GENOA CHARTER TOWNSHIP PLANNING COMMISSION PUBLIC HEARING SPECIAL MEETING JUNE 24, 2019 6:30 P.M. AGENDA

CALL TO ORDER:

PLEDGE OF ALLEGIANCE:

APPROVAL OF AGENDA:

<u>CALL TO THE PUBLIC: (Note: The Board reserves the right to not begin new business after 10:00 p.m.)</u>

OPEN PUBLIC HEARING #1...Review of a special use, site plan and environmental impact assessment for a proposed 60,335 sq. ft. industrial building located at 5665 Sterling Drive, Brighton. The request is petitioned by Schonsheck, Inc.

- A. Recommendation of Special Use Application
- B. Recommendation of Environmental Impact Assessment (5-22-19)
- C. Recommendation of Site Plan (5-22-19)

OPEN PUBLIC HEARING #2...Review of an environmental impact assessment and a site plan for a proposed 358 sq. ft. building expansion and parking lot expansion for Enterprise Rental Car located at 7184 Grand River Avenue, Brighton. The request is petitioned by Enterprise Leasing Company.

- A. Recommendation of Environmental Impact Assessment (3-26-19)
- B. Disposition of Site Plan (5-22-19)

OPEN PUBLIC HEARING #3...Review of a site plan amendment for material modifications to the existing Courtyard Marriott located at 7799 Conference Center Drive, Brighton. The request is petitioned by Robert Nofar, and Paul Krysinski, Axis Construction.

A. Disposition of Site Plan Amendment.

OPEN PUBLIC HEARING #4... Consideration of Zoning Ordinance Text amendments to Article 25 of the Zoning Ordinance, entitled "Definitions".

A. Recommendation of Amendments to Article 25.

ADMINISTRATIVE BUSINESS:

- Staff Report
- Approval of May 13, 2019 Planning Commission meeting minutes
- Member discussion
- Adjournment



GENOA CHARTER TOWNSHIP Application for Site Plan Review

TO THE GENOA TOWNSHIP PLANNING COMMISSION AND TOWNSHIP BOARD:

APPLICANT NAME & ADDRESS: Schonsheck, Inc. 50555 Pontiac Trail, Wixom, MI 48393 If applicant is not the owner, a letter of Authorization from Property Owner is needed.

OWNER'S NAME & ADDRESS: Masonite Corporation

SITE ADDRESS: ______PARCEL #(s): ______PARCEL #(s): ______ APPLICANT PHONE: (248) 669-8800 OWNER PHONE: (920) 365-2222

OWNER EMAIL: ____

LOCATION AND BRIEF DESCRIPTION OF SITE:

The project is located at 5665 Sterling Drive, Howell, MI 48843. Masonite Corporation

owns the three parcels and their current facility is located on the north parcel.

This project will be built on the other two vacant parcels.

BRIEF STATEMENT OF PROPOSED USE:

Masonite Corporation manufactures, stores and distributes pocket door frames

and commercial architectural wood doors. Due to growth, the new facility will

accommodate expansion space needed to meet the industry demand.

THE FOLLOWING BUILDINGS ARE PROPOSED:

59,400 SF facility with related site work and improvements.

I HEREBY CERTIFY THAT ALL INFORMATION AND DATA ATTACHED TO AND MADE PART OF THIS APPLICATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: SIRA

Dave R. Haskins

ADDRESS: 50555 Pontiac Trail Wixom, MI 48393

Contract In Franciscus	n		Construction and the second second
<u>Contact Information</u> -	Review Letters and	i Correspondence snan be	iorwarded to the jollowing:

1.) Dave R. Haskins

of Schonsheck, Inc. Business Affiliation at_____dhaskins@schonsheck.com

E-mail Address

FEE EXCEEDANCE AGREEMENT								
As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy.								
SIGNATURE DE PAC	DATE	5-1-19						
PRINT NAME Dave R Haskins	PHONE	248-669-8800						
ADDRESS 50555 Pontiac Trail Wixom, MI 48393								

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This application must be accompanied by a site plan review application and the associated submittal requirements. (The Zoning Official may allow a less detailed sketch plan for a change in use.)

APPLICANT NAME & ADDRESS: Schonsheck, Inc. 50555 Pontiac Trail Wixom, MI 48393 Submit a letter of Authorization from Property Owner if application is signed by Acting Agent.

APPLICANT PHONE: (248) 669-8800	EMAIL: dhaskins@schonsheck.com
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OWNER NAME & ADDRESS: Masonite Corporation

SITE ADDRESS: 5665 Sterling Drive

_PARCEL #(s): 4711-15-200-028 / 4711-15-200-029 4711-15-200-030 OWNER PHONE: (920) 365-2222 EMAIL: barmbruster@masonite.com

Location and brief description of site and surroundings:

Zoned industrial, located at the end of Sterling Drive and surrounded by other industrial uses.

Proposed Use:

New manufacturing facility

Describe how your request meets the Zoning Ordinance General Review Standards (section 19.03):

a. Describe how the use will be compatible and in accordance with the goals, objectives, and policies of the Genoa Township Comprehensive Plan and subarea plans, and will promote the Statement of Purpose of the zoning district in which the use is proposed.

The new facility of an existing industrial (IND) use that has been in Genoa Township and in

operation since 1999.

b. Describe how the use will be designed, constructed, operated, and maintained to be compatible with, and not significantly alter, the existing or intended character of the general vicinity.

As stated above, the new facility of an existing Industrial (IND) use that has been in operation since

1999. The new facility will meet the ordinance for exterior building wall materials.

c. How will the use be served adequately by essential public facilities and services such as highways, streets, police and fire protection, drainage structures, water and sewage facilities, refuse disposal and schools?

The new facility will be serviced by extending public utilities.

A fire protection system included for adequate protection in the event of a fire.

d. Will the use involve any uses, activities, processes, or materials potentially detrimental to the natural environment, public health, safety, or welfare by reason of excessive production of traffic, noise, vibration, smoke, fumes, odors, glare, or other such nuisance? If so, how will the impacts be mitigated?

The new facility will not impact the natural environment, public health, safety, or welfare

and will not produce excessive traffic, noise, vibration, smoke, fumes, odors, or glare

e. Does the use have specific criteria as listed in the Zoning Ordinance (sections 3.03.02, 7.02.02, & 8.02.02)? If so, describe how the criteria are met.

The use (IND) does not impact section 3.03.02 & 7.02.02

The proposed use is in	compliance with PERMITTED AND SPECIAL LAND USES
section 8.02.02	

I HEREBY CERTIFY THAT ALL INFORMATION AND DATA ATTACHED TO AND MADE PART OF THIS APPLICATION ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF. I AGREE TO DESIGN, CONSTRUCT AND OPERATE, AND MAINTAIN THESE PREMISES AND THE BUILDINGS, STRUCTURES, AND FACILITIES WHICH ARE GOVERNED BY THIS PERMIT IN ACCORDANCE WITH THE STATED REQUIREMENTS OF THE GENOA TOWNSHIP ZONING ORDINANCE, AND SUCH ADDITIONAL LIMITS AND SAFEGUARDS AS MAY BE MADE A PART OF THIS PERMIT.

Schonsheck, Inc. THE UNDERSIGNED STATES THAT THEY ARE THE FREE OWNER OF THE PROPERTY OF PROPERTIES DESCRIBED ABOVE AND MAKES APPLICATION FOR THIS SPECIAL LAND USE PERMIT.

0 Roll BY:

Dave R. Haskins

50555 Pontiac Trail Wixom, MI 48393 ADDRESS:

Contact Information - Review Letters and Correspondence shall be forwarded to the following:

Dave R. Haskins

Name

of Schonsheck, Inc. **Business Affiliation** at dhaskins@schonsheck.com Email

FEE EXCEEDANCE AGREEMENT

As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy.

SIGNATURE:

PRINT NAME: Dave R. Haskins

PHONE: 248-669-8800

DATE: 5-1-19



April 26, 2019

Genoa Township 2911 Dorr Rd. Brighton, MI 48116

To Whom It May Concern:

This letter herby authorizes Schonsheck, Inc. to act as our designated agent, exclusively as it relates to our new proposed facility, located at 5665 Sterling Drive, Howell, MI. As such, Schonsheck, Inc. and their representatives will apply for all site plan approval and municipal permitting on behalf of Masonite Corporation.

Sincerely,

Matt Hamlin Director of Engineering Masonite Corporation



Planning Commission Genoa Township 2911 Dorr Road Brighton, Michigan 48116

Attention:	Kelly Van Marter, AICP
	Planning Director and Assistant Township Manager
Subject:	Masonite Corporation – Special Land Use and Site Plan Review #2
Location:	5665 Sterling Drive – westerly terminus of Sterling Drive
Zoning:	IND Industrial District

Dear Commissioners:

At the Township's request, we have reviewed the special land use and site plan submittal from the Masonite Corporation (revised plans dated 5/22/19) for a new industrial building and related site improvements on the vacant parcel at the westerly terminus of Sterling Drive.

A. Summary

- 1. The special land use standards of Section 19.03 are generally met, though any technical comments provided by the Township Engineer and/or Brighton Area Fire Authority must be addressed.
- 2. Minor corrections are needed to the site notes on Sheet C-1.1 with respect to the size of the building.
- 3. The applicant must obtain authorization from the adjacent owner to the north for site elements that overlap the common property line.
- 4. We request the applicant present building material and color samples to the Commission.
- 5. The applicant requests that the Commission waive the wall/berm requirement for the buffer zone along I-96 due to the presence of existing vegetation, wetlands and steep topography.
- 6. Minor corrections are needed to the landscape plan.
- 7. At such time as signage is proposed, the applicant must obtain a permit from the Township prior to installation.

B. Proposal/Process

The proposal includes a new 59,400 square foot industrial building for manufacturing, storage and distribution of door frames and commercial doors.

The plans also identify a future building and associated parking; however, our review is only focused on the current proposal. If/when the new building is proposed, the applicant will need to apply for a new special land use/site plan review.

Per Section 8.02 of the Township Zoning Ordinance, permitted industrial uses with more than 40,000 square feet of floor area require special land use review/approval.

Procedurally, following the required public hearing, the Planning Commission is to put forth a recommendation to the Township Board on the special land use, site plan review and Impact Assessment. The Board has the final review/approval authority over the project.



Aerial view of site and surroundings (looking north)

C. Special Land Use Review

Section 19.03 of the Zoning Ordinance identifies the review criteria for Special Land Use applications as follows:

1. Master Plan. The Township Master Plan identifies the site and adjacent properties as Industrial, which is intended for "industrial uses such as research, wholesale and warehouse activities and light industrial operations which manufacture, compounding, process, package, assemble and/or treat finished or semi-finished products from previously prepared material."

Given the nature of the request and the planned uses for the subject area, we believe the proposal is compatible with the Master Plan and Future Land Use Map.

2. Compatibility. Sterling Drive contains a host of industrial uses, including several with outdoor storage (which is not proposed as part of this project).

Given the nature of the established uses in the area, including current zoning (IND) and planned uses (Industrial), the proposal is expected to be compatible with its surroundings.

3. Public Facilities and Services. Given that Sterling Drive is already developed with a variety of industrial uses, we anticipate necessary public facilities and services are in place.

With that being said, the Commission should consider any comments provided by the Township Engineer and/or Brighton Area Fire Authority with respect to this standard.

- **4. Impacts.** Similar to the compatibility comment noted above, given the nature of the subject area and the proposed use, the project is not expected to adversely impact surrounding properties or uses.
- **5.** Mitigation. If any concerns arise as part of the review process, the Township may require additional efforts to mitigate potential adverse impacts.

D. Site Plan Review

1. General Comments. The size of the proposed building has been slightly reduced from the original submittal; however, the zoning information and parking calculations on Sheet C-1.1 still reference the older building size. Additionally, the detention pond and some plantings are proposed on the adjacent property to the north. Authorization for these elements must be obtained.

2. Dimensional Requirements. The proposal has been reviewed for compliance with the dimensional standards of the IND, as follows:

	Min. L	ot Req.	Min	imum Yar	d Setbac	ks (feet)	Max. Lot	Max.
	Area	Width	Front	Side	Rear	Parking	Coverage (%)	Height
	(acres)	(feet)	Yard	Yard	Yard	Lot		(feet)
IND	1	150	85	25	40	20 front	40% building	30
						10 side/rear	85% impervious	
Proposed	18.4	1,325	102	65	279	20 front	10.3% building	28
						58 side/rear	25.8% impervious	

Given the relatively odd lot shape and access to the terminus of the roadway, we have deemed the easterly lot line to the be front, which then establishes the northerly lot line as a side and the westerly lot line as the rear.

3. Building Materials and Design. The proposed building elevation drawings depict the use of precast concrete wall panels with a flat roof.

There are differing colors depicted as vertical and horizontal bands to help break up the large wall faces, along with a scattering of windows.

We request the applicant present building material and color samples to the Commission for their consideration.

- **4. Pedestrian Circulation.** Public sidewalks are not required for projects in the IND. The plan does include an internal sidewalk (7-foot wide, concrete) along the west side of the parking lot providing a safe pedestrian path between the parking lot and building entrances.
- **5.** Vehicular Circulation. Internal parking and drives meet or exceed the dimensional standards of the Zoning Ordinance. Sheet C-2.0 provides a turning movement plan for semi-trucks, which indicates that a truck of that size can adequately maneuver around the site.
- **5. Parking.** The proposed parking lot has been reviewed for compliance with the standards of Article 14, as follows:

	Required	Proposed	Comments
Parking Spaces			
Office (1/300 SF gross floor area)	16.5		
Manufacturing (1.5/1,000 SF gross floor area)	45.3		
Warehousing (1/1,500 SF gross floor area)	16.8		
TOTAL	79	79	In compliance
Barrier Free Spaces	4	4	In compliance
Dimensions			
Spaces (75 to 90-degree)	9' x 18'	9' x 18'	
Drive aisle width (two-way)	24'	26'	In compliance
			There is ample room at the rear of the site for loading/unloading of large trucks.
			The applicant has indicated that smaller
Loading			delivery vehicles will utilize the front
Between 5,000 SF and 60,000 SF	3	0	parking lot for short term drop-off.

6. Landscaping. The revised landscape plan (Sheets L1 and L2) has been reviewed for compliance with the standards of Section 12.02, as noted in the following table:

Standard	Required	Proposed	Notes
Parking lot	8 canopy trees	8 canopy trees	Requirements met
-	790 SF landscaped area	1,959 SF landscaped area	
Buffer zone	20' width	Existing vegetation	The notes on the landscape plan reference
"В"	40 canopy trees	40 canopy trees	existing vegetation, topography and wetlands
(along I-96)	40 evergreen trees	40 evergreen trees	as hindrances to providing a berm or wall.
	159 shrubs	159 shrubs	PC has the authority to waive/modify this
	6' wall or 3' berm		requirement.
Detention	18 trees	18 trees	Requirements met
pond	169 shrubs	169 shrubs	

Some of the proposed plantings are on the adjacent property to the north, including the terminus of Sterling Drive and the detention pond. Authorization must be granted to allow off-site plantings.

Additionally, there are some minor inconsistencies between the landscape plan and plant list that should be corrected: the notation for the Black Spruce trees of "PG" is incorrect (should be "PM") and we could only identify 42 "CA" and 51 "VT."

- 7. Waste Receptacle. The cover letter included with the revised submittal notes that waste receptacle containers will be provided internal to the building within the truck docks. Containers for trash, recycling, wood and metal are also depicted on the floor plan (Sheet A-101).
- **8.** Exterior Lighting. The site lighting plan identifies 9 light poles throughout the site, as well as 14 wall-mounted fixtures. All of the lighting proposed is downward directed, shielded/cut-off LED fixtures.

Maximum lighting intensities, both on-site and along property lines, as well as pole heights (25 feet) are within that allowed by Ordinance.

- **9.** Signs. The revised submittal indicates that no signage is proposed at this time. If/when proposed, the applicant must obtain a sign permit from the Township prior to installation of any signage.
- **10. Impact Assessment.** The submittal includes an Impact Assessment dated April 24, 2019, which notes that the project is not anticipated to adversely impact natural features, public services/utilities or surrounding land uses.

Should you have any questions concerning this matter, please do not hesitate to contact our office. I can be reached by phone at (248) 586-0505, or via e-mail at <u>bborden@safebuilt.com</u>.

Respectfully, **SAFEBUILT STUDIO**

Brian V. Borden, AICP Planning Manager



June 3, 2019

Ms. Kelly Van Marter Genoa Township 2911 Dorr Road Brighton, MI 48116

Re: Masonite Corporation Site Plan Review No. 2

Dear Ms. Van Marter:

Tetra Tech conducted a second site plan review of the preliminary Masonite site plans last dated May 22, 2019. The plans were prepared by Monument Engineering Group Associates, Inc. on behalf of Masonite Corporation. The development includes 18.4 acres on three separate parcels located on the south end of Gray Road and west end of Sterling Drive. There is an existing 33,000 square foot building on the site and the petitioner is proposing to reconfigure the three parcels into two separate parcels and proposing a new 60,000 square foot building. We offer the following comments:

GENERAL NOTES

1. The petitioner is proposing a shared storm sewer system that services and is located on two separate parcels. A cross access easement agreement for drainage purposes should be developed for both parcels and the easement limits should be shown on the site plans.

SANITARY AND WATER SERVICES

- 1. The Brighton Area Fire Authority requires that the FDC be within 100 feet of a hydrant. The closest hydrant is 130 feet away. Hydrant or FDC placement should be modified as needed.
- 2. The connection to the existing water main should be shown more clearly. The proposed gate valve in well is shown at the intersection of three pipes, and if a tee is going to be used to achieve this connection it should be clear on which side of the tee the gate valve will be placed.
- 3. After final site plan approval, the petitioner will be required to submit construction plans to MHOG Sewer and Water Authority for review and approval.

DRAINAGE AND GRADING

1. The petitioner should show where the outflow from the detention basin is ultimately going. There appears to be an existing storm sewer near ES-17. A culvert may be necessary to direct drainage across the proposed drive if the intention is to direct flow to the existing storm sewer.

Ms. Kelly Van Marter Re: Masonite Corporation Site Plan Review No. 2 June 03, 2019 Page 2

We recommend the petitioner address the above comments and resubmit the site plan for review.

Please call or email if you have any questions.

Sincerely,

Gary J. Markstrom, P.E. Vice President

Shelby Scherdt

Shelby Scherdt Project Engineer

BRIGHTON AREA FIRE AUTHORITY



615 W. Grand River Ave. Brighton, MI 48116 o: 810-229-6640 f: 810-229-1619

June 3, 2019

Kelly VanMarter Genoa Township 2911 Dorr Road Brighton, MI 48116

RE: Masonite Corporation 2nd Site Plan Review 5665 Sterling Drive Genoa Twp., MI

Dear Kelly:

The Brighton Area Fire Department has reviewed the above-mentioned site plan. The plans were received for review on May 23, 2019, and previously on May 3, 2019. The revised drawings are dated May 22, 2019. The project is based on an existing 3-parcel development with an existing 36,032 square foot S-1/F-1 manufacturing and warehouse facility. The new proposed development is for a 60,335 square foot S-1/F-1 manufacturing and warehouse facility. Additionally, there is a proposed future 108,600 square foot building of similar use reflected on the drawing. The plan review is based on the requirements of the International Fire Code (IFC) 2018 edition.

- 1. The water main location shown appears compliant with fire code, however, the size of the main and locations of isolation valves are not indicated. Provide the size of the main and location of valves. (Main sizes and valve locations have been identified as required.)
- 2. The project calls for 4-new fire hydrants to be placed in varying locations on the property. This meets the requirement for fire flow and the number of hydrants, however, the locations of the hydrants need to be revised to more appropriate tactical and accessible locations. One of the hydrants shall be located within 100' of the fire department connection. Locations of hydrants may require alteration to landscape planning. The following is descriptive of new location based on existing shown locations:

a. NW Location - Along the opposite curb line, 80-feet south of the southern water lead for (WSO).

b. NE Location - 160-feet east of the shown location on landscape island. (This hydrant is at the entrance to the drive and meets the 100-foot requirement for the FDC). c. SW Location - 205-feet West and 50-feet South (on the opposite side of the curb) from current hydrant location.

d. SE Location - 210-feet East and 55-feet South (on landscape island) of the current hydrant location.

(Location of hydrants are not identified on the drawings as described. An image of the hand-drawn locations was emailed to the engineer to identify the exact locations of the hydrants.)

3. The building shall be provided with an automatic sprinkler system in accordance with NFPA 13, Standard for the Installation of Automatic Sprinkler Systems. (Building will be provided with automatic sprinklers as required.)



June 3, 2019 Page 2 Masonite Corporation 5665 Sterling Drive Site Plan Review

IFC 903

- A. The FDC shall be located on the front of the building (Sterling Dr.). East face of the NE corner of the building. (FDC location is shown as required. If changes must be made due to architectural features, approval from the fire authority is required.)
- B. The location, size, gate valve, and connection of the fire protection lead shall be indicated on the utility site plan. There are two water shut off valves (WSO) on the drawing and neither indicates intent for Fire protection or their size. (Locations and sizes are shown on the Utility Plan.)
- 4. The new building address shall be provided on future submittals. (Once generated, will be provided.)
- 5. The building address shall be displayed at a <u>minimum of 6</u>" high letters of contrasting colors and be clearly visible from the street. The location and size shall be verified prior to installation. (The address is noted to be provided on the building in a minimum 6" number visible from the street.)

IFC 505.1

6. The access drive widths are compliant with fire code minimum. With widths of 30-feet and 26-feet, the building side of the access drives shall be marked as a fire lane. Include the location of the proposed fire lane signage on the building side of the access road (spaced every 50-feet) and include a detail of the fire lane sign in the submittal. Access roads to the site shall be provided and maintained during construction. Access roads shall be constructed to be capable of supporting the imposed load of fire apparatus weighing at least 84,000 pounds. (Roadways are compliant as well as fire lane signage.)

IFC D 103.6 IFC D 103.1 IFC D 102.1 IFC D 103.3

- 7. Access throughout the site and around the building shall provide emergency vehicles with an inside turning radius 30-feet and an outside radius of 50-feet. Provide an appropriate emergency vehicle circulation plan utilizing the specifications below. (Vehicle circulation is compliant based on the provided drawing.)
- 8. A minimum vertical clearance of 13½ feet shall be maintained throughout the site. (There are no overhead obstructions located throughout the site.)
- The location of a key box (Knox Box) shall be indicated on future submittals. The Knox box will be located adjacent to the front door of the structure. (The knox box location is shown at the main entrance.)

IFC 506.1

- 10. The knox box detail is for a residential style box. Please revise to be a 3200 Series box. (Detail has been revised to the correct model.)
- 11. Gates shall be installed at Gray Rd. and as discussed between the parcels. The gate detail



June 3, 2019 Page 3 Masonite Corporation 5665 Sterling Drive Site Plan Review

shall be revised to match the attached detail. If an alternate type is requested, a full detail must be submitted and approved. If a knox padlock is not capable of being used, an alternative means of securing the gate may be discussed and approved. (Gate details have been revised and the locations updated.)

- 12. No Parking Fire Lane signs shall be installed at the entrance to the secondary access drive, both sides of the parcel gate and at the Gray rd. gate. (No parking fire lane signage is shown as requested, however, signage needs to be shown at the ungated side of the secondary access.)
- 13. Provide names, addresses, phone numbers, emails of owner or owner's agent, contractor, architect, on-site project supervisor. (To be the project progresses.)

Additional comments will be given during the building plan review process (specific to the building plans and occupancy). The applicant is reminded that the fire authority must review the fire protection systems submittals (sprinkler & alarm) prior to permit issuance by the Building Department and that the authority will also review the building plans for life safety requirements in conjunction with the Building Department.

If you have any questions about the comments on this plan review please contact me at 810-229-6640.

Cordially,

Rick Boisvert, CFPS Fire Marshal

BRIGHTON AREA FIRE AUTHORITY



June 3, 2019 Page 4 Masonite Corporation 5665 Sterling Drive Site Plan Review



BRIGHTON AREA FIRE AUTHORITY



June 3, 2019 Page 5 Masonite Corporation 5665 Sterling Drive Site Plan Review



RECEIVED 5-22-19

IMPACT ASSESSMENT

MASONITE

SECTION 15, GENOA TOWNSHIP

PREPARED BY:

Monument Engineering Group Associates, Inc. 298 Veterans Drive Fowlerville, Michigan 48836

PREPARED FOR:

Schonsheck, Inc. 50555 Pontiac Trail Wixom, Michigan 48393

April 24, 2019

IMPACT ASSESSMENT

a. Preparer

<u>Prepared by:</u> Monument Engineering Group Associates, Inc. 298 Veterans Drive Fowlerville, Michigan 48836 <u>Prepared for:</u> Schonsheck, Inc. 50555 Pontiac Trail Wixom, Michigan 48393

Monument engineering Group Associates, Inc. (MEGA) is a civil engineering, land surveying firm with extensive experience in site development. MEGA staff is experienced in writing general impact statements for various developments throughout Michigan.

b. Map(s) and written description/analysis of the project site,

The site consists of 18.4 acres (composed of 3 separate parcels) located at the south end of Gray Road and the west end of Sterling Drive. The site is bounded on the west side by I-96 Expressway. There is an existing 33,000 manufacturing / warehouse and 2,560 S.F. office facility. The company manufactures stores and distributes pocket door frames and commercial architectural flush doors. Approximately 75% of the building is storage and 25% manufacturing.

The petitioner is proposing to reconfigure the parcels into two separate parcels. On the new parcel to the south is a proposed building of $\pm - 60,000$ S.F. with provisions for a future addition of $\pm - 100,000$ sf. See survey of property along with general site plan figures 1 and 2.

c. Impact on natural features:

The property is mostly open meadow with a small tree and brush stand located on the west side and a group of trees in the northeast corner. The elevation slopes from 994 at the Northeast end of the site to elevation 973 at the Northwest end of the site.

The United States Department of Agriculture "Soil Survey of Livingston County, Michigan" indicates the soil type to mainly be Miami Loam (MoB & MoC) with 2 to 12% slopes. This moderate to poorly draining soil is typically located on tills and moraines.

There are two pockets of wetlands (A & B) that were delineated at the time of the survey and shown on the plans. The wetland consultant determined these pockets not to be regulated wetlands under MDEQ guidelines (see attached wetland report).

There is no known major wildlife impact from this development.

d. Impact on stormwater management:

Permanent storm water management will be designed, approved and constructed in accordance with the Livingston County Drain Commissioner's (LCDC) and Township requirements. These measures will include but are not limited to sumps in storm sewer structures, a pre-treatment (sedimentation basin) and a detention basin. The detention basin will be designed to limit the storm water discharge rate to pre-development rates. Surface runoff during construction will be controlled by proper methods set forth by LCDC, including silt fence, inlet filters, and seed and mulch. A grading permit will have to be obtained from the LCDC's office as well as a soil erosion control permit. A certified storm water operator will provide regular inspections and reports to insure erosion control measures are being maintained.

e. Impact on surrounding land used:

The property conforms to the current zoning of Industrial (IND). Industrial Zoning requires a 2 acre minimum unit size and 200 feet minimum frontage. The property is bordered on all sides by Industrial District Zoning, and will be consistent with adjacent uses.

The Masonite facility will have little effect on the surrounded parcels with the added lighting. All lighting plans will have zero-foot candles lighting at the property line. There will be no noise or air pollution emitted from the proposed use.

Pursuant to Article 9 of the Genoa Township Zoning Ordinance, the Principle use is permitted in the Industrial District under Paragraph "K," Manufacturing, Fabricating of Wood Materials.

f. Impact on public facilities and services:

Masonite currently employs 50 full-time employees. The hours of operation are from 7:30 a.m. - 3:30 p.m. Monday through Friday. Inbound freight is by common carrier normally one (1) truck every other week. Outbound freight is normally one truck four days a week.

The proposed building will have 56 full time employees operating between the hours of 7:30 a.m. -3:30 p.m. Monday through Friday. Should the future building addition be realized the number of full-time employees would increase to 65. Additional truck traffic would increase to 2-3 trucks per day.

The facility is industrial in nature and therefore additional visitors and/or patrons are not anticipated.

There will be little to no impact on public services with this development. The development is in an industrial zoning surrounded by other industrial uses and the freeway. The original development of the property anticipated 3 users more than 20 years ago. Public sewer and water main both extend into the site to service 3 users. The final development will service only 2 users of similar nature.

As a whole, the development will have a positive impact on public services. The development will benefit emergency vehicle access to the site by providing cross access between the buildings as well as vehicular access to Gray Road. Current access is a dead end, that forces emergency vehicles to turn around in the parking lot. The development will also provide for a looped water main around the proposed building, which increases safety during a fire event. Along with better building codes, requiring a sprinkled build and improved vehicular access will benefit the fire department.

In general terms, the project as a whole will generate jobs while creating minimal burden on public services such as schools, fire department, police department, etc.

g. Impact on public utilities:

There will be little to no impact on public services with this development. The original development of the property anticipated 3 users more than 20 years ago. Public sewer and water main both extend into the site to service 3 users. The final development will service only 2 users of similar nature. A public water main will be looped around the proposed building and future addition with appropriate hydrant coverage of the building per the fire department requirements. There is a public sanitary sewer at the end of Sterling Drive. This sewer will be extended into the site enough to service the proposed and future building addition. All public utilities will be accompanied by the appropriate easement for access and maintenance in the future.

Permanent storm water management will be designed, approved and constructed in accordance with the Livingston County Drain Commissioner's (LCDC) and Township requirements. These measures will include but not limited to sumps in storm sewer structures, a pre-treatment (sedimentation basin) and a detention basin. The detention basin will be designed to limit the storm water discharge rate to pre-development rates. Surface runoff during construction will be controlled by proper methods set forth by LCDC, including silt fence, inlet filters, and seed and mulch. A grading permit will have to be obtained from the LCDC's office as well as a soil erosion control permit. A certified storm water operator will provide regular inspections and reports to insure erosion control measures are being maintained.

h. Storage and handling of any hazardous materials:

Masonite uses no hazardous materials for its operations.

i. Impact on Traffic and Pedestrians:

Although the ordinance requires in excess of 100 parking spaces, it is not anticipated that there will ever be more than 65 employees on site between the two buildings. Therefore, a formal traffic study is not warranted.

j. Special Provisions:

There are no known deed restrictions.



FIGURE 1



FIGURE 2 (NEEDS TO BE UPDATED WITH MEGA SITE PLAN)

Received 5-22-19

LEGAL DESCRIPTION (AS PROVIDED)

Parcel Tax Number: 4711-15-200-028

PARCEL 1:

SEC 15 T2N R5E, COMM NE COR, TH N88*19'39"W 1330.21 FT TH S01*38'45"W 446.49 FT TO POB TH S01*38'45"W 213.84 FT TH ON AN ARC OF A CURVE LEFT CHORD BEARING S74*54'32"W 132.57 FT TH N88*20'15"W 853.94 FT TH N38*28'54"W 76.87 FT TH N51*31'06"E 120 FT TH N38*28'54"W 145.03 FT TH N13*01'36"E 5.16 FT TH S88*20'15"E 1031.13 FT TO POB CONT 5.66 AC.

Parcel Tax Number: 4711-15-200-029

PARCEL 2:

SEC 15 T2N R5E, COMM NE COR,TH N88*19'39"W 1330.21 FT TH S01*38'45"W 660.33 FT TH ON AN ARC OF A CURVE LEFT CHORD BEARING S74*54'32"W 132.57 FT TO POB TH CONT ON ARC OF A CURVE LEFT CHORD BEARING S49*59'52"W 65.31 FT TH S41*50'09"W 96 FT TO CENTER OF A 75 FT RADIUS CUL-DE-SAC TH S37*41'31"W 506.48 FT TH ON AN ARC OF A CURVE TO RIGHT CHORD BEARING N38*59'18"W 119.75 FT TH N38*28'54"W 569.72 FT TH S88*20'15"E 853.94 FT TO POB CONT. 5.03 AC.

Parcel Tax Number: 4711-15-200-030

PARCEL 3:

SEC 15 T2N R5E, COMM NE COR, TH N88*19'39"W 1330.21 FT TH S01*38'45"W 1111.82 FT TH ON AN ARC OF A CURVE RIGHT CHORD BEARING N42*44'12"W 765.94 FT TH N37*41'31"E 506.48 FT TO CENTER OF A 75 FT RADIUS CUL-DE-SAC TH N41*50'09"E 96 FT TH ON AN ARC OF A CURVE RIGHT CHORD BEARING N66*44'50"E 193.76 FT TO POB CONT. 7.71 AC.

BEARING REFERENCE

Bearings are based on Project Coordinate System: Michigan State Plane Coordinate System, NAD83 (Conus) (Mol) (GRS80), South Zone 2113, International Feet, Ground (Lat: 42-34-10, Lon: 83-50-25, Elev: 992, Scale Factor: 1.00005000).

SURVEY REFERENCES

- Boss Engineering, Job No.: 98184, Dated: 04-10-98 - (Recorded in Liber 2481, Page 669)
- Advantage Civil Engineering, Job No.: 01028, Dated: 05-30-01 - (Easements plotted and shown herein) - (On Recorded with Genoa Township)

DESIGN ENGINEER



MONUMENT ENGINEERING GROUP ASSOCIATES, INC

ENGINEERS - SURVEYORS - CONSULTANTS LANDSCAPE ARCHITECTS - LAND PLANNERS

> 638 S GRAND AVE., FOWLERVILLE, MI 48836 ALLAN W PRUSS, PE, PS PHONE: 517-223-3512

SITE PLAN FOR MASONITE



LOCATION MAP

CLIENT



ARCHITECT



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SQURES ARCHITECTURAL GROUP, PLLC

223 W. Grand River Ave. Suite 2 Howell, MI 48843 517.518.8843 www.squiresarchitectural.com

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS								
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1. ALL PARKING STRIPES REQUIRE THE USE OF LOOPED (DOUBLE STRIPED) SPACED PER TOWNSHIP ORDINANCES.

2. SCREENING SHALL BE PROVIDED FOR ALL MECHANICAL EQUIPMENT.

3. PARKING LOT ISLANDS SHALL BE FINISHED IN GRASS, GROUND COVER OR MULCH.



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298 VETERANS DRIVE FOWLERVILLE, MICHIGAN 48836 (OFFICE) 517-223-3512 MONUMENTENGINEERING.COM SERVICE DISABLED VETERAN OWNED SMALL BUSINESS (SDVOSB)									

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STRUCTURE SCHEDULE

EX. STORM SEWER							
STRUCTURE	PIPES						
(10045) CBS	990.37	15" W IE= 983.27 12" E IE= 984.83					
(10046) CBS	990.10	12"W IE= 985.70					

EX. SANITARY SEWER							
STRUCTURE RIM ELEV. PIPES							
(10002) SAN	989.64	8" SW IE= 980.35 8" E IE= 980.55					
(10180) SAN	991.47	8" NE IE= 981.97					





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STRUCTURE SCHEDULE

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EX. SANITARY SEWER								
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(10002) SAN	989.64	8" SW IE= 980.35 8" E IE= 980.55						
(10180) SAN	991.47	8" NE IE= 981.97						

PROPOSED STORM SEWER							
STRUCTURE	PIPES						
CB-2	986.11	12" S IE= 981.52 12" N IE= 981.52					
CB-3	986.01	12" S IE= 981.30 12" N IE= 981.30					
CB-4	985.84	12" S IE= 980.93 15" NW IE= 980.63					
CB-7	986.74	24" E IE= 979.20 24" W IE= 979.20 15" S IE= 979.90					
CB-14	982.25	15" S IE= 978.53 18" W IE= 978.23					
ES-10		30" NE IE= 978.00					
ES-15		18" E IE= 978.00					
ES-17		15" SE IE= 977.00					
EX CB 10045	984.27	15" S IE= 980.00					
EX CB-D	986.00	15" S IE= 979.38					
IN-1	985.80	12" N IE= 981.83					
IN-11	985.23	15" N IE= 979.93 12" S IE= 979.93					
IN-12	982.94	12" W IE= 979.64					
IN-13	982.59	15" N IE= 978.95					
MH-5	989.26	15" SE IE= 980.36 15" W IE= 980.26					
MH-6	987.73	15" E IE= 979.90 24" W IE= 979.30 15" N IE= 979.90					
MH-8	985.30	24" E IE= 978.77 30" S IE= 978.27 15" N IE= 979.27					
MH-9	985.02	30" N IE= 978.23 30" SW IE= 978.13 12" E IE= 979.43					
OC-16	981.98	15" NW IE= 978.00					

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BENCHMARKS

DATUM: LOCAL DATUM

BM: #1 60D NAIL IN NORTHEAST SIDE OF 40" OAK TREE. ELEV: 991.87

BM: #2 60D NAIL IN NORTH SIDE UTILITY POLE. ELEV: 991.82

BM: #3

ARROW ON TOP OF HYDRANT, 229'± SOUTH OF BUILDING. ELEV: 993.89





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DTMB SOIL EROSION & SEDIMENTATION

INNOVATIVE GEOSPATIAL



EROSION CONTROL STANDARDS

- 1. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF LIVINGSTON COUNTY DRAIN COMMISSION OFFICE.
- 2. DAILY INSPECTION SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES, AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
- 3. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
- 4. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES WHEN REQUIRED AND AS DIRECTED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES AND OTHER CHANGES HAS BEEN ACCOMPLISHED.
- 5. STAGING OF THE WORK WILL BE DONE BY THE CONTRACTOR AS DIRECTED IN THESE PLACES AND AS REQUIRED TO INSURE PROGRESSIVE STABILIZATION OF DISTURBED AREAS.
- 6. SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
- 7. A CERTIFIED STORM WATER OPERATOR WILL BE NAMED ON THE MDEQ NOTICE OF COVERAGE FOR NPDES AS REQUIRED.
- ALL DISTURBED AREAS ARE TO BE TOP SOILED AND SEEDED WITH THE FOLLOWING MIN RATIO: TOP-SOIL 3" IN DEPTH, GRASS SEED 210 LBS PER ACRE, FERTILIZER 150 LBS PER ACRE, STRAW MULCH 3" DEPTH 1.5 TO 2 TONS PER ACRE.

SOIL EROSION CONTROL MAINTENANCE SCHEDULE AND NOTES.

- 1. CONTRACTOR MUST OBTAIN A SOIL EROSION AND SEDIMENTATION CONTROL PERMIT FROM LIVINGSTON COUNTY DRAIN COMMISSION OFFICE PRIOR TO COMMENCING WORK.
- 2. EARTHWORK SHALL BE LIMITED TO THE PROPOSED SITE AS SHOWN ON THE PLAN.
- 3. CONTRACTOR SHALL INSPECT THE SOIL EROSION/SEDIMENTATION CONTROL DEVICES ONCE A WEEK AND/OR WITHIN 24 HOURS OF A RAINFALL EVENT WHICH RESULTS IN A STORM WATER DISCHARGE FROM THE SITE. ANY DAMAGE TO EROSION CONTROL MEASURES MUST BE REPAIRED IMMEDIATELY.
- 4. ALL MUD OR DEBRIS TRACKED ONTO EXISTING PUBLIC ROADS FROM THE SITE DUE TO CONSTRUCTION SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
- 5. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT-UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR RE-BACKFILL THE SILTATION FENCE SHOULD IT FAIL OR BE DAMAGED DURING CONSTRUCTION.
- 6. PERMANENT STABILIZATION BUST BE COMPLETED WITHIN 30 DAYS OF FINAL GRADING.
- ACCESS ROADS MUST BE MAINTAINED AS NECESSARY, TO KEEP THEM EFFECTIVE, NEW LAYERS OF STONE MAY BE ADDED AS OLD LAYERS BECOME COMPACTED. STEPS SHOULD ALSO BE TAKEN TO REPAIR THE ACCESS ROADS IF RUTS OR PONDING WATER APPEARS.
- 8. INLET FILTERS SHOULD BE INSPECTED FOR BUILDUP OF SILT AND OTHER DEBRIS. THIS IS EVIDENT IF GEOTEXTILE/SOD STRUCTURE IS CAUSING FLOODING. MAINTENANCE WOULD CONSIST OF REMOVING OF SEDIMENTS WITH A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTER IS BEYOND THIS LEVEL OF REPAIR, IT MAY BE NECESSARY TO REPLACE BOTH THE SOD AND GEOTEXTILE FILTER.
- 9. IF SOIL EROSION/SEDIMENT CONTROL MEASURES ARE INADEQUATE FOR THE SITE. THE PROPER EROSION CONTROL AUTHORITY MUST BE NOTIFIED.

SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION

- THE CONTRACTOR SHALL INSTALL SILT FENCE AS SHOWN ON APPROVED PLANS.
 REMOVE ALL TOPSOIL AND ORGANIC MATTER. TOPSOIL MAY BE STORED ON SITE
- IN DESIGNATED AREA TO BE USED FOR FUTURE PLANTING AND FILL AREAS. TRUCK REMAINING TOP SOIL OFFSITE AND PROPERLY DISPOSE.
- 3. ROUGH GRADE AND INSTALL NEW UNDERGROUND UTILITIES INCLUDING DETENTION BASIN. PLACE INLET FILTERS AT PROPOSED CATCH BASINS THROUGHOUT SITE.
- 4. DETENTION BASIN SHALL BE EXCAVATED, TOP SOILED, AND SEEDED IMMEDIATELY AFTER DEMOLITION WORK IS COMPLETED.
- 5. CONSTRUCT BUILDINGS.
- 6. FINISH GRADE AROUND BUILDINGS AND STABILIZE AS SOON AS POSSIBLE. STABILIZE ALL DISTURBED AREAS WITH CLASS A SEED AND MULCH. IN AREAS OF SLOPES OF 1:4 OR STEEPER, CONTRACTOR TO SEED AND INSTALL PEGGED IN PLACE EROSION CONTROL BLANKETS.
- 7. REPAIR/CLEAN INLET FILTERS AS REQUIRED.
- 8. INSTALL FINAL LANDSCAPING PER SEPARATE LANDSCAPE PLAN.
- 9. STONE AROUND OUTLET STANDPIPE STRUCTURE SHALL BE REFRESHED.
- 10. REMOVE TEMPORARY SOIL EROSION MEASURES ONCE SEEDED VEGETATION HAS ESTABLISHED. CLEAN ALL AFFECTED STORM STRUCTURES AS NECESSARY.

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Call MISS DIG 3 full working days before you dig: Michigan's One-Call Utility Notification Organization 1-800-482-7171 WWW.Missdig.org THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF C O N S T R U C T I O N .								
CLIENT :								
SESC PLAN	MASONITE 5665 STERLING DRIVE PART OF NE 1/4, SEC. 15, T2N-R8E GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN							
DATE 5/01/2019 5/22/2019								
PLAN SUBMITTALS/REVISIONS PRELIMINARY SITE PLAN SUBMITTAL REVISED SITE PLAN SUBMITTAL								
ORIGINAL 5	- ISSUE DATE: 5/01/2019							
PROJEC	T NO: $19-018$ 1" = 30'							
	1/2" 1"							
FIELD: DRAWN BY: DC DESIGN BY: BS CHECK BY: AP								
0	C-8.1							

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS



						STORM S	EWER DE	SIGN				<u> </u>			-		MONU 298 VE		NGINEERIN S DRIVE	IG GROUP	ASSOCIA	TES, LLC		
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Q = A x	1 486/n x R^2/3	3 x S^1/2			n1 =	0.01	HDPF & F	VC							-		517-22	3-3512	, 111 10000					
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	1 170/(1 20)					0.010	00110.								-				H.G. ELE	V.	INVERT EL	EV.	RIM ELEV.	
	FROM STR	AREA	COEFF.		AREA	TOTAL	TIME	INT.	FLOW	PIPE	PIPE	PIPE	PIPE	PIPE	MIN PIPE	H.G.	VEL.	TIME	UP	DOWN	UP	DOWN	UP	DOM
	TO STR	Α	С	AxC	TOTAL	СхА	t	1	Q	CAP.	AREA	LENGTH	DIA.	SLOPE	SLOPE	SLOPE	FULL	FLOW	STREAM	STREAM	STREAM	STREAM	STREAM	STRE
					At																			
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											·				-									
MAIN	IN1-CB2	0.23	0.55	0.127	0.230	0.127	15.00	4.38	0.55	2.01	0.79	98	12	0.32	0.30	0.32	2.56	0.64	982.63	982.32	981.83	981.52	985.80	986.
RUN	CB2-CB3	0.10	0.55	0.055	0.330	0.182	15.64	4.31	0.78	2.01	0.79	68	12	0.32	0.30	0.32	2.56	0.44	982.32	982.10	981.52	981.30	986.11	986.0
	CB3-CB4	0.21	0.55	0.116	0.540	0.297	16.08	4.26	1.27	2.01	0.79	117	12	0.32	0.30	0.32	2.56	0.76	982.10	981.73	981.30	980.93	986.01	985.8
	CB4-MH5	0.65	0.55	0.358	1.190	0.655	16.84	4.18	2.74	3.16	1.23	111	15	0.24	0.23	0.24	2.58	0.72	981.63	981.36	980.63	980.36	985.84	989.2
	MH5-MH6	0.00	0.55	0.000	1.190	0.655	17.56	4.11	2.69	3.16	1.23	149	15	0.24	0.23	0.24	2.58	0.96	981.26	980.91	980.26	979.91	989.26	987.
	MH6-CB7	0.00	0.55	0.000	2.280	1.254	18.52	4.02	5.04	8.46	3.14	73	24	0.14	0.12	0.14	2.69	0.45	980.91	980.80	979.31	979.20	987.73	986.
	CB7-MH8	0.24	0.55	0.132	4.060	2.233	18.97	3.98	8.89	10.11	3.14	216	24	0.20	0.12	0.20	3.22	1.12	980.80	980.37	979.20	978.77	986.74	985.3
	MH9-MH9	0.00	0.55	0.000	5.450	2.998	20.09	3.88	11.63	12.96	4.91	37	30	0.10	0.09	0.10	2.64	0.23	980.27	980.23	978.27	978.23	985.30	985.0
	MH9-ES10	0.00	0.55	0.000	5.850	3.218	20.32	3.86	12.42	12.96	4.91	134	30	0.10	0.09	0.10	2.64	0.85	980.13	980.00	978.13	978.00	985.02	978.0
Mar March Connectioned and Mr.																								
LATERAL	EXA-EXB	0.37	0.55	0.204	0.370	0.204	15.00	4.38	0.89	3.56	0.79	175	12	1.00	0.30	1.00	4.53	0.64	987.11	985.36	986.31	984.56	990.72	991.2
	EXB-EXC	0.15	0.55	0.083	0.520	0.286	15.64	4.31	1.23	2.76	0.79	312	12	0.60	0.30	0.60	3.51	1.48	985.36	983.49	984.56	982.69	991.20	987.2
	EX C-EX D	0.31	0.55	0.171	0.830	0.457	17.12	4.15	1.90	4.08	1.23	182	15	0.40	0.23	0.40	3.33	0.91	983.46	982.73	982.49	981.73	987.23	986.0
	EX D-MH8	0.56	0.55	0.308	1.390	0.765	18.04	4.07	3.11	3.16	1.23	45	15	0.24	0.23	0.24	2.58	0.29	980.38	980.27	979.38	979.27	986.00	986.
LATERAL	10046-10045	0.45	0.55	0.248	0.450	0.248	15.00	4.38	1.08	3.40	0.79	96	12	0.91	0.30	0.91	4.33	0.37	986.50	985.63	985.70	984.83	990.10	990.3
	10045-MH6	0.64	0.55	0.352	1.090	0.600	15.37	4.33	2.60	3.16	1.23	89	15	0.24	0.23	0.24	2.58	0.58	981.12	980.91	980.12	979.90	990.37	987.
			The the ball											101.0000-01										-
LATERAL	IN11-CB7	1.54	0.55	0.847	1.540	0.847	15.00	4.38	3.71	3.82	1.23	9	15	0.35	0.23	0.35	3.11	0.05	980.93	980.90	979.93	979.90	985.23	987.
LATERAL	IN12-MH9	0.40	0.55	0.220	0.400	0.220	15.00	4.38	0.96	2.01	0.79	65	12	0.32	0.30	0.32	2.56	0.42	980.44	980.23	979.64	979.43	982.95	985.3
			A																					
MAIN	IN13-CB14	1.54	0.55	0.847	1.540	0.847	15.00	4.38	3.71	3.82	1.23	122	15	0.35	0.23	0.35	3.11	0.65	979.95	979.53	978.95	978.53	982.59	982.2
RUN	CB14-ES15	0.53	0.55	0.292	2.070	1.139	15.65	4.30	4.90	5.25	1.77	91	18	0.25	0.18	0.25	2.97	0.51	979.43	979.20	978.23	978.00	982.25	979.0

COMPOUND RUNOFF COEFFICIENT

COMPOUND RUNOFF COEFFICIENT					LIVINGSTON COUNTY DETENTION METHOD							
					Tributary Ar	ea (A) =		11.45				
	AREA (SF) A	REA (AC)			Compound F	Runoff Coef	ficient (C) =	0.55				
OVERALL	498,762	11.45			Design Cons	stant (K1) =	A X C =	6.258	Allowable Outf	low Rate (Qo) = .:	10 cfs per acre =	2.290
CONTRIBUTING	498,762	11.45			_				•		•	
FLOWING OFF	0	0.00			1	2	3	4	5	6	7	
			С	$A \times C$			Intensity	Col. #2	Inflow Volume	Outflow Volume	Storage Volume	
EX BUILDING	36,032		0.90	32,429	Duration	Duration	(100-yr Storm)	x Col. #3	=Col.#4xK1	Col. #2 x Qo	Col. 5 - Col. 6	
EX PAVEMENT	46,545		0.90	41,891	(Minutes)	(Seconds)	(In/Hr)	Inches	(Cu. Ft.)	(Cu. Ft.)	(Cu. Ft.)	
PR BUILDING	60,335		0.90	54,302	5	300	9.17	2750	17208.75	687.00	16521.75	
PR PAVEMENT	103,994		0.90	93,595	10	600	7.86	4714	29500.71	1374.00	28126.71	
GRASS	251,856		0.20	50,371	15	900	6.88	6188	38719.69	2061.00	36658.69	
TOTALS	498,762			272,587	20	1200	6.11	7333	45890.00	2748.00	43142.00	
	$TOTALA \times C$		272 587	0 55	30	1800	5.00	9000	56319.55	4122.00	52197.55	
$COMPOUND C = \frac{1}{C}$	ONTRIBUTING AR		498 762	0.55	60	3600	3.24	11647	72884.12	8244.00	64640.12	
-			+30,702		90	5400	2.39	12913	80806.30	12366.00	68440.30	
SITE INFO					120	7200	1.90	13655	85450.34	16488.00	68962	
OVERALL AREA		=	11.45 AC		180	10800	1.34	14487.80	90660.73	24732.00	65928.73	
CONTRIBUTING AREA (A)		=	11.45 AC									
ALLOWABLE DISCHARGE	RATE (Qa)	=	0.20 CFS/AC									
COMPOUND RUNOFF COE	EFFICIENT (C)	=	0.55									
PROPOSED SEDIMENTATION BASIN VOLUME PROPOSED DETENTION BASIN VOLUME												

AREA (FT)	AVG AREA (FT)	INC VOLUME (CF)	VOLUME (CF)	ELEVATIO
399				
	697			
994		697	697	
	1,371			
1,748		1,371	2,068	
	2,203			
2,658	2,200	2,203	4,271	
	3,192		-	
3,726	0)101	3,192	7,463	
	AREA (FT) 399 994 1,748 2,658 3,726	AREA (FT) AVG AREA (FT) 399 994 1,371 1,748 2,203 2,658 3,192	ANG AREA INC VOLUME 399	AREA (FT) AVG AREA INC VOLUME OF VOLUME (CF) VOLUME (CF)

VOLUME SUMMARY			STORAGE ELEVATIONS				
FIRST FLUSH VOLUME			FIRST FLUSH				
$V_{tff} = 1815 \times A \times C$		11,358 CF	ELEVATION 1	=	978.00	VOLUME 1	0
			ELEVATION 2	=	979.00	VOLUME 2	13,855
BANK FULL FLOOD VOLUME						Vff	11,358
$V_{t \ bf} = 8160 \times A \times C$, =	51,063 CF	FF ELEVATION (Zff)		=	978.82	
100-YEAR VOLUME			BANKFULL				
V_{100}	=	68,962 CF	ELEVATION 1	=	981.00	VOLUME 1	48,413
			ELEVATION 2	=	982.00	VOLUME 2	69,431
SEDIMENTATION VOLUME						Vbf	51,063
$V_{sed} = 5\% \times V_{100}$	=	3,448 CF	BF ELEVATION (Zbf)		=	981.13	
			100-YEAR				
			ELEVATION 1	=	981.00	VOLUME 1	48,413
			ELEVATION 2	=	982.00	VOLUME 2	69,431
						V100	68,962
			100 ELEVATION (Z100)		=	981.98	

MASONITE STORM WATER CALCULATIONS

PROPOSED DETENTION BASIN VOLUME

ION	AREA (FT)	AVG AREA (FT)	INC VOLUME (CF)	VOLUME (CF)	
978	12,778				
		13,855			
979	14,931		13,855	13,855	
		16,086			
980	17,240		16,086	29,940	
		18,473			
981	19,706		18,473	48,413	
		21,018			
982	22,330		21,018	69,431	
		23,720			
983	25,110	·	23,720	93,151	
			·	-	

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OUTLET CONTROL STRUCTURE ORIFICE CALCULATIONS

FIRST FLUSH RUNOFF AVERAGE ALLOWABLE RELEASE F

$$Q_{ff} = \frac{V_{ff}}{T_{24}} =$$

OPENINGS IN BOTTOM OF BASIN

$$H_{avg} = \frac{2}{3} \times (2$$

$$Q_f$$

 $A_{ff} = \frac{1}{0.62\sqrt{2 \times g}}$

1" DIA HOLE HAS AN AREA OF

0.75" DIA HOLE HAS AN AREA OF

DETENTION TIME FOR ONE (1) 0.7

$$Q_{ff} = \frac{1}{0.6}$$

$$T_{ff} = \frac{V_{ff}}{Q_{ff}} = \frac{V_{ff}}{Q_{ff}}$$

DETENTION TIME OF 44 HOURS

 V_{rem} =

 $T_{rem} = T$

VOLUME THROUGH ONE (1) 0.75'

$$H_{\underline{ff}} = \frac{2}{3} \left(Z_{bf} - Z_{ff} \right) + \left(Z_{ff} \right)$$

$$Q_1 = 0.62 \times A_{ff}$$

 $V_1 = 2$

 $V_2 =$

 $H_{\underline{bf}}_{\underline{avg}} = \frac{2}{3} (Z_{b})$

 $A_2 = \frac{1}{0.62 \sqrt{2}}$

1" DIA HOLE HAS AN AREA OF

 $NUMBER \ OF \ HOLES = \frac{1}{NOMINAL}$

USE EIGHT (8) 1" DIAMETER HOLE

100-YEAR FLOOD Qa (ALLOWABLE)

 $Q_{100} = Q_a -$

```
A_{100} = \frac{Q_{100}}{0.62\sqrt{2 \times g \times (q_{100})}}
```

1" DIA HOLE HAS AN AREA OF

 $NUMBER \ OF \ HOLES = \frac{1}{NOMINAL}$

USE FIVE (5) 1" DIAMETER HOLES

SUMMARY

ONE (1) 0.75" DIAMETER HOLE AT EIGHT (8) 1" DIAMETER HOLE AT FIVE (5) 1" DIAMETER HOLES AT

24 HOURS

RATE FOR RUN	OFF IS 0.5" (OVER TH	HE SITE IN	24 HOU
$=\frac{V_{ff}}{24\times3600}$		=	0.131	CFS
N				
,	Z _{bttm}	=	978.00	
$(Z_{ff} - Z_{bttm})$		=	0.547	FT
$\frac{ff}{a \times H_{ang}}$		=	0.036	SF
g ····uvy				
1 F	0.083	=	0.0055	SF
0.75	0.063	=	0.0031	SF
0.75" DIA HOLE 0.75 "				
$\frac{A_{ff}}{\sqrt{2 \times g \times h}}$		=	0.0079	CFS
$=\frac{V_{ff}}{Q_{ff}\times 3600}$		=	24.00	HRS
		=	44	HRS
$= V_{bf} - V_{ff}$		=	39705	CF
$T_{tot} - T_{ff}$		=	20.00	HRS
5" DIA HOLE IN	20 HOURS		20.00	HRS
$(Z_{ff} - Z_{bttm})$		=	2.357	FT
$2 \times g \times H_{\underline{ff}}{avg}$		=	0.273	CFS
$= T_{rem} \times Q_1$		=	19656.93	CF
$= V_{rem} - V_1$		=	20048.35	CF
$Q_2 = \frac{V_2}{T_{rem}}$		=	0.278	CFS
$(Z_{bf} - Z_{ff})$		=	1.538	FT
$\frac{Q_2}{2 \times g \times H_{\frac{bf}{avg}}}$		=	0.045	SF
1	0.083	=	0.005	SF
A_2		=	8.279	EA
LE AT ELEVATIO	N 978.82			
		=	0 200	CFS
$Q_{ff} + Q_{hf}$		=	0.079	CFS
$-(Q_{ff} + Q_{hf})$		=	0.121	CFS
$\frac{0}{(Z_{100} - Z_{hf})}$		=	0.026	SF
1	0 002	_	0.005	СГ.
т А ₁₀₀	5.005	-	0.005 4 R5	EA
L HOLE AREA		_		_/ `
S AT ELEVATION	N 981.13			
AT r		=	978.00	
l		=	978.82	

= 981.13

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SCHONSHECK, DESIGN BUILD · CONSTRUCTION 50555 PONTIAC TRAIL WIXOM, MI 48393 P: 248.669 8800 7 248.669 0850 WWW SCHONSHERC COM								
	OID STORM WATER CALCULATIONS	019		MASUNITE	5665 STERLING DRIVE	PART OF NE 1/4, SEC, 15, T2N-R8E		
DATE	5/01/201	5/22/201						
PLAN SUBMITTALS/REVISIONS	PRELIMINARY SITE PLAN SUBMITTAL	REVISED SITE PLAN SUBMITTAL						
OI	rigi	NAL 5	. IS 5/0	SUE 1/2	E D 2019	ATE 9	:	
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	(El 0).	1	/2))	1	"	
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NOT FOR CONSTRUCTION



GENERAL NOTES

- ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE LOCAL MUNICIPALITY, THE COUNTY D.P.W., HE COUNTY DRAIN COMMISSIONER, DETROIT METRO WATER & SEWERAGE DEPARTMENT, MICHIGAN DEPARTMENT OF TRANSPORTATION, MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, THE STATE OF MICHIGAN, AND THE COUNTY ROAD COMMISSION WHERE APPLICABLE
- 2. RULES, REGULATIONS OR LAWS OF ANY CONTROLLING GOVERNMENTAL AGENCY SHALL GOVERN, WHEN THEY ARE MORE STRINGENT THAN THE REQUIREMENTS OF THESE SPECIFICATIONS.
- SHOULD THE CONTRACTOR ENCOUNTER A CONFLICT BETWEEN THESE PLANS AND SPECIFICATIONS, EITHER AMONG THEMSELVES OR WITH THE REQUIREMENTS OF ANY AND ALL REVIEWING AND PERMIT-ISSUING AGENCIES, HE SHALL SEEK CLARIFICATION IN WRITING FROM THE ENGINEER BEFORE COMMENCEMENT OF CONSTRUCTION. FAILURE TO DO SO SHALL BE AT SOLE EXPENSE TO THE CONTRACTOR
- 4. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT TO COMPLETE THE TYPE OF WORK WHICH IS BID, IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, DETAILS AND TO THE SATISFACTION OF THE OWNER AND OWNER'S REPRESENTATIVE.
- CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT. INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.
- ANY WORK WITHIN STREET OR HIGHWAY RIGHT-OF-WAYS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE GOVERNMENTAL AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL PERMITS HAVE BEEN ISSUED BY THESE GOVERNING AUTHORITIES.
- 7. ALL NECESSARY PERMITS, BONDS, INSURANCES, ETC., SHALL BE PAID FOR BY THE CONTRACTOR.
- 8. ALL ELEVATIONS SHOWN ARE BASED ON BENCHMARKS PROVIDED BY THE LOCAL MUNICIPALITY UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- 9. ALL ITEMS OF WORK NOT SPECIFICALLY INDICATED AS PAY ITEMS ON THE DRAWINGS OR IN THE BID PACKAGE SHALL BE CONSIDERED INCIDENTAL ITEMS.
- 10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL DURING THE PERIODS OF CONSTRUCTION.
- 11. AT LEAST THREE (3) WORKING DAYS PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL CONTACT MISS DIG (1-800-482-7171) TO VERIFY THE LOCATION OF ANY EXISTING UNDERGROUND UTILITIES AND SHALL NOTIFY REPRESENTATIVES OF OTHER UTILITIES IN THE VICINITY OF THE WORK.
- 12. ALL PROPERTIES OR FACILITIES IN THE SURROUNDING AREAS, PUBLIC OR PRIVATE, DESTROYED OR OTHERWISE DISTURBED DUE TO CONSTRUCTION, SHALL BE REPLACED AND/OR RESTORED TO THE ORIGINAL CONDITION BY THE CONTRACTOR, AT NO ADDITIONAL COST TO THE OWNER.
- 13. MANHOLE, CATCH BASIN, GATE WELL RIMS AND HYDRANT FINISH GRADE ELEVATIONS MUST BE AS-BUILT AND APPROVED BY THE ENGINEER BEFORE THE CONTRACTOR'S WORK IS CONSIDERED COMPLETE. AGENCY REQUIREMENTS FOR RECORD DRAWINGS ALSO APPLY.
- 14. CONTRACTOR SHALL REMOVE AND DISPOSE OF OFF-SITE ANY TREES, BRUSH, STUMPS, TRASH OR OTHER UNWANTED DEBRIS, AT THE OWNER'S DIRECTION, INCLUDING OLD BUILDING FOUNDATIONS AND FLOORS. THE BURNING OR BURYING OF TRASH. STUMPS OR OTHER DEBRIS WILL NOT BE ALLOWED.
- 15. ALL REFERENCES TO M.D.O.T. SPECIFICATIONS REFER TO THE MOST CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- 16. ALL CONTRACTORS BIDDING THIS PROJECT SHALL HAVE VISITED THE SITE TO BECOME THOROUGHLY FAMILIAR WITH THE SITE AND THE CONDITIONS IN WHICH THEY WILL BE CONDUCTING THEIR OPERATIONS. ANY VARIANCE FOUND BETWEEN THE PLANS AND EXISTING CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE DESIGN ENGINEER.
- 17. THE LOCATIONS AND DIMENSIONS SHOWN ON THE PLANS FOR EXISTING UNDERGROUND FACILITIES ARE IN ACCORDANCE WITH AVAILABLE INFORMATION PROVIDED BY THE UTILITY COMPANIES AND GOVERNMENTAL AGENCIES WITHOUT UNCOVERING AND MEASURING. THE DESIGN ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION OR THAT ALL EXISTING UNDERGROUND FACILITIES ARE SHOWN.
- 18. THE OWNER MAY EMPLOY AND PAY FOR THE SERVICES OF A ENGINEER TO PROVIDE ON-SITE INSPECTION AND VERIFY IN THE FIELD THAT ALL BACKFILL PAVEMENTS AND CONCRETE CURB AND GUTTER HAVE BEEN PLACED AND COMPACTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. IF. IN THE OPINION OF THE ENGINEER. THE WORK DOES NOT MEET THE TECHNICAL OR DESIGN REQUIREMENTS STIPULATED FOR THE WORK. THE CONTRACTOR SHALL MAKE ALL NECESSARY ADJUSTMENTS AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL MAKE NO DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT SPECIFIC WRITTEN APPROVAL OF THE OWNER.
- 19. ALL EXCAVATED MATERIAL REMOVED FROM THE SANITARY SEWER, STORM SEWER AND WATER MAIN TRENCHES UNDER, THROUGH AND WITHIN 3 FEET OF THE 45* ZONE OF INFLUENCE LINE OF EXISTING OR PROPOSED PAVING, SIDEWALK AREAS AND PER PLANS, NOT SUITABLE FOR BACKFILL, SHALL BE REMOVED FROM THESE AREAS AND DISPOSED OF.
- 20. THE CONTRACTOR SHALL RESTORE TO THEIR PRESENT CONDITIONS ANY PAVEMENT OR PUBLIC RIGHTS-OF-WAY THAT IS DISTURBED BY THE OPERATIONS OF THE CONTRACTOR. ALL RESTORATION WORK IN PUBLIC RIGHTS-OF-WAY SHALL BE PERFORMED TO THE SATISFACTION OF THE GOVERNMENT AGENCIES HAVING JURISDICTION.
- 21. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADES, SIGNAGE AND LIGHTS TO PROTECT THE WORK AND SAFELY MAINTAIN TRAFFIC, IN ACCORDANCE WITH LOCAL REQUIREMENTS AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION).
- 22. O.S.H.A. SAFETY REQUIREMENTS ALL WORK, WORK PRACTICE, AND MATERIALS SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL SAFETY, OCCUPATIONAL, HEALTH AND ENVIRONMENTAL REGULATIONS AND ALSO NFPA AND ANSI CODES AS APPLICABLE. ALL WORK INSIDE A CONFINED SPACE SUCH AS MANHOLES OR UNDERGROUND STRUCTURES SHALL BE COORDINATED WITH UTILITY OWNER AND ALL WORKER SAFETY REQUIREMENTS STRICTLY ENFORCED. LAND SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR
- 23. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE FOR OR SUPPLY TEMPORARY WATER SERVICE, SANITARY FACILITIES AND ELECTRICITY.
- 24. CONTRACTOR SHALL PROVIDE FOR THE CONTINUOUS OPERATION OF EXISTING FACILITIES WITHOUT INTERRUPTION DURING CONSTRUCTION UNLESS SPECIFICALLY AUTHORIZED OTHERWISE BY THE RESPECTIVE AUTHORITY.
- 25. THE CONTRACTOR SHALL NOTE EXISTING UNDERGROUND UTILITIES IN THE PROJECT PLANS. BACKFILL TRENCHES FOR EXISTING UTILITIES SHALL BE EXAMINED CRITICALLY. ANY TRENCH WHICH, IN THE OPINION OF THE SOILS ENGINEER AF FOUND TO BE SOFT, UNSTABLE, OR UNSUITABLE MATERIAL SHALL BE COMPLETELY EXCAVATED AND BACKFILLED WITH SUITABLE MATERIAL. SAND BACKFILL SHALL BE USED UNDER PAVEMENT OR WITHIN THE 1 ON 1 LAND INFLUENCE OF PAVEMENT OR STRUCTURES.

EROSION CONTROL STANDARDS

- ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO STANDARDS AND SPECIFICATIONS OF THE JURISDICTIONAL AGENCY UNDER PART 91 OF ACT 451 OF 1994, AS AMENDED.
- UNDER "MICHIGAN'S PERMIT-BY-RULE FOR CONSTRUCTION ACTIVITIES" PROMULGATED UNDER ACT 245, PUBLIC ACTS OF 1929 AS AMENDED, AN NPDES STORM WATER DISCHARGE COVERAGE PERMIT IS REQUIRED FOR ANY CONSTRUCTION ACTIVITY THAT DISTURBS 1 ACRES OR MORE OF LAND. A CERTIFIED STORM WATER OPERATOR IS REQUIRED FOR THE SUPERVISION AND INSPECTION OF THE SOIL EROSION CONTROL MEASURES AT THE CONSTRUCTION SITE IN ACCORDANCE WITH THE PROVISIONS OF THESE RULES.
- DAILY INSPECTIONS SHALL BE MADE BY CONTRACTOR WHILE WORKING TO DETERMINE THE EFFECTIVENESS OF EROSION AND SEDIMENT CONTROL MEASURES. ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY. ALL SOIL EROSION CONTROL PROVISIONS SHALL BE PROPERLY MAINTAINED DURING CONSTRUCTION.
- 4. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES, AND PONDS.
- 5. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES WHEN REQUIRED AND AS DIRECTED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER EARTH CHANGE AREAS HAVE BEEN COMPLETED.
- STAGING THE WORK WILL BE DONE BY THE CONTRACTOR AS DIRECTED IN THESE PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED
- 7. SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE
- 8. DUST SHALL BE CONTROLLED BY WATERING OR BY OTHER APPROVED MEANS HROUGHOUT ALL CONSTRUCTION OPERATIONS.
- PERMANENT SOIL EROSION CONTROL MEASURES FOR SLOPES, CHANNELS, DITCHES OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 5 CALENDAR DAYS AFTER FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER AN EARTH CHANGE HAS BEEN COMPLETED OR WHERE SIGNIFICANT EARTH CHANGE HAS BEEN COMPLETED OR WHERE SIGNIFICANT EARTH CHANGE ACTIVITY CEASES. TEMPORARY SOIL FROSION CONTROL MEASURES SHALL BE IMPLEMENTED WITHIN 5 CALENDAR DAYS. ALL TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND ESTABLISHED BEFORE A CERTIFICATE OF COMPLIANCE IS

STORM SEWER SPECIFICATIONS

- THESE SPECIFICATIONS SHALL BE USED IN CONJUNCTION WITH THE GENERAL SPECIFICATIONS AND THE SPECIFICATIONS AND DETAIL SHEETS OF THE GOVERNING AGENCIES. IF ANY CONFLICT IS FOUND BETWEEN THE SPECIFICATIONS, THE STRICTER SPECIFICATIONS SHALL BE FOLLOWED
- CONTRACTOR SHALL FURNISH CERTIFIED EVIDENCE THAT ALL MATERIAL TESTS AND INSPECTIONS HAVE BEEN PERFORMED AND THAT THE PRODUCT HAS BEEN MANUFACTURED IN COMPLIANCE WITH THE APPLICABLE SPECIFICATIONS.
- PROPER IMPLEMENTS, TOOLS AND FACILITIES SHALL BE PROVIDED AND USED FOR UNLOADING AND DISTRIBUTING MATERIALS ALONG THE LINE OF WORK. ANY PIPE OR FITTING DAMAGED IN TRANSPORTATION OR HANDLING SHALL BE REJECTED AND IMMEDIATELY REMOVED FROM THE JOB SITE
- 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE STORAGE OF ALL MATERIAL INTENDED FOR THE WORK. HE SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO MATERIALS, EQUIPMENT AND WORK.
- PIPE BEDDING, UNLESS OTHERWISE INDICATED, SHALL BE CL. II SAND, CRUSHED STONE OR ROUNDED GRAVEL. BEDDING MATERIAL SHALL HAVE 95% PASSING A 3/4" SIEVE AND RETAINED ON A NO. 4 SIEVE.
- POROUS FILTER MATERIAL FOR PERFORATED SUBSURFACE DRAINS SHALL BE CRUSHED ROCK OR GRAVEL GRADED BETWEEN 1-1/2" AND 3/4" OR PER PLANS AND DETAILS.
- 7. BACKFILL, UNLESS OTHERWISE NOTED, SHALL BE COARSE SAND, FINE GRAVEL OR EARTH HAVING A LOW PLASTICITY INDEX, FREE OF ROCKS, DEBRIS AND OTHER FOREIGN MATERIALS AND DEFINED AS ALL PASSING THROUGH A 3/8" SIEVE AND NOT MORE THAN 10% BY VOLUME PASSING THROUGH A 200-MESH SIEVE.
- STORM SEWER PIPING AND FITTINGS SHALL BE OF THE SIZE AND TYPE INDICATED ON THE DRAWINGS AND SHALL CONFORM TO THE FOLLOWING:
 - A. POLYVINYL CHLORIDE (PVC) AND ACRYLONITRILE BUTADIENE STYRENE ABS FOR PIPE UP TO AND INCLUDING 10" IN DIAMETER, SHALL CONFORM TO ASTM D3034, SDR 23.5 FOR PVC PIPE AND ASTM D2751 FOR ABS PIPE WITH ELASTOMETRIC GASKET JOINTS CONFORMING TO ASTM D3212 OR CHEMICALLY WELDED PIPE JOINTS CONFORMING TO ASTM F545.
 - B. REINFORCED CONCRETE PIPE, FOR PIPE 12" IN DIAMETER AND UP, SHALL CONFORM TO ASTM C-76, CLASS IV UNLESS MODIFIED BY THE DRAWINGS. JOINTS SHALL BE MODIFIED GROOVED TONGUE WITH RUBBER GASKET CONFORMING TO ASTM C-443.
 - C. PERFORATED SUBSURFACE DRAIN PIPE SHALL BE PVC CONFORMING TO ASTM D-2729 OR ADS PERFORATED, CORRUGATED POLYETHYLENE PIPE CONFORMING TO AASHTO M-294 OR CORRUGATED STEEL PIPE. JOINTS FOR PVC AND POLYETHYLENE PIPE SHALL BE PREFABRICATED COUPLING WITH SOLVENT WELD.
- MANHOLES, CATCH BASINS, AND INLETS SHALL BE OF THE SIZE AND TYPE INDICATED ON THE DRAWINGS AND SHALL BE CONSTRUCTED OF THE FOLLOWING:
 - A. REINFORCED PRE-CAST CONCRETE MANHOLE SECTIONS INCLUDING CONCENTRIC OR ECCENTRIC CONES AND GRADE RINGS SHALL BE 4000 PSI CONCRETE AND CONFORM TO ASTM C-478-64T.
 - B. BRICK SHALL BE SOUND, HARD-BURNED THROUGHOUT AND OF UNIFORM SIZE AND QUALITY AND SHALL BE IN ACCORDANCE WITH ASTM C-32, GRADE MS.
 - C. CONCRETE MASONRY SHALL BE SOLID PRE-CAST SEGMENTAL UNITS CONFORMING TO ASTM C-139.
- 10. IRON CASTINGS SHALL CONFORM TO ASTM A-48, CLASS 30. BEARING SURFACES BETWEEN CAST IRON FRAMES, COVERS AND GRATES SHALL BE MACHINED, FITTED TOGETHER AND MATCHED-MARKED TO PREVENT ROCKING. SYSTEM IDENTIFYING LETTERS 2" HIGH SHALL BE STAMPED OR CAST INTO ALL COVERS SO THAT THEY MAY BE PLAINLY VISIBLE.
- 11. CASTINGS SHALL BE MANUFACTURED BY EAST JORDAN IRON WORKS, INC., NEENAH FOUNDRY COMPANY OR EQUAL.
- 12. CONCRETE AND MASONRY MATERIALS FOR CONSTRUCTION OF STORM DRAINAGE STRUCTURES SHALL CONSIST OF THE FOLLOWING:
 - A. PORTLAND CEMENT SHALL BE STANDARD BRAND OF PORTLAND CEMENT CONFORMING TO ASTM C-150, TYPE I OR IA.
- B. FINE AND COARSE AGGREGATES FOR CONCRETE SHALL BE PER ASTM C-33.
- C. AGGREGATE FOR CEMENT MORTAR SHALL BE CLEAN, SHARP SAND CONFORMING TO ASTM C-144.
- D. HYDRATED LIME SHALL COMPLY WITH ASTM C-207, TYPE S.
- E. WATER SHALL BE CLEAN AND FREE FROM DELETERIOUS MATERIALS.
- F. REINFORCING STEEL FOR CONCRETE SHALL BE INTERMEDIATE-GRADE NEW BILLET STEEL CONFORMING TO ASTM A-615, GRADE 40.
- 13. CONCRETE, UNLESS OTHERWISE NOTED, SHALL HAVE COMPRESSIVE STRENGTH AFTER 28 DAYS OF 3000 PSI MINIMUM WITH 3" MAXIMUM SLUMP.
 - A. CONCRETE FILL BELOW GRADE MAY BE 2500 PSI AT 28 DAYS. B. CONCRETE, WHERE EXPOSED TO THE WEATHER, SHALL BE AIR-ENTRAINED. AIR ENTRAINMENT SHALL BE ACCOMPLISHED BY THE USE OF ADDITIVES CONFORMING TO ASTM C-260. AIR CONTENT SHALL BE 6% + 1%. ADDITIVE SHALL BE USED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S PRINTED
 - DIRECTIONS. C. READY-MIX CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF ASTM

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14.	MORTAR SHALL BE SPE JOB SO THAT SPECIFIED CONTROLLED AND ACCU SHALL NOT BE MIXED II USE AMOUNT OF WATEF RE-TAMPERING OF MOR	CIFIED HEREINAFTER PROPORTIONS OF RATELY MAINTAINED GREATER QUANTIT CONSISTENT WITH TAR IS NOT PERMIT	. USE METHOD OF MIXING MORTAR AT MORTAR MATERIALS CAN BE DURING WORK PROGRESS. MORTAR IES THAN REQUIRED FOR IMMEDIATE SATISFACTORY WORKABILITY. TED.	2.	SITI SI D S T
	A. MORTAR FOR LAY TO ASTM C-270, MINIMUM AT 28 [ING BRICK OR CON TYPE M, AVERAGE DAYS. MORTAR MIX	CRETE MASONRY UNITS SHALL CONFORM COMPRESSIVE STRENGTH 2500 PSI SHALL BE PROPORTIONED BY VOLUME.		A P C
	B. MORTAR FOR PLA AND 2-1/2 PAR	STERING SHALL CON IS SAND.	NSIST OF 1 PART PORTLAND CEMENT	3.	C J
	C. MORTAR FOR GRO CEMENT AND 3-	OUTING OF RIP-RAP 2 PARTS SAND.	SHALL CONSIST OF 1 PART PORTLAND	4.	A A U
5.	PERFORM ALL EXCAVAT INDICATED ON DRAWING	NG AND TRENCHING S.	TO DIMENSIONS AND ELEVATIONS		P D V
16.	OPEN NO MORE TRENCH EXPEDITE THE WORK.	I IN ADVANCE OF P	IPE LAYING THAN IS NECESSARY TO	5.	S
17.	CARE SHALL BE TAKEN DRAWINGS. WHERE EXC OVERDEPTH SHALL BE I BEDDING MATERIAL, AT	NOT TO EXCAVATE ESSIVE OR UNAUTH BACKFILLED TO THE NO EXPENSE TO TH	BELOW THE DEPTHS INDICATED ON ORIZED EXCAVATION TAKES PLACE, THE PROPER GRADE WITH COMPACTED IE OWNER.	6.	P B M
18.	WHERE UNSTABLE SOIL UNTIL A SOLID BED HA	IS ENCOUNTERED, C S BEEN PROVIDED.	CONTRACTOR SHALL NOT PLACE PIPE	7.	E
9.	EXCAVATION FOR DRAIN FROM THE WALLS AND WALLS, CONNECTIONS A	AGE STRUCTURES S FOOTINGS TO ALLOW ND FOR INSPECTION	HALL EXTEND A SUFFICIENT DISTANCE VS FOR FORMS, CONSTRUCTION OF I.	8.	N T E
20.	PROVIDE REQUIRED TIME OF EXCAVATION. DO N LADDERS FOR SAFE EN	BER SHEETING, BRAC OT BRACE SHEETING IRY TO AND EXIT FI	CING AND SHORING TO PROTECT SIDES G AGAINST PIPE. PROVIDE SUITABLE ROM EXCAVATION.	9. 10.	A P
21.	DURING EXCAVATION, M ORDERLY MANNER A SU AVOID OVERLOADING, A	ATERIAL SUITABLE F IFFICIENT DISTANCE ND TO PREVENT SLII	OR BACKFILLING SHALL BE PILED IN AN FROM THE BANKS OF TRENCHES TO DES OR CAVE-INS.	11.	V T M
22.	WHEN WET EXCAVATION UNTIL THE PIPE HAS BI ABOVE TOP OF PIPE.	IS ENCOUNTERED, " EN LAID AND BACK	THE TRENCH SHALL BE DE-WATERED FILLED TO A POINT AT LEAST 1 FOOT	12.	N V P
23.	MANHOLES AND CATCH MASONRY UNITS OR PR MANHOLE STEPS.	BASINS SHALL BE (E-CAST CONCRETE	CONSTRUCTED OF BRICK, CONCRETE WITH CAST IRON FRAMES, COVERS AND	13.	R A E
24.	THE WALL THICKNESS O VARIOUS MATERIALS AN ADHERE TO REQUIREMEN THICKNESSES:	F MANHOLES AND (D SET AT VARIOUS NTS OF THE GOVERN	CATCH BASINS CONSTRUCTED OF DEPTHS SHALL MEET THESE MINIMUMS. NING AGENCY IF THEY EXCEED THESE		L F N S
	• <u>DEPTH</u> BRIC	CONCRETE K <u>BLOCK</u>	PRE-CAST CONCRETE	14.	
	• 0' - 10' 8" • 10' - 16' 12	6" 8"	6" 8"	15.	Т
25.	• 16 – 25 16 WHENEVER EXISTING MA 4" CENTER, TO CENTER DI ANE OF WEAKNESS	12 NHOLES OR SEWER , AROUND THE PERI	12" PIPE ARE TO BE TAPPED, DRILL HOLES PHERY OF OPENINGS TO CREATE A	16.	т •
26.	MANHOLE STEPS SHALL STEPS SHALL BE FACTO	BE BUILT INTO AND RY INSTALLED IN P	D THOROUGHLY ANCHORED TO WALLS. RE-CAST STRUCTURES.		•
27.	ALL PIPING ENTERING O SUPPORTED BY POURED UNDISTURBED GROUND.	R LEAVING DRAINAG IN-PLACE CONCRE	E STRUCTURES SHALL BE ADEQUATELY TE FILL FROM PIPE CENTER TO	17.	C
28. 20	SET FRAMES IN FULL B COMPOUND AT FINAL EI	ED OF STIFF MORTA LEVATION. RELOW & PLANE 12"	R OR BITUMINOUS MASTIC JOINTING	18.	
29.	PLACE IN ORDER NOT 1 ALL OTHER SHEETING B	O DISTURB PIPE GR	ADING. BEFORE BACKFILLING, REMOVE	19.	۷ ر
50.	CAREFULLY PLACED ARE LAYER SHALL BE THORE DRY DENSITY AS PER A	DUND AND OVER PIF DUGHLY AND CAREF STM D-1557 (MODII	PE IN 6" MAXIMUM LAYERS. EACH ULLY COMPACTED TO 95% OF MAXIMUM FIED PROCTOR) UNTIL 12" OF COVER	20.	E V C
31.	REMAINDER OF TRENCH TO SPECIFIED SUBGRAD OF MAXIMUM DRY DENS	SHALL BE BACKFILI E ELEVATION. BACH ITY PER ASTM D-15	LED WITH SPECIFIED BACKFILL MATERIAL KFILLING SHALL BE COMPACTED TO 90% 557.	21.	C F A
32.	IN STREETS, DRIVES, PA IMPROVED HARD SURFA BE DEPOSITED IN 6" LC COMPACTED TO 95% OF PROCTOR) SUITABLE MA	ARKING LOTS AND O CES, BACKFILL SHAL OSE LAYERS AT OP MAXIMUM DRY DEN TERIALS FOUND ON	THER AREAS TO HAVE OR HAVING LL BE MATERIAL SPECIFIED AND SHALL TIMUM MOISTURE CONTENT $(\pm 2\%)$ ISITY PER ASTM D1557. (MODIFIED SITE MAY BE USED.		
33.	BEFORE BACKFILLING AND DEBRIS SHALL BE REMO MATERIAL SHALL BE PL LAYERS; EACH LAYER OR HAND TAMPERS.	ROUND DRAINAGE ST IVED AND CLEARED ACED SYMMETRICALL SHALL BE MOISTEN!	TRUCTURES, ALL FORMS, TRASH AND AWAY. SELECTED EXCAVATED LY ON ALL SIDES IN 8" MAXIMUM ED AND COMPACTED WITH MECHANICAL		
34.	AFTER INSTALLATION OF ADJUST TOPS TO FINISH STRUCTURES, WITH THE STRUCTURES.	PIPES AND DRAINA GRADE. PIPE SHA FULL INSIDE DIAME	AGE STRUCTURES, CLEAN THEM, AND ALL BE STRAIGHT BETWEEN TER VISIBLE WHEN SIGHTING BETWEEN	22	ſ
35.	ENDS OF HEADWALL AN MINIMUM WELDED STEEL WELD ROD AT ALL INTE	D END SECTIONS SH ROD GRATING. ROD RSECTIONS. GRATE	HALL BE FITTED WITH A #4 ROUND OS SHALL BE SPACED 6" O.C. MAXIMUM. SHALL BE REMOVABLE FOR ACCESS	22.	
36.	AND CLEANING. RIP-RAP SHALL BE LAI HAND WITH 8" MINIMUM JOINTS. COMPACTED AS	D FROM THE BOTTO DIMENSION PERPEN IT GOES. TRUF TO	M UPWARD; STONES SHALL BE LAID BY IDICULAR TO GRADE WITH WELL-BROKEN LINE. ALL JOINTS SHALL BE FILLED	24.	ד ע כ
	WITH CEMENT MORTAR. WIRE BRUSH.	SURFACE STONE T	O BE EXPOSED. CLEAN JOINTS WITH	25.	S
37.	THE CONTRACTOR SHAL AND THE CONTRACTOR	L DO ALL REQUIRED SHALL ASSUME SOL	EXCAVATION AND TRENCHING WORK	26.	P T

DUNTERED DURING THE COURSE OF THE WORK. THE OWNER WILL LIABLE FOR ANY COSTS WHATSOEVER ASSOCIATED WITH, BUT NOT LIMITED TO,

THE PRESENCE OF ROCK, PEAT, SUBTERRANEAN STREAMS, EXCESSIVE WATER OR

38. ALL CONNECTIONS TO EXISTING SEWERS SHALL BE INCIDENTAL TO THE JOB.

OTHER DIFFICULT OR UNANTICIPATED SUB-SURFACE PHENOMENA.

TER MAIN SPECIFICATIONS

- TER MAIN SPECIFICATIONS SHALL BE USED IN CONJUNCTION WITH THE GENERAL ECIFICATIONS, THE WATERMAIN SPECIFICATIONS, AND THE DETAIL SHEETS OF GOVERNING AGENCIES. IF ANY CONFLICT IS FOUND BETWEEN THE ECIFICATIONS, THE STRICTER SPECIFICATIONS SHALL BE FOLLOWED.
- CTILE IRON PIPE, 16" DIAMETER AND SMALLER, SHALL CONFORM TO ANSI/AWWA ECIFICATION C151/A21.51, CLASS 54. DUCTILE IRON FITTINGS SHALL CONFORM ANSI/AWWA SPECIFICATION C110/A21.10 FOR STANDARD FITTINGS OR TO SI/AWWA SPECIFICATION C153/A21.53 FOR COMPACT FITTINGS. DUCTILE IRON E AND FITTINGS SHALL HAVE A DOUBLE THICKNESS CEMENT MORTAR LINING NFORMING TO ANSI SPECIFICATION A21.4
- INTS FOR DUCTILE IRON WATER MAIN SHALL BE U.S. PIPE AND FOUNDRY MPANY "TYTON JOINT" OR APPROVED EQUAL
- WATER MAIN SHALL BE INSTALLED WITH A MINIMUM COVER OF FIVE FEET, OR SPECIFIED BY THE LOCAL GOVERNING MUNICIPALITY, BELOW FINISH GRADE LESS OTHERWISE NOTED IN THE PLANS. WHEN WATER MAINS MUST DIP TO SS UNDER A STORM SEWER OR SANITARY SEWER. THE SECTIONS WHICH ARI EPER THAN NORMAL SHALL BE KEPT TO A MINIMUM LENGTH BY THE USE OF RTICAL 11-1/4 BENDS PROPERLY ANCHORED.
- THE WATER MAIN STANDARD DETAIL SHEETS OF THE GOVERNING AGENCY FOR SPECIFIC TYPE OF HYDRANT AND GATE VALVE TO BE USED FOR THIS DJECT. THESE DETAIL SHEETS ARE INCLUDED AS PART OF THE PLANS.
- FORE ANY WATER MAIN WILL BE ACCEPTED BY THE GOVERNING AGENCY, IT JST PASS A PRESSURE TEST COMPLYING WITH THE CURRENT SPECIFICATIONS D PROCEDURES OF THE AGENCY.
- FORE ANY WATER MAIN SYSTEM WILL BE ACCEPTED BY THE GOVERNING ENCY, THE FIRE HYDRANTS MUST BE PAINTED AS INDICATED ON THE WATER IN STANDARD DETAIL SHEETS.
- O INCH (2") DIAMETER CORPORATION STOPS SHALL BE PROVIDED IN BOTH THE ISTING WATER MAIN AND THE NEW WATER MAIN AT ALL NEW CONNECTIONS.
- TEES, BENDS CONNECTIONS, ETC. ARE INCIDENTAL TO THE JOB.
- YSICAL CONNECTIONS SHALL NOT BE MADE BETWEEN EXISTING AND NEW TERMAINS UNTIL TESTING IS SATISFACTORILY COMPLETED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE STORAGE OF ALL TERIAL INTENDED FOR THE WORK. THE CONTRACTOR SHALL TAKE ALL CESSARY PRECAUTIONS TO PREVENT DAMAGE TO MATERIALS EQUIPMENT AND
- PE BEDDING, UNLESS OTHERWISE INDICATED, SHALL BE CRUSHED STONE OR UNDED GRAVEL. BEDDING MATERIAL SHALL HAVE 95% PASSING A 3/4" SIEVE D RETAINED ON A NO. 4 SIEVE: LOAD FACTOR SHALL BE 1.9.
- CKFILL, UNLESS OTHERWISE NOTED, SHALL BE COARSE SAND, FINE GRAVEL OR RTH HAVING A LOW PLASTICITY INDEX, FREE OF ROCKS, DEBRIS AND OTHER REIGN MATERIALS AND DEFINED AS ALL PASSING THROUGH A 3/8" SIEVE AND T MORE THAN TEN PERCENT (10%) BY VOLUME PASSING THROUGH A 200 MESH
- TE WELLS SHALL BE REINFORCED PRE-CAST CONCRETE SECTIONS INCLUDING NCENTRIC OR ECCENTRIC CONES AND GRADE RINGS SHALL BE 4000 PSI NCRETE AND CONFORM TO ASTM C-478.
- RUST BLOCKS SHALL BE MADE OF 3000 PSI CONCRETE WET MIX
- E MAXIMUM WIDTH OF TRENCH TO TOP OF PIPE SHALL BE AS FOLLOWS: PIPE DIAMETER TRENCH WIDTH

•	THROUGH 12"	36"
•	15" THROUGH 36"	0.D. PLUS 24"
•	42" THROUGH 60"	0.D. PLUS 30"
•	66" AND LARGER	0.D. PLUS 36"

- EN NO MORE TRENCH IN ADVANCE OF PIPE LAYING THAN IS NECESSARY TO PEDITE THE WORK.
- RE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED ON AWINGS. WHERE EXCESSIVE OR UNAUTHORIZED EXCAVATION TAKES PLACE, THE ERDEPTH SHALL BE BACKFILLED AT THE PROPER GRADE WITH COMPACTED DDING MATERIAL, AT NO EXPENSE TO THE OWNER.
- ERE UNSTABLE SOIL IS ENCOUNTERED, CONTRACTOR SHALL NOT PLACE PIPE TIL A SOLID BED HAS BEEN PROVIDED
- CAVATION FOR STRUCTURES SHALL EXTEND A SUFFICIENT DISTANCE FROM THE LLS AND FOOTINGS TO ALLOW FOR FORMS, CONSTRUCTION OF WALLS, NNECTIONS AND FOR INSPECTION
- TE WELLS SHALL BE CONSTRUCTED OF BRICK, CONCRETE MASONRY UNITS OR E-CAST CONCRETE WITH CAST IRON FRAMES, COVERS AND MANHOLE STEPS, INDICATED ON DRAWINGS AND SPECIFIED HEREIN.
- A. COMPLETELY FILL JOINTS ON PRE-CAST CONCRETE SECTIONS WITH BITUMINOUS MASTIC JOINTING COMPOUND OR JOINTS SHALL BE MADE WITH CEMENT MORTAR WITH INSIDE POINTING AND OUTSIDE RUBBER WRAP.
- B. BRICK SHALL BE WET WHEN LAID. LAY BRICK OR CONCRETE MASONRY UNITS IN MORTAR SO AS TO FORM FULL BED, WITH END AND SIDE JOINTS IN ONE OPERATION, WITH JOINTS NOT MORE THAN 3/8" WIDE EXCEPT WHEN BRICKS OR CONCRETE MASONRY UNITS ARE LAID RADIALLY, IN WHICH CASE THE NARROWEST PART OF JOINT SHALL NOT EXCEED 1/4". LAY IN TRUE LINE AND, WHENEVER PRACTICAL, JOINTS SHALL BE CAREFULLY STRUCK AND POINTED ON INSIDE.
- PROTECT FRESH BRICK WORK FROM FREEZING, FROM DRYING EFFECTS OF SUN AND WIND, AND FOR SUCH TIME AS DIRECTED BY THE GEOTECHNICAL ENGINEER. IN FREEZING WEATHER, HEAT SUFFICIENTLY TO REMOVE ICE AND FROST FROM BRICK WORK.
- TE WELL STEPS SHALL BE BUILT INTO AND THOROUGHLY ANCHORED TO WALLS. PIPING ENTERING OR LEAVING GATE WELLS SHALL BE ADEQUATELY PPORTED BY POURED-IN-PLACE CONCRETE FILL FROM PIPE CENTER TO
- DISTURBED GROUND. OUTSIDE SURFACES OF BRICK OR CONCRETE MASONRY PORTION OF GATE
- LLS SHALL BE PLASTERED AND TROWELED SMOOTH WITH 1/2" LAYERS OF IFNT MORTAR.
- FRAMES IN FULL BED OF STIFF MORTAR OR BITUMINOUS MASTIC JOINTING MPOUND AT FINAL ELEVATION.
- ACE HORIZONTAL AND/OR VERTICAL THRUST BLOCKS AT ALL PLUGS, CAPS, ES AND FITTINGS. THE COST OF THRUST BLOCKS SHALL BE INCLUDED IN THE ICE BID PER FOOT FOR WATER MAIN. THRUST BLOCKS SHALL NOT BI BACKFILLED PRIOR TO OBSERVATION BY THE CONTROLLING GOVERNMENTAL AGENCY.
- 27. IN UNSTABLE SOIL CONDITIONS, THRUST BLOCKS SHALL BE SUPPORTED BY PILING DRIVEN TO SOLID FOUNDATIONS OR BY REMOVAL OF THE UNSTABLE SOILS AND REPLACEMENT WITH BALLAST OF SUFFICIENT STABILITY TO RESIST THE THRUSTS. THE COST OF PILING OR BALLAST AT THRUST BLOCKS SHALL BE INCLUDED IN THE PRICE BID FOR WATER MAIN.
- 28. PLACE ALL CONCRETE ANCHORAGES AND ENCASEMENTS, AS CALLED FOR ON THE DRAWINGS. THE COST OF ANCHORAGE AND ENCASEMENTS SHALL BE INCLUDED IN THE PRICE BID FOR WATER MAIN.
- 29. BEDDING USED FOR TRENCH BOTTOM SHALL BE EXTENDED UP THE SIDES AND CAREFULLY PLACED AROUND AND OVER PIPE IN 6" MAXIMUM LAYERS. EACH LAYER SHALL BE THOROUGHLY AND CAREFULLY COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS PER ASTM D-1557(MODIFIED PROCTOR) UNTIL 12" OF COVER EXISTS OVER PIPE.
- 30. REMAINDER OF TRENCH SHALL BE BACKFILLED WITH SPECIFIED BACKFILL MATERIAL TO SPECIFIED SUBGRADE ELEVATION. BACKFILLING SHALL BE COMPACTED TO 90% OF MAXIMUM DRY DENSITY PER ASTM D-1557.
- 31. IN STREETS, DRIVES, PARKING LOTS AND OTHER AREAS PAVED, OR AREAS PROPOSED TO BE PAVED, PLACE SAND BACKFILL IN 6" LOOSE LAYERS AT OPTIMUM MOISTURE CONTENT (±2%) AND COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557 (MODIFIED PROCTOR)
- 32. BEFORE BACKFILLING AROUND STRUCTURES, ALL FORMS, TRASH AND DEBRIS SHALL BE REMOVED AND CLEARED AWAY. SELECTED EXCAVATED MATERIAL SHALL BE PLACED SYMMETRICALLY ON ALL SIDES IN 8" MAXIMUM LAYERS; EACH LAYER SHALL BE MOISTENED AND COMPACTED WITH MECHANICAL OR HAND TAMPERS
- 33. THE CONTRACTOR SHALL DO ALL REQUIRED EXCAVATION AND TRENCHING WORK AND THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR THE COMPLETION OF THE WORKS HEREIN REGARDLESS OF THE NATURE OF MATERIALS ENCOUNTERED DURING THE COURSE OF THE WORK. THE OWNER WILL NOT BE LIABLE FOR ANY COSTS WHATSOEVER ASSOCIATED WITH. BUT NOT LIMITED TO. THE PRESENCE OF ROCK. PEAT, SUBTERRANEAN STREAMS, EXCESSIVE WATER OR OTHER DIFFICULT OR UNANTICIPATED SUB-SURFACE PHENOMENA.

SANITARY SEWER SPECIFICATIONS

- THESE SPECIFICATIONS SHALL BE USED IN CONJUNCTION WITH THE GENERAL SPECIFICATIONS AND THE SANITARY SEWER SPECIFICATIONS AND DETAIL SHEETS OF THE GOVERNING AGENCIES. IF ANY CONFLICT IS FOUND BETWEEN THE SPECIFICATIONS, THE STRICTER SPECIFICATIONS WILL BE FOLLOWED.
- 2. THE GOVERNING AGENCY WILL INSPECT THE INSTALLATION OF ALL SANITARY SEWER PIPING.
- PROPER IMPLEMENTS, TOOLS AND FACILITIES SHALL BE PROVIDED AND USED FOR UNLOADING AND DISTRIBUTING MATERIALS ALONG THE LINE OF WORK. ANY PIPE OR FITTING DAMAGED IN TRANSPORTATION OR HANDLING SHALL BE REJECTED AND IMMEDIATELY REMOVED FROM THE JOB SITE.
- 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE STORAGE OF ALL MATERIAL INTENDED FOR THE WORK. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO MATERIALS, EQUIPMENT AND
- 5. THE CONTRACTOR SHALL DO ALL REQUIRED EXCAVATION AND TRENCHING WORK AND THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR THE COMPLETION OF THE WORKS HEREIN REGARDLESS OF THE NATURE OF MATERIALS ENCOUNTERED DURING THE COURSE OF THE WORK. THE OWNER WILL NOT BE LIABLE FOR ANY COSTS WHATSOEVER ASSOCIATED WITH, BUT NOT LIMITED TO, THE PRESENCE OF ROCK, PEAT, SUBTERRANEAN STREAMS, EXCESSIVE WATER OR OTHER DIFFICULT OR UNANTICIPATED SUB-SURFACE PHENOMENA.
- 6. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE AND SCHEDULE THE SANITARY SEWER INSTALLATION WITH THE GRADING, EXCAVATION AND OTHER SITE UTILITY SUBCONTRACTORS AND THE OWNERS REPRESENTATIVE SO AS TO PROVIDE FOR A SMOOTH AND ORDERLY PROGRESSION OF THE WORK.
- 7. SANITARY SEWER PIPING AND FITTINGS SHALL BE OF THE SIZE AND TYPE INDICATED ON THE DRAWINGS AND SHALL CONFORM TO THE REQUIREMENTS OF THE GOVERNING AGENCY.
- 8. REINFORCED PRE-CAST CONCRETE MANHOLE SECTIONS INCLUDING CONCENTRIC OR ECCENTRIC CONES AND GRADE RINGS SHALL BE 4000 PSI CONCRETE AND CONFORM TO ASTM C-478 OR AASHTO M-199.
- 9. OPEN NO MORE TRENCH IN ADVANCE OF PIPE LAYING THAN IS NECESSARY TO EXPEDITE THE WORK.
- 10. CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED ON DRAWINGS. WHERE EXCESSIVE OR UNAUTHORIZED EXCAVATION TAKES PLACE, THE OVERDEPTH SHALL BE BACKFILLED AT THE PROPER GRADE WITH COMPACTED BEDDING MATERIAL, AT NO EXPENSE TO THE OWNER.
- 11. PROVIDE REQUIRED TIMBER SHEETING, BRACING AND SHORING TO PROTECT SIDES OF EXCAVATION. DO NOT BRACE SHEETING AGAINST PIPE. PROVIDE STAGING AND SUITABLE LADDERS WHERE REQUIRED.
- 12. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE PILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF TRENCHES TO AVOID OVERLOADING, AND TO PREVENT CAVE-INS.
- 13. WHEN WET EXCAVATION IS ENCOUNTERED, THE TRENCH SHALL BE DE-WATERED UNTIL THE PIPE HAS BEEN LAID AND BACKFILLED TO A POINT AT LEAST 1 FOOT ABOVE TOP OF PIPE.
- 14. SANITARY SEWER CROSSINGS SHALL BE MADE WITH 18" OF VERTICAL CLEARANCE FROM ANOTHER UTILITY AND SHALL BE MADE WITHOUT PLACING POINT LOADS ON EITHER PIPE. CONSTRUCT SADDLES, OR PLACE PROTECTIVE CONCRETE CAP TO PREVENT DAMAGE.
- 15. ALL CONNECTION BRANCHES IN THE SEWER PIPE SHALL BE SECURELY AND COMPLETELY FASTENED TO, OR FORMED IN, THE WALL OF THE PIPE DURING THE COURSE OF MANUFACTURE. ALL PIPE CONTAINING SUCH CONNECTION BRANCHES SHALL BE INSTALLED WITH THE MAIN SEWER. THE PROPOSED LOCATION OF THE WYE SHALL BE PER PLAN OR AS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.
- 16. SERVICE LEADS SHALL TERMINATE (WITH AN APPROVED STOPPER) PER PLANS OR AS DIRECTED BY OWNER OR OWNER'S REPRESENTATIVE.
- 17. EACH RISER AND/OR SERVICE LEAD SHALL BE MARKED WITH A 2 INCH X 2 INCH X 8 FOOT LONG HARDWOOD MARKER, PLACED VERTICALLY AT THE END OF THE PIPE.
- 18. DOWNSPOUTS, WEEP TILE, FOOTING DRAINS, OR ANY CONDUIT, THAT CARRIES STORM OR GROUND WATER SHALL NOT BE ALLOWED TO DISCHARGE INTO A SANITARY SEWER
- 19. THE CONNECTION TO AN EXISTING SANITARY SEWER MANHOLE SHALL BE MADE IN STRICT CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. WITH ALL WORK BEING DONE IN A WORKMANLIKE MANNER. THIS WORK SHALL INCLUDI THE CONSTRUCTION OF A PROPER CHANNEL IN THE EXISTING MANHOLE AT WHICH THE CONNECTION IS TO BE MADE, TO DIRECT THE FLOW OF INCOMING FLUIDS TO THE EXISTING OUTLET IN A MANNER WHICH WILL TEND TO CREATE THE LEAST AMOUNT OF TURBULENCE. ANY PORTION OF THE EXISTING STRUCTURE WHICH WOULD INTERFERE WITH SUCH CONSTRUCTION SHALL BE REMOVED. THE COST OF ALL CONNECTIONS SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE MAIN SEWER UNLESS OTHERWISE PROVIDED IN THE
- 20. WHEN CONNECTIONS ARE MADE WITH SEWERS OR DRAINS CARRYING FLUIDS, SPECIAL CARE MUST BE TAKEN THAT NO PART OF THE WORK IS BUILT UNDER WATER. A FLUME OR DAM MUST BE INSTALLED AND PUMPING MAINTAINED, IF NECESSARY, AND THE NEW WORK KEPT DRY UNTIL COMPLETED AND ANY CONCRETE OR MORTAR HAS SET.
- 21. ALL TIMBER SHEETING BELOW A PLANE 12" ABOVE TOP OF PIPE SHALL REMAIN IN PLACE IN ORDER NOT TO DISTURB PIPE GRADING. BEFORE BACKFILLING, REMOVE ALL OTHER SHEETING, BRACING AND SHORING.
- 22. BEDDING USED FOR TRENCH BOTTOM SHALL BE EXTENDED UP THE SIDES AND CAREFULLY PLACED AROUND AND OVER PIPE IN 6" MAXIMUM LAYERS. EACH LAYER SHALL BE THOROUGHLY AND CAREFULLY COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS PER ASTM D-1557 (MODIFIED PROCTOR) UNTIL 12" OF COVER EXISTS OVER PIPE.
- 23. REMAINDER OF TRENCH SHALL BE BACKFILLED WITH SPECIFIED BACKFILL MATERIAL AS APPROVED BY THE GEOTECHNICAL ENGINEER TO SPECIFIED SUBGRADE ELEVATION. BACKFILLING SHALL BE COMPACTED TO 90% OF MAXIMUM DRY DENSITY PER ASTM D-1557.
- 24. IN STREETS, DRIVES, PARKING LOTS AND OTHER AREAS TO HAVE OR HAVING IMPROVED HARD SURFACES, BACKFILL SHALL BE MATERIAL SPECIFIED AND SHALL BE DEPOSITED IN 6" LOOSE LAYERS AT OPTIMUM MOISTURE CONTENT (±2%) AND COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557 (MODIFIED PROCTOR). SUITABLE MATERIALS FOUND ON SITE MAY BE USED IF APPROVED BY THE GEOTECHNICAL ENGINEER AND OWNER'S REPRESENTATIVE. WHERE SERVICE OR UTILITY LINES CROSS PAVEMENT OR SIDEWALK, BEDDING SHALL BE CARRIED TO 3 FEET BEHIND THE CURB LINE OR 3 FEET BEHIND THE SIDE OF SIDEWALK FARTHEST AWAY FROM THE PROPOSED PAVEMENT
- 25. BEFORE BACKFILLING AROUND MANHOLES, ALL FORMS, TRASH AND DEBRIS SHALL BE REMOVED AND CLEARED AWAY. SELECTED EXCAVATED MATERIAL SHALL BE PLACED SYMMETRICALLY ON ALL SIDES IN 8" MAXIMUM LAYERS; EACH LAYER SHALL BE MOISTENED AND COMPACTED WITH MECHANICAL AND HAND TAMPERS.
- 26. SANITARY SEWER MANHOLES MUST BE WATER-TIGHT AND SHALL BE PRECAST SECTIONS WITH MODIFIED GROOVED TONGUE JOINTS WITH RUBBER GASKETS, CONFORMING TO ASTM DESIGNATION C478. CAST IRON STEPS SHALL BE CAST INTO THE MANHOLE SECTIONS AT 16" O.C. DURING MANUFACTURE AND AT 45" FROM THE CENTERLINE OF THE SEWER, MANHOLE STEPS SHALL BE NEENAH R-1980-E, EAST JORDAN IRON WORKS, 8500 OR APPROVED EQUAL.
- 27. WHEN EXISTING REINFORCED CONCRETE MANHOLES OR SEWER PIPES ARE TO BE TAPPED, A HOLE OF THE APPROPRIATE DIAMETER, SHALL BE CORE DRILLED, THROUGH THE WALL OF THE MANHOLE OR SEWER PIPE, TO ACCEPT A RESILIENT CONNECTOR CONFORMING TO ASTM DESIGNATION C-923. RESILIENT CONNECTORS SHALL BE "KOR-N-SEAL" AS MANUFACTURED BY "THE CORE AND SEAL CO." OR APPROVED EQUAL.
- 28. ALL SEWERS SHALL BE SUBJECTED TO INFILTRATION, AIR OR EXFILTRATION TESTS OR A COMBINATION THEREOF IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS, PRIOR TO ACCEPTANCE OF THE SYSTEM AND PRIOR TO REMOVAL OF THE BULKHEADS.
 - A. ALL SEWERS OVER 24" DIAMETER SHALL BE SUBJECTED TO INFILTRATION TESTS. ALL SEWERS OF 24" DIAMETER OR SMALLER, WHERE GROUND WATER LEVEL ABOVE THE TOP OF SEWER IS OVER SEVEN (7) FEET, SHALL BE SUBJECTED TO AN INFILTRATION TEST.
 - B. ALL SEWERS OF 24" DIAMETER OF LESS, WHERE THE GROUND WATER LEVEL ABOVE THE TOP OF THE SEWER IS SEVEN (7) FEET OR LESS, SHALL BE SUBJECT TO AIR TESTS OR EXFILTRATION TESTS.
- 29. NO SANITARY SEWER INSTALLATION OR PORTION THEREOF SHALL HAVE INFILTRATION EXCEEDING 100 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOUR PERIOD.



GRADING AND EARTHWORK SPECIFICATIONS

- ALTHOUGH A SUB-SURFACE INVESTIGATION MAY HAVE BEEN MADE BY THE OWNER, THE BIDDER AND ANY SUB-CONTRACTORS SHALL MAKE A PERSONAL INVESTIGATION OF SITE AND EXISTING SURFACE AND SUB-SURFACE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE TO ACQUAINT HIMSELF WITH CONDITIONS OF THE WORK AREA. THE CONTRACTOR IS ADVISED TO DETERMINE THE SUB-SURFACE SOIL CONDITIONS AND GROUND WATER CONDITIONS TO HIS OWN SATISFACTION PRIOR TO BIDDING. NO MODIFICATIONS TO THE UNIT PRICES BID FOR ANY ITEM WILL BE MADE DUE TO VARIABLE SUB-SURFACE CONDITIONS. DEWATERING, IF DETERMINED NECESSARY BY THE CONTRACTOR, BY WELL POINTING OR DEEP WELLS WILL BE INCIDENTAL TO THE INSTALLATION COST OF THE ITEM.
- 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING DETERMINED TO HIS SATISFACTION PRIOR TO THE SUBMISSION OF HIS BID THE CONFIRMATION OF THE GROUND, THE CHARACTER AND QUALITY OF THE SUBSTRATA, THE TYPES AND QUANTITIES OF MATERIALS TO BE ENCOUNTERED, THE NATURE OF THE GROUNDWATER CONDITIONS, THE PROSECUTION OF THE WORK, THE GENERAL AND LOCAL CONDITIONS INCLUDING RECENT CLIMATIC CHANGES, THE TIME OF YEAR IN WHICH CONSTRUCTION WILL TAKE PLACE AND ALL OTHER MATTERS WHICH CAN IN ANY WAY AFFECT THE WORK UNDER THIS CONTRACT.
- 3. PRIOR TO COMMENCING THE EXCAVATION THE CONTRACTOR SHALL SUBMIT A PLAN OF HIS PROPOSED OPERATIONS AND TIME SCHEDULE TO THE OWNER & OWNERS REPRESENTATIVE FOR THEIR APPROVAL.
- 4. THE CONTRACTOR SHALL CONSIDER, AND HIS PLAN FOR EXCAVATION SHALL REFLECT, THE EQUIPMENT AND METHODS TO BE EMPLOYED IN THE EXCAVATION AND WHAT METHODS WILL BE USED WHEN WET CONDITIONS ARE ENCOUNTERED REQUIRING GROUNDWATER CONTROL OR OTHER MOISTURE CONDITIONING. THE CONTRACTOR SHALL SUBMIT AN OUTLINE OF HIS EARTHWORK METHODS WHICH SHALL TAKE INTO ACCOUNT THE OVERALL CONSTRUCTION SCHEDULE. THE PRICES ESTABLISHED IN THE PROPOSAL FOR THE WORK TO BE DONE SHALL REFLECT ALL COSTS PERTAINING TO THE WORK. NO CLAIMS FOR EXTRAS BASED ON SUBSTRATA OR GROUNDWATER TABLE CONDITIONS OR MOISTURE CONDITIONING WILL BE ALLOWED.
- 5. THE CONTRACTOR SHALL KEEP INFORMED AND THE OWNER'S REPRESENTATIVE INFORMED AT ALL TIMES AS TO A "FILL SURPLUS OR SHORTAGE" SITUATION. SHORTAGE OR SURPLUS OF SUITABLE MATERIAL AT THE CONCLUSION OF THE GRADING AND EARTHWORK OPERATION SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND HE WILL BE REQUIRED TO SUPPLY THE DEFICIENCY OR DISPOSE OF THE SURPLUS WITHOUT ADDITIONAL COST TO THE OWNER.
- 6. THE CONTRACTOR SHALL REMOVE VEGETATION, DEBRIS, UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS, AND OTHER DELETERIOUS MATERIALS FROM GROUND SURFACE PRIOR TO CUT OR FILL OPERATIONS.
- 7. MATERIALS FOR FILL OR BACKFILL REQUIRED TO GRADE THE SITE AND ACHIEVE DESIGN ELEVATIONS SHALL BE EITHER ON OR OFF-SITE SOILS WHICH ARE FREE OF ORGANIC MATTER AND DEBRIS. NO TOPSOIL SHALL BE USED AS ENGINEERED FILL.
- 8. NO FILL MAY BE PLACED UNTIL THE EXPOSED SURFACES HAVE BEEN APPROVED BY THE GEOTECHNICAL ENGINEER. ALL FILL MATERIALS SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.
- 9. IF ANY UNKNOWN SUBSURFACE STRUCTURES ARE ENCOUNTERED DURING CONSTRUCTION, THEY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND DESIGN ENGINEER PRIOR TO PROCEEDING.
- 10. ALL FILL MATERIAL SHALL BE PLACED AND COMPACTED AT THE OPTIMUM MOISTURE CONTENT OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- 11. NO FROZEN MATERIAL SHALL BE USED AS FILL NOR WILL ANY FILL BE PLACED ON A FROZEN BASE.
- 12. NO ROCK OR SIMILAR MATERIAL GREATER THAN 6" DIAMETER SHALL BE PLACED IN THE FILL UNLESS RECOMMENDATIONS FOR SUCH PLACEMENT HAVE BEEN SUBMITTED BY THE GEOTECHNICAL ENGINEER IN ADVANCE AND APPROVED BY THE OWNER AND OWNER'S REPRESENTATIVE.
- 13. COMPACT FILL MATERIAL TO AT LEAST THE FOLLOWING PERCENTAGE OF MAXIMUM DRY DENSITY, AS DETERMINED BY ASTM D-1557 (MODIFIED PROCTOR). NO DEVIATION FROM THESE COMPACTION DENSITIES WILL BE ALLOWED UNLESS SPECIFICALLY RECOMMENDED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE OWNER AND OWNER'S REPRESENTATIVE.
- FILL AREAS % OF MAXIMUM DRY DENSITY
 FILL UNDER BUILDING (EXTENDING 5' BEYOND FOOTINGS AT A SLOPE OF 1 ON 1)
 FILL IN THE UPPER 18" UNDER 95%

	PAVEMENT OR SIDEWALKS	
•	FILL PLACED UNDER OR BEHIND RETAINING WALLS	95%

- ALL OTHER FILL 90%
- 14. ALL FILL MATERIAL SHALL BE PLACED AND COMPACTED IN LIFTS, THAT WILL NOT EXCEED THE DEPTH IN WHICH THE COMPACTION EQUIPMENT CAN ACHIEVE THE MAXIMUM DENSITY REQUIRED FOR THE ENTIRE DEPTH OF THE MATERIAL PLACED IN THE LIFT.
- 15. ALL AREAS WHERE FILL HAS BEEN PLACED OR THE EXISTING SOILS HAVE BEEN DISTURBED SHALL BE SUBJECT TO COMPACTION TESTING BY THE GEOTECHNICAL ENGINEER AND SHALL BE TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER, OWNER AND OWNER'S REPRESENTATIVE.
- 16. FILL MATERIAL UNDER PAVEMENTS OR STRUCTURES SHALL BE FREE OF ORGANIC OR DELETERIOUS MATERIALS. IT SHALL BE SUITABLE FOR SUPPORTING PAVEMENTS AND STRUCTURES WITHOUT ADVERSE SHRINKING OR SWELLING.
- 17. FILL MATERIAL IN BERMS AND LANDSCAPE AREAS SHALL BE SUITABLE TO SUPPORT GROWTH OF THE LANDSCAPING MATERIALS (TYPICAL FOR THE LOCAL CLIMATE) AND AS PROPOSED BY THE LANDSCAPE ARCHITECT.
- 18. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF, IN A LEGAL MANNER, ANY TREES, BRUSH OR DEBRIS THAT ARE WITHIN THE DESIGNATED CUTTING AND FILLING AREAS TO BRING THE SITE TO PROPOSED GRADES
- 19. THE CONTRACTOR SHALL STOCKPILE EXCAVATED MATERIAL ONLY IN DESIGNATED AREAS AS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.
- 20. DURING THE PERFORMANCE OF SITE GRADING OPERATIONS, THE SUBGRADE SHALL BE EXAMINED CRITICALLY, AND ANY AREAS DISCOVERED WHICH, IN THE OPINION OF THE OWNER'S REPRESENTATIVE OR GEOTECHNICAL ENGINEER, ARE SOFT AND UNSTABLE, SHALL BE EXCAVATED TO SUCH DEPTHS AS MAY BE NECESSARY TO INSURE SATISFACTORY SUPPORTING PROPERTIES AS DETERMINED BY THE GEOTECHNICAL ENGINEER. THESE AREAS OF EXCAVATION SHALL BE BACKFILLED IMMEDIATELY AND SHALL BE BROUGHT BACK TO THE ELEVATION OF THE SURROUNDING AREAS WITH APPROVED FILL MATERIAL AND IN ACCORDANCE WITH THE EARTH FILL CONSTRUCTION PROCEDURE.
- 21. NEWLY GRADED AREAS SHALL BE PROTECTED FROM THE ACTION OF THE ELEMENTS. ANY SETTLEMENT, DISPLACEMENT, PONDING OR WASHING OUT THAT MAY OCCUR PRIOR TO COMMENCING THE NEXT PHASE OF CONSTRUCTION SHALL BE REPAIRED, AND GRADES REESTABLISHED TO THE REQUIRED ELEVATIONS AND SLOPES.
- 22. THE FINISHED SUBGRADE SURFACE SHALL BE SHAPED TO INDICATED PROFILES AND SHALL BE REASONABLY SMOOTH AND FREE FROM IRREGULAR SURFACE CHANGES AND SHALL BE NO MORE THAN 1 INCH ABOVE OR BELOW THE INDICATED SUBGRADE ELEVATIONS.
- 23. THE GRADING CONTRACTOR SHALL BACKFILL ALL PARKING LOT PLANTERS AND LAWN AREAS TO WITHIN 2 INCHES OF THE TOP ADJACENT CURB GRADES. THE TOP 4 INCHES MINIMUM SHALL BE TOPSOIL, FREE FROM DEBRIS AND STONES LARGER THAN 1 INCH IN DIAMETER.
- 24. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY PUMPS, DITCHING, WELL POINT SYSTEMS AND OTHER MEANS FOR REMOVING WATER FROM EXCAVATIONS, TRENCHES, SUBGRADES AND OTHER PARTS OF THE WORK. THE CONTRACTOR SHALL CONTINUE DE-WATERING OPERATIONS UNTIL THE WATER HAS BEEN REMOVED ENTIRELY. UPON COMPLETION OF WATER REMOVAL THE CONTRACTOR SHALL TAKE APPROPRIATE ACTION TO DRY THE SOILS, REGRADE TO PROPOSED ELEVATIONS AND COMPACT SOILS TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER AND OWNER'S REPRESENTATIVE.
- 25. THE CONTRACTOR SHALL DISPOSE OF WATER IN A SAFE AND SANITARY WAY TO PREVENT FLOODING OR INJURY TO PUBLIC OR PRIVATE PROPERTY AND SHALL OBTAIN APPROVAL OF THE LOCAL GOVERNING AUTHORITY BEFORE DISCHARGING RUN-OFF WATER TO THEIR SYSTEM.
- 26. THE CONTRACTOR SHALL PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING GRADES AND NEW GRADES.

BITUMINOUS PAVING SPECIFICATIONS

REFERENCE SPECIFICATIONS WHERE APPLICABLE TO WORK UNDER THIS SECTION ARE REFERRED TO BY ABBREVIATION AS FOLLOWS:

- A. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO).
- B. THE ASPHALT INSTITUTE (TAI)
- C. MICHIGAN DEPARTMENT OF TRANSPORTATION/ CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION (M.D.O.T.)
- D. AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM)
- CRUSHED AGGREGATE BASE COURSE (CABC) SHALL MEET THE REQUIREMENTS OF SECTION 8.02 OF THE MDOT STANDARD SPECIFICATION FOR CONSTRUCTION AND SHALL CONSIST OF 21AA CRUSHED AGGREGATE. THE USE OF SLAG IS PROHIBITED.
- 3. TACK COAT SHALL BE EMULSIFIED ASPHALT MEETING REQUIREMENTS OF AASHTO M140 AND TAI SS-1H.
- 4. AGGREGATE SHALL CONSIST OF CRUSHED STONE, CRUSHED GRAVEL, A MIXTURE OF UNCRUSHED GRAVEL WITH EITHER CRUSHED STONE OR CRUSHED GRAVEL, OR OTHER INERT MATERIAL HAVING SIMILAR CHARACTERISTICS. IT SHALL BE COMPOSED OF CLEAN, TOUGH, DURABLE FRAGMENTS FROM AN EXCESS OF FLAT OR ELONGATED PIECES, AND SHALL BE FREE OF ORGANIC MATTER AND DELETERIOUS SUBSTANCES AND MEET THE REQUIREMENTS OF MDOT STANDARD SPECIFICATIONS, SECTION 8.02.
- 5. FINE AGGREGATE SHALL BE WELL GRADED FROM COARSE TO FINE AND CONSIST OF NATURAL SAND, STONE SCREENINGS, OR A BLEND OF NATURAL SAND AND STONE SCREENINGS. IT SHALL BE COMPOSED OF ROUGH SURFACED AND ANGULAR GRAINS OF QUARTZ OR OTHER HARD DURABLE ROCK AND MEET THE REQUIREMENTS OF MDOT STANDARD SPECIFICATIONS, SECTION 8.02.
- 6. ASPHALT CEMENT SHALL COMPLY WITH THE REQUIREMENTS OF AASHTO M226 (ASTM 3381) FOR BITUMINOUS CONCRETE SURFACE COURSE AND SURFACE TREATMENT
- 7. BITUMINOUS CONCRETE SHALL COMPLY WITH MDOT SECTION 7.10 OF STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- 8. BITUMINOUS LEVELING COURSE SHALL BE MDOT 1100L, 20AA MIX.
- 9. BITUMINOUS WEARING COURSE SHALL BE MDOT 1100T, 20AA MIX.
- 10. THE CONTRACTOR SHALL SUBMIT, TO THE OWNER, TWO COPIES OF MATERIALS CERTIFICATES SIGNED BY MATERIAL PRODUCER AND CONTRACTOR. CERTIFICATES SHALL STATE THAT EACH MATERIAL ITEM MEETS SPECIFIED REQUIREMENTS.
- 11. THE CONTRACTOR SHALL SUBMIT TO THE GEOTECHNICAL ENGINEER, JOB-MIX FORMULAS FOR EACH REQUIRED ASPHALT AGGREGATE MIXTURE. MIX DESIGNS SHALL BE WITHIN ALLOWABLE TOLERANCES AS SPECIFIED FOR THE PARTICULAR APPLICATION.
- 12. SUBGRADE PREPARATIONS SHALL CONSIST OF THE FINAL MACHINING OF THE SUBGRADE IMMEDIATELY PRIOR TO PLACING THE BITUMINOUS BASE COURSE. THE SUBGRADE SHALL BE COMPACTED PER PLANS AND DETAILS. THE SUBGRADE SHALL BE TRUE TO LINE AND GRADE.
- 13. CRUSHED AGGREGATE BASE COURSE SHALL BE COMPACTED TO A DENSITY EQUAL TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557 (MODIFIED PROCTOR).
- 14. BITUMINOUS CONCRETE PAVEMENT CONSTRUCTION METHODS SHALL CONFORM TO APPLICABLE PORTIONS OF SECTION 4.00 OF THE MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- 15. THE CONTRACTOR SHALL NOT PLACE THE AGGREGATE BASE COURSE OR THE BITUMINOUS BASE COURSE PRIOR TO THE APPROVAL OF THE SUBGRADE BY THE GEOTECHNICAL ENGINEER.
- 16. EACH LIFT AND COURSE OF BITUMINOUS CONCRETE SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER, PRIOR TO THE PLACEMENT OF A SUCCEEDING COURSE OR LIFT.
- 17. APPLY BITUMINOUS TACK COATS ONLY WHEN TEMPERATURE HAS NOT BEEN BELOW 35 DEGREES F. FOR 12 HOURS IMMEDIATELY PRIOR TO APPLICATION. CONSTRUCT BITUMINOUS CONCRETE WEARING COURSE ONLY WHEN ATMOSPHERIC TEMPERATURE IS ABOVE 40-DEGREES F. AND PROCEEDING COURSE OR LIFT IS CLEAN AND DRY. BASE COURSE MAY BE LAID WHEN TEMPERATURE IS ABOVE 35 DEGREES F. AND RISING AND APPROVED BY THE GEOTECHNICAL ENGINEER.
- 18. THE BITUMINOUS CONCRETE SHALL BE TRANSPORTED FROM THE MIXING PLANT TO THE POINT OF USE IN VEHICLES CONFORMING TO THE REQUIREMENTS OF SECTION 4.00 OF THE MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION. DELIVERIES SHALL BE SCHEDULED SO THAT SPREADING AND ROLLING OF ALL BITUMINOUS CONCRETE PREPARED FOR ONE DAY'S RUN CAN BE COMPLETED DURING DAYLIGHT, UNLESS ADEQUATE ARTIFICIAL LIGHTING IS PROVIDED. HAULING OVER FRESHLY PLACED BITUMINOUS MAT SHALL NOT BE PERMITTED UNTIL THE BITUMINOUS CONCRETE HAS BEEN COMPACTED, AS SPECIFIED, AND ALLOWED TO COOL TO ATMOSPHERIC TEMPERATURE.
- 19. UPON ARRIVAL, THE BITUMINOUS CONCRETE SHALL BE SPREAD TO A THICKNESS NOT TO EXCEED 3-INCHES AND TO THE FULL WIDTH BY AN APPROVED BITUMINOUS PAVER. IT SHALL BE STRUCK OFF IN A UNIFORM LAYER OF SUCH DEPTH THAT, WHEN THE WORK IS COMPLETED, IT SHALL HAVE THE REQUIRED THICKNESS AND CONFORM TO THE GRADE AND CONTOUR INDICATED. THE SPEED OF THE PAVER SHALL BE REGULATED TO ELIMINATE PULLING AND TEARING OF THE BITUMINOUS MAT. UNLESS OTHERWISE DIRECTED, PLACEMENT OF THE BITUMINOUS CONCRETE SHALL BEGIN ALONG THE CENTERLINE OF A CROWNED SECTION OR ON THE HIGH SIDE OF AREAS WITH A ONE-WAY SLOPE. THE BITUMINOUS CONCRETE SHALL BE PLACED IN CONSECUTIVE ADJACENT STRIPS HAVING A MINIMUM WIDTH OF 10 FEET, EXCEPT WHERE EDGE LANES REQUIRE LESS WIDTH TO COMPLETE THE AREA. TRANSVERSE JOINTS IN ADJACENT LANES SHALL BE OFFSET A MINIMUM OF 10 FEET.
- 20. ON AREAS WHERE IRREGULARITIES OR UNAVOIDABLE OBSTACLES MAKE THE USE OF MECHANICAL SPREADING AND FINISHING EQUIPMENT IMPRACTICAL, THE BITUMINOUS CONCRETE MAY BE SPREAD AND RAKED BY HAND TOOLS.
- 21. THE BITUMINOUS CONCRETE SHALL BE PLACED AT A TEMPERATURE OF NOT LESS THAN 250 NOR HIGHER THEN 350 DEGREES F OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- 22. THE BITUMINOUS CONCRETE MIXTURE SHALL BE THOROUGHLY AND UNIFORMLY COMPACTED BY ROLLING. THE SURFACE SHALL BE ROLLED WHEN THE BITUMINOUS MAT HAS ATTAINED SUFFICIENT STABILITY SO THAT THE ROLLING DOES NOT CAUSE UNDUE DISPLACEMENT, CRACKING AND SHOVING. THE SEQUENCE OF ROLLING OPERATIONS SHALL BE AT THE DISCRETION OF THE CONTRACTOR.
- 23. THE SPEED OF THE ROLLER SHALL, AT ALL TIMES, BE SUFFICIENTLY SLOW TO AVOID DISPLACEMENT OF THE HOT BITUMINOUS CONCRETE. ANY DISPLACEMENT OCCURRING AS A RESULT OF REVERSING THE DIRECTION OF THE ROLLER, OR FROM ANY OTHER CAUSE, SHALL BE CORRECTED AT ONCE.
- 24. SUFFICIENT ROLLERS SHALL BE FURNISHED TO HANDLE THE OUTPUT OF THE PLANT. ROLLING SHALL CONTINUE UNTIL ALL ROLLER MARKS ARE ELIMINATED, THE SURFACE IS OF UNIFORM TEXTURE AND TRUE TO GRADE AND CROSS-SECTION, AND THE REQUIRED FIELD DENSITY IS OBTAINED.
- 25. TACK COAT SHALL BE APPLIED TO THE SURFACE OF PREVIOUS LIFTS AND COURSES OF BITUMINOUS CONCRETE AND TO SURFACES ABUTTING OR PROJECTING INTO THE BITUMINOUS CONCRETE.
- 26. IMMEDIATELY BEFORE PLACING A SUCCEEDING LIFT OR COURSE OF BITUMINOUS CONCRETE THE PRECEDING LIFT OR COURSE SHALL BE CLEARED OF ANY DEBRIS BY APPROPRIATE METHODS.
- 27. TO PREVENT ADHESION OF THE BITUMINOUS CONCRETE TO THE ROLLER, THE WHEELS SHALL BE KEPT PROPERLY MOISTENED, BUT EXCESSIVE WATER WILL NOT BE PERMITTED.
- 28. IN AREAS NOT ACCESSIBLE TO THE ROLLER, THE BITUMINOUS CONCRETE SHALL BE THOROUGHLY COMPACTED WITH HOT HAND TAMPERS.
- 29. ANY BITUMINOUS CONCRETE THAT BECOMES LOOSE AND BROKEN, MIXED WITH DIRT, OR IN ANY WAY DEFECTIVE SHALL BE REMOVED AND REPLACED WITH FRESH HOT BITUMINOUS CONCRETE AND IMMEDIATELY COMPACTED TO CONFORM TO THE SURROUNDING AREA. THIS WORK SHALL BE DONE AT THE CONTRACTOR'S EXPENSE. SKIN PATCHING SHALL NOT BE ALLOWED.
- 30. THE CONTRACTOR SHALL PROVIDE AT LEAST TWO ROLLERS FOR EACH PAVER OPERATING ON THE WORK. THE CONTRACTOR SHALL USE ADDITIONAL ROLLERS AS REQUIRED TO OBTAIN THE SPECIFIED PAVEMENT DENSITY.

BITUMINOUS PAVING SPECIFICATIONS, CONTINUED

- 31. THE CONTRACTOR SHALL CAREFULLY MAKE JOINTS BETWEEN OLD AND NEW PAVEMENTS, OR BETWEEN SUCCESSIVE DAYS' WORK, TO ENSURE A CONTINUOUS BOND BETWEEN ADJOINING WORK. CONSTRUCT JOINTS TO HAVE THE SAME TEXTURE, DENSITY AND SMOOTHNESS AS OTHER SECTIONS OF THE BITUMINOUS CONCRETE COURSE. THE CONTRACTOR SHALL CLEAN CONTACT SURFACES OF SAND, DIRT, OR OTHER OBJECTIONABLE MATERIAL BEFORE MAKING THE JOINT.
- 32. THE CONTRACTOR SHALL TEST THE FINISHED SURFACE OF EACH BITUMINOUS CONCRETE COURSE FOR SMOOTHNESS, USING A 10 FOOT STRAIGHTEDGE APPLIED PARALLEL WITH AND AT RIGHT ANGLES TO CENTERLINE OF PAVED AREA. SURFACE SHALL NOT BE ACCEPTABLE IF EXCEEDING THE FOLLOWING TOLERANCES FOR SMOOTHNESS.
- A. LEVELING COURSE SURFACE: 1/4 INCH, PLUS OR MINUS 1/4 INCH.
- B. SURFACE COURSE: 1/4 INCH
- 33. THE CONTRACTOR SHALL TEST CROWNED SURFACES WITH A CROWN TEMPLATE, CENTERED AND AT RIGHT ANGLES TO THE CROWN. SURFACES WILL NOT BE ACCEPTABLE IF THE FINISHED CROWN SURFACES VARY MORE THAN 1/4 INCH FROM THE CROWN TEMPLATE.
- 34. AFTER FINAL ROLLING, THE CONTRACTOR SHALL NOT PERMIT VEHICULAR TRAFFIC ON THE BITUMINOUS CONCRETE PAVEMENT UNTIL IT HAS COOLED AND HARDENED, AND IN NO CASE SOONER THAN SIX HOURS OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- 35. THE AGGREGATE BASE MUST EXTEND A MINIMUM OF 1' BEHIND THE BACK-OF-CURB AROUND THE PERIMETER OF THE PARKING LOT AND DRIVES.

CONCRETE CURB, SIDEWALK AND PAVEMENT SPECIFICATIONS

- . THESE SPECIFICATIONS SHALL GOVERN THE CONSTRUCTION OF ALL PAVEMENTS, CURB AND GUTTER, SIDEWALKS, SERVICE WALKS, DRIVEWAY APPROACHES, AND LOADING DOCK AREAS, AS INDICATED ON THE DRAWINGS.
- REFERENCE SPECIFICATIONS WHERE APPLICABLE TO WORK UNDER THIS SECTION ARE REFERRED BY ABBREVIATION AS FOLLOWS: A. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION
- OFFICIALS (AASHTO). B. AMERICAN CONCRETE INSTITUTE (ACI)
- C. MICHIGAN DEPARTMENT OF TRANSPORTATION/ CURRENT STANDARD
- SPECIFICATIONS FOR CONSTRUCTION (M.D.O.T.) D. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
- 3. THE FINE AGGREGATE SHALL MEET ALL REQUIREMENTS OF SECTION 8.02 OF OF
- MDOT SPECIFICATION FOR NO. 2NS NATURAL SAND.4. THE COARSE AGGREGATE SHALL MEET ALL REQUIREMENTS OF SECTION 8.02 OF
- M.D.O.T. SPECIFICATIONS FOR NO. 6AA COARSE AGGREGATE.
- 5. THE CONTRACTOR SHALL SUBMIT, TO THE OWNER, TWO COPIES OF MATERIALS CERTIFICATES SIGNED BY MATERIAL PRODUCER AND CONTRACTOR. CERTIFICATES SHALL STATE THAT EACH MATERIAL ITEM MEETS SPECIFIED REQUIREMENTS.
- 6. THE CONTRACTOR SHALL SUBMIT, TO THE GEOTECHNICAL ENGINEER, JOB MIX-FORMULAS FOR EACH REQUIRED CEMENT-AGGREGATE MIXTURE. MIX DESIGNS SHALL BE WITHIN ALLOWABLE TOLERANCES AS SPECIFIED FOR THE PARTICULAR APPLICATION.
- CONCRETE MIX SHALL BE AIR-ENTRAINED AND PROPORTIONED TO PROVIDE THE FOLLOWING:
- A. COMPRESSIVE STRENGTH AT 28 DAYS: 3500 PSI MIN., OR AS INDICATED ON PLANS.
- B. TOTAL AIR CONTENT BY VOLUME: 5% TO 8%.
- C. SLUMP 3 INCH MAXIMUM, OR AS INDICATED ON PLANS.
- B. THE CONTRACTOR SHALL AT HIS EXPENSE FURNISH SAMPLES OF FRESH CONCRETE AND PROVIDE SAFE AND SATISFACTORY FACILITIES FOR OBTAINING THE SAMPLES.
- 9. CONSTRUCT CONCRETE CURBING ONLY WHEN GROUND TEMPERATURE IS ABOVE 35 DEGREES F. AND BASE IS DRY.
- ALL CEMENT USED IN CURB CONSTRUCTION SHALL BE PORTLAND CEMENT, TYPE I OR IA ASTM C-150.
 WATER USED IN CONCRETE SHALL BE CLEAN. FREE FROM OIL ACIDS STRONG
- 11. WATER USED IN CONCRETE SHALL BE CLEAN, FREE FROM OIL, ACIDS, STRONG ALKALIS OR VEGETABLE MATTER AND POTABLE. IF MUNICIPAL WATER IS USED IN THE CONCRETE, ALL NECESSARY PERMITS SHALL BE OBTAINED FROM THE MUNICIPAL WATER DEPARTMENT.
- 12. AIR ENTRAINING ADMIXTURE SHALL BE IN ACCORDANCE WITH ASTM C-260.
- 13. ALL READY-MIXED CONCRETE SUPPLIERS MUST BE APPROVED BY THE OWNER. CONCRETE SHALL BE MANUFACTURED AND DELIVERED TO THE JOB SITE BY A READY MIXED CONCRETE MANUFACTURER THOROUGHLY EXPERIENCED IN READY-MIXED CONCRETE. IF REQUESTED BY THE OWNER, SUBMIT A WRITTEN DESCRIPTION OF PROPOSED READY-MIXED CONCRETE MANUFACTURER, GIVING QUALIFICATIONS OF PERSONAL, LOCATION OF BATCHING PLANT, LIST OF PROJECTS SIMILAR IN SCOPE OF SPECIFIED WORK, AND OTHER INFORMATION AS MAY BE REQUESTED BY THE OWNER.
- 14. THE CONTRACTOR SHALL SUBMIT A STATEMENT OF PURCHASE FOR READY-MIXED CONCRETE: PRIOR TO ACTUAL DELIVERY OF CONCRETE, SUBMIT TO THE GEOTECHNICAL ENGINEER FOUR COPIES OF STATEMENT OF PURCHASE, GIVING THE DRY WEIGHTS OF CEMENT AND SATURATED SURFACE DRY WEIGHTS OF FINE AND COARSE AGGREGATES AND QUANTITIES, TYPE AND NAME OF ADMIXTURES (IF ANY) AND OF WATER PER CU.YD., THAT WILL BE USED IN THE MANUFACTURE OF THE CONCRETE. THE CONTRACTOR SHALL ALSO FURNISH EVIDENCE SATISFACTORY TO THE GEOTECHNICAL ENGINEER THAT THE MATERIALS TO BE USED AND PROPORTIONS SELECTED WILL PRODUCE CONCRETE OF THE QUALITY SPECIFIED. WHATEVER STRENGTHS ARE OBTAINED, THE QUANTITY OF CEMENT USED SHALL NOT BE LESS THAN THE MINIMUM SPECIFIED.
- 15. READY-MIXED CONCRETE DELIVERY TICKETS: SUBMIT ONE COPY OF EACH DELIVERY TICKET TO THE GEOTECHNICAL ENGINEER AND CONTRACTOR IN ACCORDANCE WITH SECTION 16 OF ASTM C94.
- 16. READY-MIXED CONCRETE SHALL BE BATCHED, MIXED AND TRANSPORTED IN ACCORDANCE WITH ASTM C94, AND COMPLY WITH ACI 304 "RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE," EXCEPT AS OTHERWISE SPECIFIED HEREIN.
- 17. READY-MIXED CONCRETE SHALL BE MIXED AND DELIVERED TO THE POINT OF DISCHARGE AT THE JOB BY MEANS OF A READY MIX CONCRETE TRUCK.
- 18. NO WATER FROM THE TRUCK WATER SYSTEM OR ELSEWHERE SHALL BE ADDED AFTER THE INITIAL INTRODUCTION OF THE MIXING WATER FOR THE BATCH. UNDER NO CIRCUMSTANCES SHALL THE APPROVED MAXIMUM WATER CONTENT BE EXCEEDED NOR SHALL THE SLUMP EXCEED THE MAXIMUM SPECIFIED.
- 19. DISCHARGE OF THE CONCRETE SHALL BE COMPLETED WITHIN 1-1/2 HOURS OR BEFORE THE DRUM HAS REVOLVED 300 REVOLUTIONS, WHICHEVER COMES FIRST, AFTER THE INTRODUCTION OF THE MIXING WATER TO THE CEMENT AND AGGREGATES OR THE INTRODUCTION OF THE CEMENT TO THE AGGREGATES.
- 20. IN HOT WEATHER (AIR TEMPERATURE 80-DEGREES F. AND ABOVE) OR UNDER CONDITIONS CONTRIBUTING TO QUICK STIFFENING OF THE CONCRETE, THE TIME SHALL BE REDUCED TO ONE HOUR.
- 21. CONCRETE DELIVERED IN COLD WEATHER (AIR TEMPERATURE 45-DEGREES F. AND LOWER) SHALL HAVE A TEMPERATURE NOT LESS THAN 60-DEGREES F. AT THE POINT OF DISCHARGE AT THE JOB, AND IN COMPLIANCE WITH ACI 306R "COLD WEATHER CONCRETING". CONCRETE PLACING WILL NOT BE PERMITTED WHEN THE AIR TEMPERATURE IS 35-DEGREES F. OR LOWER.
- 22. CONCRETE DELIVERED UNDER HOT WEATHER CONDITIONS CONTRIBUTING TO QUICK STIFFENING OF CONCRETE, OR IN AIR TEMPERATURE OF 80-DEGREES F. AND OVER, SHALL HAVE A TEMPERATURE BETWEEN 60- AND 80-DEGREES F. AT THE POINT OF DISCHARGE AT THE JOB, AND IN ACCORDANCE WITH ACI 305R "HOT WEATHER CONCRETING."
- 23. IN NO CASE SHALL THE MIXER OR TRUCK BE FLUSHED OUT ONTO THE STREET PAVEMENT, IN A CATCH BASIN OR SEWER MANHOLE, OR IN ANY PUBLIC RIGHT-OF-WAY.
- 24. REINFORCEMENT BARS SHALL BE PER ASTM A615-84A, GRADE 60 DEFORMED BILLET STEEL BARS.
- 25. TIE WIRE SHALL BE BLACK, ANNEALED STEEL WIRE, NOT LESS THAN 16 GAUGE.

CONCRETE CURB, SIDEWALK AND PAVEMENT SPECIFICATIONS, CONTINUED

- 26. BAR SUPPORTS SHALL CONFORM TO "BAR SUPPORT SPECIFICATIONS" CONTAINED IN ACI "MANUAL OF STANDARD PRACTICE." PROVIDE CHAIRS, SPACERS AND OTHER DEVICES SUITABLE FOR PROPER SPACING SUPPORTING AND FASTENING REINFORCING BARS.
- 27. WHEN FORMS ARE USED AND THE CURB RADIUS IS LESS THAN 200 FEET, THE CURVED ALIGNMENT SHALL BE PROVIDED FOR BY EITHER STANDARD STEEL FORMS EQUIPPED WITH FLEXIBLE LINES OR BY FLEXIBLE FORMS. THE FORMS SHALL BE OF THE FULL DEPTH OF THE SECTION. CURB AND GUTTER FORMS SHALL BE SO CONSTRUCTED AS TO PERMIT THE INSIDE OF THE FORMS TO BE SECURELY FASTENED TO THE OUTSIDE FORMS.
- 28. ALL NEW CURB SHALL BE PLACED ONLY ON A PREPARED SUBGRADE, SMOOTH AND LEVELED TO THE GRADES ESTABLISHED BY THE ENGINEER.
- 29. COMPACT AND CUT-TO-GRADE SUBGRADE UNDER FORMS SO THAT FORMS WHEN SET WILL BE UNIFORMLY SUPPORTED FOR THE ENTIRE LENGTH. SECURELY STAKE AND BRACE OR TIE FORMS TO PREVENT LEAKAGE OF MORTAR. BRACING WITH EARTH WILL NOT BE PERMITTED.
- 30. COAT SURFACES OF FORMS TO BE IN CONCRETE WITH A LIGHT CLEAR PARAFFIN OIL OR PARTING COMPOUND WHICH WILL NOT STAIN THE CONCRETE.
- 31. THE INTERIOR SURFACES OF CONCRETE CONVEYING EQUIPMENT SHALL BE MAINTAINED FREE OF HARDENED CONCRETE, DEBRIS, WATER, SNOW, ICE AND OTHER DELETERIOUS MATERIALS.
- 32. CURBING MAY BE CONSTRUCTED EITHER BY USE OF FORMS OR BY A MECHANICAL CURB AND GUTTER PAVER, PROVIDED THE REQUIRED FINISH, AND CROSS-SECTION, AS SHOWN ON DRAWINGS ARE OBTAINED. CONCRETE SHALL BE PLACED TO PROVIDE ONE COURSE MONOLITHIC STRUCTURE WITHOUT THE USE OF MORTAR TOPPING OR SAND-CEMENT DRIER. CONCRETE SHALL BE SPADED OR VIBRATED SUFFICIENTLY TO ENSURE SATISFACTORY CONSOLIDATION.
- 33. PROVIDE REINFORCEMENT FOR CONCRETE CURB AS SHOWN ON THE DRAWINGS. REINFORCEMENT SHALL BE KEPT CLEAN AND FREE FROM OBJECTIONABLE RUST. BENDS OR KINKS IN REINFORCING BARS SHALL BE CORRECTED BEFORE PLACING. ALL REINFORCEMENT SHALL BE ACCURATELY LOCATED IN FORMS AND SECURELY HELD IN PLACE BEFORE AND DURING CONCRETE PLACING, BY SUPPORTS ADEQUATE TO PREVENT DISPLACEMENT DURING THE COURSE OF CONSTRUCTION.
- 34. THE CONCRETE CURB SURFACE SHALL BE STRUCK OFF THE REQUIRED CROSS-SECTION WITH A TEMPLATE. AFTER THE CONCRETE CURB HAS BEEN FLOATED TO AN EVEN SURFACE, THE CONTRACTION JOINT SHALL BE CUT AND ALL SLAB EDGES ROUNDED WITH A 1/2 INCH RADIUS EDGING TOOL THAT WILL FINISH TO A WIDTH OF 2 INCHES. AFTER THE CONCRETE HAS SLIGHTLY SET, A BROOM SHALL BE BRUSHED LIGHTLY ACROSS THE SURFACE PARALLEL TO FORMS SO AS TO IMPART A ROUGH FINISH.
- 35. CONTRACTION JOINTS SHALL BE CUT IN CONCRETE CURBING AT 10' INTERVALS. THE JOINT SHALL CUT 1/4 INCH WIDE BY 1/3 THE DEPTH OF THE CONCRETE CURB SECTION.
- 36. ISOLATION JOINTS SHALL BE PLACED IN CURBING AT TANGENT POINTS IN CURB RETURNS AT INTERSECTIONS, AT BOTH SIDES OF STRUCTURES LOCATED IN THE LINE AND IN RUNS OF CURB AT INTERVALS NOT EXCEEDING 400 FEET. ISOLATION JOINTS SHALL BE 1" THICK PRE-FORMED JOINT FILLER STRIPS. THE STRIPS SHALL EXTEND THE FULL DEPTH OF THE CONCRETE CURB SECTION. ISOLATION JOINTS SHALL BE PLACED IN CURB AT THE END OF EACH DAYS POUR AND WHEN ABUTTING PREVIOUSLY POURED CURB.
- 37. THE CURING COMPOUND SHALL BE WHITE MEMBRANE TYPE AND COMPLY WITH ASTM C-309. IT SHALL NOT ALLOW A MOISTURE LOSS OF MORE THAN 0.055 GR/SQ/CM WHEN APPLIED AT 200 SQ/FT/GAL.
- 38. ALL CONTRACTION JOINTS IN CONCRETE CURB SECTIONS SHALL BE SEALED WITH EITHER HOT POURED JOINT SEALER OR COLD APPLIED JOINT SEALER.
- 39. SLIGHTLY UNDERFILL JOINT GROOVE WITH JOINT SEALER TO PREVENT EXTRUSION OF THE SEALER. REMOVE EXCESS JOINT SEALER MATERIALS AS SOON AFTER SEALING AS POSSIBLE.
- 40. FRESHLY PLACED CONCRETE SHALL BE PROTECTED AS REQUIRED TO MAINTAIN THE TEMPERATURE OF THE CONCRETE AT NOT LESS THAN 50 DEGREES F. NOR MORE THAN 80 DEGREES F. AND IN A MOIST CONDITION CONTINUOUSLY FOR THE PERIOD OF TIME NECESSARY FOR THE CONCRETE TO CURE. CHANGES IN TEMPERATURE OF THE CONCRETE DURING CURING SHALL BE AS UNIFORM AS POSSIBLE AND SHALL NOT EXCEED 5 DEGREES F. IN ANY ONE HOUR, NOR 50 DEGREES F. IN ANY 24 HOUR PERIOD.
- 41. COLD WEATHER PROTECTION: WHEN THE TEMPERATURE OF THE ATMOSPHERE IS 40-DEGREES F. AND BELOW, THE CONCRETE SHALL BE PROTECTED BY HEATING, INSULATION COVERING, OR COMBINATION THEREOF AS REQUIRED TO MAINTAIN THE TEMPERATURE OF THE CONCRETE AT OR ABOVE 50-DEGREES F. AND IN A MOIST CONDITION CONTINUOUSLY FOR THE CONCRETE CURING PERIOD. COLD WEATHER PROTECTION SHALL MEET THE REQUIREMENTS OF ACI 306R "COLD WEATHER CONCRETING".
- 42. HOT WEATHER PROTECTION: WHEN THE TEMPERATURE OF THE ATMOSPHERE IS 90-DEGREES F. AND ABOVE, OR DURING OTHER CLIMATIC CONDITIONS WHICH WILL CAUSE TOO RAPID DRYING OF THE CONCRETE, THE CONCRETE SHALL BE PROTECTED BY WINDBREAKS, SHADING, FOG SPRAYING LIGHT COLORED MOISTURE RETAINING COVERING, OR A COMBINATION OF THEREOF AS REQUIRED TO MAINTAIN THE TEMPERATURE OF THE CONCRETE BELOW 80-DEGREE F. AND IN A MOIST CONDITION CONTINUOUSLY FOR THE CONCRETE CURING PERIOD. HOT WEATHER PROTECTION SHALL MEET THE REQUIREMENTS OF ACI 305R "HOT WEATHER CONCRETING"
- 43. ALL FORMS, RAILS AND STAKES SHALL BE REMOVED WITHIN 24 HOURS AFTER PLACING THE CURB.
- 44. AFTER COMPLETION OF CONCRETE CURBING IN AN AREA, REMOVE ALL WEATHER PROTECTION MATERIALS, RUBBISH AND DEBRIS RESULTING FROM SPECIFIED WORK, SWEEP CONCRETE CURBS CLEAN, AND SEAL JOINTS.
- 45. ALL CEMENT USED IN SIDEWALK CONSTRUCTION SHALL BE PORTLAND CEMENT, TYPE I OR IA ASTM C-150.
- 46. ALL NEW WALKS AND CONCRETE PAVEMENTS SHALL BE PLACED ONLY ON A PREPARED SUBGRADE, SMOOTHED AND LEVELED TO THE GRADES ESTABLISHED BY THE ENGINEER. IN CLAY SOILS THE SUBGRADE SHALL BE EXCAVATED 2-INCHES BELOW THE SIDEWALK BASE AND FILLED WITH APPROVED SAND MEETING MDOT CLASS II, SAND DESIGNATION.
- 47. CONSTRUCT CONCRETE SURFACE COURSE ONLY WHEN GROUND TEMPERATURE IS ABOVE 35 DEGREES F. AND BASE IS DRY.
- 48. SIDEWALKS SHALL PITCH TOWARD THE STREET OR AWAY FROM BUILDINGS WITH A REQUIRED CROSS SLOPE OF 1/4-INCH PER FOOT OF WIDTH. IN SOME EXTREME CASES, AS DETERMINED BY THE ENGINEER, THE CROSS-SLOPE MAY BE INCREASED BUT IN NO CASE SHALL IT BE LESS THAN 3/16-INCH PER FOOT OF WIDTH.
- 49. PRIOR TO PLACING THE CONCRETE, ALL DEBRIS, STONES, DIRT, ETC., SHALL BE REMOVED FROM THE SUBGRADE. THE SUBGRADE SHALL BE MOISTENED WITH WATER IN SUCH A MANNER AS TO THOROUGHLY WET THE MATERIAL WITHOUT FORMING PUDDLES OR POCKETS OF WATER. NO CONCRETE SHALL BE PLACED ON FROZEN SUBGRADE.
- 50. FORMS SHALL BE METAL OR WOOD AND OF AN APPROVED SECTION. THEY SHALL BE STRAIGHT, FREE FROM DISTORTION AND SHALL SHOW NO VERTICAL VARIATION GREATER THAN 1/8-INCH IN 10-FOOT LENGTHS FROM THE TRUE PLANE SURFACE ON THE TOP OF THE FORMS WHEN TESTED WITH A 10-FOOT STRAIGHTEDGE, AND SHALL SHOW NO LATERAL VARIATION GREATER THAN 1/4-INCH IN 10-FEET FROM THE TRUE PLANE SURFACE OF THE LATERAL FACE OF THE FORM WHEN TESTED WITH A 10-FOOT STRAIGHTEDGE. THEY SHALL BE OF THE DEPTH SPECIFIED FOR THE SIDEWALK, OR CONCRETE PAVEMENT PER PLANE AND DETAILS, AND BE SECURELY HELD IN PLACE AND TRUE TO LINE AND GRADE.
- 51. THE CONCRETE SHALL BE DEPOSITED CONTINUOUSLY IN THE FORMS IN SUCH A MANNER AS TO AVOID SEGREGATION AND IT SHALL BE THOROUGHLY TAMPED OR VIBRATED SO THAT THE FORMS ARE ENTIRELY FILLED AND THE CONCRETE THOROUGHLY CONSOLIDATED. THE SLABS SHALL BE PLACED IN SECTIONS OR BLOCKS IN ONE OPERATION AS A MONOLITH.
- 52. THE CONCRETE SURFACE SHALL BE STRUCK OFF TO A PLANE SURFACE WITH A STRAIGHTEDGE. AFTER THE CONCRETE HAS BEEN FLOATED TO AN EVEN SURFACE, THE CONTRACTION JOINT SHALL BE CUT AND ALL SLAB EDGES ROUNDED WITH A 1/2-INCH RADIUS EDGING TOOL THAT WILL FINISH TO A WIDTH OF 2-INCHES. AFTER THE CONCRETE HAS SLIGHTLY SET, A BROOM SHALL BE BRUSHED LIGHTLY ACROSS THE SURFACE AT RIGHT ANGLES TO FORMS SO AS TO IMPART A ROUGH FINISH.
- 53. CONTRACTION JOINTS SHALL BE PLACED AT RIGHT ANGLES TO THE EDGE OF THE SIDEWALK OR CONCRETE PAVEMENT AND PERPENDICULAR TO THE SURFACE AND AT A DEPTH OF AT LEAST 1/4 THE SLAB THICKNESS WITH A MINIMUM DEPTH OF 1-1/4-INCHES FOR SIDEWALKS AND 3-INCHES FOR CONCRETE PAVEMENT SLABS.
- 54. CONTRACTION JOINTS IN SIDEWALKS SHALL BE SPACED AT A MINIMUM OF EVERY 5-FEET, OR AS SHOWN ON THE PLANS.

CONCRETE CURB, SIDEWALK AND PAVEMENT SPECIFICATIONS, CONTINUED

- 55. ISOLATION PAPERS SHALL BE OF THE PRE-MOLDED, NON-EXTRUDING, ASPHALT IMPREGNATED TYPE, NOT LESS THAN 1/2-INCH THICK. THE LENGTH SHALL BE EQUAL TO THE WIDTH OF THE SLAB, AND THE DEPTH EQUAL TO THE THICKNESS OF THE SLAB PLUS 1-INCH.
- 56. ISOLATION JOINTS SHALL BE PLACED AT THE FOLLOWING LOCATION FOR SIDEWALKS AND CONCRETE PAVEMENTS:
 - A. AT THE BACK OF THE CURB AND FRONT EDGE OF THE SIDEWALKS AND PAVEMENT SLABS ADJACENT TO EACH DRIVEWAY APPROACH AND SERVICE WALK.
 - B. AT INTERVALS NOT TO EXCEED 50-FEET IN ALL PUBLIC SIDEWALKS.
 - C. AT THE BACK OF THE CURB WHERE THE RAMPS EXTEND FROM THE KEY FLAG TO THE PAVEMENT.
 - D. BETWEEN THE KEY FLAG AND THE RAMP IN ALL CASES, EXCEPT WHERE THERE ARE EXISTING EXPANSION JOINTS AT THE INTERSECTIONS OF THE SIDEWALKS AND THE KEY FLAG.
 - E. AT ANY PLACE WHERE A SIDEWALK OR CONCRETE PAVEMENT ABUTS A BUILDING OR FIXED STRUCTURE.
 - F. AT ANY OTHER LOCATIONS INDICATED ON THE PLAN.
- 57. CONTRACTION JOINTS IN THE CONCRETE PAVEMENT IN THE LOADING AREA WILL BE AS FOLLOWS:
 - A. TRANSVERSE JOINTS SHALL BE AT 10-FOOT INTERVALS OR AS SHOWN ON PLANS AND DETAILS.
 - B. LONGITUDINAL JOINTS SHALL BE AT 12-FOOT INTERVALS OR AS SHOWN ON PLANS AND DETAILS.
- 58. PRIOR TO APPLYING JOINT SEALER, CLEAN JOINT GROOVE OF FOREIGN MATTER AND LOOSE PARTICLES, AND DRY SURFACE.

TRAFFIC LANE AND PARKING LOT MARKING

- 1. PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, AND SERVICES NECESSARY TO COMPLETE ALL TRAFFIC LANE AND PARKING LOT MARKINGS AS INDICATED IN THE CONSTRUCTION DOCUMENTS.
- 2. WORK INCLUDES, BUT NOT LIMITED TO PAINTING OF LETTERS, MARKINGS, STRIPES AND ISLANDS ON THE PAVEMENT SURFACE APPLIED IN ACCORDANCE WITH THIS SPECIFICATION AND AT THE LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
- 3. THE PAINT SHALL MEET THE REQUIREMENTS OF FEDERAL SPECIFICATION TT-P-115C(3), WITH OR WITHOUT REFLECTORIZED BEADS AS REQUIRED ON THE PLANS.
- 4. COLOR SHALL BE AS SPECIFIED ON THE PLANS OR AS FOLLOWS:
 - A. TRAFFIC LANE STRIPING SHALL BE WHITE OR YELLOW REFLECTORIZED, AS SHOWN ON THE PLANS.
 - B. TRAFFIC MARKING AND CURB FACES SHALL BE WHITE UNLESS NOTED OTHERWISE.
 - C. PARKING LOT STRIPING SHALL BE WHITE, UNLESS NOTED OTHERWISE.
 - D. HANDICAP STALL STRIPING MEETING CURRENT ADA REQUIREMENTS SHALL BE BLUE UNLESS NOTED OTHERWISE.
- 5. THE PAINTING SHALL BE PERFORMED ONLY WHEN THE EXISTING SURFACE IS DRY AND CLEAN, WHEN THE ATMOSPHERIC TEMPERATURE IS ABOVE 40-DEGREES F. AND WHEN THE WEATHER IS NOT EXCESSIVELY WINDY, DUSTY OR FOGGY.
- 6. ALL EQUIPMENT FOR THE WORK SHALL BE APPROVED BY THE CONTRACTOR AND SHALL INCLUDE THE APPARATUS NECESSARY TO PROPERLY CLEAN THE EXISTING SURFACE, A MECHANICAL MARKING MACHINE, AND SUCH AUXILIARY HAND PAINTING EQUIPMENT AS MAY BE NECESSARY TO SATISFACTORILY COMPLETE THE JOB.
- 7. THE MECHANICAL MARKER SHALL BE AN APPROVED ATOMIZING SPRAY-TYPE MARKING MACHINE SUITABLE FOR APPLICATION OF TRAFFIC PAINT. IT SHALL PRODUCE AN EVEN AND UNIFORM FILM THICKNESS AT THE REQUIRED COVERAGE AND SHALL BE DESIGNED SO AS TO APPLY MARKINGS OF UNIFORM CROSS-SECTIONS AND CLEAR-CUT EDGES WITHOUT RUNNING OR SPATTERING AND WITHIN THE L LIMITS FOR STRAIGHTNESS SET FORTH HEREIN. WHEN NEEDED, A DISPENSER SHALL BE FURNISHED, WHICH IS PROPERLY DESIGNED FOR ATTACHMENT TO THE MECHANICAL MARKER AND SUITABLE FOR DISPENSING THE REQUIRED QUANTITY OF REFLECTIVE BEADS.
- 8. SUITABLE ADJUSTMENTS SHALL BE PROVIDED ON THE SPRAYER/SPRAYERS OF A SINGLE MACHINE OR BY FURNISHING ADDITIONAL EQUIPMENT FOR PAINTING THE WIDTH REQUIRED.
- 9. IMMEDIATELY BEFORE APPLICATION OF THE PAINT, THE EXISTING SURFACE SHALL BE DRY AND ENTIRELY FREE FROM DIRT, GREASE, OIL, ACIDS, DEBRIS, OR OTHER FOREIGN MATTER WHICH WOULD REDUCE THE BOND BETWEEN THE COAT OF PAINT AND THE PAVEMENT. THE SURFACE SHALL BE THOROUGHLY CLEANED BY SWEEPING AND BLOWING AS REQUIRED TO REMOVE ALL DIRT, DEBRIS AND LOOSE MATERIALS. AREAS WHICH CANNOT BE SATISFACTORILY CLEANED BY BROOMING AND BLOWING SHALL BE SCRUBBED AS DIRECTED WITH A WATER SOLUTION OF TRI-SODIUM PHOSPHATE (10%NA3PO4 BY WEIGHT) OR AN APPROVED EQUAL SOLUTION. AFTER SCRUBBING, THE SOLUTION SHALL BE RINSED OFF AND THE SURFACE DRIED PRIOR TO PAINTING.
- 10. EXISTING MARKINGS OR STRIPES WHICH ARE TO BE ABANDONED OR REMOVED SHALL BE OBLITERATED OR OBSCURED BY THE BEST METHODS SUITED FOR THE PURPOSE AND TO THE SATISFACTION OF THE OWNER OR OWNERS REPRESENTATIVE.
- 11. THE CONTRACTOR IS RESPONSIBLE FOR LAYING OUT A SAMPLE SECTION OF STRIPING WHICH IS TO BE APPROVED BY THE OWNER OR OWNERS REPRESENTATIVE AS TO QUALITY BEFORE THE CONTRACTOR MAY PROCEED WITH THE STRIPING. THE CONTRACTOR IS TO INSURE THAT ALL SUBSEQUENT STRIPING MEETS THE QUALITY OF THE APPROVED SAMPLE APPLICATION.
- 12. ON THOSE SECTIONS OF PAVEMENTS WHERE NO PREVIOUSLY APPLIED FIGURES, MARKINGS, OR STRIPES ARE AVAILABLE TO SERVE AS A GUIDE, SUITABLE LAYOUTS AND LINES OF PROPOSED STRIPES SHALL BE SPOTTED IN ADVANCE OF THE PAINT APPLICATION. CONTROL POINTS SHALL BE SPACED AT SUCH INTERVALS AS WILL ENSURE ACCURATE LOCATION OF ALL MARKINGS.
- 13. THE CONTRACTOR SHALL PROVIDE AN EXPERIENCED TECHNICIAN TO SUPERVISE THE LOCATION ALIGNMENT, LAYOUT, DIMENSIONS AND APPLICATION OF THE PAINT.
- 14. MARKINGS SHALL BE APPLIED AT THE LOCATIONS AND TO THE DIMENSIONS AND SPACING INDICATED ON THE PLANS OR AS SPECIFIED. PAINT SHALL NOT BE APPLIED UNTIL THE INDICATED ALIGNMENT IS LAID OUT AND THE CONDITIONS OF THE EXISTING SURFACE HAVE BEEN APPROVED BY THE OWNER OR OWNERS REPRESENTATIVE.
- 15. THE PAINT SHALL BE MIXED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS BEFORE APPLICATION. THE PAINT SHALL BE THOROUGHLY MIXED AND APPLIED TO THE SURFACE OF THE PAVEMENT WITH THE MARKING MACHINE AT ITS ORIGINAL CONSISTENCY WITHOUT THE ADDITION OF THINNER. IF THE PAINT IS APPLIED BY BRUSH, THE SURFACE SHALL RECEIVE TWO (2) COATS; THE FIRST COAT SHALL BE THOROUGHLY DRY BEFORE THE SECOND COAT IS APPLIED.
- 16. A MINIMUM OF ONE (1) WEEK SHALL ELAPSE BETWEEN APPLICATION OF THE BITUMINOUS SEAL COAT, SLURRY SEAL OR THE PLACEMENT OF THE BITUMINOUS SURFACE COURSE AND THE MARKING OF THE PAVEMENT. THE PAINT SHALL NOT BLEED EXCESSIVELY, CURL, OR DISCOLOR WHEN APPLIED TO BITUMINOUS OR CONCRETE SURFACES.
- 17. IN THE APPLICATION OF STRAIGHT STRIPES, ANY DEVIATION IN THE EDGES EXCEEDING 1/2-INCH IN 50-FEET SHALL BE OBLITERATED AND THE MARKING CORRECTED. THE WIDTH OF THE MARKINGS SHALL BE AS DESIGNATED WITHIN A TOLERANCE OF 5 PERCENT (5%). ALL PAINTING SHALL BE PERFORMED TO THE SATISFACTION OF THE OWNER OR OWNERS REPRESENTATIVE BY COMPETENT AND EXPERIENCED EQUIPMENT OPERATORS, LABORERS, AND ARTISANS IN A NEAT AND WORKMANLIKE MANNER.
- 18. PAINT SHALL BE APPLIED UNIFORMLY BY SUITABLE EQUIPMENT AT A RATE OF 0.0094 GAL./S.F. FOR STENCILS AND 0.00313 GAL./FT. FOR STRIPING. PAINT APPLICATION SHALL PRODUCE AN AVERAGE WET FILM THICKNESS OF 0.015-INCHES.
- 19. AFTER APPLICATIONS OF THE PAINT, ALL MARKINGS SHALL BE PROTECTED WHILE THE PAINT IS DRYING. THE FRESH PAINT SHALL BE PROTECTED FROM INJURY OR DAMAGE OF ANY KIND. THE CONTRACTOR SHALL BE DIRECTLY RESPONSIBLE AND SHALL ERECT OR PLACE SUITABLE WARNING SIGNS, FLAGS, OR BARRICADES, PROTECTIVE SCREENS OR COVERINGS AS REQUIRED. ALL SURFACES SHALL BE PROTECTED FROM DISFIGURATION BY SPATTER, SPLASHES, SPILLAGE, DRIPPINGS OF PAINT OR OTHER MATERIAL.





- LAWN SEED LIMITS, TYP.

m

\ AC — LAWN SEED LIMITS, TYP.

GRADING LIMITS, TYP.

\ GB /

Landscape Requirements:

ARTICLE 12 - SITE DEVELOPMENT REGULATIONS:

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. 12.02.01 Required Greenbelt along Street Frontage:

Sterling Drive dead-ends at the property. A new cul-de-sac is proposed. As such, there is no s Required: 1 canopy tree (50% may be substituted with evergreen trees) per 40 linear feet of fronta Provided:

\PM /

The frontage along the cul-de-sac is 135 l.f. 135 divided by 40 = 3.3. Being a cul-de-sac drives and very little green space abutting the cul-de-sac. Proposed utilities also hampers the 2 evergreen trees, 2 upright canopy trees and 6 shrubs have been proposed.

2. 12.02.03 Required Buffer Zones:

BN /

6 PG

The property is zoned industrial and abuts US I-96 to the south, requiring "Buffer B". The property is 1455.81 I.f. However, a dense section of existing trees shall remain, reducing the frontage to be photos and measurements on sheet L2).

Required: 1 canopy tree, 1 evergreen tree and 4 shrubs per 30 l.f. as well as a 3' berm. Provided: 1192.21 divided by 30 = 39.7. $39.7 \times 4 = 158.8$. 40 canopy trees, 40 evergreen trees and

Due to the existing trees to be saved, existing wetlands or existing grades that are 5 feet or more berm would provide no benefit and none is provided.

3. 12.02.04 Required Parking Area Landscaping: Required:

1 Canopy tree and 100 s.f. of landscape area per 10 spaces. Provided:

There are 77 proposed parking spaces. 77 divide by 100 = 7.7. 7.7 x 100 s.f. = 770 8 trees and 1959 s.f. of landscape area has been provided.

4. 12.02.05 Detention/Retention Pond Landscaping:

Required: 1 deciduous shade or evergreen tree and 10 shrubs shall be planted for every 50 l.f. of pond Provided:

- The sedimentation basin perimeter is 267 l.f. 267 divided by 50 = 5.34. $5.34 \times 10 = 53.4$. 6 trees and 54 shrubs have been provided. The detention basin perimeter is 571.5 l.f. 571.5 divided by 50 = 11.43. $11.43 \times 10 = 114.3$.
- 12 trees and 115 shrubs have been provided.
- 5. **12.02.08 Minimum Sizes:**
- The proposed landscape meets minimum size requirements.

6. 12.02.09 Mixing of Species:

The overall landscape plan shall not contain more than 33% of any one plant species. Refer to the confirmation that no one plant species exceeds 33% of proposed materials, and one native tree is

General Landscape Notes:

1. Base information provided by Spartan Engineering Solutions LLC.

\ OR

48 V0/

\cs/

9 BN

2. The contractor(s) shall verify the location of all underground utilities prior to construction.

3. All existing vegetation shown is to be saved and protected during the demolition and construction process.

4. All landscape areas to be grass common to region except where other plant material is called

5.. All trees and shrubs are to be planted in mulch beds with spade edge separating mulch from turf grass areas.

6. Any landscape areas disturbed by construction shall be scarified to a depth of 2", graded smooth to allow for positive drainage. For any landscape area so designated to remain whether on or off site, remove weeds, rocks construction items, etc., scarify area, re-seed and fertilize. All R.O.W. curb and gutters are to be cleaned of debris.

7. Lawn areas as shown on plan shall be seeded and mulched (or hydroseeded) as follows: 50% Creeping Red Fescue, 30% Kentucky Bluegrass and 20% Perennial Rye Grass.

8. The detention/sedimentation pond shall be seeded as shown on plan with "Stormwater Seed Mix" by Cardno Native Plant Nursery (128 Sunset Dr., Walkerton, IN 46574, 574-586-2412, nurserysales@cardno.com) at 32.6 PLS pounds/acre or approved equal.

9. Mulch slopes exceeding 1:5 with a straw mulch blanket staked in place or hydroseeded.

10. Contractor to repair all areas of erosion to satisfaction of Owner/Township to establish proper turf within one year.

11. Finish grade in landscape islands shall be installed so that they are 1" lower than the top of the surrounding curbs.

12. Install pipe sleeves where irrigation lines cross or are under pavement. All sleeves to be twice the diameter of the pipe(s) is houses.

13. Plants shall conform to the sizes as shown on the drawings and shall be of sound health. All measurements such as spread, ball size, height, caliper and quality designations shall be in conformance to the latest edition of the American Standards for Nursery Stock. All plant material shall be hardy to the Grand Traverse area, be free of disease and insects, and conform to the American Standard for Nursery Stock of the American Nurserymen.

14. All evergreen tree species are to be full, dense plants branched fully to the ground.

15. Prune all dead and broken branches from all plants immediately after installation.

16. Planting soil mixture shall be prepared on—site by mixing 3 parts topsoil to 1 part existing site soils to 1 part peat, adding phosphate free all purpose fertilizer (at manufacturers recommended rates) to each cubic yard of the mixture.

17. Organic mulch requirements: shade trees, ornamental trees and evergreen trees — 6" of shredded bark; shrubs and shrub beds -4" of shredded bark; perennial flowers -2" of shredded bark.

18. All Landscaping shall be maintained in a healthy, neat and orderly state following installation. Any and all plant material that dies or becomes diseased, shall be replaced within six months.

street frontage. age.	EXIS TO R EXIS
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y frontage along US I-96 landscaped to 1192.21 I.f (see	CAN
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nd 159 have been provided. e lower than the highway, a	EVER
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perimeter.	LAW
5.	DETE
	LAWI TREE
e Plant List on sheet L2 for a part of the design.	

Legend:
EXISTING TREE - C
EXISTING EVERGREEN TREE TO REMAIN
EXISTING CONTOURS
CANOPY TREE $-$ (\circ)
ORNAMENTAL TREE - (+)
EVERGREEN TREE
PLANTKEY
SPECIES AS
SPADE BED EDGE
LAWN SEED
DETENTION SEED
LAWN SEED LIMITS
TREE PROTECTION
OVERALL SITE PLAN
0 25' 50' 100' SCALE: 1" = 50'





Aerial Photo of Exist Trees along I-96

From Google Earth with measurement

PLANT LIST

					Si	ze			
Qty.	Key	Botanical Name	Common Name	Caliper	Height	Spread	Other	Root	% of TOTA
Trees	5				1				
17	AC	Abies concolor	Concolor Fir		6'			B&B	3.1%
15	AR	Acer rubrum	Red Maple	2 1/2"				B&B	2.3%
14	BN	Betula nigra	River Birch	2 1/2"				B&B	3.1%
6	GB	Ginkgo biloba 'Sentry'	Sentry Ginkgo	2 1/2"				B&B	3.1%
4	GT	Gleditsia triaconthos 'Skyline'	Skyline Honeylocust	2 1/2"				B&B	3.1%
2	МА	Malus 'Adirondack'	Adirondack Crabapple	2"				B&B	2.3%
13	PD	Picea glauca var. densata	Black Hills Spruce		6'			B&B	3.1%
17	PG	Picea glauca	White Spruce		6'			B&B	3.1%
16	PG	Picea mariana	Black Spruce		6'			B&B	1.5%
20	QR	Quercus rubra	Red Oak	2 1/2"				B&B	3.9%
Shrul	bs			<u> </u>				1	
12	BG	Buxus 'Green Gem'	Green Gem Boxwood		24"			Cont.	9.3%
56	СА	Clethra alnifolia	Summersweet		24"			Cont.	17.8%
52	CS	Cornus sericea	Redtwig Dogwood		24"			Cont.	15.5%
14	EA	Euonymus alatus 'Compactus'	Compact Burningbush		24"			Cont.	9.3%
52	JG	Juniperus 'Grey Owl'	Grey Owl Juniper			24"		Cont.	17.8%
59	JS	Juniperus 'Sea Green'	Sea Green Juniper			24"		Cont.	15.5%
3	SG	Spirea x bumalda 'Goldflame'	Goldflame Spirea		24"			Cont.	4.6%
12	TG	Thuja 'Golden Globe'	Golden Globe Arborvitae		24"			Cont.	2.3%
10	VC	Viburnum carlesii 'Compactum'	Comp. Koreanspice Viburnum		24"			Cont.	9.3%
48	VO	Viburnum opulus	European Cranberrybush		24"			Cont.	6.9%
61	VT	Viburnum t. 'Compactum'	Comp. American Cranberrybush		24"			Cont.	17.8%

B&B = Balled & Burlapped

Cont. = Container



Photo of Exist Trees along I-96 From Google Earth with measurement



INSTALL TREE AND STAKES PLUMB PRUNE ALL DAMAGED OR BROKEN BRANCHES RUBBER HOSE WIRE GUY SCREW EYE: #414 SCREW EYE: #414

UNDER 3" IN CALIPER





Evergreen Tree

6' IN HEIGHT AND ABOVE

Shrub Planting Detail



SCALE: NO SCALE











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Symbol	Avg Max	Min Max	x/Min	Avg/Min	Avg/Max	Symbol	Label	QTY	Manufact	Catalog Number	Description	Numb er Filename	Lumens	LLF	Wattage	Lamp							GRA	
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GENOA CHARTER TOWNSHIP Application for Site Plan Review

APR - 3 2019 RECEIVED

TO THE GENOA TOWNSHIP PLANNING COMMISSION AND TOWNSHIP BOARD:

APPLICANT NAME & ADDRESS: Enterprise Leasing Company of Detroit LLC. 29301 Grand River Ave, Farmington Hills, MI 48336 If applicant is not the owner, a letter of Authorization from Property Owner is needed.

OWNER'S NAME & ADDRESS: Scott Matthew Underwood. 2588 E Jones Rd Howell MI 48855

SITE ADDRESS: PARCEL #(s):
APPLICANT PHONE: (517) 202-8238 OWNER PHONE: (810) 923-4500
OWNER EMAIL: scott.j.inman@ehi.com
LOCATION AND BRIEF DESCRIPTION OF SITE: 7184 Grand River Ave, Brighton MI 48114. We currently operate
an Enterprise Rent A Car on-site. The site contains a single story building with an attached garage for vehicle preparation.
There is a paved parking area located off of Grand River. There is a graveled lot in the rear where the dumpster pad is located inside
an enclosure. I have attached a site plan for more details.
BRIEF STATEMENT OF PROPOSED USE: There is no use change. We would like to expand an existing garage by
roughly 376 sq ft. This would allow us to vacuum and wipe down two vehicles at the same time. This would create efficiencies in our
operation and allow us to more quickly service the communities car rental needs. We would continue to operate Enterprise Rent
A Car on site. Secondly, and not contingent on the wash bay addition, we would like to asphalt the existing gravel surface.

THE FOLLOWING BUILDINGS ARE PROPOSED: We are proposing to add roughly an additional 376 sq ft to to the existing garage. I have attached a building diagram for reference.

I HEREBY CERTIFY THAT ALL INFORMATION AND DATA ATTACHED TO AND MADE PART OF THIS APPLICATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

cott . BY: man 5913 Executive Dr. 300 Lansing MI 48911 ADDRESS:

Contact Information - F	Review Letters an	d Correspondence shal	Ill be forwarded to the following:	
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1.) Scott Inman Name

of Enterprise Holdings, Inc. Business Affiliation at scott.j.inman@ehi.com E-mail Address

FEE EXCEEDANCE AGREEMENT

As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy.

SIGNATURE S		DATE 4-	- 22 -	19	
PRINENAME Scott -	Inman	PHONE (5	17) 20	02-82	238
ADDRESS 5913	Executive D.	- Suite	300	Lucix	MI YES

Planning Commission Genoa Township 2911 Dorr Road Brighton, Michigan 48116

Attention:	Kelly Van Marter, AICP
	Planning Director and Assistant Township Manager
Subject:	Enterprise Rental Car – Site Plan Review #2
Location:	7184 Grand River Avenue – south side of Grand River, east of Hubert Road
Zoning:	GCD General Commercial District

Dear Commissioners:

At the Township's request, we have reviewed the revised site plan submittal for a building expansion at the Enterprise Rental Car site (plans most recently dated 5/21/19).

A. Summary

- 1. The inconsistency with respect to the size of the proposed building addition must be corrected.
- 2. The applicant must provide lot coverage calculations (both building and impervious).
- 3. The Commission may allow building materials that do not comply with Section 12.01 (too much vinyl siding) since they will match the existing building.
- 4. We request the applicant present building material and color samples to the Commission for their consideration.
- 5. The width of the proposed drive aisle (20') is deficient (24' miniumum required).
- 6. The parking calculations on Sheet C2.0 need to be corrected.
- 7. We request the applicant submit photographs of existing light fixtures to ensure they comply with current standards.
- 8. The plan depicts an existing light pole at the rear of the site that will remain, although this area will be converted to lawn and a detention pond. We suggest this pole be removed.
- 9. The landscape plan is deficient in plantings and there are inconsistencies that need to be corrected.
- 10. Details of the waste receptacle enclosure and concrete base pad must be provided.
- 11. We encourage the applicant to replace the nonconforming pole sign with a compliant monument sign.

B. Proposal/Process

The applicant proposes a 358 square foot addition to the existing building on site. The site plan review application notes that the expansion is for a garage space used to clean vehicles – the current operation can only accommodate 1 vehicle at a time and the expansion would allow for a second.

There is a minor inconsistency in the submittal with respect to the size of the proposed addition. More specifically, Sheet A2.0 notes a 358 square foot addition, while Sheet C2.0 describes it as 308 square feet. This discrepancy must be corrected.

The project also includes paving of the rear gravel parking/vehicle storage lot, a new waste receptacle and a detention pond at the rear of the site.

Automobile rental facilities are listed as special land uses in the GCD. In accordance with Section 19.16, existing special land uses may be expanded by up to 25% without the need for special land use review.

As such, the project requires only site plan review/approval by the Planning Commission.

Genoa Township Planning Commission Enterprise Rental Car Site Plan Review #2 Page 2

Aerial view of site and surroundings (looking south)

C. Site Plan Review

1. **Dimensional Requirements.** As shown in the table below, the existing site and proposed improvements have been reviewed for compliance with the dimensional requirements of the GCD:

	Min. L	ot Req.	Μ	linimum Ya	Max. Lot	Max.		
	Area	Width	Front	Side	Rear	Parking Lot	Coverage (%)	Height
	(acres)	(feet)	Yard	Yard	Yard			(feet)
GCD	1	150	70	15	50	20 front	35% building	35
						10 side/rear	75% impervious	
Proposed	1.24	100	167	9 (W)	268	63 front	Information not	13.5
_				55 (E)		10 sides	provided	
						111 rear	_	

2. Building Materials and Design. The building elevation drawings note the use of vinyl siding matching the existing building.

While the amount of vinyl siding depicted does not comply with standards of Section 12.01, the Ordinance allows the Commission to modify these requirements for expansion of existing buildings where the proposed design and materials match (Section 12.01.08b).

We request the applicant present building material and color samples to the Commission for their consideration.

- **3. Pedestrian Circulation.** The existing sidewalk along Grand River Avenue is depicted on the site plan. No other sidewalks or pedestrian paths are noted.
- 4. Vehicular Circulation. The site is currently accessed by a drive to/from Grand River Avenue and no changes are proposed to this drive. However, the drive aisle for the proposed parking/storage area at the rear of the site is deficient in width for two-way travel (20' proposed vs. 24' required).

5. Parking. The Ordinance does not include a parking standard specifically automobile rental. The closest fit is that of automobile sales, which requires 1 space for each 200 square feet of gross leasable area, plus 3 spaces for each service bay.

The revised plans include parking calculations noting the need for 8 spaces and indicating that 16 are provided. However, the plan depicts a total of 22 spaces in the front lot, while the 34 spaces proposed at the rear of the site are intended for vehicle storage. The calculations should be corrected.

While the amount of parking provided is excessive based on Section 14.02; however, this is an existing condition that is not changing.

6. Exterior Lighting. The revised submittal notes that no new lighting is proposed, and that existing lighting complies with current standards. We request the applicant provide photographs of existing lighting to ensure this is the case.

Additionally, there is a double-fixture light pole at the rear of the site that will remain, though it will now be within a lawn area at the upper level of the detention pond. We suggest this light pole be removed.

7. Landscaping. The landscape plan (Sheet C4.0) has been reviewed for compliance with the standards of Section 12.02, as noted in the following table:

Standard	Required	Proposed	Comments
Greenbelt	20' width	55' width	Deficient by 1 canopy tree
	3 canopy trees	2 existing trees	
Parking lot	6 canopy trees	2 trees	Deficient by 4 canopy trees
	560 SF landscaped area	640 SF landscaped area	
Buffer zone "B"	20' width	20+' width	Type of trees not indicated.
(south)	3 canopy trees	4 trees	Deficient in tree and shrub
	3 evergreen trees	5 shrubs	plantings, as well as a wall
	12 shrubs		or berm.
	6' wall or 3' berm		
Detention pond	5 trees	1 tree	Deficient by 4 trees and 40
	50 shrubs	10 shrubs	shrubs

Three of the plantings noted in the table (A, B and C) are not depicted on the plan and the trees proposed at the rear of the site are not identified (as noted in the table above).

- 8. Waste Receptacle and Enclosure. The plan proposes a new waste receptacle in the rear yard. The location complies with Section 12.04; however, no details are provided for the required enclosure or concrete base pad.
- **9.** Signs. The revised submittal notes that new signage is not proposed. We encourage the applicant to remove the nonconforming pole sign and replace it with a compliant monument sign to bring the site closer to compliance with current Ordinance standards.

Should you have any questions concerning this matter, please do not hesitate to contact our office. I can be reached by phone at (248) 586-0505, or via e-mail at <u>bborden@safebuilt.com</u>.

Respectfully, **SAFEBUILT STUDIO**

Brian V. Borden, AICP

Planning Manager

June 4, 2019

Ms. Kelly Van Marter Genoa Township 2911 Dorr Road Brighton, MI 48116

Re: Enterprise Addition Site Plan Review No. 2

Dear Ms. Van Marter:

Tetra Tech has conducted a second site plan review of the Enterprise Rental Car Garage Expansion plans submitted May 22, 2019. The plans were submitted by ABE Associates, Inc. on behalf of Enterprise Leasing Company of Detroit LLC. The property includes 1.25 acres located at 7184 West Grand River Avenue with an existing 1425-square-foot building. The petitioner is proposing a 396-square-foot garage addition and parking lot improvements. We offer the following comments:

TRAFFIC/ROADWAYS

- 1. A cross section of the proposed parking lot should be provided.
- 2. The proposed dumpster enclosure detail meets the Genoa Township Zoning Ordinance, but the dumpster enclosure should be shown on the site plan as it is unclear where the dumpster will sit. The petitioner should ensure that the dumpster and enclosure do not obstruct the two proposed parking spots adjacent to the proposed dumpster and if they do obstruct those parking spaces the dumpster should be moved back or the two parking places should be removed from the plan.

DRAINAGE AND GRADING

- 1. Approval from the Livingston County Road Commission for discharging into their system should be obtained prior to site plan approval.
- 2. The proposed swale must have a minimum slope of 1% for proper drainage.
- 3. As it is currently shown, the proposed drainage facility will not drain. The basin outlet (R.O. 1) is shown at a lower elevation than the downstream pipe outlet (P.D. 1) and the site would be partially flooded before any outflow from P.D. 1 unless the petitioner is planning to pump storm water from the storage facility. The petitioner should revise the stormwater system to ensure proper drainage and provide more detail.
- 4. The description of R.O.1 has incorrect elevations of 685.5 and 683.5 and these should be revised.
- 5. Riprap is required at outlet structures for proper energy dissipation and this should be shown on the site plan.

Ms. Kelly Van Marter Re: Enterprise Addition SPR 2 June 4, 2019 Page 2

6. The petitioner should provide more detail on the inlet to the storage facility. There seems to be some type of forebay and if so, more detail should be provided and the volume of the forebay shall be 5% of the 100-year storm volume. Genoa Township requires a sedimentation forebay be provided at the inlet of all detention basins. There appears to be two inlets to the storage facility and both inlets should be connected to the sedimentation forebay, or two sedimentation forebays shall be provided.

We recommend the petitioner address the above comments, provide more information on the site plan, and resubmit the site plan for additional review.

Please call or email if you have any questions.

Sincerely,

Gary J. Markstrom, P.E. Vice President

Shelby Scherdt

Shelby Scherdt Project Engineer

BRIGHTON AREA FIRE AUTHORITY

615 W. Grand River Ave. Brighton, MI 48116 o: 810-229-6640 f: 810-229-1619

June 3, 2019

Kelly VanMarter Genoa Township 2911 Dorr Road Brighton, MI 48116

RE: Enterprise Rental Car 7184 Grand River Genoa Twp., MI

Dear Kelly:

The Brighton Area Fire Department has reviewed the above-mentioned site plan. The plans were received for review on May 23, 2019, and previously on April 10, 2019. The drawings are dated November 15, 2018. The project is based on an existing Type II-B, 1,898 square foot Business-use with outside vehicle storage. The plan review is based on the requirements of the International Fire Code (IFC) 2018 edition.

The size of the alteration and scope of work does not warrant a full fire code application to the project as it does not increase the hazard. The site will remain as an existing non-conforming site in regards to fire code for access and water supply.

Additional comments will be given during the building plan review process (specific to the building plans and occupancy). The applicant is reminded that the fire authority must review the fire protection systems submittals (sprinkler & alarm) prior to permit issuance by the Building Department and that the authority will also review the building plans for life safety requirements in conjunction with the Building Department. If you have any questions about the comments on this plan review please contact me at 810-229-6640.

Cordially,

Rick Boisvert, CFPS Fire Marshal

cc: Amy Ruthig - Genoa Twp.

June 17, 2019

Ms. Kelly Van Marter Genoa Township 2911 Dorr Road Brighton, MI 48116

Re: Enterprise Addition Site Plan Review Response No. 2

Dear Ms. Van Marter:

ABE Associates, Inc. has completed the review of the comments submitted by Tetra Tech. Enclosed are our responses to the review comments dated 6/4/19.

TRAFFIC/ROADWAYS

1. A cross section of the proposed parking lot should be provided.

Response: Not a requirement of Genoa Township nor Livingston County. Elevations provided and swale detail provides sufficient detail to illustrate design intent.

2. The proposed dumpster enclosure detail meets the Genoa Township Zoning Ordinance, but the dumpster enclosure should be shown on the site plan as it is unclear where the dumpster will sit. The petitioner should ensure that the dumpster and enclosure do not obstruct the two proposed parking spots adjacent to the proposed dumpster and if they do obstruct those parking spaces the dumpster should be moved back or the two parking places should be removed from the plan.

Response: Dumpster is located 2' west of east parking lot edge and 2' north of south parking lot edge as shown on drawings. These dimensions have been added to the drawing Sheet C3.0 and the detail is also shown on this drawing.

DRAINAGE AND GRADING

1. Approval from the Livingston County Road Commission for discharging into their system should be obtained prior to site plan approval.

Response: We will comply with the Conditions for Livingston County Road Commission approval. The design was based on Livingston County Road Commission direction.

2. The proposed swale must have a minimum slope of 1% for proper drainage.

Response: Per Livingston County Rule, Section 7 – Stormwater Conveyance, page 34 the minimum channel velocity is 1.5 FPS. We are providing a channel velocity of 1.85 FPR with the 0.5% channel slope. Our design meets this requirement. Please clarify where the minimum slope of 1% is required.

440 Burroughs Street · Ste. 605 · Detroit, Michigan 48202 Phone: 313 961 5170 · Fax: 313 961 5172 Page 2

3. As it is currently shown, the proposed drainage facility will not drain. The basin outlet (R.O. 1) is shown at a lower elevation than the downstream pipe outlet (P.D. 1) and the site would be partially flooded before any outflow from P.D. 1 unless the petitioner is planning to pump storm water from the storage facility. The petitioner should revise the stormwater system to ensure proper drainage and provide more detail.

Response: The outflow from the basin is restricted to 0.13 CFS for a 100 year storm. The basin is designed to store a 100 year storm event. The outlet will consist of infiltration in the basin area as well as infiltration in the perforated discharge pipe. In the event that we will experience a 100 year storm the basin will head up in the discharge pipe and flow will discharge through P.D. 1 once the elevation of the basin is higher than P.D. 1. At this point the basin is functioning similar to an agricultural flow rate for the existing conditions. No pumping is necessary this system will dewater by infiltration and surcharge.

4. The description of R.O.1 has incorrect elevations of 685.5 and 683.5 and these should be revised.

Response: The typos for R.O.1 have been corrected 685.5 & 683.5 now 985.5 & 983.5.

5. Riprap is required at outlet structures for proper energy dissipation and this should be shown on the site plan.

Response: Please clarify where you are advising riprap be placed.

6. The petitioner should provide more detail on the inlet to the storage facility. There seems to be some type of forebay and if so, more detail should be provided and the volume of the forebay shall be 5% of the 100-year storm volume. Genoa Township requires a sedimentation forebay be provided at the inlet of all detention basins. There appears to be two inlets to the storage facility and both inlets should be connected to the sedimentation forebay, or two sedimentation forebay shall be provided.

Response: Yes there is one forebay provided with the total 5% forebay volume for both inlets was provided at the east inlet (200 CF). We will add a forebay on the west inlet 86 CF and the east forebay will be revised to capture 114 CF.

Please call or email if you have any questions.

Sincerely,

André Broka

Andre Brooks, P.E. President

June 18, 2019

Planning Commission Genoa Township 2911 Dorr Road Brighton, Michigan 48116

Attention:	Kelly Van Marter, AICP
	Planning Director and Assistant Township Manager
Subject:	Enterprise Rental Car – Site Plan Review #2
Location:	7184 Grand River Avenue – south side of Grand River, east of Hubert Road
Zoning:	GCD General Commercial District

Dear Commissioners:

We have reviewed the comments from your Planner Dated 6/4/19 and our responses are listed below.

1. Size of the Proposed Addition – The size of the additions on Sheet A2.0 and C2.0 does not match.

Response: The size of the additions on Sheet C2.0 has been revised to 358 SF to match A2.0.

2. Dimensional Requirements. Maximum Lot Coverage not provided:

Response: See proposed Maximum Lot Coverage below:

	Min. Lot Req.		Minimum Yard Setbacks (feet)				Max. Lot	Max.
	Area	Width	Front	Side	Rear	Parking Lot	Coverage (%)	Height
	(acres)	(feet)	Yard	Yard	Yard			(feet)
GCD	1	150	70	15	50	20 front	35% building	35
						10 side/rear	75% impervious	
Proposed	1.24	100	167	9 (W)	268	63 front	4% Building	13.5
_				55 (E)		10 sides	54% Impervious	
						111 rear	_	

3. Building Materials and Design. The amount of vinyl siding does not comply with standards of Section 12.01, the Ordinance allows the Commission to modify these requirements for expansion of existing buildings where the proposed design material match (Section 12.01.08b)

We request building material and color samples be presented to the Commission for their consideration.

Response: The building material and color samples will be presented to the Commission for their consideration.

4. Pedestrian Circulation. The existing sidewalk along Grand River Avenue is depicted on the site plan. No other sidewalks or pedestrian paths are noted.

Response: No action required.

5. Vehicular Circulation. The site is currently accessed by a drive to/from Grand River Avenue and no

changes are proposed to this drive. However, the drive aisle for the proposed parking/storage area at the rear of the site is deficient in width for two-way travel (20' proposed vs. 24' required).

Response: See sheet C3.0, proposed drive aisle is 24' wide.

6. Parking. The Ordinance does not include a parking standard specifically automobile rental. The closest fit is that of automobile sales, which requires 1 space for each 200 square feet of gross leasable area, plus 3 spaces for each service bay.

The revised plans include parking calculations noting the need for 8 spaces and indicating that 16 are provided. However, the plan depicts a total of 22 spaces in the front lot, while the 34 spaces proposed at the rear of the site are intended for vehicle storage. The calculations should be corrected.

While the amount of parking provided is excessive based on Section 14.02; however, this is an existing condition that is not changing.

Response: Parking Calculations revised see below.

- 11 Spaces Required (1 Barrier Free)
- 16 Spaces Provided in Front and side of building
- 32 Spaces provided for Enterprise Fleet Vehicles
- **48 Total Spaces Provided**
- 7. Exterior Lighting. The revised submittal notes that no new lighting is proposed, and that existing lighting complies with current standards. We request the applicant provide photographs of existing lighting to ensure this is the case.

Additionally, there is a double-fixture light pole at the rear of the site that will remain, though it will now be within a lawn area at the upper level of the detention pond. We suggest this light pole be removed.

Response: Existing lights are shown on Sheet C1.0 and E1.0. A description of the lights are provided on Sheet E1.0. The lights on the north and west sides of the building are 250 Watt Metal Halide with directional shield lenses to prevent spread of light offsite. Photographs of the lights will be brought to the meeting.

8. Landscaping. The landscape plan (Sheet C4.0) has been reviewed for compliance with the standards of Section 12.02, as noted in the following table:

Standard	Required	Proposed	Comments
Greenbelt	20' width	55' width	Deficient by 1 canopy tree
	3 canopy trees	2 existing trees	
Parking lot	6 canopy trees	2 trees	Deficient by 4 canopy trees
	560 SF landscaped area	640 SF landscaped area	
Buffer zone "B"	20' width	20+' width	Type of trees not indicated.
(south)	3 canopy trees	4 trees	Deficient in tree and shrub
	3 evergreen trees	5 shrubs	plantings, as well as a wall
	12 shrubs		or berm.
	6' wall or 3' berm		
Detention pond	5 trees	1 tree	Deficient by 4 trees and 40
	50 shrubs	10 shrubs	shrubs

Three of the plantings noted in the table (A, B and C) are not depicted on the plan and the trees proposed at the rear of the site are not identified (as noted in the table above).

Response: In the comments dated April 18, 2019 from your planners in item 7- Landscaping it

Genoa Township Planning Commission Enterprise Rental Car Site Plan Review Response #2 Page 3

stated that if there are existing shrubs they would be counted toward the total shrub requirement. It appears that the comments for Item 7 – Landscaping in the June 4, 2019 comments from your planners did not take into account the 74 existing scrubs on the property. Please review this item and revise accordingly.

See other responses below.

Standard	Required	Proposed	Comments	
Greenbelt	20' width	55' width	1 canopy tree will be	
	3 canopy trees	2 existing trees	provided	
		1 proposed tree		
Parking lot	6 canopy trees	6 trees	4 additional canopy trees will	
	560 SF landscaped area	640 SF landscaped area	be provided	
Buffer zone "B"	20' width	20+' width	2 additional trees will be	
(south)	3 canopy trees	6 trees (3 Canopy, 3	provided. 8 shrubs will be	
	3 evergreen trees	Evergreen)	added(adjust per comment	
	12 shrubs	12 shrubs	above). We are requesting	
	6' wall or 3' berm		a variance for the wall.	
Detention pond	5 trees	5 trees	4 additional trees will be	
	50 shrubs	50 shrubs	provided and 40 shrubs	
			(adjust per the comment	
			above)(54 new shrubs	
			were provided on the	

9. Waste Receptacle and Enclosure. The plan proposes a new waste receptacle in the rear yard. The location complies with Section 12.04; however, no details are provided for the required enclosure or concrete base pad.

Response: See Sheet C3.0 for detail of enclosure and concrete pad.

10. Signs. The revised submittal notes that new signage is not proposed. We encourage the applicant to remove the nonconforming pole sign and replace it with a compliant monument sign to bring the site closer to compliance with current Ordinance standards.

Response: Existing sign is not being replaced. Existing sign was compliant when it was installed and it is not being changed.

Should you have any questions concerning this matter, please do not hesitate to contact our office. I can be reached by phone at (313) 475-2549, or via e-mail at <u>andreb@abe-engineers.com</u>

Respectfully, **ABE Associates, Inc.**

André Brokes-

Andre Brooks, PE President

Environmental Impact Statement

to support

Application for Site Plan Review

Project: An approximately 396 sq foot addition to the existing wash bay. Secondary request to asphalt existing gravel lot.

submitted to

Genoa Township Planning Commission

by

Enterprise Rent A Car

7184 West Grand River Avenue

Brighton, MI 48114

Prepared by: Scott Inman

Facilities Specialist for Enterprise Holdings Inc.

on

March 26th, 2019

A. Name and address of Person responsible for preparation of the impact assessmet and a brief statement:

Scott Inman, Group Facilities Specialist for Enterprise Leasing Company of Detroit, LLC with Group Headquartered at 29301 Grand River Avenue, Farmington Hills, Michigan 48336.

This assessment statement is very similar to the one submitted in 2004. The project up for review is an approximately 396 sq ft addition to the project granted in 2004. The environmental impact has not/or is expected to change with this small addition.

B. Map and written description/analysis of site:

The project site is located at 7184 West Grand River Avenue in Brighton Michigan 48114. The site covers approximately 1.4 acres with approximately 7000 square feet of that dedicated to asphalt driveway and parking lot. There is an existing building that is approximately 1425 square foot.

C. Impact on natural features:

Landscape and frontage sidewalk was added to the site in 2004 per the Genoa Township Board. We do not expect any change to the natural features since the existing use will remain the same.

D. Impact on storm water management:

Minimal impact to the storm water since the disruption of grade and change in impervious surfaces will be minimal. We would follow township requirements for any asphalt parking lot addition.

E. Impact on surrounding land use:

Dust control measures will be used, as appropriate during construction. No other change in impact since the expansion will be used in the same manner as the current structure.

F. Impact on public facilities and services:

No impact is expected on the public utilities. The addition will tie into the existing oil-water separator which is serviced four times a year. No additional water usage is expected. The same

quantity of vehicles will be prepared. The addition would allow us to do this more efficiently. i.e two at time.

G. Impact on public utilities

No impact as this project expands efficiencies, not the volume of car preparations. The same use that currently exists.

H. Storage and handling of any hazardous material:

No hazardous materials will be used, stored, or disposed of on this site.

I. Impact on traffic and pedestrians:

The hours of operations will remain the same. We are currently open 8am-6pm Monday through Friday and 9am-12pm Saturday-Sunday. No impact is anticipated as the use of the addition will remain the same.

J. Special Provisions:

No provisions exist that would prohibit this wash bay addition. The use remains that same as exist today.

ENTERPRISE RENTAL CAR GARAGE EXPANSION

BUILDING CODES 2015 MICHIGAN REHABILATION CODE FOR EXISTING BUILDINGS

EXISTING SITE PLAN

SCALE: NTS

RECEIV

LEGAL DESCRIPTION

7184 GRAND RIVER, BRIGHTON, MI 48116

SEC 13 T2N R5E BEG AT A POINT DISTANT, N 89*41'40"E 659.19 FT, N 1*01'10"W 594.36 FT & N 89*39'15"W 188.90 FT FROM W 1/4 COR OF SEC 13, TH N 1*01'10"W 564.74 FT, TH N 71*08'30"W ALONG THE C.L. OF GRAND RIVER, 100 FT, TH S 1*01'10"E 589.91 FT, TH S 85*39'15"E 94.45 FT TO POB, SPLIT FR 019, 1.24AC M/L

OWNER: ENTERPRISE RENTAL CAR

PARCEL NO.: 4711-99-000-713

DRAWINGS

CS1.0	COVER SHEET
A1.0	EXISTING FLOOR PLAN
A2.0 A3.0	PROPOSED FLOOR PLAN ELEVATIONS
C1.0	EXISTING SITE PLAN / SURVEY
C2.0	PROPOSED SITE PLAN
C3.0	PROPOSED DIMENSIONING PLAN
C4.0	PLANTING PLAN
E1.0	ELECTRICAL PLAN
M1.0	MECHANICAL PLAN

LOCATION CURRENT BUI

PROPOSED B

ZONING CLAS ADJACENT SIT BUILDING COE ADA COMPLIA USE GROUPS FIRE RATING LEASED SPAC PAVED AREA SITE LIGHTING OCCUPANT LO

CONSTRUCTION FRONT YARD REAR YARD SIDE YARD # OF OCCUPA BUILDING ARE BUILDING HEI

OFF-STREET F

PROJECT CON

VED 5-22-19		A40 BURRETUGHS ST. A40 BURRETUGHS ST. DETRUIT, MI 48202 Phone: (313) 961-5170 COWNER ENTERPRISE RENTAL CAR
LOCATI	ON PLAN	
		PROJECT
PF ILDING USE	ROJECT INFORMATION 7184 Grand River, Brighton, MI, 48116 Rental Car Company	GARAGE EXPANSION 7184 GRAND RIVER BRIGHTON, MI 48116
BUILDING USE	Rental Car Company	
SSIFICATION	GC: General Commercial	OF MICHIG
TE ZONING	GC	Andream property for
DE	2015 Michigan Building Code	ASIGT OF
ANCE	ANSI-117.1 Accessibility Standard	Commune.
;	B: Rental Car Company	
	Not Sprinklered	BT REVISIONS DATE
CE AREA	1,806 sq. ft.	
	10,070 sq. ft. Existing paved Lot	
G	Light fixtures on Building	
OAD	5 1 Required (3 Provided)	Review commentsDate:11/15/18Scale:AS NOTEDDrawn:ARB
ON CLASSIFICATION		Job: 2018111 Sheet
	48.00 ft.	
	6.00 ft.	SHEET TITLE
	446.00 ft.	COVER SHEET
ANTS	5	—
EA	1.9 GSF	—
IGHT	13'-6"	
PARKING	20 Spaces	
VAL	Dumpster, private	
MPLETION	N/A	

BUILDING AREA:

NEW CAR PREP AREA: = 358 SQ. FT. CAR PREP BAY: = 505 SQ. FT. OFFICE AREA: = 943 SQ. FT. TOTAL GROSS BUILDING AREA: = 1,806 SQ. FT.

PERCENTAGE OF NEW BUILDING AREA:

NEW CAR PREP AREA: = 358 SQ. FT. EXISTING CAR PREP BAY: = 505 SQ. FT. OFFICE AREA: = 943 SQ. FT. EXISTING GROSS BUILDING AREA: = 1,448 SQ. FT. PERCENTAGE OF NEW CONSTRUCTION AREA: = 20%

<u>NOTE:</u>

VERIFY ALL NEW CEILING HEIGHTS IN FIELD.

NEW FLOOR:

CONTRACTOR SHALL PROVIDE POSITIVE FLOW FROM THE EDGE OF THE NEW CONCRETE FLOOR TOWARD THE EXISTING DRAIN. CONTRACTOR SHALL PROVIDE DOWELS TO JOIN NEW CONCRETE SLAB WITH THE EXISTING CONCRETE SLAB AT 2' O.C. NEW CONCRETE SLAB SHALL MATCH THE EXISTING SLAB THICKNESS.

CONSTRUCTION NOTES:

CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO COMMENCING ANY WORK OR ORDERING ANY COMPONENTS.

PROVIDE FRP BOARD ON §' DUROCK ON §" WATERBOARD AT ALL NEW WALLS IN CAR PREP BAY FROM FINISH FLOOR UP TO 8'-0" (SEE DETAIL ON SHEET A3.0)

ARCHITECTURAL WORK

CONTRACTOR SHALL INSTALL ALL NEW ARCHITECTURAL WORK THAT IS REQUIRED INCLUDING FOOTING, FLOORS, BASES, CEILINGS, WALLS, ECT. IN ACCORDANCE WITH GENOA TOWNSHIP AND LIVINGSTON COUNTY CODES AND STANDARDS.

MECHANICAL WORK

CONTRACTOR SHALL INSTALL NEW MECHANICAL WORK TO CONFORM TO NEW LAYOUT INCLUDING PIPING, PLUMBING, FIXTURES, DUCT WORK, DEVICES, CONTROLS, ECT. IN ACCORDANCE WITH GENOA TOWNSHIP AND LIVINGSTON COUNTY CODES AND STANDARDS. ABANDON ALL PLUMBING FOR NEW LAYOUT. CONTRACTOR SHALL RECONNECT ALL ITEMS THAT WERE STORED AND BEING REUSED IN THE NEW GARAGE ADDITION.

ELECTRICAL WORK

CONTRACTOR SHALL INSTALL ALL ELECTRICAL WORK TO CONFORM TO NEW LAYOUT INCLUDING CONDUIT, FIXTURES, LIGHTING, WIRING, POWER SWITCHES, DEVICES, ECT. FROM CEILINGS AND WALLS FOR NEW ELECTRICAL WORK. CONTRACTOR TO REWORK NEW DISTRIBUTION TO EXISTING DISTRIBUTION CIRCUITS FROM MAIN DISTRIBUTION PANEL IN AREAS OF RENOVATION TO BE REWORKED AND REDEVELOPED FOR NEW ELECTRICAL DEMANDS.

CONTRACTOR TO REPAIR ALL DISTURBED FINISHES DUE TO NEW CONSTRUCTION WORK TO CONFORM TO NEW LAYOUT.

CONTRACTOR TO INSTALL ELECTRIC METER AT LOCATION SHOWN ON THE PLANS.

CONTRACTOR SHALL PROVIDE TEMPORARY POWER AS NEEDED FOR THE REMOVAL OF THE EXISTING ELECTRIC METER AND COMPONENTS.

CONTRACTOR SHALL INSTALL PHONE BOX AND LINES AT THE LOCATION SHOWN ON THE PLANS.

CONTRACTOR SHALL PROVIDE TEMPORARY PHONE SERVICE AS NEEDED DURING THE REMOVAL OF THE EXISTING PHONE LINES.

REVIEW ALL DEMOLITION WORK WITH OWNER OR ARCHITECT BEFORE STARTING WORK.

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		VINY
	11'-0 <u>3</u> "- D'-11"	
		5 5

NORTH ELEVATION

SCALE: N.T.S.

(TYP)

	<u> </u>	U

Tributary Area = 0.63	
Compound Runoff Coefficient (C)	= 0.5
Design Constant (K1) =	0.33
Allowable Outflow Rate (Qo) =	0.1

1	2	3	4	5	6	7
					Outflow	
		Intensity		Inflow	Volume =	Storage
		(100 Yr	Col. # 2 x	Volume =	Col. #2 x	Volume =
Duration	Duration	Storm)	Col. #3	Col. 4 x K1	Qo (Cu.	Col. 5 - Col. 6
(Minutes)	(Seconds)	(In.Hr)	Inches	(Cu. Ft.)	Ft.)	(Cu. Ft.)
5	300	9.17	2751	907.83	39	868.83
10	600	7.86	4716	1556.28	78	1478.28
15	900	6.88	6192	2043.36	117	1926.36
20	1200	6.11	7332	2419.56	156	2263.56
30	1800	5	9000	2970	234	2736
60	3600	3.24	11664	3849.12	468	3381.12
90	5400	2.39	12906	4258.98	702	3556.98
120	7200	1.9	13680	4514.4	936	3578.4
180	10800	1.34	14472	4775.76	1404	3371.76

Elevation	Depth	Width	Avg. Width	Length	Avg. Length	Volume
985.5	0	32		38		
			37		43	1591
986.5	1	42		48		
			47		53	2491
987.5	2	52		58		
			57		63	3591
985.5	3	62		68		



SITE LIG	CHTING NOTE:		CONTRACTOR SHALL EXERCISE CARE NO
ONE EX	ISTING SITE LIGHTING POLI	E WITH 2 FIXTURES.	REMOVED AND STORED FOR INSTALLATIC ADDITION. CONTRACTOR SHALL REMOVE
NO NEW	I LIGHTING POLES REQUIR	ED.	FOLLOWING ITEMS FOR RE-INSTALLATION ADDITION: GARAGE DOOR OPENER, SOAF
TWO EX THE RE/ STORACI	ISTING BUILDING MOUNTED AR OF THE BUILDING TO I	WALL PACKS ARE PROVIDED ON LLUMINATE THE RENTAL CAR	VACUUM, EXHAUST FAN, LIGHT, LIGHTS BUILDING, CARBON MONOXIDE DETECTOR OPENER BUTTON, SENSORS, ELECTRIC N
THREE	EXISTING BUILDING MOUNT	ED WALL PACKS ARE PROVIDED	
ADJACEN OF BUIL LENSES	D, ALL 250 WATT METAL TO PREVENT SPREAD OF	HALIDE WITH DIRECTIONAL SHIELD LIGHT OFFSITE.	
CONTRAC	<u>JCTION NOTES:</u> CTOR SHALL VERIFY ALL D	IMENSION PRIOR TO	
	CING ANY WORK OR ORDE	IRING ANY COMPONENTS.	
NEW WAL	LLS AT CAR PREP BAY FR TAIL THIS SHEET)	COM FINISH FLOOR UP TO 8'-0"	₽
ELECTRIC	CAL WORK		PHO ROO
TO NEW	LAYOUT INCLUDING COND SWITCHES, DEVICES, ECT.	UIT, FIXTURES, LIGHTING, WIRING, FROM CEILINGS AND WALLS FOR	3'-
DISTRIBU	LUTRICAL WORK, CONTRACT JTION TO EXISTING DISTRIB JTION PANEL IN AREAS OF	UTION CIRCUITS FROM MAIN RENOVATION TO BE REWORKED	
CONTRAC	DEVELOPED FOR NEW ELEC	URBED FINISHES DUE TO NEW	
CONTRA	CTOR TO INSTALL ELECTRIC	METER AT LOCATION SHOWN	
CONTRAC	TOR SHALL PROVIDE TEMI F REMOVAL OF THE EVISTI	PORARY POWER AS NEEDED	CUS
CONTRAC	CTOR SHALL INSTALL PHON	NE BOX AND LINES AT THE	
	N SHOWN ON THE PLANS.		
NEEDED REVIEW	DURING THE REMOVAL OF ALL DEMOLITION WORK WI	THE EXISTING PHONE LINES.	
BEFURE	STARTING WORK.		FLOOR SINK WITH WATER HEATER ABOVE
	ELECTRICAL SYMBO	<u>DL LEGEND</u>	CO-RAY -VAC HEATER - VENT TO ATMOSPHERE
	IARE LIGHT		
Ń	GARAGE DOOR OPENER	CEILING MTD. LT. FIXT.	
	EX. 2X4 LIGHT	SELEC. SWITCH	6" BOLLARD PIPE GUARD
ĒA	EX. TUBE LIGHT		EX. FLOOR DRAIN WITH OIL WATER SEPARATOR
ГА LED	NEW LED LIGHT		
\otimes	NEW LED LIGHT		
L \$	NEW LED LIGHT SWITCH	BATT. OPERATED EMER. LT.	







TO THE GENOA TOWNSHIP PLANNING COMMISSION AND TOWNSHIP BOARD:						
APPLICANT NAME & ADDRESS: ROBERT NOFAR / FAULT ERST. If applicant is not the owner, a letter of Authorization from Property Owner is needed.						
OWNER'S NAME & ADDRESS: ROBERT NOFAR, 27451 SCHOOL CRAFT, LIVONIAI						
SITE ADDRESS: 7799 CONFERENCE CTIL PARCEL #(s):						
APPLICANT PHONE: (248) 787 6511 OWNER PHONE: (248) 787 6511						
OWNER EMAIL: robertnofar e mon. com						
LOCATION AND BRIEF DESCRIPTION OF SITE: <u>EXISTING</u> NOTEL						
BRIEF STATEMENT OF PROPOSED USE: MODIFIY EXTERIOR						
THE FOLLOWING BUILDINGS ARE PROPOSED:						
I HEREBY CERTIFY THAT ALL INFORMATION AND DATA ATTACHED TO AND MADE PART OF THIS APPLICATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.						
BY: Aris CONSTR.						
ADDRESS: 2630 BOIDFORD, HAMTRANCIC, M.I						

Contact Information - Review Letters and Correspondence shall be forwarded to the following: 1.) BILL JARRATT OF JARRATT ARCH at Name Business Affiliation Business Affiliation Business Affiliation Business Affiliation Business Affiliation		
FEE EXCEEDANCE AGREEMENT As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy. SIGNATURE: Image: Comparison of the standing of this policy. PRINT NAME: Image: Comparison of the standing of this policy. ADDRESS: Image: Comparison of the standing		

1

BRIGHTON AREA FIRE AUTHORITY



615 W. Grand River Ave. Brighton, MI 48116 o: 810-229-6640 f: 810-229-1619

June 13, 2019

Kelly VanMarter Genoa Township 2911 Dorr Road Brighton, MI 48116

RE: Courtyard Marriott 7799 Conference Center Genoa Twp., MI

Dear Kelly:

The Brighton Area Fire Department has reviewed the above-mentioned site plan. The plans were received for review on June 12, 2019, and the drawings are dated May 3, 2019. The project is based on an existing 48,831 square foot R-1 Hotel that will undergo a re-branding of the exterior to include a new facade, finishes, exit canopies, and a new porte-cochere. The plan review is based on the requirements of the International Fire Code (IFC) 2018 edition.

- 1. All access drives throughout the site and curb lines immediately to the structure shall be maintained free of obstructions. This includes vehicles, dumpster, construction materials, and equipment.
- 2. The building shall include the building address on the building. The address shall be a **minimum of 6**" high letters of contrasting colors and be clearly visible from the street. The location and size shall be verified prior to installation.

IFC 505.1

- 3. The new porte-cochere must maintain a minimum vertical clearance of 13½ feet.
- 4. The location of the key box (Knox Box) shall be indicated on future submittals. The existing Knox box will likely require contact with BAFA to open for removal and relocation approval. The box shall be located adjacent to the front door of the structure.

IFC 506.1

5. Provide names, addresses, phone numbers, emails of owner or owner's agent, contractor, architect, on-site project supervisor.

If you have any questions about the comments on this plan review please contact me at 810-229-6640.

Cordially,

Rick Boisvert, CFPS Fire Marshal

cc:Amy Ruthig











COURTYARD BY MARRIOTT

EXTERIOR RENOVATION

A-001B	COVER SHEET BRIGHTON
100B	OVERALL EXISTING PLAN
101B	OVERALL PLANS BRIGHT
A211 CYB	EXISTING ELEVATIONS BI
A212 CYB	ELEVATIONS BRIGHTON
A212	ELEVATIONS Courtyard Ne
051	OVERALL FIRST FLOOR D
052	ROOF DEMOLITION PLAN
053	EXTERIOR DEMOLITION E
054	EXTERIOR DEMOLITION E
110	PORTE COCHERE - ENLA
111	PORTE COCHERE - ROOP
112	PORTE COCHERE - DETA
115B	FRONT ENTRY FEATURE
116	FRONT ENTRY FEATURE
117B	FRONT ENTRY FEATURE
118B	FRONT ENTRY FEATURE
120B	REAR ENTRY FEATURE F
121	REAR ENTRY FEATURE F
122	REAR ENTRY FEATURE F
123	REAR ENTRY FEATURE F
124	REAR ENTRY FEATURE F
125	TYPICAL (3 BAY) FEATUR
126	TYPICAL (3 BAY) FEATUR
127	STARCASE FEATURE FRA

DRAWING INDEX

NS BRIGHTON ΓΟΝ BRIGHTON

ewark DEMOLITION PLAN (WITH MEETING ROOM)

ELEVATIONS

ELEVATIONS ARGED PLANS & RCP

OF PLAN

AILS

E FRAME - ENLARGED PLANS -Brighton

E FRAME - ENLARGED ROOF PLAN

E FRAME - ENLARGED ELEVATIONS

E FRAME - DETAILS BRIGHTON

FRAME - ENLARGED PLANS - BRIGHTON

FRAME - ENLARGED ROOF PLAN FRAME - ENLARGED ELEVATIONS

FRAME - DETAILS

FRAME - DETAILS

RE FRAME - ENLARGED PLANS & ELEVATIONS

RE FRAME - DETAILS

RAME - FLOOR PLANS, RCP & ELEVATIONS

	www.Jarratt Architecture.com			
	William T. Jarratt Licensed Architect Michigan 41752Michigan 41752OCOURTYARD by Marriott Exterior RenovationDTWBR BRIGHTON, MI			
CO I Re BF				
INFORMA WORK TY INFORMA EXISTING	TION IN BLACK IS NEW PICAL TION IN GRAY IS TYPICAL			
5/3/2019 Date	Permit and Pricing DESCRIPTION			
SHEET COV BI	TITLE /ER SHEET RIGHTON			
A	-001B			

NOTE : FIELD CONDITIONS MAY VARY. FOR REFERENCE ONLY

















1 FIRST FLOOR DEMOLITION PLAN SCALE: 3/32" = 1'-0"











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DEMOLITION FRONT ELEVATION SCALE: 3/32" = 1'-0"

2 DEMOLITION SIDE ELEVATION SCALE: 3/32" = 1'-0"





















	REFERENCE NOTES	
	A. REFER TO DESIGN STANDARDS "SITE & BUILDING EXTERIOR" CHAPTER FOR MAIN REQUIREMENTS RELATED TO THIS SHEET. ARCHITECT IS RESPONSIBLE FOR DESIGNING PROJECT IN ACCORDANCE WITH THE ENTIRE DESIGN STANDARDS.	cture
	GENERAL NOTES 1. STRUCTURAL INFORMATION SHOWN FOR ARCHITECTURAL INTENT ONLY. STRUCTURAL INFORMATION IN DESIGN GUIDELINES DOES NOT CONVEY INFORMATION REQUIRED FOR CONSTRUCTION AND CANNOT BE USED IN LIEU OF DRAWINGS PREPARED BY A REGISTERED STRUCTURAL ENGINEER.	Archite
	2. STRUCTURAL ENGINEER TO PROVIDE FULL DESIGN SERVICES INCLUDING BUT NOT LIMITED TO; DETERMINING SIZE AND SPACING OF MEMBERS BASED ON ALL CODE REQUIREMENTS, DESIGNING FOOTINGS & FOUNDATIONS BASED ON ALL CODE REQUIREMENTS, AND DETAILING ALL STRUCTURAL CONNECTIONS.	Jarratt
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Y /	4. ARCHITECT IS RESPONSIBLE FOR DETERMINING NUMBER AND LAYOUT OF ROOF DRAINS AND SIZE OF RAIN LEADERS AS REQ'D FOR LOCAL CODE AND CONDITIONS. OVERFLOW DRAINS TO BE DIRECTED TO DAYLIGHT IN AREAS THAT WILL NOT DRAIN ACROSS WALKING SPACES.	
	5. COORDINATE PORTE COCHERE DETAILS WITH ADJACENT SITE DETAILS. SEE SITE PLAN FOR ADDITIONAL INFORMATION.	
	6. WALL SECITONS ARE DRAWN TO PROVIDE DESIGN INTENT AND TO PROVIDE INFORMATION REGARDING SPECIFIC FINISH SYSTEMS CONSTRUCTION AND RELATIONSHIPS. ARCHITECT TO DRAW PORTE COCHERE BASED ON CHOSEN STRUCTURAL SYSTEM.	William T. Jarratt Licensed Architect Michigan 41752
	7. THE SITE FABRICATED PORTE COCHERE AND ASSOCIATED SITE DESIGN ELEMENTS SHOWN ARE A GUIDE FOR DEVELOPING THESE SIGNATURE ELEMENTS OF THE BRAND. FINAL CONFIGURATION, SIZE, DETAILS TO BE BY DESIGNER.	COURTYARD
7	CRITERIA NOTES ARE SHOWN CATEGORIZED BY DISCIPLINE AND COULD BE INTERPRETED TO APPLY TO MORE THAN ONE DISCIPLINE. FOR EFFICIENCY, NOTES ARE ONLY SHOWN UNDER ONE PREDOMINANT DISCIPLINE. CONSULTANTS SHOULD FAMILIARIZE THEMSELVES WITH ALL CRITERIA NOTES	Marriott Exterior Renovation
	A0 <u>ARCHITECTU</u> <u>RAL</u>	
5 111	 A57 EXTEND DRAINS DOWN AT COLUMN LOCATIONS. DOWNSPOUTS TO TIE INTO SEWER SYSTEM PER DESIGN & CONSTRUCTION STANDARDS A58 SINGLE PLY MEMBRANE ROOF OVER TAPERED INSULATION SLOPED PER CODE. STARTING THICKNESS 1 1/2" AT DRAINS. A105 ROOF DRAIN A152 EDGE OF NEW CANOPY ABOVE A164 OVERFLAW SPOUT AT THE EDGE OF CANOPY A167 *OPTION* PRE-ENGINEERED PORTE COCHERE BY MCGEE CORPORATION WWW.MCGEECORP.COM (704) 882 1500 	INFORMATION IN BLACK IS NEW WORK TYPICAL INFORMATION IN GRAY IS EXISTING TYPICAL
	S0 <u>STRUCTUR</u> <u>AL</u>	
	 S20 COORDINATE STRUCTURE WITH PONDING BASED ON HEIGHT OF OVERFLOW SCUPPER S21 BEAM ABOVE S22 SUSPEND CANOPY FROM BEAM ABOVE PER STRUCTURAL ENGINEER 	
		5/3/2019 Permit and Pricing
	EXTERIOR FINISH LEGEND	Date DESCRIPTION
	EF1 EIFS, SHERWIN WILLIAMS, SW 7004 - SNOWBOUND EIF2 EIFS, BENJAMIN MOORE, 1601 - HEARTHSTONE EIF3, BENJAMIN MOORE, 1603 - GRAPHITE FIBER CEMENT 1 , NICHIHA PANEL, VINTAGEWOOD - CEDAR	SHEET TITLE
S MAY	MT1 METAL, MATCH EF1 COLOR MT2 METAL, MATCH EF2	PORTE COCHERE -
	COLOR MT3 METAL, MATCH EF3 COLOR MT4 METAL (PORTE	ROOF PLAN
SEE ACTUAL PROJECT EXTERIOR TONS SHEET A212 FOR LOCATIONS, SIZES JANTITIES -	COCHERE) PN1 SHERWIN WILLIAMS, SW 6095 - TOASTY (METALIC PAINT SOFFIT - MATCH	
ILET IS FOR GENERAL COSTRUCTION ENCE ONLY	MT4) PN3 (INTUMESCENT PAINT - MATCH MT4)	
	NEW EIFS	111







REFER TO DESIGN STANDARDS "SITE BUILDING EXTERIOR" CHAPTER FOR M REQUIREMENTS RELATED TO THIS SHEET. ARCHITECT IS RESPONSIBLE F DESIGNING PROJECT IN ACCORDANCE WITH THE ENTIRE DESIGN STANDARDS

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William T. Jarratt

Licensed Architect

Michigan 41752/

by

Marriott

Exterior

Renovation

INFORMATION IN BLACK IS NEW

INFORMATION IN GRAY IS

EXISTING TYPICAL

WORK TYPICAL

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GENERAL NOTES

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CRITERIA NOTES CRITERIA NOTES ARE SHOWN CATEGORIZEI

DISCIPLINE AND COULD BE INTERPRETED TO APPLY TO MORE THAN ONE DISCIPLINE. FOR EFFICIENCY, NOTES ARE ONLY SHOWN UNDER ONE PREDOMINANT DISCIPLINE. CONSULTAN SHOULD FAMILIARIZE THEMSELVES WITH ALI CRITERIA NOTES

A0 <u>ARCHITECTU</u> <u>RAL</u>

- A94 NEW NICHIHA WALL CLADDING & SHEATHING, 1"
- INSULATION A100 NEW ALUMINUM STOREFRONT, TO MATC
- EXISTING FINISH A106 NEW WALL
- A108 EDGE OF ROOF ABOVE
- A116 SOFFIT VENT A124 CONCEAL RAIN LEADER IN WALL
- A125 CONCEAL OVERFLOW DRAIN IN WALL
- A128 NEW EIFS WALL FINISH
- A140 NEW EIFS SOFFIT FINISH A144 NICHIHA WINDOW TRIM J-MOLD
- A145 NICHIHA CORNER PIECE OUTSIDE CORN
- X-TRIM A148 NICHIHA TRIM J-MOLD
- A157 NEW SOFFIT
- SO <u>STRUCTUR</u> <u>AL</u>
- EXISTING TO REMAIN FOOTING S10 NEW CONCRETE FOOTING PER STRUCTU
- DESIGN S16 NEW STRUCTURAL COLUMN PER STRUC ENGINEER

E0 <u>ENGINEERI</u>

NG

E2 EXTERIOR RECESSED LIGHT FIXTURE

SHEET TITLE FRONT ENTRY FEATURE FRAME ·

5/3/2019 Permit and Pricing

Date DESCRIPTION

ENLARGED PLANS -Brighton

115B



NOTE: SEE ACTUAL PROJECT EXTERIOR ELEVATIONS SHEET A212 FOR LOCATIONS, SIZES AND QUANTITIES -THIS SHEET IS FOR GENERAL COSTRUCTION REFERENCE ONLY



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

1 ELEVATION SIMILAR SCALE: 3/16" = 1'-0"



(INTUMESCENT PAINT - MATCH

MT4)

NEW EIFS

117B

FRONT ENTRY FEATURE FRAME - ENLARGED SIDE

NOTE : FIELD CONDITIONS MAY VARY. FOR REFERENCE ONLY



1 REAR ENTRY FEATURE FRAME - ELEVATION SIMILAR

COSTRUCTION REFERENCE ONLY









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′ William T. Jarratt

Licensed Architect

Michigan 41752/

COURTYARD

by

Marriott

Exterior

Renovation

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INFORMATION IN GRAY IS EXISTING TYPICAL

5/3/2019 Permit and Pricing

Date DESCRIPTION

WORK TYPICAL

1.11

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A0 ARCHITECTU

- A10 METAL COPING
- A93 *OPTION* CONVERT TO INDOOR/OUTDOOR FIREPLACE IF OUTDOOR FIRE FEATURE DOES NOT EXIST.
- A95 NEW ROOF MEMBRANE A97 EXISTING WALL
- A108 EDGE OF ROOF ABOVE
- A111 EXISTING SLOPED ROOF. INSPECT EXISTING ROOF CONDITIONS AND DESIGNATE AREAS RECEIVE NEW ROOFING MATERIAL
- A114 NEW DOWN SPOUT A116 SOFFIT VENT
- A118 EXTEND ROOF MEMBRANE AND END OVER AT LEAST 2'-0" UNDER EXISTING ROOFING MATERIAL
- A119 OVERFLOW SCUPPER
- A121 EXPANSION JOINT
- A128 NEW EIFS WALL FINISH
- A138 EIFS REVEAL LINES.
- A140 NEW EIFS SOFFIT FINISH A149 PAINT EXISTING TRIM TO MATCH ADJACENT FINISH
- A153 PROVIDE RUSKIN ET125-30 LOUVER FOR PTA GRILLE ON EXTERIOR WALL. ALTERNATE GRILLES OF EQUIVALENT APPEARANCE AND PERFORMANCE MAY BE SUBMITTED FOR TH ARCHITECT'S APPROVAL. COLOR TO MATCH
- ADJACENT FINISH A157 NEW SOFFIT A158 EXISTING GUTTER. PAINT TO MATCH ADJACEN
- FINISH. A159 EXISTING RAILINGS. NEW PAINT TO MATCH
- ADJACENT FINISH. STRUCTOR REVEAL LINES. LOCATION MAY ARIES. ARCHITECT TO VIF
- A369 EEN TORCKE REMAIN FOOTING
- S10 NEW CONCRETE FOOTING PER STRUCTURAL DESIGN
- S16 NEW STRUCTURAL COLUMN PER STRUCTUR ENGINEER

S19 NEW ROOF DECK & STRUCTURE EXTERIOR FINISH LEGEND

- EIFS, SHERWIN WILLIAMS, SW 7004 -SNOWBOUND
- EIFS, BENJAMIN MOORE, 1601 -
- HEARTHSTONE
- EIFS, BENJAMIN MOORE, 1603 -
- GRAPHITE FIBER CEMENT 1, NICHIHA PANEL,
- VINTAGEWOOD CEDAR
- METAL, MATCH EF1
- COLOR METAL, MATCH EF2
- COLOR
- METAL, MATCH EF3 COLOR
- METAL (PORTE

NEW EIFS

- COCHERE) SHERWIN WILLIAMS, SW 6095 -
- TOASTY
- (METALIC PAINT SOFFIT MATCH MT4)
- MT4)
- (INTUMESCENT PAINT MATCH
- ENLARGED PLANS

SHEET TITLE

& ELEVATIONS

TYPICAL (3 BAY)

FEATURE FRAME -

125



May 8, 2019

Planning Commission Genoa Township 2911 Dorr Road Brighton, Michigan 48116

Attention:	Kelly Van Marter, AICP	
	Planning Director and Assistant Township Manager	
Subject:	Proposed amendments to Articles 7 and 25 of the Township Zoning Ordinance	

Dear Commissioners:

As requested, we have prepared this memo to assist the Planning Commission with its consideration of amendments (enclosed) proposed to Articles 7 (Commercial and Service Districts) and 25 (Definitions) of the Township Zoning Ordinance.

The proposed amendments to Article 7 include minor modifications to current uses, as well as the inclusion of new uses, along with specific conditions for the new uses, as follows:

Modifications to current uses/conditions

- Child care centers are currently permitted by right in OSD, NSD and GCD, but not allowed in RCD; the proposal would add this as a permitted use in RCD. The conditions of footnote (e) are also being amended to reference state requirements for such uses.
- Schools are currently permitted by right in OSD; the proposal would change this to a special land use.
- Vocational and technical training facilities are currently permitted by right in OSD, GCD and RCD; the proposal would change this to a special land use in OSD.
- Churches and similar places of worship are currently permitted by right in NSD and GCD, but not listed in RCD; the proposal would add this as a by right use in RCD. As a point of reference, this change was made so that such uses are treated the same as other assembly uses in accordance with federal law.
- Public/governmental buildings are currently permitted by right in OSD, NSD and GCD; the proposal would change it to a special land use in OSD and add it as a by right use in RCD.
- Footnotes (h) and (t) are being cleaned up with respect to utility references.
- Footnote (k) would include a reference to the hazardous material/fuel storage requirements for automobile service stations.

New uses

- Brewpubs would be permitted by right in GCD and RCD.
- Micro-brewery, small distillery and small winery would be added as special land uses in GCD and RCD, along with specific conditions (footnote y).
- Climate-controlled indoor commercial storage would be added as a special land use in RCD and GCD, along with specific conditions (footnote z).
- Upper floor dwelling units would be added as a special land use in OSD, NSD and GCD, along with specific conditions (footnote aa).

The proposed amendments to Article 25 are generally limited to the new uses being added to Article 7 (brewpub, climate controlled indoor commercial storage and small winery), although edits are also proposed to mini/self-storage to make a clearer distinction between those uses and the proposed use of climate-controlled indoor commercial storage.

Genoa Township Planning Commission **Proposed Ordinance Amendments – Articles 7 and 25** Page 2

Should you have any questions concerning this matter, please do not hesitate to contact our office. I can be reached by phone at (248) 586-0505, or via e-mail at <u>bborden@safebuilt.com</u>.

Respectfully, **SAFEBUILT STUDIO**

١ Brian V. Borden, AICP

Brian V. Borden, Ald Planning Manager

ARTICLE 25 DEFINITIONS

Sec. 25.01 CONSTRUCTION OF LANGUAGE

The following rules of construction apply to the text of this Ordinance:

- a. The particular shall control the general.
- b. In the case of any difference of meaning or implication between the text of this ordinance and any caption or illustration, the text shall control.
- c. The word "shall" is always mandatory and not discretionary. The word "may" is permissive, with the decision made by the Township Zoning Administrator, Planning Commission, Township Board or Zoning Board of Appeals; as indicated.
- d. Words used in the present tense shall include the future and words used in the singular number shall include the plural, and the plural the singular, unless the context clearly indicates the contrary.
- e. The word "building" includes the word "structure." The word "build" includes the words "erect" and "construct." A "building" or "structure" includes any part thereof.
- f. The phrase "used for" includes "arranged for," "designed for," "intended for," "maintained for," or "occupied for."
- g. The term "including" means "including, but not limited to" and the term "such as" means "such as, but not limited to" unless otherwise noted.
- h. The word "person" includes an individual, a corporation, a partnership, an incorporated association, or any other similar entity recognizable as a "person" under the laws of Michigan.
- i. Unless the context clearly indicates the contrary, where a regulation involves two or more items, conditions, provisions or events connected by the conjunction "and," "or," "either...or," the conjunction shall be interpreted as follows:
 - 1) "And" indicates that all the connected items, conditions, provisions or events shall apply.
 - 2) "Or" indicates that the connected items, conditions, provisions, or events may apply singly or in any combination (i.e. "or" also means "and/or").
 - 3) "Either...or" indicates that the connected items, conditions, provisions or events shall apply singly but not in combination.
- j. The terms "abutting" or "adjacent to" include property along the lot lines of the subject site including those in another community, but do not include lands separated by a public street right-of-way.
- k. The word "days" shall mean calendar days and include all weekend days and holidays.
- 1. Terms not herein defined shall have the meaning customarily assigned to them.

self-serve, track mounted units and similar high volume washing establishments, but shall not include hand washing operations in an "Automobile service station."

Bar/lounge/tavern: A bar or lounge is a type of restaurant which is operated primarily for the dispensing of alcoholic beverages, although the sale of prepared food or snacks may also be permitted. If a bar or lounge is part of a larger dining facility, it shall be defined as that part of the structure so designated or operated.

Basement: The portion of a building which is partially or wholly below grade but so located that the

vertical distance from the mean grade to the floor is greater than the vertical distance from the mean grade to the ceiling (see Figure 25.1). A basement shall not be counted as a story.

Bed and Breakfast Inn: Shall mean any dwelling in which overnight accommodations are provided or offered for transient guest for compensation, including provision for a morning meal only for the overnight guest only. A bed and breakfast is distinguished from a motel in that a bed and breakfast establishment shall have only one set of kitchen facilities, employ only those living in the house or up to one (1) additional employee, and have facade style consistent with surrounding homes.





Block: The property abutting one side of a street and lying between the two nearest intersecting streets, crossing or terminating) or between the nearest such street and railroad right-of-way, unsubdivided acreage, lake, river or live stream; or between any of the foregoing and any other barrier to the continuity of development, or corporate boundary lines of the Municipality.

Block Face: Defined as and consists of those properties fronting along an existing right-of-way and located between the intersections of existing streets, or between intersections and dividers such as rivers, rail-roads, and other similar natural or man-made features.

Board of Appeals: (also referred to in this Zoning Ordinance as the Board of Zoning Appeals). The body established by the Township Board to exercise the authority granted by the Michigan Zoning Enabling Act (Public Act 110 of 2006). The jurisdiction of the Board of Appeals is described in Article 23. (as amended 12/31/06)

Brewpub: A manufacturer and brewer of not more than 18,000 barrels of beer per calendar year in Michigan including on premise sales of the beer produced for consumption on or off the brewpub premises with appropriate state licenses.

Buffer Zone: A strip of land with landscaping, berms or walls singularly or in combination required between certain zoning districts based on the landscaping standards of this zoning ordinance. The intent of the required buffer zones is to lessen visual and noise impacts.

Building: Any structure (excluding fences) either temporary or permanent, having a roof supported by columns or walls, and intended for the shelter, or enclosure of persons, animals, chattels, or property of any kind. A building shall include mobile homes, manufactured housing, sheds, garages, greenhouses, pole barns and used for the purposes of a building and similar structures. A building shall not include such structures as signs, fences or smokestacks, but shall include structures such as storage tanks, produce silos, coal bunkers, oil cracking towers, or similar structures.

<u>Climate-controlled indoor commercial storage:</u> A fully enclosed multi-story temperature and humidity controlled commercial building with limited exterior access points and controlled indoor only access to individual and compartmentalized stalls or lockers for storage of customer's goods or wares.

Clinic, medical: An establishment where human patients who are not lodged overnight are admitted for examination and treatment by a group of physicians, dentists, or similar professionals. A medical clinic may incorporate customary laboratories and pharmacies incidental to or necessary for its operation or to the service of its patients, but may not include facilities for overnight patient care or major surgery.

Club or fraternal organization: An organization of persons for special purposes or for the promulgation of sports, arts, sciences, literature, politics, or the like, but not operated for profit or to espouse beliefs or further activity that is not in conformance with the constitution of the United States or any laws or ordinances. The facilities owned or used by such organization may be referred to as a "club" in this ordinance.

Coffee Shop: An establishment serving coffee beverages as its primary product to a customer in a readyto-consume state. The preparation and sale of food or snacks to customers may also be permitted. The method of operation may include indoor and/or outdoor seating and may be characteristic of a carryout or drive-through restaurant or combination thereof. (as amended 3/5/10)

Commercial vehicle: Any vehicle bearing or required to bear commercial license plates and which falls into one or more of the categories listed below:

- a. truck tractor;
- b. semi-trailer, which shall include flat beds, stake beds, roll-off containers, tanker bodies, dump bodies and full or partial box-type enclosures;
- c. vehicles of a type that are commonly used for the delivery of ice cream, milk, bread, fruit or similar vending supply or delivery trucks. This category shall include vehicles of a similar nature which are also of a type commonly used by electrical, plumbing, heating and cooling, and other construction oriented contractors;
- d. tow trucks;
- e. commercial hauling trucks;
- f. vehicle repair service trucks;
- g. snow plowing trucks;
- h. any other vehicle with a commercial license plate having a gross vehicle weight in excess of ten thousand (10,000) pounds or a total length in excess of 22 feet.

Condominium Act: Michigan Act 59 of 1978, as amended.

Condominium, Contractible: A condominium project from which any portion of the submitted land or building may be withdrawn in pursuant to express provisions in the condominium documents and in accordance with the Genoa Township Code of Ordinances and the Condominium Act, Act 59 of the Public Acts of 1978, as amended.

features affecting site design.

Lot of Record: A parcel of land, the dimensions of which are shown or, a document or map on file with the County Register of Deeds or in common use by Municipal or County Officials, and which actually exists as so shown, or any part of such parcel held in a record ownership separate from that of the remainder thereof.

Lot, Through: Any interior lot having frontage on two more or less parallel streets as distinguished from a corner lot. In the case of a row of double frontage lots, all yards of said lots adjacent to streets shall be considered frontage, and front yard setbacks shall be provided as required.



Figure 25.11 Rear Lot Line on Triangular Lot

Lot, Width: The horizontal distance between side lot lines measured parallel to the front lot line at the minimum required front setback excluding private road access easement. For irregularly shaped lots with access easements or "flag lots" connecting to a public street, the minimum lot width shall be measured at

the point where the narrow access connects to the main section of the parcel. This determination shall be made by the Zoning Administrator. Figure 25.12 illustrates calculation of minimum lot width for lots along curvilinear streets.

Major Thoroughfare: An arterial street, state trunkline, or roadway classified as a Primary Road by the Livingston County Road Commission, which is intended to service as a large volume of traffic, generally within a right-of-way at least eighty six (86) feet wide.

Manufactured Home: A dwelling unit which is designed for long-term residential use and is wholly or substantially constructed at an off-site location.



Figure 25.12 Lot Width on Curvilinear Streets

Master Plan: The Comprehensive Community Plan, sub area plans or corridor plans including graphic and written proposals for future land use, zoning, site design, physical development and or capital improvements.

Mezzanine: An intermediate floor in any story occupying a maximum one-third (1/3) of the story's floor area.

Microbrewer: A brewer that produces in total less than 60,000 barrels of beer per year and that may sell the beer produced to consumers at the licensed brewery premises for consumption on or off the licensed brewery premises and to retailers as provided by State Law. (as amended 09/04/18)

Mini or Self Storage Warehouse: A <u>single-story</u> building or group of <u>single-story</u> buildings in a <u>controlled access and</u> fenced compound that <u>provides direct outdoor controlled access</u> <u>contains varying</u> <u>sizes of to</u>-individual <u>and</u>, compartmentalized, <u>and controlled access</u> stalls or lockers for the storage of customer's goods or wares.

Site plan: A plan, prepared to scale, showing accurately and with complete dimensions, the boundaries of a site and the location of all buildings, structures, uses, and principal site development features proposed for a specific parcel of land, and conforming to the standards of this Ordinance.

Small distiller: A manufacturer of spirits annually manufacturing in Michigan not exceeding 60,000 gallons of spirits, of all brands combined. (as amended 09/04/18)

Small Winery: A wine manufacturer of no more than 50,000 gallons per year which involves sales to licensed wholesalers or self-distribute to retailer licensees, wine produced at the licensed winery facility, and to customers for consumption on premises at a tasting room. A Small Winery may also sell wine it manufactures at an approved tasting room off the manufacturing premises with appropriate state licenses.

Special land use: A use of land for an activity which, under usual circumstances, could be detrimental to other land uses permitted within the same district but which may be permitted because of circumstances unique to the location of the particular use and which use can be conditionally permitted without jeopardy to uses permitted within such district. Such uses are defined as "Special Land Uses" in the Michigan Zoning Enabling Act (Public Act 110 of 2006).

Stable, Commercial: A facility for the rearing and housing of horses, mules and ponies or for riding and training academies.

Stable, Private: A facility for the rearing and training of horses, ponies and mules which are owned by the occupant of the dwelling unit.

Story: That part of a building included between the surface of any floor and the surface of the floor, or roof, next above. When the distance from the average established grade to the ceiling of a story partly below such grade exceeds five (5) feet, then the basement or cellar constituting the story partially below grade shall be counted as a story (refer to Figure 25.14).

Story, Half: An uppermost story lying under a sloping roof having an area of at least two hundred (200) square feet with a clear height of seven feet six inches (7' - 6''). For the Purposes of this Ordinance, the usable floor area is only that area having at least four (4) feet clear height between floor and ceiling.

Street: A dedicated public right-of-way, other than an alley which affords the principal means of access to abutting property. Various types of streets are defined below.





a. **Arterial Street or Roadway**: A street or roadway which carries high volumes of traffic at relatively high speeds, and serves as an avenue for circulation of traffic onto, out of, or around the Genoa Township area. An arterial roadway may also be defined as a major thoroughfare, major arterial or minor arterial roadway. Since the primary function of the regional arterial roadway is to provide mobility, access to adjacent land uses may be controlled to optimize capacity along the roadway. Arterial roadways are listed in the Township Master Plan.

GENOA CHARTER TOWNSHIP PLANNING COMMISSION PUBLIC HEARING MAY 13, 2019 6:30 P.M. MINUTES

CALL TO ORDER: The meeting of the Genoa Charter Township Planning Commission was called to order at 6:30 p.m. Present were Chairman Doug Brown, Jeff Dhaenens, Jill Rickard, Marianne McCreary, Jim Mortensen and Eric Rauch. Absent was Chris Grajek. Also present was Kelly VanMarter, Community Development Director/Assistant Township Manager, Brian Borden of SafeBuilt Studio, and Gary Markstrom of Tetra Tech. There were eight audience members present.

PLEDGE OF ALLEGIANCE: The pledge of allegiance was recited.

APPROVAL OF AGENDA:

Moved by Commissioner McCreary, seconded by Commissioner Rickard, to approve the agenda as presented.

CALL TO THE PUBLIC: The call to the public was made at 6:32 pm with no response.

OPEN PUBLIC HEARING # 1... Review of an amendment to a previously approved site plan and environmental impact assessment for a proposed 15-unit, single family site condominium located north of Cunningham Lake Road and west of Sundance Trail, known as Mountain Top Estates. The request is petitioned by Mountain Top Estates, LLC.

Mr. Wayne Perry with Desine and Mr. Steve Davis owner of the property with AdvanceCraft were present. Mr. Perry stated that they are here to seek an amendment to the approved site plan. Mr. Davis purchased the property with the intent to implement the site plan as it existed. Mr. Perry indicated it was approved with 16 units however unit 15 was removed from the project. They attempted to update the site plan to implement the plan as approved and discovered that the removal of unit 15 impacted the storm drainage and the plan could no longer work as proposed. There were multiple other deficiencies with the prior approved site plan. They are now keeping the stormwater on site and have reconfigured the road to eliminate 10,000 yards of excavation. The retention basin in the northwest corner is being increased since the one that was approved didn't meet standards of the Drain Commissioner. They corrected items from the 2006 approval related to lighting, landscaping and grading. The retention basin in the northwest and the detention basin proposed near the entrance have been revised. The detention basin is now designed as a site amenity with appropriate side slopes, eliminated fence, and added landscaping. They have approvals from Health, Drain, and Road Commission and are now seeking Township approval.

In regard to the review letters, Mr. Perry addressed the tree removal issue. He presented the 2006 approved landscape plan and showed areas of trees that were to be saved and trees to be added. Many of the trees labeled to be saved when compared to the grading plan would not have been able to be saved. He shows the succession of the plans and indicates that many of the trees were proposed to be removed and many of those planned to be saved would not have been able to be saved. The plans that were approved by the Township in 2006 show trees preserved in areas where they were not capable of being saved. Mr. Perry now proposes to expand the clearing in some areas but also they are saving trees in additional areas. The primary difference is additional clearing on lots 7 and 8 for septic fields, the berm proposed along units 6 through 8 and the storm water conveyance along the rear of Unit 4 and 5.

Chairman Brown asked when Mr. Davis took control of this property and when were the trees removed. Mr. Davis responded that they acquired the property in November 2018 and the trees were removed in March 2019. Chairman Brown questioned why they didn't get approval before clearing the trees and requests a count of the total trees that were cut should be provided. He believes the trees should be replaced.

Mr. Davis responded that he went ahead with tree clearing because he thought he had approvals since the plans already went to the Planning Commission. They started clearing based on the original plan because he thought he had approval. Mr. Perry added that the problems arise from the change from 16 to 15 units. That change altered the ability to develop the site plan that was approved. Mr. Perry states that the original 2006 plan required tree removal, the Planning Commission approved that plan and this plan also requires tree removal but they are also planning to save many of the trees and it would be unfair to make them restore trees in the short term that would just be cut to facilitate the development as proposed.

Chairman Brown indicated that he believes that once the road and utilities are installed they should plant trees to replace those trees that would have been remaining but which were removed illegally. Mr. Perry questioned if the trees that had to be cut to build the project should be replaced?

Commissioner Mortensen stated that we are dealing with trees that were cut on an expired site plan. Mrs. VanMarter responded that the site plan was not yet expired. Mr. Mortensen asked how the trees proposed for removal on the current plan compare to the clearing of trees that were not foreseen to be removed on the original now deemed non-workable plan. In other words, how does the 2006 tree removal plan compare with what is being proposed. He is headed towards requiring an enhancement of the landscaping to make up for lost trees.

Commissioner Rickard stated that without a tree survey we can't know how much of the trees were removed.

Mr. Perry responded that the answer to that question is erroneous. The plan in 2006 represented areas of trees not individual trees. He can't count the trees that were removed because they have been removed. I can show you areas that are now proposed to be saved and then also areas that were not proposed to be removed. We are taking down more trees than we are

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preserving but at the same time we are preserving as much as we can and only clearing those needed for roads, storm water, and some sanitary fields.

Chairman Brown asked if there was a calculation of the number of trees to be removed in the agreement with the tree removal company. Mr. Davis responded that the tree company was based on a per acre rate, not the number of trees.

Commissioner Rickard had some questions on the grading including if the original road was designed to standards at the time also that the grading on the lots looks like additional tree removal will be needed in order to construct homes. She also asked how the property boundaries have changed with the loss of the 16th unit. Mr. Davis responded that the seller of the property wanted to keep the large barn on what was lot 16 and still lives in the existing house on Cunningham Lake Road. The land that was proposed as lot 16 was simply combined with the home property. Mr. Perry stated that the approved plan from 2006 had 24' roads and 10% road grade. They wanted to build exactly what was approved so they have kept that grade and width.

Commissioner McCreary stated that it appears misleading since you aren't showing where the homes will go and the clearing necessary for each home site. Mr. Perry responded that he has been very careful to only indicate trees to be removed during development of the roads and infrastructure. There will be additional tree removal for home sites and septic fields. They have cleared and graded 7, 8 and 10 so as not to impact drainage and or disposal fields as required by the health department. All the other lots will need trees cleared to build homes, driveways, and disposal fields.

Commissioner Dhaenens requested an explanation of the depiction on page 89 of tonight's packet. Mr. Perry responded that the plan shows what has been cleared in blue. The gray area is the additional clearing that is needed to build the project. The 2006 plans required 9.5 acres of clearing for the roads and infrastructure, they are proposing 11.7 acre of clearing.

Commissioner Rauch asked if the trees removed over the course of the last 6 months were within the tree removal plan from 2006. Mr. Perry responded that no, they removed additional trees as shown in the darker tan on the PowerPoint. Mr. Davis stated that his company has been building in this area since 1971. The tree people asked him at the time about removing additional trees. He doesn't know the configuration of the homes and won't remove the trees on each lot until they select a home layout and remove the trees necessary to build the home. They try to maintain all the trees they can. He is not opposed to something in the approval that would require that he have to plant 5 more trees on any lot after the home is built. Mr. Davis then provided a hand out about his company.

Commissioner Rauch stated that the reality of this is that those trees are coming out for the home construction anyway. What is depicted on the drawings showing tree removal is not what will end up being. We are only talking about whether these trees are staying for a few months before someone builds their house and removes them.

Commission Mortensen indicates his concern is the effect of perimeter trees coming down and the impacts on the neighbors.
Mr. Brian Borden reviewed his letter dated May 8, 2019. His primary concern is that if trees have been removed that would have provided a buffer to the adjacent property owners those trees should be replaced. In addition, the changes to the condo docs would be nice to have in red line version so I know what has changed. Mr. Perry responded that he does not know what was in the original condo documents since they didn't start with them. It is a fallacy to start with a bad set of documents so they started clean and are working from there. Mr. Borden indicated the Township Attorney should review the condo docs and there should be an analysis to confirm that the standards of the private road maintenance agreement as required by ordinance are met.

Mr. Gary Markstrom reviewed his letter dated May 7, 2019. The current length of the road is 1400 feet which exceeds the 1000 feet requirement. This is only 15 lots and if the fire department finds it acceptable, we would support the 1400 feet length. Similarly the road right of way is proposed to be 50 feet wide which is less than the required 66 feet but the ordinance allows this deviation in situations like this. Lastly, the 10% grade on the road is steeper than the standard but this is a very hilly site and to get the desired 6% grade would take more trees removed. The 10% slope is not unsafe and we support it. All these are subject to fire department approval. They will need a construction plan review phase for the private road and a spot inspection process during construction. The areas on the 2006 plans would have drained onto the adjacent owners, they have fixed that to keep all the water on site but it will stop off site drainage from impacting the neighbors. The plans comply with drain commissioner standards.

Chairman Brown asked how many lots are impacted by the 10% slope. Mr. Perry responded that all the lots are impacted because that slope is near the entrance to the neighborhood.

Commissioner McCreary has concern with the hill and sliding into the detention basin or sliding through the stop sign. During icy road conditions the steep slope could be dangerous. She questioned if there was any protection to keep someone from driving into the pond if it's icy. Mr. Perry responded that he pond will be landscaped. Commission Rickard stated that the Homeowner's Association will be responsible for maintaining the road and keeping it safe for vehicles.

Chairman Brown reviewed the Fire Department letter dated May 7, 2019. The fire department is requesting a water supply source, 4" address numbers, 26' wide road width with no parking, and reduction in the 10% slope. Mr. Perry responded that the request for water supply, 4" numbers and the 26' roads were also requested in 2016 but the Planning Commission did not require it. Mrs. VanMarter reviewed the minutes from 2016 and indicated that only the water supply requirement was excluded from the approval.

Commissioner Dhaenens stated that knowing what he knows now, he would be uncomfortable not making this Development meet current standards. We recently had the Moretti project provide a water source.

Mrs. VanMarter stated that recently a policy was discussed with the Fire Department in response to the Moretti project that all future all residential developments over 10 lots would need to provide the required water supply from the Fire Code. Since this project was approved before this

standard was in place and since the applicant is only seeking an amendment to the approved plan, the Planning Commission could determine that this project does not qualify. Commissioner Rauch stated this he believes this requirement for fire flow is completely inappropriate. This development if approved will be similar to 98% of our community. We are not risking public health safety or welfare if we allowed this as proposed.

Commission Mortensen stated that Townships are beginning to require this but since this one is an amendment to a pre-existing approved plan he is inclined to allow it.

Mr. Perry indicated that they can address items 2-4 in the fire department letter which includes the 26' wide road provided the water supply issue is not required.

A call to the public was made at 7:53pm with the following response:

Mrs. Bonnie Spicher of 5606 Mountain Road lives behind unit 9. She watched the trees be removed in one day with 2 machines. She doesn't think that anyone in this county ever wants to see clear cutting. She has been here 40 years and has never seen anything like it. The developer should have to do something to undo what he did. To clear cut a whole lot was unnecessary. She walked out and asked them to stop. It looked like a war zone. Some of the trees they removed 18" in diameter.

Mr. Keith Spicher of 5606 Mountain Road suggests that the Commissioners drive through copperleaf to see the impact of the clear cut. If you drive along Eggert they clear cut a few lots and it is a night and day difference. He requested clarification on that what is the tree protection fence is shown on the plan. Mr. Perry responded that it is essentially orange snow fencing. Mr. Spicher states that the original plans indicated they would be 128 feet from my property line with the tree clearing. Now they are going to be 50 feet cleared. This is not the character in the neighborhood.

Mr. John Septer of 5700 Eggert Place is concerned with the pink stakes and flags on his property. There are pink flags everywhere. He wants to know what the flags and stakes on his property mean. Mr. Wayne Perry stated that the corner of his property is where the northwest retention basin is proposed. Mr. Septer is very concerned for the impact all the tree removal will have on his property. He was considering putting his addition on his home and now is unsure if he should proceed. Mr. Perry offered to meet with Mr. Septer on site and to show him what the lines and markers are. Mr. Perry gave Mr. Septer his business card.

Commissioner McCreary indicated that she understands the concerns regarding the complete change in the look since the surrounding area was developed so long ago the trees in the area have already been reestablished and had time to grow.

The call to the public was closed at 8:11pm.

Moved by Commissioner Mortensen to recommend approval of the environmental impact assessment dated 4-5-19 for an amendment to a previously approved site plan and environmental

impact assessment for a proposed 15-unit, single family site condominium located north of Cunningham Lake Road and west of Sundance Trail, known as Mountain Top Estates. Supported by Commissioner Dhaenens

Motion carried unanimously.

Moved by Commissioner Mortensen to recommend approval of the final condominium site plan dated 4-5-19 for an amendment to a previously approved site plan and environmental impact assessment for a proposed 15-unit, single family site condominium located north of Cunningham Lake Road and west of Sundance Trail, known as Mountain Top Estates subject to:

- 1.) The Master Deed and Bylaws be revised to add a private road maintenance agreement if the present language is not consistent with Township Ordinance subject to review by staff.
- 2.) The requirements in the Township engineer letter of March (May) 7th, 2019 will be met and the Planning Commission supports the recommendations regarding the private road length, the easement width and the grading.
- 3.) The requirements of the Brighton Area Fire Department in their letter dated May 7, 2019 shall be met with the exception of the underground water storage. This requirement is recommended for waiver in view of the fact that this is an amendment and it was not a requirement in prior site plan approvals for this site.

The motion was supported for discussion by Commission Rauch. Commissioner Rauch would like to require a minimum tree requirement for each lot included in the motion. In addition, he requests additional plantings in that area in the northwest corner in response to the comments received from the adjacent property owner this evening.

Commissioner Mortensen then adds to the motion the following:

- 4.) Additional evergreen trees shall be added around the retention pond in the northwest of the site plan and this will be reviewed by Township Staff for approval.
- 5.) Each lot shall provide the required 2 street trees per the ordinance plus an additional 3 trees shall be provided elsewhere on the lot. These trees shall be shown on a landscape plan associated with each land use permit for new homes.

The revised motion was supported by Commissioner Rickard.

Motion carried unanimously

OPEN PUBLIC HEARING #2... Consideration of Zoning Ordinance Text amendments to Article 7 of the Zoning Ordinance, entitled "Commercial and Service Districts" and discussion of supporting amendments to Article 25.

Brian Borden presents the proposed amendments to Article 7. The changes involve both modifications to existing uses as well as new uses. The first changes are modifications to existing uses. The changes include: making child care centers a permitted use in RCD and to have the ordinance meet the state requirements for outdoor play area; making schools a special land use in the OSD district rather than a permitted use; vocational and technical training to be made a special land use in the OSD district; churches would be a permitted use in RCD since we allow other types of assembly uses in RCD; public and government buildings are added as permitted use in RCD and as a special land use in office. Auto service standards are updated to ensure

compliance with environmental standards in addition to the specific use conditions. New land uses added include brewpubs which would be allowed by right in GCD and RCD; microbrewery, small distillery and small winery would be special land uses in RCD and GCD; Climate controlled indoor commercial storage would be added as a Special Land Use in RCD and GCD with specific conditions; and upper floor dwelling units is also added as a special land use in OSD, NSD, and GCD all with specific conditions.

Article 25 amendments are also included as a supplement to the changes proposed in Article 7, but they were not published so they are not included in the action items for this evening. The changes to Article 25 will be on the next meeting's agenda.

Commissioner Rauch suggested that the 25% window and the door color requirement for the climate controlled indoor storage be given discretion by the Planning Commission and that should be written into the language. Mr. Borden stated that he would prefer for the discretion and ability to deviate being clear in the ordinance.

A call the public was made at 8:59pm with the following response:

Daniel Boorstein with SVI Properties, LLC addressed the Planning Commission. He suggests that the letter he wrote can be disregarded since he hadn't fully reviewed the proposed changes to the text. The difference in what he wants to propose as climate controlled indoor storage as compared to mini-storage is that there are not exterior access overhead doors. The Township's goal should be to limit the exterior overhead doors. You may also want to set back these buildings so they aren't right over Grand River Avenue. The only concern with windows in this building is to put them facing a major thoroughfare. Also, too many windows can impact the usability of the space if you require them on the rear exterior. You should consider balancing the use with distance off the road.

Ms. VanMarter added that the proposed definitions address the suggestion for limited outdoor access.

The call to public closed was at 9:12pm.

A. Recommendation of Amendments to Article 7.

Moved by Commissioner Mortensen to recommend to the Township Board approval of the proposed amendments to Article 7 provided that the ordinance is revised in regard to the climate controlled indoor storage to include the flexibility suggested by Commissioner Rauch as discussed this evening.

Supported by Commissioner Rickard.

The motion carried unanimously.

OPEN PUBLIC HEARING #3... Discussion regarding amendments to Article 11 of the Zoning Ordinance.

Ms. VanMarter briefly reviewed the proposed changes. There are many changes proposed to this section stemming from administering and enforcing the ordinance as well as changes often requested by residents. The additional 2-feet of fence height being requested is the single most requested revision staff receives from the community. Given the late hour of the meeting she suggested that the Commissioners review the changes and get back to her if they have any questions or concerns with what is being proposed.

Commissioner Dhaenens stated that charging stations and their associated solar panels for electric cars are coming. The solar charging stations are coming to retail parking lots in addition to homes. Mr. Borden suggested that we could add solar charging stations in parking lots in Article 14.

Commissioner Rauch questioned on if the changes to the permitted projections will make restrictions on small lake lots greater. Ms. VanMarter responded that when the 5 foot reduction change to the side yard setback was made years ago, the permitted projections were not considered and now allow projections as close as 2 feet to a side property line that could cause problems for maintenance and trespass so the proposed change is to ensure there is a minimum of 3 feet of setback in situations where a projection would extend into the required side yard.

Commissioner McCreary asked if there are any ordinances about docks that regulate size, shape, placement or construction? Ms. VanMarter indicated she will research other community ordinances in lake communities.

ADMINISTRATIVE BUSINESS:

Staff Report

Ms. VanMarter stated applications have been received for the June Planning Commission meeting from Enterprise and Masonite. In addition the Article 25 amendments as discussed this evening will be on the agenda.

Approval of the April 8, 2019 Planning Commission meeting minutes

Moved by Commissioner McCreary, seconded by Commissioner Dhaenens, to approve the minutes of the April 8, 2019 Planning Commission Meeting as presented. **The motion carried unanimously.**

Member Discussion

Commissioners Dhaenens and Rauch indicated that they will not be able to attend the June Meeting. Chairman Brown may also miss June's meeting but will do his best to attend. Ms. VanMarter indicated that all remaining members would need to attend the meeting or else the meeting would need to be cancelled due to lack of quorum. Commissioner Rickard indicated she is unable to attend the July meeting.

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Adjournment

Moved by Commissioner Dhaenens, seconded by Commissioner Rickard, to adjourn the meeting at 9:33 pm. **The motion carried unanimously.**

Respectfully Submitted,

Kelly VanMarter, Recording Secretary