

CHARTER TOWNSHIP OF MERIDIAN
PLANNING COMMISSION
AGENDA

WORK SESSION MEETING
AND
REGULAR MEETING

DECEMBER 21, 2015

Meridian Municipal Building
5151 Marsh Road, Okemos, MI 48864

Work Session Meeting – Administrative Conference Room

1. Call meeting to order at approximately 6:00 p.m.
2. Approval of agenda
3. Discussion
 - A. Master Plan Request for Proposals
4. Public Remarks
5. Adjournment

Regular Meeting – Town Hall Room

1. Call meeting to order at approximately 7:00 p.m.
2. Approval of agenda
3. Approval of minutes
 - A. None
4. Election of the Chair, Vice-Chair and Secretary for 2016
5. Public remarks
6. Communications
7. Public Hearings
 - A. Special Use Permit #15171 (Chick-fil-A), request to construct an 4,730 square foot restaurant with drive-through window
 - B. Special Use Permit #15181 (Chick-fil-A), request to work in the 100-year floodplain to construct a Chick-Fil-A restaurant

Planning Commission Agenda

December 21, 2015

Page 2

- C. Special Use Permit #15-70141 (Chick-fil-A), request for a major special use permit amendment to reduce site area for the Meijer site at 2055 Grand River Avenue
8. Unfinished Business
 - A. Special Use Permit #15161(Okemos Road LLC), develop an 8-unit townhouse project at 3698 Okemos Road
 - B. Special Use Permit #15131 (Paiolero), request to construct a non-residential use in a residential district (optometry clinic) on two undeveloped platted lots located on the east side of Marsh Road north of Haslett Road
 - C. Zoning Amendment #15080 (Township Board), proposal to amend Section 86-473 Street Trees
9. Other Business
 - A. Resolution of appreciation – Tom Deits
10. Township Board, Planning Commission officer, committee chair, and staff comment or reports
 - A. New Applications
 - i. Special Use Permit #16011 (Marriott), request to construct a 67,000 square foot Courtyard by Marriott with 99 room on Jolly Oak Road east of Staybridge Suites.
 - B. Update of Ongoing Projects
 - i. Site Plans Received
 - ii. Site Plans Approved
11. Public Remarks
12. Adjournment

Post Script: NONE

The Planning Commission's Bylaws state agenda items shall not be introduced for discussion or public hearing that is opened after 10:00 p.m. The chair may approve exceptions when this rule would cause substantial backlog in Commission business (Rule 5.14 Limit on Introduction of Agenda Items).

Persons wishing to appeal a decision of the Planning Commission to the Township Board in the granting of a Special Use Permit must do so within ten (10) days of the decision of the Planning Commission (Sub-section 86-189 of the Zoning Ordinance)

**TENTATIVE
PLANNING COMMISSION AGENDA**

**Work Session Meeting
and**

**Regular Meeting
January 11, 2016**

**Meridian Municipal Building
5151 Marsh Road, Okemos, MI 48864**

Work Session Meeting – Administrative Conference Room

1. 2005 Master Plan Update

Regular Meeting – Town Hall Room

1. Public Hearings
 - A. Special Use Permit #16011 (Marriott), request to construct a 67,000 square foot Courtyard by Marriott with 99 room on Jolly Oak Road east of Staybridge Suites.
2. Unfinished Business
 - A. Special Use Permit #15171 (Chick-fil-A), request to construct an 4,730 square foot restaurant with drive-through window
 - B. Special Use Permit #15181 (Chick-fil-A), request to work in the 100-year floodplain to construct a Chick-Fil-A restaurant
 - C. Special Use Permit #15-70141 (Chick-fil-A), request for a major special use permit amendment to reduce site area for the Meijer site at 2055 Grand River Avenue
3. Other Business

**Special Use Permit #15171
(Chick-fil-A, Inc.)
December 21, 2015**

APPLICANT: Jason Hill
Chick-fil-A, Inc.
5200 Buffington Rd
Atlanta, GA 30349

STATUS OF APPLICANT: Option to Purchase Property

REQUEST: SUP to construct a retail building with drive-thru facility

CURRENT ZONING: C-3 (Commercial)

LOCATION: South of Grand River Avenue, between 2041 and 2085 Grand River Avenue, Okemos

AREA OF SUBJECT SITE: Approximately 1.32 acres

EXISTING LAND USE: Undeveloped

EXISTING LAND USES IN AREA: N: McDonalds/Taco Bell
S: Meijer
E: Heat N' Sweep
W: Leo's Lodge

CURRENT ZONING IN AREA: N: C-2 (Commercial)
S: C-3 (Commercial)
E: C-2 (Commercial)
W: C-2 (commercial)

FUTURE LAND USE DESIGNATION: Commercial Core Area

FUTURE LAND USE MAP: N: Commercial Core
S: Commercial Core
E: Commercial Core
W: Commercial Core

CHARTER TOWNSHIP OF MERIDIAN

MEMORANDUM

TO: Planning Commission

FROM: Harmony Gmazel
Harmony Gmazel
Associate Planner

DATE: December 14, 2015

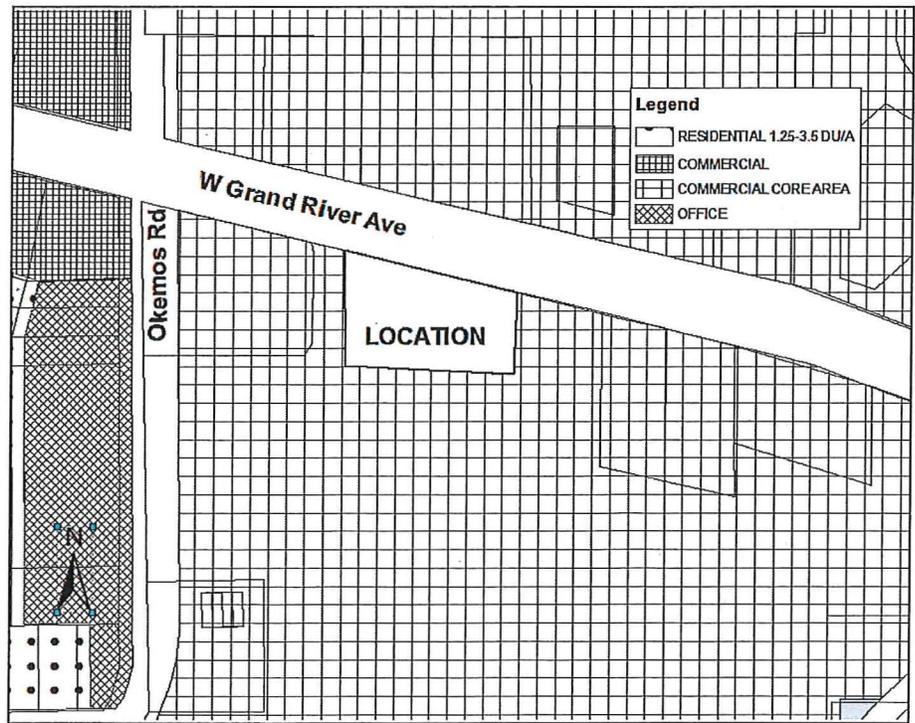
RE: Special Use Permit #15171 (Chick-fil-A, Inc.), construct a fast-food restaurant with a drive-thru facility

Chick-fil-A, Inc. the applicant, has requested a special use permit to construct a 4,730 square foot restaurant building with a drive-thru facility along the south side of Grand River Avenue located between 2041 and 2085 Grand River Avenue, Okemos. The site is undeveloped. The approximate 1.32 acre site is zoned C-3 (Commercial). A drive-thru use is permitted by special use permit in the C-3 district, per Section 86-404(e)(13)

Master Plan

The 2005 Master Plan designates the subject site and its surroundings in the *Commercial Core Area* category.

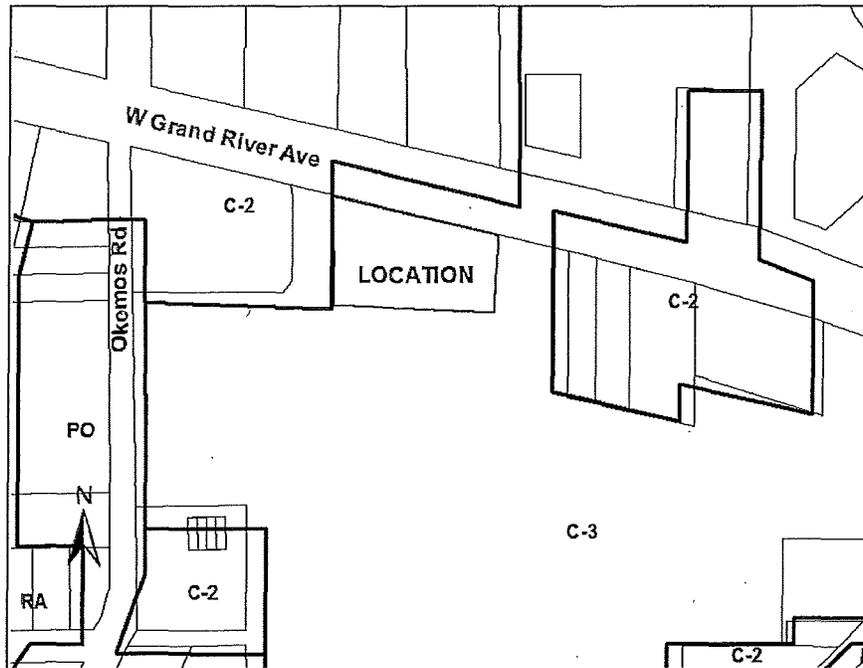
FUTURE LAND USE MAP



Zoning

Sites zoned C-3 Commercial require a minimum 100 feet of lot width and a minimum of 10,000 square feet of lot area. The subject site's lot width along the Grand River Avenue frontage is approximately 354 feet. Lot area is approximately 57,715 sq. ft, or 1.32 acres.

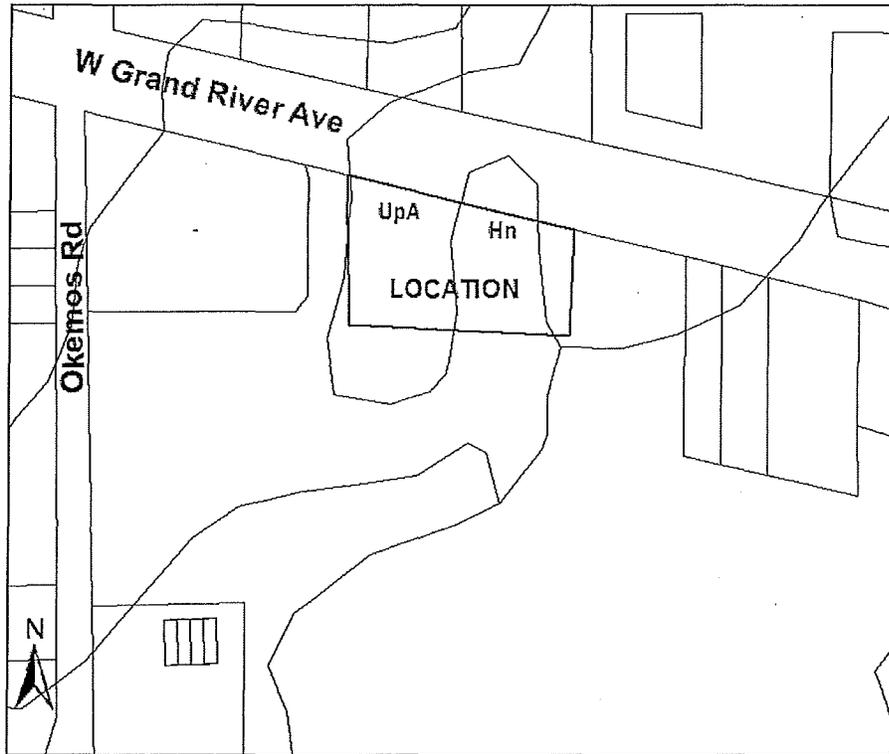
ZONING MAP



Physical Features

Currently the site is vacant with a wetland centrally located on the site. The site gently slopes to the northwest corner west from a high of approximately 844 feet above mean sea level to a low of approximately 839 feet above mean sea level. Elevations below 842.1 feet below mean sea level are designated as a floodplain. Vegetation consists of lawn areas, deciduous trees along Grand River Avenue, and 0.24 acre wetland centrally located on the site. Please refer to the staff report for SUP #15181 for information about floodplain areas on the site.

SOILS MAP

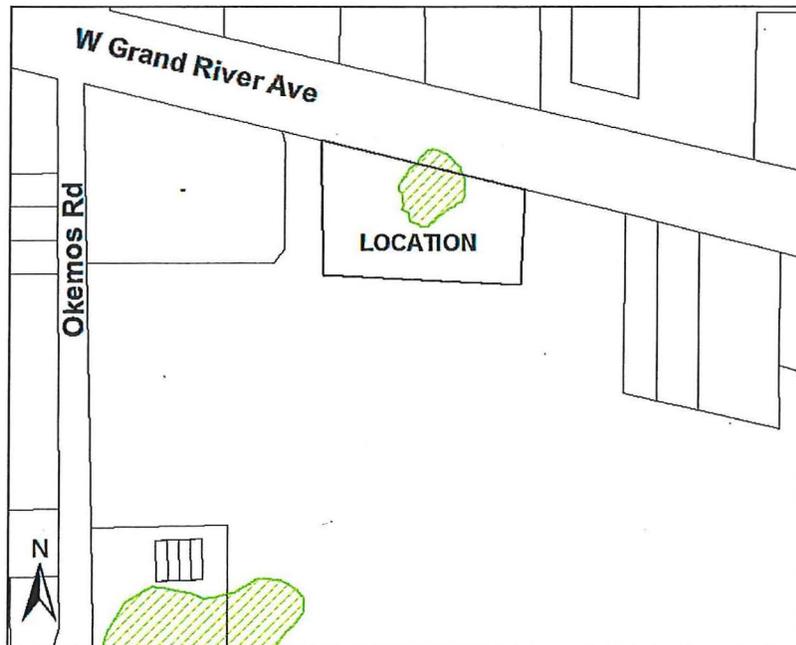


The following chart summarizes soil information for the subject site:

SOIL ASSOCIATION	SEVERE BUILDING SITE LIMITATIONS
Hn (Houghton)	Ponding & Frost Action
UpA (Urban Land-Capac-Colwood)	Wetness, Ponding & Frost Action

Source: Soil Survey of Ingham County, Michigan, 1992.

WETLANDS MAP



Wetlands

Township Wetland 21-11 is located on the central portion of the site and consists of a low-quality, emergent wetland. The applicant completed a Wetland Delineation Report, developed by Terracon, dated July 22, 2015, stating that this wetland is depressional, seasonally flooded and appears to be hydrologically fed by precipitation and sheet flow. Dominant vegetation consists of cattail and green ash. The wetland appears to be isolated. The waterline within the wetland area is at 842.1 feet above sea level, the same elevation as the nearby floodplain.

The Township environmental consultant completed a wetland verification on September 28, 2015 and prepared the findings provided in the attached letter. The consultant inspected the flagged wetland and reviewed the delineation report concurring that the wetland does not meet the definition of a "protected wetland" under Section 105-3(l) of the Township's Wetland Protection Ordinance.

Streets & Traffic

The applicant will not create new access points to the site. The applicant proposes to utilize three existing private access drives along Grand River Avenue/Okemos Road for access to the Chick-fil-A site at 3 access points: 1) Okemos Rd, just south of Leo's Lodge; 2) Grand River Ave, just east of Leo's Lodge; and 3) Grand River Ave, just west of Heat N' Sweep.

Grand River Avenue is a five lane primary arterial with two westbound lanes, two eastbound lanes, and a two-way left turn center lane. Michigan Department of Transportation (MDOT) data shows an average of 24,000 vehicles travel along Grand River Avenue, near the site, between

Okemos Road and Marsh Road daily, based on the MDOT 2013 traffic counts.

The applicant provided a Traffic Impact Study, prepared by Palmer Engineering, dated November 2015. The study area includes the three access points mentioned above. The report provides an analysis of traffic conditions in the study area for a "No-build" scenario, and for the "Proposed" scenario. The "No-Build" Scenario reveals that Grand River Avenue near the site operates at a LOS "D" during peak times with queue lengths at the Okemos Road intersection averaging 12 vehicles. The "Proposed" Scenario is similar to the "No-Build" Scenario, with no notable increase in traffic delays or negative impacts to traffic patterns.

The applicant's traffic analysis shows trip generation estimates for AM and PM peak hours are based on *Fast Food with Drive Thru* (Land Use Code 934), using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition. Approximately 218 total trips are projected on the Chick-fil-A site for the A.M. peak hour and 149 total trips for the P.M. peak hour. An estimated 2,347 daily trips are expected at the site.

The applicant's traffic consultant offered the following conclusions and recommendations:

- All movements on Grand River Avenue operate at an LOS near the no-build levels, so no infrastructure improvements are needed for traffic to continue to operate near the current condition.
- The optimization of existing signals on Grand River Avenue would improve the existing traffic flow as traffic continues to grow in the surrounding areas.

The Township's traffic consultant reviewed the site plan and traffic study and concurs with its findings. The consultant noted that Access Point #3, near Heat N' Sweep is in need of an improved island to prohibit left turns out onto Grand River Avenue. As an offsite improvement, Meijer and MDOT would need to work together to address this island issue at a future date if deemed necessary.

Internal to the site, customer traffic is accommodated by one main drive aisle with access to 55 parking spaces. The drive-thru lane is a "dual-lane" with two order stations combining down to one lane as traffic approaches the pick-up window. A by-pass lane is provided after vehicles move through the ordering station. Bike parking is available at the northwest corner of the building.

The Capital Area Transit Authority (CATA) has two routes that stop along Grand River Avenue as follows: Route 1 which runs between downtown Lansing and Meridian Mall; and Route 23 which runs between Michigan State University, Okemos, and Haslett. A Township's Pedestrian-Bicycle Pathway has been constructed along the frontage of the subject site.

Public Utilities

Public water and sanitary sewer services are available to serve the site.

Storm Water Management

Underground stormwater storage vaults will be installed on the site. Site drainage will be directed to the northwest corner of the site. The Township's Engineering Department has reviewed the proposal and noted review and permits will be required by Michigan Department of Environmental Quality for work in the floodplain, and from the Michigan Department of Transportation for stormwater connections to the Grand River Avenue drain.

Staff Analysis

The applicant has requested a special use permit to construct an approximate 4,730 square foot restaurant building with drive-thru lanes located on the east side of the building. The retail use is allowed by right in the C-3 zoning district however the drive-thru facility requires a special use permit as outlined in Section 86-404(e)(13). The applicant is in the process of purchasing the site from Meijer. Once purchased, a land division is required to separate the site from the original Meijer site. Development of the new parcel is subject to all standards for lot and setback areas, parking, landscaping and impervious surfaces. As applicable, Special Use Permit criteria (Section 86-126 of the Code of Ordinances) are used to evaluate special use permit requests. A copy of the criteria is attached. The following chart summarizes requirements:

Design Objective	Standard	Proposed
Minimum lot width	100 feet	354 feet (Grand River Ave)
Maximum building Coverage	35%	16.60%
Front yard setback	100 feet (GR Ave c/l)	110 feet
Side yard setback (east from the building and west)	20 feet	15 feet
Rear yard setback from the building (south)	20 feet	15.5 feet
Landscape Buffers	4 feet (around building) 15 feet (all other areas)	Meets requirements except for one area with truck-loading zone encroaching into 15-foot buffer
Maximum building Height	35 feet	25.6 feet
Parking	57 (1 space/75 s.f. of usable floor area plus 1 space/4 seats)	55 (Reduced due to proposed bike parking areas)
Bike Parking	6 (1 per 10 car parking spaces)	10 (4 extra spaces)
Impervious Surfaces	70%	66.96%
Stacking Spaces		8 per lane

The minimum lot width, lot coverage, impervious surface and front yard setback requirements are met by the applicant. As required by ordinance, three stacking spaces are provided for the drive-thru lane. A continuous by-pass lane is typical, but the proposal shows a by-pass lane only between the ordering stations and the pick-up window.

Building/Signage

Building details are depicted in the image below. The lower 2/3 of the building on all 4 sides will be of a brick-type material. One wall sign is planned for the north side of the building facing Grand River Avenue. Only one wall sign is permitted. On December 17, 2015, the applicant submitted plans for a free-standing monument sign that incorporates a changing message. Changing message signs are permitted subject to receiving a special use permit from the Planning Commission. Since the sign was not requested as part of Special Use Permit #15171, the applicant may amend the special use permit at which time a second public hearing will be scheduled. Or, as an alternative, the applicant may apply for a new special use permit specifically for the changing message sign.



Setbacks

The 20 foot setback requirements from the building to the west property line and the south property line have not been met. The applicant proposes a 15-foot setback to the west and a 15.5-foot setback to the south. The applicant must apply for a variance if the proposed setbacks are to remain the same as depicted on the site plan.

Landscaping

A landscape plan was submitted to the Township. There is a 4-foot perimeter landscape buffer requirement around the building. On the west side near the building, there is an outdoor patio that encroaches into the landscape buffer. The applicant must identify the location of plantings that would've been placed in the patio area throughout the remaining 4-foot buffer area. The landscaping for this area can be moved to other areas around the building to compensate for

the loss of plantings, and a 15-foot buffer requirement along the parking or open space portions of the site. On the south side of the property, along the drive-thru area, a truck-loading lane encroaches into the 15-foot landscape buffer. Due to the severe encroachment, it is recommended that a variance application be submitted to the Township for the 15-foot buffer.

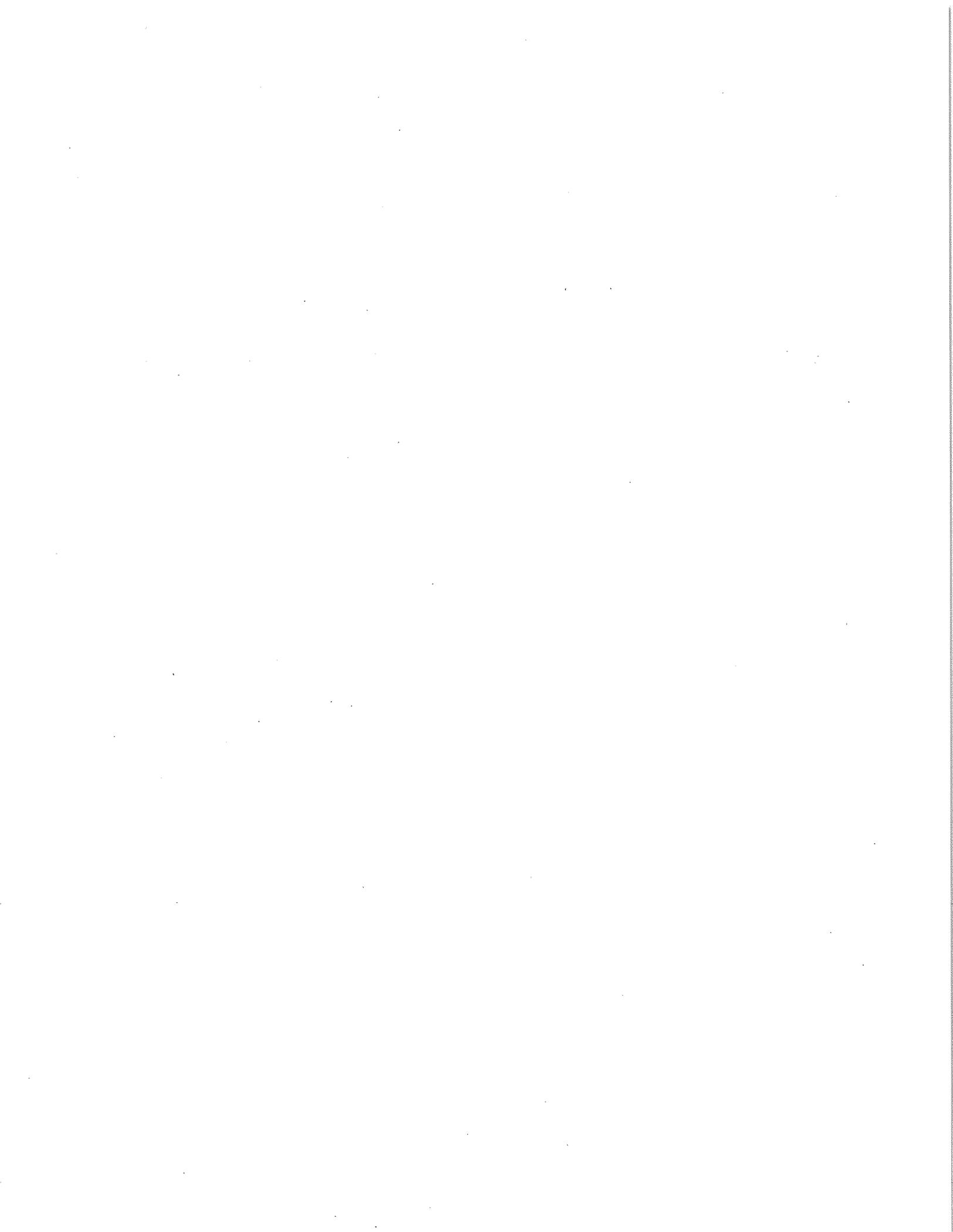
Comments made by the Township Development Review Committee (DRC) have been incorporated into this memorandum.

Planning Commission Options

The Planning Commission may approve, approve with conditions or deny the special use permit. A resolution to approve the drive-thru lane (use) is provided.

Attachments

1. Application and Submittals
2. Special Use Permit criteria (Section 86-126)
3. Letter from Township Traffic Consultant, Dated December 14, 2015
4. Letter from Township Environmental Consultant, Dated October 2, 2015
5. Site Plans, dated November 23, December 11 and 17, 2015



**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 GBC Design, Inc., Gary R. Rouse
Address of Applicant
565 White Pond Drive, Akron, OH 44320 *7/10/7* grouse@gbcdesign.com
Telephone - Work 330-836-0228 Home 330-256-4876 Fax 330-836-5782 Email _____
Interest in property (circle one): Owner Tenant Option Other
(Please attach a list of all persons with an ownership interest in the property.)
2055 W. Grand River Avenue, Okemos, MI 48864
- B. Site address / location / parcel number Part of 33-02-02-21-276-010
Legal description (please attach if necessary)
See attached "Land Division" Submittal
Current zoning C-3
Use for which permit is requested / project name Fast Food Restaurant with a drive-thru; Chick-fil-A
Corresponding ordinance number _____
- C. Developer (if different than applicant) Chick-fil-A, Inc.
Address 5200 Buffington Rd., Atlanta, GA 30349
Telephone - Work 404-684-8530 Home 404-665-7169 Fax 404-684-8550
- D. Architect, Engineer Planner or Surveyor responsible for design of project if different from applicant:
Name GBC Design, Inc.
Address 565 White Pond Drive, Akron, OH 44320
Telephone - Work 330-836-0228 Home _____ Fax 330-836-5782
- E. Acreage of all parcels in the project: Gross 1.32 Net 1.32
- F. Explain the project and development phases: Chick-fil-A intends to construct a new restaurant with a drive-thru on a vacant parcel of land currently owned by Meijer.
- G. Total number of:
Existing: structures 0 bedrooms _____ offices _____ parking spaces 0 carports _____
garages _____ Proposed: structures 1 bedrooms _____ offices _____ parking spaces 55 carports _____
garages _____
- H. Square footage: existing buildings 0 proposed buildings 4730
Usable Floor area: existing buildings _____ proposed buildings 1915
- 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: 12
- J. Existing Recreation: Type N/A Acreage N/A
Proposed Recreation: Type N/A Acreage N/A

Existing Open Space:	Type	Grass	Acreage	1.32
Proposed Open Space:	Type	Landscape/ Planting	Acreage	0.55

- K. If Multiple Housing: N/A
- 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.
- S.

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. Yes. A fast-food restaurant with a drive-thru is a permitted use with a Special Use Permit, as is construction in a Flood Plain.
(2) The project is consistent with applicable land use policies contained in the Township's comprehensive development plan of current adoption. Yes. The Site is Zone C-3 which permits fast-food restaurants with a drive-thru with a Special Use Permit.
(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. Chick-fil-A will be an excellent fit in this commercial area.
(4) The project will not adversely affect or be hazardous to existing neighboring uses. Construction of this Chick-fil-A will not have an adverse or hazardous affect on neighboring uses.
(5) The project will not be detrimental to the economic welfare of surrounding properties or the community. The addition of Chick-fil-A should actually help boost the economic welfare of the surrounding properties and 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. All of the necessary public facilities are available. Stormwater will be detained in detention tanks so that there is no increase to the peak rate of runoff. Although there will be a small amount of fill in the Flood Plain (73 C.Y.) it will be replaced on-site with 129 C.F. of Flood Plain.
(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. Existing facilities are available. Proposed facilities will not adversely affect the existing facilities and will be properly designed to handle the long term needs.
(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. Chick-fil-A will not have an adverse affect on the area.
(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. There is a 0.24 Area area of isolated wetlands on-site. It has been delineated and reviewed by the Township's consultant where it was determined that a Welland Permit will not be necessary.

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.

[X] 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]
Signature of Applicant

11-20-15
Date

Gary R. Rouse
Type/Print Name

Fee: \$1,000.00

Received by/Date: Peter Menser 11-23-15

GBC DESIGN, INC.

565 White Pond Drive • Akron, OH 44320-1123 • Phone 330-836-0228 • Fax 330-836-5782 • www.GBCdesign.com

November 20, 2015

Meridian Township
5151 Marsh Road
Okemos, MI 48864

Attention: Peter Menser

Subject: **Special Use Permit Submittal**
Chick-fil-A #3695
2055 W. Grand River Avenue
Okemos, MI
GBC Project No. 48115



Dear Peter,

Chick-fil-A is interested in purchasing a 1.32 Acre parcel of vacant land in front of the Meijer Store at 2055 W. Grand River Avenue. Due to facts that Chick-fil-A has a drive-thru, and a portion of the Flood Plain will be filled and relocated on-site, we need to obtain Special Use Permits for both of these items. Since Chick-fil-A will be purchasing the land from Meijer, we are submitting a Lot Split depicting the land that Chick-fil-A intends to purchase, as well as the residual parcel that will be retained by Meijer. Another fact to note about the Chick-fil-A parcel is that there is a 0.24 Acre area of isolated wetlands on it. The wetland has been delineated by Chick-fil-A's consultant and the delineation was approved by the Township's consultant Fishbeck, Thompson, Carr & Huber, Inc. As stated in their approval letter dated October 2, 2015, "The delineated wetland does not meet the definition of "protected wetland" under Section 105-3 (1) of the Township's Wetland Protection Ordinance. Therefore, a Wetland Use Permit is not required from the Township for future impacts to the wetland."

As stated above, it will be necessary to fill 73 C.Y. of Flood Plain in order to construct the Chick-fil-A. This volume will be relocated on-site by creating a 129 C.Y. area of Flood Plain.

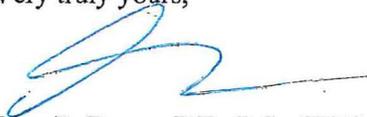
Although we are submitting full sets of Site Plans for the Township's review, pertinent Site Data can be found on drawing C-2.0, and the Flood Plain fill and relocation areas are shown on drawing C-3.0. Enclosed are the following:

- One (1) Application.
- Check in the amount of \$1,000.00 for the two (2) Special Use Permits.
- Check in the amount of \$510.00 for the Site Plan Review.
- Fifteen (15) copies of the authorization letter from Meijer.
- Fifteen (15) copies of the Meijer Deed.
- Fifteen (15) copies of the proposed Chick-fil-A Lot Split which includes a Legal Description for the Chick-fil-A parcel (Lot B).
- Fifteen (15) copies of the Traffic Impact Study.
- Fifteen (15) copies of the Chick-fil-A Site Plans.
- Fifteen (15) copies of Architectural Color Renderings.
- Material Board (under separate cover).
- Fifteen (15) copies of the Wetland Delineation Report.
- Fifteen (15) copies of the Wetland Verification Letter.
- Fifteen (15) copies of the Storm Water Management Report.

Peter Menser
November 20, 2015
Page 2 of 2

If you have any questions or need any other information, please contact me.

Very truly yours,



Gary R. Rouse, P.E., P.S., CPESC, CPSWQ

Enclosure

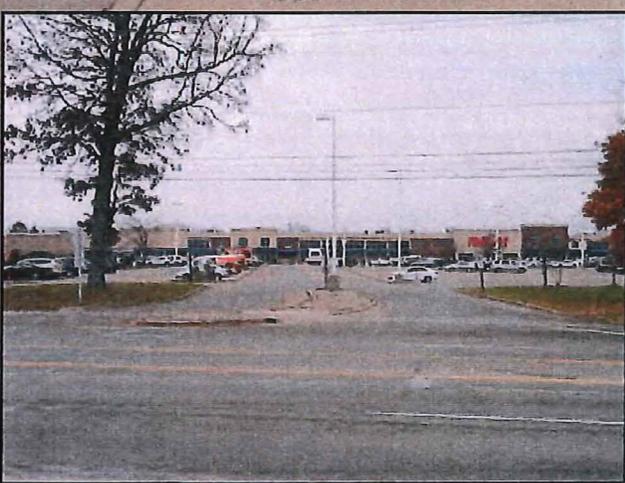
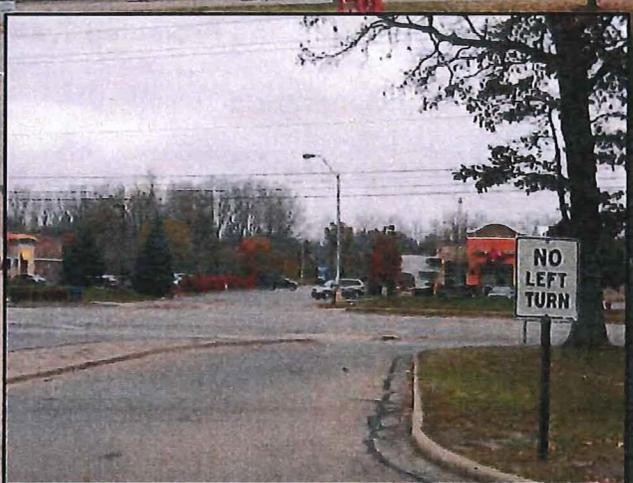
c: Jason Hill, Chick-fil-A w/ enclosed via email
Kurt Adams, Meijer w/ enclosed via email
file

Chick-Fil-A Traffic Impact Study

Okemos, Michigan

Prepared for
GBC Design

November 2015



INTRODUCTION

This traffic study was undertaken to assess the traffic impact of a proposed development in Ingham County, Michigan, in the Meridian Township outside of East Lansing, Michigan. The development will be to the south of the West Grand River Road corridor, with access being provided via West Grand River and Okemos Drive. The vicinity map (Figure 1) displays the location of the proposed development and study area.



West Grand River Road Near Proposed Development

The proposed development is a Chick-Fil-A restaurant which will be located in the out lot of the Meijer development. The Chick-Fil-A development is currently zoned for proper zoning.

This traffic impact study analyzed two access points along West Grand River Road and one access point on Okemos Road. The West Grand River Road corridor currently consists of numerous commercial businesses, including restaurants, banks, and is located adjacent to a Meijer.



Access Road near Proposed Site

EXISTING CONDITIONS

Regional and Local Access

West Grand River Road will provide regional access and Okemos Road and Marsh Road will provide access to West Grand River Ave. A brief description of the surrounding roadways follows:

West Grand River Ave – In the vicinity of the project site, West Grand River Ave is a 5-lane urban highway that runs in an east-west direction. The roadway speed limit is posted at 45 mph and consists of 12-foot lanes with curb and gutter and sidewalks. A center turn lane provides for turns into and out of the businesses along the corridor.

Okemos Road – Okemos Road provides access along the west side of the development and generally runs in a north-south direction. Lane widths vary from 11 to 12 feet with curb and gutters and sidewalks and a posted speed limit of 40 mph. In the vicinity of the project site, this road consists of two thru lanes in each direction and a center turn lane.

LEVEL OF SERVICE AND DELAY

Level of Service (LOS) was used as the measure of effectiveness for each lane and turning movement. According to the Highway Capacity Manual, the level of service is defined in terms of delay (See Tables 1 and 2). Delay results in driver discomfort, frustration, fuel consumption, and lost travel time. Delay is caused by a number of factors including traffic signal timing, geometrics, traffic congestion, and accidents at an intersection. Level of Service is based on a grade scale from A to F with A being excellent and F being failure. A Level of Service C is desirable, and D is acceptable in an urban setting.

Table 1 – Unsignalized Intersections

Level of Service	Delay (Seconds per Vehicle)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Table 2 – Signalized Intersections

Level of Service	Delay (Seconds per Vehicle)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Chick-fil-A Proposed Development Trip Generation Tables								
ITE Code	Land Use	Sq. Ft./Units	Average Rate	AM Peak	In	%	Out	%
				934	Fast-Food Restaurant with Drive-Through Window	4,730	46.27	218
ITE Code	Land Use	Sq. Ft./Units	Average Rate	PM Peak	In	%	Out	%
				934	Fast-Food Restaurant with Drive-Through Window	4,730	31.80	149
ITE Code	Land Use	Sq. Ft./Units	Average Rate	Daily	In	%	Out	%
				934	Fast-Food Restaurant with Drive-Through Window	4,730	496.12	2,347

Table 3 - Trip Generation Table

TRIP DISTRIBUTION

	<u>Distribution</u>
From the north via Okemos Road	15% (AM) 17% (PM)
From the west via West Grand River Ave	32% (AM) 32% (PM)
From the east via West Grand River Ave	33% (AM) 31% (PM)
From the south via Okemos Road	20% (AM) 20% (PM)

LEVEL OF SERVICE AND DELAY ANALYSIS

All intersection traffic volumes, vehicle delay, and level of service information can be found in the Appendix. The 2016 base traffic volume information will be the focus upon comparisons between the projected background traffic and the proposed traffic volumes (full build out). The 2016 No-Build volumes would exist on the roadway system in the absence of the proposed development and the 2016 Build Volumes are the volumes with the proposed development included.

The No-Build Scenario analysis assumes that no proposed improvements to the roadway system have been implemented. This would be the case assuming the proposed development was not built.

The proposed scenario would increase the traffic at existing access points on West Grand River Ave and Okemos Drive. These changes were assumed in the proposed condition traffic analysis.

INTERSECTION ANALYSIS**2016 No Build Analysis**

The HCS analysis reveals that all of the approaches operate at LOS "E" or better in weekday peak period under existing conditions except for the access points that are adjacent to the West Grand River and Okemos Rd Intersection. These intersections have delay for the left turning vehicles that are exiting the development. The maximum delay is experienced during the PM peak by those vehicles exiting the development due to the heavy through volumes on mainline.

The West Grand River and Okemos Rd signalized intersection is a heavily traveled intersection and currently has delays on the Okemos approaches during the peak hours. The delays are minimum and they still operate above LOS "D" except for the Southbound approach which falls to a LOS "E". Even though the delays may be high the maximum queue length is 12 vehicles.

2016 Proposed Analysis

The HCS analysis reveals that the majority of approaches continue to operate at similar levels of service when comparing the Build and No Build conditions. The maximum queue increases slightly during the peak periods by those vehicles turning left to exit the development. The overall delay of the intersection increases slightly due to the extra trips that have been added to the system. The left turn volume exiting the development onto West Grand River Ave will experience delays and the left turns onto Okemos Road will also experience delays.

CONCLUSIONS AND RECOMMENDATIONS

All movements operate at the Level of Service near the no build levels so no improvements are needed for traffic to continue to operate near the current condition. The access points adjacent to the signalized intersection of West Grand River Ave and Okemos Rd will continue to experience delay due to the left turning vehicles. Each of these approaches have other options that are likely to be used during peak hours which would result in an improvement. The optimization of existing signal would also improve the intersection as traffic continues to grow in the surrounding area.

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File Name : Grand River_Okemos Rd
Site Code : 00000000
Start Date : 11/6/2015
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	OKEMOS RD From North					W GRAND RIVERS AVE From East					OKEMOS RD From South					W GRAND RIVERS AVE From West					Int. Tot.
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
06:30 AM	10	27	8	0	45	1	73	17	0	91	8	6	7	0	21	5	34	2	0	41	198
06:45 AM	9	34	7	0	50	9	86	14	0	109	10	17	13	0	40	11	36	5	0	52	251
Total	19	61	15	0	95	10	159	31	0	200	18	23	20	0	61	16	70	7	0	93	449
07:00 AM	9	48	5	0	62	10	106	17	0	133	9	24	14	0	47	16	33	6	0	55	297
07:15 AM	15	66	8	0	89	8	149	30	0	187	15	24	22	0	61	24	64	6	0	94	431
07:30 AM	31	64	7	0	102	8	228	49	0	285	8	42	41	0	91	23	48	7	0	78	556
07:45 AM	37	84	14	0	135	18	212	26	0	256	17	40	37	0	94	30	77	9	0	116	601
Total	92	262	34	0	388	44	695	122	0	861	49	130	114	0	293	93	222	28	0	343	1885
08:00 AM	24	62	14	0	100	8	167	23	0	198	21	35	29	0	85	23	78	6	0	107	490
08:15 AM	24	86	22	0	132	11	155	32	0	198	19	35	45	0	99	20	74	2	0	96	525
08:30 AM	20	74	17	0	111	12	180	32	0	224	21	36	45	0	102	23	83	6	0	112	549
08:45 AM	25	80	18	0	123	9	172	28	0	209	23	41	43	0	107	15	89	4	0	108	547
Total	93	302	71	0	466	40	674	115	0	829	84	147	162	0	393	81	324	18	0	423	2111
*** BREAK ***																					
11:00 AM	22	35	26	0	83	10	146	28	0	184	29	29	39	0	97	23	189	14	0	226	590
11:15 AM	25	41	17	0	83	16	134	27	0	177	41	59	49	0	149	30	192	18	0	240	649
11:30 AM	17	57	18	0	92	10	162	32	0	204	36	57	56	0	149	35	196	12	0	243	67
11:45 AM	27	47	17	0	91	20	184	51	0	255	48	54	55	0	157	39	209	20	0	268	77
Total	91	180	78	0	349	56	626	138	0	820	154	199	199	0	552	127	786	64	0	977	2698
12:00 PM	17	64	26	0	107	20	195	45	0	260	32	59	65	0	156	37	232	32	0	301	824
12:15 PM	19	55	28	0	102	15	213	49	0	277	44	76	70	0	190	47	211	34	0	292	861
12:30 PM	17	40	26	0	83	22	178	55	0	255	50	68	53	0	171	43	232	18	0	293	802
12:45 PM	32	51	36	0	119	21	157	63	0	241	55	72	61	0	188	50	204	22	0	276	824
Total	85	210	116	0	411	78	743	212	0	1033	181	275	249	0	705	177	879	106	0	1162	3311
*** BREAK ***																					
04:00 PM	15	71	20	0	106	24	180	38	0	242	48	110	65	0	223	28	255	17	0	300	871
04:15 PM	13	54	26	0	93	11	181	39	0	231	35	91	61	0	187	47	231	22	0	300	811
04:30 PM	20	76	28	0	124	18	173	41	0	232	44	75	70	0	189	50	276	22	0	348	893
04:45 PM	22	72	31	0	125	20	183	42	0	245	41	113	54	0	208	51	288	34	0	373	951
Total	70	273	105	0	448	73	717	160	0	950	168	389	250	0	807	176	1050	95	0	1321	3526

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Start Time	OKEMOS RD From North					W GRAND RIVERS AVE From East					OKEMOS RD From South					W GRAND RIVERS AVE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 06:30 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	31	64	7	0	102	8	228	49	0	285	8	42	41	0	91	23	48	7	0	78	556
07:45 AM	37	84	14	0	135	18	212	26	0	256	17	40	37	0	94	30	77	9	0	116	601
08:00 AM	24	62	14	0	100	8	167	23	0	198	21	35	29	0	85	23	78	6	0	107	490
08:15 AM	24	86	22	0	132	11	155	32	0	198	19	35	45	0	99	20	74	2	0	96	525
Total Volume	116	296	57	0	469	45	762	130	0	937	65	152	152	0	369	96	277	24	0	397	2172
% App. Total	24.7	63.1	12.2	0		4.8	81.3	13.9	0		17.6	41.2	41.2	0		24.2	69.8	6	0		
PHF	.784	.860	.648	.000	.869	.625	.836	.663	.000	.822	.774	.905	.844	.000	.932	.800	.888	.667	.000	.856	.903
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	17	64	26	0	107	20	195	45	0	260	32	59	65	0	156	37	232	32	0	301	824
12:15 PM	19	55	28	0	102	15	213	49	0	277	44	76	70	0	190	47	211	34	0	292	861
12:30 PM	17	40	26	0	83	22	178	55	0	255	50	68	53	0	171	43	232	18	0	293	802
12:45 PM	32	51	36	0	119	21	157	63	0	241	55	72	61	0	188	50	204	22	0	276	824
Total Volume	85	210	116	0	411	78	743	212	0	1033	181	275	249	0	705	177	879	106	0	1162	3311
% App. Total	20.7	51.1	28.2	0		7.6	71.9	20.5	0		25.7	39	35.3	0		15.2	75.6	9.1	0		
PHF	.664	.820	.806	.000	.863	.886	.872	.841	.000	.932	.823	.905	.889	.000	.928	.885	.947	.779	.000	.965	.961
Peak Hour Analysis From 02:00 PM to 07:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	22	72	31	0	125	20	183	42	0	245	41	113	54	0	208	51	288	34	0	373	951
05:00 PM	20	89	24	0	133	18	175	39	0	232	40	120	77	0	237	55	265	33	0	353	955
05:15 PM	21	68	23	0	112	19	176	38	0	233	48	109	66	0	223	41	301	35	0	377	945
05:30 PM	17	65	37	0	119	16	179	38	0	233	53	138	77	0	268	44	314	36	0	394	1014
Total Volume	80	294	115	0	489	73	713	157	0	943	182	480	274	0	936	191	1168	138	0	1497	3865
% App. Total	16.4	60.1	23.5	0		7.7	75.6	16.6	0		19.4	51.3	29.3	0		12.8	78	9.2	0		
PHF	.909	.826	.777	.000	.919	.913	.974	.935	.000	.962	.858	.870	.890	.000	.873	.868	.930	.958	.000	.950	.953

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05:00 PM	0	0	0	0	0	0	248	18	0	266	26	0	0	0	26	8	330	0	0	338	630
05:15 PM	0	0	0	0	0	0	245	11	0	256	43	0	0	0	43	14	376	0	0	390	689
05:30 PM	0	0	0	0	0	0	234	17	0	251	30	0	0	0	30	7	364	0	0	371	652
05:45 PM	0	0	0	0	0	0	248	18	0	266	38	0	0	0	38	9	280	0	0	289	593
Total	0	0	0	0	0	0	975	64	0	1039	137	0	0	0	137	38	1350	0	0	1388	2564
06:00 PM	0	0	0	0	0	0	233	16	0	249	38	0	1	0	39	5	250	0	0	255	543
06:15 PM	0	0	0	0	0	0	236	9	0	245	30	0	0	0	30	8	249	0	0	257	532
Grand Total	0	0	0	0	0	0	5935	334	0	6269	584	0	6	0	590	174	5649	0	0	5823	12682
Apprch %	0	0	0	0	0	0	94.7	5.3	0	99	0	0	1	0	99	3	97	0	0	97	
Total %	0	0	0	0	0	0	46.8	2.6	0	49.4	4.6	0	0	0	4.7	1.4	44.5	0	0	45.9	
Unshifted	0	0	0	0	0	0	5857	316	0	6173	584	0	6	0	590	146	5604	0	0	5750	12513
% Unshifted	0	0	0	0	0	0	98.7	94.6	0	98.5	100	0	100	0	100	83.9	99.2	0	0	98.7	98.7
Bank 1	0	0	0	0	0	0	78	18	0	96	0	0	0	0	0	28	45	0	0	73	169
% Bank 1	0	0	0	0	0	0	1.3	5.4	0	1.5	0	0	0	0	0	16.1	0.8	0	0	1.3	1.3
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	ACCESS POINT 1 From North					W GRAND RIVER AVE From East					ACCESS POINT 1 From South					W GRAND RIVER AVE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 06:30 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	311	8	0	319	6	0	0	0	6	3	75	0	0	78	403
07:45 AM	0	0	0	0	0	0	267	7	0	274	7	0	1	0	8	4	91	0	0	95	377
08:00 AM	0	0	0	0	0	0	229	6	0	235	7	0	0	0	7	1	102	0	0	103	345
08:15 AM	0	0	0	0	0	0	224	7	0	231	5	0	0	0	5	2	109	0	0	111	347
Total Volume	0	0	0	0	0	0	1031	28	0	1059	25	0	1	0	26	10	377	0	0	387	1472
% App. Total	0	0	0	0	0	0	97.4	2.6	0	96.2	0	0	3.8	0	2.6	2.6	97.4	0	0	97.4	
PHF	.000	.000	.000	.000	.000	.000	.829	.875	.000	.830	.893	.000	.250	.000	.813	.625	.865	.000	.000	.872	.913

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06:30 AM	0	0	0	0	0	0	98	2	0	100	0	0	2	0	2	4	34	0	0	38	140
06:45 AM	0	0	0	0	0	0	125	1	0	126	2	0	1	0	3	4	53	0	2	59	188
Total	0	0	0	0	0	0	223	3	0	226	2	0	3	0	5	8	87	0	2	97	328
07:00 AM	0	0	0	0	0	0	142	0	2	144	0	0	3	0	3	0	47	0	0	47	194
07:15 AM	0	0	0	0	0	0	186	0	0	186	0	0	1	0	1	3	93	0	0	96	283
07:30 AM	0	1	0	0	1	0	302	0	0	302	2	0	5	0	7	7	79	0	0	86	396
07:45 AM	0	0	0	0	0	0	287	1	0	288	1	0	0	0	1	6	99	0	0	105	394
Total	0	1	0	0	1	0	917	1	2	920	3	0	9	0	12	16	318	0	0	334	1267
08:00 AM	0	0	0	0	0	0	224	0	1	225	0	0	2	0	2	8	98	0	0	106	333
08:15 AM	0	0	0	0	0	0	222	6	0	228	1	0	3	0	4	7	118	0	0	125	357
08:30 AM	0	0	0	0	0	0	220	3	1	224	1	0	1	0	2	7	125	0	0	132	358
08:45 AM	0	0	0	0	0	0	227	1	0	228	2	0	0	0	2	5	112	0	0	117	347
Total	0	0	0	0	0	0	893	10	2	905	4	0	6	0	10	27	453	0	0	480	1395
*** BREAK ***																					
11:00 AM	0	0	0	0	0	0	158	4	0	162	6	0	1	0	7	13	174	0	0	187	356
11:15 AM	0	0	0	0	0	0	189	8	0	197	7	0	1	0	8	30	204	0	0	234	439
11:30 AM	0	0	0	0	0	0	208	3	0	211	7	0	4	0	11	20	233	0	0	253	47
11:45 AM	0	0	0	0	0	0	191	5	0	196	12	0	4	0	16	23	238	0	0	261	47
Total	0	0	0	0	0	0	746	20	0	766	32	0	10	0	42	86	849	0	0	935	1743
12:00 PM	0	0	0	0	0	1	203	1	0	205	14	0	5	0	19	24	255	0	0	279	503
12:15 PM	0	0	0	0	0	0	222	4	0	226	15	0	11	0	26	30	228	0	0	258	510
12:30 PM	0	0	0	0	0	0	243	11	0	254	16	0	13	0	29	21	252	0	0	273	556
12:45 PM	0	0	0	0	0	0	219	4	0	223	10	0	4	0	14	24	249	0	0	273	510
Total	0	0	0	0	0	1	887	20	0	908	55	0	33	0	88	99	984	0	0	1083	2079
*** BREAK ***																					
04:00 PM	0	0	0	0	0	0	201	6	0	207	3	0	9	0	12	34	268	3	0	305	524
04:15 PM	0	0	0	0	0	0	179	2	0	181	11	0	4	0	15	26	259	0	0	285	481
04:30 PM	0	0	0	0	0	1	191	6	2	200	5	0	8	1	14	28	274	0	2	304	518
04:45 PM	0	0	0	0	0	0	193	2	1	196	10	0	10	0	20	28	321	0	0	349	565
Total	0	0	0	0	0	1	764	16	3	784	29	0	31	1	61	116	1122	3	2	1243	2088

Palmer Engineering Company

400 Shopper Drive
Winchester, Ky 40392
859-744-1218

Default Comments
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Select File/Preference in the Main Scree
Then Click the Comments Tab

File Name : Grand River_AP2
Site Code : 00000000
Start Date : 11/5/2015
Page No : 3

Start Time	ACCESS POINT 2 From North					W GRAND RIVERS AVE From East					ACCESS POINT 2 From South					W GRAND RIVERS AVE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	0	0	0	1	203	1	0	205	14	0	5	0	19	24	255	0	0	279	503
12:15 PM	0	0	0	0	0	0	222	4	0	226	15	0	11	0	26	30	228	0	0	258	510
12:30 PM	0	0	0	0	0	0	243	11	0	254	16	0	13	0	29	21	252	0	0	273	556
12:45 PM	0	0	0	0	0	0	219	4	0	223	10	0	4	0	14	24	249	0	0	273	510
Total Volume	0	0	0	0	0	1	887	20	0	908	55	0	33	0	88	99	984	0	0	1083	2079
% App. Total	0	0	0	0	0	0.1	97.7	2.2	0		62.5	0	37.5	0		9.1	90.9	0	0		
PHF	.000	.000	.000	.000	.000	.250	.913	.455	.000	.894	.859	.000	.635	.000	.759	.825	.965	.000	.000	.970	.935
Peak Hour Analysis From 02:00 PM to 06:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	234	5	0	239	7	0	4	0	11	23	337	0	0	360	610
05:15 PM	0	0	0	0	0	0	244	5	2	251	10	0	8	0	18	43	383	0	0	426	695
05:30 PM	0	0	0	0	0	0	227	6	0	233	12	0	11	0	23	29	357	0	0	386	642
05:45 PM	0	0	0	1	1	0	233	12	1	246	15	0	3	0	18	34	287	0	2	323	588
Total Volume	0	0	0	1	1	0	938	28	3	969	44	0	26	0	70	129	1364	0	2	1495	2535
% App. Total	0	0	0	100		0	96.8	2.9	0.3		62.9	0	37.1	0		8.6	91.2	0	0.1		
PHF	.000	.000	.000	.250	.250	.000	.961	.583	.375	.965	.733	.000	.591	.000	.761	.750	.890	.000	.250	.877	.912

Palmer Engineering Company

400 Shopper Drive
Winchester, Ky 40392
859-744-1218

Default Comments
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Select File/Preference in the Main Scree
Then Click the Comments Tab

File Name : OKEMOS_AP3
Site Code : 00000000
Start Date : 11/6/2015
Page No : 2

Groups Printed- Unshifted - Bank 1

Start Time	OKEMOS RD From North					ACCESS POINT 3 From East					OKEMOS RD From South					ACCESS POINT 3 From West					Int. Tot.
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
05:00 PM	0	154	20	0	174	25	0	16	0	41	24	189	0	0	213	0	0	0	0	0	428
05:15 PM	0	130	22	0	152	20	0	17	0	37	26	216	0	0	242	0	0	0	0	0	431
05:30 PM	0	123	17	0	140	21	0	32	0	53	38	216	0	0	254	0	0	0	0	0	447
05:45 PM	0	114	18	0	132	21	0	29	0	50	41	159	0	0	200	0	0	0	0	0	382
Total	0	521	77	0	598	87	0	94	0	181	129	780	0	0	909	0	0	0	0	0	1688
06:00 PM	0	111	16	0	127	16	0	22	0	38	27	158	0	0	185	0	0	0	0	0	350
06:15 PM	0	100	14	0	114	19	0	22	0	41	24	145	0	0	169	0	0	0	0	0	324
Grand Total	2	3127	329	0	3458	340	6	413	2	761	612	3468	1	3	4084	0	4	0	0	4	8307
Apprch %	0.1	90.4	9.5	0		44.7	0.8	54.3	0.3		15	84.9	0	0.1		0	100	0	0		
Total %	0	37.6	4	0	41.6	4.1	0.1	5	0	9.2	7.4	41.7	0	0	49.2	0	0	0	0	0	
Unshifted	2	3099	326	0	3427	338	6	408	2	754	610	3426	1	3	4040	0	4	0	0	4	8225
% Unshifted	100	99.1	99.1	0	99.1	99.4	100	98.8	100	99.1	99.7	98.8	100	100	98.9	0	100	0	0	100	99
Bank 1	0	28	3	0	31	2	0	5	0	7	2	42	0	0	44	0	0	0	0	0	82
% Bank 1	0	0.9	0.9	0	0.9	0.6	0	1.2	0	0.9	0.3	1.2	0	0	1.1	0	0	0	0	0	1

Start Time	OKEMOS RD From North					ACCESS POINT 3 From East					OKEMOS RD From South					ACCESS POINT 3 From West					Int. Tot.
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 06:30 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	134	11	0	145	2	0	7	0	9	18	93	0	0	111	0	0	0	0	0	265
08:00 AM	0	101	4	0	105	5	0	7	0	12	14	76	0	0	90	0	0	0	0	0	207
08:15 AM	0	130	8	0	138	7	0	16	0	23	16	82	0	0	98	0	0	0	0	0	259
08:30 AM	0	117	8	0	125	5	0	6	0	11	12	102	0	0	114	0	0	0	0	0	250
Total Volume	0	482	31	0	513	19	0	36	0	55	60	353	0	0	413	0	0	0	0	0	981
% App. Total	0	94	6	0		34.5	0	65.5	0		14.5	85.5	0	0		0	0	0	0		
PHF	.000	.899	.705	.000	.884	.679	.000	.563	.000	.598	.833	.865	.000	.000	.906	.000	.000	.000	.000	.000	.925



FIGURE 1
2015 EXISTING COUNTS
(AM) PM

PROPOSED CHICK-FIL-A
EAST LANSING, MICHIGAN



FIGURE 3
EXITING TRIP GENERATED
(AM) PM

PROPOSED CHICK-FIL-A
EAST LANSING, MICHIGAN



FIGURE 5
EXITING TRIP GENERATED
(AM) PM

PROPOSED CHICK-FIL-A
EAST LANSING, MICHIGAN

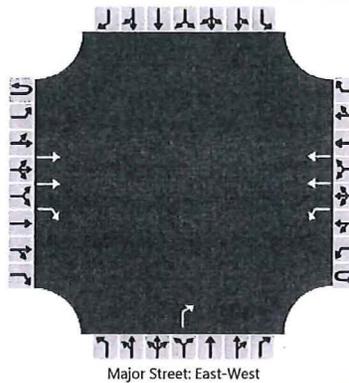
HCS 2010 Two-Way Stop Control Summary Report

General Information

Site Information

Analyst	SDS	Intersection	W Grand River Rd/AP1
Agency/Co.	Palmer Eng	Jurisdiction	
Date Performed	11/18/2015	East/West Street	W Grand River Rd
Analysis Year	2015	North/South Street	Access Point 1
Time Analyzed	AM Peak	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	1	0	1	2	0		0	0	1		0	0	0
Configuration			T	R		L	T					R				
Volume (veh/h)			377	10		28	1031					25				
Percent Heavy Vehicles						3						3				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						32										28			
Capacity						1110										788			
v/c Ratio						0.03										0.04			
95% Queue Length						0.1										0.1			
Control Delay (s/veh)						8.3										9.7			
Level of Service (LOS)						A										A			
Approach Delay (s/veh)					0.2				9.7										
Approach LOS					A				A										

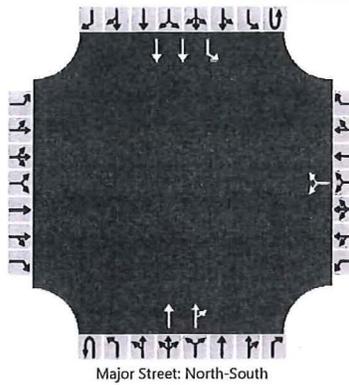
HCS 2010 Two-Way Stop Control Summary Report

General Information

Site Information

Analyst	SDS	Intersection	W Grand River Rd/AP2
Agency/Co.	Palmer Eng	Jurisdiction	
Date Performed	11/18/2015	East/West Street	Access Point 3
Analysis Year	2015	North/South Street	Okemos
Time Analyzed	AM Peak	Peak Hour Factor	0.88
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	2	0	0	1	2	0
Configuration							LR				T	TR		L	T	
Volume (veh/h)						36		19			353	60		31	482	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							63								35	
Capacity							401								1082	
v/c Ratio							0.16								0.03	
95% Queue Length							0.6								0.1	
Control Delay (s/veh)							15.6								8.4	
Level of Service (LOS)							C								A	
Approach Delay (s/veh)					15.6								0.5			
Approach LOS					C								A			

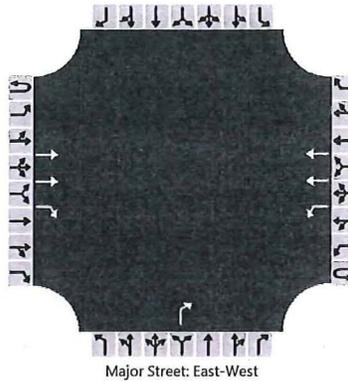
HCS 2010 Two-Way Stop Control Summary Report

General Information

Site Information

Analyst	SDS	Intersection	W Grand River Rd/AP1
Agency/Co.	Palmer Eng	Jurisdiction	
Date Performed	11/18/2015	East/West Street	W Grand River Rd
Analysis Year	2015	North/South Street	Access Point 1
Time Analyzed	PM Peak	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	1	0	1	2	0		0	0	1		0	0	0
Configuration			T	R		L	T					R				
Volume (veh/h)			1350	38		64	975					137				
Percent Heavy Vehicles						3						3				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						73										156
Capacity						409										343
v/c Ratio						0.18										0.46
95% Queue Length						0.6										2.3
Control Delay (s/veh)						15.7										24.0
Level of Service (LOS)						C										C
Approach Delay (s/veh)					1.0				24.0							
Approach LOS					A				C							

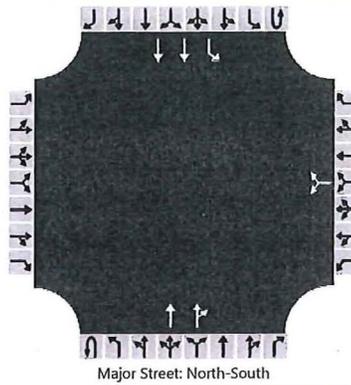
HCS 2010 Two-Way Stop Control Summary Report

General Information

Site Information

Analyst	SDS	Intersection	W Grand River Rd/AP2
Agency/Co.	Palmer Eng	Jurisdiction	
Date Performed	11/18/2015	East/West Street	Access Point 3
Analysis Year	2015	North/South Street	Okemos
Time Analyzed	PM Peak	Peak Hour Factor	0.88
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	0	0		0	2	0		0	1	2	0
Configuration							LR				T	TR		L	T		
Volume (veh/h)						85		85			796	125		66	564		
Percent Heavy Vehicles						3		3						3			
Proportion Time Blocked																	
Right Turn Channelized	No				No				No				No				
Median Type	Undivided																
Median Storage																	

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							194								75	
Capacity							177								654	
v/c Ratio							1.10								0.11	
95% Queue Length							9.7								0.4	
Control Delay (s/veh)							150.3								11.2	
Level of Service (LOS)							F								B	
Approach Delay (s/veh)					150.3								1.2			
Approach LOS					F								A			

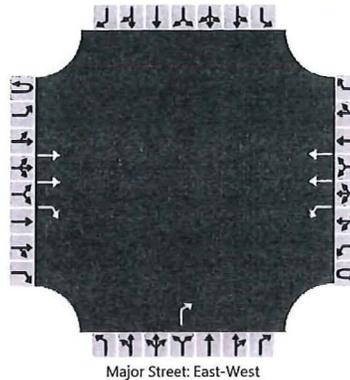
HCS 2010 Two-Way Stop Control Summary Report

General Information

Site Information

Analyst	SDS	Intersection	W Grand River Rd/AP1
Agency/Co.	Palmer Eng	Jurisdiction	
Date Performed	11/18/2015	East/West Street	W Grand River Rd
Analysis Year	2015	North/South Street	Access Point 1
Time Analyzed	AM Peak	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	build		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	1	0	1	2	0		0	0	1		0	0	0
Configuration			T	R		L	T					R				
Volume (veh/h)			380	15		57	1039					52				
Percent Heavy Vehicles						3						3				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)					65							59				
Capacity					1101							786				
v/c Ratio					0.06							0.08				
95% Queue Length					0.2							0.2				
Control Delay (s/veh)					8.5							10.0				
Level of Service (LOS)					A							A				
Approach Delay (s/veh)					0.4				10.0							
Approach LOS					A				A							

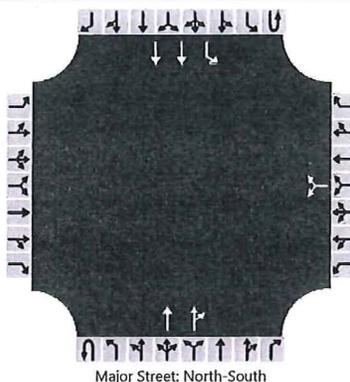
HCS 2010 Two-Way Stop Control Summary Report

General Information

Site Information

Analyst	SDS	Intersection	W Grand River Rd/AP2
Agency/Co.	Palmer Eng	Jurisdiction	
Date Performed	11/18/2015	East/West Street	Access Point 3
Analysis Year	2015	North/South Street	Okemos
Time Analyzed	AM Peak	Peak Hour Factor	0.88
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	build		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	0	0		0	2	0		0	1	2	0
Configuration							LR				T	TR		L	T		
Volume (veh/h)						57		53			353	82		49	482		
Percent Heavy Vehicles						3		3						3			
Proportion Time Blocked																	
Right Turn Channelized	No				No				No				No				
Median Type	Undivided																
Median Storage																	

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							125								56	
Capacity							410								1059	
v/c Ratio							0.31								0.05	
95% Queue Length							1.3								0.2	
Control Delay (s/veh)							17.6								8.6	
Level of Service (LOS)							C								A	
Approach Delay (s/veh)					17.6								0.8			
Approach LOS					C								A			

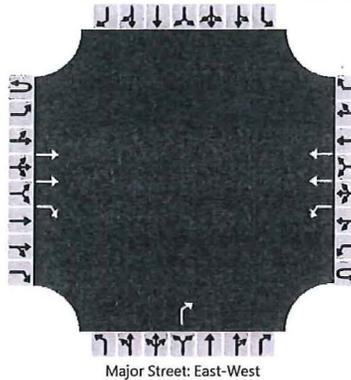
HCS 2010 Two-Way Stop Control Summary Report

General Information

Site Information

Analyst	SDS	Intersection	W Grand River Rd/AP1
Agency/Co.	Palmer Eng	Jurisdiction	
Date Performed	11/18/2015	East/West Street	W Grand River Rd
Analysis Year	2015	North/South Street	Access Point 1
Time Analyzed	PM Peak	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	BUILD		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	1	0	1	2	0		0	0	1		0	0	0
Configuration			T	R		L	T					R				
Volume (veh/h)			1354	44		81	982					155				
Percent Heavy Vehicles						3						3				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						92										176
Capacity						405										341
v/c Ratio						0.23										0.52
95% Queue Length						0.9										2.8
Control Delay (s/veh)						16.5										26.3
Level of Service (LOS)						C										D
Approach Delay (s/veh)					1.3				26.3							
Approach LOS					A				D							

HCS 2010 Two-Way Stop Control Summary Report

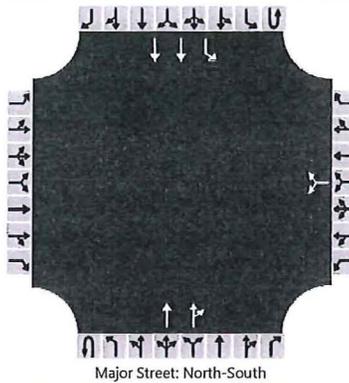
General Information

Analyst	SDS
Agency/Co.	Palmer Eng
Date Performed	11/18/2015
Analysis Year	2015
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	BUILD

Site Information

Intersection	W Grand River Rd/AP2
Jurisdiction	
East/West Street	Access Point 3
North/South Street	Okemos
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes

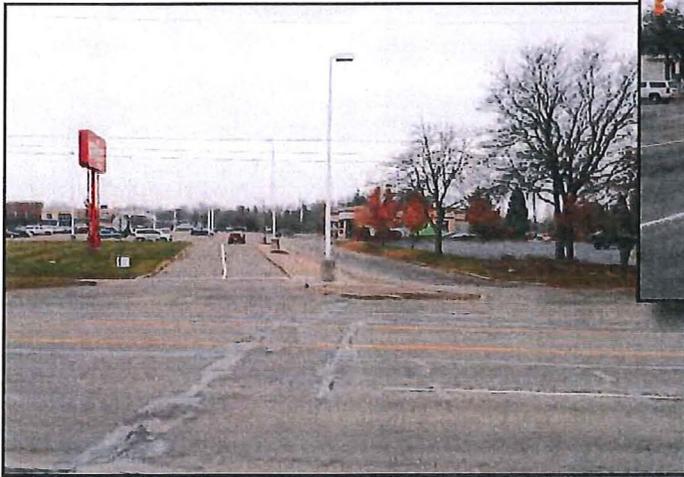


Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	0	0		0	2	0		0	1	2	0
Configuration							LR				T	TR		L	T		
Volume (veh/h)						99		113			796	141		75	564		
Percent Heavy Vehicles						3		3						3			
Proportion Time Blocked																	
Right Turn Channelized	No				No				No				No				
Median Type	Undivided																
Median Storage																	

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							240								85		
Capacity							175								644		
v/c Ratio							1.37								0.13		
95% Queue Length							14.4								0.5		
Control Delay (s/veh)							250.8								11.4		
Level of Service (LOS)							F								B		
Approach Delay (s/veh)					250.8								1.3				
Approach LOS					F								A				



400 Shoppers Drive
P.O. Box 747
Winchester, KY 40392
859-744-1218

www.palmernet.com

Stormwater Management Report

FOR



East Lansing FSU

Store # 3695

Near 2055 W. Grand River Avenue
Okemos, MI 48864

PREPARED FOR

Chick-fil-A

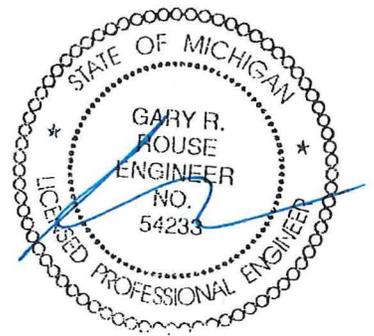
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11-20-15

Job No.: 48115A

Date: 11/20/2015

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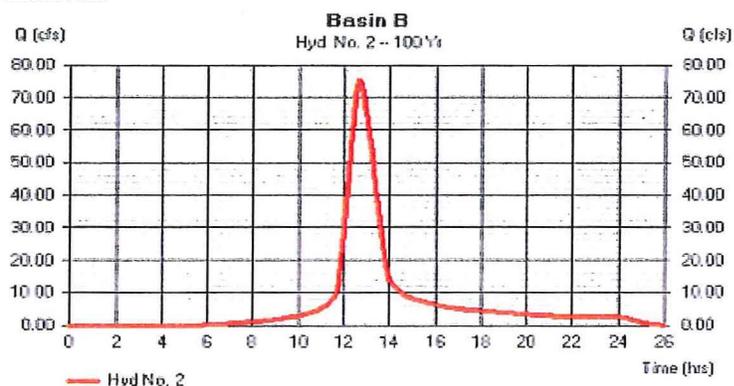
STORM ROUTING PROCEDURE

The Unit Hydrograph Theory

A unit hydrograph is a hydrograph resulting from 1 inch of rainfall excess on a watershed over a given time interval. It is not the final runoff hydrograph! It merely reflects the watershed characteristics and geologic factors. Once a unit hydrograph of a particular watershed is known, any design storm can be applied to it for computing the final runoff hydrograph. Many hydrologists use the SCS 24-hour storms but remember any storm of any length can be used with the unit hydrograph method. The Bulletin 71 Huff and Hydraflow's Synthetic distributions are good examples and are gaining popularity.

Hydraflow computes SCS Method runoff hydrographs by convoluting a rainfall hyetograph through a unit hydrograph. This method is also used in SCS TR-20. Convolution is known as linear superpositioning, and means that each ordinate of the rainfall hyetograph is multiplied by each ordinate of the unit hydrograph, thus creating a series of smaller hydrographs. These hydrographs are then summed to form the final runoff hydrograph. For example, if the rainfall hyetograph (design storm) contained 1,440 ordinates and the unit hydrograph contained 30, then a total of 43,200 ordinates ($1,440 \times 30$) would have to be computed before reaching the final hydrograph. Needless to say, this method is highly accurate, but not very practical without the use of a computer.

Technical Highlight: It is important to note that many projects contain small watersheds with short times of concentration, T_c . Since the time interval (unit duration) of the unit hydrograph should be $0.133(T_c)$, a great number of ordinates will be required to perform the convolution when modeling long design storms such as the SCS 24-hour storms. A drainage basin with a T_c of 30 minutes will require a time interval of 4 minutes, $0.1333(30)$. The resulting hydrograph, when using a 24-hour storm, will need at least 360 ordinates ($1,440 \text{ minutes} / 4$). Hydraflow can use up to 2,880 points for each hydrograph, thus allowing you to model very small watersheds (with T_c as low as 2 minutes) while using a 24-hour storm and achieve accuracy unobtainable by short-cut methods. What's more, Hydraflow manufactures its design storms on the fly so that they are compatible with the selected time interval of the final hydrograph. This assures you of the highest degree of accuracy, eliminating any interpolation between fixed ordinates or having to convert the final hydrograph to match the time interval.



ALLOWABLE OUTFLOW SUMMARY

The allowable outflow from the site was determined to be 0.177 cfs (0.15 cfs x 1.18 acre), as required by Ingham County Drain Commissioners.

STORM SEWER DESIGN

Hydraflow Storm Sewers 2015 was used to perform the storm sewer computations, calculations are in the Storm Sewer Design section of the report. A manning's 'n' value of 0.015 has been used in the calculations along with the provided precipitation values for Okemos, MI. Precipitation values are taken from NOAA Precipitation Data Frequency Server. The storm sewer has been sized for full flow capacity for a 10-year storm event.

STORM ROUTING HYDROGRAPH DESCRIPTIONS

The stormwater management system has been modeled utilizing the following hydrographs for the storm routing.

Number	Name	Description
Hydrograph 1	Post-developed (Proposed)	Post-developed condition of the Chick-fil-A site. (SCS Method, drains to the underground detention facility)
Hydrograph 2	Underground Detention	Post-developed routing of the underground detention facility.

STORM ROUTING SUMMARY

The following table is a summary of the post-developed storm routings.

Storm Event	Allowable Outflow from Site, c.f.s	Peak Outflow from Site, c.f.s.	Peak Elevation of Detention System, c.f.s.	Peak Storage of Detention System, c.f.
1	0.177	0.04	834.93	5,441
2	0.177	0.05	835.02	6,267
5	0.177	0.07	835.18	7,832
10	0.177	0.08	835.34	9,280
25	0.177	0.11	835.59	11,525
50	0.177	0.13	835.81	13,479
100	0.177	0.17	836.03	15,581

STORMWATER MANAGEMENT BMP DESIGN SUMMARY

The following table summarizes the underground detention facility design information.

Underground Detention Facility Design Information

Crown of Underground Detention Chambers Elevation	837.60
Top of Weir Plate Elevation	836.06
Inv. 1" Orifice Elevation (4 Total)	834.10
Inv. 12" Outlet Storm Sewer Elevation	834.10
Provided Detention Storage Volume	24,903 c.f.

Hydrograph Return Period Recap

Hydranow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

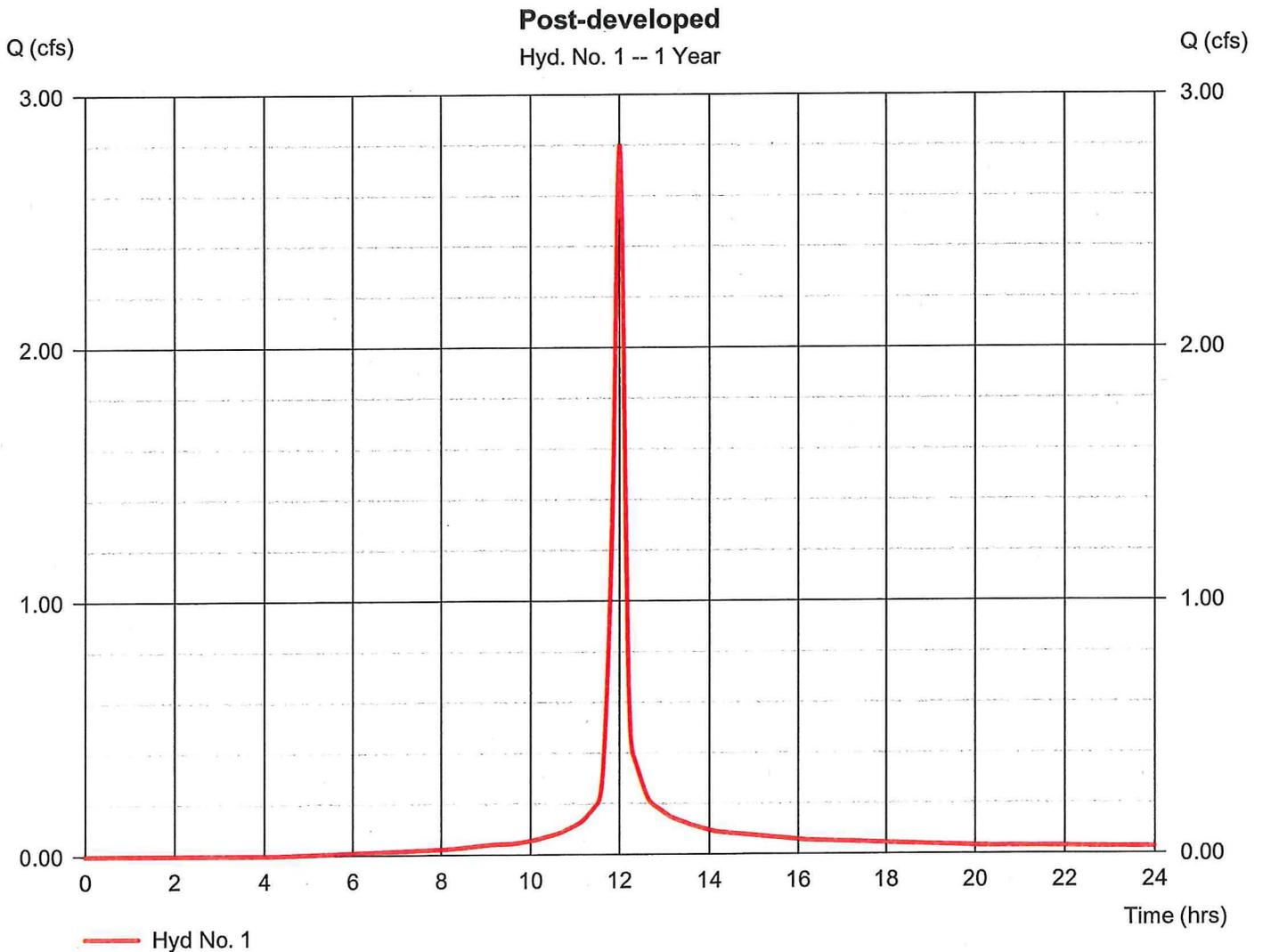
Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	2.804	3.209	-----	3.968	4.676	5.777	6.735	7.780	Post-developed
2	Reservoir	1	0.044	0.051	-----	0.066	0.081	0.107	0.133	0.165	Underground Detention

Hydrograph Report

Hyd. No. 1

Post-developed

Hydrograph type	= SCS Runoff	Peak discharge	= 2.804 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.00 hrs
Time interval	= 1 min	Hyd. volume	= 7,090 cuft
Drainage area	= 1.180 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.10 min
Total precip.	= 2.15 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Pond Report

Pond No. 1 - Underground Detention

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	834.10	n/a	0	0
0.50	834.60	n/a	2,325	2,325
0.58	834.68	n/a	802	3,127
0.75	834.85	n/a	1,596	4,723
0.92	835.02	n/a	1,580	6,303
1.08	835.18	n/a	1,560	7,863
1.25	835.35	n/a	1,537	9,400
1.42	835.52	n/a	1,509	10,909
1.58	835.68	n/a	1,478	12,387
1.75	835.85	n/a	1,443	13,830
1.92	836.02	n/a	1,403	15,233
2.08	836.18	n/a	1,358	16,591
2.25	836.35	n/a	1,303	17,894
2.42	836.52	n/a	1,234	19,128
2.58	836.68	n/a	1,155	20,283
2.75	836.85	n/a	1,039	21,322
2.83	836.93	n/a	441	21,763
2.92	837.02	n/a	418	22,181
3.00	837.10	n/a	397	22,578
3.08	837.18	n/a	388	22,966
3.50	837.60	n/a	1,937	24,903

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	Inactive	Inactive	1.00
Span (in)	= 12.00	0.00	0.00	1.00
No. Barrels	= 1	1	1	4
Invert El. (ft)	= 834.10	0.00	0.00	834.10
Length (ft)	= 40.00	0.00	0.00	1.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .015	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	Yes

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	834.10	0.00	---	---	0.00	---	---	---	---	---	---	0.000
0.05	233	834.15	0.00 ic	---	---	0.00	---	---	---	---	---	---	0.001
0.10	465	834.20	0.00 ic	---	---	0.00	---	---	---	---	---	---	0.002
0.15	698	834.25	0.00 ic	---	---	0.00	---	---	---	---	---	---	0.003
0.20	930	834.30	0.01 ic	---	---	0.00	---	---	---	---	---	---	0.005
0.25	1,163	834.35	0.01 ic	---	---	0.01	---	---	---	---	---	---	0.007
0.30	1,395	834.40	0.01 ic	---	---	0.01	---	---	---	---	---	---	0.009
0.35	1,628	834.45	0.01 ic	---	---	0.01	---	---	---	---	---	---	0.012
0.40	1,860	834.50	0.01 ic	---	---	0.01	---	---	---	---	---	---	0.014
0.45	2,093	834.55	0.02 ic	---	---	0.02	---	---	---	---	---	---	0.017
0.50	2,325	834.60	0.02 ic	---	---	0.02	---	---	---	---	---	---	0.020
0.51	2,405	834.61	0.02 ic	---	---	0.02	---	---	---	---	---	---	0.021
0.52	2,485	834.62	0.02 ic	---	---	0.02	---	---	---	---	---	---	0.021
0.52	2,566	834.62	0.02 ic	---	---	0.02	---	---	---	---	---	---	0.021
0.53	2,646	834.63	0.02 ic	---	---	0.02	---	---	---	---	---	---	0.022
0.54	2,726	834.64	0.02 ic	---	---	0.02	---	---	---	---	---	---	0.023
0.55	2,806	834.65	0.02 ic	---	---	0.02	---	---	---	---	---	---	0.023
0.56	2,886	834.66	0.02 ic	---	---	0.02	---	---	---	---	---	---	0.024
0.56	2,967	834.66	0.02 ic	---	---	0.02	---	---	---	---	---	---	0.024
0.57	3,047	834.67	0.03 ic	---	---	0.02	---	---	---	---	---	---	0.025
0.58	3,127	834.68	0.03 ic	---	---	0.03	---	---	---	---	---	---	0.025
0.60	3,287	834.70	0.03 ic	---	---	0.03	---	---	---	---	---	---	0.026
0.61	3,446	834.71	0.03 ic	---	---	0.03	---	---	---	---	---	---	0.027

Continues on next page 13

Underground Detention

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.84	14,532	835.94	0.15 ic	---	---	0.15	---	---	---	---	---	---	0.149
1.85	14,672	835.95	0.16 ic	---	---	0.15	---	---	---	---	---	---	0.150
1.87	14,812	835.97	0.16 ic	---	---	0.15	---	---	---	---	---	---	0.153
1.89	14,952	835.99	0.16 ic	---	---	0.16	---	---	---	---	---	---	0.155
1.90	15,093	836.00	0.16 ic	---	---	0.16	---	---	---	---	---	---	0.157
1.92	15,233	836.02	0.16 ic	---	---	0.16	---	---	---	---	---	---	0.159
1.94	15,369	836.04	0.17 ic	---	---	0.16	---	---	---	---	---	---	0.161
1.95	15,505	836.05	0.17 ic	---	---	0.16	---	---	---	---	---	---	0.163
1.97	15,640	836.07	0.17 ic	---	---	0.17	---	---	---	---	---	---	0.166
1.98	15,776	836.08	0.17 ic	---	---	0.17	---	---	---	---	---	---	0.168
2.00	15,912	836.10	0.17 ic	---	---	0.17	---	---	---	---	---	---	0.169
2.02	16,048	836.12	0.18 ic	---	---	0.17	---	---	---	---	---	---	0.171
2.03	16,184	836.13	0.18 ic	---	---	0.17	---	---	---	---	---	---	0.174
2.05	16,319	836.15	0.18 ic	---	---	0.18	---	---	---	---	---	---	0.176
2.06	16,455	836.16	0.18 ic	---	---	0.18	---	---	---	---	---	---	0.178
2.08	16,591	836.18	0.18 ic	---	---	0.18	---	---	---	---	---	---	0.180
2.10	16,721	836.20	0.19 ic	---	---	0.18	---	---	---	---	---	---	0.182
2.11	16,852	836.21	0.19 ic	---	---	0.18	---	---	---	---	---	---	0.185
2.13	16,982	836.23	0.19 ic	---	---	0.19	---	---	---	---	---	---	0.187
2.15	17,112	836.25	0.19 ic	---	---	0.19	---	---	---	---	---	---	0.189
2.16	17,243	836.27	0.19 ic	---	---	0.19	---	---	---	---	---	---	0.191
2.18	17,373	836.28	0.20 ic	---	---	0.19	---	---	---	---	---	---	0.194
2.20	17,503	836.30	0.20 ic	---	---	0.20	---	---	---	---	---	---	0.196
2.22	17,633	836.32	0.20 ic	---	---	0.20	---	---	---	---	---	---	0.199
2.23	17,764	836.33	0.20 ic	---	---	0.20	---	---	---	---	---	---	0.201
2.25	17,894	836.35	0.20 ic	---	---	0.20	---	---	---	---	---	---	0.203
2.27	18,017	836.37	0.21 ic	---	---	0.21	---	---	---	---	---	---	0.205
2.28	18,141	836.38	0.21 ic	---	---	0.21	---	---	---	---	---	---	0.208
2.30	18,264	836.40	0.21 ic	---	---	0.21	---	---	---	---	---	---	0.210
2.32	18,388	836.42	0.21 ic	---	---	0.21	---	---	---	---	---	---	0.213
2.34	18,511	836.44	0.22 ic	---	---	0.21	---	---	---	---	---	---	0.215
2.35	18,634	836.45	0.22 ic	---	---	0.22	---	---	---	---	---	---	0.217
2.37	18,758	836.47	0.22 ic	---	---	0.22	---	---	---	---	---	---	0.220
2.39	18,881	836.49	0.22 ic	---	---	0.22	---	---	---	---	---	---	0.222
2.40	19,005	836.50	0.22 ic	---	---	0.22	---	---	---	---	---	---	0.225
2.42	19,128	836.52	0.23 ic	---	---	0.23	---	---	---	---	---	---	0.227
2.44	19,244	836.54	0.24 ic	---	---	0.23	---	---	---	---	---	---	0.229
2.45	19,359	836.55	0.24 ic	---	---	0.23	---	---	---	---	---	---	0.232
2.47	19,475	836.57	0.24 ic	---	---	0.23	---	---	---	---	---	---	0.234
2.48	19,590	836.58	0.24 ic	---	---	0.24	---	---	---	---	---	---	0.236
2.50	19,706	836.60	0.24 ic	---	---	0.24	---	---	---	---	---	---	0.238
2.52	19,821	836.62	0.25 ic	---	---	0.24	---	---	---	---	---	---	0.241
2.53	19,937	836.63	0.25 ic	---	---	0.24	---	---	---	---	---	---	0.243
2.55	20,052	836.65	0.25 ic	---	---	0.25	---	---	---	---	---	---	0.246
2.56	20,168	836.66	0.25 ic	---	---	0.25	---	---	---	---	---	---	0.248
2.58	20,283	836.68	0.25 ic	---	---	0.25	---	---	---	---	---	---	0.250
2.60	20,387	836.70	0.26 ic	---	---	0.25	---	---	---	---	---	---	0.253
2.61	20,491	836.71	0.26 ic	---	---	0.26	---	---	---	---	---	---	0.255
2.63	20,595	836.73	0.26 ic	---	---	0.26	---	---	---	---	---	---	0.258
2.65	20,699	836.75	0.26 ic	---	---	0.26	---	---	---	---	---	---	0.261
2.66	20,803	836.77	0.26 ic	---	---	0.26	---	---	---	---	---	---	0.263
2.68	20,906	836.78	0.27 ic	---	---	0.27	---	---	---	---	---	---	0.265
2.70	21,010	836.80	0.28 ic	---	---	0.27	---	---	---	---	---	---	0.268
2.72	21,114	836.82	0.28 ic	---	---	0.27	---	---	---	---	---	---	0.271
2.73	21,218	836.83	0.28 ic	---	---	0.27	---	---	---	---	---	---	0.274
2.75	21,322	836.85	0.28 ic	---	---	0.28	---	---	---	---	---	---	0.276
2.76	21,366	836.86	0.28 ic	---	---	0.28	---	---	---	---	---	---	0.277
2.77	21,410	836.87	0.28 ic	---	---	0.28	---	---	---	---	---	---	0.278
2.77	21,454	836.87	0.28 ic	---	---	0.28	---	---	---	---	---	---	0.279
2.78	21,498	836.88	0.29 ic	---	---	0.28	---	---	---	---	---	---	0.281
2.79	21,543	836.89	0.29 ic	---	---	0.28	---	---	---	---	---	---	0.282
2.80	21,587	836.90	0.29 ic	---	---	0.28	---	---	---	---	---	---	0.283
2.81	21,631	836.91	0.29 ic	---	---	0.28	---	---	---	---	---	---	0.285
2.81	21,675	836.91	0.29 ic	---	---	0.29	---	---	---	---	---	---	0.286
2.82	21,719	836.92	0.29 ic	---	---	0.29	---	---	---	---	---	---	0.287
2.83	21,763	836.93	0.29 ic	---	---	0.29	---	---	---	---	---	---	0.289
2.84	21,805	836.94	0.29 ic	---	---	0.29	---	---	---	---	---	---	0.290
2.85	21,847	836.95	0.29 ic	---	---	0.29	---	---	---	---	---	---	0.291
2.86	21,888	836.96	0.29 ic	---	---	0.29	---	---	---	---	---	---	0.293
2.87	21,930	836.97	0.29 ic	---	---	0.29	---	---	---	---	---	---	0.294
2.88	21,972	836.97	0.31 ic	---	---	0.30	---	---	---	---	---	---	0.295
2.88	22,014	836.98	0.31 ic	---	---	0.30	---	---	---	---	---	---	0.297

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Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.209	1	720	8,180	-----	-----	-----	Post-developed
2	Reservoir	0.051	1	1082	5,166	1	835.02	6,267	Underground Detention
2015-11-16 Stormwater Management - Difference in Peak Storage								Friday, 11 / 20 / 2015	17

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

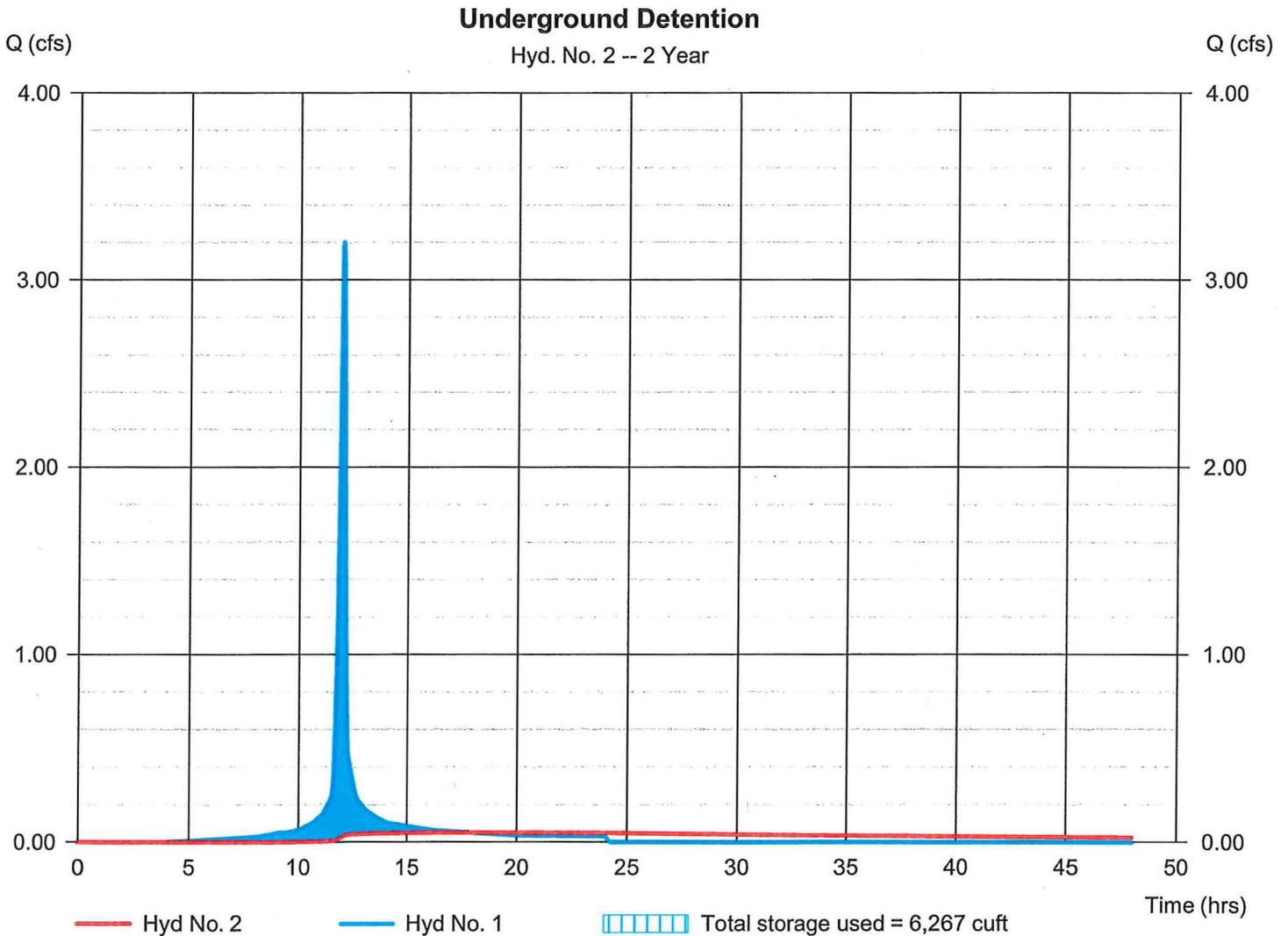
Friday, 11/20/2015

Hyd. No. 2

Underground Detention

Hydrograph type	= Reservoir	Peak discharge	= 0.051 cfs
Storm frequency	= 2 yrs	Time to peak	= 18.03 hrs
Time interval	= 1 min	Hyd. volume	= 5,166 cuft
Inflow hyd. No.	= 1 - Post-developed	Max. Elevation	= 835.02 ft
Reservoir name	= Underground Detention	Max. Storage	= 6,267 cuft

Storage Indication method used.

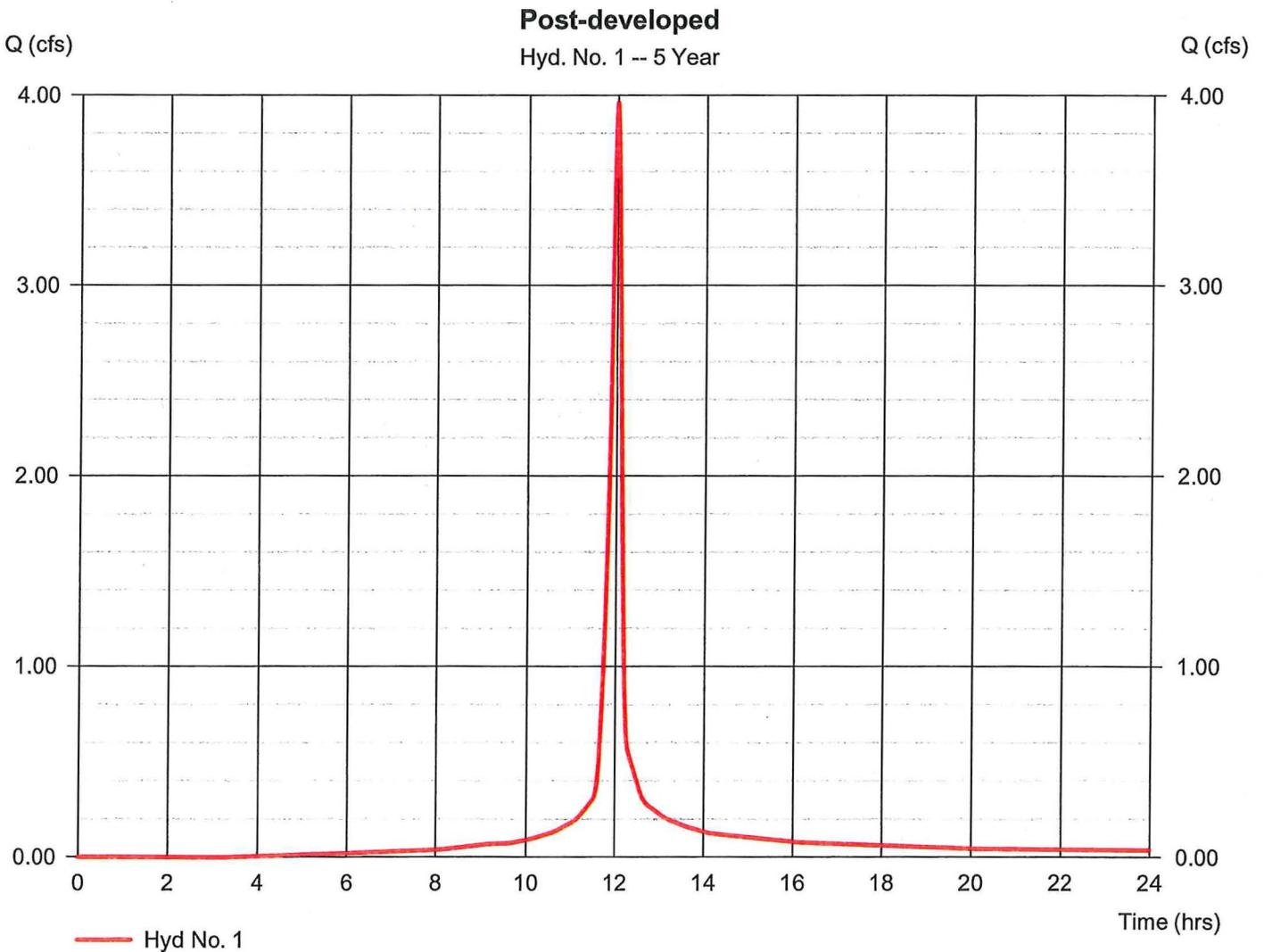


Hydrograph Report

Hyd. No. 1

Post-developed

Hydrograph type	= SCS Runoff	Peak discharge	= 3.968 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.00 hrs
Time interval	= 1 min	Hyd. volume	= 10,254 cuft
Drainage area	= 1.180 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.10 min
Total precip.	= 2.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	4.676	1	720	12,215	-----	-----	-----	Post-developed
2	Reservoir	0.081	1	1031	7,891	1	835.34	9,280	Underground Detention
2015-11-16 Stormwater Management - Differential Period, 10 Year						Friday, 11 / 20 / 2015			23

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

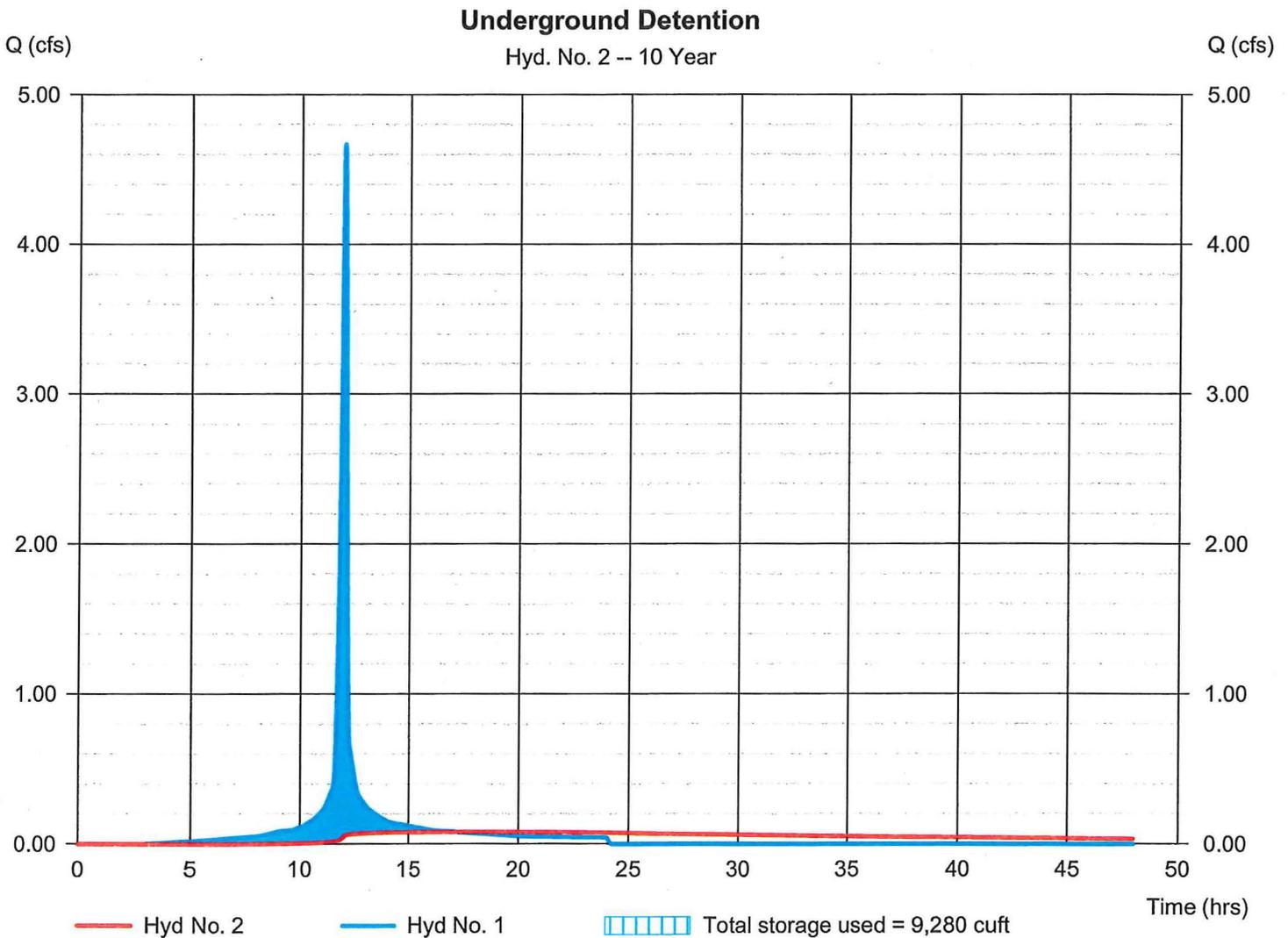
Friday, 11 / 20 / 2015

Hyd. No. 2

Underground Detention

Hydrograph type	= Reservoir	Peak discharge	= 0.081 cfs
Storm frequency	= 10 yrs	Time to peak	= 17.18 hrs
Time interval	= 1 min	Hyd. volume	= 7,891 cuft
Inflow hyd. No.	= 1 - Post-developed	Max. Elevation	= 835.34 ft
Reservoir name	= Underground Detention	Max. Storage	= 9,280 cuft

Storage Indication method used.



Hydrograph Report

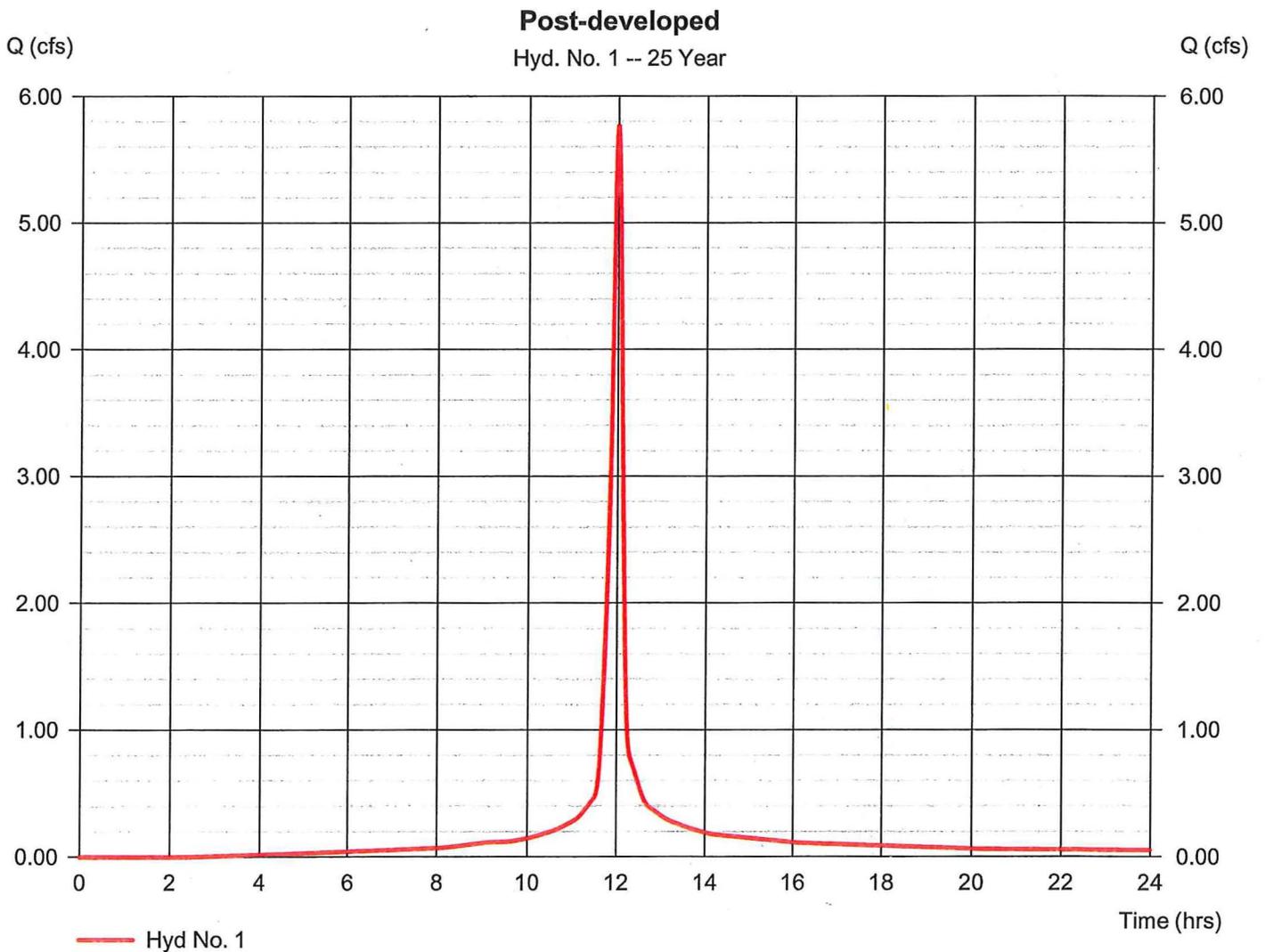
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

Friday, 11 / 20 / 2015

Hyd. No. 1

Post-developed

Hydrograph type	= SCS Runoff	Peak discharge	= 5.777 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.00 hrs
Time interval	= 1 min	Hyd. volume	= 15,303 cuft
Drainage area	= 1.180 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.10 min
Total precip.	= 4.08 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	6.735	1	720	18,017	-----	-----	-----	Post-developed
2	Reservoir	0.133	1	963	12,160	1	835.81	13,479	Underground Detention
2015-11-16 Stormwater Management - Differential Period 50 Year								Friday, 11 / 20 / 2015	29

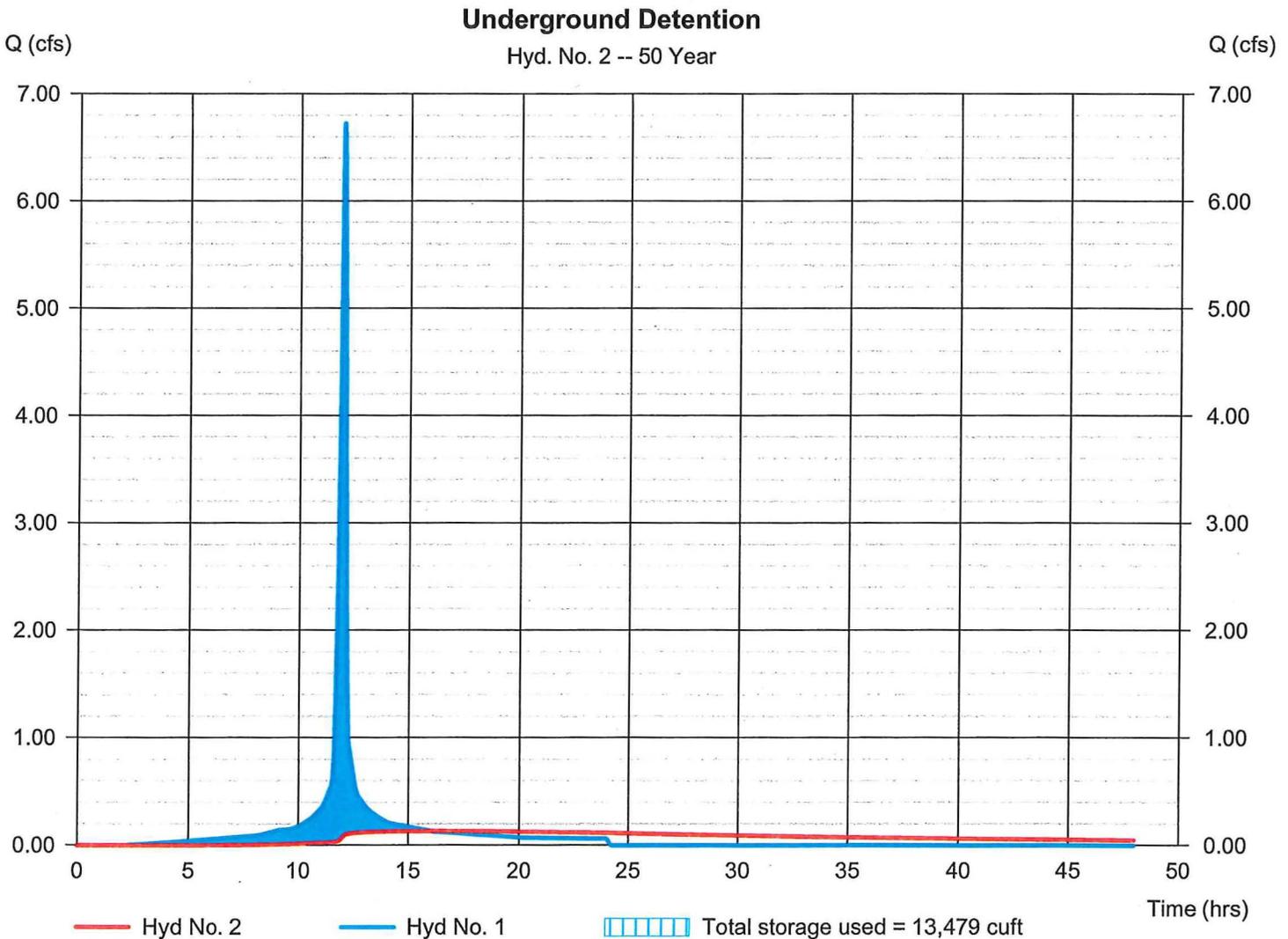
Hydrograph Report

Hyd. No. 2

Underground Detention

Hydrograph type	= Reservoir	Peak discharge	= 0.133 cfs
Storm frequency	= 50 yrs	Time to peak	= 16.05 hrs
Time interval	= 1 min	Hyd. volume	= 12,160 cuft
Inflow hyd. No.	= 1 - Post-developed	Max. Elevation	= 835.81 ft
Reservoir name	= Underground Detention	Max. Storage	= 13,479 cuft

Storage Indication method used.

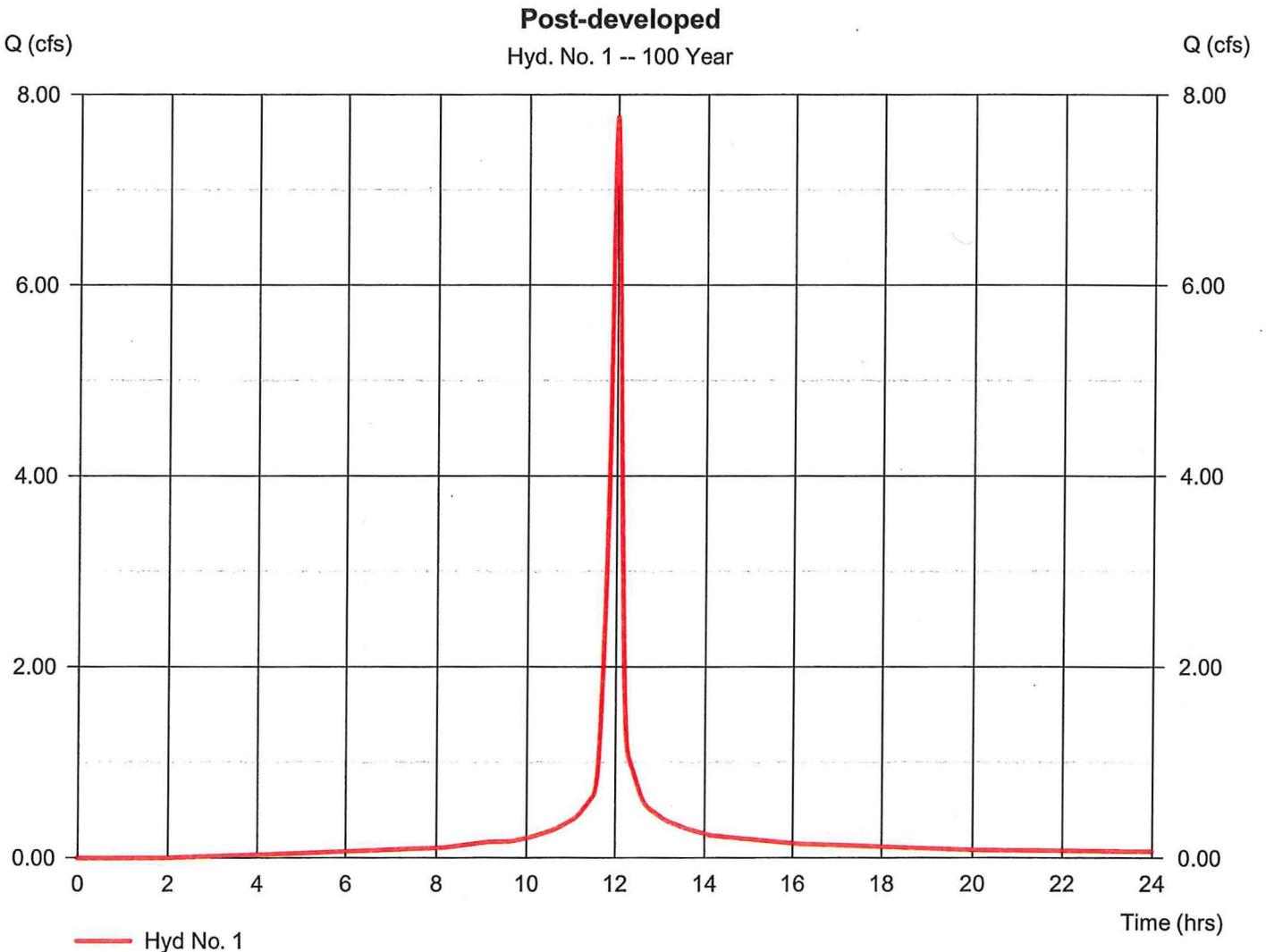


Hydrograph Report

Hyd. No. 1

Post-developed

Hydrograph type	= SCS Runoff	Peak discharge	= 7.780 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 1 min	Hyd. volume	= 20,997 cuft
Drainage area	= 1.180 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.10 min
Total precip.	= 5.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	29.1258	8.5000	0.8143	-----
2	26.9827	7.1000	0.7586	-----
3	0.0000	0.0000	0.0000	-----
5	25.1435	5.2000	0.6880	-----
10	24.7913	4.1000	0.6455	-----
25	26.0700	3.2000	0.6098	-----
50	27.2149	2.6000	0.5870	-----
100	30.1959	2.5000	0.5821	-----

File name: East Lansing 2015-9-17.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	3.50	2.71	2.23	1.90	1.67	1.49	1.35	1.23	1.14	1.06	0.99	0.93
2	4.07	3.13	2.58	2.21	1.94	1.74	1.58	1.45	1.34	1.25	1.18	1.11
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.09	3.87	3.18	2.73	2.41	2.17	1.98	1.83	1.70	1.59	1.50	1.42
10	5.96	4.49	3.69	3.18	2.81	2.54	2.33	2.15	2.01	1.89	1.78	1.69
25	7.23	5.41	4.44	3.83	3.40	3.08	2.83	2.62	2.45	2.31	2.19	2.08
50	8.27	6.15	5.05	4.36	3.88	3.52	3.24	3.01	2.82	2.66	2.52	2.40
100	9.34	6.94	5.71	4.93	4.39	3.98	3.66	3.40	3.19	3.01	2.86	2.72

Tc = time in minutes. Values may exceed 60.

i CFA 3695 East Lansing, Okemo, MI\48115A Site Plans\Design\Stormwater Management\East Lansing 2015-9-17.pcp

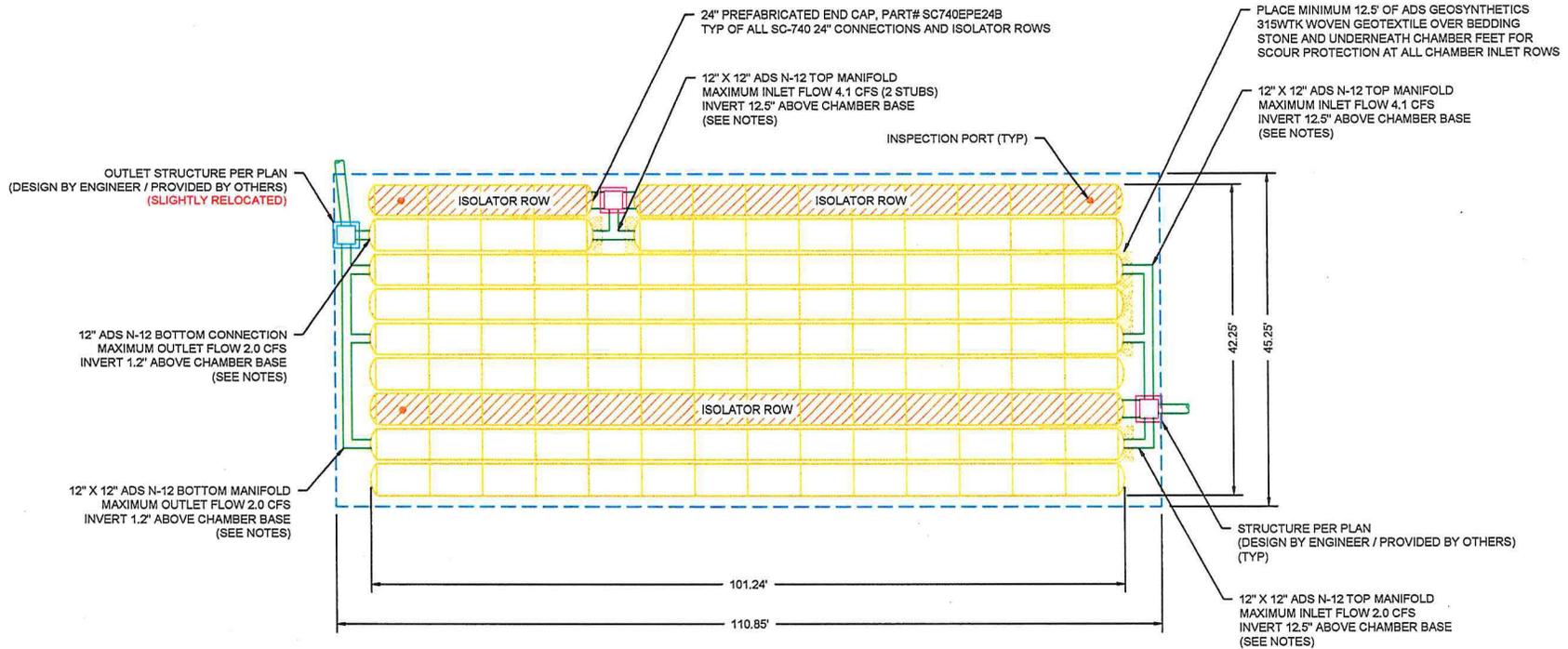
Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.15	2.41	0.00	2.90	3.36	4.08	4.71	5.40
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PROPOSED LAYOUT - BASIN 1

(124) STORMTECH SC-740 CHAMBERS
 (22) STORMTECH SC-740 END CAPS
 INSTALLED WITH 6" COVER STONE, 6" BASE STONE, 40% STONE VOID
 INSTALLED SYSTEM VOLUME: 10,441 CF (PERIMETER STONE INCLUDED)
 AREA OF SYSTEM: 5,016 FT²
 PERIMETER OF SYSTEM: 312 FT

PROPOSED ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	845.10
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	838.60
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	838.60
TOP OF STONE:	837.60
TOP OF CHAMBER:	837.10
12" TOP MANIFOLD INVERT:	835.64
12" BOTTOM MANIFOLD INVERT:	834.70
24" ISOLATOR ROW INVERT:	834.61
BOTTOM OF CHAMBER:	834.60
BOTTOM OF STONE:	834.10



NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.

CHICK-FIL-A		MERIDIAN TOWNSHIP, MICHIGAN	
DATE:	10/29/15	DRAWN:	RFT
PROJECT #:	121209	CHECKED:	GFI
SMALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE FIELD CONSTRUCTION MEETS ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.			
REV	DRW	CHK	DESCRIPTION
11-18-15	RFT	KP	REPLACE CHAMBERS BED TO CHANGE ELEVATIONS

StormTech
 ADVANCED MANHOLE SYSTEMS
 70 WOODBROOK ROAD, SUITE 1 ROCKY HILL, CT 06067
 PH: 860-399-2984 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD
 HILLIARD, OH 43026
 1-800-735-7473

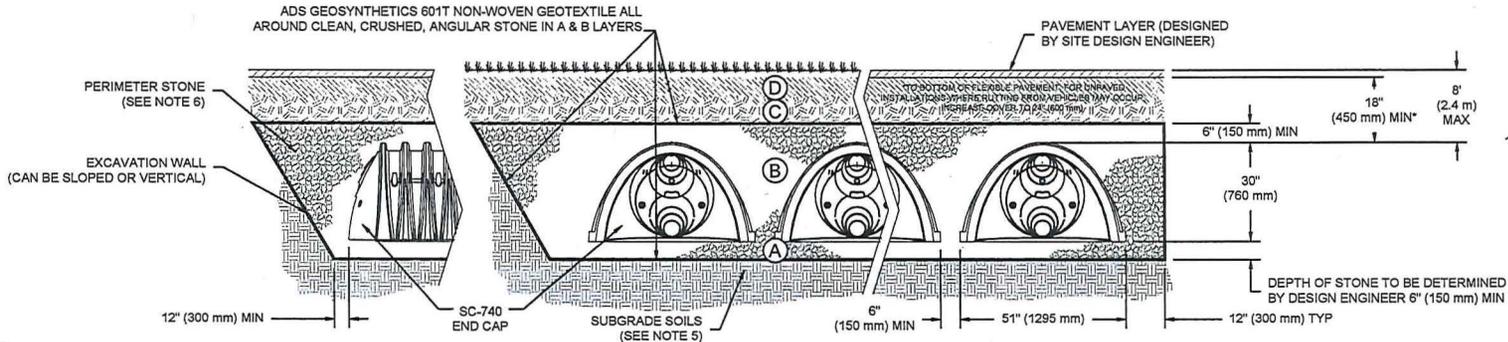
0 15' 30'

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. **

PLEASE NOTE:

- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
- WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



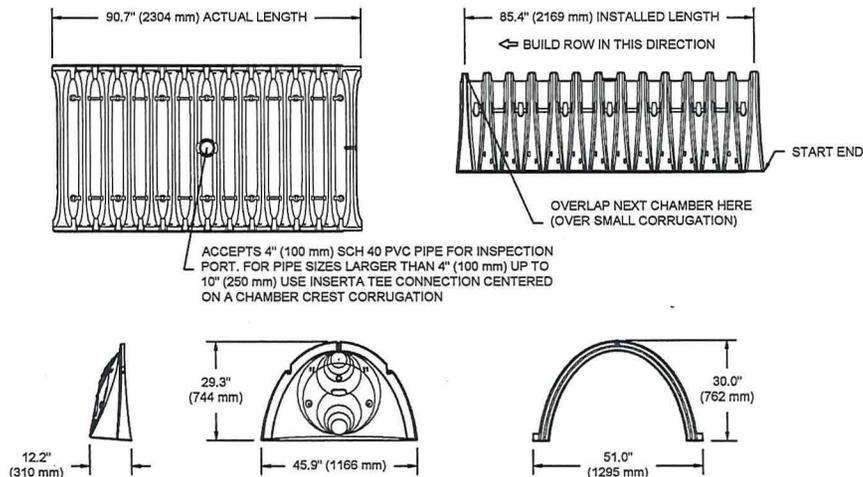
NOTES:

- SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

CHICK-FIL-A		MERIDIAN TOWNSHIP, MICHIGAN	
REV	CHK	DATE	PROJECT #
11-18-15	RP	10-29-15	121209
DESCRIPTION		DRAWN	CHECKED
REDUCE CHAMBERED 2' CHANGE ELEVATIONS		RFT	GFI
PLEASE REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE LIABILITY OF THE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE TO VERIFY THE SITE DESIGN, REGULATIONS, AND PROJECT REQUIREMENTS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.			
70 INWOOD ROAD, SUITE 1 ROCKY HILL, CT 06007 860-333-2881 WWW.STORMTECH.COM			
USE THE LOCATION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE TO VERIFY THE SITE DESIGN, REGULATIONS, AND PROJECT REQUIREMENTS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.			
4630 TRUEMAN BLVD HILLIARD, OH 43026 1-800-735-7473		ADS ADVANCED DRAINAGE SYSTEMS, INC.	
SHEET			
4 OF 36			

SC-740 TECHNICAL SPECIFICATION

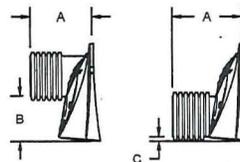
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m ³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m ³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
 PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
 PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE05T / SC740EPE05TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	—
SC740EPE06B / SC740EPE06BPC	—	—	—	0.5" (13 mm)
SC740EPE08T / SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	—
SC740EPE09B / SC740EPE09BPC	—	—	—	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	—
SC740EPE10B / SC740EPE10BPC	—	—	—	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	—
SC740EPE12B / SC740EPE12BPC	—	—	—	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	—
SC740EPE15B / SC740EPE15BPC	—	—	—	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	—
SC740EPE18B / SC740EPE18BPC	—	—	—	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	—	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

CHICK-FILA		MERIDIAN TOWNSHIP, MICHIGAN	
REV	DRW	CHK	DESCRIPTION
11-18-15	RFT	KP	REMOVE CHAMBERS BEHIND CHANGE ELEVATIONS
DATE: 10-29-15		DRAWN: RFT	
PROJECT #: 121209		CHECKED: GFI	
SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE ENGINEER TO ENSURE THAT THE DRAWING MEETS ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.			
8141 BERKIN AVE SHERWOOD, OH 43086 PHN (770) 932-2443 FAX (770) 932-2450 www.nyloplast-usa.com			
ADVANCED DRAINAGE SYSTEMS, INC.			
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED BY THE CLIENT. ADVANCED DRAINAGE SYSTEMS, INC. ACCEPTS NO LIABILITY FOR ANY ERRORS OR OMISSIONS. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED AND FOR THE DESIGN ENGINEER TO ENSURE THAT THE DRAWING MEETS ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.			
4640 TRUENAN BLVD HILLIARD, OH 43026 1-800-735-7473		SHEET 6 OF 16	

Wetland Delineation Report

Proposed Chick-fil-A
W. Grand River Avenue
Okemos, MI



Date: July 22, 2015

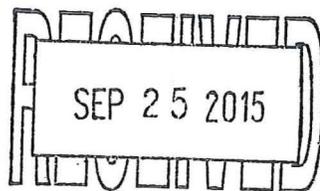
Terracon Project No. N1157157

Prepared for:

Chick-fil-A
Atlanta, GA

Prepared by:

Terracon Consultants, Inc.
Cincinnati, OH



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APPENDIX A – EXHIBITS

- Exhibit 1 – Topographic Site Map
- Exhibit 2 – National Wetland Inventory Map
- Exhibit 3 – SSURGO Soils Map
- Exhibit 4 – Aerial Image
- Exhibit 5 – Wetland Delineation Map

APPENDIX B – GROUND PHOTOGRAPHS

APPENDIX C – WETLAND DETERMINATION DATA FORMS

Wetland Delineation Report
Proposed Chick-fil-A Site
Okemos, MI
Terracon Project No. N1157157
July 22, 2015

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) was retained by Chick-fil-A (client) to perform a wetland delineation to determine if potential waters of the U.S. (WUS) are present at the approximately 1.4-acre site, hereafter referred to as the site. The site is located on the west side of W. Grand River Avenue and consists of an open field area covering the majority of the site. The site location is depicted on Exhibit 1 in Appendix A.

The site is an approximate 1.4-acre tract of land consisting of undeveloped open field land. The site is generally level and located between W. Grand River Avenue and a Meijer Store parking area.

The purpose of performing this wetland delineation of the site was to characterize the existing site conditions, observe the site for suspect waterbodies and wetlands and provide a recommendation regarding whether or not suspect waterbodies (if observed) would be considered jurisdictional.

It is important to note that the findings presented in this report represent Terracon's professional opinion, based upon field observations made during the site visit and our experience with current regulatory guidance under the Clean Water Act. In order to verify the delineation boundaries and jurisdictional classifications presented in this report, the Michigan Department of Environmental Quality (MDEQ) must review this report and make a jurisdictional determination.

2.0 SCOPE OF SERVICES

Terracon performed the following scope of work:

- Reviewed topographical, National Wetland Inventory and aerial photograph resources to assist with identifying suspect Waters of the United States (WUS) and wetland areas at the subject site.

Wetland Delineation Report

Proposed Chick-fil-A Site ■ Okemos, MI

July 22, 2015 ■ Terracon Project No. N1157157



- Mobilized to the site to conduct the preliminary site visit.
- Prepared a map showing approximate locations of suspect waterbodies or wetland areas observed during the site visit, if any.
- Completed a Wetland Delineation Report that included site characterization information, a discussion of applicable data, and recommendations for the site.

3.0 PRELIMINARY DATA GATHERING AND ANALYSIS

Prior to performing the delineation, several map and aerial photograph resources were reviewed to assist with identifying WUS and wetland areas at the site. Each source of data is described in detail below.

3.1 Topographic Site Map

The United States Department of the Interior Geologic Survey (USGS) 7.5-Minute Topographic Map of the subject site was reviewed to identify drainages or WUS within the project area. A portion of the East Lansing, Michigan Quadrangle can be seen as Exhibit 1 in Appendix A. The USGS map shows no water features within the site boundaries.

3.2 National Wetland Inventory Map

The National Wetland Inventory (NWI) Map of the site was reviewed to identify potential wetland areas. The map for the site was published by the U.S. Department of the Interior's Fish and Wildlife Service and depicts probable wetland areas based on stereoscopic analysis of high altitude aerial photographs. The review of the NWI map did not indicate the presence of wetlands within the project boundaries. The NWI map data for the site can be seen as Exhibit 2 in Appendix A.

3.3 Soil Survey

Data from the soil survey of Ingham County, Michigan was reviewed to identify soil types, including hydric soils. Data for the soil survey was compiled by the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) in 1979. A soil survey map is included as Exhibit 3 in Appendix A.

The following soil type was identified within the site on the soil survey map:

- Urban land-Capac-Colwood complex, 0 to 4 percent slopes (UpA): This soil is defined as deep, very poorly drained, and black to very dark grayish-brown in color. This map unit is classified as hydric.

Wetland Delineation Report

Proposed Chick-fil-A Site ■ Okemos, MI

July 22, 2015 ■ Terracon Project No. N1157157



- Houghton muck, 0 to 1 percent slopes (Hn): This soil is defined as very deep, very poorly drained, and black to very dark brown in color. This map unit is classified as hydric.

Hydric soils information was gathered from the 'National Hydric Soils List' (USDA Natural Resource Conservation Service).

3.4 Aerial Photographs

A recent aerial photograph of the site was reviewed to determine land use and evaluate vegetative cover. The aerial photograph of the site shows the site to be an undeveloped open field with an apparent water detention area in the center of the site. The aerial coverage of the site is similar as it appeared at the time of the site reconnaissance. For reference, the aerial photograph has been included as Exhibit 4 in Appendix A.

4.0 FIELD TECHNIQUES

Terracon personnel Scott West and Michael Perkins conducted a reconnaissance of the site on July 14, 2015, to characterize the existing site conditions and observe for the presence of wetlands and potential jurisdictional waters. Characteristics of jurisdictional waters and wetland areas were assessed utilizing the criteria detailed in sections 4.1 and 4.2 of this report. The evaluation methods generally followed the routine on-site determination method referenced in the 1987 USACE Manual and 2012 Northcentral and Northeast Regional Supplement.

4.1 Wetland Observations

Wetlands generally have three essential characteristics: hydrophytic (wetland) vegetation, hydric soils, and wetland hydrology. During the site assessment, Terracon personnel walked the site and observed one wetland area. Based on NWI data, aerial imagery and topographical data, on-site areas were investigated for potential wetland properties. Additional areas were investigated, based on observations made during the site reconnaissance. Data regarding the three essential characteristics was gathered within observed suspect wetland areas to further delineate boundaries.

4.1.1 Plant Community Assessment

Suspect areas were visually observed to determine the species, when possible, and absolute percentage of ground cover for four stratum of plant community types. Herbs were generally observed within a five-foot radius, shrubs/saplings within a fifteen-foot radius, and trees and vines within a thirty-foot radius of the observation location.

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For each species of vegetation observed, their wetland indicator status was evaluated. Indicator status was determined using the NRCS Plants Database. Indicator categories for vegetation are presented below:

- * **Obligate Wetland (OBL)** - occur almost always (estimated probability greater than 99%) under natural conditions in wetlands.
- * **Facultative Wetland (FACW)** - usually occur in wetlands (estimated probability 67% - 99%) but occasionally found in non-wetlands.
- * **Facultative (FAC)** - equally likely to occur in wetlands or non-wetlands (estimated probability 34% - 66%).
- * **Facultative Upland (FACU)** - usually occur in non-wetlands (estimated probability 67% - 99%) but occasionally found in wetlands.
- * **Obligate Upland (UPL)** – rarely occur in wetlands, but occur almost always (estimated probability greater than 99%) under natural conditions in non-wetlands.

The percent cover of each stratum was determined and dominance was evaluated. Dominant species were the most abundant species that accounted for more than 20 percent of the absolute percent coverage of the stratum. The number of dominant species with an indicator status of OBL, FACW, and/or FAC was compared to the total number of dominant species across all strata. Typically, when more than 50 percent of the dominant species had an indicator status of OBL, FACW, and/or FAC, hydrophytic vegetation was present.

If the percentage of dominant species with an indicator status of OBL, FACW, and/or FAC was less than 50 percent, prevalence index and morphological adaptations may have been evaluated to confirm if hydrophytic vegetation was present or absent.

4.1.2. Hydric Soils Assessment

After Terracon evaluated wetland vegetation, subsurface soil samples were collected using a soil probe. The samples were collected to a depth of approximately 15 inches below ground surface and were visually compared to Munsell Soil Color Charts (Munsell, 2009), which aided in the evaluation of hydric soil characteristics. The soil samples were further examined for hydric soil indicators including, but not limited to, histosol, thick dark surface, sandy gleyed matrix, sandy redox, loamy gleyed matrix, redox dark surface, and/or redox

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depressions. If these or other hydric soil indicators were observed in the subsurface soil sample, the observation location was considered to have hydric soil.

4.1.3 Wetland Hydrology Assessment

Visual indicators of wetland hydrology were evaluated. Examples of primary wetland hydrology indicators include, but are not limited to, surface water, high water table, soil saturation, water marks, sediment deposits, drift deposits, iron deposits, inundation visible on aerial imagery, sparsely vegetated concave surface, and water-stained leaves. If at least one primary or two secondary indicators were observed, the observation location was considered to have wetland hydrology.

4.1.4 Classification of Wetlands

Upon completion of the review of the three wetland criteria at each area, a wetland determination was made. Under normal circumstances, if one or more of the wetland criteria were not identified, the area was not considered to be a wetland. If all three wetland indicators were identified, the area was classified as wetland. Additional observations were made throughout the wetland area to define the wetland/non-wetland boundary. Vegetation, soil and hydrology assessment data from at least one location within the wetland and one upland location outside of the wetland were recorded on a USACE Wetland Determination Form. The recorded data forms for the subject site can be found in Appendix C.

4.2 WUS Observations

Terracon also made observations of site features that may be considered a jurisdictional waterbody. If a potential jurisdictional waterbody was identified, observations regarding its characteristics were recorded. Potential jurisdictional waterbodies were evaluated based on the observation of the following characteristics:

- Flow Characteristics:
 - Perennial: contains water at all times except during extreme drought.
 - Intermittent: carries water a considerable portion of the time, but ceases to flow occasionally or seasonally.
 - Ephemeral: carries water only during and immediately after periods of rainfall or snowmelt.
- Ordinary High Water Mark: The limit line on the shore established by the fluctuation of the water surface. It is shown by such things as a clear line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, the presence of litter and debris or other features influenced by the surrounding area.
- Bank Shape Descriptions:

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- Undercut: banks that overhang the stream channel
- Steep: bank slope of approximately greater than 30 degrees
- Gradual: bank slope of approximately 30 degrees or less
- Aquatic Habitat Descriptions:
 - Pool: deeper portion of a stream where water flows slower than in neighboring, shallower portions, smooth surface, and finer substrate
 - Riffle: shallow area in a stream where water flows swiftly over gravel and rock or other coarse substrate resulting in a rough flow and a turbulent surface
 - Run: section of a stream with a low or high velocity and with little or no turbulence on the surface of the water.

5.0 FIELD OBSERVATIONS RESULTS

On July 14, 2015 Terracon performed field observations and identified one wetland area within the project boundaries. The location of this on-site feature is illustrated on Exhibit 5 in Appendix A. Ground photographs, included in Appendix B, provide an indication of the physical characteristics observed during the site visit. The majority of the site is level and covered by grass. Descriptions of the observed areas are listed in the following sections.

5.1 Wetlands

- Wetland A (0.24 acres) is located in the central portion of the site and consists of a low-quality, emergent wetland. This wetland is depressional, seasonally flooded, and appears to be hydrologically fed by precipitation and sheet flow. Dominant vegetation consisted of cattail (*Typha angustifolia*) and green ash (*Fraxinus pennsylvanica*). This wetland area appears to be isolated, as there is no apparent significant nexus to any additional waters.

5.2 Streams

Streams were not observed within the site boundaries.

5.3 Other Waters

No ponds or lakes were observed within the limits of the site.

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6.0 SUMMARY AND CONCLUSIONS OF FIELD OBSERVATIONS

A wetland delineation of an approximately 1.4-acre site located in Okemos, Ingham County, Michigan was conducted on July 14, 2015. A review of the site was conducted utilizing readily available information including, but not limited to, topographical, aerial and wetland data. In addition, a preliminary site visit was performed to characterize the existing site conditions and observe the site for suspect waterbodies and wetlands (if any). A summary of field observations and conclusions concerning jurisdictional status is outlined in the following sections.

6.1 Wetlands

As discussed in Section 4, Terracon personnel observed one wetland area. Wetland A (0.24 acres) appears to be a low-quality, seasonally flooded, emergent, depressionnal wetland formed within an abandoned stormwater basin in the center of the site. This wetland appears to be hydrologically isolated.

6.2 Streams

Streams were not observed within the site boundaries.

6.3 Other Waters

No other waters were observed within the limits of the site.

7.0 RECOMMENDATIONS

According to our preliminary site visit observations, one wetland was observed on the site. It is the opinion of Terracon that the on-site wetland will not be considered jurisdictional by the MDEQ, since it is hydrologically isolated and not within 500 feet of a river, stream, lake, county drain or pond.

Based on conversations with the client, it is understood that efforts will be made to avoid impacts to the potential WUS within the site. However, it may be determined that unavoidable impacts may be necessary in order to accommodate to project needs. If future development of the site does impact the wetland area, it is Terracon's opinion that this feature would be considered exempt under the jurisdiction of the MDEQ. However, Terracon recommends submitting a wetland assessment request to the agency to confirm that they will not require permitting for unavoidable impacts.

Wetland Delineation Report

Proposed Chick-fil-A Site ■ Okemos, MI

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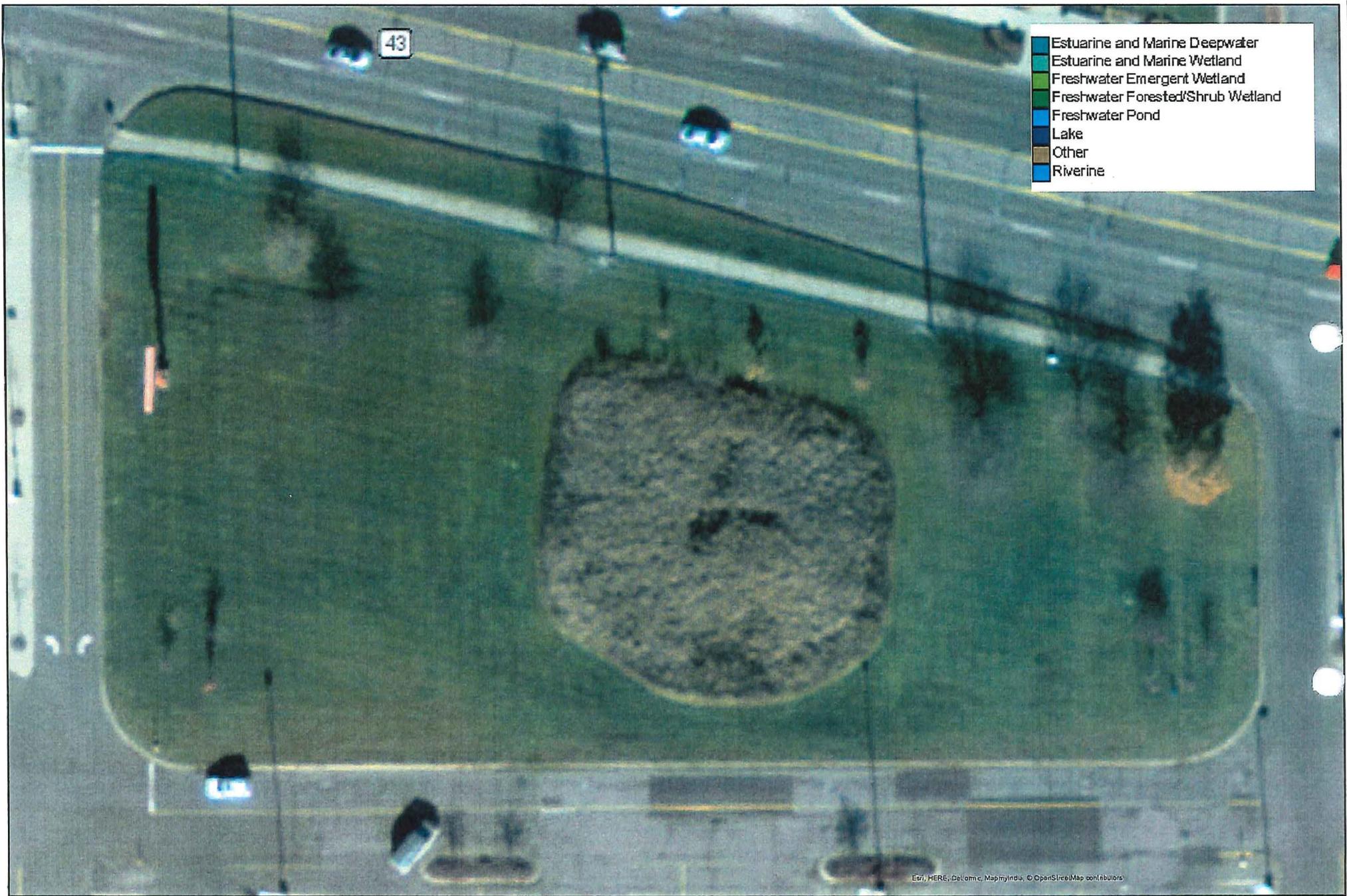


8.0 GENERAL COMMENTS

The preliminary WUS assessment was performed in accordance with generally accepted practices of this profession undertaken in similar studies at the same time and in the same geographical area. A preliminary WUS assessment, such as the one performed at this site, is of limited scope, is noninvasive, and cannot eliminate the potential that wetlands or waterbodies are present at the site beyond what is identified by the limited scope of this preliminary assessment. In conducting the limited scope of services described herein, certain sources of information and public records were not reviewed. No biological assessment can wholly eliminate uncertainty regarding the potential for concerns in connection with a project. The limitations of this preliminary assessment should be recognized.

This report has been prepared in accordance with generally accepted scientific and engineering evaluation practices. This report is for the exclusive use of the client for the project being discussed. No warranties, either expressed or implied, are intended or made.

APPENDIX A
Exhibits



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

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Project No. N1157157
Drawn By: MDP
Approved By: SEW
Date: 7/15/2015

Terracon
Consulting Engineers & Scientists

611 Lunken Park Drive Cincinnati, Ohio 45226
PH: (513) 214-9780 FAX: (513) 321-0294

National Wetland Inventory Map

CHICK-FIL-A - OKEMOS
W GRAND RIVER AVENUE
OKEMOS, INGHAM COUNTY, MICHIGAN

Exhibit
2



Urban land-Capac-Colwood complex, 0 to 4 percent slopes

Houghton muck

Urban land-Capac-Colwood complex, 0 to 4 percent slopes

Houghton muck

Urban land-Marlette complex, 2 to 12 percent slopes

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Project No.	N1157157
Drawn By:	MDP
Approved By:	SEW
Date:	7/15/2015

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SSURGO Soils Map

CHICK-FIL-A - OKEMOS
 W GRAND RIVER AVENUE
 OKEMOS, INGHAM COUNTY, MICHIGAN

Exhibit	3
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Project No.	N1157157
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Aerial Image

CHICK-FIL-A - OKEMOS
W GRAND RIVER AVENUE
OKEMOS, INGHAM COUNTY, MICHIGAN

Exhibit
4

Legend

-  Wetland
-  Wetland Data Point
-  Upland Data Point
-  GPS Points

Approximate Site Boundary

Wetland A: 0.24 acres

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Project No.
N1157157
Drawn By:
MDP
Approved By:
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Date:
7/15/2015

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Wetland Delineation Map
CHICK-FIL-A - OKEMOS
W GRAND RIVER AVENUE
OKEMOS, INGHAM COUNTY, MICHIGAN

Exhibit
5

APPENDIX B
Ground Photographs

Photographic Documentation

Client: Chick-Fil-A Project Number: N1157157
Location: Okemos, Michigan Photographer: S. West

Photograph No. 1

Date: July 14, 2015

Direction: Northeast

Description:

A view of Wetland A and the surrounding upland area.



Photograph No. 2

Date: July 14, 2015

Direction: Northwest

Description:

A view of the western portion of the site.



Photographic Documentation

Client: Chick-Fil-A Project Number: N1157157
Location: Okemos, Michigan Photographer: S. West

Photograph No. 3

Date: July 14, 2015

Direction: East

Description:
A view of hydrophytic vegetation in Wetland A



Photograph No. 4

Date: July 14, 2015

Direction: East

Description:
A view of the northern side of Wetland A and the upland area between the wetland and W Grand River Avenue



Photographic Documentation

Client: Chick-Fil-A

Project Number: N1157157

Location: Okemos, Michigan

Photographer: S. West

Photograph No. 5

Date: July 14, 2015

Direction: --

Description:

A view of hydric soils from Wetland A.



Photograph No. 6

Date: July 14, 2015

Direction: --

Description:

A view of wetland hydrology in Wetland A.



APPENDIX C
Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Proposed Check-Fill - A City/County: Okanos/Ingham Sampling Date: 7/19/2015
 Applicant/Owner: Check-Fill - A State: MI Sampling Point: Wet 1
 Investigator(s): S. West, M. Parkins Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): L R R L Lat: 42 43.276 Long: -87 25.525 Datum: NAD83
 Soil Map Unit Name: Urban land-Capac-Colwood Complex NWI classification: NA
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <div style="font-size: 2em; text-align: center; margin-top: 20px;">Wetland A</div>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (Inches): <u>2-6</u> Water Table Present? Yes _____ No _____ Depth (Inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (Inches): <u>surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: _____ _____	
Remarks: _____ _____	

VEGETATION – Use scientific names of plants.

Sampling Point: Wet 1

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fraxinus pennsylvanica</u>	<u>5</u>	<u>Y</u>	<u>N/FACW</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>10</u>	x 1 = <u>10</u>
FACW species <u>5</u>	x 2 = <u>10</u>
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B)

Prevalence Index = B/A = _____

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Typha angustifolia</u>	<u>90</u>	<u>Y</u>	<u>OBL</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Definitions of Vegetation Strata:

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

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

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

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Proposed Chick-Fil-A City/County: Oakman/Ingham Sampling Date: 7/17/2015
 Applicant/Owner: Chick-Fil-A State: MI Sampling Point: Up 7
 Investigator(s): S. West, M. Perkins Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): LRR L Lat: 42 43.288 Long: -84 25.531 Datum: NAD83
 Soil Map Unit Name: Urban land - Capex - Calwood Complex NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <div style="font-size: 2em; text-align: center; margin-top: 20px;">Upland to Wetland A</div>	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: Upl

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Poa pratensis</u>	<u>100</u>	<u>Y</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 1 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

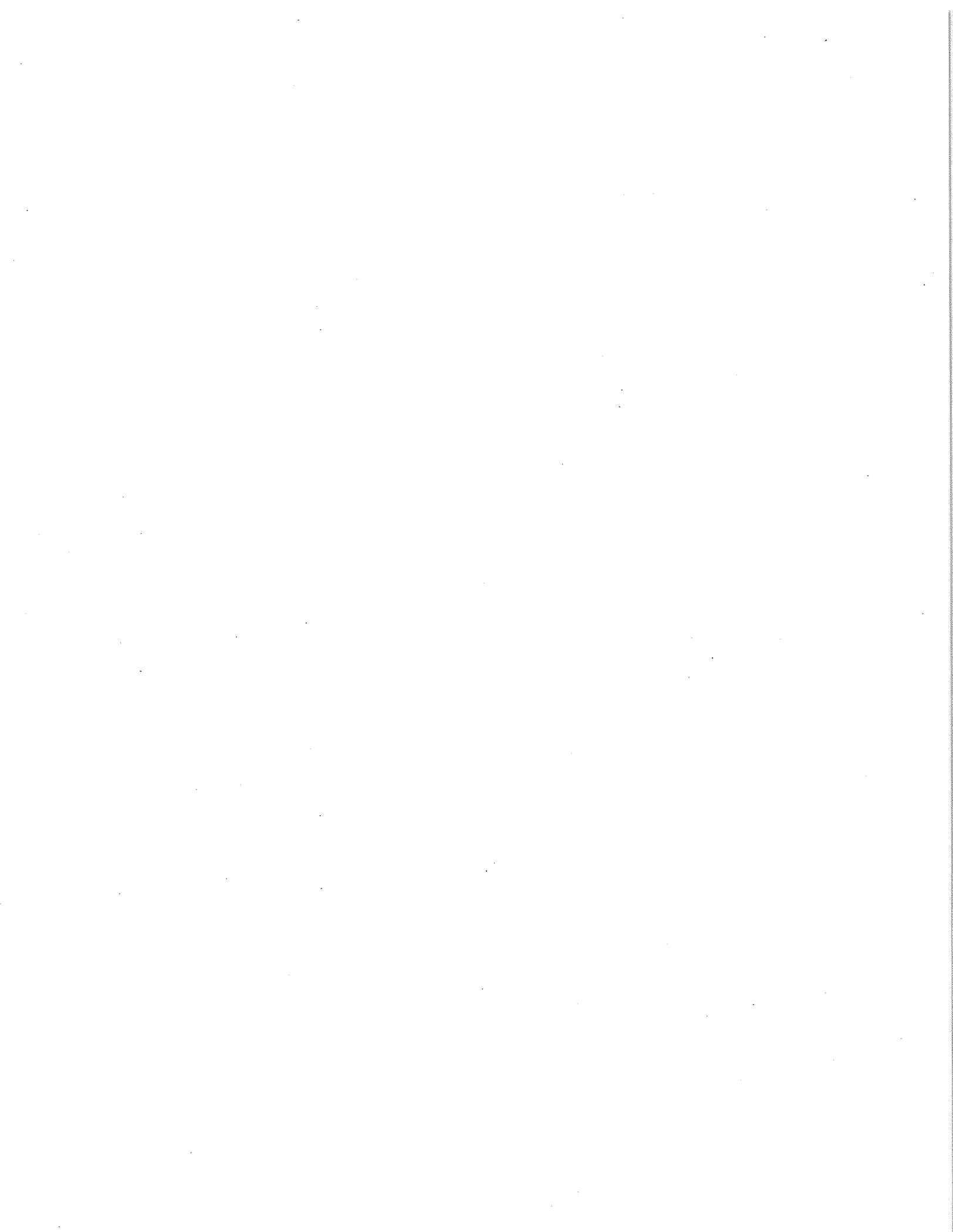
Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by:
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species 100 x 3 = 300
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = 3

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

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



**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.

William F. Savage
Savage Traffic Engineering, Inc.

Summer Address

6401 Timber Ridge Trail
East Lansing, MI 48823
Phone & Fax: 517-339-3933

e-mail: MSUSavage@aol.com

Winter Address

6611 Stone River Road, #206
Bradenton, FL 34203
Phone & Fax: 941-755-4681

December 14, 2015

Harmony Gmazel, Associate Planner
Charter Township of Meridian
5151 March Road
Okemos, MI 48864

RE: Chick-Fil-a (Grand River @ Okemos

Hi Harmony:

I have reviewed Traffic Impact Study submitted by Palmer Engineering Company. The study showed a couple of instances of level-of-service F, but can occur at many urban intersections.

The only comment that I have is that the eastern entrance is in need a better island (to prohibit left turns). This should according to current MDOT standards.

Sincerely,

WFSavage

William F. Savage



October 2, 2015
Project No. G150126W08

Mr. Rick Brown, AICP, CBSP
Charter Township of Meridian
5151 Marsh Road
Okemos, MI 48864

Re: Wetland Verification
Proposed Chick-fil-A
2055 West Grand River Avenue, Okemos, MI 48864

Dear Mr. Brown:

At the request of the Charter Township of Meridian (Township), FTCH reviewed Terracon's July 22, 2015, *Wetland Delineation Report, Proposed Chick-fil-A, West Grand River Avenue, Okemos, MI* (Report), and inspected the flagged wetland boundary on September 28, 2015, at the referenced site. The site consists of a 1.4-acre tract of undeveloped land. Most of the site contains mowed turf. Cattail marsh is present in a depression in the center of the site.

Based upon data presented in the Report, the wetland investigation appears to have been conducted in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* and 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2)*. Wetland Data Forms were completed for sample points in the cattail marsh and the adjacent turf area. Data obtained from these locations confirmed the presence of wetland in the marsh and upland in the turf area. Wetland flags were placed at the outer perimeter of the area dominated by narrow-leaf cattail, an invasive wetland species. FTCH concurs that these flags accurately represent the wetland boundary.

The Report stated the delineated wetland is 0.24 acre in size and consists of low quality, emergent wetland. The Report noted the wetland area appears to be isolated, without a significant nexus to any additional waters. FTCH concurs that the wetland is not contiguous with a water body. Due to the wetland's low quality, it is not likely the Michigan Department of Environmental Quality would determine the protection of this wetland is essential to the preservation of the natural resources of the state from pollution, impairment or destruction. For these reasons, the delineated wetland does not meet the definition of "protected wetland" under Section 105-3(l) of the Township's Wetland Protection Ordinance. Therefore, a Wetland Use Permit is not required from the Township for future impacts to the wetland.

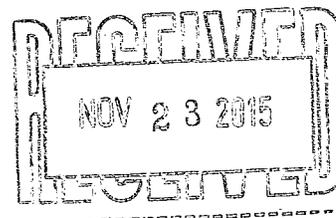
We appreciate the opportunity to assist in the review of this file. If you have any questions or require additional information, please contact me at 616.464.3738 or ehtripp@ftch.com.

Sincerely,

FISHBECK, THOMPSON, CARR & HUBER, INC.

Elise Hansen Tripp, PWS

pmb
By email



**Special Use Permit #15181
(Chick-fil-A, Inc.)
December 21, 2015**

APPLICANT: Jason Hill
Chick-fil-A, Inc.
5200 Buffington Rd
Atlanta, GA 30349

STATUS OF APPLICANT: Option to Purchase the Property

REQUEST: SUP to construct a retail building within a 100-year floodplain

CURRENT ZONING: C-3 (Commercial)

LOCATION: South of Grand River Avenue, between 2041 and 2085 Grand River Avenue, Okemos

AREA OF SUBJECT SITE: Approximately 1.32 acres

EXISTING LAND USE: Undeveloped

EXISTING LAND USES IN AREA: N: McDonalds/Taco Bell
S: Meijer
E: Heat N' Sweep
W: Leo's Lodge

CURRENT ZONING IN AREA: N: C-2 (Commercial)
S: C-3 (Commercial)
E: C-2 (Commercial)
W: C-2 (commercial)

FUTURE LAND USE DESIGNATION: Commercial Core Area

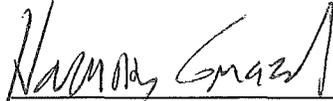
FUTURE LAND USE MAP: N: Commercial Core
S: Commercial Core
E: Commercial Core
W: Commercial Core

CHARTER TOWNSHIP OF MERIDIAN

MEMORANDUM

TO: Planning Commission

FROM:


Harmony Gmazel
Associate Planner

DATE: December 15, 2015

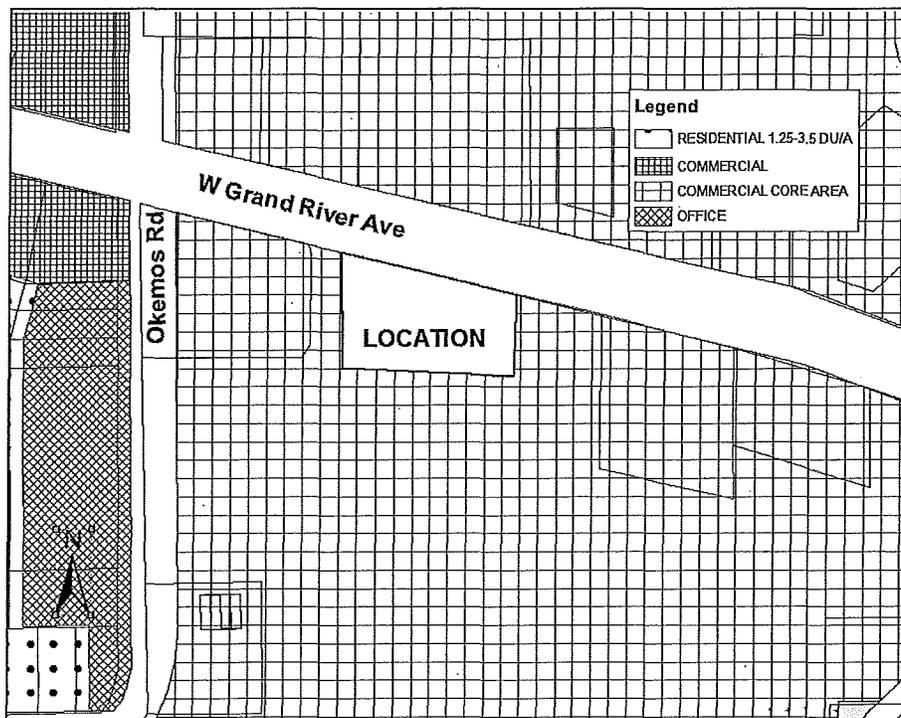
RE: Special Use Permit #15181 (Chick-fil-A, Inc.), construct a fast-food restaurant within a 100-year floodplain

Chick-fil-A, Inc. the applicant, has requested a special use permit to work within the 100-year floodplain to construct a 4,730 square foot restaurant building with a drive-thru facility along the south side of Grand River Avenue located between 2041 and 2085 Grand River Avenue, Okemos. The site is undeveloped. This request to work within a floodplain is running concurrently with SUP #15171 for a restaurant with a drive-thru facility. The approximate 1.32 acre site is zoned C-3 (Commercial).

Master Plan

The 2005 Master Plan designates the subject site and its surroundings in the Commercial Core Area category.

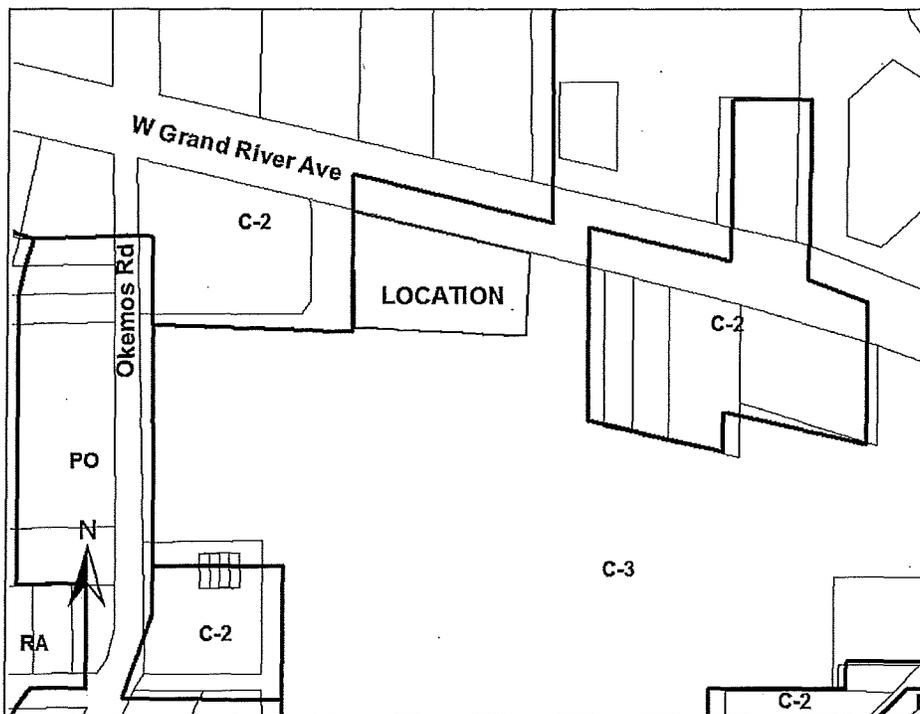
FUTURE LAND USE MAP



Zoning

Sites zoned C-3 Commercial require a minimum 100 feet of lot width and 4,000 square feet of lot area. The subject site's lot width along the Grand River Avenue frontage is approximately 354 feet. Lot area is approximately 57,715 sq. ft, or 1.32 acres.

ZONING MAP

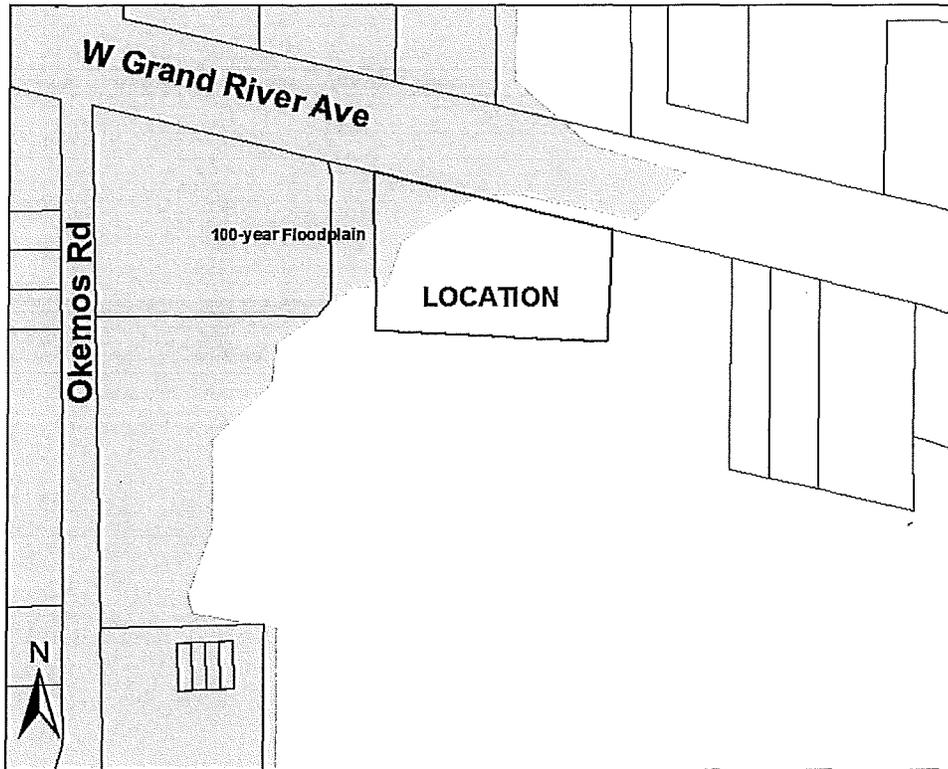


Physical Features

Currently the site is vacant with a wetland centrally located on the site. The site gently slopes to the northwest corner west from a high of approximately 844 feet above mean sea level to a low of approximately 839 feet above mean sea level. The floodplain elevation is 842.1 feet above mean sea level as depicted in the map above.

Vegetation consists of lawn areas, deciduous trees along Grand River Avenue, and 0.24 acre wetland centrally located on the site.

FLOODPLAIN MAP



Floodplain

The northwest corner of the site is located in a 100-year Floodplain. The applicant proposes to fill in 73 cubic yards within the floodplain, and to provide a compensating cut of 129 cubic yards. The cut/fill ratio is 1.77 to 1. The minimum required by ordinance is a 1:1 cut/fill ratio. The 100-year floodplain is present on the site, indicated by the shading in the map above at an elevation of 842.1 feet above sea level.

Public Utilities and Storm Water Management

Public water and sanitary sewer services are available to serve the site. A stormwater detention basin in the northwest corner of the site will be created to address runoff. The Township's Engineering Department has reviewed the proposal and notes that a review and permits will be required by Michigan Department of Environmental Quality, the Michigan Department of Transportation, the Township, and possibly the Ingham County Drain Commissioner's office during the installation of the system and for work within the floodplain.

Staff Analysis

This staff analysis refers to Sheet 1 of 1: "Supplemental Site Plan" dated December 11, 2015. The site plan depicts details of the proposed work within the floodplain. Township regulations require a special use permit to excavate within the 100-year floodplain. The standards for review of the project are contained in Section 86-126 and Section 86-436 of the Code of Ordinances. Specific guidance for review of applications for work in the floodway fringe can be found in Section 86-436(l). Issues to consider include whether the use will be adverse to the purpose of the zoning district or damaging to the public health, safety, or welfare, or impose a financial burden upon the community.

Information provided by the applicant does not indicate the actual floodplain elevation on the site nor has the location for extracted soils been identified. The Township Chief Engineer, a certified floodplain manager, has reviewed the project and recommends that the proposed work within the floodplain area may require permits from the Township, MDEQ and possibly FEMA.

Planning Commission Options

The Planning Commission may approve, approve with conditions or deny the special use permit. A resolution to approve the work within the floodplain is provided.

Attachments

1. Application and Submittals
2. Memorandum from Township Engineer, Dated December 18, 2015
3. Site Plans, dated November 23, December 11 & 17, 2015

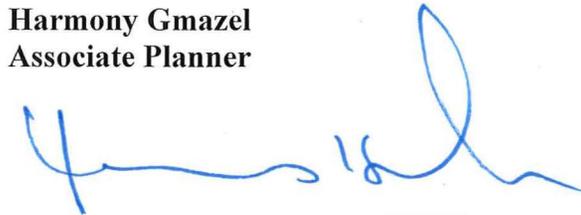
CHARTER TOWNSHIP OF MERIDIAN

MEMORANDUM

DATE: December 18, 2015

TO: Harmony Gmazel
Associate Planner

FROM:



Younes Ishraidi, PE
Chief Engineer

RE: Chick-fil-A – 2055 Grand River Avenue

In response to your request for comments regarding the subject site plans, we offer the following comments:

Sanitary System:

- The proposed 8” sanitary main in Grand River Avenue shall be PVC (SDR-26), not SDR-35.
- A profile view of the 8” main must be shown on sheet PS-10.
- Cleanouts are required for the proposed laterals at all bends and on straight runs exceeding 90 feet.
- Review and approval of plumbing plans is required from this office, to ensure compliance with Township’s requirements of the proposed grease interceptor’s fixture connections. A maintenance agreement for the grease interceptor will be required.
- A sanitary permit from MDEQ may be required for the proposed sanitary main.

Water System:

- A portion of the proposed water main is within private property; a third party easement to Meridian Township will be required for this portion of the water main. The third party easement must be secured before construction of the main, and site development can start.
- A profile view of the proposed water main is required.
- The water main, extending to 10’ behind the hydrant, shall be in an easement.
- The water main and service lines shall be revised to meet Township requirements for point of separation. Refer to Township’s standard water detail sheet.
- A water permit from MDEQ will be required.

- The fire protection system installation and maintenance shall be in accordance with Meridian Township policy. Fire protection plans require approval by this office and the fire department. A maintenance agreement for the backflow prevention devices will be required.
- What is the proposed domestic and irrigation meter' sizes? Fixture flow calculations are required to justify meter sizes for all water meters larger than 1".

Storm system and drainage:

- Storm water calculations have been received but not yet approved, pending comments from ICDC, and MDOT.

Soil Erosion & Sedimentation Control:

- A soil erosion/ sedimentation control (SESC) plan and permit will be required.

Pathway and sidewalks:

- Sections of the 7' pathway along Grand River Avenue may need to be replaced, pending field inspection.
- Ramps within the development must be ADA compliant.

General:

- There is proposed work within the a floodplain area on the subject site; permits from the Township, MDEQ & possibly FEMA will be required.
- Meridian Township's current standard detail sheets, and standard notes for construction, water, sanitary and pathway/sidewalk shall be included with all future plan submittals. The applicant's engineer may contact our office for digital files of these sheets and notes.
- A permit will be required from MDOT for all proposed work within Grand River Avenue R.O.W.

Fees:

The following fees and/or deposits will be required:

Engineering Review Fee: to be determined*

Inspection Escrow Deposit: to be Determined*

SESC Permit: to be determined

* Exact amount will be determined when itemized cost estimates of all proposed sanitary, water, pathway work are provided.

**Special Use Permit #15-70141
(Chick-fil-A, Inc.)
December 21, 2015**

APPLICANT: Jason Hill
Chick-fil-A, Inc.
5200 Buffington Rd
Atlanta, GA 30349

STATUS OF APPLICANT: Option to Purchase

REQUEST: Major Amendment to Special Use Permit (SUP) #70141 to reduce the existing lot size through a lot split.

CURRENT ZONING: C-3 (Commercial)

LOCATION: 2055 W. Grand River Avenue, Okemos

AREA OF SUBJECT SITE: 35.73 acres

EXISTING LAND USE: Commercial (Meijer)

EXISTING LAND USES IN AREA:
N: Commercial
S: Office and Commercial
E: Residential and Commercial
W: Office and Commercial

CURRENT ZONING IN AREA:
N: C-2 (Commercial)
S: RC (Multiple Family); C-2 (Commercial); PO (Office)
E: C-2 (Commercial); RX (Duplex)
W: C-2 (commercial); PO (Office)

FUTURE LAND USE DESIGNATION: Commercial Core Area

FUTURE LAND USE MAP:
N: Commercial Core
S: Commercial Core
E: Commercial Core
W: Office

CHARTER TOWNSHIP OF MERIDIAN

MEMORANDUM

TO: Planning Commission

FROM: Harmony Gmazel
Harmony Gmazel
Associate Planner

DATE: December 15, 2015

RE: Special Use Permit #15-70141 (Meijer.), a major amendment to reduce the existing lot size by 1.32 acres.

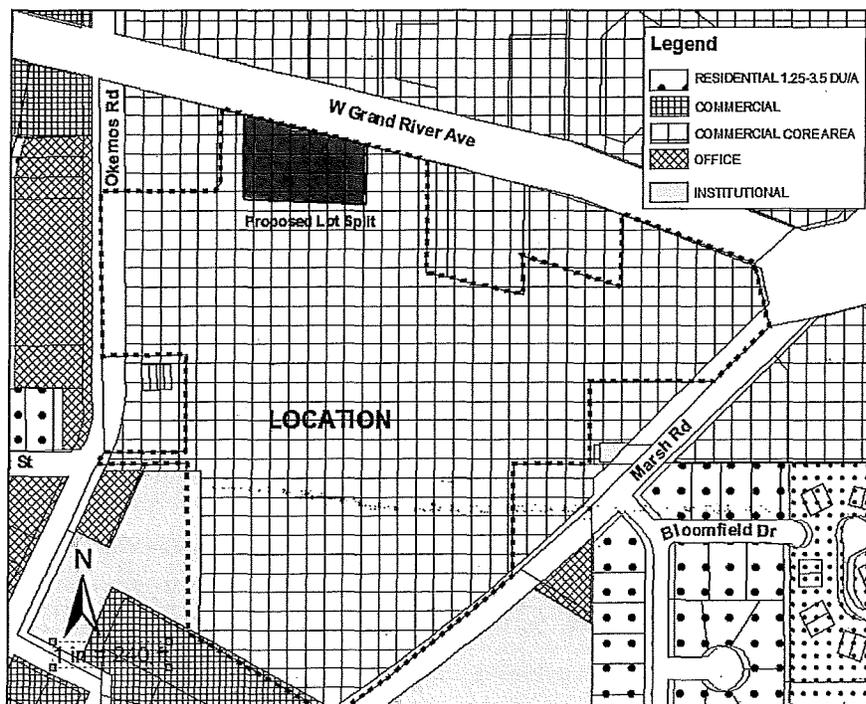
On behalf of Meijer, Chick-fil-A, Inc. has requested a major amendment to the special use permit (SUP #70141) for the reduction of the existing Meijer site by 1.32 acres. Chick-fil-A intends to purchase the site in order to accommodate a fast-food restaurant and drive-thru. The proposed 1.32 acre site is located on the south side of Grand River Avenue, between 2041 and 2083 Grand River Ave. The original lot in question is a 35.73 acre site located at 2055 W. Grand River Avenue in Okemos.

With the request to split this parcel, a major amendment to the original 1970 SUP is required (Section 86-404(e)(14). The Planning Commission will decide the amendment for the lot split.

Master Plan

The 2005 Master Plan designates the subject site in the Commercial Core Area category. Surrounding areas include commercial, office, institutional and residential. The red area depicted below shows the 1.32 acres being purchased by Chick-fil-A, Inc. The remaining Meijer site is the 34.41 acres depicted within the dashed line.

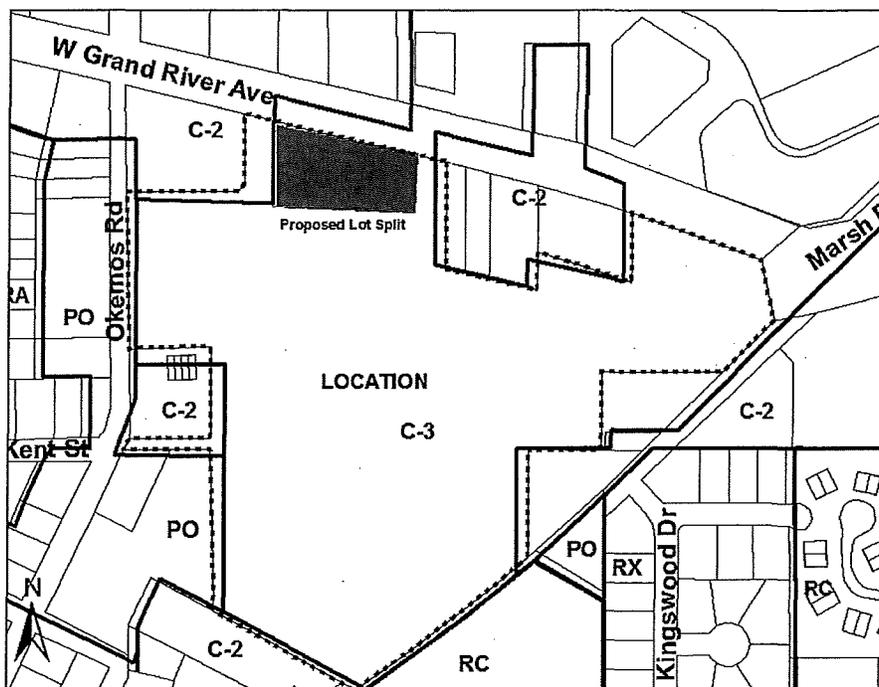
FUTURE LAND USE MAP



Zoning

Sites zoned C-3 Commercial require a minimum 100 feet of lot width and 10,000 square feet of lot area. The subject site's lot width and lot area exceed the minimum requirements due to its size of over 35 acres. The proposed lot also meets lot width requirements on Grand River Avenue and Okemos Road, and area requirements for C-3.

ZONING MAP



Physical Features

Currently the 1.32 acre site is undeveloped, while the remaining 34.41 acre Meijer site consists of the Meijer retail store and outside parking.

Public Utilities

The Meijer site is served by public water, public sewer, Consumers Energy and other local and regional utility providers.

Storm Water Management

Storm drainage patterns and storm water management shall remain as existing. No change in storm water quantity is proposed. Impervious areas will increase as a result of the proposed lot split. According to an approved Meijer site plan dated December 20, 2011, impervious surface was 72.3% of the site. In 2014, a land division removed 2.65 acres from the Meijer site. Together with the removal of 1.32 acres of open space from the site with this proposed amendment, the pervious surface rate for the amended Meijer site is approximately 25%.

Staff Analysis

The applicant has requested a major amendment to special use permit to reduce their lot size to accommodate the selling of 1.32 acres on Grand River Avenue. The new and existing sites are zoned C-3 (Commercial) and are planned as a commercial core area. The existing site and proposed site both meet zoning requirements for lot area and width. The stormwater patterns for the existing site and amended site will remain the same. Due to the reduction of 1.32 acres of open space on the Meijer site to accommodate the lot split, and the lot split that occurred in 2014 that removed 2.65 acres, the overall Meijer impervious ratio is increased from just over 72% to nearly 75% imperviousness on the site.

Planning Commission Options

The Planning Commission may approve, approve with conditions or deny the major amendment to the special use permit. A resolution to approve the major amendment is provided.

Attachments

1. Application and Submittals
2. Special Use Permit criteria (Section 86-126)
3. Site Plans, dated November 23, 2015 & December 20, 2011

**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 GBC Design, Inc., Gary R. Rouse
Address of Applicant
565 White Pond Drive, Akron, OH 44320 *74 107* Telephone - Work 330-836-0228 Home 330-256-4876 Fax 330-836-5782 Email grouse@gbcdesign.com
Interest in property (circle one): Owner Tenant Option Other
(Please attach a list of all persons with an ownership interest in the property.)
2055 W. Grand River Avenue, Okemos, MI 48864
- B. Site address / location / parcel number Part of 33-02-02-21-276-010
Legal description (please attach if necessary)
See attached Meijer Deed
Current zoning C-3
Use for which permit is requested / project name Sale of 1.32 Acres of vacant land to Chick-fil-A.
Corresponding ordinance number _____
- C. Developer (if different than applicant) Meijer
Address 2530 3 Mile Road NW, Grand Rapids, MI 49544
Telephone - Work 616-791-3909 Home _____ Fax _____
- D. Architect, Engineer Planner or Surveyor responsible for design of project if different from applicant:
Name GBC Design, Inc.
Address 565 White Pond Drive; Akron, OH 44320
Telephone - Work 330-836-0228 Home _____ Fax 330-836-5782
- E. Acreage of all parcels in the project: Gross 35.73 Net 34.41
- F. Explain the project and development phases: Meijer intends to sell Chick-fil-A a 1.32 Acre parcel of vacant land for their development.
- G. Total number of:
Existing: structures 1 bedrooms _____ offices _____ parking spaces 1045 carports _____
garages _____ Proposed: structures 1 bedrooms _____ offices _____ parking spaces 1045 carports
_____ garages _____
- H. Square footage: existing buildings ^{256,542} _____ proposed buildings 0
Usable Floor area: existing buildings ^{256,542} _____ proposed buildings 0
- 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 N/A Acreage N/A
Proposed Recreation: Type N/A Acreage N/A

- M. Any other information specified by the Director of Community Planning and Development which is deemed necessary to evaluate the application.
- N. In addition to the above requirements, for zoning districts, **RD, RC, RCC, RN, and CV** and **Group Housing Residential Developments** the following is required:
1. Existing and proposed contours of the property at two foot intervals based on United States Geological Survey (USGS) data.
 2. Preliminary engineering reports in accordance with the adopted Township water and sewer standards, together with a letter of review from the Township Engineer.
 3. Ten copies of a report on the intent and scope of the project including, but not limited to: Number, size, volume, and dimensions of buildings; number and size of living units; basis of calculations of floor area and density and required parking; number, size, and type of parking spaces; architectural sketches of proposed buildings.
 4. Seven copies of the project plans which the Township shall submit to local agencies for review and comments.
- O. In addition to the above requirements, a special use application in zoning district **RP** requires the following material as part of the site plan:
1. A description of the operations proposed in sufficient detail to indicate the effects of those operations in producing traffic congestion, noise, glare, air pollution, water pollution, fire hazards or safety hazards or the emission of any potentially harmful or obnoxious matter or radiation.
 2. Engineering and architectural plans for the treatment and disposal of sewerage and industrial waste tailings, or unusable by-products.
 3. Engineering and architectural plans for the handling of any excessive traffic congestion, noise, glare, air pollution, or the emission of any potentially harmful or obnoxious matter or radiation.
- P. In addition to the above requirements, a special use application for a use in the Floodway Fringe of zoning district **CV** requires the following:
1. A letter of approval from the State Department of Environmental Quality.
 2. A location map including existing topographic data at two-foot interval contours at a scale of one inch representing 100 feet.
 3. A map showing proposed grading and drainage plans including the location of all public drainage easements, the limits, extent, and elevations of the proposed fill, excavation, and occupation.
 4. A statement from the County Drain Commissioner, County Health Department, and Director of Public Works and Engineering indicating that they have reviewed and approved the proposal.
- Q. In addition to the above requirements, a special use application for a use in the Groundwater Recharge area or zoning district **CV** requires the following:
1. A location map including existing topographic data at two-foot interval contours.
 2. A map showing proposed grading and drainage plans including the location of all public drainage easements, the limits and extent of the proposed fill, excavation, and occupation.
 3. A statement from the County Drain Commissioner, County Health Department, and Director of Public Works and Engineering indicating that they have reviewed and approved the proposal.
- R. In addition to the above requirements, the Township Code of Ordinances, Article VI, should be reviewed for the following special uses: group housing residential developments, mobile home parks, nonresidential structures and uses in residential districts, planned community and regional shopping center developments, sand or gravel pits and quarries, sod farms, junk yards, sewage treatment and disposal installations, camps and clubs for outdoor sports and buildings greater than 25,000 square feet in gross floor area.
- S.

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. Yes. Since a fast-food restaurant is a permitted use in this Zoning District, the sale of this parcel is consistent with the Code.
(2) The project is consistent with applicable land use policies contained in the Township's comprehensive development plan of current adoption. Yes. The Site is Zone C-3 which permits fast-food restaurants, so the sale of the land for this purpose is consistent.
(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. As Chick-fil-A will be an excellent fit in this commercial area, the sale of land for their development will be harmonious and appropriate.
(4) The project will not adversely affect or be hazardous to existing neighboring uses. The sale of land for construction of this Chick-fil-A will not have an adverse or hazardous affect on neighboring uses.
(5) The project will not be detrimental to the economic welfare of surrounding properties or the community. The sale of land for the addition of Chick-fil-A should actually help boost the economic welfare of the surrounding properties and 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. All of the necessary public facilities are available.
(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. Existing facilities are available. Proposed facilities will not adversely affect the existing facilities and will be properly designed to handle the long term needs.
(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. The sale of land for development by Chick-fil-A will not have an adverse affect on the area.
(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. There is a 0.24 Area area of isolated wetlands on-site. It has been delineated and reviewed by the Township's consultant where it was determined that a Wetland Permit will not be necessary.

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.

[X] 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

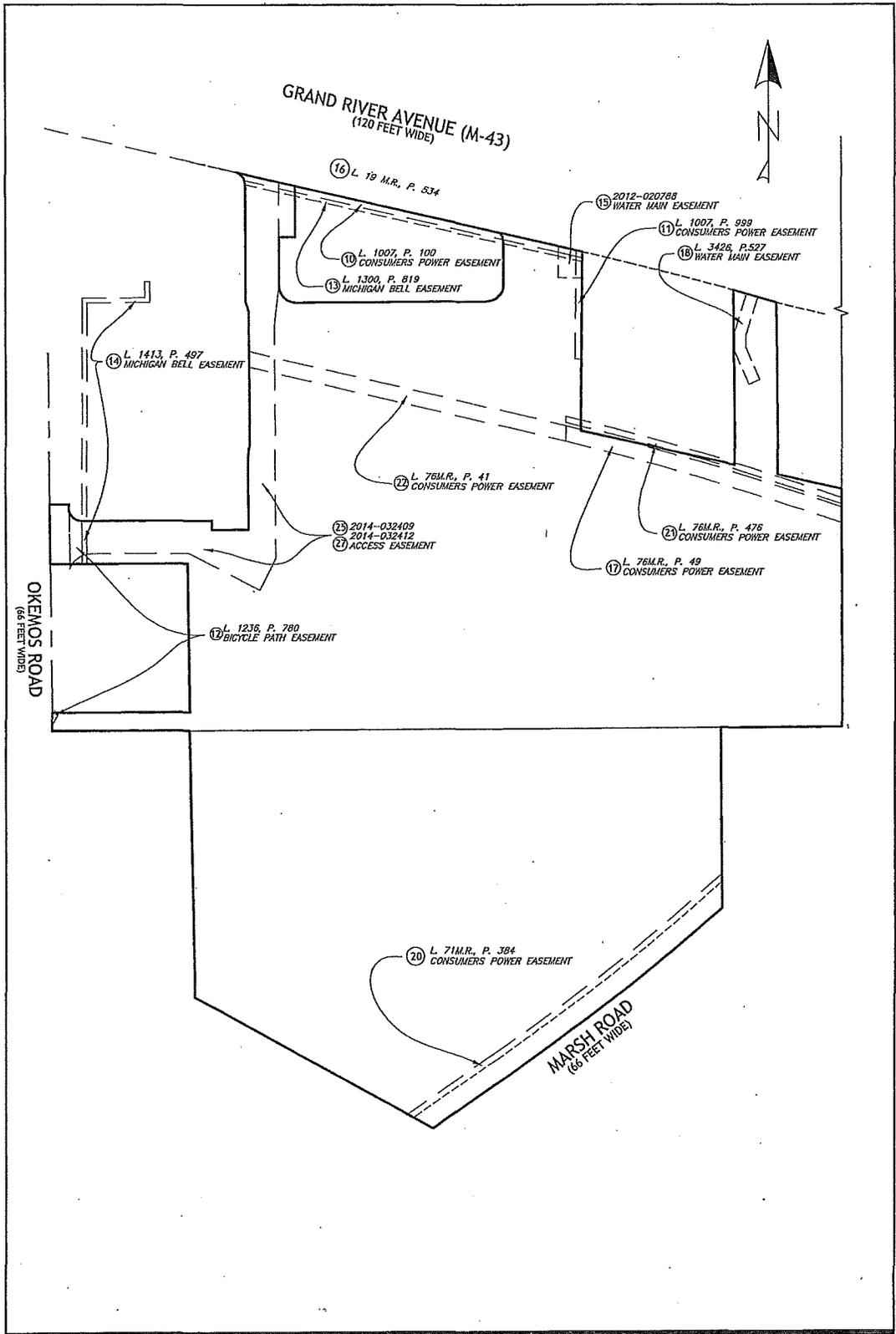
[Signature]
Signature of Applicant

11-20-15
Date

Gary R. Rouse
Type/Print Name

Fee: _____

Received by/Date: _____



ENGINEERING THE FUTURE.
 13500 REECK ROAD
 SOUTHGATE, MI 48195
 (734) 759-1600
 FAX (734) 282-6566
 WWW.HENGINEERS.COM

TITLE			
CERTIFICATE OF SURVEY - EASEMENTS			
SECTION 21			
MERIDIAN TOWNSHIP			
INGHAM COUNTY, MICHIGAN			
DRAWN	REH, PS	APPROVED	REH, PS
PROJECT No.	53472	SCALE	1" = 200'
DATE	11/12/15	DRAWING NUMBER	SHEET 2 OF 5

GBC DESIGN, INC.

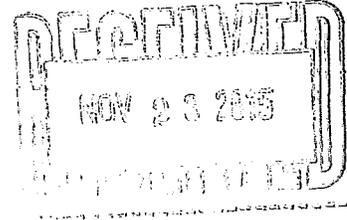
565 White Pond Drive • Akron, OH 44320-1123 • Phone 330-836-0228 • Fax 330-836-5782 • www.GBCdesign.com

November 20, 2015

Meridian Township
5151 Marsh Road
Okemos, MI 48864

Attention: Peter Menser

Subject: **Amendment to the Meijer Special Use Permit
2055 W. Grand River Avenue
Okemos, MI
GBC Project No. 48115**



Dear Peter,

Meijer is interested in selling a 1.32 Acre parcel of vacant land in front of their store at 2055 W. Grand River Avenue. This store received a Special Use Permit from Meridian Township on December 27, 2011. Therefore, in order for Meijer to sell Chick-fil-A the 1.32 Acre parcel, they must obtain a Special Use Permit Amendment. Enclosed are the following for submission to the Planning Department for the Meijer Special Use Permit Amendment:

- One (1) Special Use Permit Application.
- Fifteen (15) copies of the authorization letter from Meijer.
- Fifteen (15) prints of the Meijer Special Use Permit "Overall Site Plan" approved on December 27, 2011.
- Fifteen (15) prints of the Meijer "Special Use Permit Amendment Site Plan" dated November 20, 2015.
- Fifteen (15) copies of the proposed Lot Split of the 1.32 Acre parcel. Included with this are the Legal Description of the 1.32 Acre parcel to be sold to Chick-fil-A, and the residual parcel to be retained by Meijer.
- Fifteen (15) copies of the Meijer Deed.

Please note on the "Special Use Permit Amendment Site Plan" that the Meijer parcel area will be reduced 35.73 Acres to 34.41 Acres and that the impervious surface will be increased from 72.3% to 75.0%. As the required maximum impervious surface area is 70%, the existing condition is non-conforming and will remain non-conforming. It is also important to note on the Lot Split drawings that the residual widths of the parcels fronting on W. Grand River Avenue after splitting off the Chick-fil-A parcel will exceed the required minimum of 100 feet.

If you have any other information please contact me.

Very truly yours,

Gary R. Rouse, P.E., P.S., CPESC, CPSWQ

Enclosure

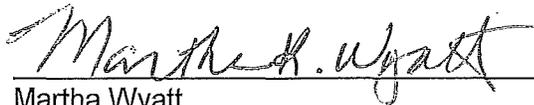
c: Kurt Adams, Meijer w/ enclosed via email
Jason Hill, Chick-fil-A w/ enclosed via email
file

CHARTER TOWNSHIP OF MERIDIAN

MEMORANDUM

TO: Planning Commission

FROM:



Martha Wyatt
Associate Planner/Landscape Architect

DATE: December 18, 2015

RE: Special Use Permit #15131 (Robbie Pairolero), request to establish an optometry clinic as a nonresidential use in a residential district, east side of Marsh Road, north of Haslett Road, Haslett MI

The Planning Commission held a public hearing regarding Special Use Permit #15131 at its October 12, 2015 meeting. The special use permit is a request by Dr. Pairolero to establish an optometry clinic, a nonresidential use permitted by special use permit in a residential district, on two vacant platted lots zoned RN (Multiple Family, Mixed Residential), located on the east side of Marsh Road, north of Haslett Road. The approximate 0.40 acre site is in Section 10 of the Township.

At the public hearing the Planning Commission noted concerns with the number of variances that would be required, including building and parking setbacks, landscape buffer width, and insufficient parking. The applicant had requested a decision the same night as the public hearing however the Planning Commission did not act on that request.

The applicant presented a revised plan at the November 23, 2015 regular meeting of the Planning Commission. The revisions included a reduction in the square footage of the building, which eliminated the need for a variance for the number of parking spaces. Although the building was moved further from rear lot line (approximately 10.1 feet from the rear lot line), a variance was required as the rear setback is 50 feet. Variances were also required for the parking area for the north, south, and front yard setbacks.

The Planning Commission directed the applicant to consider additional design options to reduce the encroachment into the rear yard (for the building) as the top priority and reduce the extent of the other variances related to parking area setbacks and the number of parking spaces. It was the consensus of the Planning Commission to have the applicant make changes to the plans as noted and present sketch plans to the Planning Commission at its December 14, 2105 meeting.

The applicant has provided revised plans for the December 21, 2015 Planning Commission meeting, including a plan showing the required building and parking setbacks. The building size remains at 3,588 square feet (for the main floor) as was proposed on plans presented on November 23, 2015. The building elevations remain the same as shown on November 23, 2015. The location of the building was revised to provide a rear yard setback of 20.14 feet, as opposed to the previous setback of 10.1 feet. In moving the building forward the 100 foot setback from the centerline of Marsh Road is not met, as the building is located 98.98 feet from the centerline.

SUP #15131 (Robbie Pairolero)
Planning Commission (12/18/15)
Page 2

The parking area design was adjusted to add two parking spaces in the row of parking along the front of the building. The parking area is now six feet from the side lot lines on the north and south whereas the parking area was shown at 15 feet from the north and south lot lines. The landscaped buffer along the frontage of the site is now seven feet in width, for an increase of two feet from the previous plan.

Fourteen parking spaces are provided and 16 parking spaces are required, using the bicycle parking reduction. Two parallel parking spaces are shown on either side of the entrance drive however staff is not sure the spaces will accommodate the necessary parking maneuvers to exit the space easily.

Several variances are required as summarized below:

- Front yard setback for the building, from the centerline of Marsh Road (a 100 foot setback is required and the proposed setback is 98.98 feet).
- Rear yard setback for the building (a 50 foot setback is required and the proposed setback is 20.14 feet).
- Side yard setback for the parking area (a 20 foot setback is required and the proposed setbacks are 6 feet from the north and south lot lines).
- Landscaped buffer along the frontage of the site adjacent to parking (a 20-foot wide landscaped buffer is required and a 5-foot wide landscaped buffer is proposed).
- Number of parking spaces (16 [parking spaces are required and 14 parking spaces are proposed).

Planning Commission Options

The Planning Commission may approve, approve with conditions or deny the special use permit. A resolution to approve has been provided.

Attachments

1. Resolution to Approve
2. Planning Commission minutes dated November 23, 2015
3. Site Plan showing required setbacks
4. Aerial Photograph
5. Revised Site Plan dated December 15, 2105

RESOLUTION TO APPROVE

**Special Use Permit #15131
(Robbie Pairolero)**

East side of Marsh Road, north of Haslett Road

RESOLUTION

At a regular meeting of the Planning Commission of the Charter Township of Meridian, Ingham County, Michigan, held at the Meridian Municipal Building, in said Township on the 21st day of December 2015, at 7:00 p.m., Local Time.

PRESENT: _____

ABSENT: _____

The following resolution was offered by _____ and supported by _____

WHEREAS, Robbie Pairolero, requested a special use permit (Special Use Permit #15131) to construct an optometry clinic on an approximate 0.40 acre site zoned RN (Multiple Family, Mixed Residential) and located on the east side of Marsh Road, north of Haslett Road; and

WHEREAS, the Planning Commission held a public hearing for Special Use Permit #15131 at its October 12, 2015 meeting; and

WHEREAS, the Planning Commission reviewed and discussed staff material forwarded under cover memorandums dated October 9, 2015, November 20, 2015, and December 18, 2015; and

WHEREAS, the subject site is appropriately zoned RN (Multiple Family, Mixed Residential), which allows for an optometry clinic subject to special use permit approval; and

WHEREAS, the proposed building will be harmonious and appropriate with the existing and intended character of the adjacent office buildings south of the subject site; and

WHEREAS, public water and sanitary sewer are available to serve the site; and

WHEREAS, the proposed optometry clinic will be adequately served by essential public facilities and services, such as police, fire, stormwater drainage, existing roadways and public transit; and

WHEREAS, the proposed project is consistent with the general standards for granting a special use permit found in Section 86-126 of the Code of Ordinances.

**Resolution to Approve
SUP #15131 (Robbie Pairolero)
December 18, 2015
Page 2**

NOW THEREFORE, BE IT RESOLVED THE PLANNING COMMISSION OF THE CHARTER TOWNSHIP OF MERIDIAN hereby approves Special Use Permit #15131 subject to the following conditions:

1. Approval is based on application materials submitted by Robbie Pairolero; site plans prepared by KEBS, Inc dated December 15, 2015; and building elevations prepared by M.A.S. Residential House Plan Designers, dated November 15 2015, subject to revisions as required.
2. Approval is subject to receiving all necessary variances from the Zoning Board of Appeals.
3. The final site plan, landscape plan, building elevations, building materials and colors, shall be subject to the approval of the Director of Community Planning and Development.
4. The trash dumpster shall be enclosed on four sides; three sides of the enclosure shall be constructed with masonry products to match the building.
5. All mechanical, heating, ventilation, air conditioning, generators, and similar systems shall be screened from view by an opaque structure or landscape material selected to complement the building. Such screening is subject to approval by the Director of Community Planning and Development.
6. Site and building lighting shall comply with Article VII in Chapter 38 of the Code of Ordinances and shall be subject to the approval of the Director of Community Planning and Development. LED lighting shall be used where feasible.
7. Final utility, grading, and storm drainage plans for the site shall be subject to the approval of the Director of Public Works and Engineering and shall be completed in accordance with the Township Engineering Design and Construction Standards.
8. The applicant shall obtain all necessary permits, licenses and approvals from the Ingham County Drain Commissioners office, the Ingham County Road Department, and the Township. Copies of all permits, licenses, and approvals shall be submitted to the Department of Community Planning & Development.
9. Copies of the site plan information and construction plans for the project that exist in an AutoCAD compatible format shall be provided to the Township Engineering staff.
10. Any future modifications to the optometry clinic shall require a modification to Special Use Permit #15131.

**Resolution to Approve
SUP #15131 (Robbie Pairolero)
December 18, 2015
Page 3**

ADOPTED: YEAS: _____

NAYS: _____

STATE OF MICHIGAN)
) ss
COUNTY OF INGHAM)

I, the undersigned, the duly qualified Chairperson of the Planning Commission of the Charter Township of Meridian, Ingham County, Michigan, DO HEREBY CERTIFY that the foregoing is a true and a complete copy of a resolution adopted at a regular meeting of the Planning Commission on the 21st day of December, 2015.

John Scott-Craig, Chair
Meridian Township Planning Commission

ROLL CALL VOTE: YEAS: Commissioners DeGross, Deits, Honicky, Ianni, Jackson, Van Coevering, Chair Scott-Craig

NAYS: None

Motion carried 7-0.

- 
- C. Special Use Permit #15131 (Pairolero), request to construct a non-residential use in a residential district (optometry clinic) on two undeveloped platted lots located on the east side of Marsh Road north of Haslett Road

Commissioner Deits suggested this item be removed from the agenda and an additional public hearing be scheduled, due to submission of new information by the applicant.

Associate Planner Wyatt summarized the changes to the special use permit request as outlined in staff memorandum dated November 20, 2015.

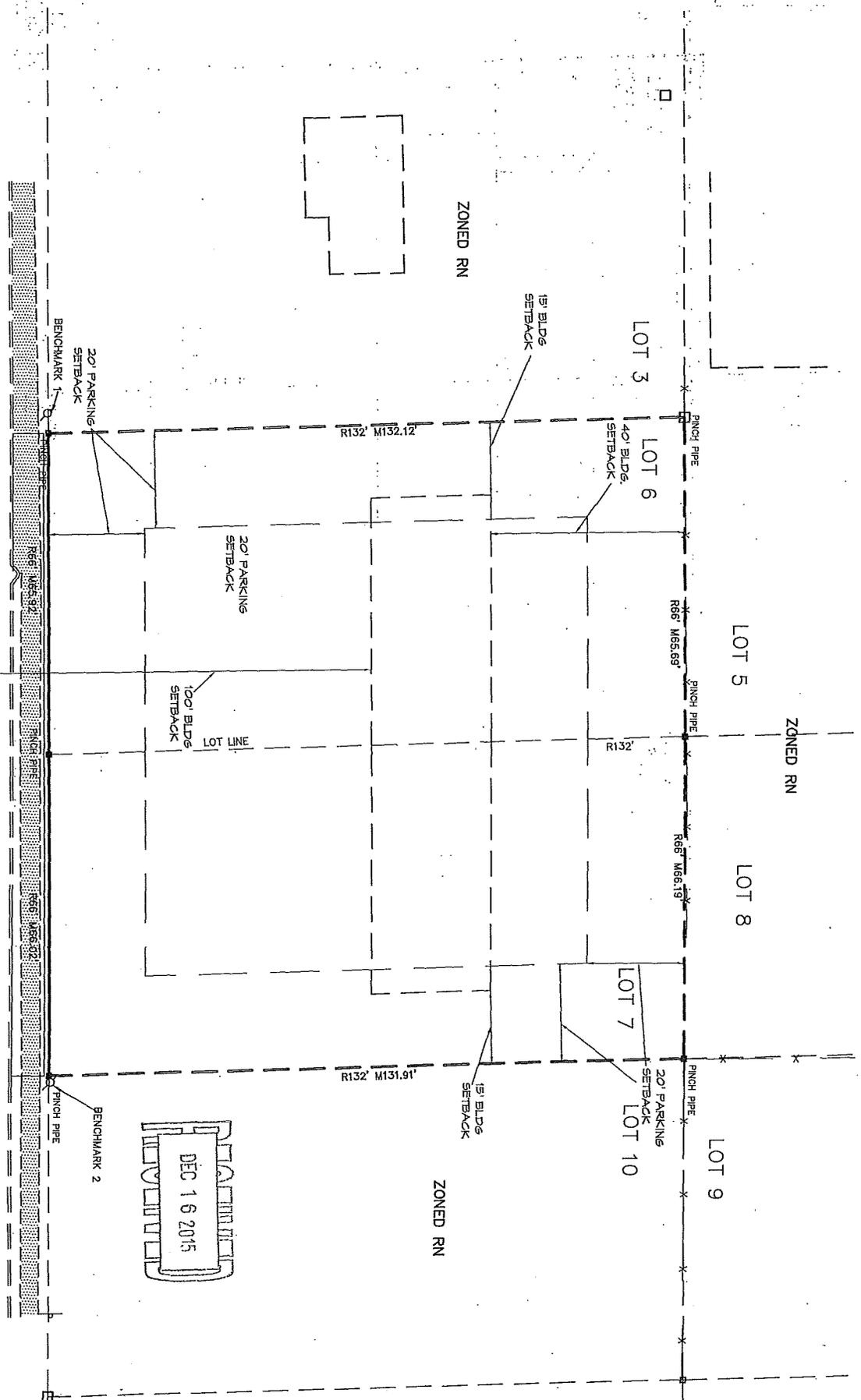
Planning Commission, staff and applicant discussion:

- Reduction of 252 square feet in the building which reduced the required number of parking spaces to 18
- Offer of bicycle parking reduced the number of motor vehicle parking spaces to 16
- Rear yard setback was increased from 7.96 feet to 10 feet
- Building elevations remain the same
- Commissioner belief there will not be much opportunity for residential development of this land on Marsh Road, a major commercial area
- Difficulty exists with placing commercial development on this sized property without a variance(s)
- Concern with isolating a small piece of land to the south
- Preference for the applicant to purchase the piece of land to the south (lot 10), reconfigure the parking and move the building forward so variances are unnecessary
- Concern with water management due to the eight (8) foot drop from the front to the rear of the subject property
- Inquiry as to the distance of the buildings on lots 14, 15 and 18 from their rear property line
- Commissioner belief placement of the building as proposed compromises the residential character of the land to the north and south
- Commissioner preference, from a planning point of view, to initiate an investigation whether to rezone this parcel to Professional and Office (PO)
- Zoning amendment to PO would allow the property to be utilized for other uses, if sold, as opposed to the proposed use allowed by SUP
- Testimony from the last meeting that lot 10 is not on the market and the owner has no desire to sell
- Doctor's office is a great community based business for nearby residents
- Subject property does not have sufficient space for most types of development
- Rezoning to PO would not change the setbacks in the front or rear
- PO zoned parcel next to residential requires a 50 foot rear yard setback and the building front requires 100 feet from the center line of March Road
- Depth of lot is 132 feet
- Front and rear yard setback requirements allow 16 feet of building depth
- Tax collection for lot 10 has been turned over to the county for the last three (3) tax cycles
- Commissioner statement there is no way to build a conforming building on the subject property

- Commissioner belief the proposed building does not fit this lot
- Commissioner preference to bring the building forward on the lot with parking in the rear
- Net “gain” in buildable area if the parking was placed in the rear
- Need for a mechanism to get past the difficulties associated with the setback requirements on this parcel while respecting the neighbors
- Zoning Board of Appeals (ZBA) will consider that the front and rear yard setbacks prevent anything being built on the property greater than 16 feet in depth
- Zoning ordinance created the difficulty with development on this property
- Reduction in the required parking will require a variance
- Variance(s) will be required in order for there to be any development on the site
- Turning the building on its side would not alleviate the need for a variance(s)
- Lot 10 would also be unbuildable due to setback requirements
- Commissioner preference to maintain the building’s square footage, but make the building more square shaped to have smaller amounts of needed variances
- Appreciation the applicant has tried to alter plans based on Planning Commission feedback
- Commissioner preference to grant a front variance rather than a rear variance as it would not have an impact on the community
- Suggestion to “split” the parking, with employee parking in the rear with a driveway along one side
- Inquiry by the applicant’s representative about the 2004 variance for the vet clinic to add an addition to a non-conforming building and a non-conforming extension of a parking buffer along the front
- Sixteen (16) parking spaces is not “excessive”, but is more than adequate
- Six employees (doctor included) would be the maximum present on any given shift
- Maximum estimate of patients at any given time is eight (8)
- Planning Commission or the Township Board has the right to initiate a property’s rezoning without the permission of the applicant
- Commissioner request to have the applicant set the reduction in the rear yard setback variance as the highest priority in order to lessen the impact to the community
- Need to rank the importance of the variances
- Commissioner preference to impact the roadway through a front yard variance rather than requesting a large variance for the rear yard setback
- Focus of reducing the requested variances over placement of parking in the rear
- Emphasis of the ZBA that they consider requests on a case-by-case basis
- Comparisons of variances received for other nearby properties would need to be very specific and very similar in order to be relevant to the ZBA
- Commissioner suggestion to focus on reducing certain variances as much as possible, particularly in the rear of the property rather than reducing the amount of required parking
- Commissioner caution to ensure there are sufficient parking spaces to meet the applicant’s needs
- Commissioner suggestion to include this area in the update of the Future Land Use Map
- Planning Commission and the ZBA have a desire for the applicant to have maximum use of the land which now sits vacant
- Planning Commission desire to minimize the extent of the needed variance in the rear, even if it requires a greater number of variances

It was the consensus of the Planning Commission to have the applicant make changes based on comments by Commissioners and bring back sketch plans to the Planning Commission at its December 14th meeting.

MARSH ROAD



PLATTED
DEC 16 2015

1 Rod

DEC 16 2015

MARSH ROAD



LOT 18

LOT 17

LOT 1

LOT 13

LOT 16

LOT 2

LOT 9

LOT 10

LOT 8

LOT 7

LOT 5

LOT 6

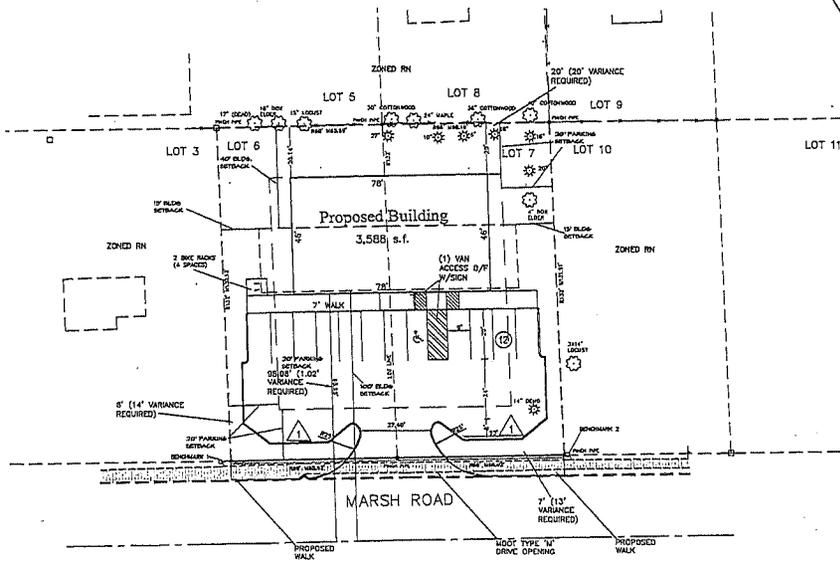
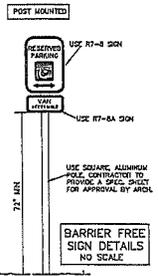
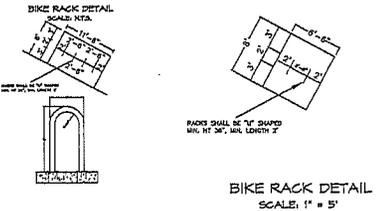
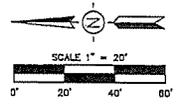
LOT 4

LOT 3

S.U.P. PLAN FOR:
Eye Care Associates
 MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

CLIENT:
 JAMES EDWARDS BUILDERS, INC.
 1001 E. SHARON ST.
 LANSING, MI 48206
 PH: (313) 333-7700
 FAX: (313) 467-1123

ENGINEER/SURVEYOR:
 KEBS, INC.
 2116 HAZLETT RD.
 HAZLETT, MI 48840
 PH: (517) 333-1014
 FAX: (517) 333-8047



Legal Description (as provided): Lot 8, Block 12, Village of Nemoia, Meridian Township, Ingham County, Michigan, according to the recorded plat thereof, as recorded in Liber 1 of Plats, Page 25, Ingham County Records.

Legal Description (as provided): Lot 7, Block 12, Village of Nemoia, Meridian Township, Ingham County, Michigan, according to the recorded plat thereof, as recorded in Liber 1 of Plats, Page 25, Ingham County Records.

PROPOSED 2-STORY BUILDING
 LOWER LEVEL STORAGE ONLY
 3588 SF/FLOOR
 ZONED RN
 USE-MEDICAL CLINIC

PARKING REQUIRED 5 SPACES/1000 GFS
 (CLINIC AREA)
 3588 x 5 = 17.9 OR 18 SPACES

4 BICYCLE SPACES PROVIDED

PARKING REQUIRED:
 18 = (1 SPACE/2 BIKE SPACES) * 4 = 18 - 2
 = 16 SPACES REQUIRED

14 PARKING SPACES PROVIDED
 (2 SPACE VARIANCE REQ'D)

REQUIRED SETBACKS:
 BUILDING FRONT 100' FROM C/L
 SIDE 15'
 REAR 40'

PARKING FRONT 20' FROM R.O.W.
 REAR 20' FROM RESIDENTIAL

PROPOSED SETBACKS:
 BUILDING FRONT 98.98' - (1.02' VARIANCE REQUIRED)
 SIDE GREATER THAN REQUIRED
 REAR 20' - (20' VARIANCE REQUIRED)

PARKING FRONT 7' - (13' VARIANCE REQUIRED)
 SIDE 5' - (14' VARIANCE REQUIRED)
 REAR GREATER THAN REQUIRED

NOTE: JANITORIAL SERVICE TO BE PROVIDED
 NO DUMPSTER PROPOSED

BUILDING COVERAGE
 MAX. 35% ALLOWED

BUILDING 3,588 S.F.
 TOTAL PROPERTY = 17,420 S.F.
 3,588/17,420 = 20.60%

TOTAL LOT COVERAGE PROPOSED
 MAX. 75% ALLOWED

10,715/17,420 = 61.51%

⓪ DENOTES PROPOSED NUMBER OF 3'x6' PARKING SPACES
 ▲ DENOTES PROPOSED NUMBER OF 8'x12' PARALLEL PARKING SPACES

BENCHMARK 1 ELEV = 888.03
 NAIL IN WEST SIDE POWER POLE
 NEAR NORTHWEST CORNER OF SITE

BENCHMARK 2 ELEV = 886.06
 NAIL IN WEST SIDE POWER POLE
 NEAR SOUTHWEST CORNER OF SITE

NOTE: WATER SHALL HAVE 1/4" HORIZONTAL
 DEVIATION & 1/4" VERTICAL DEVIATION FROM
 ALL OTHERS.

LEGEND	
---	EXT. CONTAINER
---	EXT. WATER MAIN
---	EXT. SANITARY SEWER
---	EXT. STORM SEWER
---	EXT. ELEVATIONS
---	PROPOSED WATER MAIN
---	PROPOSED SANITARY SEWER
---	PROPOSED STORM SEWER
---	PROPOSED CH
---	PROPOSED CH
---	CENTER LINE OF ROAD
---	UTILITY ALIGNMENT
---	PROPERTY LINE
---	POLE W/RYAN
---	WATER VALVE
---	THROAT BLOCK
---	PROPOSED TOP OF CURB ELEV.

EX. LEGEND	
---	SET 1/2" BAR WITH CAP
---	PELAGI SIGN AS NOTED
---	DISTANCE NOT TO SCALE
---	FINISH
---	ASPHALT
---	GRASS LINE
---	UNDERGROUND TELEVISION
---	UNDERHEAD WIRE
---	DECIDUOUS TREE
---	CONIFEROUS TREE
---	UTILITY POLE

EX. INVENTORY:

SANITARY MANHOLE #700
 FIN ELEV. = 884.1
 8" CONC. SE. INV. = 833.37
 6" CONC. W. INV. = 834.45
 12" CONC. N. INV. = 833.57

SANITARY MANHOLE #813
 FIN ELEV. = 863.0
 8" CONC. N. INV. = 841.7
 12" CONC. S. INV. = 833.24
 12" CONC. E. INV. = 842.1



SHEET INDEX

- COVER SHEET
- UTILITY PLAN
- GRADING PLAN
- LANDSCAPE PLAN

REVISIONS		APPROVED BY	
1	11-30-15 TYP.	DATE	BY
2	11-18-15 TYP.	DATE	BY
3	12-15-15 ELEC.	DATE	BY

TAX ID# 33-02-02-10-280-002 & 003

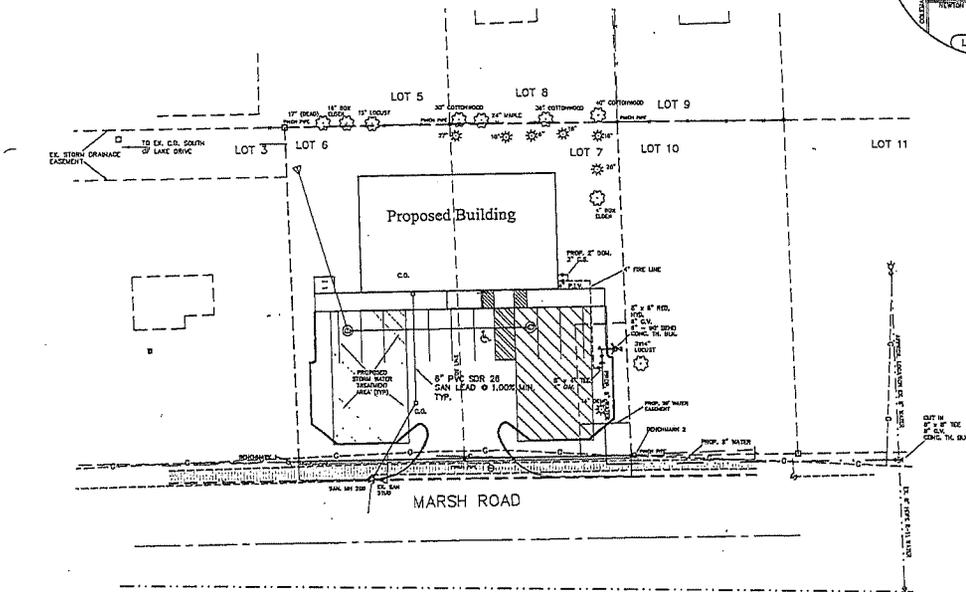
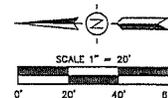
KEYS, INC. ENGINEERING
 2116 HAZLETT ROAD, HAZLETT, MI 48840
 PH: 517-333-1014 FAX: 517-333-8047

Eye Care Associates
 CONSTRUCTION

APPROVED BY: JAMES EDWARDS BUILDERS, INC.
 DATE: 01-06-16
 SHEET 1 OF 4

SURVEYED BY: JAMES EDWARDS BUILDERS, INC. DATE: 11/15/15

S.U.P. PLAN FOR:
Eye Care Associates
 MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN



BENCHMARK 1 ELEV = 855.03
 NAIL IN WEST SIDE POWER POLE
 NEAR NORTHWEST CORNER OF SITE

BENCHMARK 2 ELEV = 856.08
 NAIL IN WEST SIDE POWER POLE
 NEAR SOUTHWEST CORNER OF SITE

NOTE: WATER SHALL HAVE 12" HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWER.

LEGEND	
---	EX. CONTIGUOUS
---	EX. WATER MAIN
---	EX. SANITARY SEWER
---	EX. STORM SEWER
---	EX. ELEVATIONS
---	PROPOSED WATER MAIN
---	PROPOSED SANITARY SEWER
---	PROPOSED STORM SEWER
---	MANHOLE OPEN
---	PROPOSED C&G
---	MANHOLE COVER
---	UTILITY LOCATED
---	CONTROL LINE OF ROAD
---	ROAD FRONT OF WAY
---	PROPERTY LINE
---	POLE HOISTWAY
---	WATER VALVE
---	TRUSS BLOCK
---	1/2" IRON
---	PROPOSED TOP OF CURB ELEV.

EX. LEGEND	
○	8" x 1/2" BAW WITH CAP
□	FLANG FROM AS NOTED
---	DISTANCE NOT TO SCALE
---	FINISH
---	ASPHALT

EX. WHOLESTORY
 SANITARY MANHOLE #800
 18" DIA. = 864.13
 6" CONC. DE. INV. = 850.27
 12" CONC. DE. INV. = 851.57
 18" CONC. DE. INV. = 852.87
 SANITARY MANHOLE #800
 18" DIA. = 864.13
 6" CONC. DE. INV. = 844.72
 12" CONC. DE. INV. = 843.24
 18" CONC. DE. INV. = 842.76



TAX ID# 33-02-02-10-280-002 & 003

REVISIONS		DATE	
1	ISSUED FOR PERMITS	11-15-15	TRM
2	ISSUED FOR PERMITS	12-15-15	BLD

KEBS, INC. 218 HAGLEY ROAD, MARSH, MI 48840
 PH: 517-338-1814 FAX: 517-338-8047
 MERIDIAN OFFICE PH: 248-781-2300

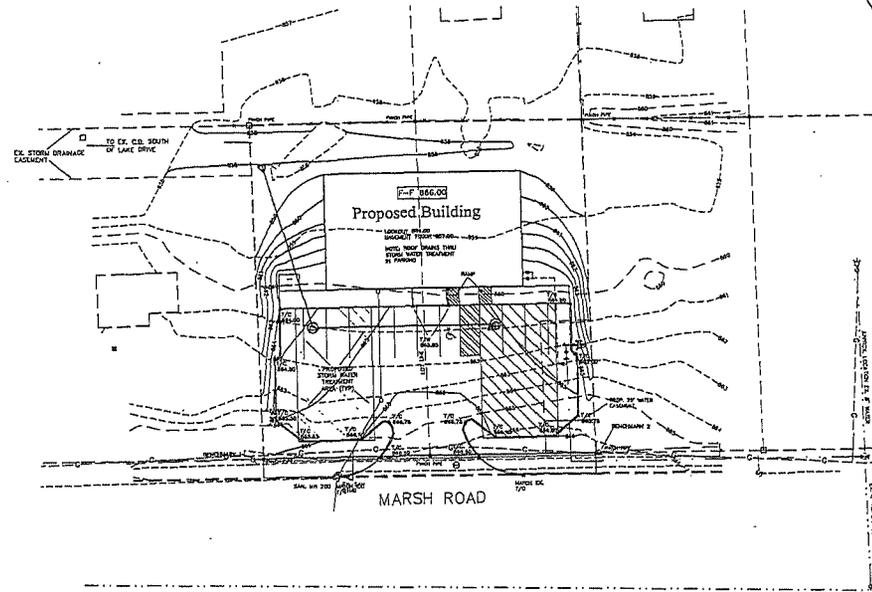
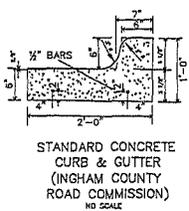
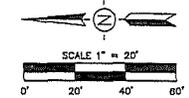
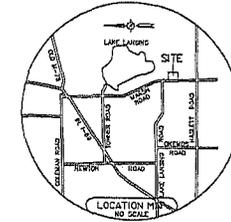
Eye Care Associates
 UTILITY PLAN
 SCALE: 1" = 20'
 DATE: 9-28-15
 AUTHORIZED BY: JAMES EDWARD BURDICK, INC.
 DRAWN BY: JAMES EDWARD BURDICK, INC.

SHEET 2 OF 4
 8/9/05

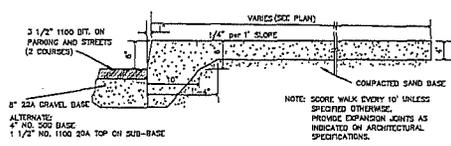
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S.U.P. PLAN FOR:
Eye Care Associates
 MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

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



INTEGRAL SIDEWALK AND CURB DETAIL
 NO SCALE



BENCHMARK 1 ELEV = 858.83
 NAIL IN WEST SIDE POWER POLE
 NEAR NORTHWEST CORNER OF SITE

BENCHMARK 2 ELEV = 856.83
 NAIL IN WEST SIDE POWER POLE
 NEAR SOUTHWEST CORNER OF SITE

- LEGEND**
- EX. CONTIGUES
 - EX. METEOR SHAH
 - EX. SANITARY SEWER
 - EX. STORM SEWER
 - EX. ELEVATION
 - PROPOSED WATER MAIN
 - PROPOSED SANITARY SEWER
 - PROPOSED STORM SEWER
 - MARKED FOR REMOVAL
 - UTILITY CAUGHT
 - CENTER LINE OF ROAD
 - ROAD RIGHT OF WAY
 - FIRE HYDRANT
 - WATER VALVE
 - THIRST MARK
 - AT&T MARK
 - PROPOSED TOP OF CURB ELEV.

NOTE: WATER SHALL MAINT 12" MINIMUM SEPARATION & 12" VERTICAL SEPARATION FROM ALL SEWERS.

- EX. LEGEND**
- DISTANCE NOT TO SCALE
 - FENCE
 - ASPHALT



EX. DIMENSIONS

SANITARY MANHOLE #200
 8" DIA. = 864.1
 6" CONC. W. WALL = 853.4
 12" CONC. W. WALL = 853.27

SANITARY MANHOLE #200
 8" DIA. = 864.1
 6" CONC. W. WALL = 864.72
 12" CONC. W. WALL = 853.24
 12" CONC. L. WALL = 848.76

TAX ID# 33-02-02-10-250-002 & 003		SURVEY/PROJ/LOT/PT	
REVISIONS	DATE'S	BY	REVISIONS
ESSENTIAL	8-20-15	TWP.	2018 HASLETT ROAD, HASLETT, MI 48842 PH: 517-339-6814 FAX: 517-339-6847
11-18-15	TWP.	Survey Office	ph: 262-761-5600
12-15-15	ROAD		
SOLD 1" x 20"		DRAWN BY	
DATE 8-20-15		PROJECT NO.	
AUTHORIZED BY		SHEET 3 OF 4	
JAMES EDWARD BURDICK, Inc.		JOB #	
		89105	

CHARTER TOWNSHIP OF MERIDIAN
MEMORANDUM

DATE: December 17, 2015

TO: Planning Commission

FROM: 
Gail Oranchak, AICP
Principal Planner

RE: Zoning Amendment #15080 (Township Board), amend Section 86-473 Street Trees

The Planning Commission held a public hearing on November 9, 2015 to consider amendments to Section 86-473 Street Trees. Based on commissioner comments, staff revised the draft ordinance which the Planning Commission discussed at the December 14th meeting. The attached draft dated December 17, 2015 offers a few additional changes shown in **RED**.

Planning Commission Options

The Planning Commission may recommend approval of the draft as proposed or a revised draft to the Township Board. A resolution to recommend approval has been provided.

Attachments

1. Resolution to recommend approval
2. Proposed amendment to Section 86-473 Street Trees dated December 17, 2015

RESOLUTION TO APPROVE

**Zoning Amendment #15080
Township Board
Section 86-473 Street Trees**

RESOLUTION

At the regular meeting of the Planning Commission of the Charter Township of Meridian, Ingham County, Michigan, held at the Meridian Municipal Building, in said Township on the 21st day of December, 2015, at 7:00 p.m., Local Time.

PRESENT: _____

ABSENT: _____

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

WHEREAS, a zoning amendment (ZA #15080) was initiated to amend Section 86-473 Street Trees to continue to require the installation of new street trees and to expand the ordinance to consider preservation of existing street trees along and within the rights-of-way of public streets in Meridian Township; and

WHEREAS, the Planning Commission held a public hearing and discussed the request at its November 9, 2015 meeting; and

WHEREAS, the Planning Commission reviewed staff material forwarded under cover memorandums dated November 5, 2015, December 10, 2015 and December 17, 2015; and; and

WHEREAS, the amendment to Section 86-473 Street Trees continues to require the planting of new street trees along public streets for the purpose of improving public health, safety and general welfare; and

WHEREAS, the amendment promotes the retention of existing street trees within public road rights-of-way to further preserve the township's natural assets and environment by allowing existing trees to substitute for required new street trees; and

WHEREAS, the amendment provides a mechanism for evaluating existing street trees prior to removal to determine viability for preservation by considering tree species, size, form, age, location and physical condition; and

WHEREAS, the amendment is consistent with Goal 3, Objective E, Strategy 3 of the 2005 Master Plan to initiate and maintain a program of tree planting along the Township's major thoroughfares; and

WHEREAS, the amendment is consistent with a 2015 Township Board goal to update the street tree ordinance.

NOW THEREFORE BE IT RESOLVED THE PLANNING COMMISSION OF THE CHARTER TOWNSHIP OF MERIDIAN hereby recommends approval of Zoning Amendment #15080, to amend Section 86-473 Street Trees of the Code of Ordinances to protect, provide and preserve trees along and near streets within the Township for the purposes of improving air quality, promoting traffic calming, and maintaining natural beauty.

ADOPTED: YEAS: _____

NAYS: _____

STATE OF MICHIGAN)
) ss
COUNTY OF INGHAM)

I, the undersigned, the duly qualified and acting Chair of the Planning Commission of the Charter Township of Meridian, Ingham County, Michigan, DO HEREBY CERTIFY that the foregoing is a true and a complete copy of a resolution adopted at a regular meeting of the Planning Commission on the 21st day of December, 2015.

John Scott-Craig
Planning Commission Chair

Sec. 86-473. Street trees.

The purpose of this section is to protect, preserve and provide trees along and near streets within the Township; to provide for public health, safety, and general welfare gained from the visual aesthetics, air purification, and traffic calming benefits of trees; to promote and retain the Township's natural beauty; and to identify, address mitigate and resolve concerns regarding trees during the design phase of projects.

A. New street trees. New street trees shall be planted as part of any nonresidential or multiple-family developments, planned unit developments (PUD), mixed use planned unit developments (MUPUD), and commercial planned unit developments (CPUD), using the following minimum standards:

(1) Location of new street trees shall be determined by street classifications found in Section 86-367.

a. Arterial streets: New street trees shall be planted in a manner determined appropriate by the Director of Community Planning and Development with input from the Ingham County Road Department and the Michigan Department of Transportation, as applicable.

b. Collector and local streets: Street trees shall be planted between the curb line and edge of pavement and the right of way line of the street provided site visibility shall be maintained in a manner consistent with Section 86-474. ~~Final determination on the appropriateness of the proposed street tree location(s) shall be determined by the Director of Community Planning and Development with input from the Ingham County Road Department and the Michigan Department of Transportation, as applicable.~~ **THE DIRECTOR OF COMMUNITY PLANNING AND DEVELOPMENT WITH INPUT FROM THE INGHAM COUNTY ROAD DEPARTMENT OR MICHIGAN DEPARTMENT OF TRANSPORTATION, AS APPLICABLE SHALL DETERMINE THE APPROPRIATENESS OF THE FINAL LOCATION OF PROPOSED STREET TREES.**

c. In those cases where a street tree is planted less than five feet from the curb line or a sidewalk/pathway, materials shall be installed with the tree(s) which prevent heaving by deflecting the roots away from growing directly under the curb, street or sidewalk/pathway.

(2) Tree size. New street trees shall be at least two inches in caliper when planted. Any tree which dies within two years after planting shall be replaced by the developer.

B. Existing trees. In an effort to preserve viable existing trees and in lieu of planting new street trees, existing trees located in the right of way of all street classifications may be preserved and used as street trees subject to the approval of the Director of Community Planning and Development with input from the Ingham County Road Department or Michigan Department

of Transportation, **AS APPLICABLE**. The following minimum standards shall be utilized for all existing trees located within the right of way:

- (1) Existing trees shall be identified by species and diameter at breast height (**DBH**) on plans submitted with applications for special use permits, planned unit developments (PUD), mixed use planned unit developments (MUPUD), commercial planned unit developments (CPUD), and site plans if one or both of the following are proposed:
 - a. An applicant proposes to retain an existing street tree in lieu of planting a new tree.
 - b. An applicant proposes to remove one or more existing street trees located in the right of way abutting a development site and demonstrates the lack of feasible or prudent alternatives **WITHOUT** causing undue hardship.
- (2) Evaluation of existing street trees for either substitution for a new street tree or for preservation shall be based on the following criteria: desirability of the existing tree's species, form, size, age, location and physical condition.
- (3) The preservation of individual existing trees meeting the criteria above should have priority over the design and location of proposed streets, access drives, and infrastructure when there are other practical alternatives to removing the tree(s).
- (4) The Township may impose conditions on the method and extent of the proposed activities in the right of way, as necessary, to ensure they will be conducted in a manner which will minimize damage, encroachment, or interference with the health and well-being of the tree(s).
- (5) Tree protection measures identified in Section 22-179 of the code of ordinances may be required to assure the health and well-being of each existing tree to be preserved. Activities should not be conducted within the drip line of the tree, including but not limited to placing solvents, material, machinery, vehicles, or soil.
- (6) One replacement **DECIDUOUS** tree shall be planted for each preserved existing tree that dies within ~~12 months~~ **TWO YEARS** after completion of the project. Tree species and planting locations are subject to the approval of the Director of Community Planning and Development. **Deciduous** Trees shall be a minimum of two inches in diameter.

RESOLUTION

At a regular meeting of the Planning Commission of the Charter Township of Meridian, Ingham County, Michigan, held on the 21st day of December 2015 at 7:00 p.m., local time.

PRESENT: _____

ABSENT: _____

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

WHEREAS, Thomas Deits has served as a member of the Charter Township of Meridian Planning Commission since January, 2004; and

WHEREAS, during his 12-year tenure, Tom Deits has enthusiastically dedicated his time and effort to the Planning Commission serving as Chair of the Planning Commission from January, 2011 through December, 2012; as Vice-Chair from January, 2010 to December 2011 and January, 2013 through December 2014; and serving as the Planning Commission's liaison to the Downtown Development Authority; and as a member of various committees including Public Improvements Program, Future Land Use, Economic Analysis, Mixed Use Planned Unit Development; and Commercial Planned Unit Development; and

WHEREAS, Tom Deits has attended and participated in numerous and sometimes lengthy regular meetings, work sessions, and special meetings to consider day-to-day and future planning issues and proposals and participated in the completion of the 2005 Master Plan; and

WHEREAS, Tom Deits has thoughtfully considered each request presented before the Planning Commission during his term.

NOW, THEREFORE, BE IT RESOLVED BY THE PLANNING COMMISSION OF THE CHARTER TOWNSHIP OF MERIDIAN, INGHAM COUNTY, MICHIGAN as follows:

The Planning Commission of the Charter Township of Meridian, by means of resolution, extends to Tom Deits grateful thanks for his voluntary effort on behalf of all residents of the community during this period of dedicated service on the Planning Commission.

ADOPTED: YEAS: _____

NAYS: _____

STATE OF MICHIGAN)
)ss
COUNTY OF INGHAM)

I, the undersigned, the duly qualified Chairperson of the 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 Planning Commission on the 21st day of December 2015.

John Scott-Craig, Chair