &1622 GRAND RIVER AVE
OKEMOS, MI 48864

TITLE DRAWING:
EXTERIOR ELEVATIONS

SEAL & SIGNATURE

DATE:	02/27/23
PROJECT No.	23004
DRAWING BY:	J.R.
CHK BY:	W.V.
DWG. No.:	A-200.00
	NB

DOB JOB NUMBER:

NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

November 21, 2023

Natural Features Assessment
1614 Grand River Ave. - Meridian Township

The vacant site is located at 1614 Grand River Avenue in Meridian Township. Previously residential, the overall property consists of several lots totaling 358,889 square feet or 8.66 acres. The developed area consists of approximately 231,921 s.f. or 5.32 acres. The remnant area will remain undisturbed as there are no current plans for development.

The proposed development will consist of a 127,500 s.f. three story climate controlled self-storage facility, at the rear of the property, a 3,996 s.f. marijuana dispensary, located at the southeast, and a 7,254 s.f. commercial property, yet to be identified, located at the southwest.

Access to the site will be from Grand River Avenue via a single drive approach and is proposed to be a 3-lane ingress/egress. Future connections to the northern remainder parcel, and to the existing office center to the west will be provided, in compliance with good access management standards.

Natural features on the site include woodlands consisting of a mix of native hardwood species, some pioneer species, and coniferous species. A tree survey was performed on the site. The tree survey information is provided on the topographic survey sheet and includes location, identifying tag numbers, botanical and common names, and general tree condition. Overall, 282 trees were surveyed. Of those, 12 were identified as off-site. Based on impact from the proposed plan, 161 trees are proposed to be removed, leaving 109 trees, over 40% of the trees on-site, to remain. Landscape plantings proposed, are in excess of the minimum requirements in order to mitigate tree removal.

There are six individual areas of wetlands identified on-site. The total area of the wetland is approximately 0.57 acres. Of these the majority, 0.47 acres are present on the remaining undisturbed portion of the property and will remain undisturbed. The disturbed area, identified as area ‘E’ and area ‘F’ are located along the east property line, and are required to be filled to facilitate the construction of the drive aisle in the area. The total area of the disturbed wetland area is 0.1 acre. All work and associated permitting will be done in accordance with local and state agency reviews. No floodplain, floodway or open water exist on-site.

The proposed site plan attempts to minimize impacts on the site, by providing a compact area of development, sharing parking facilities, in an arrangement complimentary to the adjacent developments on the east and west.

Should there be any questions pertaining to the above, please call us at (248) 332-7931.

Respectfully,
Nowak and Fraus Engineers

_____
Michael D. Peterson, P.E.
Principal

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

MEMO

VIA EMAIL: ammar@winvestorsgroup.com

To:	**W Investment Holdings, LLC**
From:	**Julie M. Kroll, PE, PTOE** **Mason Gamble, EIT** **Fleis & VandenBrink Engineering**
Date:	**December 12, 2023**
Re:	**1614 W. Grand River Avenue** **Traffic Impact Study - Cover Memo**

1 INTRODUCTION

This memorandum presents the results of the traffic volume comparison and trip generation analysis for the proposed development that includes a provisioning center and mini-warehouse/self-storage facility site, located at 1614 W. Grand River Avenue in Meridian Township, Michigan. Fleis & VandenBrink (F&V) previously completed a Traffic Impact Study (TIS) for the provisioning center use only, dated January 21, 2020. Since this study was completed, the site plan has been revised and now includes the two (2) uses on the property. Additionally, traffic volumes utilized in the study were over five (5) years old at this time. Therefore, the Township has requested a comparison of the 2018 traffic volumes utilized in the TIS to the available current traffic volume data and a comparison between the trip generation calculations associated with the previous TIS and the currently proposed development plans for this site.

The scope of the study was developed based on Fleis & VandenBrink's (F&V) understanding of the development program, accepted traffic engineering practice, information provided by Meridian Township, and methodologies published by the Institute of Transportation Engineers (ITE).

2 TRAFFIC VOLUME COMPARISON

The previous 2020 TIS utilized turning movement count data that was collected by Traffic Engineering Associates (TEA) in 2018. Therefore, a comparison with current traffic volume data was evaluated, in order to verify the accuracy of the previous analyses. The MDOT Transportation Data Management System (TDMS) was utilized to review historical traffic volume data and Average Annual Daily Traffic (AADT) volume information along the study roadways of Grand River Avenue and Dobie Road / Central Park Drive. The results of the comparison are summarized in **Table 1**.

Table 1: Traffic Volume (AADT) Comparison

Year	Grand River (At Dobie Rd.)	Dobie Road / Central Park (At Grand River Ave.)	Grand River (E. of Hamilton Rd.)	Average
2018	0%	0%	0%	0%
2019	-4%	0%	-1%	-2%
2020	-20%	-15%	-20%	-18%
2021	+14%	+14%	+5%	11%
2022	+1%	0%	+1%	1%
2023*	+1%	+1%	+1%	1%
Difference (2018 – 2023)	**-8%**	**0%**	**-14%**	**-7%**

**Estimated Growth Rate*

27725 Stansbury Boulevard, Suite 195
Farmington Hills, MI 48334
P: 248.536.0080
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The result of the comparison indicates that the historical AADT (vpd) data has been decreasing on the adjacent roadways since 2018. Therefore, the 2018 TEA turning movement counts that were utilized in the original 2020 TIS are expected to provide a conservative analysis of the current 2023 conditions.

3 TRIP GENERATION ANALYSIS

The number of weekday peak hour (AM and PM) and daily vehicle trips that would be generated by the proposed development was forecast based on data published by ITE in the *Trip Generation, 11th Edition*. It should be noted that the trip generation analysis completed for this site in the F&V 2020 TIS utilized the ITE *Trip Generation, 10th Edition.* No changes to the previous trip generation calculations were made for this comparison. The site trip generation forecast is summarized in **Table 2**.

Table 2: Site Trip Generation Comparison

Scenario	Land Use	ITE Code	Size	Unit	Average Daily Traffic (vpd)	AM Peak Hour (vph)			PM Peak Hour (vph)		
						In	Out	Total	In	Out	Total
Previous Site Plan (1/21/2020 TIS)	Marijuana Dispensary*	882	5,430	SF	1,372	32	25	57	60	59	119
Current Site Plan (2023)	Marijuana Dispensary	882	4,000	SF	844	22	20	42	38	38	76
	Mini Warehouse	151	127,500	SF	185	6	5	10	9	10	19
Difference					**-343**	**-4**	**0**	**-4**	**-13**	**-11**	**-24**

**ITE Trip Generation 10th Edition*

4 CONCLUSIONS

- The results of the traffic volume comparison indicates that the historical AADT (vpd) data has been decreasing since 2018. Therefore, the turning movement counts that were utilized in the original 2020 TIS are expected to provide a conservative analysis of the current 2023 conditions.
- The trip generation comparison indicates that the currently proposed site plan will generate **less trips** than the trip generation projections utilized for the previous 2020 TIS, based on the reduced building size and the updated ITE rates and equations.
- The results of this comparison show that trip generation and the traffic volumes in 2023 are *less* that the analysis that was performed in 2020. Therefore, the proposed development is expected to have less of an impact to the adjacent roadway network than evaluated in the 2020 TIS.

Any questions related to this memorandum, study, analysis, and results should be addressed to Fleis & VandenBrink.

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Michigan.

Julie M. Kroll 12/12/2023

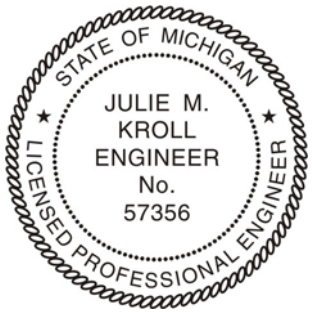
Attachments: Proposed Site Plan
2020 Traffic Impact Study

MG:jmk

PROPOSED PROVISION CENTER TRAFFIC IMPACT STUDY

MERIDIAN TOWNSHIP, MICHIGAN

JANUARY 21, 2020



PREPARED FOR:
W INVESTMENT HOLDINGS, LLC
29580 NORTHWESTERN HWY, SUITE 1000
SOUTHFIELD, MI 48034

PREPARED BY:

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

27725 STANSBURY BLVD., SUITE 195
FARMINGTON HILLS, MI 48834

#842350

Notice and Disclaimer

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The opinions, findings, and conclusions expressed herein are those of Fleis & VandenBrink Engineering, Inc. and do not necessarily reflect the official views or policy of the Meridian Township, or the Michigan Department of Transportation (MDOT), which makes no warranty, either implied or expressed, for the information contained in this document; neither does it assume legal liability or responsibility for the accuracy, completeness or usefulness of this information. Any products, manufacturers or trademarks referenced in this document are used solely for reference purposes.

Agency Review	Date	Comments

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References

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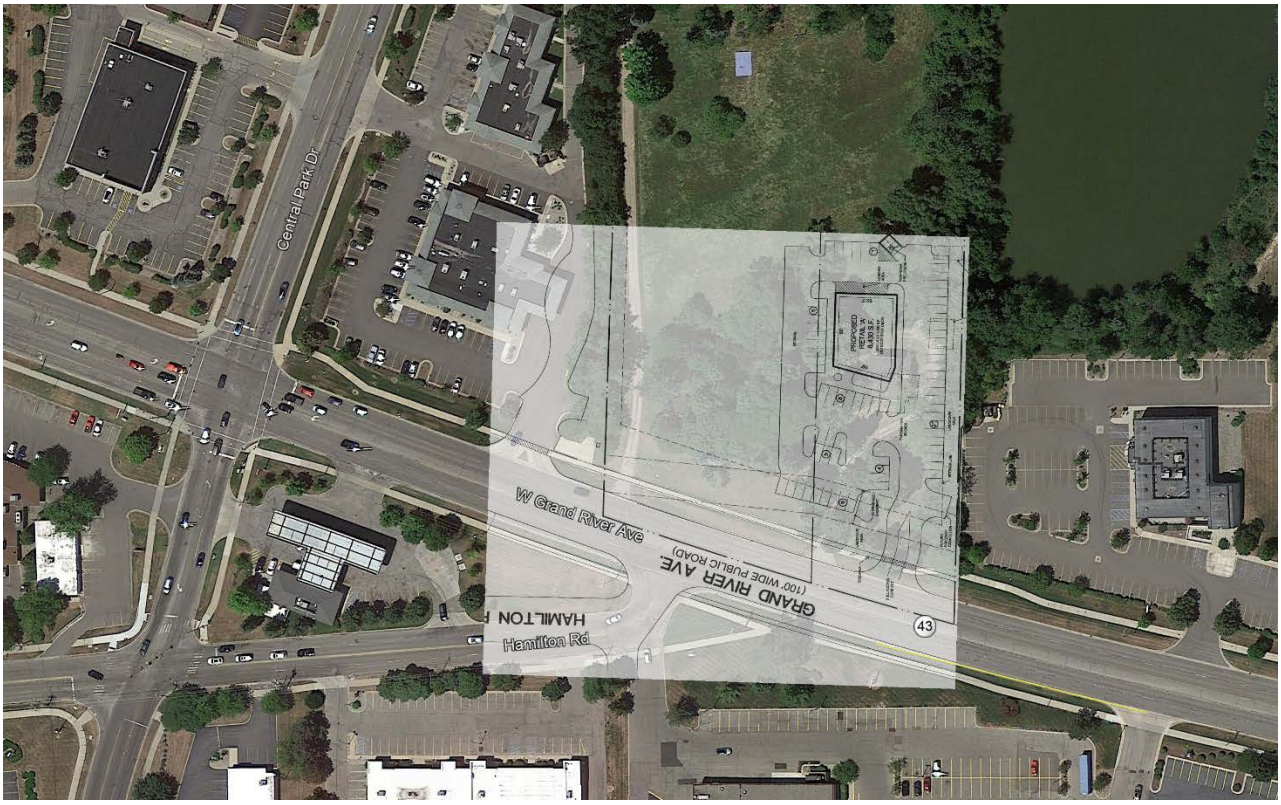
EXECUTIVE SUMMARY

This report presents the results of a Traffic Impact Study (TIS) for the proposed provision center development in Meridian Township, Michigan. The project site is located generally in the northeast quadrant of W. Grand River Avenue and Central Park Avenue, adjacent to the north side of W. Grand River Avenue, opposite the intersection with Hamilton Road, as shown on **Figure E1**. The proposed development includes a 5,430 SF marijuana dispensary with site access to be provided via one site driveway to W. Grand River Ave. The Michigan Department of Transportation (MDOT) has jurisdiction over W. Grand River Ave. (M-43).

FIGURE E1: SITE LOCATION



This TIA has been completed at the request of Meridian Township to identify the impacts (if any) of the proposed development on the proposed site access point and the permitting of the site access. The scope of the study was developed based on Fleis & VandenBrink's (F&V) knowledge of the study area, understanding of the development program, accepted traffic engineering practice, methodologies published by the Institute of Transportation Engineers (ITE) and the requirements of Meridian Township. Additionally, F&V obtained input regarding the scope of work from Meridian Township Planning Department. In accordance with Township Ordinance, a Traffic Impact Study (TIS) is required for site plan approval.

EXISTING OPERATIONS

The existing conditions analysis included the evaluation of the existing 2020 operations at the study intersections. The results of the existing conditions analysis are summarized below.

Grand River Ave. & Central Park Drive

- During the AM peak hour, the intersection operates well, with an acceptable LOS and queue lengths for all approaches and movements.
- During the PM peak hour, the southbound left-turns on Central Park Drive operate at a LOS E, with excessive queue lengths that extend beyond the existing left-turn lane and impact the southbound through traffic on Central Park Drive.

- In order to improve the existing operations at this intersection mitigation measures were investigated, including signal timing changes and operations.
    - Signal timing optimization **is** recommended.
    - Left-turn phasing *is not* recommended.
- With the signal timing optimization at this intersection the operations improve to acceptable LOS and significantly reduce queue length.

Grand River Ave. & Hamilton Road

- During the both the AM and PM peak hours the intersection operates well, with an acceptable LOS and queue lengths for all approaches and movements.

FUTURE CONDITIONS

The future conditions analysis included the evaluation of the future 2020 operations with the addition of the proposed development traffic at the study intersections. The results of the future conditions analysis are summarized below.

Grand River Ave. & Central Park Drive

- During the AM peak hour the intersection operates well, with acceptable LOS and queue lengths for all approaches and movements.
- During the PM peak hour the southbound left-turns on Central Park Drive operate at a LOS E, with excessive queue lengths that extend beyond the existing left-turn lane and impact the southbound through traffic on Central Park Drive.
    - With the signal timing optimization at this intersection the operations improve to an acceptable LOS and significantly reduce queue length.

Grand River Ave. & Hamilton Road

- During the both the AM and PM peak hours the intersection operates well, with an acceptable LOS and queue lengths for all approaches and movements.

Grand River Ave. & Site Drive

- During both the AM and PM peak hours the intersection operates well, at a LOS B/C during the peak periods with queue lengths of 1-2 vehicles.

ACCESS MANAGEMENT

1. The proposed site driveway meets Grand River Ave. (M-43) Corridor Access Management criterion, provided the exceptions are granted by the Township and MDOT for the following driveways:
    - Tom's Driveway
    - Speedway Driveway
    - Sparrow Driveway
2. There is an existing center left-turn lane adjacent to the site; therefore, only the MDOT right-turn lane criteria was evaluated for the proposed site drive intersection. The results of the analysis show that a right-turn lane or taper is not required.
3. The results of the intersection sight distance analysis show that there will be adequate intersection sight distance at the proposed site driveway on Grand River Ave.

RECOMMENDATIONS

The recommendations of this TIS are as follows:

- MDOT should investigate signal timing optimization at the Grand River & Central Park Drive intersection to improve existing and future PM peak hour operations.

1 INTRODUCTION

This report presents the results of a Traffic Impact Study (TIS) for the proposed provision center development in Meridian Township, Michigan. The project site is located generally in the northeast quadrant of W. Grand River Avenue and Central Park Avenue, adjacent to the north side of W. Grand River Avenue, opposite the intersection with Hamilton Road, as shown on **Figure 1**. The proposed development includes a 5,430 SF marijuana dispensary with site access to be provided via one site driveway to W. Grand River Ave. The Michigan Department of Transportation (MDOT) has jurisdiction over W. Grand River Ave. (M-43).

This TIA has been completed at the request of Meridian Township to identify the impacts (if any) of the proposed development on the proposed site access point and the permitting of the site access. The scope of the study was developed based on Fleis & VandenBrink's (F&V) knowledge of the study area, understanding of the development program, accepted traffic engineering practice, methodologies published by the Institute of Transportation Engineers (ITE) and the requirements of Meridian Township. Additionally, F&V obtained input regarding the scope of work from Meridian Township Planning Department. In accordance with Township Ordinance, a Traffic Impact Study (TIS) is required for site plan approval.

The purpose of this study is to identify the traffic related impacts, if any, of the proposed development project on the adjacent road network. Specific tasks undertaken for this study include the following:

1. **Study Area**
    a. Provide a description of the study area including surrounding land uses, intersection and roadway geometries, speed limits, functional classifications and traffic volume data (where available). In addition, a study area site map showing the site location and the study intersections will also be provided.
2. **Proposed Land Use**
    a. Obtain and review the proposed site plan which includes the proposed land uses, densities, and desired site access locations. A description of the current and proposed land use will be accompanied with a complete project site plan (with buildings identified as to proposed use). A schedule for construction of the development will also be provided.
3. **Existing Conditions**
    a. Provide an analysis of the traffic-related impacts of the proposed development at the following study intersections:
        - Grand River Ave. & Central Park Drive/Dobie Road
        - Grand River Ave. & Hamilton Road
        - Grand River Ave. & Proposed Site Drive
    b. Obtain existing AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak period turning movement counts at the study intersections from Meridian Township for use in this study.
    c. Identify the Existing AM and PM peak hour traffic volumes at the study intersections based on turning movement count data provided.
    d. Calculate the **Existing** vehicle delays, LOS, and vehicle queues at the study intersections during the AM and PM. The analysis will be performed at each of the study intersections. Intersection analysis shall include LOS determination for all approaches and movements. The LOS will be based on the procedures outlined in the HCM 6th Edition, the latest edition of Transportation Research Board's Highway Capacity Manual.
    e. Identify improvements (if any) for the study road network that would be required to accommodate the existing traffic volumes.
4. **Future Background Growth**
    a. If the planned completion date for the project or the last phase of the project is beyond one year of the study, an estimate of background traffic growth for the adjacent street network will be made and included in the analysis.
    b. Calculate the future background traffic volumes based on an appropriate traffic growth determined from local or statewide data to the project build-out year and/or any applicable background developments in the vicinity of this project as identified by Meridian Township.

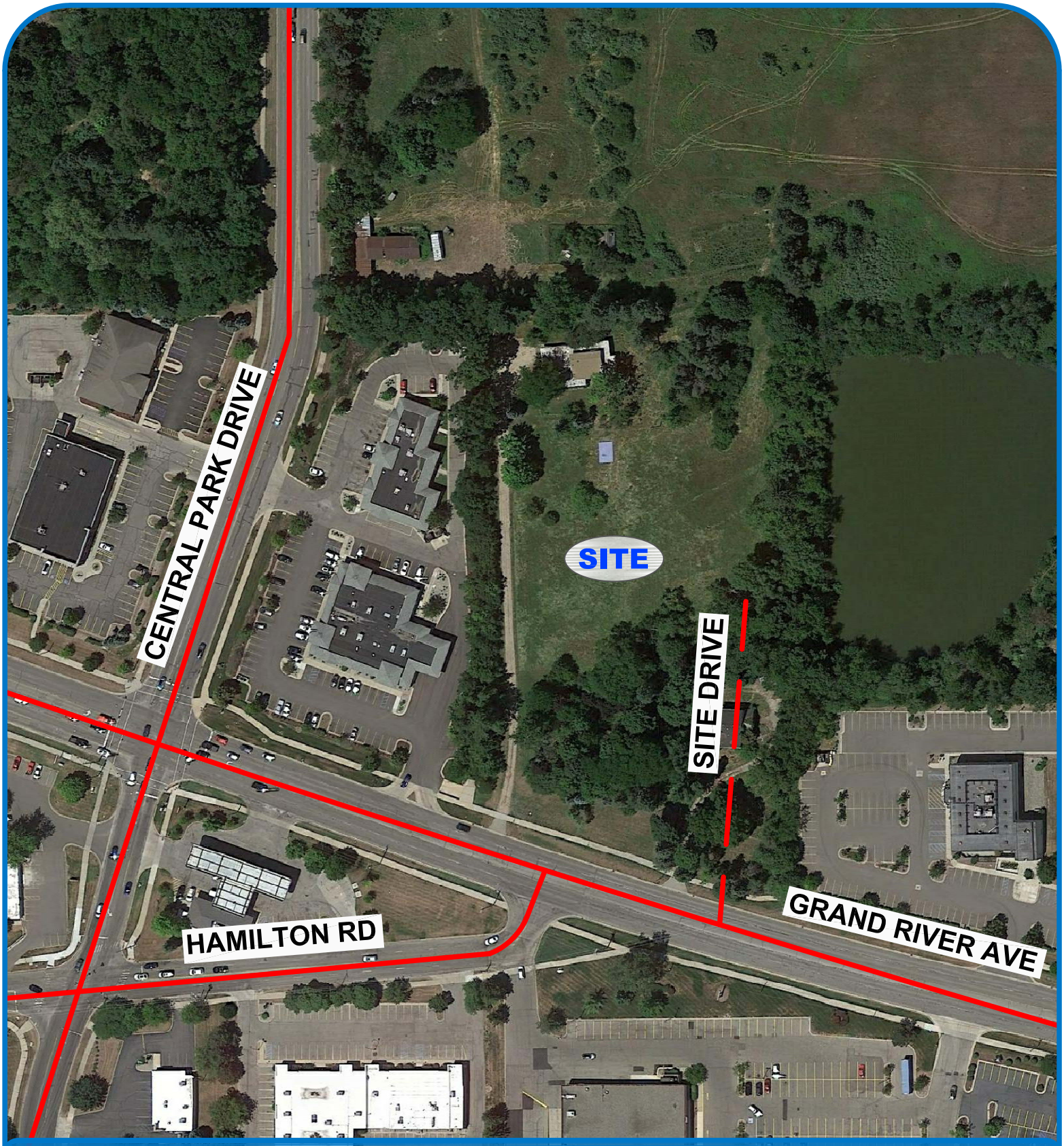


FIGURE 1
SITE LOCATION MAP

PROPOSED PROVISIONING CENTER
MERIDIAN TOWNSHIP, MI

LEGEND

SITE — SITE LOCATION

NORTH
SCALE: NOT TO SCALE

5. **Background Conditions (No Build)**
    a. Calculate the **Background *(without the proposed development)*** vehicle delays, LOS, and vehicle queues at the study intersections during the AM and PM peak periods. Intersection analysis shall include LOS determination for all approaches and movements. The LOS will be based on the procedures outlined in the HCM 6th Edition, the latest edition of Transportation Research Board's Highway Capacity Manual.
    b. Any state, local, or private transportation improvement projects in the project study area that will be underway in the build-out year and traffic that is generated by other proposed developments in the study area will be included as background conditions.
    c. Identify improvements (if any) for the study road network that would be required to accommodate the background traffic volumes.
6. **Trip Generation**
    a. Forecast the number of AM and PM peak hour trips that would be generated by the proposed development based on data published by the Institute of Transportation Engineers (ITE) in *Trip Generation, 10th Edition*.
    b. A table will be provided in the report outlining the categories and quantities of land uses, with the corresponding trip generation rates or equations, and the resulting number of trips.
7. **Trip Distribution and Traffic Assignment**
    a. Assign the trips that would be generated by the proposed development to the adjacent road network based on existing traffic patterns. The distribution of the estimated trip generation to the adjacent street network and nearby intersections shall be included in the report and the basis will be explained. The distribution percentages with the corresponding volumes will be provided in a graphical format.
    b. Combine the site-generated traffic assignments with the background traffic forecasts to establish the Future AM and PM peak hour traffic volumes.
8. **Future Conditions**
    a. Calculate the **Future (with the proposed development)** vehicle delays, LOS, and vehicle queues at the study intersections. Intersection analysis shall include LOS determination for all approaches and movements. The LOS will be based on the procedures outlined in the HCM 6th Edition, the latest edition of Transportation Research Board's Highway Capacity Manual.
    b. Identify improvements (if any) for the study road network that would be required to accommodate the future traffic volumes.
9. **Access Management**
    a. Evaluate the Meridian Township Access Management criteria for the proposed site driveway on Grand River Ave., including adjacent driveway locations, opposite driveway locations, the location and spacing of the proposed site access in relation to the existing adjacent driveway and intersections.
    b. Evaluate the proposed intersection sight distance at the proposed site driveway intersection on Grand River Ave.

The scope of this study was developed based on Fleis & VandenBrink's (F&V) knowledge of the study area, understanding of the development program, accepted traffic engineering practice and information published by the Institute of Transportation Engineers (ITE). In addition, Meridian Township provided input regarding the scope of work for this study. The study analyses were completed using Synchro/SimTraffic (Version 10). Sources of data for this study included Traffic Engineering Associates (TEA) and information provided by Meridian Township, MDOT and ITE. All background information is provided in **Appendix A**.

2 BACKGROUND DATA

2.1 EXISTING ROAD NETWORK

Vehicle transportation for the proposed development is provided via Grand River Avenue located adjacent to the south side of the project site location. The lane use and traffic control at the study intersections are shown on **Figure 2** and the study roadways are further described below. For the purpose of this study, all minor streets and driveways are assumed to have an operating speed of 25 miles per hour (mph).

Grand River Avenue (M-43) runs generally in the east and west directions with a posted speed limit of 45 mph. Grand River Ave. is under the jurisdiction of MDOT and is classified a *Minor Arterial* adjacent to the proposed project site. The study segment has an AADT of approximately 13,250 vehicles per day (MDOT 2019). Grand River has a typical five-lane cross section in the vicinity of the site location, with two lanes in each direction and a center left-turn lane. The intersection with Central Park Drive is signalized, the intersection with Hamilton Road is unsignalized.

2.2 EXISTING TRAFFIC VOLUMES

The existing weekday turning movement count data used in this study were obtained from Meridian Township. TEA performed a traffic impact study in the vicinity of this project in 2018 and turning movement count data was collected at the study intersections for that project. The turning movement count data collected in 2018 was compared to the weekday traffic volume data obtained from the MDOT Traffic Data Management System (TDMS). This data included 24-hour traffic volume data collected on March 11-12, 2019 and recorded in 15-minute intervals. This data was used as a baseline to determine if a background growth rate was necessary to calculate the existing 2020 traffic volume for use in this study. The results of this comparison showed that the 2018 traffic volumes were essentially equal to the 2019 traffic volumes; therefore, no background growth was applied to the 2018 traffic volumes to establish the existing 2020 traffic conditions without the proposed development. The 2018 data were used as a baseline to establish the current 2020 peak hour traffic volumes for the analysis of existing traffic conditions. During collection of the turning movement counts, pedestrian data and commercial truck percentages were recorded and used in the traffic analysis. Peak Hour Factors (PHFs) were also calculated for each study intersection approach.

The peak hour volumes for each intersection were utilized for this study and the volumes were balanced upward through the study network, and through volumes were carried along the main study roadways. The peak hour traffic volumes were identified to occur between 7:45 AM to 8:45 AM and 5:00 PM to 6:00 PM. The traffic volume data are included in **Appendix A** and the existing peak hour traffic volumes used in the analysis are summarized on **Figure 3**.

3 ANALYSIS

3.1 EXISTING CONDITIONS

The existing AM and PM peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersection using Synchro traffic analysis software. The results of the analysis of existing conditions were based on the existing lane use and traffic control shown on **Figure 2**, the existing traffic volumes shown on **Figure 3**, and the methodologies presented in the Highway Capacity Manual 6th Edition (HCM6).

Descriptions of LOS “A” through “F” as defined in the HCM, are provided in **Appendix B** for signalized and unsignalized intersections. Typically, LOS D is considered acceptable, with LOS A representing minimal delay, and LOS F indicating failing conditions. The results of the analysis of existing conditions are presented in **Appendix B** and are summarized in **Table 1**. Microsimulations were also conducted at the study intersections using SimTraffic to further evaluate the network performance.

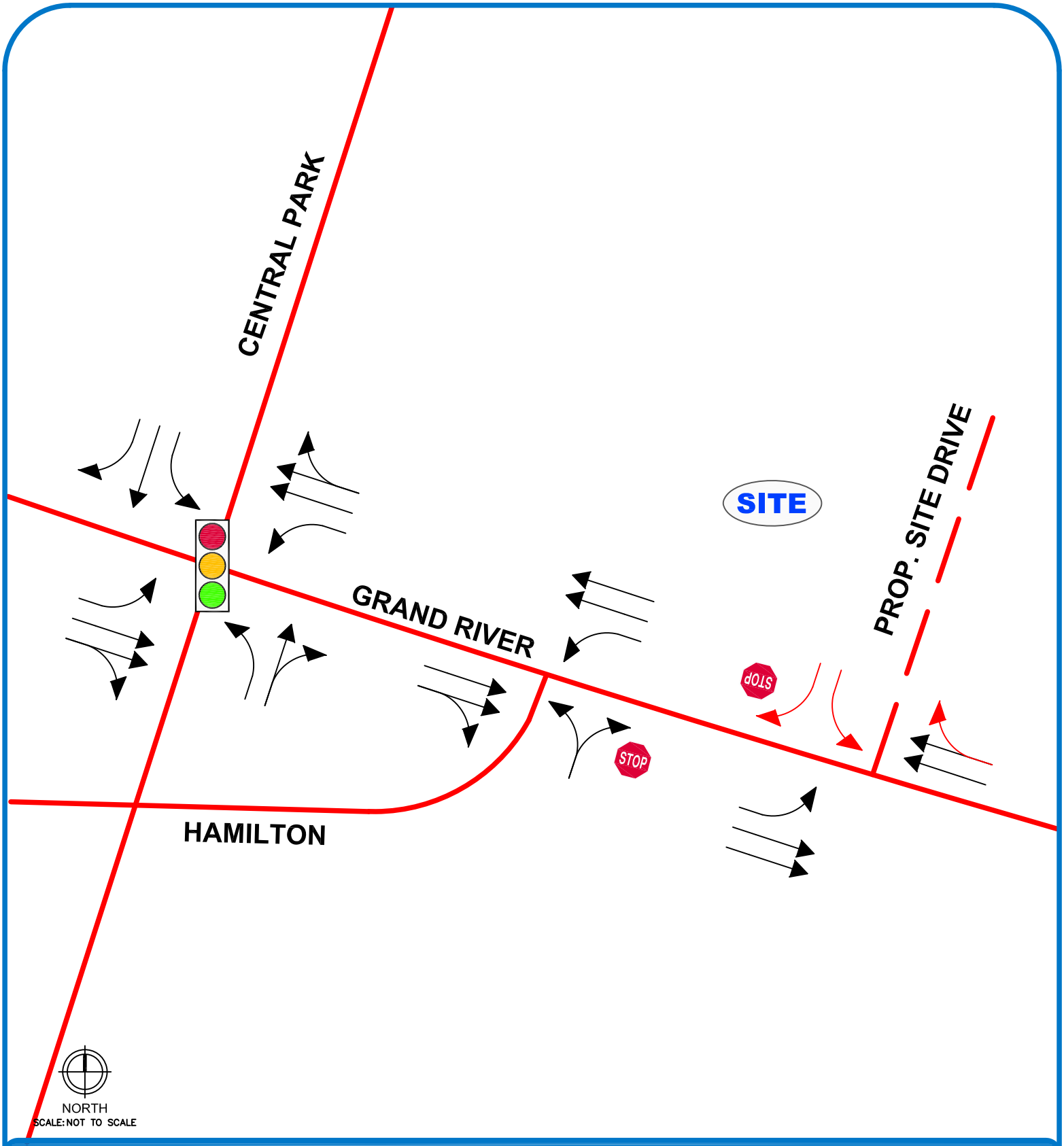


FIGURE 2
LANE USE AND TRAFFIC CONTROL

PROPOSED PROVISIONING CENTER
MERIDIAN TOWNSHIP, MI

LEGEND

- ROADS
- LANE USE
- PROPOSED LANE USE
- UNSIGNALIZED INTERSECTION
- SIGNALIZED INTERSECTION

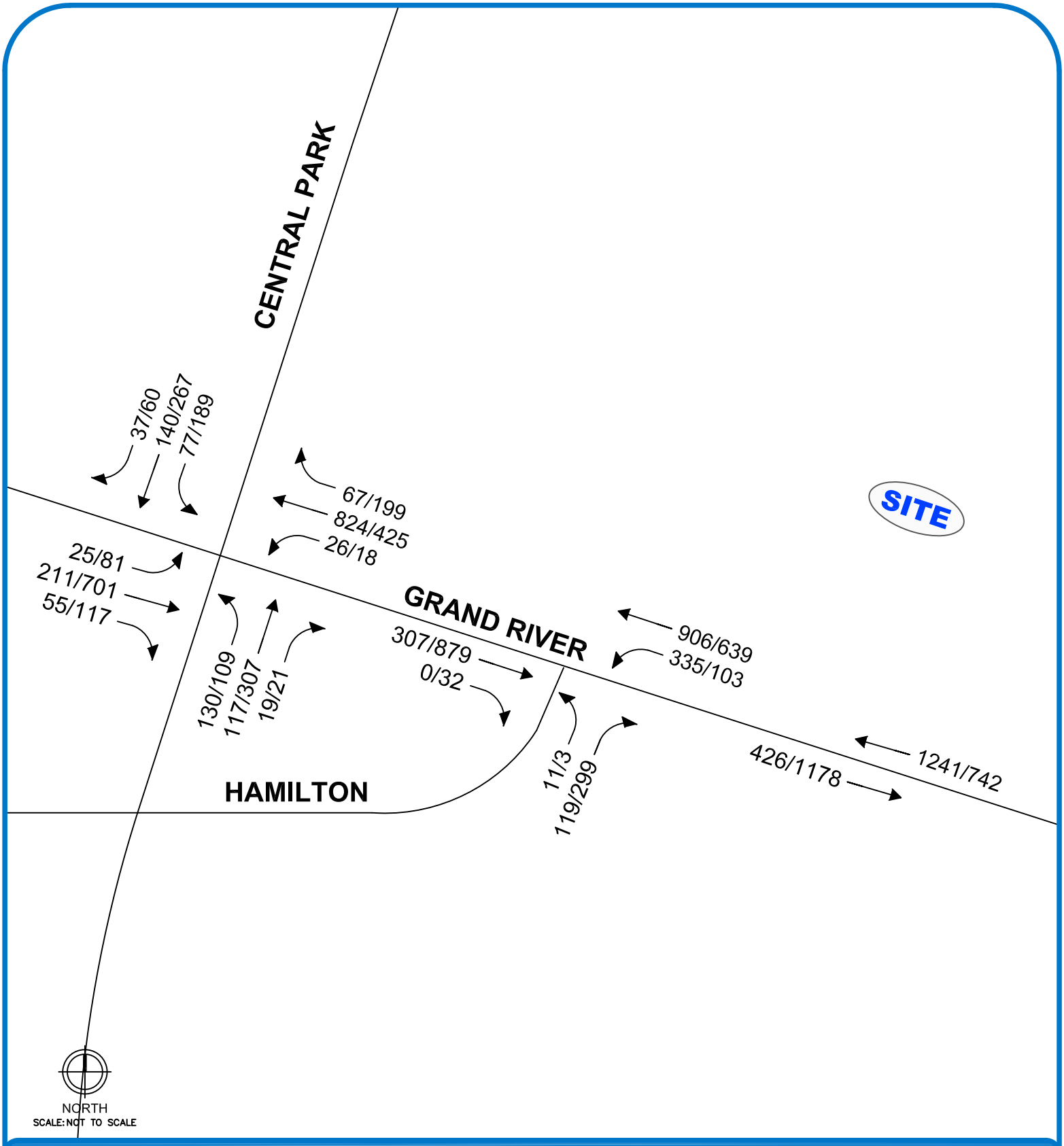


FIGURE 3
EXISTING TRAFFIC VOLUMES

PROPOSED PROVISIONING CENTER
MERIDIAN TOWNSHIP, MI

LEGEND

ROADS

TRAFFIC VOLUMES (AM/PM)

Table 1: Existing Intersection Operations

Intersection		Control	Approach	Existing Conditions							
				AM Peak				PM Peak			
				Delay (s/veh)	LOS	Avg. Queue (ft)	95th% Queue (ft)	Delay (s/veh)	LOS	Avg. Queue (ft)	95th% Queue (ft)
1	Grand River Ave. & Central Park/Dobie	Signalized	NBL	43.6	D	94	170	36.1	D	70	137
			NBTR	32.6	C	65	126	28.8	C	140	240
			SBL	38.6	D	49	95	55.9	E	326	503
			SBT	32.9	C	67	123	27.0	C	441	991
			SBR	30.1	C	17	43	23.3	C	131	647
			EBL	15.8	B	17	48	20.4	C	45	92
			EBT	8.0	A	37	82	14.7	B	95	149
			EBR	7.8	A	8	28	12.6	B	21	53
			WBL	8.9	A	11	42	18.5	B	11	34
			WBTR	11.7	B	125	214	14.8	B	97	162
			Overall	18.4	B			22.4	C		
2	Grand River Ave. & Hamilton Road	STOP (Minor Street)	NB	9.0	A	43	72	26.2	D	67	98
			WBL	9.4	A	40	73	11.1	B	34	76

The results of the existing conditions analysis show that all approaches and movements at the study intersections are currently operating acceptably at a LOS D or better, with the exception of the following:

Grand River Ave. & Central Park Drive

- During the PM peak hour, the southbound left-turns on Central Park Drive operate at a LOS E, with excessive queue lengths that extend beyond the existing left-turn lane and impact the southbound through traffic on Central Park Drive.

3.2 EXISTING IMPROVEMENTS

In order to improve the existing operations at this intersection mitigation measures were investigated, including signal timing changes and operations. The signal timing changes evaluated include optimizing the existing splits, and the amount of green time allocated for N/S and E/W movements. The operations evaluation included a review of the MDOT left-turn phasing calculations to determine if permissive/protected left-turn phasing should be added to the signal operations.

Signal Timing Changes

The signal currently operates during the PM peak hour with the 100 sec cycle length and 60(E/W)/40(N/S) splits. The 40 seconds does not provide adequate time to accommodate the existing southbound left-turn volume on the Central Park Drive approach. Therefore, the splits were optimized to provide 46(E/W)/54(N/S). The results of this change in signal timing are summarized below in **Table 2** and show significant improvement in the existing operations and reductions in queue lengths on the southbound approach. Furthermore, these changes in signal timing did not impact the operations on Grand River Ave.

Left-Turn Phasing

The MDOT left-turn phasing analysis spreadsheet was used to evaluate the existing left-turn volumes at this intersection to determine if separate left-turn phasing should be provided. The results of the analysis are attached and show that permissive/protected left-turns are warranted only on the SB Central Park Drive approach during the PM peak hour. Therefore, left-turn phasing is not recommended at this intersection to mitigate existing left-turn delays.

Table 2: Existing Intersection Operations-With Improvements

Intersection		Control	Approach	PM Peak Period											
				Existing Conditions				Existing with Improvements				Difference			
				Delay (s/veh)	LOS	Avg. Queue (ft)	95th% Queue (ft)	Delay (s/veh	LOS	Avg. Queue (ft)	95th% Queue (ft)	Delay (s/veh)	LOS	Avg. Queue (ft)	95th% Queue (ft)
1	Grand River Ave. & Central Park/Dobie	Signalized	NBL	36.1	D	70	137	30.5	C	62	118	-5.6	D to C	-8	-19
			NBTR	28.8	C	140	240	24.2	C	127	223	-4.6	n/c	-13	-17
			SBL	55.9	E	326	503	39.3	D	119	200	-16.6	E to D	-207	-303
			SBT	27.0	C	441	991	23.0	C	106	186	-4.0	n/c	-335	-805
			SBR	23.3	C	131	647	20.0	B	20	42	-3.3	C to B	-111	-605
			EBL	20.4	C	45	92	25.0	C	47	101	4.6	n/c	2	9
			EBT	14.7	B	95	149	18.0	B	125	199	3.3	n/c	30	50
			EBR	12.6	B	21	53	15.4	B	19	46	2.8	n/c	-2	-7
			WBL	18.5	B	11	34	22.6	C	15	40	4.1	B to C	4	6
			WBTR	14.8	B	97	162	18.3	B	112	183	3.5	n/c	15	21
			Overall	22.4	C			21.8	C			-0.6	n/c		

3.3 BACKGROUND CONDITIONS

Since the proposed development is anticipated to be constructed and completed within the next year, existing conditions were assumed equal to background (no build) conditions with a project buildout year of 2020.

3.4 SITE TRIP GENERATION

The number of Weekday AM and PM peak hour and daily vehicle trips that would be generated by the proposed development was forecast based on data published by ITE in the *Trip Generation Manual, 10th Edition*. The site trip generation forecast is summarized in **Table 3**.

Table 3: Site Trip Generation

Land Use	ITE Code	Amount	Units	Average Daily Traffic (vpd)	AM Peak Hour (vph)			PM Peak Hour (vph)		
					In	Out	Total	In	Out	Total
Marijuana Dispensary	882	5,430	SF	1,372	32	25	57	60	59	119

3.5 SITE TRAFFIC ASSIGNMENT

The vehicular trips that would be generated by the proposed development were assigned to the study roads based on existing peak hour traffic patterns in the adjacent roadway network, the proposed site access points, and the methodologies published by ITE. To determine trip distribution using the adjacent street traffic, it was assumed that the development land uses are trip generators; therefore, the global trip generation is based on trips entering the study network and traveling to the development. The ITE trip distribution methodology also assumes that new trips will return to their direction of origin. The resulting site trip distributions used in the analysis are summarized in **Table 4**.

Table 4: Site Trip Distribution

To / From	Via	AM	PM
West	Grand River Ave.	13%	31%
East	Grand River Ave.	57%	25%
South/West	Hamilton Rd./Dobie Rd.	18%	26%
North	Central Park Drive	12%	18%
Total		100%	100%

The vehicular traffic volumes shown in **Table 3** were distributed to the roadway network according to the distribution shown in **Table 4**. The site generated trips are shown on **Figure 4** and were added to the future existing traffic volumes shown on **Figure 2** to calculate the future peak hour traffic volumes with the proposed development, as shown on **Figure 5**.

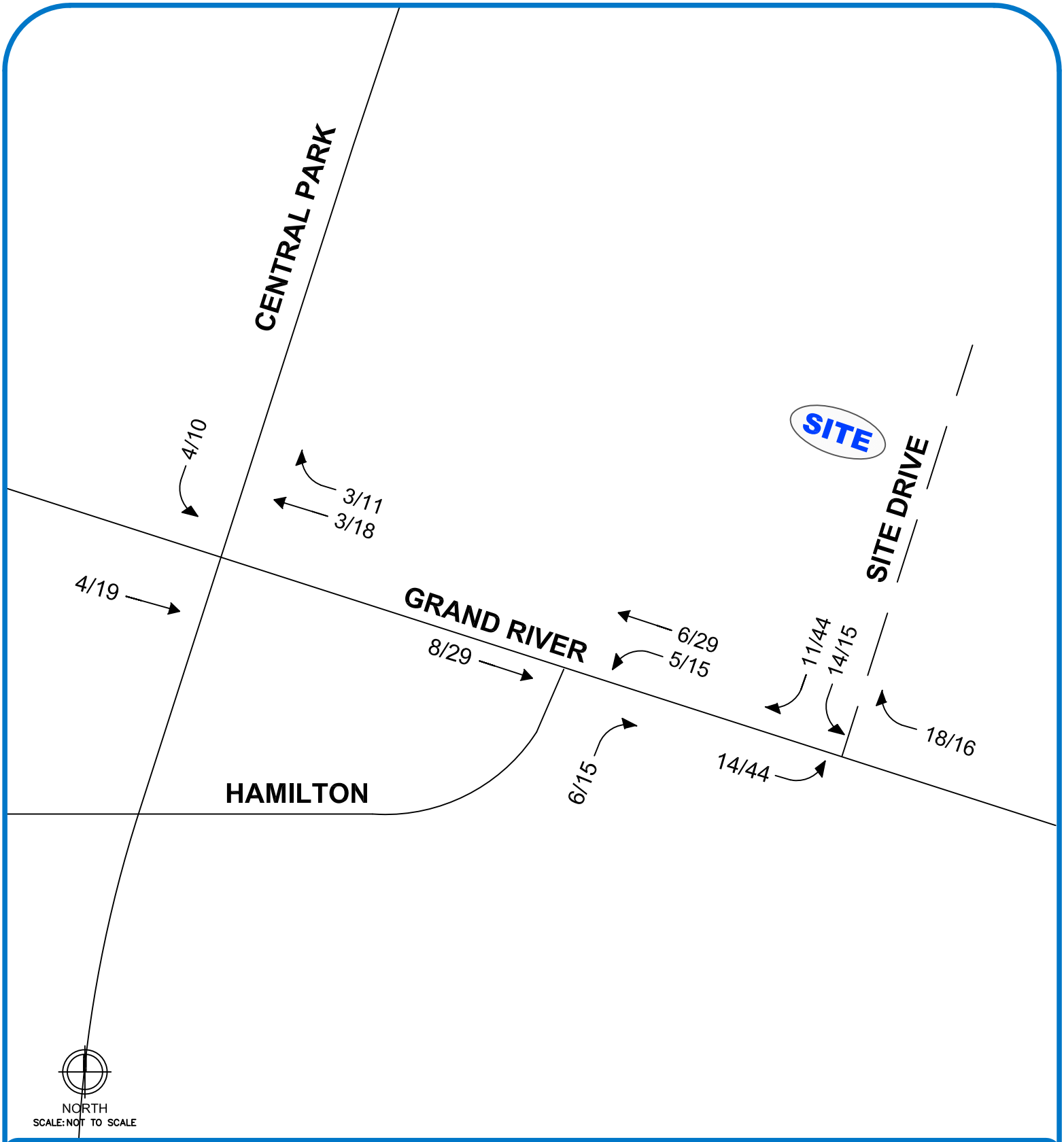


FIGURE 4
SITE-GENERATED TRAFFIC VOLUMES

PROPOSED PROVISIONING CENTER
MERIDIAN TOWNSHIP, MI

LEGEND

ROADS

TRAFFIC VOLUMES (AM/PM)

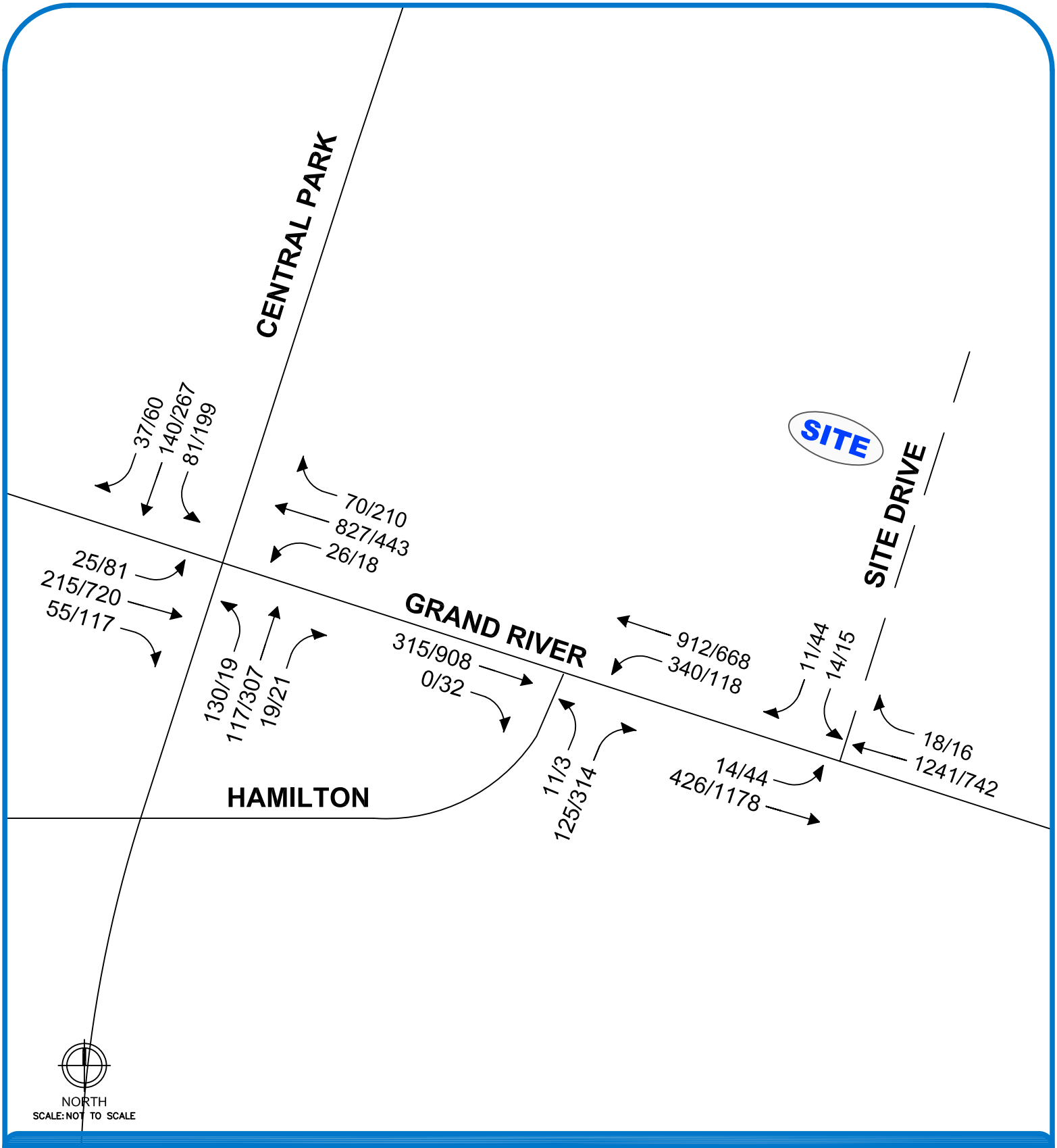


FIGURE 5
FUTURE TRAFFIC VOLUMES

PROPOSED PROVISIONING CENTER
MERIDIAN TOWNSHIP, MI

LEGEND

ROADS

TRAFFIC VOLUMES (AM/PM)

3.6 FUTURE CONDITIONS

The future peak hour vehicle delays and LOS ***with the proposed development*** were calculated based on the existing lane use and traffic control shown on **Figure 2**, the proposed site access plan, the future traffic volumes shown on **Figure 5**, and the methodologies presented in the HCM6. The results of the future conditions analysis are presented in **Appendix C** and are summarized in **Table 5.**

Table 5: Future Intersection Operations

Intersection		Control	Approach	AM Peak Period											
				Existing Conditions				Future Conditions				Difference			
				Delay (s/veh)	LOS	Avg. Queue (ft)	95th% Queue (ft)	Delay (s/veh)	LOS	Avg. Queue (ft)	95th% Queue (ft)	Delay (s/veh)	LOS	Avg. Queue (ft)	95th% Queue (ft)
1	Grand River Ave. & Central Park Drive/Dobie Road	Signalized	NBL	43.6	D	94	170	43.6	D	82	139	0.0	n/c	-12	-31
			NBTR	32.6	C	65	126	32.6	C	67	129	0.0	n/c	2	3
			SBL	38.6	D	49	95	38.9	D	52	101	0.3	n/c	3	6
			SBT	32.9	C	67	123	32.9	C	67	120	0.0	n/c	0	-3
			SBR	30.1	C	17	43	30.1	C	17	44	0.0	n/c	0	1
			EBL	15.8	B	17	48	15.9	B	16	50	0.1	n/c	-1	2
			EBT	8.0	A	37	82	8.0	A	36	74	0.0	n/c	-1	-8
			EBR	7.8	A	8	28	7.8	A	15	24	0.0	n/c	7	-4
			WBL	8.9	A	11	42	8.9	A	12	36	0.0	n/c	1	-6
			WBTR	11.7	B	125	214	11.7	B	126	210	0.0	n/c	1	-4
			Overall	18.4	B			18.4	B			0.0	n/c		
2	Grand River Ave. & Hamilton Road	STOP (Minor Street)	NB	9.0	A	43	72	9.3	A	42	71	0.3	n/c	-1	-1
			WBL	9.4	A	40	73	9.5	A	41	71	0.1	n/c	1	-2
3	Grand River Ave. & Site Drive	STOP (Minor Street)	SBL					28.7	D	15	42	28.7	D	15	42
			SBR					14.5	B	10	33	14.5	B	10	33
			EBL					12.5	B	9	32	12.5	B	9	32

Intersection		Control	Approach	PM Peak Period											
				Existing Conditions				Future Conditions				Difference			
				Delay (s/veh)	LOS	Avg. Queue (ft)	95th% Queue (ft)	Delay (s/veh)	LOS	Avg. Queue (ft)	95th% Queue (ft)	Delay (s/veh)	LOS	Avg. Queue (ft)	95th% Queue (ft)
1	Grand River Ave. & Central Park/Dobie	Signalized	NBL	36.1	D	70	137	36.1	D	62	124	0.0	n/c	-8	-13
			NBTR	28.8	C	140	240	28.8	C	153	258	0.0	n/c	13	18
			SBL	55.9	E	326	503	60.3	E	380	528	4.4	n/c	54	25
			SBT	27.0	C	441	991	27.0	C	695	1276	0.0	n/c	254	285
			SBR	23.3	C	131	647	23.3	C	360	1138	0.0	n/c	229	491
			EBL	20.4	C	45	92	21.0	C	39	84	0.6	n/c	-6	-8
			EBT	14.7	B	95	149	14.9	B	102	159	0.2	n/c	7	10
			EBR	12.6	B	21	53	12.6	B	17	47	0.0	n/c	-4	-6
			WBL	18.5	B	11	34	18.8	B	13	37	0.3	n/c	2	3
			WBTR	14.8	B	97	162	15.2	B	98	164	0.4	n/c	1	2
			Overall	22.4	C			22.8	C			0.4	n/c		
2	Grand River Ave. & Hamilton Road	STOP (Minor Street)	NB	26.2	D	67	98	30.1	D	70	100	3.9	n/c	3	2
			WBL	11.1	B	34	76	11.5	B	42	81	0.4	n/c	8	5
3	Grand River Ave. & Site Drive	STOP (Minor Street)	SBL					22.4	C	13	38	22.4	C	13	38
			SBR					11.6	B	25	53	11.6	B	25	53
			EBL					9.7	A	19	47	9.7	A	19	47

Note: Slight variations (+/-) in the vehicle queuing from existing and future conditions are due to the multiple iterations included in the SimTraffic modeling of the network. Approaches/movements with significant increases in queue lengths were further evaluated for mitigation measures as summarized in Section 3.7.

The results of the future conditions analysis show that all approaches and movements at the study intersections are expected to operate in a manner similar to existing conditions, operating acceptably at a LOS D or better, with the exception of the following:

Grand River Ave. & Central Park Drive

- During the PM peak hour, the southbound left-turns on Central Park Drive will continue to operate at a LOS E, with excessive queue lengths that extend beyond the existing left-turn lane and impact the southbound through traffic on Central Park Drive.

3.7 FUTURE IMPROVEMENTS

In order to improve traffic operations to a LOS D or better for all approaches and movements at the study intersections under future conditions ***with the proposed development***, mitigation measures were investigated. The results of the analyses are summarized in **Table 6** and summarized below.

- Signal timing optimization was evaluated for Grand River Ave. & Central Park Drive and found to adequately mitigate the impact of the proposed development and improve the existing operations.

Table 6: Future Intersection Operations with Improvements

Intersection		Control	Approach	PM Peak Period											
				Future Conditions				Future with Improvements				Difference			
				Delay (s/veh	LOS	Avg. Queue	95th% Queue	Delay (s/veh	LOS	Avg. Queue	95th% Queue	Delay (s/veh)	LOS	Avg. Queue	95th% Queue
1	Grand River Ave. & Central Park/Dobie	Signalized	NBL	36.1	D	62	124	29.7	C	60	122	-6.4	D to C	-2	-2
			NBTR	28.8	C	153	258	23.6	C	119	206	-5.2	n/c	-34	-52
			SBL	60.3	E	380	528	39.1	D	125	207	-21.2	E to D	-255	-321
			SBT	27.0	C	695	1276	22.4	C	105	189	-4.6	n/c	-590	-1087
			SBR	23.3	C	360	1138	19.5	B	17	41	-3.8	C to B	-343	-1097
			EBL	21.0	C	39	84	26.5	C	48	100	5.5	n/c	9	16
			EBT	14.9	B	102	159	18.7	B	126	192	3.8	n/c	24	33
			EBR	12.6	B	17	47	15.8	B	20	45	3.2	n/c	3	-2
			WBL	18.8	B	13	37	23.6	C	14	43	4.8	B to C	1	6
			WBTR	15.2	B	98	164	19.0	B	119	191	3.8	n/c	21	27
			Overall	22.8	C			22.1	C			-0.7	n/c		

3.8 ACCESS MANAGEMENT

3.8.1 Grand River Ave. (M-43) Corridor Access Management

Meridian Township, in coordination with MDOT, has developed access management criteria for use in evaluating proposed site access driveways along this corridor. The access management criteria for the proposed site driveway location are summarized in **Table 7** and shown on **Figure 6**.

Table 7: Intersection/ Driveway Spacing Summary

Adjacent Driveways/ Intersections	Same Side/Opposite	Distance	Meridian Twp. Rec.	Meets Req.
Speedway	Opposite	550	630	NO
Bank of America	Same Side	400	350	YES
Hamilton Road	Opposite-Intersection	225	200	YES
Sparrow (1600 Grand River)	Same Side	317	350	NO
Tom's	Opposite	286	630	YES*

* With exception granted by Meridian Township Planning (minimum 150 ft for non-conflicting left-turns)

In accordance with MDOT guidelines, in the event that a particular parcel lacks sufficient frontage to maintain adequate spacing, the Region/TSC Traffic and Safety and Utility and Permit Engineers have the following options:

1. *Choose the next lowest spacing. For example, on 30 mph roadway requiring 185 ft spacing, the distance may be reduced to no less than 130 ft which is the spacing from 25 mph speed.*

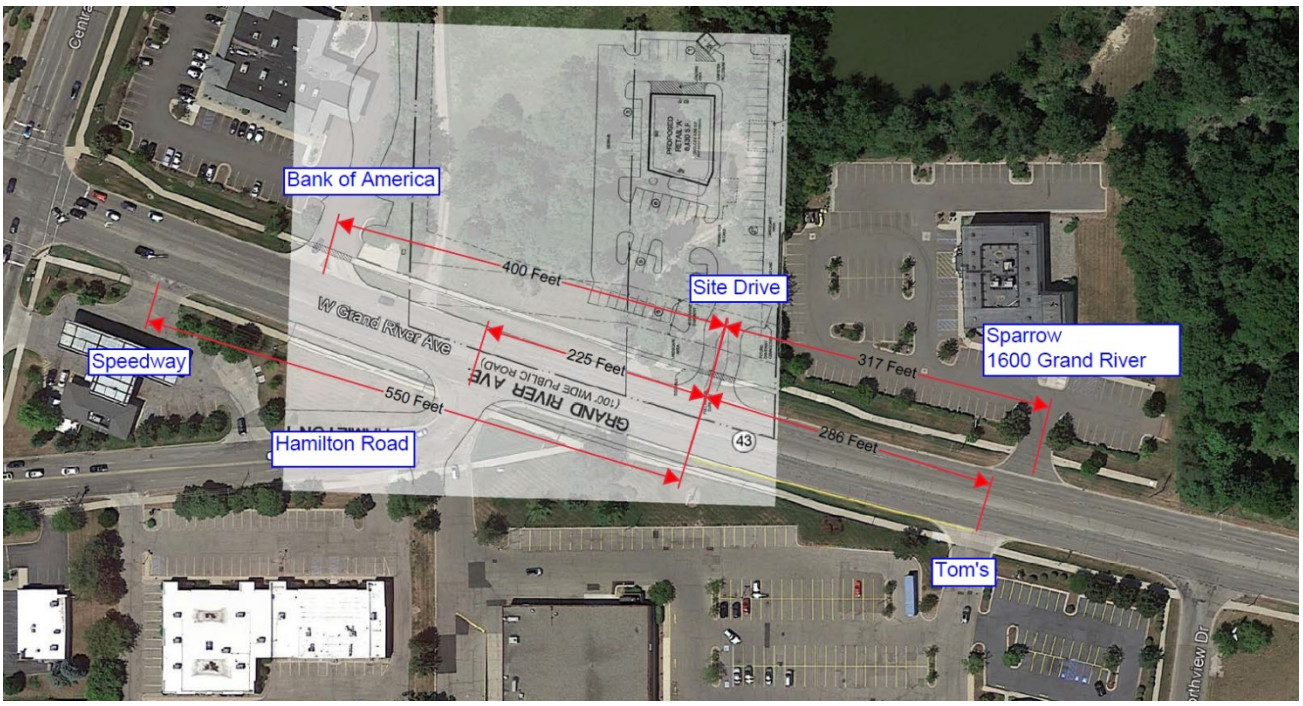
   The next lowest speed was reviewed at the locations that do not meet the minimum spacing requirements. The results of this analysis are summarized in **Table 8** and show that the spacing requirements are still not met at these locations.

Table 8: Intersection/ Driveway Spacing Summary-Alternative Minimums

Adjacent Driveways/ Intersections	Adjacent/Opposite	Distance	Meridian Twp. Rec.	Meets Req.
Speedway	Opposite	550	525	YES
Sparrow (1600 Grand River)	Same Side	317	300	YES

By using the next lowest speed category, all of the driveways and intersections will meet access management spacing criteria. Therefore, none of the further criterion was necessary for consideration for this site driveway.

FIGURE 6: ACCESS MANAGEMENT INTERSECTION SPACING



3.8.2 MDOT Right-Turn Lane Analysis

The MDOT Geometric Design Guidance Sections 1.1.4 (formerly MDOT Traffic & Safety Notes 604A) was utilized in order to determine if a right-turn lane or taper is required at the proposed site driveway. The results of the analysis are provided in **Appendix D** and indicate the following:

- A right-turn radius only is recommended for the proposed Site Drive. No additional right-turn treatment is required.

3.8.3 Intersection Sight Distance Analysis

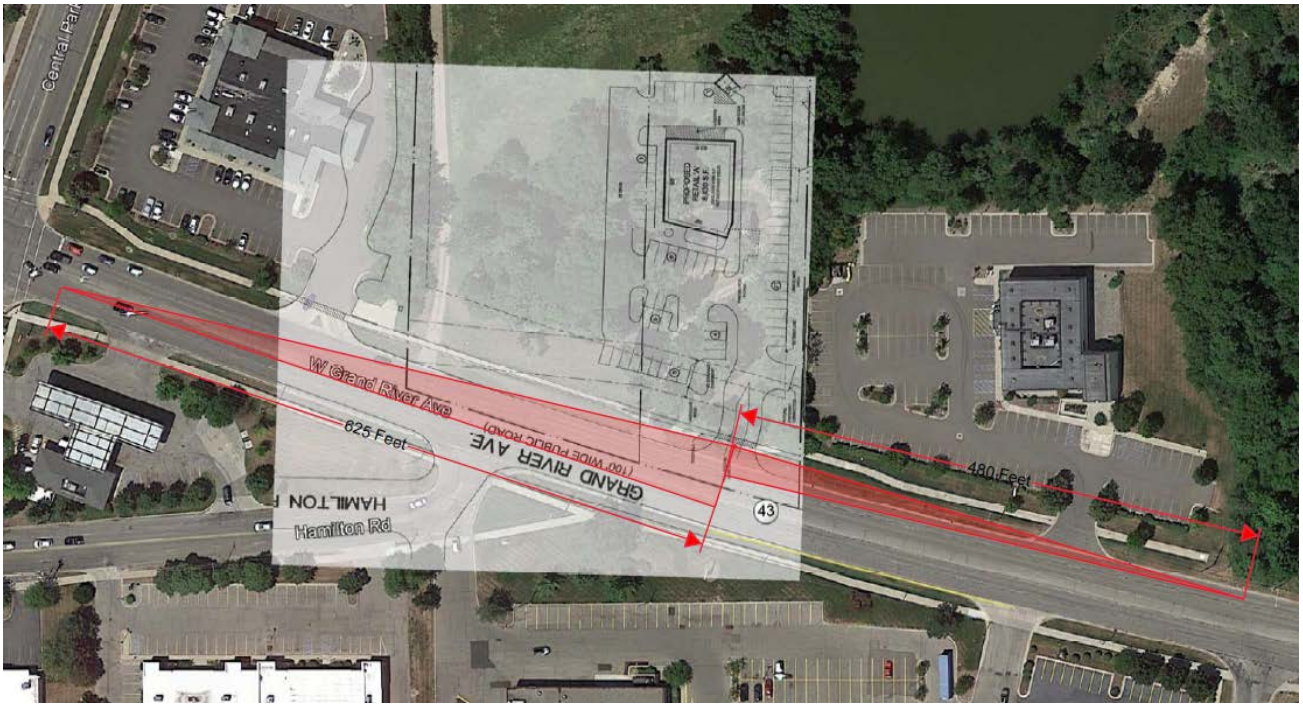
The intersection sight distance was reviewed at the proposed Grand River Ave. & Site Drive intersection. According to *Section 9.5 – Intersection Sight Distance* of the AASHTO design manual *A Policy on Geometric Design of Highways and Streets, 7th Edition (2018),* an intersection sight distance of 625 feet is required for a left turn from a complete stop and a sight distance of 480 feet is required for a right turn from a stopped position at the study intersection based on the existing 45 mph speed limit (50 mph design speed).

The AASHTO manual states that the "vertex (decision point) of the departure sight triangle on the minor road should be 14.5 ft from the edge of the major-road traveled way". This gives an accurate depiction of driver

behavior when making a turn from a minor roadway. The results of the sight distance analysis show that there is adequate sight distance at the proposed intersection location. In addition, this section of Grand River Ave. has very little grade change and vertical distance is not a concern at this location. The intersection sight distance measurements are shown on **Figure 7**.

The results of the intersection sight distance analysis show that there will be adequate intersection sight distance at the proposed site driveway on Grand River Ave. There is the potential for vehicles queued on EB Grand River Ave. at the signalized intersection at Central Park Drive to block the view for egress left-turns; however, based on the vehicle queueing analysis (both with and without recommended signal timing improvements) the peak vehicle queues on this approach will not extend into the sight distance area as shown on **Figure 7**.

FIGURE 7: INTERSECTION SIGHT DISTANCE



4 CONCLUSIONS

The conclusions of this Traffic Impact Study are as follows:

1. The results of the existing conditions analysis show that all approaches and movements at the study intersections are currently operating acceptably at a LOS D or better, with the exception of the Grand River Ave. & Central Park Drive. During the PM peak hour, the southbound left-turns on Central Park Drive operate at a LOS E, with excessive queue lengths that extend beyond the existing left-turn lane and impact the southbound through traffic on Central Park Drive.
2. In order to improve the existing operations at this intersection, mitigation measures were investigated, including signal timing changes and operations.
    a. Signal timing optimization **is** recommended.
    b. Left-turn phasing *is not* recommended.
3. With the addition of site generated traffic volumes, the Grand River Ave. & Central Park Drive intersection is expected to operate similar to existing conditions, with both increased delays and vehicle queue lengths on the southbound approach.
4. In order to improve the future operations at the Grand River Ave. & Central Park Drive intersection, signal timing optimization is recommended.

5. The proposed site driveway is expected to operate well, at LOS B/C during the peak periods with queue lengths of 1-2 vehicles.
6. The proposed site driveway meets Grand River Ave. (M-43) Corridor Access Management criterion, provided the following exceptions are granted by the Township and MDOT.
    a. The Tom's driveway is located opposite the proposed site driveway, approximately 286 feet to the east. The requirement is 630 feet; however, "The Director of Community Planning and Development may reduce this to no less than 150 feet where the offsets are aligned to not create left-turn conflict[1]", as they are in this location.
    b. The Speedway driveway is located opposite the proposed site driveway, approximately 550 feet to the west. The requirement is 630 feet; however, in accordance with MDOT guidelines, in the event that a particular parcel lacks sufficient frontage to maintain adequate spacing, the Region/TSC Traffic and Safety and Utility and Permit Engineers may reduce this and choose the next lowest spacing. The next lowest spacing would be for a design speed of 45 mph, with a spacing criteria of 525 feet. Therefore, the driveway spacing would meet the spacing requirement.
    c. The Sparrow driveway is located on the same side as the proposed site driveway, approximately 317 feet to the east. The requirement is 350 feet; again due to limited frontage, the next lowest spacing is 300 feet. Therefore, the driveway spacing would meet the spacing requirement.
7. There is an existing center left-turn lane adjacent to the site; therefore, only the MDOT right-turn lane criteria was evaluated for the proposed site drive intersection. The results of the analysis show that a right-turn lane or taper is not required.
8. The results of the intersection sight distance analysis show that there will be adequate intersection sight distance at the proposed site driveway on Grand River Ave.

5 RECOMMENDATIONS

The recommendations of this TIS are as follows:

- MDOT should investigate signal timing optimization at the Grand River & Central Park Drive intersection to improve PM peak hour operations.

[1] Ord. No. 2004-06, 9-5-2004, (e) (8)

TRIBUTE OF APPRECIATION FOR COMMISSIONER JERRY RICHARDS FOR OUTSTANDING PUBLIC SERVICE

At a regular meeting of the Township Planning Commission of the Charter Township of Meridian, Ingham County, Michigan, held on the 22nd day of January, 2024 at 6:30 p.m. local time.

PRESENT: _____

ABSENT: _____

The following resolution was offered by _____ and supported by _____.

WHEREAS, Jerry Richards began serving the interests of Meridian Township in 1994, serving as the Township Manager for over 19 years; and

WHEREAS, He continued his public service to the Township starting in 2017, when he was appointed to the Planning Commission; and

WHEREAS, During his six year tenure as Planning Commissioner, Mr. Richards has ably represented the interests of this Planning Commission and the citizens of Meridian Township, serving as the Planning Commission's secretary and also serving on the Building Board of Appeals and the Zoning Board of Appeals; and

WHEREAS, Mr. Richard worked tirelessly to advance and achieve the goals and objectives adopted by this Commission and the Township Board, selflessly contributing valuable focus, perspective, insight and energy to our most challenging efforts and subsequent accomplishments, bringing his background in construction to the decision making process; and

NOW, THEREFORE, BE IT RESOLVED BY THE TOWNSHIP PLANNING COMMISSION OF THE CHARTER TOWNSHIP OF MERIDIAN, INGHAM COUNTY, MICHIGAN, wishes publicly to recognize, commend and thank Jerry Richards for invaluable contributions to and impacts on the work of this Commission and the quality of life in this community. This Commission is grateful for your outstanding public service and wishes you well in your future pursuits.

BE IT FURTHER RESOLVED THAT THE TOWNSHIP PLANNING COMMISSION OF THE CHARTER TOWNSHIP OF MERIDIAN, INGHAM COUNTY, MICHIGAN, hereby adopts this tribute of appreciation to Planning Commissioner Jerry Richards, as presented.

STATE OF MICHIGAN)
) ss
COUNTY OF INGHAM)

I, the undersigned, the duly qualified and acting Chair of the Township Planning Commission of the Charter Township of Meridian, Ingham County, Michigan, DO HEREBY CERTIFY that the foregoing is a true and complete copy of a resolution adopted at a regular meeting of the Township Planning Commission on the 22nd day of January, 2024.

_____
Mark Blumer
Planning Commission Chair

To: **Members of the Planning Commission**

From: **Timothy R. Schmitt, *AICP***
Director of Community Planning and Development

Date: **January 19, 2024**

Re: **Planning Commission Liaison Assignments**

On an annual basis, the Planning Commission assigns liaisons to several Boards and Commissions for the upcoming year. In 2023, the following assignments were made by the Planning Commission:

- Zoning Board of Appeals (ZBA) – Vice Chair Trezise
- Corridor Improvement Authority (CIA) – Commissioner Brooks
- Downtown Development Authority (DDA) – Commissioner Blumer
- Environmental Commission (EC) – Commissioner McConnell
- Economic Development Corporation (EDC) – Commissioner Scales
- Transportation Commission (TC) – Commissioner McCurtis
- Brownfield Redevelopment Authority (BRA) – Vice Chair Trezise

The meeting schedule for those boards is as follows:

- ZBA – 6:30PM on the 3rd Wednesday of the month
- CIA – 6:00 PM on the 3rd Wednesday of the month
- DDA – 7:30AM on the 1st Monday of the month
- EC – 7:00PM on the 1st Wednesday of the month
- EDC – 7:30AM on the 1st Thursday of the month
- TC – On demand, but generally 7:00PM on the 3rd Thursday of every other month
- BRA – On demand, but generally 9AM on the 2nd Thursday of the month

Please let me know if you have any questions in advance of the Planning Commission's meeting. As a reminder for scheduling purposes, the Township Board generally meets on the 1st and 3rd Tuesdays of a month and the Planning Commission on the 2nd and 4th Mondays.