

**HOWELL TOWNSHIP PLANNING COMMISSION**

**SPECIAL MEETING**

3525 Byron Road

Howell, MI 48855

April 2, 2024

6:30 pm

1. Call to Order
2. Roll Call:       ( ) Wayne Williams - Chair               ( ) Denise Markham  
                      ( ) Robert Spaulding – Vice Chair   ( ) Paul Pominville  
                      ( ) Mike Newstead – Secretary       ( ) Tim Boal  
                      ( ) Matthew Counts – Board Rep.
3. Pledge of Allegiance
4. Approval of the Agenda:  
   Planning Commission Special Meeting: April 2, 2024
5. Approval of the Minutes:  
   Regular Meeting December 19, 2023
6. Zoning Board of Appeals Report:
7. Township Board Report:
8. Scheduled Public Hearings  
   A. None
9. Other Matters to be Reviewed by the Planning Commission:  
   A. Officer Elections
10. Old Business:  
    A. Solar Ordinance - Discussion
11. New Business:  
    A. Old Glory, File # PC2024-03, 4120 W. Grand River Ave. Parcel # 4706-20-201-015.  
       Preliminary Site Plan Review  
  
    B. ADU Ordinance – Discussion
12. Call to the Public:
13. Adjournment

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**HOWELL TOWNSHIP PLANNING COMMISSION**  
**UNAPPROVED MINUTES DECEMBER 19, 2023, 6:30 P.M.**  
**3525 BYRON RD. HOWELL TOWNSHIP HALL, HOWELL MI 48855 (517-546-2817)**

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**MEMBERS PRESENT:**

Wayne Williams      Chairman  
 Robert Spaulding      Vice-Chair  
 Matthew Counts      Board Rep  
 Mike Newstead      Commissioner  
 Tim Boal      Commissioner

**MEMBERS ABSENT:**

Denise Markham      Commissioner  
 Paul Pominville      Commissioner

Also in attendance: Zoning Administrator Joe Daus, Township Planner Anna Wysocki

**The meeting was called to order at 6:30 p.m. The roll was called.**

**APPROVAL OF AGENDA: MOTION** by Spaulding, second by Boal, **“To approve the November 21, 2023 Planning Commission Agenda”** Motion carried.

**APPROVAL OF MINUTES: MOTION** by Newstead, second by Boal, **“To approve the October 24, 2023, November 14, 2023, and the November 21, 2023 Planning Commission minutes”** Motion carried.

**TOWNSHIP BOARD REPORT:** The synopsis of the Township Board Meeting were attached. Wayne Williams noted that the Board voted to deny the Special Use Permit for the gas station at Burkhart and Mason Road. There were no other questions.

**ZONING BOARD OF APPEALS REPORT:** Joe Daus reported that the ZBA had one item on the agenda, it was to allow for an accessory structure in front of the rear line of the house. It was approved.

**ZONING ADMINISTRATOR REPORT:** Monthly Permit list was attached, there were no questions

**OLD BUSINESS:**

**A.** Michigan Storage Barns, File# PC2023-06, 675 E. Highland Road, Howell, Parcel ID# 4706-25-200-011. Preliminary / Final Site Plan review.

Township Planner Anna Wysocki reviewed her report on the proposed site plan. Robert Spaulding had a question on parking. The applicant’s engineer Tim Zimmer & the applicant addressed the planners concerns, and the question on parking. A discussion followed.

**Motion** by Boal, second by Newstead **“To approve the preliminary / final site plan for Michigan Storage Barns, file# PC2023-06, 675 E Highland Road, Howell, parcel 4706-25-200-011 subject to the condition in the planers report date and the engineers report”** Motion carried, 5 yes, 0 no.

**B.** Mason & Burkhart, LLC. Request to amend Heritage Square approved Preliminary/PUD site plan, file# PC2023-13, Parcel #4706-32-400-013, vacant land on Mason Road and Burkhart Road.

Township Planner Anna Wysocki reviewed the proposed project, the EGLE report and BARR Engineering report. The applicant’s engineer Kevin McDevitt & the applicant addressed the planners concerns, and took question from the Board members. Discussion followed.

**Motion** by Counts second by Newstead **“To recommend approval to the Township Board for the amendment to the Heritage Square preliminary/PUD site plan File# PC2023-13, Parcel# 4706-32-400-013, subject to the planners report of November 19, 2023”** Spaulding – Yes, Boal – No, Williams – Yes, Newstead – Yes, Counts – Yes. Motion carried, 4 yes, 1 no.

**NEW BUSINESS:**

**A.** Public Hearing for Joss Construction, Requesting a rezoning from AR - Agricultural Residential to SFR – Single Family Residential. File #PC2023-011, Parcel #4706-22-100-014, and 4706-22-100-016. Vacant land located on Tooley and Bowen Roads.

**Motion** by Newstead second by Counts **“To open the public hearing.”** Motion carried, 5 yes, 0 no.

Township Planner Anna Wysocki presented her report on the request. Chairmen Williams invited comments from the public. Mark Gorski 2990 Bowen Rd, stated that we was concerned with the density, and the homes being built in his back yard. The applicant gave a brief over view of the proposed project. Steve Ripper 2851 Bowen Road, Stated is concerns with the extra traffic on the gravel road. Greg Lehr 2530 Tooley Road, concerned with the traffic at the intersection of Tooley and Bowen Roads. Michael Wetherbee 2520 Tooley, water draining from the airport, the power outages, and the infrastructure the will need work. Ron Rowse 2484 Tooley Road, also concerned with the infrastructure, and the water coming off the airport, and the power issues. George Hillman 3730 Bowen, ask about the past zoning, and if they would pay the same tap fees and assessments as the rest of the residents in the area.

**Motion** by Counts second by Newstead **“To close the Public Hearing”** Motion carried 5 yes. 0 no.

Discussion followed.

**Motion** by Newstead second by Spaulding **“To recommend approve Joss Construction request to rezone from AR-Agricultural Residential to SFR-Single Family Residential, File 3PC2023-011, Parcel ID #4706-22-100-014 & 4706-22-100-016”**

Motion did not carry, 3 yes, 2 no.

**B.** Public Hearing for Springborn Properties, Requesting a rezoning from OS – Office Service to NSC Neighborhood Service Commercial, File #PC2023-012, Parcel #4706-25-200-047, and 4706-25-200-048. Vacant land on Oak Grove Road and Highland Road.

Township Planner Anna Wysocki presented her report on the request.

**Motion** by Counts second by Newstead **“To open the public hearing.”** Motion carried, 5 yes, 0 no.

Patrick Cleary, the engineer for the applicant explained the need for the rezoning. There were question from the PC members. Chairmen Williams invited comments from the public. David lynch 195 E. Highland Road, he is concerned about noise and light. John Mills 1750 Oak Grove road, he is in favor of the propped use.

**Motion** by Newstead second by Counts **“To close the Public Hearing”** Motion carried, 5 yes, 0 no.

**Motion** by Newstead second by Spaulding **“To recommend approval of Springborn Properties to rezone from OS – Office Service to NSC – Neighborhood Service Commercial, File #PC2023-016, Parcel #4706-25-200-047 and 4706-25-200-048 based on the planners report dated December 15, 2023.”** Motion carried 5 yes. 0 no.

**C.** Soapy Bucket Carwash, File #PC2023-016, Parcel ID# 4706-25-200-048. Final Site Plan.

Township Planner Anna Wysocki presented her report on the proposed project. Patrick Cleary, the engineer for the applicant, and the applicant reported on the site plan and the planners concerns. Discussion followed.

**Motion** by Counts, second by Newstead **“To approve the final site plan for Springborn Properties, file# PC2023-016, parcel 4706-25-200-048 subject to the condition in the planers report date December 12, 2023 and the engineers report dated December 14, 2023 and accepting the landscape plan as presented”** Motion carried, 5 yes, 0 no.

**OTHER BUSINESS:** Discussion on sidewalks.

**CALL TO THE PUBLIC:** Evan Sasiela, introduced himself, he is a reporter for the Livingston Daily, if we ever have any information that we like to share we can contact him.

**ADJOURNMENT:** Meeting adjourned at 9:25 P.M.

Approved: \_\_\_\_\_

Mike Newstead, Secretary \_\_\_\_\_

As Presented: \_\_\_\_\_

Dated: \_\_\_\_\_

As Amended: \_\_\_\_\_

As Corrected: \_\_\_\_\_

HOWELL TOWNSHIP BOARD  
March 4, 2024  
Regular Meeting  
Synopsis

The March 4, 2024 Howell Township regular meeting, held at the Township Hall, 3525 Byron Road, was called to order by Supervisor Coddington at 6:30 PM. Members present: Coddington, Daus, Hohenstein, Melton, Wilson. The following actions were taken: 1) Approved the agenda 2) Approved the February 12, 2024 Regular Board meeting minutes as amended 3) Approved the bid from Sprungtown Outdoor Services for cemetery maintenance 4) Approved the 2024 road projects for Layton Road and Bowen Road 5) Approved the bid to treat the Township Hall walking path 6) Approved the water utility consent and franchise agreement with Oceola Township 7) Approved the sewer utility consent and franchise agreement with Oceola Township 8) Approved the extraterritorial sewer and water agreement with Operating Engineers Local 324 9) Accepted the HR Committee's recommendations 10) Approved sending the ADU Ordinance to the Planning Commission 11) Approved the contract for flag services for the Township 12) Accepted the disbursements and customary payments for the month 13) Adjourned at 8:00 pm

Tanya Davidson  
Recording Secretary



**Carlisle | Wortman**  
ASSOCIATES, INC.

117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

**TO:** Howell Township Planning Commission

**FROM:** Paul Montagno, AICP, Principal Planner  
Grayson Moore, Community Planner

**DATE:** March 21, 2024

**RE:** New Renewable Energy Legislation

This memorandum is a brief overview of the state’s new renewable energy policies as we currently understand them. The policies are complex and include some gray areas that will hopefully be clarified in the coming months. Please note that this document should not be interpreted as legal advice.

On November 28, 2023, Governor Whitmer signed a package of bills meant to streamline the permitting process for large, utility-scale wind, solar and energy storage facilities, diversify Michigan’s sources of electricity, and promote the use of clean and renewable energy resources. The new legislation consists of three separate bills that are outlined in the table below.

PA 233 of 2023 is significant because it preempts local governments’ authority over the siting and permitting of utility-scale renewable energy facilities, which is typically exercised by zoning. As of Nov 29 2024, developers will have the option to apply directly to the Michigan Public Service Commission (MPSC) for review and approval under certain circumstances. Local governments may still regulate utility-scale wind, solar and energy storage facilities if they adopt a “compatible renewable energy ordinance” (CREO), which cannot be more restrictive than PA 235 of 2023. However, if the MPSC finds that a local government failed to comply with the Act’s requirements, the CREO status will be lost.

Act	Effective Date
<b>Public Act 233 of 2023:</b> Establishes the review procedures and siting requirements for utility scale wind, solar, battery storage facilities that both the state and local governments that retain review control must follow. (Part 8 of the Clean and Renewable Energy and Energy Waste Reduction Act)	November 29, 2024
<b>Public Act 234 of 2023:</b> Amends the Michigan Zoning Enabling Act (MCL 125.3205) so that zoning is subject to the new Part 8, grants nonconforming status to renewable facilities approved on or after January 1, 2021.	February 13, 2024
<b>Public Act 235 of 2023:</b> Sets benchmarks for the percentage of energy that must come from renewable or clean sources within the next decade and beyond.	February 27, 2024

Benjamin R. Carlisle, *President* Douglas J. Lewan, *Executive Vice President* John L. Enos, *Vice President*  
David Scurto, *Principal* Sally M. Elmiger, *Principal* R. Donald Wortman, *Principal*  
Paul Montagno, *Principal*, Megan Masson-Minock, *Principal*, Laura Kreps, *Principal*  
Richard K. Carlisle, *Past President/Senior Principal*

Utility-scale facilities are defined by the following “nameplate capacity” thresholds, which are the facility’s designed sustained energy output. To provide context to the land required for these type of system, acreage estimates are provided after each system nameplate capacity. These areas are greatly influenced by site topography, wetlands and vegetation so sizes should be considered broad estimates.

- Any solar energy facility with a nameplate capacity of 50 megawatts or more. Approximately 400-500 acres.
- Any wind energy facility with a nameplate capacity of 100 megawatts or more. Approximately 650 acres

Any energy storage facility with a nameplate capacity of 50 megawatts or more and an energy discharge capability of 200 megawatt hours or more. Approximately 5 acres,

PA 235 of 2023 also appears to require an unprecedented level of coordination between all effected local governments. It is important to note that a single renewable energy facility may be located on more than one parcel of land, including noncontiguous parcels, and across municipalities. While still a gray area, the language in the Act suggests that *all* effected local units of governments (counties, townships, villages and cities) must have a CREO in effect in order to require local review.

Local governments are now faced with several considerations in light of the new legislation:

1. Should we adopt a CREO and retain local review authority over utility-scale renewable facilities and should it only mirror the states limited requirements?
2. Don’t adopt a CREO and leave utility-scale renewable facility review to the MPSC.
3. Should we adopt regulations for wind, solar, battery storage facilities that are under the PA 235 of 2023 capacities and if so, with what regulations/requirements in place?
  - Howell Township has ordinances for wind and solar that would apply to facilities that are under the capacities, but no regulations for battery energy storage. Previously we were working on updates to the wind and solar sections related to utility scale production and as accessories to commercial and residential use.

While there are many factors to consider, PA 235 of 2023 offers local governments two financial benefits for complying with the MPSC review process. Only one benefit is available under a compliant local review.

1. *Available only under MPSC review:* Applicants will be required to make a 1-time grant to each affected local unit for an amount not more than \$75,000 per affected local unit and not more than \$150,000 in total as determined by the MPSC.
2. *Available under MPSC review or compliant local review:* Applicants must enter into a host community agreement to pay each affected local unit \$2,000 per megawatt of nameplate capacity located within the affected local unit. The payment shall be used as determined by the affected local unit for police, fire, public safety, other infrastructure, or for other projects. If an affected local unit refuses to enter into a host community agreement after good-faith negotiations, the applicant may enter into a community benefits agreement with 1 or more community-based organizations within, or that serve residents of, the affected local unit.

We offer the following additional consideration:

- Howell could develop a two-tier ordinance that addresses both utility scale and sub utility scale renewable energy facilities.
- Facilities that are under the utility scale renewable energy facilities as defined by the act can be regulated with total local control so long as regulations are substantiated and reasonable.
- While not clear at this time, we feel municipalities could use zoning, overlay and special land use tools to regulate the placement of both facilities. Should it be determined that utility scale renewable energy facilities can be regulated by zoning mechanisms, the community will be prepared with regulations in place. If it is determined that these tools are not permissible for utility scale systems, the community can quickly amend that portion of the ordinance as opposed to being rushed into developing geographic designations for the sites.
- The act is also silent on screening. Screening requirements could also be added to a local CREO but could be quickly amended if it is determined that these regulations are not permissible for utility scale systems.

It is important for communities that want to retain local control to adopt the necessary regulations, and coordinate with their neighbors, before November 29, 2024.

Additionally, we are prepared to help Howell coordinate with its neighbors to draft consistent regulations under the new state requirements.

We have attached a draft ordinance that would take the two-tiered approach for your consideration if the township decides to do in this direction. Once you have provided direction we will coordinate the language that we have previously developed for accessory wind and solar with any changes to the production scale regulations and provide a complete proposed amendment.

We look forward to discussing this with you at the next Planning Commission meeting.

Respectfully submitted,

  
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**CARLISLE/WORTMAN ASSOC., INC.**  
Paul Montagno, AICP  
Principal

  
\_\_\_\_\_  
**CARLISLE/WORTMAN ASSOC., INC.**  
Grayson Moore  
Community Planner

## Edit Schedule of Uses Section

## Edit Definitions Section

### *Renewable Energy Definitions*

1. *Abandonment*: Any renewable energy system or facility that is no longer producing power over a consecutive 12-month period of time.
2. *Decommission*: To remove and/or retire a renewable energy system or facility from active service.
3. *Facility Boundary*. The boundary around a parcel, multiple parcels, or portions thereof, leased or purchased for the purposes of operating a renewable energy facility.
4. *Nameplate Capacity*: The designed full-load sustained generating output of an energy facility. This is determined by reference to the sustained output of an energy facility even if components of the energy facility are located on different parcels, whether contiguous or noncontiguous.
5. *Nonparticipating Property*: A property that is adjacent to an energy facility and that is not a participating property.
6. *Occupied Community Building*: a school, place of worship, day-care facility, public library, community center, or other similar building that the applicant knows or reasonably should know is used on a regular basis as a gathering place for community members.
7. *Solar Array*: A collection of solar panels, wired together to generate electricity from the sun.
8. *Renewable Energy Facilities*: A facility where the principal design, purpose, or use is to provide renewable energy via wind, solar and/or storage to off-site uses or the wholesale or retail sale of generated electricity.
9. *Renewable Energy Systems*: A device, and/or components designed to generate renewable energy.
10. *Wind Energy Conversion System (WECS)*: Any device such as a turbine, windmill, or charger that converts wind energy to a usable form of energy.

**Section 16.23**

A. Intent. Renewable Energy Facilities may only be permitted in (choose existing zones or overlay / overlay recommended). The following regulations are intended to ensure the interests of the landowner and the Township are achieved harmoniously with no negative effect to the long-term viability of the subject property or those surrounding it. In the overlay or zoning districts where this special land use is permitted, facilities for the capture, storage, and distribution of renewable energy for commercial purposes are subject to the following standards:

1. Facility Boundary. The facility boundary may cross road rights-of-way, but required setbacks shall be provided and calculated on each side of any such road where pertinent.
2. Regulation Schedules. All renewable energy facilities with nameplate capacities at or above the thresholds defined below shall use Schedule A. All other renewable energy facilities shall use Schedule B.
  - Solar: 50 megawatt capacity or more.
  - Wind: 100 megawatt capacity or more.
  - Energy Storage: 50 megawatts or more and an energy discharge capacity of 200 megawatt hours or more.
3. Schedule A: Sites of this scale shall conform to the regulations outlined below.
  - a. Solar
    - i. Minimum Setbacks: Measured from the nearest edge of the perimeter fencing of the facility.

Occupied Community Building / Dwellings on Nonparticipating Properties	300 feet from nearest point on the outer wall
Public Road ROW	50 feet measured from the nearest edge of a public road ROW
Nonparticipating Parties	50 feet measured from the nearest shared property line

- ii. Fencing: Complies with the latest version of the National Electric Code as of the effective date of the amendatory act that added this section or any applicable successor standard approved by the Planning

Commission as reasonable and consistent with the purposes of this subsection.

- iii. Height: Solar panel components do not exceed a maximum height of 25 feet above ground when the arrays are at full tilt.
- iv. Sound: The solar energy facility does not generate a maximum sound in excess of 55 average hourly decibels as modeled at the nearest outer wall of the nearest dwelling located on an adjacent nonparticipating property. Decibel modeling shall use the A- weighted scale as designed by the American National Standards Institute.
- v. Dark Skys: The solar energy facility will implement dark sky-friendly lighting solutions.
- vi. Additional Planning Commission Requirements: The solar energy facility will comply with any more stringent requirements adopted by the Planning Commission. Before adopting such requirements, the Planning Commission must determine that the requirements are necessary for compliance with state or federal environmental regulations.

b. Wind

- i. Minimum Setbacks: Measured from the center of the base of the wind tower:

Occupied community buildings and residences on nonparticipating properties	2.1 times the maximum blade tip height to the nearest point on the outside wall of the structure
Residences and other structures on participating properties	1.1 times the maximum blade tip height to the nearest point on the outside wall of the structure
Nonparticipating property lines	1.1 times the maximum blade tip height
Public road right-of-way	1.1 times the maximum blade tip height to the center line of the public road right-of-way
Overhead communication and electric transmission, not including utility service lines to individual houses or outbuildings	1.1 times the maximum blade tip height to the center line of the easement containing the overhead line

- ii. Placement: Each wind tower is sited such that any occupied community building or nonparticipating residence will not experience more than 30 hours per year of shadow flicker under planned operating conditions as indicated by industry standard computer modeling.
- iii. Height: Each wind tower blade tip does not exceed the height allowed under a Determination of No Hazard to Air Navigation by the Federal Aviation Administration under 14 CFR part 77.
- iv. Sound: The wind energy facility does not generate a maximum sound in excess of 55 average hourly decibels as modeled at the nearest outer wall of the nearest dwelling located on an adjacent nonparticipating property. Decibel modeling shall use the A-weighted scale as designed by the American National Standards Institute.
- v. Lighting: The wind energy facility is equipped with a functioning light-mitigating technology. To allow proper conspicuity of a wind turbine at night during construction, a turbine may be lighted with temporary lighting until the permanent lighting configuration, including the light-mitigating technology, is implemented. The Planning Commission may grant a temporary exemption from the requirements of this subparagraph if installation of appropriate light-mitigating technology is not feasible. A request for a temporary exemption must be in writing and state all of the following:
  - a. The purpose of the exemption.
  - b. The proposed length of the exemption.
  - c. A description of the light-mitigating technologies submitted to the Federal Aviation Administration.
  - d. The technical or economic reason a light-mitigating technology is not feasible.
  - e. Any other relevant information requested by the Planning Commission.
- vi. Radar: The wind energy facility meets any standards concerning radar interference, lighting, subject to subparagraph (v), or other relevant issues as determined by the Planning Commission.
- vii. Additional Planning Commission Requirements: The wind energy facility will comply with any more stringent requirements adopted by the Planning Commission. Before adopting such requirements, the Planning Commission must determine that the requirements are

necessary for compliance with state or federal environmental regulations.

c. Energy Storage Facilities

- i. Minimum Setbacks: Minimum setback requirements, with setback distances measured from the nearest edge of the perimeter fencing of the facility.

Occupied Community Building / Dwellings on Nonparticipating Properties	300 feet from nearest point on the outer wall
Public Road ROW	50 feet measured from the nearest edge of a public road ROW
Nonparticipating Parties	50 feet measured from the nearest shared property line

- ii. Installation: The energy storage facility complies with the version of NFPA 855 "Standard for the Installation of Stationary Energy Storage Systems" in effect on the effective date of the amendatory act that added this section or any applicable successor standard adopted by the Planning Commission as reasonable and consistent with the purposes of this Subsection.
- iii. Sound: The energy storage facility does not generate a maximum sound in excess of 55 average hourly decibels as modeled at the nearest outer wall of the nearest dwelling located on an adjacent nonparticipating property. Decibel modeling shall use the A weighted scale as designed by the American National Standards Institute.
- iv. Dark Skys: The energy storage facility will implement dark sky friendly lighting solutions.
- v. Additional Planning Commission Requirements: The energy storage facility will comply with any more stringent requirements adopted by the Planning Commission. Before adopting such requirements, the Planning Commission must determine that the requirements are necessary for compliance with state or federal environmental regulations.

- d. Site Plans. A site plan required under Public Act Section 223 or 225 shall meet application filing requirements established by Planning Commission

rule or order to maintain consistency between applications. The site plan shall include the following:

- i. The location and a description of the energy facility.
- ii. A description of the anticipated effects of the energy facility on the environment, natural resources, and solid waste disposal capacity, which may include records of consultation with relevant state, tribal, and federal agencies.
- iii. Additional information required by Planning Commission rule or order that directly relates to the site plan.

4. Regulation Schedule B / Special Land Uses

a. Solar and Storage Facilities

- i. Setbacks. The solar and storage renewable energy facility setback requirements are found in the table below. All accessory equipment shall be subject to the same requirements. Setback requirements for all yards may be increased or decreased by the Planning Commission based upon impacts to existing land uses and/or zoning of adjacent properties.

District	Insert with Overlay Requirements or refer to Zoning designation standards / Can separate storage and solar into different standards if needed		
Adjacent Properties	Residential Land Uses	Place of Worship or Public Institutional Land Uses	All Other Land Uses
Front Yard Setback (adjacent to right-of-way)	300ft from nearest dwelling unit or 100ft from property line whichever is greater	100ft from property line	50ft from property line
Side Yard Setback	300ft from nearest dwelling unit or 100ft from property line whichever is greater	100ft from property line	50ft from property line
Rear Yard Setback	300ft from nearest dwelling unit or 100ft from property line whichever is greater	100ft from property line	50ft from property line

In instances where the renewable energy facility is comprised of multiple parcels, these setbacks shall apply to the exterior perimeter of all adjoining parcels. All setback distances are measured from the

property line, or nearest point of a dwelling unit, to the closest point of the renewable energy system. Should the nearest component of the renewable energy system be a solar or photovoltaic array, the measurement shall be taken from the array at minimum tilt.

- ii. Lot Coverage. The area of the renewable solar energy facility and any associated accessory structures shall not exceed 75% of the square footage of the entire site within the facility boundary. Impervious surfaces for the purpose of calculating lot coverage for renewable solar energy systems include, but are not limited to, mounting pads, footings, concrete or asphalt driveways and walkways, and accessory structures.

The area of the renewable storage energy facility and any associated accessory structures shall not exceed 50% of the square footage of the entire site within the facility boundary. Impervious surfaces for the purpose of calculating lot coverage for renewable storage energy systems include, but are not limited to mountings pads or structure foundations, concrete or asphalt driveways and walkways, and accessory structures.

- iii. Height. The height of the renewable solar energy system and any mounts, buildings, accessory structures, and related equipment must not exceed twenty-five (25) feet when orientated at maximum tilt. Lightning rods may exceed twenty-five (25) feet in height, but they must be limited to the height necessary to protect the solar energy system from lightning and clearly shown in site plan proposals.

The height of the renewable storage energy system or any structure constructed to enclose the system shall not exceed thirty (30) feet.

- iv. Screening. Screening is required around the entire facility boundary perimeter to obscure, to the greatest extent possible, the solar or storage renewable energy system from all adjacent properties. Screening standards set forth in Section 28.03 A. shall be applied to all solar and storage renewable energy facilities. Each owner, operator, or maintainer of solar or storage renewable energy facility to which this ordinance applies shall utilize good husbandry techniques with respect to said vegetation, including but not limited to, proper pruning, proper fertilizer, and proper mulching, so that the vegetation will reach maturity as soon as practical and will have maximum density in foliage.

Dead or diseased vegetation shall be removed and must be replanted at the next appropriate planting time. Applicant agrees to submit an acceptable and reasonable long term landscape maintenance plan prior to final approval. The Planning Commission may modify these requirements if it reasonable determines it necessary as it relates to proposed placement of renewable energy systems and adjacent land uses and/or zoning.

- v. Fencing. The facility boundary perimeter of a solar or storage renewable energy facility shall be completely enclosed by a lock gated perimeter fence at least eight (8) feet in height and in accordance with the other relevant Fencing and Protective Screening language of Section 14.26, 14.27, 28.08 and 28.09 of the Township Zoning Ordinance Additional fencing may be required for screening or security purposes in cases where the Planning Commission deems necessary. All fencing must comply with the latest version of the National Electrical Code.
- vi. Glare. Solar renewable energy systems must be placed and oriented such that concentrated solar radiation or glare does not project onto roadways and nearby properties. Applicants have the burden of proving any glare produced does not cause annoyance, discomfort, or loss in visual performance and visibility. An analysis by a qualified professional third-party, mutually agreeable by both the Township and applicant, shall be required to determine if glare from the Utility-scale solar energy system will be visible from nearby residents and roadways. The analysis shall consider the changing position of the sun throughout the day and year, and its influence on the solar renewable energy system.
- vii. Drainage and Stormwater. Renewable solar and storage energy facilities shall not increase stormwater runoff onto adjacent properties. The application shall include a drainage plan prepared by a registered civil engineer showing how stormwater runoff shall be managed and demonstrating that runoff from the site shall not cause undue flooding. Any necessary permits from outside agencies for off-site discharge shall be provided. It should also be demonstrated that maintenance procedures and products will not introduce chemicals or create detrimental impacts to the natural environment, groundwater, and wildlife.
- viii. Noise. Solar and storage facilities must conform to Section 14.45.B.

- ix. Code Compliance. All renewable storage energy facilities, all dedicated use buildings, and all other buildings or structures that (1) contain or are otherwise associated with a renewable storage energy facility and (2) subject to the Building Code shall be designed, erected, and installed in accordance with all applicable provisions of the Building Code, all applicable state and federal regulations, and industry standards as referenced in the Building Code and the Oxford Township Zoning Ordinance.
  
- b. Wind Energy Conversion System (WECS)
  - i. Design Safety Certification. The safety of the design of all WECS structures shall comply with all current applicable State of Michigan guidelines and standards.
  
  - ii. Interference. All WECS structures shall be certified by the manufacturer to minimize or mitigate interference with existing electromagnetic communications, such as radio, telephone, microwave or television signals.
  
  - iii. Setbacks. The distance between a WECS and the nearest property line and/or nearest road right of way shall be at least one and one-half (1.5) times the height of the WECS. No part of the WECS structure, including guy wire anchors, may extend closer than ten (10) feet to the owner's property line.

All accessory equipment shall at least one hundred (100) feet from the nearest property line. Setback requirements for all yards may be increased or decreased by the Planning Commission based upon impacts to existing land uses and/or zoning of adjacent properties.
  
  - iv. Shadow Flicker. Each wind tower is sited such that any occupied community building or nonparticipating residence will not experience more than 30 hours per year of shadow flicker under planned operating conditions as indicated by industry standard computer modeling.
  
  - v. Height. Each wind tower blade tip does not exceed the height allowed under a Determination of No Hazard to Air Navigation by the Federal Aviation Administration under 14 CFR part 77.

- vi. Lighting. The WECS is equipped with a functioning light-mitigating technology. To allow proper conspicuity of a wind turbine at night during construction, a turbine may be lighted with temporary lighting until the permanent lighting configuration, including the light-mitigating technology, is implemented. The Planning Commission may grant a temporary exemption from the requirements of this subparagraph if installation of appropriate light-mitigating technology is not feasible. A request for a temporary exemption must be in writing and state all of the following:
  - a. The purpose of the exemption.
  - b. The proposed length of the exemption.
  - c. A description of the light-mitigating technologies submitted to the Federal Aviation Administration.
  - d. The technical or economic reason a light-mitigating technology is not feasible.
  - e. Any other relevant information requested by the Planning Commission
- vii. Guy Wires. If an on-site WECS is supported by guy wires, the wires shall be clearly visible to a height of at least six (6) feet above the guy wire anchors.
- viii. Fencing. Facilities shall be completely enclosed by a lock gated perimeter fence at least eight (8) feet in height and in accordance with the other relevant Fencing and Protective Screening language of Section 14.26, 14.27, 28.08 and 28.09 of the Township Zoning Ordinance. Additional fencing may be required for screening or security purposes in cases where the Planning Commission deems necessary. All fencing must comply with the latest version of the National Electrical Code.
- ix. Noise. WECS facilities must conform to Section 14.45.B.
- x. Color. Towers and blades shall be a non-reflective neutral color.
- xi. Controls and Brakes. All commercial WECS structures shall be equipped with manual and automatic controls to limit rotation of blades to a speed below the designed limits of the WECS. The Professional Engineer must certify that the rotor and overspeed control design and fabrication conform to applicable design standards. No changes or alterations from certified design shall be permitted unless accompanied by a Professional Engineer's statement of certification.

- xii. Compliance with FAA. It shall be the responsibility of the applicant to obtain the appropriate FAA permits for the WECS structure, or to obtain a determination of no significant impact to air navigation from the FAA.
  - xiii. Climb Prevention. All commercial WECS structures must be protected by anti-climbing devices.
  - xiv. Warning Signage. A visible warning sign of High Voltage is required to be placed at the base of all commercial WECS structures. Such signs shall also be located at all points of site ingress and egress.
- c. Standards for all Schedule B Renewable Energy Facilities
- i. Abandonment, Removal, Repowering and/or Maintenance. If a renewable energy facility ceases to perform its intended function (generating electricity) for more than 12 consecutive months, the operator shall remove all associated equipment and facilities no later than 90 days after the end of the 12-month period. Where the removal has not been lawfully completed as required above, and after at least 30 days' written notice, the Township may remove or secure the removal of the renewable energy facility and/or system or if due to abandonment and/or negligence to maintain, the Township shall have the right to enter the site for the reason of repowering the facility, in cases where repairs or replacements to the renewable energy system components are necessary, in order to properly maintain the system. The Township's actual cost and reasonable administrative charges to be covered by the operator's security bond. Charges may include the procurement of a contractor with the expertise to oversee and execute the entire set of repairs and/or maintenance to restore the site to its original capacity. Any costs incurred by the Township above and beyond the value of the security bond will be the responsibility of the operator.
  - ii. Decommissioning. The ground shall be restored to its original condition within 60 days of removal of structures. The restoration will include returning all soil within the facility to its original environmental state of which record must be taken prior to the commencement of construction. Acceptable ground covers include grasses, trees, crops, or other material demonstrated to be characteristic of the surrounding land. All above and below ground materials shall be removed when the renewable energy facility and/or system is decommissioned. All

installed landscaping and greenbelts shall be permitted to remain on the site as well as any reusable infrastructure as determined by the Township. These can include service drives, utilities, etc.

- iii. Surety. A letter of credit, cash deposit, or other security instrument found acceptable to the Township Board will be posted by the owner(s) and/or operator of the Utility-scale solar energy facility shall post a security instrument in a form acceptable to the Township equal to one-hundred fifty (150) percent of the total estimated decommissioning and/or reclamation costs. The cost of decommissioning shall be re-reviewed and submitted to the Township annually to ensure adequate funds are allocated for decommissioning. The Township shall have the right to evaluate the security instrument defined herein, at least every five (5) years to assess whether it should be appropriately adjusted to reflect the current decommissioning estimate.

The applicant shall engage a certified professional engineer acceptable to the Township to estimate the total cost of decommissioning all structures in the facility in accordance with the requirements of this Ordinance, including reclamation to the original site conditions.

A security bond, if utilized, shall be posted and maintained with a bonding company licensed in the State of Michigan or a Federal or State-chartered lending institution acceptable to the Township.

Any bonding company or lending institution shall provide the Township with 90 days' notice of the expiration of the security bond. Lapse of a valid security bond is grounds for the actions defined below.

If at any time during the operation of the renewable energy facility or prior to, during, or after the sale or transfer of ownership and/or operation of the facility the security instrument is not maintained, the Township may take any action permitted by law, revoke the special land use, order a cessation of operations, and order removal of the structure and reclamation of the site.

In the event of sale or transfer of ownership and/or operation of the renewable energy facility, the security instrument shall be maintained throughout the entirety of the process. The security instrument shall be maintained until decommissioning and

removal has been completed to the satisfaction of the Township.

- iv. Provision of Manufacturers' Safety Data Sheet(s). The applicant must submit manufacturer safety data sheets for all proposed equipment. If approval is granted, applicant must provide the Township with finalized manufacturer safety data sheets both to be kept on record at with the Township and on-site in a clearly marked waterproof container. Applicants must provide updated manufacturer data sheets whenever equipment is modified so that all records are up to date. Documentation shall include the type and quantity of all materials used in the operation of all equipment.
- v. Fire Response. All electrical equipment associated with and necessary for the operations of the facility shall comply with all local and state codes. All design and installation work shall comply with all applicable provisions of the National Electrical Code (NEC).

The applicant shall provide training, at no cost to the Township, before, approximately halfway through and after construction for all emergency service departments serving the Township. Including all other requirements for permits, all three trainings must have been completed to receive final permits. Trainings upon the completion and during the operation of the renewable energy facility will be conducted upon the request of all emergency service departments but not exceed four (4) trainings per any given twelve (12) month period.

The applicant shall provide a set of procedures and protocols for managing risk or fire and for responding in the event of an emergency at the facility. It will be the burden of the applicant to ensure said procedures and protocols provided to the various emergency service departments is the most up to date version.

Special equipment that may be required to ensure the safety of fire and rescue personnel when responding to an emergency at the facility shall be provided at no cost to the Township prior to commencement of construction of the facility. The authority to determine whether, and what type of, special equipment is needed shall be with the fire and/or rescue department(s) serving the Township.

The applicant shall provide for and maintain reasonable means of access for emergency services. Lock boxes and keys shall be provided

at locked entrances for emergency personnel access. If any adjoining properties are damaged as a result of ingress/egress to the facility, the applicant shall remedy all damages in full.

- vi. Anticipated Construction Schedule. Applicant must provide an anticipated construction schedule which highlights when potentially hazardous materials will be brought on-site and installed.
- vii. Permits. Applicant must coordinate with all applicable agencies for required permitting including but not limited to the Oakland County Road Commission and/or Michigan Department of Transportation (MDOT) Oakland County Drain Commission, Environmental Protection Agency (EPA), Michigan Department of Environment, Great Lakes and Energy (EGLE), etc.
- viii. Photographic Record. Applicant must submit a complete set of photos and video of the entire development area prior to construction. This will be used as historical documentation for the township to secure and refer to if/when decommissioning and redevelopment activities take place.
- ix. Site Security. A security plan shall be submitted with the special land use application and site plan application for a renewable energy facility. Additional fees may be required to cover specialized reviews of these plans and or the Township's building official inspection of the site. The security plan shall:
  - a. Show all points of secured access as well as the means for limiting access to authorized personnel only.
  - b. Along with other signage requirements in this Ordinance and the Township Sign Ordinance, install and maintain warning signage on all dangerous equipment and facility entrances.
  - c. Provide a schedule outlining the implementation and maintenance of site security as well as routine inspections to ensure site security infrastructure is intact and operating as intended.
- x. Indemnity. Applicant will indemnify and hold the Township harmless from any costs or liability arising from the approval, installation, construction, maintenance, use, repair, or removal of the Utility-scale solar energy facility and/or system, which is subject to the Township's review and approval.

- xi. **Ownership Changes:** If the owner of the Utility-scale solar energy facility changes or the owner of the property changes, the special use permit shall remain in effect, provided that the successor owner or operator assumes in writing all of the obligations of the special use permit, site plan approval, and decommissioning responsibilities. A new owner or operator of the Utility-scale solar energy facility shall notify the Township of such change in ownership or operator within 30 days of the ownership change. A new owner or operator must provide such notification to the Township in writing. The special use permit and all other local approvals for the Utility-scale solar energy facility may be determined by the Township Board at a public meeting to be void if a new owner or operator fails to provide written notification to the Township in the required timeframe, unless the new owner or operator provides a reasonable explanation for any delay. Reinstatement of a void special use permit will be subject to the same review and approval processes for new applications under this Ordinance.
  
- d. **Schedule B Site Plans.** Applications for all schedule B renewable energy facilities must be accompanied by detailed site plans, drawn to scale and dimensioned and certified by a registered engineer licensed in the State of Michigan. All site plans shall conform to the requirements of Section 12. In addition they shall display the following information:
  - i. Horizontal and vertical to scale drawings (elevations) with dimensions that show the location of the proposed solar array(s), wind turbines and energy storage facilities, buildings, structures, electrical tie lines and transmission lines, security fencing and all above ground structures and utilities on the property.
  
  - ii. Location of all existing and proposed overhead and underground electrical transmission or distribution lines within the renewable energy facility and within one hundred (100) feet of all facility boundary property lines. Use of above-ground lines shall be kept to a minimum.
  
  - iii. Planned security measures to prevent unauthorized trespass and access during the construction, operation, removal, maintenance or repair of the renewable energy facility. In no instance shall barbwire be used.

- iv. A written description of the maintenance program to be used for the renewable energy facility, including decommissioning and removal. The description shall include maintenance schedules, types of maintenance to be performed, and decommissioning and removal procedures and schedules if the renewable energy facility is decommissioned. Description should include the average useful life of all primary renewable energy system equipment and components being proposed.
  - v. Additional detail(s) and information as required by the Planning Commission and/or Township Board.
- e. Schedule B Required Studies. All studies/analyses listed below are required for all schedule B renewable energy facilities unless waived by the Planning Commission.
- i. Stormwater Study. An analysis by a qualified professional third-party, mutually agreeable by both the Township and applicant, shall be required to account for the proposed layout of the renewable solar or storage energy facility and how the spacing, row separation, and slope affects stormwater infiltration, including calculations for a 100-year rain-event (storm). Percolation tests or site-specific soil information shall be provided to demonstrate infiltration on-site without the use of engineered solutions.
  - ii. Wildlife Impact Analysis: The applicant shall provide an analysis by a qualified professional third-party, mutually agreeable by both the Township and applicant, to identify and assess any potential impacts on wildlife and endangered species. The applicant shall take appropriate measures to minimize, eliminate, or mitigate adverse impacts identified in the analysis. The applicant shall identify and evaluate the significance of any net effects or concerns that will remain after mitigation efforts. Sites requiring special scrutiny include wildlife refuges, other areas where birds are highly concentrated, bat hibernacula, wooded ridge tops that attract wildlife, sites that are frequented by federally or state listed endangered species of birds and bats, significant bird migration pathways, and areas that have landscape features known to attract large numbers of raptors. At a minimum, the analysis shall include a thorough review of existing information regarding species and potential habitats in the vicinity of the project area. Where appropriate, surveys for bats, raptors, or general avian use should be conducted. The analysis shall include the

- potential effects on species listed under the federal Endangered Species Act and Michigan’s Endangered Species Protection Law. The applicant shall follow all pre-construction and post-construction recommendations of the United States Fish and Wildlife Service. The analysis shall indicate whether a post-construction wildlife mortality study will be conducted and, if not, the reasons why such a study does not need to be conducted. Power lines should be placed underground, when feasible, to prevent avian collisions and electrocutions. All aboveground lines, transformers, or conductors should follow any Avian Power Line Interaction Committee (APLIC, <http://www.aplic.org/>) guidelines to prevent avian mortality.
- iii. Natural Feature Preservation Study. The plan for installation of a renewable energy facility shall include a tree survey and plan for cutting of trees greater than 6” DBA. No such trees shall be cut in any required setback other than those reasonably required for the installation of a drive to access the facility. Retention of natural grades, soils, and groundcover material is encouraged where feasible.
  - iv. Environmental Impact Analysis. An analysis by a qualified professional third-party, mutually agreeable by both the Township and applicant, shall be required to identify and assess any potential impacts on the natural environment including, but not limited to, wetlands and other fragile ecosystems, historical and cultural sites, and antiquities. The applicant shall take appropriate measures to minimize, eliminate, or mitigate adverse impacts identified in the analysis.

An applicant shall identify and evaluate the significance of any net effects or concerns that will remain after mitigation efforts. The applicant shall comply with applicable parts of the following:

- (a) Michigan Natural Resources and Environmental Protection Act (Act 451 of 1994, MCL 324.101 et seq.) including but not limited to:
- (b) Part 31 Water Resources Protection (MCL seq.),
- (c) Part 91 Soil Erosion and Sedimentation Control (MCL 324.9101 et seq.),
- (d) Part 301 Inland Lakes and Streams (MCL 324.30101 et seq.),

- (e) Part 303 Wetlands (MCL 324.30301 et seq.),
- (f) Part 323 Shoreland Protection and Management (MCL 324.32301 et seq.),
- (g) Part 325 Great Lakes Submerged Lands (MCL 324.32501 et seq.),
- (h) Part 353 Sand Dunes Protection and Management (MCL 324.35301 et seq.).



**Carlisle | Wortman**  
ASSOCIATES, INC.

117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

Date: March 20, 2024

**Site Plan Review  
For  
Howell Township, Michigan**

<b>Applicant:</b>	Old Glory LLC
<b>Project Name:</b>	Parking Lot Addition
<b>Plan Date:</b>	January 25, 2024
<b>Location:</b>	4120 W Grand River Ave
<b>Zoning:</b>	Regional Service Commercial District (RSC)
<b>Action Requested:</b>	Preliminary Site Plan Approval

**PROJECT AND SITE DESCRIPTION**

The applicant has submitted a preliminary site plan dated January 25, 2024, that proposes several modifications to the site layout for an existing car wash located at 4120 W Grand River Ave otherwise known as parcel #4706-20-201-015. To accommodate the proposed addition of Touchless Wash Bays a 1,365 Square Feet building addition with landscaping island is proposed. Removal and replacement of 236 Square Feet dumpster pad and 22,225 Square Feet of asphalt to match existing elevations. Removal of two (2) twelve (12) inch storm sewers. Extensive expansion of the existing detention pond.

The site is currently zoned as part of the Regional Service Commercial District (RSC) and functions as a car wash. The submitted site plans continue to uphold this use and plan only to expand upon it. Figure 1 provides an arial image of the current site outlined in blue.

**Figure 1. Aerial Image of Subject Site and Vicinity**



**Items to be Addressed: None.**

**NEIGHBORING ZONING, LAND USE AND MASTER PLAN**

Neighboring zoning designations are summarized in Table 1.

**Table 1. Zoning, Land Use and Master Plan Designations**

	Zoning
<b>Subject Site</b>	RSC – Regional Service Commercial
<b>North</b>	RT – Research & Tech
<b>South</b>	Grand River Ave. R/W
<b>East</b>	SFR – Single Family Residential
<b>West</b>	RSC – Regional Service Commercial

**Items to be Addressed: None.**

**AREA, WIDTH, HEIGHT, SETBACKS**

The following table summarizes the Density, Placement, and Height Regulations for the site plan associated with the use.

**Table 2. Density, Placement, and Height Regulations**

	<b>Required</b>	<b>Provided</b>
<b>Lot Area</b>	2 Acres	2.039 Acres
<b>Lot Width</b>	200 Feet	240 Feet
<b>Front Setback</b>	35 Feet	35 Feet
<b>Side Setback</b>	10 – 25 Feet (10 ft. min with a combine total of 25 ft.)	51.7 Feet East 29.9 Feet West
<b>Rear Setback</b>	50 Feet	105.1 Feet
<b>Lot Coverage</b>	75 % Max	46 %
<b>Building Height</b>	70 Feet Max	Not Given

The setback standards listed on the site plan appear to alter slightly throughout and should be clarified to reflect the proposed extension of the detention pond. The proposed extension of the detention pond does not meet ordinance setbacks in both the front and side yards. The building height is not included on Sheet C.1.0 in the table Zoning Information, but is listed as 8ft in later elevation sheets.

**Items to be Addressed:** 1) The height of the proposed building should be clarified on Sheet C.1.0. 2) The applicant will need to revise plans or apply for a variance to approve the proposed structure setbacks of the detention pond.

**BUILDING LOCATION AND SITE ARRANGEMENT**

The proposed addition is to the west of the existing building. The proposed layout is the only logical place for expansion of the facility based on the location of the exiting building and the circulation needs for a car wash facility.

**Items to be Addressed:** None.

**PARKING, LOADING**

The applicant notes that the current site does not include any striped parking and does not include any in the site plan. Per section 18.02.G.5, which sets requirements for Gasoline filling and service stations, one (1) space for ea. service bay, plus one (1) space for ea. employee working during maximum employment (Sec. 18.02.G.5 – Gasoline Filling and Service Stations).

**Automatic Wash Bays**

There are two (2) existing automatic wash bays.

**Hand Wash Bays**

There are four (4) existing hand wash bays.

**Wash Bays**

There are two (2) proposed wash bays to be added.

### **Number of Employees**

There is no number of employees indicated on the plans.

Because the bays are self-service or drive through, there is no need to provide parking for them, however, the applicant must provide the number of employees at maximum employment and show adequate parking to meet the requirements of Section 18 accounting for maximum employee parking and service bays.

**Items to be Addressed:** *List number of employees at maximum employment. Demonstrate adequate parking is available for the number of employees at maximum employment and for each service bay.*

## **SITE ACCESS AND CIRCULATION**

The applicant provides a refuse vehicle circulation and emergency vehicle circulation plan which demonstrate proper vehicular traffic flow.

We defer to Engineering and the Fire Chief for further consideration.

**Items to be Addressed:** *None.*

## **NATURAL FEATURES**

The location and arrangement of the site will essentially be the same as it is currently with the exception of the addition on the Northwest side of the building and the extension of the existing detention pond.

The site plan calls out that the National Wetland Inventory notes no wetlands on the subject parcel and that wetland flagging was not observed during the field survey. The site plan also details the subject property appears to be entirely in zone (X) area determined to be outside of the 0.2% annual chance floodplain according to the flood insurance rate map for the County of Livingston Community Panel NO. (26093C0188D), effective date 9/17/2008.

Stamped approval from EGLE will not be required for construction as it is evident that there are no wetlands shown for the property through the EGLE wetland database.

**Items to be Addressed:** *None.*

**LANDSCAPING**

The applicant has provided a landscape plan, as shown in the following table.

**Table 3. Landscaping Requirements**

Landscaped Area	Requirement	Factor	Required	Provided
Road Frontages	1 deciduous or evergreen tree per 40 linear feet	210	5	5
	1 ornamental tree per 100 linear feet		2	2
	Min. of 8 shrubs per every 40 linear feet		42	42
Foundations	1 ornamental tree per 35 feet of building frontage	90	2	2
	5 shrubs per 35 feet of building frontage		5	5
Stormwater Detention/ Retention Areas	1 deciduous or evergreen tree per 50 feet of perimeter	253	5	5
	10 shrubs per 50 feet of perimeter		50	“Existing”
Residential Screening	1 canopy or evergreen tree per 40 linear feet	344	5	5
	1 ornamental tree per 100 feet		2	2
	8 shrubs per 40 linear feet		42	42

On sheet CD-1.0 two (2) existing pine trees are said to be removed. On sheet LS24.004.02 the same two (2) pine trees are listed as existing to remain and are counted towards landscaping requirements for the detention area. The above table reflects the count of the existing trees remaining. It should be clarified if the pine trees will remain or be removed with an updated count to reflect this. The “existing” number of shrubs should be clarified to show compliance with the ordinance following the expansion of the detention pond.

**Items to be Addressed:** 1) The number of existing shrubs surrounding the detention pond should be clarified. 2) The two (2) pine trees counted toward the stormwater detention pond should be clarified as to if they are to remain or be removed.

**LIGHTING**

Lighting plans are required for preliminary site plans. The applicant did not provide a lighting plan with their submission and will need to submit one before the final site plan review can be completed.

**Items to be Addressed:** *The applicant must provide light fixture details and a photometric plan that demonstrates compliance with Section 14.22.*

## SIGNS

Site plan references keeping an existing sign with no additional signage being added.

If added, signs will require a separate permit from the Zoning Administrator. A sign application must be filed with the Zoning Administrator, at which time the zoning administrator will determine if the signs meet the requirements of the ordinance.

**Items to be Addressed:** *None.*

## FLOOR PLAN AND ELEVATIONS

Floor plan and elevation sheets have been included in the site plan on sheets A-101, A-102, A-103, and A-201.

**Items to be Addressed:** *None.*

## TRASH ENCLOSURE

The applicant has indicated that garbage receptacle will be replaced and stored outside the building in the Northeast corner on a new concrete slab in the same position as the existing. The current plans do not outline the screening of the receptacle. Ordinance requirements for receptacles are as follows:

*Truck-lifted or transported receptacle areas. All such receptacle areas shall be enclosed by a six (6) foot high wooden or a masonry wall to prevent the unsightly deposit or collection of solid waste and prevent children and pets from having access to these areas.*

**Items to be Addressed:** *Clarify trash enclosure screening.*

## RECOMMENDATIONS

We recommend the following items be addressed before the Planning Commission takes action on the preliminary site plan:

1. The applicant shall request a variance to approve the proposed structure setbacks of the detention pond or revise plans to meet the Ordinance requirements.
2. The height of the proposed building should be listed on Sheet C.1.0.
3. List the number of employees at maximum employment.

4. Demonstrate adequate parking for the site as defined in Section 18.02.G.5 for Gasoline Filling and Service Stations.
5. The number of existing shrubs surrounding the detention pond should be clarified.
6. The two (2) pine trees currently counted toward the stormwater detention pond should be clarified if they are to remain or be removed.
7. The applicant shall provide light fixture details and a photometric plan that demonstrates compliance with Section 14.22.
8. The trash enclosure screening should be included in the plans with the height and material listed.



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**CARLISLE/WORTMAN ASSOC., INC.**  
**Paul Montagno, AICP**  
**Principal**



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**CARLISLE/WORTMAN ASSOC., INC.**  
**Grayson Moore**  
**Community Planner**

Wednesday, February 28, 2024

Joe Daus, Zoning Administrator  
Howell Township  
3525 Byron Road  
Howell, MI 48855

RE: Old Glory Car Wash  
4120 Grand River Avenue, Howell Township  
Preliminary Site Plan Review

Dear Mr. Daus,

We have received and reviewed the site plan for the proposed improvements to the existing car wash at 4120 Grand River Avenue. The plans were prepared by Monument Engineering Group Associates Inc. for Old Glory Carwash and are dated January 25, 2023. Based on our review, we offer the following comments:

**General**

The current and proposed site use is for a car wash. The parcel is zoned Regional Service Commercial (RSC). The Proposed site use is appropriate for this zoning. We defer all comments regarding zoning and the site's compliance to the Township Planner.

A location map is provided on the plans.

A legal description that closes within acceptable tolerances should be provided on the cover page.

The plans are signed and sealed by a professional engineer.

**Grading and Drainage**

The existing topography of the site indicates that surface runoff flows generally to the South. Existing grading is shown with 1-foot contours and spot elevations. The paved portion of the site drains to several catch basins located in the parking lot. These catch basins connect to a storm sewer system that drains to a detention pond in the southern portion of the site. The detention pond drains to the Grand River Avenue R.O.W.

Improvements to the storm sewer network are proposed on site. The proposed improvements include removal and replacement of the storm sewer on the west side of the site to convey additional surface runoff from the roof of the proposed expansion of the building, as well as expansion of the paved areas. The proposed improvements also include conversion of the existing detention pond to forebay and the addition of a new detention pond southwest of the forebay that ultimately outlets to the Grand River Avenue R.O.W.

February 28, 2024

Page 2 of 3

Sizing calculations of the detention system will be reviewed in the final site plan review. Sizing calculations of the storm sewer conveyance system will be reviewed in the construction review.

We defer to Livingston County Drain Commissioner's office and Livingston County Road Commission on additional comments relating to storm water management.

### **Parking and Landscaping**

The proposed hard surfaces included 4-inch HMA pavement for the drive and parking surfaces, 8-inch concrete surface under the proposed wash bays and concrete curb and gutter to the west of the proposed addition to the building. Details of the pavement will be reviewed in future site plan reviews.

The correct setbacks are listed and shown on the plans; however, the proposed detention ponds and security chain-linked fence are within the 35-foot front setback. The pond must be relocated outside of the influence of the 35-foot front setback, or a variance must be granted by the zoning board.

The site has one, two-way, drive that is assumed to be 29' wide to match the existing, this dimension should be included on the paving plan. The demolition plan shows the existing pavement being sawcut at the R.O.W. and leaving the existing approach. We defer further comment on the approach to Livingston County Road Commission.

A landscaping plan is provided for the site, includes various plants around the paved area on the south and west perimeters of the site. We defer to the Township Planner for comment on landscaping and lighting.

### **Utilities**

No new sanitary or water main improvements are proposed.

An existing water main is shown in the Grand River Avenue R.O.W. and connects to a hydrant on the northwest side of the roadway. No services are shown off this main. Services should be shown. We defer to MHOG and the Fire Marshal for comment on the proposed water distribution system.

Existing gravity sanitary sewer is shown to service the site. The existing sanitary sewer is shown to connect to the existing sanitary sewer main located in Grand River Avenue R.O.W.

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**Recommendations**

Should the Planning Commission decide to proceed with approval of this project, we recommend the following conditions be placed on the approval:

1. Plans should be reviewed and approved by:
  - a. Fire Marshal
  - b. Township Planner
  - c. Livingston County Drain Commissioner
  - d. Livingston County Road Commission
2. Please include a legal description of the site
3. Include all dimensions for evaluation of the proposed paving.
4. Include the location of all existing utilities.
5. Storm water pond location and fence impedance

If you have any questions or need anything further, please feel free to contact our office.

Sincerely,



**Adam C. Jacqmain**

Phone: (989) 598-6196

Mailto: adamj@spicergroup.com



**John W. Bradley**

Phone: (517) 719-5503

Mailto: johnbradley@spicergroup.com

**SPICER GROUP, INC.**

1595 W Lake Lansing Rd Suite 200

East Lansing, MI 48823

CC: SGI File  
Livingston County Road Commission  
Ken Recker, Livingston County Chief Deputy Drain Commissioner



# Howell Area Fire Department Fire Marshal Division

1211 W Grand River Ave Howell, MI 48843  
office: 517-546-0560 fax: 517-546-6011  
[firemarshal@howellfire.net](mailto:firemarshal@howellfire.net)

**DATE:** February 26, 2024

**TO:** Joe Daus  
Howell Twp Zoning Administrator  
3525 Byron Rd  
Howell, MI 48855

**FROM:** Bryan Hager-Fire Inspector

**PROJECT:** Old Glory Addition, **Howell Township**

**REF:** Site Plan Review - **Approved w/concerns noted**

## **CONCERNS:**

I have reviewed the above listed site plan and find that it is **satisfactory** as presented as long as the **following conditions** are met:

1. A Knox Box is required for this location. Application can be obtained from the Howell Area Fire Department or on-line at [www.knoxbox.com](http://www.knoxbox.com).
2. Where the road is 20' wide to 26' wide, "No Parking-Fire Lane" signs would be required on both sides of the lot. Where the road is between 27' and 32' wide, "No Parking this side of street" signs would be required on the building side of the street.
3. An approved fire apparatus access road shall be within 150 feet of all portions of the building(s)
4. The fire department access road shall meet the following conditions:
  - a. The minimum unobstructed width shall be 20 feet.
  - b. The minimum unobstructed height shall be 13 feet
  - c. The access drive shall be accessible at all times (i.e. snow removal) and posted as a fire lane.
  - d. The use of the Knox Rapid Entry system padlock or Knox key switch may be required, if a gate is going to be installed.
  - e. The access drive shall be constructed so it can support up to 100,000 pound fire apparatus.
  - f. The installation of security gates across a fire apparatus access road shall be approved by the fire department.
5. A final inspection of the whole building and site shall be performed by the fire department before C of O is issued.

Any changes in this site plan shall be submitted to the Howell Area Fire Department for additional approval. If there is anything further that you need, please feel free to give me a call.



# Brian Jonckheere

**Livingston County Drain Commissioner**

**2300 E. Grand River Ave., Ste. 105**

**Howell, MI 48843-7581**

**Phone: 517-546-0040 FAX: 517-545-9658**

Website: [www.livgov.com/drain](http://www.livgov.com/drain) Email: [drain@livgov.com](mailto:drain@livgov.com)

March 27, 2024

Mr. Al Pruss  
Monument Engineering Group  
298 Veterans Dr  
Fowlerville, Michigan 48836

Re: Old Glory Car Wash Addition  
Construction Plans  
Southeast 1/4 of Section 20  
Howell Township

Dear Mr. Pruss:

We received Construction Plans for the above referenced project on March 7, 2024. The submitted information has been reviewed for conformance with the current L.C.D.C. "Procedures and Design Criteria for Stormwater Management Systems." My comments on the proposed drainage design are as follows:

- 1.) Drainage System Ownership - The Construction Plans should include a general note stating that "The existing and proposed drainage systems are to be owned and properly maintained by the property owner." A stormwater maintenance agreement, similar to that found in Appendix K of the current L.C.D.C. Design Criteria, should be executed with Howell Township prior to final project approval.
- 2.) Overall Drainage Concept - The 2.04 acre project site located on the northeast side of Grand River Avenue approximately 800 feet northwest of Burkhart Road, currently contains a car wash, its associated driveway areas and a stormwater detention basin. The proposed site improvements include a building addition with two new wash bays, the repaving and expansion of the existing driveway areas and the construction of a new stormwater basin south of the existing basin.

Runoff from the site is currently routed by storm sewers to the existing detention basin which discharges to the adjacent Grand River Avenue Road ditch. Runoff from the impervious expansion area will be directed by a realigned

storm sewer to the existing detention basin which is to be connected to the proposed detention basin by a 12" diameter culvert. The new basin is to discharge to the existing 18" diameter outlet pipe flowing to the road ditch. This discharge follows the road ditch approximately 250 feet to the southeast, crosses under Grand River Avenue in a 24" diameter culvert and ultimately flows through the Livingston Commerce Center drainage system and enters the Howell No. 1 Drain near I-96.

- 3.) Drainage Areas Plan - The tributary area flowing to existing CB-50506 located in the northeast corner of the parcel was intended to be 0.87 acres, including 0.60 acres of offsite area, according to the previously approved plans for this site. The originally approved intercepting swale should be installed in this greenbelt area and the entire 0.87 acres should be accounted for in the drainage system design.
- 4.) Stormwater Detention/Infiltration - The proposed stormwater management calculations apply the current L.C.D.C. Design Criteria in determining the amount of additional stormwater storage volume required for the proposed improvements in keeping with past L.C.D.C. policy. However, infiltration testing should be performed within the proposed detention basin area to confirm that the proposed Channel Protection Volume credit used in the design calculations is appropriate and to document any existing groundwater elevations. The following additional detention/infiltration related items should also be addressed on the plans:
  - a.) The proposed OCS-7 rim elevation must be raised to at least 952.10 to provide the combined existing and proposed storage volumes, if a separate outlet control structure is not provided on the proposed pipe connecting to the new basin. Adding such a control structure would not only permit different storage levels within the basins, but would also allow the existing basin to perform the function of a forebay and thereby eliminate the need for the currently proposed SED-3 treatment structure.
  - b.) A rip-rap lined overflow spillway should be provided between the two detention basins. The spillway crest should be set at least 6" below the upper basin's freeboard elevation.

- c.) The Spillway Detail provided on Sheet C-9.2 should specify 6" minimum diameter angular stone.
  - d.) The detention basin volume provided calculations should not include any storage below the basin's outlet elevation.
  - e.) The full hydraulic head should be used when designing the 100 Year Storm orifices.
  - f.) The Land Use Chart shown on the Cover Sheet should be filled out with appropriate site information.
- 6.) Storm Sewers - An initial time of concentration of 15 minutes should be used in the storm sewer design calculations. The proposed storm sewer between existing CB-50543 and ES-4 should be raised to eliminate the currently proposed partial submergence of the pipe. This can be accomplished by setting the invert elevation of ES-4 at the outlet elevation of 949.17 and utilizing the minimum slope of 0.26% for the upstream 12" HDPE storm sewer. The proposed pipe between the two stormwater basins should be 18" diameter to accommodate the upstream flow.
- 7.) Site Grading - The proposed grade shown on the northeast corner of the CB-50543 concrete apron should be higher than its rim elevation of 953.39. The proposed pavement grade shown at the southeast building corner should be reviewed and revised as necessary, as it is higher than the existing concrete apron grade shown at that point.

I am withholding approval of the Construction Plans for Old Glory Car Wash Addition until the abovementioned items have been addressed satisfaction.

Very truly yours,



Kenneth E. Recker, II, P.E.  
Chief Deputy Drain Commissioner

C: Paul Lewsley, Spalding DeDecker  
John Bradley, Spicer Group  
Gary Markstrom, Tetra Tech  
Jonathan Hohenstein, Howell Township Zoning  
Kim Hiller, Livingston County Road Commission  
Matt Martin, Old Glory LLC



# Monument Engineering Group Associates, Inc.

Developing Lifelong Relationships

[monumentengineering.com](http://monumentengineering.com)

298 Veterans Drive, Fowlerville, MI 48836 (HQ)  
(517) 223-3512



Date March 26, 2024  
MEGA Project 22-177

Jonathan Hohenstein  
Treasurer  
Howell Township

**RE: Old Glory Carwash  
Site Plan Review**

Mr. Hohenstein,

Monument Engineering Group Associates, Inc. (MEGA) is in receipt of review comments from the Township engineer (Spicer Group) and planner (Carlisle Wortman). We offer the following responses:

Engineering Review (February 28, 2024)

1. Plan Reviews
  - a. We assume the plans have been submitted to the Fire Marshal
  - b. We're in receipt of the planner's review.
  - c. Plans have been submitted to the drain commission for review.
  - d. There is no work proposed in the ROW, therefore plans have not been submitted to the road commission.
2. A legal description is provided on the cover sheet per the current deed.
3. Dimensions have been added to sheet C-1.0.
4. Existing utility information has been added to the plans.
5. A variance has been applied for to have the detention basin in the front setback. The ZBA meeting is April 16<sup>th</sup>, 2024.

Planning Review (March 20, 2024)

1. A variance has been applied for to have the detention basin in the front setback. The ZBA meeting is April 16<sup>th</sup>, 2024.
2. The height of the building has been added to Sheet C-1.0.
3. The number of employees is listed on Sheet C-1.0 for parking calculations.
4. Parking spaces have been added to Sheet C-1.0.
5. The landscape plan is in the process of being revised.
6. The landscape plan is in the process of being revised.
7. A lighting plan is in progress. Once completed it will be included in the plan set.
8. The trash enclosure has been included and a detail added to the plans.

**Old Glory Carwash**

Sincerely

Monument Engineering Group Associates, Inc

A handwritten signature in black ink, appearing to read "Allan W Pruss". The signature is fluid and cursive, with a prominent initial "A" and a long, sweeping underline.

Allan W Pruss, PE, PS  
President

**HOWELL TOWNSHIP**  
**Application for Site Plan Review**

3525 Byron Road Howell, MI 48855  
Phone: 517-546-2817 ext. 108  
Email: inspector@howelltownshipmi.org

File # PZE 2024-03

Parcel ID #: 4706-	<u>20 201 015</u>	Date	_____
Applicant Name	<u>Old Glory LLC</u>	Applicant Address	<u>PO Box 328</u>
Phone	<u>517-375-0555</u>	Fax	_____
		Email	<u>carwashguy.mm@gmail.com</u>
Property Owner Name	<u>Old Glory LLC</u>		
Phone	<u>517-375-0555</u>	Fax	_____
		Email	<u>carwashguy.mm@gmail.com</u>
Please list all recipients to receive information and/or reports:			
Name:	<u>Matt Martin</u>	Email	<u>carwashguy.mm@gmail.com</u>
Name:	<u>Allan Pruss</u>	Email	<u>apruss@monumentengineering.com</u>
Name:	_____	Email	_____

Location of Property	<u>North Side of Grand River Ave, just west of Burkhart</u>	Current Zoning Classification	<u>RSC</u>
Existing Use	<u>Car Wash</u>	Proposed Use	<u>Car Wash</u>

Check One:

- |   |  |
|---|--|
| <input type="checkbox"/> Preliminary Site Plan Review (20.06) | <input checked="" type="checkbox"/> Final Site Plan Review (20.07)   |
| <input type="checkbox"/> Temporary Use (14.34)                | <input type="checkbox"/> Commercial/Industrial Development   |
| <input type="checkbox"/> Subdivision/Site Plan Condo          | <input type="checkbox"/> Multi-Family/Condo  |
| <input type="checkbox"/> Planned Unit Development (PUD) Type: | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |

Applicant needs to provide the following site plan drawings: twelve (12) full size copies, eight (8) - 11" x 17" copies, and an electronic set (either on an USB drive or provide an online link) for the preliminary site plan drawings. Drawings shall be submitted with an application for site plan review (20.06 a) thirty (30) days prior to the meeting.

**LEGAL DESCRIPTION (AS PROVIDED)**

(PER SURVEY BY: CORNERSTONE ENGINEERING, JOB NO.: 02013.GIN, DATED: 02/18/2002)

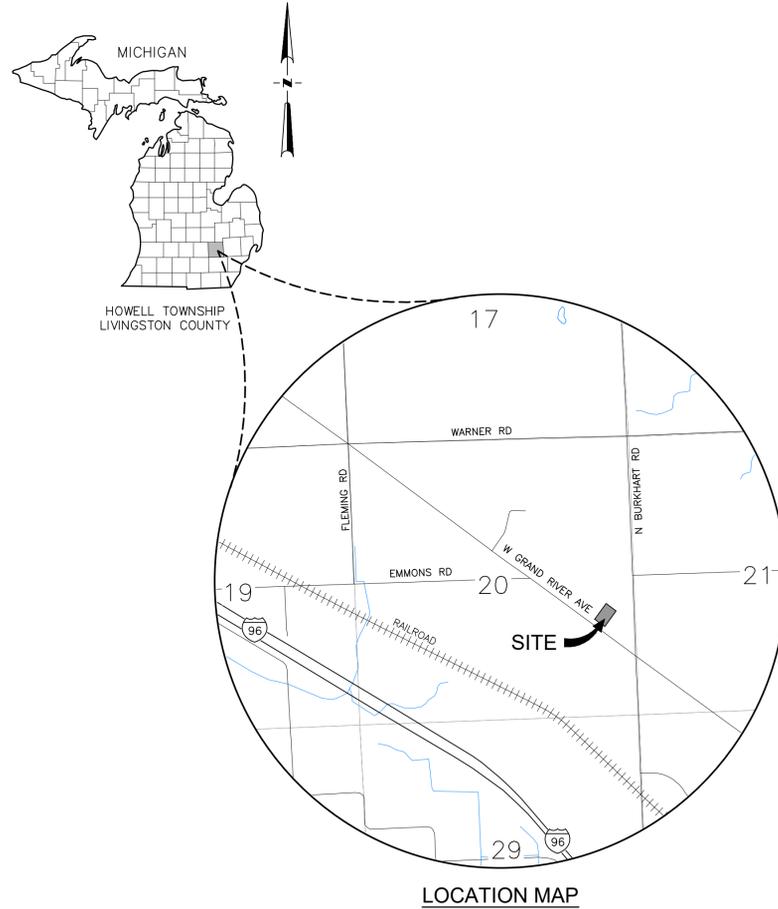
TAX ID: 4706-20-201-015

LOT 3 OF "NEWMAN'S GRAND VIEW ESTATES" A PART OF S. 1/2 N.E. 1/4 AND A PART OF N. 1/2 S.E. 1/4 SECTION 20, T. 3 N., R. 4 E., HOWELL TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN, AS RECORDED IN LIBER 8 OF PLATS, PAGE 24, LIVINGSTON COUNTY RECORDS. 2.04 ACRES

**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.: , LON.: , ELEV.: , SCALE FACTOR: ).

# PRELIMINARY SITE PLAN FOR NEW TOUCHLESS WASH BAYS



LOCATION MAP

**LAND USE SUMMARY**

LAND USE DATA	CHARACTERISTIC	EXISTING CONDITIONS	PROPOSED CONDITIONS
	TOTAL DEVELOPMENT AREA (AC)	X.XX AC	X.XX AC
	IMPERVIOUS AREA (AC)	X.XX AC	X.XX AC
	TOTAL PERVIOUS AREA (AC)	X.XX AC	X.XX AC
<b>PERVIOUS AREA BREAKDOWN BY COVER TYPE</b>			
PERVIOUS AREA	MEADOW/FALLOW/NATURAL AREAS (NON-CULTIVATED)	X.XX AC	X.XX AC
	PREDOMINANT NRCS SOIL TYPE (A, B, C, OR D)	TYPE X = X.XX AC	TYPE X = X.XX AC
	IMPROVED AREAS (TURF GRASS, LANDSCAPE, ROW CROP)	X.XX AC	X.XX AC
	PREDOMINANT NRCS SOIL TYPE (A, B, C, OR D)	TYPE X = X.XX AC	TYPE X = X.XX AC
	WOODED AREAS	X.XX AC	X.XX AC
	PREDOMINANT NRCS SOIL TYPE (A, B, C, OR D)	TYPE X = X.XX AC	TYPE X = X.XX AC
	CPVC VOLUME CALCULATED (CF)		X.XXX CF
	CPVC VOLUME PROVIDED (CF)		X.XXX CF
	CPRC VOLUME PROVIDED (CF)		X.XXX CF

THE PROFESSIONAL ENGINEER WHO SIGNS AND SEALS THIS SITE PLAN CERTIFIES THAT THE VALUES IN THIS TABLE REFLECT THE WRC STORMWATER CALCULATIONS REQUIRED FOR THIS DEVELOPMENT AND THAT GEOTECHNICAL INVESTIGATIONS WERE PERFORMED THAT PROVIDE CONCLUSIVE DOCUMENTATION THAT DEMONSTRATES WHETHER INFILTRATION (I.E. CPVC VOLUME CONTROL) IS PRACTICABLE.

**DESIGN ENGINEER/SURVEYOR**



MONUMENT ENGINEERING GROUP ASSOCIATES, INC

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

298 VETERANS DRIVE,  
FOWLERVILLE, MI 48836  
PHONE: 517-223-3512

**CLIENT**



OLD GLORY CAR WASH  
PO BOX 328  
FOWLERVILLE, MI 48836  
POC: MATT MARTIN  
PHONE: 517-375-0555

**ARCHITECT**

GILLET ASSOCIATES ARCHITECTURE  
32969 HAMILTON COURT, SUITE 211  
FARMINGTON HILLS, MI 48334  
POC: TIM MELVIN  
PHONE: 248-489-2344

PLAN SUBMITTALS	
DATE	DESCRIPTION
1/25/2024	SITE PLAN SUBMITTAL
3/21/2024	REVISED SITE PLAN SUBMITTAL

**SHEET INDEX**

INCLUDED SHEETS	
SHEET	DESCRIPTION
<b>GENERAL</b>	
SHEET G-1.0	COVER
<b>SURVEY</b>	
SHEET V-1.0	TOPOGRAPHIC SURVEY
<b>CIVIL DEMOLITION</b>	
SHEET CD-1.0	DEMOLITION PLAN
<b>SITE PLAN</b>	
SHEET C-1.0	DIMENSION AND PAVING PLAN
<b>VEHICLE CIRCULATION</b>	
SHEET C-2.0	EMERGENCY VEHICLE CIRCULATION
SHEET C-2.1	REFUSE VEHICLE CIRCULATION
<b>UTILITY</b>	
SHEET C-6.0	STORM SEWER PLAN
SHEET C-6.1	STORM SEWER PROFILES
<b>GRADING</b>	
SHEET C-7.0	GRADING PLAN
<b>SOIL EROSION &amp; SEDIMENTATION CONTROL (SESC)</b>	
SHEET C-8.0	SESC PLAN
SHEET C-8.1	LCDC SESC NOTES AND DETAILS
SHEET C-8.2	LCDC SESC DETAILS
<b>STORM WATER MANAGEMENT</b>	
SHEET C-9.0	DRAINAGE AREA PLAN
SHEET C-9.1	STORM WATER CALCULATIONS
SHEET C-9.2	DETENTION BASIN DETAILS
<b>SPECIFICATIONS</b>	
SHEET C-12.0	SPECIFICATIONS
SHEET C-12.1	SPECIFICATIONS
<b>LANDSCAPE</b>	
SHEET LS-1	LANDSCAPE PLAN

CITY/TOWNSHIP, COUNTY STANDARD DETAILS



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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 COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE INDIVIDUALLY RESPONSIBLE FOR DETERMINING THE EXACT UTILITIES, LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

**CLIENT :**  
Old Glory Car Wash  
PO BOX 328  
FOWLERVILLE, MI 48836  
POC: MATT MARTIN  
517-375-0555

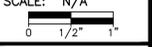
**COVER**  
NEW TOUCHLESS WASH BAYS  
4120 GRAND RIVER ROAD  
PART OF SE 1/4, SEC. 20, T3N-R4E  
HOWELL TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

DATE	DESCRIPTION
1/25/2024	SITE PLAN SUBMITTAL

ORIGINAL ISSUE DATE:

PROJECT NO: 22-177

SCALE: N/A



FIELD:  
DRAWN BY: DC  
DESIGN BY:  
CHECK BY: AP

**G-10**

NOT FOR CONSTRUCTION



### BENCHMARKS

DATUM: NAVD88

BM A:  
CHISELED "X" ON NW SIDE CONCRETE PAD FOR LIGHT POLE, 208± EAST OF CENTERLINE W GRAND RIVER ROAD & 20± SOUTH OF CENTERLINE FOR ACCESS DRIVE TO SUBJECT'S PROPERTY.  
ELEV = 953.54

BM B:  
BENCH TIE IN NE SIDE UTILITY POLE, 32± EAST OF CENTERLINE W GRAND RIVER ROAD & 57± NORTH OF CENTERLINE FOR ACCESS DRIVE TO SUBJECT'S PROPERTY.  
ELEV = 953.25

### SOILS INFO

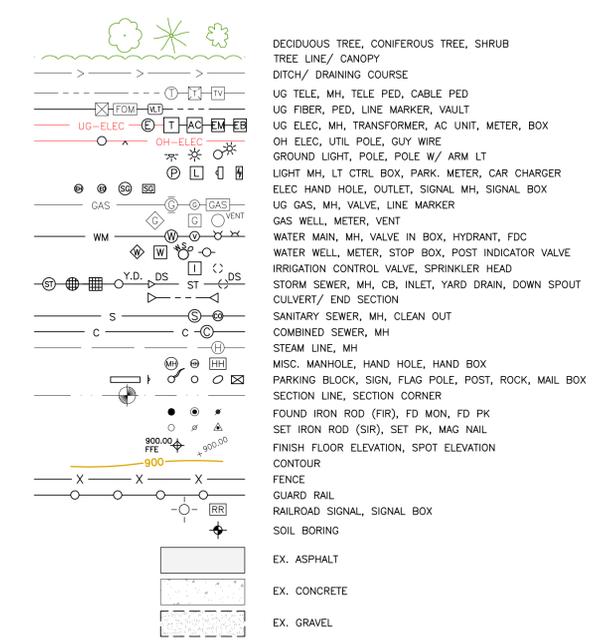
SOIL TYPES ARE ACCORDING TO THE USDA SOIL SURVEY WEB SITE (<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>)

- Cvrab: CONOVER LOAM, 0-4% SLOPES
- MoB: WAWASEE LOAM, 2-6% SLOPES

### EXISTING PARKING

THERE ARE NO STRIPED PARKING SPACES ON THE SUBJECT PROPERTY.

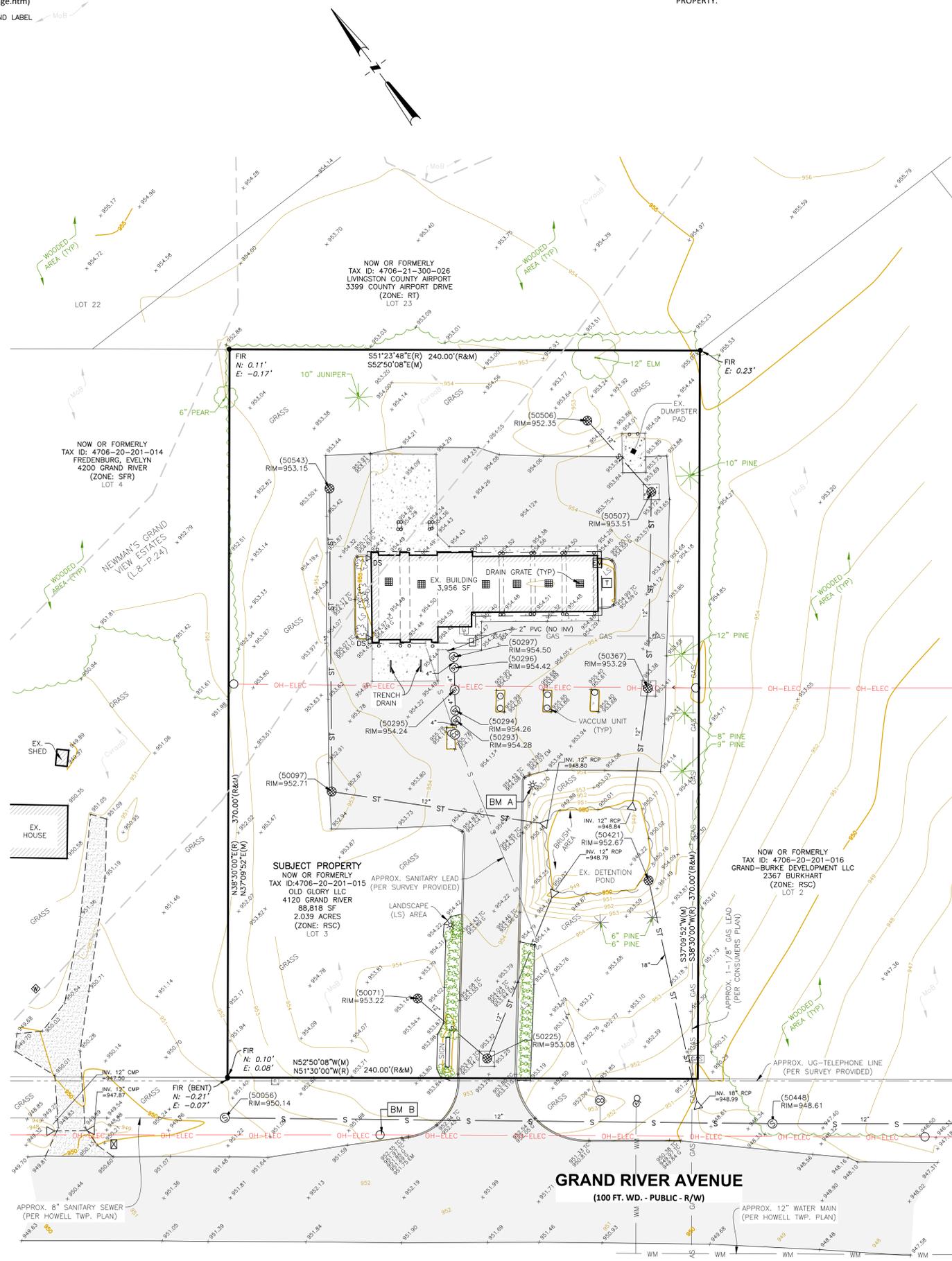
### EXISTING LEGEND



### STRUCTURE SCHEDULE

EX. STORM SEWER		
STRUCTURE	RIM ELEV.	PIPES
(50071) CBB	953.22	12" S IE= 949.35
(50097) CBR	952.71	12" NE IE= 949.16 12" SE IE= 948.68
(50225) CBR	953.08	12" NE IE= 949.13 12" N IE= 949.07
(50293) STMH	954.28	4" SW IE= 950.31
(50294) STMH	954.26	4" NE IE= 950.34
(50295) STMH	954.24	4" NE IE= 950.42
(50296) STMH	954.42	4" NE IE= 950.57
(50297) STMH	954.50	4" SW IE= 950.78
(50367) CBR	953.29	12" SW IE= 949.14 12" NE IE= 949.09
(50421) OCS	952.67	18" SW IE= 949.33
(50506) CBB	952.35	12" S IE= 949.81
(50507) CBR	953.51	12" SW IE= 949.64 12" N IE= 949.49
(50543) CBR	953.15	12" SW IE= 949.62

EX. SANITARY SEWER		
STRUCTURE	RIM ELEV.	PIPES
(50056) SMH	950.14	12" SE IE= 940.16
(50448) SMH	948.61	12" NW IE= 939.33 12" SE IE= 939.17



### WETLAND NOTE

ACCORDING TO THE NATIONAL WETLAND INVENTORY WEBSITE ([HTTP://WWW.FWS.GOV/WETLANDSDATAMAPPER.HTML](http://www.fws.gov/wetlands/datamapper.html)), THERE ARE NO NOTED WETLANDS ON THE SUBJECT PARCEL. WETLAND FLAGGING WAS NOT OBSERVED DURING THE FIELD SURVEY. AN OFFICIAL STUDY FOR THE PRESENCE OF WETLANDS WAS NOT CONDUCTED BY MONUMENT ENGINEERING GROUP ASSOCIATES.

### FLOOD ZONE

FEMA MAP SCALES DO NOT SUPPLY SUFFICIENT LEVEL OF DETAIL TO PLOT ACCURATELY. ZONES IF PLOTTED HEREIN ARE APPROXIMATE.

BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, THE SUBJECT PROPERTY APPEARS TO LIE ENTIRELY IN ZONE (X) AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN ACCORDING TO THE FLOOD INSURANCE RATE MAP FOR THE COUNTY OF LIVINGSTON, COMMUNITY PANEL NO. (26093C0188D), EFFECTIVE DATE 9/17/2008.

### UTILITY NOTES

- ALL UNDERGROUND UTILITIES SHOWN ARE BASED ON DESIGN PLANS PROVIDED AT TIME OF SURVEY UNLESS NOTED OTHERWISE.
- THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN IN THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

### UTILITY REFERENCES

- WM: HOWELL TOWNSHIP ~ MHOG  
RECEIVED: 8/5/22 ~ N/A
- SAN: HOWELL TOWNSHIP  
RECEIVED: 8/5/22
- STORM: LIVINGSTON COUNTY ROAD COMMISSION  
RECEIVED: N/A
- GAS: CONSUMERS ENERGY  
RECEIVED: 8/11/22
- ELEC: DTE ENERGY ~ TANGER PROPERTIES LIMITED PARTNERSHIP ELECTRIC  
RECEIVED: 8/8/22 ~ N/A
- PHONE/CABLE: AT&T  
RECEIVED: 7/18/22

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**  
MONUMENT ENGINEERING GROUP ASSOCIATES

298 VETERANS DRIVE  
FOWLERVILLE  
MICHIGAN 48836  
(OFFICE) 517-223-3512  
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**ALLAN W. PRUSS**  
ENGINEER  
NO. 620143168

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**CLIENT :**

**NEW TOUCHLESS WASH BAYS**  
4120 GRAND RIVER ROAD  
PART OF SE 1/4, SEC. 20, T3N-R4E  
HOWELL TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

**TOPOGRAPHIC SURVEY**

DATE: 1/25/2024  
REVISED: 3/21/2024

PLAN SUBMITTALS/REVISIONS

DATE: 1/25/2024  
SITE PLAN SUBMITTAL  
REVISED SITE PLAN SUBMITTAL

ORIGINAL ISSUE DATE:

PROJECT NO: 22-177

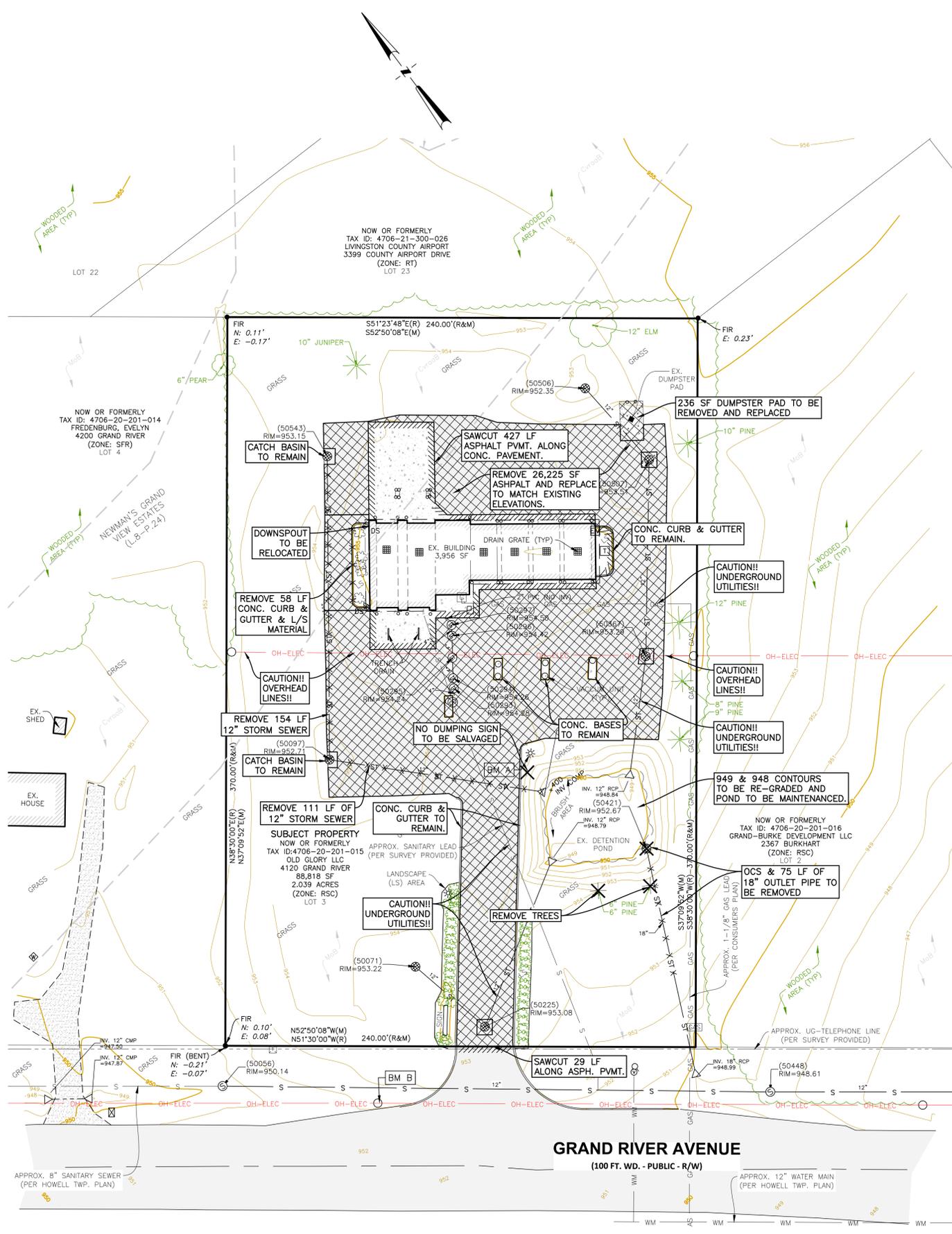
SCALE: 1" = 30'

0 1/2" 1"

FIELD:  
DRAWN BY: DC  
DESIGN BY:  
CHECK BY: AP

**V-10**

NOT FOR CONSTRUCTION



**DEMOLITION LEGEND**

- • • • • ABANDON IN PLACE
- /// /// /// /// ABANDON LINEAR FEATURE
- //// //// //// //// SAWCUT
- X X X X X X X X X X REMOVE LINEAR FEATURE
- --- --- --- LIMITS OF DISTURBANCE
- X REMOVE OBJECT
- XXXXXX REMOVE PAVEMENT

**DEMOLITION NOTES**

1. UTILITY OBJECTS SUCH AS GAS METER, TRANSFORMER, TELEPHONE PEDESTAL, UTILITY POLE & WIRES ARE TO BE REMOVED BY OTHERS IF APPLICABLE.
2. ANY TREES NOT MARKED PER PLAN ARE TO BE PROTECTED & PRESERVED DURING CONSTRUCTION.

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

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CLIENT :

NEW TOUCHLESS WASH BAYS  
4120 GRAND RIVER ROAD  
PART OF SE 1/4, SEC. 20, T3N-R4E  
HOWELL TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

**DEMOLITION PLAN**

NEW TOUCHLESS WASH BAYS  
4120 GRAND RIVER ROAD  
PART OF SE 1/4, SEC. 20, T3N-R4E  
HOWELL TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

DATE	DESCRIPTION
1/25/2024	REVISIONS
3/21/2024	REVISIONS

ORIGINAL ISSUE DATE:

PROJECT NO: 22-177

SCALE: 1" = 30'

FIELD:  
DRAWN BY: DC  
DESIGN BY:  
CHECK BY: AP

**CD-1.0**

NOT FOR CONSTRUCTION

**ZONING INFORMATION**

THIS ZONING INFORMATION IS TAKEN FROM HOWELL TOWNSHIP ZONING ORDINANCE DATED: APRIL 2015

SUBJECT PARCEL ZONING: (RSC) REGIONAL SERVICE COMMERCIAL	SUBJECT PARCEL		PROPOSED BUILDING	MAXIMUM HEIGHT OF BUILDING		BUILDING SETBACKS (FT)			PARKING SETBACKS (FT)			MAXIMUM % OF IMPERVIOUS SURFACE
	AREA (AC)	WIDTH AT BUILDING SITE (FT)	BUILDING 'A' AREA (SF)	IN STORIES	IN FEET	FRONT (S)	SIDE (E,W)	REAR (N)	FRONT (S)	SIDE (E,W)	REAR (N)	
REQUIRED	2	200	-	NA	70	35	10 MIN. OR 25 FEET TOTAL	50	35	10 MIN. OR 25 FEET TOTAL	10	75
PROVIDED	2.039	240	1,365	NA	21.21	232.4	51.7, 29.9	105.1	181.8	40.1, 112.2	55.2	46

**ADJACENT ZONING**

NORTH: (RT) RESEARCH AND TECH  
 SOUTH: GRAND RIVER AVE. R/W  
 EAST: (SFR) SINGLE FAMILY RESIDENTIAL  
 WEST: (RSC) REGIONAL SERVICE COMMERCIAL

**% OF IMPERVIOUS SURFACES**

BUILDINGS AND IMPERVIOUS SURFACES:  
 40,860.12 SF/88,818.8 SF = 46.00%

**PROPOSED PARKING**

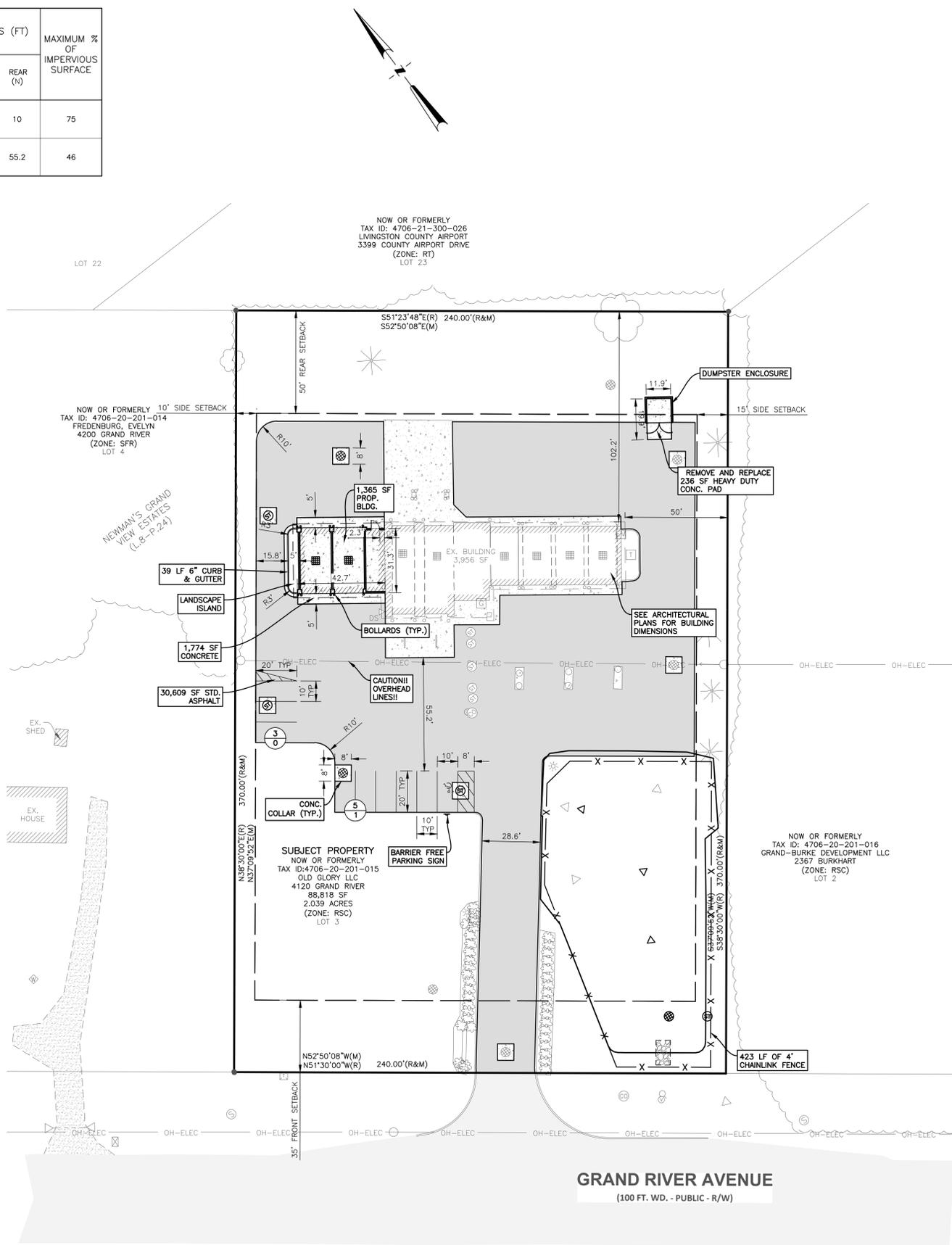
1 PER STALL + 1 PER EMPLOYEE

8 STALLS + 1 EMPLOYEE = 9 SPACES

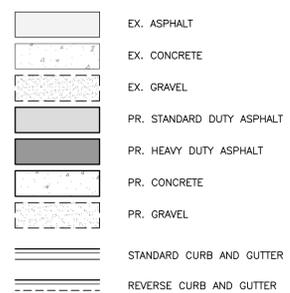
TOTAL PARKING REQUIRED: 9

PARKING SPACES: 8  
 BARRIER FREE PARKING SPACES: 1  
 TOTAL PARKING PROVIDED: 9

REGULAR SPACES  
 BARRIER FREE SPACES



**PAVEMENT LEGEND**



**NOTES**

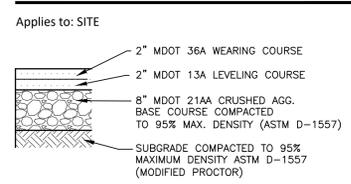
- SCREENING SHALL BE PROVIDED FOR ALL MECHANICAL EQUIPMENT.
- PARKING LOT ISLANDS SHALL BE FINISHED IN GRASS, GROUND COVER OR MULCH.

**DIMENSIONING NOTE**

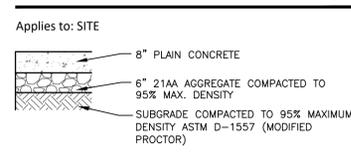
- DIMENSIONS ARE TO THE BACK OF CURB UNLESS OTHERWISE SPECIFIED.

FC = FACE OF CURB

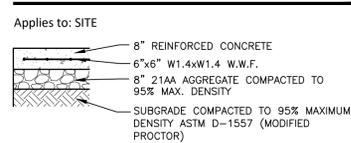
**STANDARD DUTY HMA PAVEMENT SECTION**



**STANDARD DUTY CONCRETE PAVEMENT SECTION**



**HEAVY DUTY CONCRETE PAVEMENT SECTION**



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 ENGINEER  
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 OLD GLORY CAR WASH  
 PO BOX 328  
 FOWLERVILLE, MI 48836  
 POC: MATT MARTIN  
 517-375-0555

**DIMENSION AND PAVING PLAN**  
 NEW TOUCHLESS WASH BAYS  
 4120 GRAND RIVER ROAD  
 PART OF SE 1/4, SEC. 20, T3N-R4E  
 HOWELL TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

DATE	REVISIONS
1/25/2024	
3/21/2024	

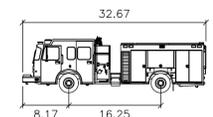
ORIGINAL ISSUE DATE:  
 PROJECT NO: 22-177  
 SCALE: 1" = 30'  
 0 1/2" 1"  
 FIELD:  
 DRAWN BY: DC  
 DESIGN BY:  
 CHECK BY: AP

**C-10**

NOT FOR CONSTRUCTION



EMERGENCY VEHICLE



TOYNE PUMPER

FEET  
WIDTH : 8.35  
TRACK : 7.93  
LOCK TO LOCK TIME : 6.0  
STEERING ANGLE : 50.0

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**EMERGENCY VEHICLE CIRCULATION**

NEW TOUCHLESS WASH BAYS  
4120 GRAND RIVER ROAD  
PART OF SE 1/4, SEC. 20, T3N-R4E  
HOWELL TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

PLAN SUBMITTALS/REVISIONS	DATE
SITE PLAN SUBMITTAL	1/25/2024
REVISED SITE PLAN SUBMITTAL	3/21/2024

ORIGINAL ISSUE DATE:

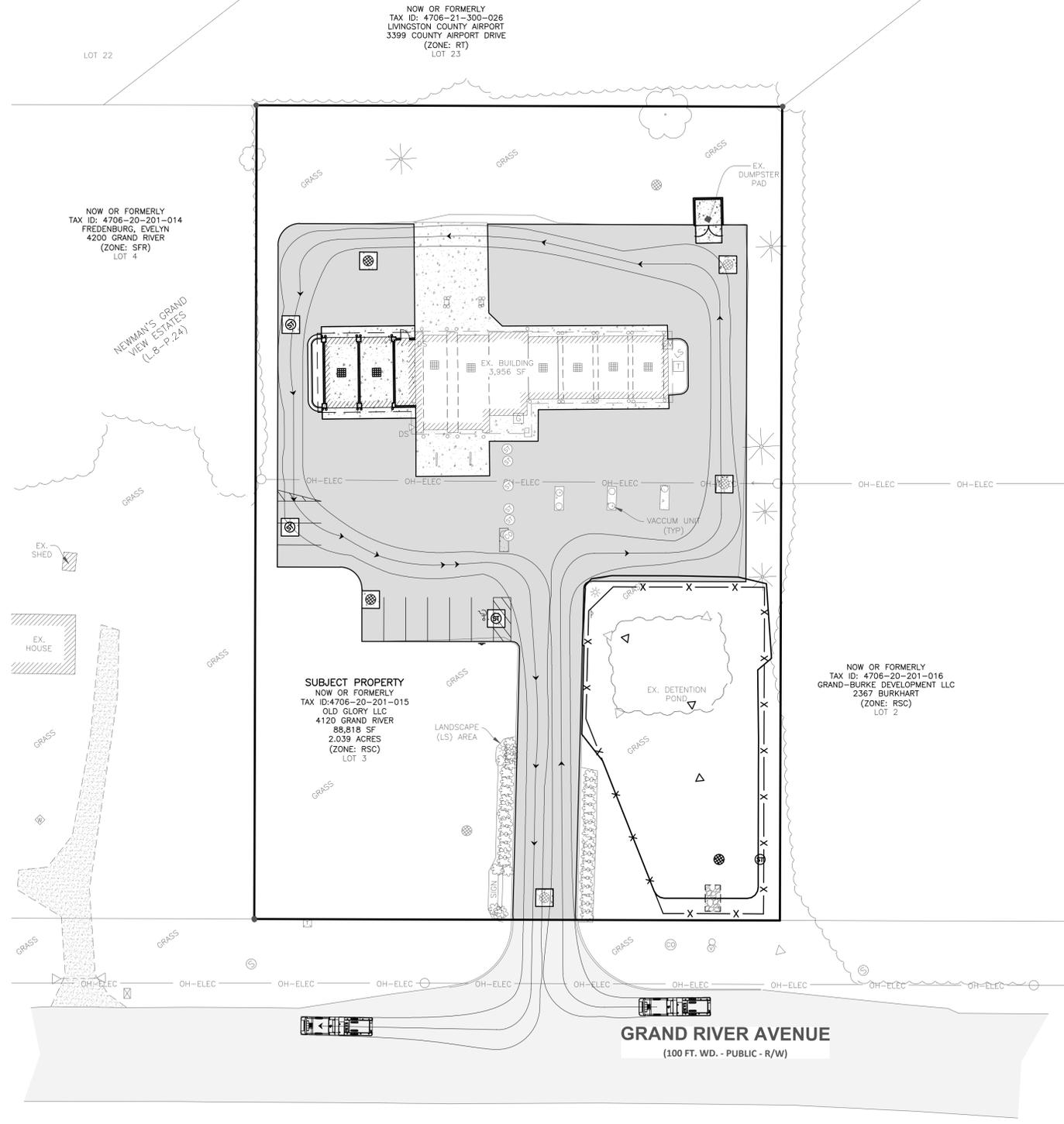
PROJECT NO: 22-177

SCALE: 1" = 30'

FIELD:  
DRAWN BY: DC  
DESIGN BY:  
CHECK BY: AP

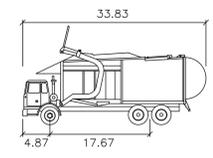
**C-2.0**

NOT FOR CONSTRUCTION

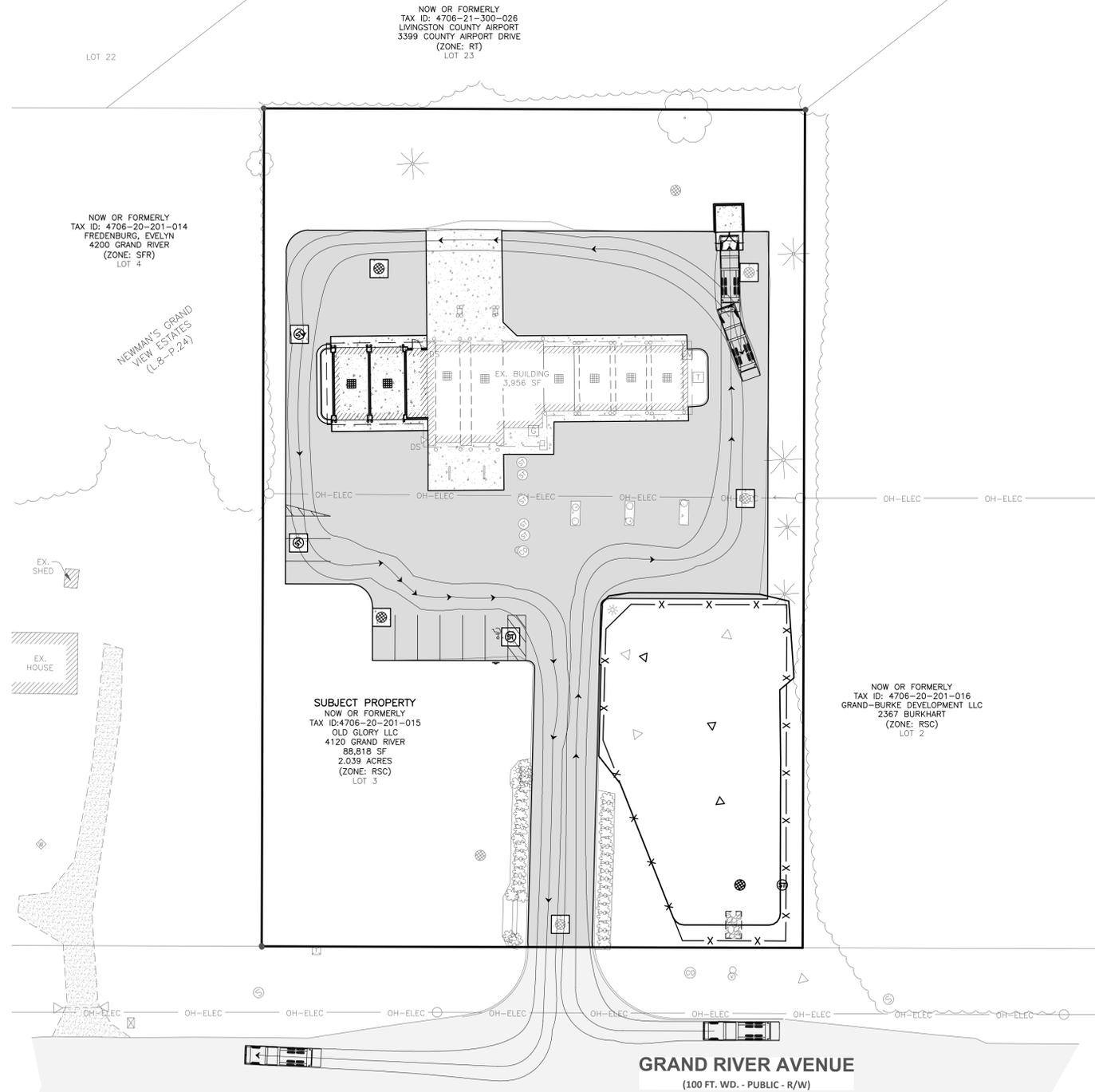




REFUSE VEHICLE



Wayne Titan  
FEET  
WIDTH : 8.46  
TRACK : 8.00  
LOCK TO LOCK TIME: 6.0  
STEERING ANGLE : 45.0



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**REFUSE VEHICLE CIRCULATION**

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PROJECT NO: 22-177

SCALE: 1" = 30'  
0 1/2" 1"

FIELD:  
DRAWN BY: DC  
DESIGN BY:  
CHECK BY: AP

**C-2.1**

NOT FOR CONSTRUCTION

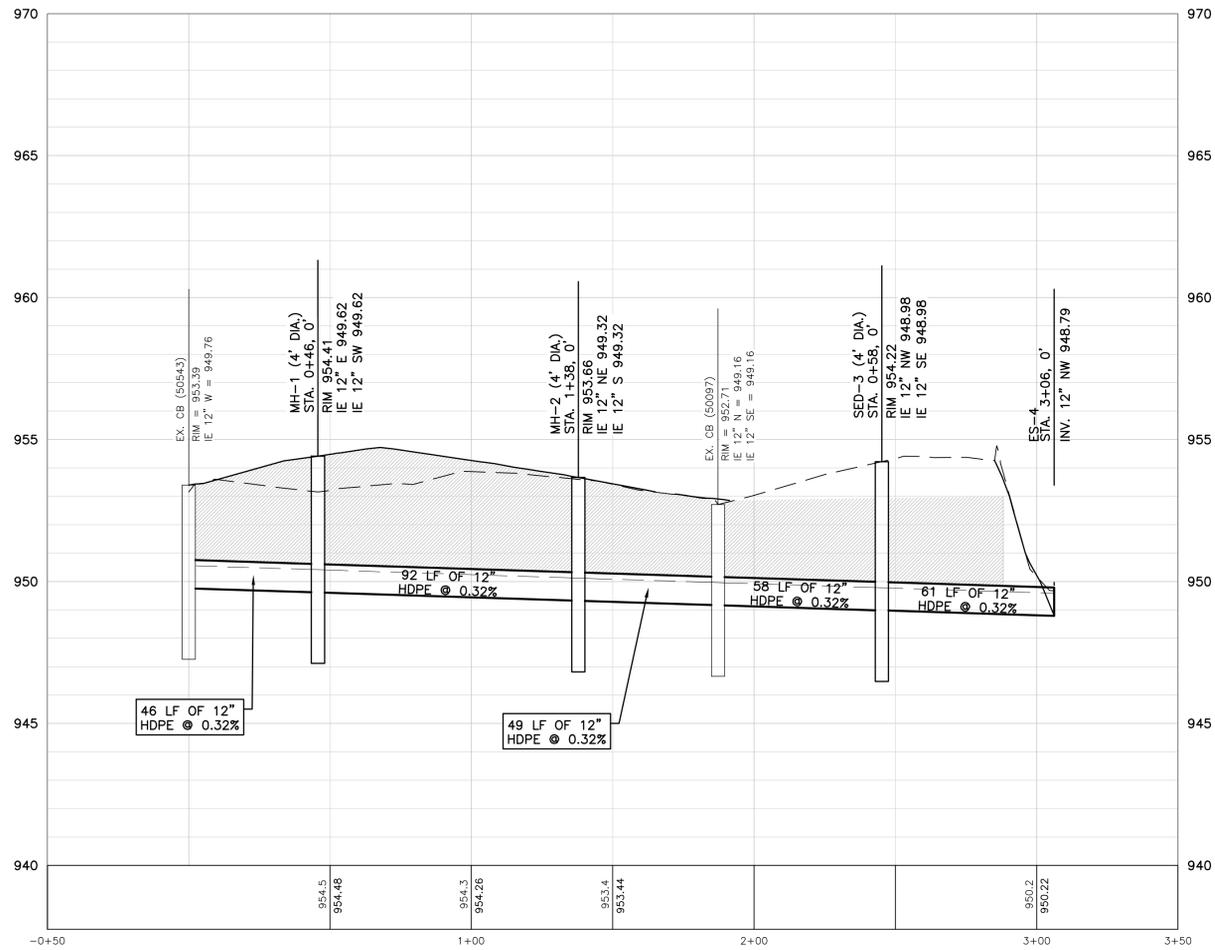
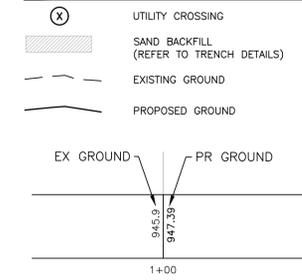




### NOTES

- SAND BACKFILL AND BEDDING TO BE MDOT CL II.
- MAINTAIN MINIMUM 18" VERTICAL CLEARANCE BETWEEN ALL UTILITIES.

### PROFILE LEGEND



EX CB (50543) TO ES-4

PROFILE SCALE  
HORIZ: 1"=30'  
VERT: 1"=3'

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517-375-0555

**STORM SEWER PROFILES**

NEW TOUCHLESS WASH BAYS  
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0 1/2" 1"

FIELD:  
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CHECK BY: AP

**C-6.1**

NOT FOR CONSTRUCTION



### BENCHMARKS

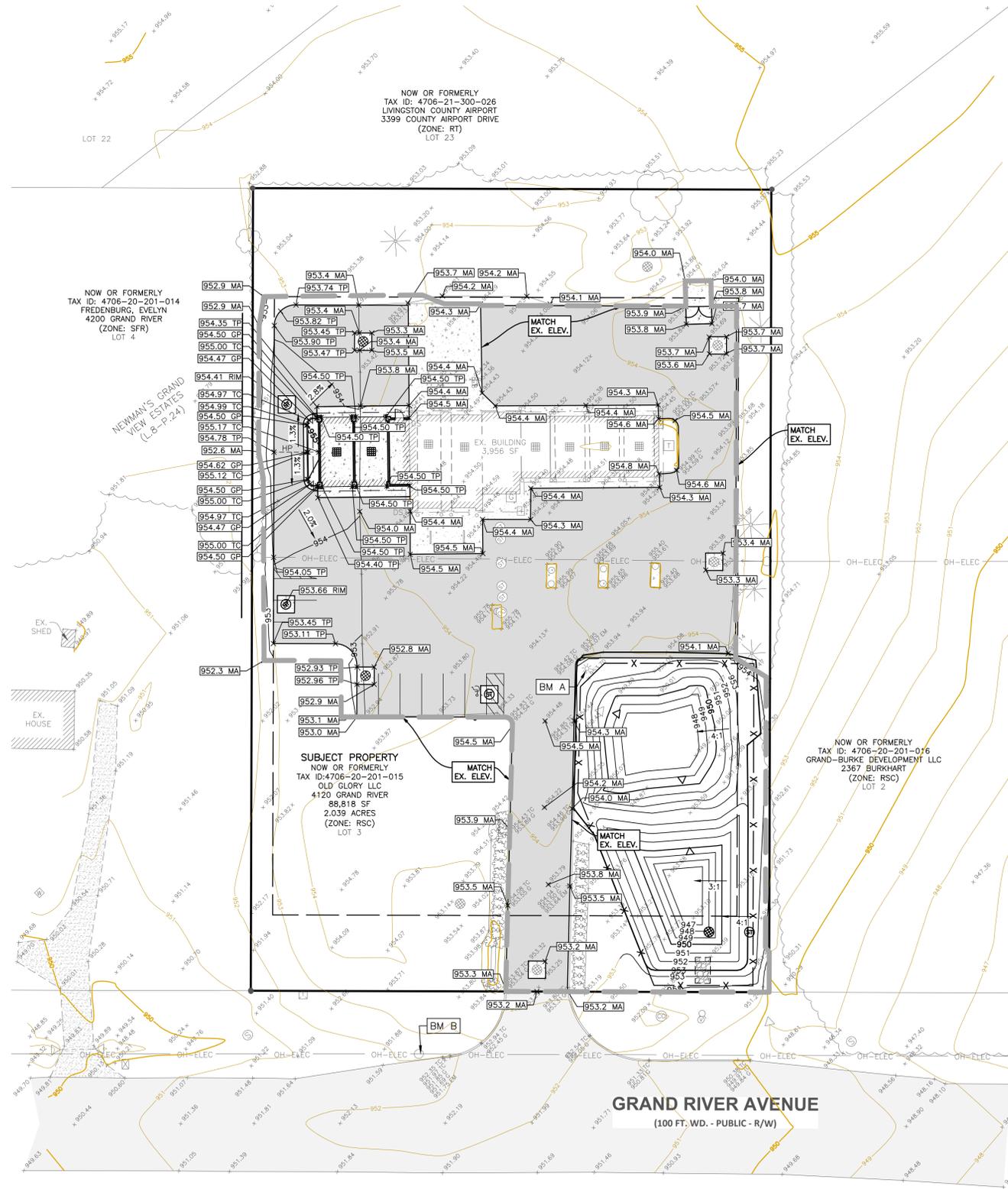
DATUM: NAVD88

BM A:  
CHISELED "X" ON NW SIDE CONCRETE PAD FOR LIGHT POLE, 208'± EAST OF CENTERLINE W GRAND RIVER ROAD & 20'± SOUTH OF CENTERLINE FOR ACCESS DRIVE TO SUBJECT'S PROPERTY.  
ELEV = 955.54

BM B:  
BENCH TIE IN NE SIDE UTILITY POLE, 32'± EAST OF CENTERLINE W GRAND RIVER ROAD & 57'± NORTH OF CENTERLINE FOR ACCESS DRIVE TO SUBJECT'S PROPERTY.  
ELEV = 953.25

### GRADING LEGEND

- X 940.00 TP PROPOSED TOP OF PAVEMENT GRADE
- X 940.00 SW PROPOSED SIDEWALK GRADE
- X 940.00 FG PROPOSED FINISH GRADE
- X 940.00 TC PROPOSED TOP OF CURB GRADE
- X 940.00 GP PROPOSED GUTTER PAN GRADE
- X 940.00 TW PROPOSED TOP OF WALL GRADE
- X 940.00 BW PROPOSED BOTTOM OF WALL GRADE
- X 940.0 MA MATCH EXISTING GRADE
- X 940.0 FFE PROPOSED FINISH FLOOR GRADE
- X 940.00 RIM PROPOSED RIM GRADE
- X 940.00 ADJ-RIM ADJUSTED RIM GRADE
- X 940.00 INV PROPOSED INVERT GRADE
- R ADA COMPLIANT SIDEWALK RAMP
- L ADA COMPLIANT SIDEWALK LANDING
- 740.00 ± EXISTING ELEVATION
- 900 EXISTING CONTOUR
- 900 PROPOSED CONTOUR
- SOIL TYPE LIMIT AND LABEL (FROM USGS SOIL SURVEY)
- LIMITS OF DISTURBANCE
- OVERFLOW ROUTE



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**GRADING PLAN**

NEW TOUCHLESS WASH BAYS  
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0 1/2" 1"

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CHECK BY: AP

**C-7.0**

NOT FOR CONSTRUCTION



CONSTRUCTION SEQUENCE	OPERATION TIME SCHEDULE -- BEGINNING APRIL 2024					
	APR	MAY	JUN	JUL	AUG	SEP
1 CONTRACTOR SHALL INSTALL SILT FENCE AS SHOWN ON APPROVED PLANS.						
2 DETENTION BASIN SHALL BE EXCAVATED, TOP SOILED, AND SEEDED IMMEDIATELY AFTER DEMOLITION WORK IS COMPLETED.						
3 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.						
4 ROUGH GRADE AND INSTALL NEW UNDERGROUND UTILITIES. PLACE INLET FILTERS AT PROPOSED CATCH BASINS THROUGHOUT SITE.						
5 CONSTRUCT BUILDING(S).						
6 FINISH GRADE AROUND BUILDING(S) 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 BEEN ESTABLISHED. CLEAN ALL AFFECTED STORM STRUCTURES AS NECESSARY.						

### SOILS INFO

SOIL TYPES ARE ACCORDING TO THE USDA SOIL SURVEY WEB SITE (<https://websurveys.sc.egov.usda.gov/App/HomePage.htm>)

SOIL TYPE LIMIT AND LABEL

- CvrabB: CONOVER LOAM, 0-4% SLOPES
- MoB: WAWASEE LOAM, 2-6% SLOPES

### EROSION CONTROL QUANTITIES

Disturbed Area: 35,376.1 SF = 0.81 Acres

QTY	UNIT	ITEM
1,105	LF	SILT FENCE
6	EA	INLET FILTER
1	EA	STABILIZED CONSTRUCTION ACCESS

NOTE: QUANTITIES ARE FOR ENTIRE SITE

### SESC LEGEND

- SILT FENCE
- LIMITS OF DISTURBANCE
- STABILIZED CONSTRUCTION ACCESS

### DTMB SOIL EROSION & SEDIMENTATION CONTROL MEASURES

MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT, AND BUDGET (DTMB)

EROSION CONTROLS			
KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
E6	MULCH		FOR USE IN AREAS SUBJECT TO ERODING SURFACE FLOWS OR SEVERE WIND OR ON NEWLY SEEDED AREAS.
E8	PERMANENT SEEDING		STABILIZATION METHOD UTILIZED ON SITES WHERE EARTH CHANGE HAS BEEN COMPLETED (FINAL GRADING ATTAINED).

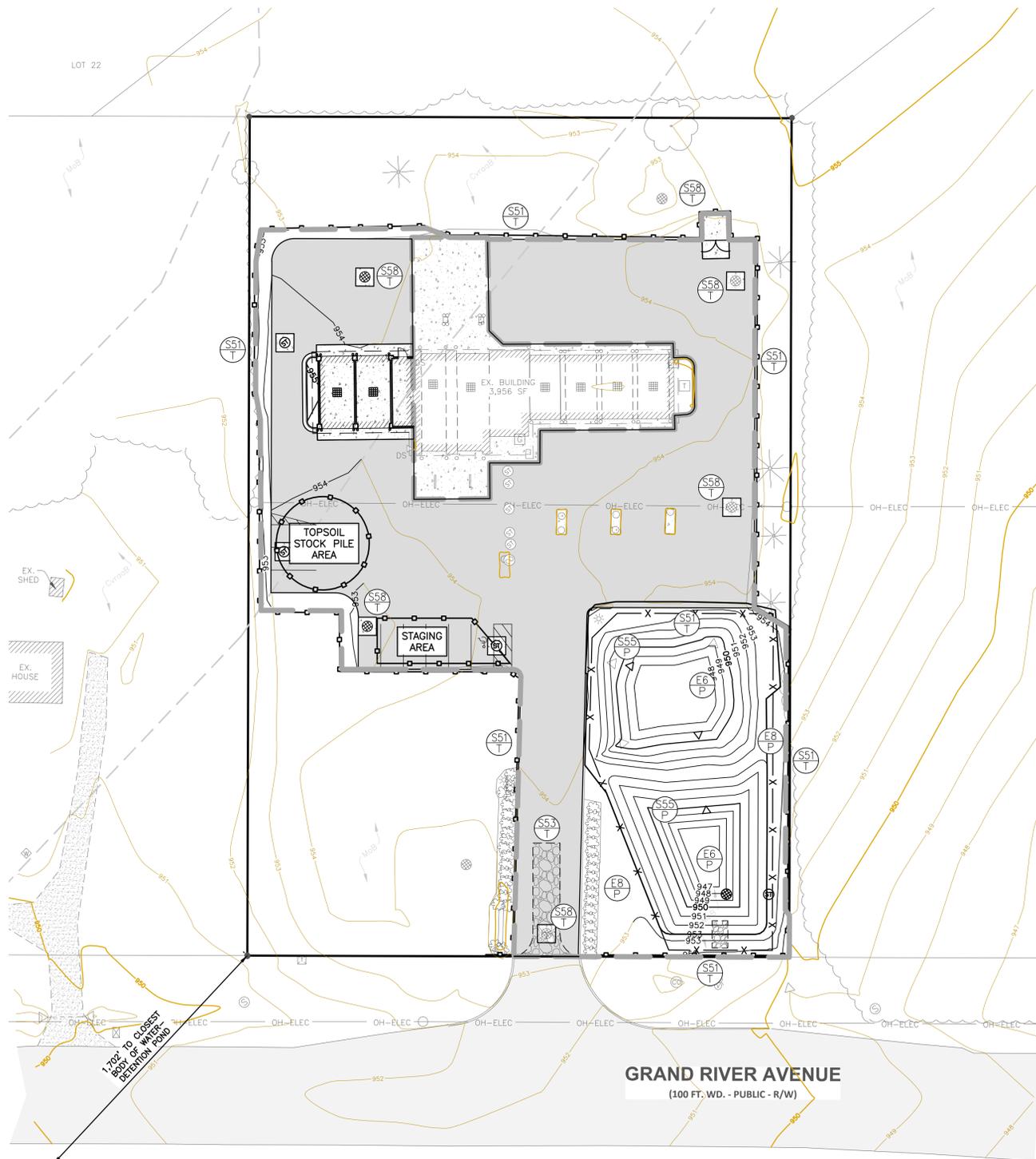
SEDIMENT CONTROLS			
KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
S51	SILT FENCE		USE ADJACENT TO CRITICAL AREAS, TO PREVENT SEDIMENT LADEN SHEET FLOW FROM ENTERING THESE AREAS.
S53	STABILIZED CONSTRUCTION ACCESS		USED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE.
S55	SEDIMENT BASIN		AT THE OUTLET OF DISTURBED AREAS AND AT THE LOCATION OF A PERMANENT DETENTION BASIN.
S58	INLET PROTECTION FABRIC DROP		USE AT STORMWATER INLETS, ESPECIALLY AT CONSTRUCTION SITES.

EROSION & SEDIMENT CONTROLS			
KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
ES31	CHECK DAM		USED TO REDUCE SURFACE FLOW VELOCITIES WITHIN CONSTRUCTED AND EXISTING FLOW CORRIDORS.

XX TEMPORARY    
 XP PERMANENT



### EROSION CONTROL STANDARDS

- ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE.
- 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.
- 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.
- 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.
- 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.
- 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.
- A CERTIFIED STORM WATER OPERATOR WILL BE NAMED ON THE EGLE NOTICE OF COVERAGE FOR NPDES AS REQUIRED.
- ALL DISTURBED AREAS ARE TO BE TOP SOILED AND SEEDED WITH THE FOLLOWING MIN RATIO:  
TOPSOIL TO BE SCREENED, 3" MIN. IN DEPTH. GRASS SEED 218 LBS PER ACRE, FERTILIZER 150 LBS PER ACRE, STRAW MULCH 3" DEPTH 1.5 TO 2 TONS PER ACRE.
- HYDRO-SEEDING IS NOT ACCEPTABLE FOR SLOPES EXCEEDING 1%. ON SLOPES OVER 1%, STABILIZATION SHALL BE DONE WITH SEED AND STRAW MULCH WITH A TACKIFIER, OR STRAW BLANKETS PEGGED IN PLACE.

### SOIL EROSION CONTROL MAINTENANCE SCHEDULE AND NOTES.

- CONTRACTOR MUST OBTAIN A SOIL EROSION AND SEDIMENTATION CONTROL PERMIT FROM THE LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE PRIOR TO COMMENCING WORK.
- EARTHWORK SHALL BE LIMITED TO THE PROPOSED SITE AS SHOWN ON THE PLAN.
- 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.
- ALL MUD OR DEBRIS TRACKED ONTO EXISTING PUBLIC ROADS FROM THE SITE DUE TO CONSTRUCTION SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
- 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.
- PERMANENT STABILIZATION MUST 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.
- 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.
- IF SOIL EROSION/SEDIMENT CONTROL MEASURES ARE INADEQUATE FOR THE SITE. THE PROPER EROSION CONTROL AUTHORITY MUST BE NOTIFIED.
- ANY DEWATERING REQUIRED SHALL HAVE A DEWATERING PLAN SUBMITTED PRIOR TO STARTING THE ACTIVITY AND MAY REQUIRE EGLE APPROVAL.



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CLIENT :

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POC: MATT MARTIN  
517-375-0555

**SESC PLAN**

NEW TOUCHLESS WASH BAYS  
4120 GRAND RIVER ROAD  
PART OF SE 1/4, SEC. 20, T3N-R4E  
HOWELL TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

DATE	PLAN SUBMITTALS/REVISIONS
1/25/2024	REVISIONS
3/21/2024	REVISIONS

ORIGINAL ISSUE DATE:

PROJECT NO: 22-177

SCALE: 1" = 30'

FIELD:  
DRAWN BY: DC  
DESIGN BY:  
CHECK BY: AP

**C-8.0**

NOT FOR CONSTRUCTION

# LCDC NOTES

## Top Soil & Soil Storage Areas:

- Top soil or soil storage areas shall be seeded and mulched, or matted with straw, immediately after the stripping process is completed, to prevent wind and water erosion.

## Slopes and Ditches:

- On-site ditches shall be of the flat bottom type, minimum width of 2' with a minimum of 3' horizontal to 1' vertical side slopes, 3:1.
- Side slopes in excess of 3' horizontal to 1' vertical shall not be used except with a mechanical device such as a retaining wall, or terracing.
- Ditches with steep grades will need "stone flow checks" to prevent scouring of the ditch bottoms. They may be used as a temporary measure and removed once sufficient stabilization has been established. These shall be depicted on plans by the engineer. Indicate flow checks on all slopes 3.00% and greater.

## Detention/Retention, Sedimentation Ponds:

- New land developments within Livingston County shall be equipped with detention/retention facilities for storm water in accordance with the Drainage Policies of the Livingston County Drain Commissioner.
- Inlets into detention ponds must not discharge at the same location as the outlet structure.
- Detention Pond Stand Pipe Outlet Detail must be the Livingston County Drain Commissioner's standard Detention Pond outlet, e.g. orifice outlets without sedimentation control devices are prohibited.
- Stand pipe structure must have a 2 ft. sump.
- Detention Pond stand pipe structure shall show staggering of outlet holes at different elevations. This will minimize plugging and provide for more effective filtering.
- The stone around the stand pipe structure shall be refreshed with clean stone prior to completion of the project.
- Detention/Retention, Sedimentation Ponds shall be excavated, top soiled, seeded, mulched and tacked prior to the start of massive earth disruption.
- Inlets into Detention/Retention Ponds must be located within two feet of the bottom floor of the pond.

## Detention Pond Spillway:

- Rip-rap proposed in the construction of the emergency spillway must be placed over keyed-in geo-fabric blanket.

## Silt Fence:

- All commercial projects constructed in Livingston County shall install 36" high silt fence.

## Inlet Protection:

- Sedimentation protection for catch-basin inlets. Silt sacks are the preferred choice in the winter months, because they are less likely to be disturbed by the process of snow plowing.
- Open-Pipe, inlet protection must be provided with straw bales, stone or geo-fabric.

## Outlet Protection:

- All storm drains 15" in diameter or larger shall have animal guards installed to prevent entrance to the system.
- All rip-rap must be placed over keyed in geo-fabric.
- Storm drain outlets that do not empty into the retention/detention pond shall have a temporary 5'x10'x3' sump installed at the termination of the storm sewer. Upon completion of the stabilization work the sump area shall be filled and rip-rapped with cobble stone over keyed in filter fabric. Silt traps shall be inspected after each storm.
- Splash blocks may be required depending on the outley flow rate or velocity.

## Tracking onto public roadway:

- It is required that each development have an ingress/egress of crushed stone to restrict tracking of material onto the Public Roadway. All commercial construction sites require a minimum 75-foot tracking mat shown at ingress/egress.

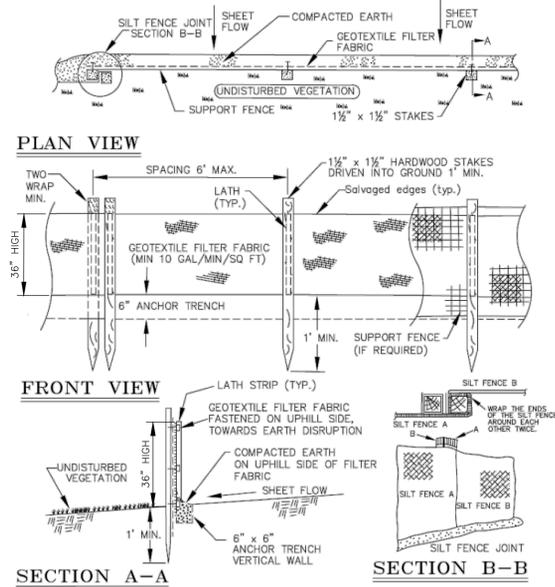
## Stabilization Standards:

- For subdivision and site condominium developments: As of May 01, 2000, it is required that temporary stabilization of the entire site be completed and approval from the Livingston County Drain Commissioner's Office obtained prior to the issuance of single family dwelling permits.
- For commercial or industrial sites, common areas shall be called out on plans, in accordance with Part 17, prescribed by R 323.1709 and R 323.1710, pursuant to PART 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act (Previously known as P.A. 347 of 1972) of Act 347, Public Acts Of 1972, as amended) indicating areas to be stabilized after 15 days of grade work. Areas to be outlined are as follows: detention/retention, drainage easements, utility easements, boulevards, etc.

## Seeding, Fertilizer and Mulch Bare Ground Ratio:

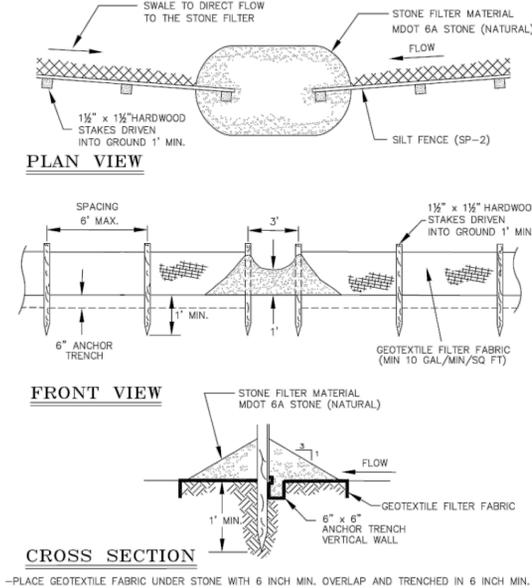
- This information shall be detailed on the construction plans.
- Top Soil Screened, 3" min. in depth
- Grass Seed 217.84 lbs per acre
- Fertilizer 150 lbs per acre
- Straw Mulch 3" in depth (All mulching must have a tie down)
- Hydroseeding is not acceptable for slopes exceeding 1%, in such cases stabilization shall be done with seed and and straw mulch with a tackifier.

### 36" SILT FENCE STANDARD CONTROL

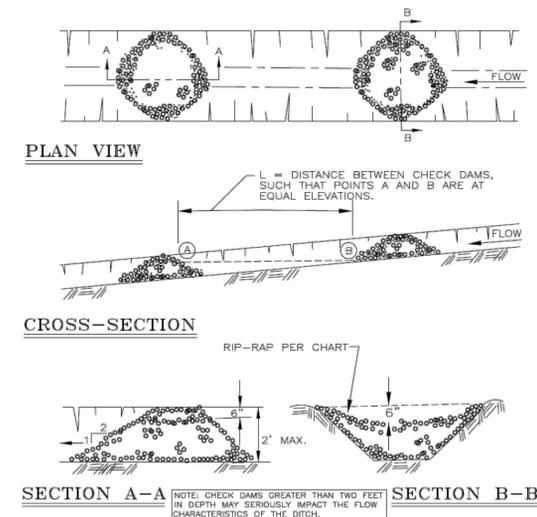


### 36" SILT FENCE GRAVEL FILTER STANDARD CONTROL

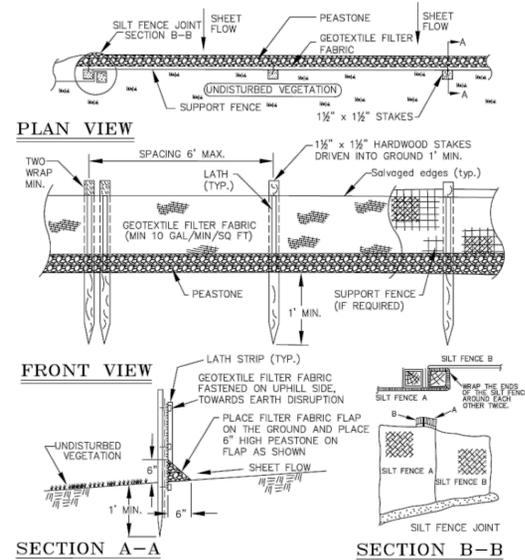
(ALL ALTERNATIVES MUST BE PRE-APPROVED BY THE INSPECTOR ON A CASE BY CASE BASIS)



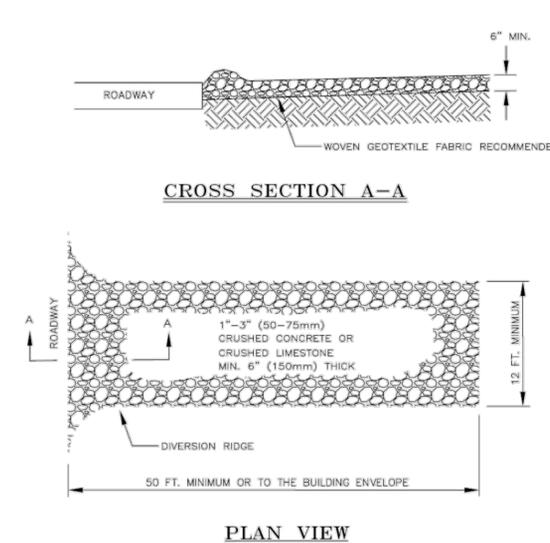
### ANGULAR RIP RAP CHECK DAM STANDARD CONTROL



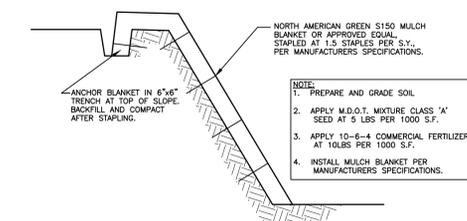
### 36" SILT FENCE WINTER FROZEN GROUND INSTALLATION STANDARD CONTROL



### TRACKING MAT STANDARD CONTROL



### EROSION CONTROL BLANKET DETAIL



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Utility Notification Organization  
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LCDC SECC NOTES AND DETAILS  
NEW TOUCHLESS WASH BAYS  
4120 GRAND RIVER ROAD  
PART OF SE 1/4, SEC. 20, T3N-R4E  
HOWELL TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

DATE	DESCRIPTION
1/25/2024	PLAN SUBMITTALS/REVISIONS
3/21/2024	REVISIONS

ORIGINAL ISSUE DATE:  
PROJECT NO: 22-177  
SCALE: N/A  
DRAWN BY: DC  
DESIGN BY:  
CHECK BY: AP

C-8.1

NOT FOR CONSTRUCTION







### GENERAL NOTES

- ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE LOCAL MUNICIPALITY, THE LOCAL WATER AND/OR SEWER AUTHORITY, THE COUNTY D.P.W., THE COUNTY DRAIN COMMISSIONER, MICHIGAN DEPARTMENT OF TRANSPORTATION, MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY, THE STATE OF MICHIGAN, AND THE COUNTY ROAD COMMISSION WHERE APPLICABLE.
- 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, CONTRACTOR SHALL SEEK CLARIFICATION IN WRITING FROM THE ENGINEER BEFORE COMMENCEMENT OF CONSTRUCTION. FAILURE TO DO SO SHALL BE AT SOLE EXPENSE TO THE CONTRACTOR.
- 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.
- ALL NECESSARY PERMITS, BONDS, INSURANCES, ETC., SHALL BE PAID FOR BY THE CONTRACTOR.
- ALL ELEVATIONS SHOWN ARE BASED ON BENCHMARKS PROVIDED BY THE LOCAL MUNICIPALITY UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- ALL ITEMS OF WORK NOT SPECIFICALLY INDICATED AS PAY ITEMS ON THE DRAWINGS OR IN THE BID PACKAGE SHALL BE CONSIDERED INCIDENTAL ITEMS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL DURING THE PERIODS OF CONSTRUCTION.
- 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.
- 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.
- 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.
- 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.
- ALL REFERENCES TO M.D.O.T. SPECIFICATIONS REFER TO THE MOST CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- 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.
- 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.
- THE OWNER MAY EMPLOY AND PAY FOR THE SERVICES OF AN 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.
- 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.
- 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.
- 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).
- 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.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE FOR OR SUPPLY TEMPORARY WATER SERVICE, SANITARY FACILITIES AND ELECTRICITY.
- CONTRACTOR SHALL PROVIDE FOR THE CONTINUOUS OPERATION OF EXISTING FACILITIES WITHOUT INTERRUPTION DURING CONSTRUCTION UNLESS SPECIFICALLY AUTHORIZED OTHERWISE BY THE RESPECTIVE AUTHORITY.
- THE CONTRACTOR SHALL NOTE EXISTING UNDERGROUND UTILITIES IN THE PROJECT PLANS. TRENCH BACKFILL FOR EXISTING UTILITIES SHALL BE EXAMINED CRITICALLY. ANY TRENCH WHICH, IN THE OPINION OF THE SOILS ENGINEER ARE 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 3 FEET OF THE 45° INFLUENCE LINE 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 ACRE 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.
- 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.
- 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.

### EROSION CONTROL STANDARDS CONTINUED

- STAGING THE WORK WILL BE DONE BY THE CONTRACTOR AS DIRECTED IN THESE PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED EARTH.
- 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.
- DUST SHALL BE CONTROLLED BY WATERING OR BY OTHER APPROVED MEANS THROUGHOUT ALL CONSTRUCTION OPERATIONS.
- ALL WATER FROM DEWATERING OR SURFACE DRAINAGE FROM THE CONSTRUCTION SITE SHALL BE CONTROLLED TO ELIMINATE SEDIMENT CONTAMINATION OF OFF-SITE WATERWAYS OR STORM SEWERS. SUCH MEASURES SHALL BE APPROVED BY THE ENGINEER PRIOR TO ANY DEWATERING OR LAND DISTURBANCE.
- 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 CEASES, TEMPORARY SOIL EROSION 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 ISSUED.

### 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.
- 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 AT LEAST 50% 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" PER PLANS AND DETAILS.
- 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:
  - 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 ELASTOMERIC GASKET JOINTS CONFORMING TO ASTM D3212 OR CHEMICALLY WELDED PIPE JOINTS CONFORMING TO ASTM F545.
  - 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.
  - PERFORATED SUBSURFACE DRAIN PIPE SHALL BE PVC CONFORMING TO ASTM D-2729 OR PERFORATED, CORRUGATED HIGH DENSITY POLYETHYLENE PIPE CONFORMING TO AASHTO M-294. 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:
  - REINFORCED PRE-CAST CONCRETE MANHOLE SECTIONS INCLUDING CONCENTRIC OR ECCENTRIC CONES AND GRADE RINGS SHALL BE 4000 PSI CONCRETE AND CONFORM TO ASTM C-478-84T.
  - BRICK SHALL BE SOUND, HARD--BURNED THROUGHOUT AND OF UNIFORM SIZE AND QUALITY AND SHALL BE IN ACCORDANCE WITH AASHTO M 91, GRADE MS.
  - CONCRETE MASONRY SHALL BE SOLID PRE-CAST SEGMENTAL UNITS CONFORMING TO ASTM C-139.
- 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 ARE PLAINLY VISIBLE. SEE MUNICIPALITY STANDARDS FOR ACTUAL WORDING.
- CASTINGS SHALL BE MANUFACTURED BY EAST JORDAN IRON WORKS, INC., NEENAH FOUNDRY COMPANY OR EQUAL.
- CONCRETE AND MASONRY MATERIALS FOR CONSTRUCTION OF STORM DRAINAGE STRUCTURES SHALL CONSIST OF THE FOLLOWING:
  - PORTLAND CEMENT SHALL BE STANDARD BRAND OF PORTLAND CEMENT CONFORMING TO ASTM C-150, TYPE I OR IA.
  - FINE AND COARSE AGGREGATES FOR CONCRETE SHALL BE PER ASTM C-33.
  - AGGREGATE FOR CEMENT MORTAR SHALL BE CLEAN, SHARP SAND CONFORMING TO ASTM C-144.
  - HYDRATED LIME SHALL COMPLY WITH ASTM C-207, TYPE S.
  - WATER SHALL MEET THE REQUIREMENTS OF MDOT SPEC SECTION 911.
  - REINFORCING STEEL FOR CONCRETE SHALL BE INTERMEDIATE-GRADE NEW BILLET STEEL CONFORMING TO ASTM A-615, GRADE 40.
- CONCRETE, UNLESS OTHERWISE NOTED, SHALL HAVE COMPRESSIVE STRENGTH AFTER 28 DAYS OF 3000 PSI MINIMUM WITH 3" MAXIMUM SLUMP.
  - CONCRETE FILL BELOW GRADE MAY BE 2500 PSI AT 28 DAYS.
  - 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.
  - READY-MIX CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-94.
- MORTAR SHALL BE SPECIFIED HEREINAFTER. USE METHOD OF MIXING MORTAR AT JOB SO THAT SPECIFIED PROPORTIONS OF MORTAR MATERIALS CAN BE CONTROLLED AND ACCURATELY MAINTAINED DURING WORK PROGRESS. MORTAR SHALL NOT BE MIXED IN GREATER QUANTITIES THAN REQUIRED FOR IMMEDIATE USE, WITH AMOUNT OF WATER CONSISTENT WITH SATISFACTORY WORKABILITY. RE-TAMPING OF MORTAR IS NOT PERMITTED.
  - MORTAR FOR LAYING BRICK OR CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C-270, TYPE M. AVERAGE COMPRESSIVE STRENGTH 3500 PSI MINIMUM AT 28 DAYS. MORTAR MIX SHALL BE PROPORTIONED BY VOLUME.
  - MORTAR FOR PLASTERING SHALL CONSIST OF 1 PART PORTLAND CEMENT AND 2-1/2 PARTS SAND.
  - MORTAR FOR GROUTING OF RIP-RAP SHALL CONSIST OF 1 PART PORTLAND CEMENT AND 3-1/2 PARTS SAND.
- PERFORM ALL EXCAVATING AND TRENCHING TO DIMENSIONS AND ELEVATIONS INDICATED ON DRAWINGS.

### STORM SEWER SPECIFICATIONS, CONTINUED

- OPEN NO MORE TRENCH IN ADVANCE OF PIPE LAYING THAN IS NECESSARY TO EXPEDITE THE WORK.
- 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 TO THE PROPER GRADE WITH COMPACTED BEDDING MATERIAL, AT NO EXPENSE TO THE OWNER.
- WHERE UNSTABLE SOIL IS ENCOUNTERED, CONTRACTOR SHALL NOT PLACE PIPE UNTIL A SOLID BED HAS BEEN PROVIDED.
- EXCAVATION FOR DRAINAGE STRUCTURES SHALL EXTEND A SUFFICIENT DISTANCE FROM THE WALLS AND FOOTINGS TO ALLOW FOR FORMS, CONSTRUCTION OF WALLS, CONNECTIONS AND FOR INSPECTION.
- PROVIDE REQUIRED TIMBER SHEETING, BRACING AND SHORING TO PROTECT SIDES OF EXCAVATION. DO NOT BRACE SHEETING AGAINST PIPE. PROVIDE SUITABLE LADDERS FOR SAFE ENTRY TO AND EXIT FROM EXCAVATION.
- 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 SLIDES OR CAVE-INS.
- 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.
- MANHOLES AND CATCH BASINS SHALL BE CONSTRUCTED OF BRICK, CONCRETE MASONRY UNITS OR PRE-CAST CONCRETE WITH CAST IRON FRAMES, COVERS AND MANHOLE STEPS.
- THE WALL THICKNESS OF MANHOLES AND CATCH BASINS CONSTRUCTED OF VARIOUS MATERIALS AND SET AT VARIOUS DEPTHS SHALL MEET THESE MINIMUMS. ADHERE TO REQUIREMENTS OF THE GOVERNING AGENCY IF THEY EXCEED THESE THICKNESSES:
 

DEPTH	BRICK	CONCRETE BLOCK	PRE-CAST CONCRETE
0' - 10'	8"	6"	6"
10' - 16'	12"	8"	8"
16' - 25'	16"	12"	12"
- WHENEVER EXISTING MANHOLES OR SEWER PIPE ARE TO BE TAPPED, DRILL HOLES 4" CENTER, TO CENTER, AROUND THE PERIPHERY OF OPENINGS TO CREATE A PLANE OF WEAKNESS JOINT BEFORE BREAKING SECTION OUT.
- MANHOLE STEPS SHALL BE BUILT INTO AND THOROUGHLY ANCHORED TO WALLS. STEPS SHALL BE FACTORY INSTALLED IN PRE-CAST STRUCTURES.
- ALL PIPING ENTERING OR LEAVING DRAINAGE STRUCTURES SHALL BE ADEQUATELY SUPPORTED BY POURED IN-PLACE CONCRETE FILL FROM PIPE CENTER TO UNDISTURBED GROUND.
- SET FRAMES IN FULL BED OF STIFF MORTAR OR BITUMINOUS MASTIC JOINTING COMPOUND AT FINAL ELEVATION.
- 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.
- 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.
- 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.
- WITHIN 3' OF THE 45° INFLUENCE LINE OF THE SUBGRADE OF 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%) COMPACTED TO 95% OF MAXIMUM DRY DENSITY PER ASTM D1557. (MODIFIED PROCTOR) SUITABLE MATERIALS FOUND ON SITE MAY BE USED.
- BEFORE BACKFILLING AROUND DRAINAGE STRUCTURES, ALL FORMS, TRASH AND DEBRIS SHALL BE REMOVED AND CLEARED AWAY. SELECTED EXCAVATED MATERIAL SHALL BE PLACED SYMMETRICALLY ON ALL SIDES IN 6" MAXIMUM LAYERS. EACH LAYER SHALL BE MOISTENED AND COMPACTED WITH MECHANICAL OR HAND TAMPERS.
- AFTER INSTALLATION OF PIPES AND DRAINAGE STRUCTURES, CLEAN THEM, AND ADJUST TOPS TO FINISH GRADE. PIPE SHALL BE STRAIGHT BETWEEN STRUCTURES, WITH THE FULL INSIDE DIAMETER VISIBLE WHEN SIGHTING BETWEEN STRUCTURES.
- ENDS OF HEADWALL AND END SECTIONS FOR PIPES LARGER THAN 6 INCHES, SHALL BE FITTED WITH A #4 ROUND MINIMUM WELDED STEEL ROD GRATING. RODS SHALL BE SPACED 6" O.C. MAXIMUM. WELD ROD AT ALL INTERSECTIONS. GRATE SHALL BE REMOVABLE FOR ACCESS AND CLEANING.
- RIP-RAP SHALL BE LAID FROM THE BOTTOM UPWARD; STONES SHALL BE LAID BY HAND WITH 8" MINIMUM DIMENSION PERPENDICULAR TO GRADE WITH WELL-BROKEN JOINTS, COMPACTED AS IT GOES, TRUE TO LINE. ALL JOINTS SHALL BE FILLED WITH CEMENT MORTAR. SURFACE STONE TO BE EXPOSED. CLEAN JOINTS WITH WIRE BRUSH.
- THE CONTRACTOR SHALL DO ALL REQUIRED EXCAVATION AND TRENCHING WORK AND THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR THE COMPLETION OF THE WORK 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.
- ALL CONNECTIONS TO EXISTING SEWERS SHALL BE PER MUNICIPAL REQUIREMENTS, AND ALL COSTS INCLUDING TESTING AND/OR VIDEO OF SEWERS SHALL BE INCIDENTAL TO THE JOB.

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

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CLIENT :

OLD GLORY CAR WASH  
PO BOX 328  
FOWLERVILLE, MI 48836  
POC: MATT MARTIN  
517-375-0555

**SPECIFICATIONS**

NEW TOUCHLESS WASH BAYS  
4120 GRAND RIVER ROAD  
PART OF SE 1/4, SEC. 20, T3N-R4E  
HOWELL TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

DATE	PLAN SUBMITTALS/REVISIONS
1/25/2024	SITE PLAN SUBMITTAL
3/21/2024	REVISED SITE PLAN SUBMITTAL

ORIGINAL ISSUE DATE:

PROJECT NO: 22-177

SCALE: N/A

FIELD:  
DRAWN BY: DC  
DESIGN BY:  
CHECK BY: AP

**C-12.1**

NOT FOR CONSTRUCTION

## 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 ACCOUNT 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. DETERMINING IF DETERMINED NECESSARY BY THE CONTRACTOR, BY WELL POINTING OR DEEP WELLS WILL BE INCIDENTAL TO THE INSTALLATION COST OF THE ITEM.
- 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 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.
- PRIOR TO COMMENCING THE EXCAVATION THE CONTRACTOR SHALL SUBMIT A PLAN OF HIS PROPOSED OPERATIONS AND TIME SCHEDULE TO THE OWNER & OWNER'S REPRESENTATIVE FOR THEIR APPROVAL.
- 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 AND 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.
- 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 NOTIFY THE DEFICIENCY OR DISPOSE OF THE SURPLUS WITHOUT ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL REMOVE VEGETATION, DEBRIS, UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS, AND OTHER DELETERIOUS MATERIALS FROM GROUND SURFACE PRIOR TO CUT OR FILL OPERATIONS. SUCH MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR TO BE DISPOSED OF IN A LEGAL MANNER OFF SITE.
- 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.
- 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.
- IF ANY UNKNOWN SUBSURFACE STRUCTURES ARE ENCOUNTERED DURING CONSTRUCTION, THEY SHALL BE REPORTED TO THE ATTENTION OF THE CONTRACTOR'S REPRESENTATIVE AND DESIGN ENGINEER PRIOR TO PROCEEDING.
- ALL FILL MATERIAL SHALL BE PLACED AND COMPACTED AT THE OPTIMUM MOISTURE CONTENT OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- NO FROZEN MATERIAL SHALL BE USED AS FILL NOR WILL ANY FILL BE PLACED ON A FROZEN BASE.
- 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.
- 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 COMPACTATION 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)	98%
FILL UNDER PAVEMENT OR SIDEWALKS	95%
FILL PLACED UNDER OR BEHIND RETAINING WALLS	95%
ALL OTHER FILL	90%

- ALL FILL MATERIAL SHALL BE PLACED AND COMPACTED IN LIFTS, THAT WILL NOT EXCEED THE DEPTH OF THE COMPACTATION EQUIPMENT CAPABILITY. THE MAXIMUM DENSITY REQUIRED FOR THE ENTIRE DEPTH OF THE MATERIAL PLACED IN THE LIFT.
- ALL AREAS WHERE FILL HAS BEEN PLACED OR THE EXISTING SOILS HAVE BEEN DISTURBED SHALL BE SUBJECT TO COMPACTATION TESTING BY THE GEOTECHNICAL ENGINEER AND SHOWN TO BE TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER, OWNER AND OWNER'S REPRESENTATIVE.
- 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.
- 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.
- 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.
- THE CONTRACTOR SHALL STOCKPILE EXCAVATED MATERIAL ONLY IN DESIGNATED AREAS AS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.
- 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.
- NEWLY GRADED AREAS SHALL BE PROTECTED FROM THE ACTION OF THE ELEMENTS. ANY SETTLEMENT, DISPLACEMENT, PONDING OR EROSION THAT MAY OCCUR PRIOR TO COMMENCING THE NEXT PHASE OF CONSTRUCTION SHALL BE REPAIRED, AND GRADES REESTABLISHED TO THE REQUIRED ELEVATIONS AND SLOPES.
- 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.
- THE GRADING CONTRACTOR SHALL BACKFILL ALL PARKING LOT PLANTERS AND LAWN AREAS TO WITHIN 2 INCHES OF THE TOP ADJACENT CURB GRADES. THE TOP 2 INCHES MINIMUM SHALL BE TOPSOIL, FREE FROM DEBRIS AND STONES LARGER THAN 1 INCH IN DIAMETER.
- 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/CONSOLIDATE SOILS, REGRADE TO PROPOSED ELEVATIONS AND COMPACT SOILS TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER AND OWNER'S REPRESENTATIVE.
- 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 FROM THE APPROPRIATE AUTHORITY BEFORE DISCHARGING RUN-OFF WATER TO THEIR SYSTEM. SEE EROSION CONTROL NOTES FOR ADDITIONAL REQUIREMENTS.
- 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:
  - AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO).
  - THE ASPHALT INSTITUTE (TAI)
  - MICHIGAN DEPARTMENT OF TRANSPORTATION/ CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION (MDOIT)
  - AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM)
- AGGREGATE BASE COURSE SHALL MEET THE REQUIREMENTS OF SECTION 902 OF THE MDOIT STANDARD SPECIFICATION FOR CONSTRUCTION AND SHALL CONSIST OF 21AA CRUSHED AGGREGATE. THE USE OF SLAG IS PROHIBITED.
- TACK COAT SHALL BE EMULSIFIED ASPHALT MEETING REQUIREMENTS OF MDOIT SECTION 904, GRADE CSS-1H.
- 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 MDOIT STANDARD SPECIFICATIONS, SECTION 902, 21AA. CONTRACTOR MAY USE CRUSHED HMA AGGREGATE SCREENED TO MEET THE REQUIREMENTS OF MDOIT 21AA MATERIAL.
- 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 MDOIT STANDARD SPECIFICATIONS, SECTION 902 FOR CLASS II OR CLASS III GRANULAR MATERIAL. CONTRACTOR MAY USE CRUSHED HMA AGGREGATE SCREENED TO MEET THE REQUIREMENTS OF MDOIT CLASS II OR CLASS III MATERIAL.
- ASPHALT CEMENT SHALL COMPLY WITH THE REQUIREMENTS OF MDOIT SECTION 904.
- HOT MIXED ASPHALT (HMA) SHALL COMPLY WITH MDOIT SECTION 501 OF STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- BITUMINOUS LEVELING COURSE SHALL BE MDOIT HMA, 13A, UNLESS OTHERWISE REQUIRED BY THE MUNICIPALITY OR ROAD AGENCY WITH JURISDICTION.
- BITUMINOUS WEARING COURSE SHALL BE MDOIT HMA, 36A UNLESS OTHERWISE REQUIRED BY THE MUNICIPALITY OR ROAD AGENCY WITH JURISDICTION. CONTRACTOR MAY SUBSTITUTE 13A WITH THE APPROVAL OF THE OWNER AND ENGINEER.
- 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.
- THE CONTRACTOR SHALL SUBMIT TO THE GEOTECHNICAL ENGINEER, JOB-MIX FORMULAS FOR EACH REQUIRED ASPHALT AGGREGATE MIXTURE. JOB DESIGNS SHALL BE WITHIN ALLOWABLE TOLERANCES AS SPECIFIED BY MDOIT FOR THE PARTICULAR APPLICATION.
- 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.
- 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).
- BITUMINOUS CONCRETE PAVEMENT CONSTRUCTION METHODS SHALL CONFORM TO APPLICABLE PORTION OF SECTION 501 OF THE MDOIT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- 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.
- EACH LIFT AND COURSE OF BITUMINOUS CONCRETE SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER, PRIOR TO THE PLACEMENT OF A SUCCEEDING COURSE OR LIFT.
- APPLY BITUMINOUS TACK COATS ONLY WHEN TEMPERATURE HAS NOT BEEN BELOW 35 DEGREES F. FOR 12 HOURS IMMEDIATELY PRIOR TO APPLICATION. CONSOLIDATE BITUMINOUS CONCRETE WEARING COURSE ONLY WHEN ATMOSPHERIC TEMPERATURE IS ABOVE 40-DEGREES F AND RISING, 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.
- THE BITUMINOUS CONCRETE SHALL BE TRANSPORTED FROM THE MIXING PLANT TO THE POINT OF USE IN VEHICLES CONFORMING TO THE REQUIREMENTS OF SECTION 501 OF THE MDOIT 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.
- 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 PAVEMENT. 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 PAVEMENT SHALL BE REGULATED TO ELIMINATE PULLING AND TEARING OF THE BITUMINOUS MAT, UNLESS OTHERWISE SPECIFIED. 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. WHERE POSSIBLE, JOINTS SHALL BE LOCATED AT THE LANE EDGES.
- ON AREAS WHERE IRREGULARITIES OR UNAVOIDABLE OBSTACLES MAKE THE USE OF MECHANICAL SPREADING EQUIPMENT UNDESIRABLE, THE BITUMINOUS CONCRETE MAY BE SPREAD AND RAKED BY HAND TOOLS.
- THE BITUMINOUS CONCRETE SHALL BE PLACED AT A TEMPERATURE OF NOT LESS THAN 250 NOR HIGHER THAN THE RECOMMENDED TEMPERATURE OF THE BINDER PRODUCER OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- 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 UNIFORM DISPLACEMENT, CRACKING AND SHOWING. THE SEQUENCE OF ROLLING OPERATIONS SHALL BE AT THE DISCRETION OF THE CONTRACTOR.
- 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.
- 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 FILL DENSITY IS OBTAINED.
- 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.
- IMMEDIATELY BEFORE PLACING A SUCCEEDING LIFT OR COURSE OF BITUMINOUS CONCRETE THE PRECEDING LIFT OR COURSE SHALL BE CLEARED OF ANY DEBRIS OR STANDING WATER BY APPROPRIATE METHODS.
- TO PREVENT ADHESION OF THE BITUMINOUS CONCRETE TO THE ROLLER, THE WHEELS SHALL BE KEPT PROPERLY MOISTENED, BUT EXCESSIVE WATER WILL NOT BE PERMITTED.
- IN AREAS NOT ACCESSIBLE TO THE ROLLER, THE BITUMINOUS CONCRETE SHALL BE THOROUGHLY COMPACTED WITH HOT HAND TAMPERS.
- 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.
- THE CONTRACTOR SHALL PROVIDE AT LEAST TWO ROLLERS FOR EACH PAVEMENT OPERATING ON THE WORK. THE CONTRACTOR SHALL USE ADDITIONAL ROLLERS AS REQUIRED TO OBTAIN THE SPECIFIED PAVEMENT DENSITY.

## BITUMINOUS PAVING SPECIFICATIONS, CONTINUED

- THE CONTRACTOR SHALL CAREFULLY MAKE JOINTS BETWEEN OLD AND NEW PAVEMENTS, OR BETWEEN SUCCESSIVE DAYS' WORK, TO ENSURE A CONTINUOUS BOND BETWEEN ADJOINING WORK. CONTRACT 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 AND APPLY TACK COAT BEFORE MAKING THE JOINT.
  - 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.
    - LEVELING COURSE SURFACE: 1/4 INCH, PLUS OR MINUS 1/4 INCH.
    - SURFACE COURSE: 1/4 INCH
  - 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.
  - 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.
  - THE AGGREGATE BASE MUST EXTEND A MINIMUM OF 1' BEHIND THE BACK-OF-CURB OR BEYOND EDGE OF PAVEMENT WHEN NO CURB IS PROPOSED.
- 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:
    - AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO).
    - AMERICAN CONCRETE INSTITUTE (ACI)
    - MICHIGAN DEPARTMENT OF TRANSPORTATION/ CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION (MDOIT)
    - AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
  - THE FINE AGGREGATE SHALL MEET ALL REQUIREMENTS OF SECTION 902 OF MDOIT SPECIFICATION FOR 2MS NATURAL SAND.
  - THE COARSE AGGREGATE SHALL MEET ALL REQUIREMENTS OF SECTION 902 OF MDOIT.O.T. SPECIFICATIONS FOR 6AA COARSE AGGREGATE.
  - 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.
  - THE CONTRACTOR SHALL SUBMIT TO THE GEOTECHNICAL ENGINEER, JOB MIX-FORMULAS FOR EACH REQUIRED CEMENT-AGGREGATE MIXTURE. JOB DESIGNS SHALL BE WITHIN ALLOWABLE TOLERANCES AS SPECIFIED FOR THE PARTICULAR APPLICATION.
  - CONCRETE MIX SHALL BE AIR-ENTRAINED AND PROPORTIONED TO PROVIDE THE FOLLOWING:
    - COMPRESSIVE STRENGTH AT 28 DAYS: 3500 PSI MIN. OR AS INDICATED ON PLANS.
    - TOTAL AIR CONTENT BY VOLUME: 5% TO 8%.
    - SLUMP 3 INCH MAXIMUM, OR AS INDICATED ON PLANS.
  - THE CONTRACTOR SHALL AT HIS EXPENSE FURNISH SAMPLES OF FRESH CONCRETE AND PROVIDE SAFE AND SATISFACTORY FACILITIES FOR OBTAINING THE SAMPLES.
  - 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 II, AS IN ASTM C-150.
  - WATER USED IN CONCRETE SHALL MEET THE REQUIREMENTS OF MDOIT SECTION 911.
  - AIR ENTRAINING ADMIXTURE SHALL BE SELECTED FROM THE MDOIT QUALIFIED PRODUCTS LIST.
  - ALL READY-MIXED CONCRETE SUPPLIERS MUST BE APPROVED BY THE OWNER AND MEET THE CURRENT REQUIREMENTS OF THE NATIONAL READY MIX CONCRETE ASSOCIATION (NRMA). 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.
  - 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 IN ACCORDANCE WITH 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.
  - 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.
  - 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.
  - READY-MIXED CONCRETE SHALL BE MIXED AND DELIVERED TO THE POINT OF DISCHARGE AT THE JOB BY MEANS OF A READY MIX CONCRETE TRUCK.
  - 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.
  - 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.
  - 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.
  - 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.
  - 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".
  - 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. SEE SOIL EROSION CONTROL PLAN FOR CONCRETE WASHOUT LOCATION.
  - REINFORCEMENT BARS SHALL BE PER MDOIT SECTION 905.
  - THE WIRE SHALL BE BLACK, ANNEALED STEEL WIRE, NOT LESS THAN 16 GAUGE.

## CONCRETE CURB, SIDEWALK AND PAVEMENT SPECIFICATIONS, CONTINUED

- BAR SUPPORTS SHALL CONFORM TO THE BAR SUPPORT SPECIFICATIONS CONTAINED IN CONCRETE REINFORCING STEEL INSTITUTE'S (CRS) "MANUAL OF STANDARD PRACTICE." PROVIDE CHAIRS, SPACERS AND OTHER DEVICES SUITABLE FOR PROPER SPACING SUPPORTING AND FASTENING REINFORCING BARS.
- 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.
- ALL NEW CURB SHALL BE PLACED ONLY ON A PREPARED SUBGRADE, SMOOTH AND LEVELED TO THE GRADES ESTABLISHED BY THE ENGINEER.
- 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 THE FORMS TO PREVENT LEAKAGE OF MORTAR. BRACING WITH EARTH WILL NOT BE PERMITTED.
- COAT SURFACES OF FORMS TO BE IN CONCRETE WITH A LIGHT CLEAR PARAFFIN OIL OR PARTING COMPOUND WHICH WILL NOT STAIN THE CONCRETE.
- THE INTERIOR SURFACES OF CONCRETE CONVEYING EQUIPMENT SHALL BE MAINTAINED FREE OF HARDENED CONCRETE, DEBRIS, WATER, SNOW, ICE AND OTHER DELETERIOUS MATERIALS.
- CURBING MAY BE CONSTRUCTED EITHER BY USE OF FORMS OR BY A MECHANICAL CURB AND GUTTER PAVEMENT, PROVIDED THE REQUIRED FINISH, AND CROSS-SECTION, ARE OBTAINED. FORMS ARE OBTAINABLE FOR CURBING. PROVIDE ONE COURSE MONOLITHIC STRUCTURE WITHOUT THE USE OF MORTAR TOPPING OR SAND-CEMENT DRYER. CONCRETE SHALL BE SPADED OR VIBRATED SUFFICIENTLY TO ENSURE SATISFACTORY CONSOLIDATION.
- PROVIDE REINFORCEMENT FOR CONCRETE CURB AS SHOWN ON THE DRAWINGS. REINFORCEMENT SHALL BE KEPT CLEAN AND FREE FROM OBJECTIONABLE RUST, SANDS OR KINGS 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.
- THE CONCRETE CURB SURFACE SHALL BE STRUCK OFF THE REQUIRED CROSS-SECTION ALL TRAFFIC LANE AND PARKING LOT MARKINGS AS INDICATED IN THE CONSTRUCTION DOCUMENTS. THE 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 BROUGHT LIGHTLY ACROSS THE SURFACE PARALLEL TO FORMS SO AS TO IMPART A ROUGH FINISH.
- CONTRACTION JOINTS SHALL BE CUT IN CONCRETE CURBING AT MINIMUM 10' INTERVALS. THE JOINT SHALL CUT 1/4 INCH WIDE BY 1/3 THE DEPTH OF THE CONCRETE CURB SECTION. JOINTS SHALL ALSO BE LOCATED ADJACENT TO CURB DROPS.
- ISOLATION JOINTS SHALL BE PLACED IN CURBING AT TANGENT POINTS IN CURB RETURNS AT INTERSECTIONS, AT BOTH SIDES OF STRUCTURES LOCATED IN THE CURB AND IN CURBING AT INTERSECTIONS. ISOLATION JOINTS SHALL BE 1" THICK PRE-FORMED JOINT FILLER STRIPS. THE STRIPS SHALL EXTEND THE FULL DEPTH OF THE CONCRETE CURB SECTION. ISOLATION JOINTING SHALL BE PLACED AT THE END OF EACH DAY'S POUR AND WHEN ABUTTING PREVIOUSLY POURED CURB.
- THE CURING COMPOUND SHALL BE A WHITE PARAFFIN BASE COMPOUND SELECTED FROM MDOIT'S QUALIFIED PRODUCTS LIST APPLIED AT 200 SQ.FT./GAL.
- ALL CONTRACTION JOINTS IN CONCRETE CURB SECTIONS SHALL BE SEALED WITH EITHER HOT POURURE JOINT SEALER OR COLD POURURE JOINT SEALER.
- SLIGHTLY UNDERFILL JOINT GROOVE WITH JOINT SEALER TO PREVENT EXTRUSION OF THE SEALER. EXCESS JOINT SEALER MATERIALS AS SEEN AFTER SEALING AS POSSIBLE.
- 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 MOST CONDITION CONTINUOUSLY FOR THE PERIOD OF CURING. OR A COMBINATION OF THESE AS REQUIRED TO MAINTAIN THE 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.
- COLD WEATHER PROTECTION: WHEN THE TEMPERATURE OF THE ATMOSPHERE IS 40-DEGREES F. AND BELOW, THE CONCRETE SHALL BE PROTECTED BY HEATING, INSULATION, OR COMBINATION THEREOF AS REQUIRED TO MAINTAIN THE TEMPERATURE OF THE CONCRETE AT OR ABOVE 50-DEGREES F. AND IN A MOST CONDITION CONTINUOUSLY FOR THE CONCRETE CURING PERIOD. COLD WEATHER PROTECTION SHALL MEET THE REQUIREMENTS OF ACI 306R "COLD WEATHER CONCRETING".
- 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 THESE AS REQUIRED TO MAINTAIN THE TEMPERATURE OF THE CONCRETE BELOW 90-DEGREE F. AND IN A MOST CONDITION CONTINUOUSLY FOR THE CONCRETE CURING PERIOD. "HOT WEATHER PROTECTION SHALL MEET THE REQUIREMENTS OF ACI 305R "HOT WEATHER CONCRETING".
- ALL FORMS, RAILS AND STAKES SHALL BE REMOVED WITHIN 24 HOURS AFTER PLACING OF CURB. EXPOSED EDGES OF CONCRETE SHALL BE IMMEDIATELY BACKFILLED OR SPRAYED WITH CURING COMPOUND.
- 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.
- ALL CEMENT USED IN SIDEWALK CONSTRUCTION SHALL BE PORTLAND CEMENT, TYPE I OR II, AS IN ASTM C-150.
- 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 NO CASE SHALL THE MIXER OR TRUCK BE FLUSHED OUT ONTO THE SIDEWALK BASE AND FILLED WITH APPROVED SAND MEETING MDOIT CLASS II, SAND DESIGNATION.
- CONSTRUCT CONCRETE SURFACE COURSE ONLY WHEN GROUND TEMPERATURE IS ABOVE 35 DEGREES F. AND BASE IS DRY.
- SIDEWALKS SHALL PITCH TOWARD THE STREET OR AWAY FROM BUILDINGS WITH A MINIMUM CROSS SLOPE OF 1/4-INCH PER FOOT OF WIDTH AND A MINIMUM CROSS SLOPE OF 1/8-INCH PER FOOT OF WIDTH. CROSS SLOPE DIRECTION TRANSITIONS SHALL BE ACCOMPLISHED IN LENGTHS OF 10 FEET OR LESS.
- 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.
- 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 LENGTH 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.
- 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.
- 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.
- CONTRACTION JOINTS SHALL BE PLACED AT RIGHT ANGLES TO THE EDGE OF THE SIDEWALK OR CONCRETE PAVEMENT AND PERPENDICULAR TO THE SURFACE. 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.
- REINFORCEMENT BARS SHALL BE PER MDOIT SECTION 905.
- THE WIRE SHALL BE BLACK, ANNEALED STEEL WIRE, NOT LESS THAN 16 GAUGE.

## CONCRETE CURB, SIDEWALK AND PAVEMENT SPECIFICATIONS, CONTINUED

- 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.
- ISOLATION JOINTS SHALL BE PLACED AT THE FOLLOWING LOCATION FOR SIDEWALKS AND CONCRETE PAVEMENTS:
  - AT THE BACK OF THE CURB AND FRONT EDGE OF THE SIDEWALKS AND PAVEMENT SLABS ADJACENT TO EACH DRIVEWAY APPROACH AND SERVICE WALK.
  - AT INTERVALS NOT TO EXCEED 50- FEET IN ALL PUBLIC SIDEWALKS.
  - AT THE BACK OF THE CURB WHERE THE RAMPS EXTEND FROM THE KEY FLAG TO THE PAVEMENT.
  - 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.
  - AT ANY PLACE WHERE A SIDEWALK OR CONCRETE PAVEMENT ABUTS A BUILDING OR FIXED STRUCTURE.
  - AT ANY OTHER LOCATIONS INDICATED ON THE PLAN.
- CONTRACTION JOINTS IN THE CONCRETE PAVEMENT WILL BE AS FOLLOWS:
  - TRANSVERSE JOINTS SHALL BE AT MAXIMUM 10-FOOT INTERVALS OR AS SHOWN ON PLANS AND DETAILS.
  - LONGITUDINAL JOINTS SHALL BE AT MAXIMUM 12-FOOT INTERVALS OR AS SHOWN ON PLANS AND DETAILS.
- PRIOR TO APPLYING JOINT SEALER, CLEAN JOINT GROOVE OF FOREIGN MATTER AND LOOSE PARTICLES, AND DRY SURFACE.

## TRAFFIC LANE AND PARKING LOT MARKING

- PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, AND SERVICES NECESSARY TO COMPLETE ALL TRAFFIC LANE AND PARKING LOT MARKINGS AS INDICATED IN THE CONSTRUCTION DOCUMENTS.
- 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.
- TRAFFIC MARKING PAINT SHALL MEET THE REQUIREMENTS OF FEDERAL SPECIFICATION TT-PP-855F, WITH OR WITHOUT REFLECTORIZED BEADS AS REQUIRED ON THE PLANS. PAINT SHALL BE A PRODUCT FROM THE CURRENT MDOIT QUALIFIED PRODUCTS LIST.
- COLOR SHALL BE AS SPECIFIED ON THE PLANS OR AS FOLLOWS:
  - TRAFFIC LANE STRIPING SHALL BE WHITE OR YELLOW REFLECTORIZED, AS SHOWN ON THE PLANS.
  - TRAFFIC MARKING AND CURB FACES SHALL BE WHITE UNLESS NOTED OTHERWISE.
  - PARKING LOT STRIPING SHALL BE WHITE, UNLESS NOTED OTHERWISE.
  - HANDICAP STALL STRIPING MEETING CURRENT ADA REQUIREMENTS SHALL BE BLUE UNLESS NOTED OTHERWISE.
- 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 AND WHEN RAIN IS NOT FORECASTED FOR AT LEAST 2 HOURS AFTER PAINT IS APPLIED.
- 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 EQUIPMENT AS MAY BE NECESSARY TO SATISFACTORILY COMPLETE THE JOB.
- THE MECHANICAL MARKER SHALL BE AN APPROVED ATOMIZING SPRAY-TYPE MARKING MACHINE FOR APPLICATION OF TRAFFIC PAINT. IT SHALL BE CAPABLE OF PRODUCING 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 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.
- SUITABLE ADJUSTMENTS SHALL BE PROVIDED ON THE SPRAYER/SPRAYSERS OF A MACHINE FOR VARYING THE WIDTH REQUIRED. MULTIPLE PARALLEL PASSES TO THE PAINT THE REQUIRED WIDTH WILL NOT BE ALLOWED.
- 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 PROPECIUM PROPECIUM (OR BY OTHER APPROVED EQUAL SOLUTION) AFTER SCRUBBING, THE SOLUTION SHALL BE RINSED OFF AND THE SURFACE DRIED PRIOR TO PAINTING.
- EXISTING MARKINGS OR STRIPES WHICH ARE TO BE ABANDONED OR REMOVED SHALL BE OBLITERATED OR OBBURED BY THE BEST METHODS SUITED FOR THE PURPOSE AND TO THE SATISFACTION OF THE OWNER OR OWNER'S REPRESENTATIVE.
- THE CONTRACTOR IS RESPONSIBLE FOR LAYING OUT A SAMPLE SECTION OF STRIPING WHICH IS TO BE APPROVED BY THE OWNER OR OWNER'S 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.
- ON THOSE SECTIONS OF PAVEMENTS WHERE NO PREVIOUSLY APPLIED FIGURES, MARKINGS OR STRIPING IS TO BE REMOVED OR OBLITERATED, THE MARKING 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.
- THE CONTRACTOR SHALL PROVIDE AN EXPERIENCED TECHNICIAN TO SUPERVISE THE LOCATION ALIGNMENT, LAYOUT, DIMENSIONS AND APPLICATION OF THE PAINT.
- 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 LAYOUT IS LAYED OUT AND THE CONDITIONS OF THE EXISTING SURFACE HAVE BEEN APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE.
- 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 WITHIN THE LIMITS OF THE THICKNESS 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.
- 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. CURING COMPOUND MUST BE REMOVED FOR THE ENTIRE WIDTH OF THE PAINTED STRIPE OR SYMBOL PRIOR TO PAINTING NEW CONCRETE.
- IN THE APPLICATION OF STRAIGHT STRIPES, ANY DEVATION 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 OWNER'S REPRESENTATIVE BY COMPETENT AND EXPERIENCED EQUIPMENT OPERATORS, LABORERS, AND ARTISANS IN A NEAT AND WORKMANLIKE MANNER.
- 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.
- 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.



# Livingston County Department of Planning

## Memorandum

**Scott Barb**  
AICP, PEM  
Director

**To:** All Livingston County Zoning Administrators and Local Planning Commissioners

**From:** Livingston County Department of Planning

**Robert A. Stanford**  
AICP  
Principal Planner

**Date:** February 09, 2024

**Subject:** Sample Accessory Dwelling Unit Ordinance for Your Consideration

**Martha Haglund**  
Principal Planner

Dear Zoning Administrators and Local Planning Commissioners,

As a member of the Housing Catalysts, the Livingston County Planning Department is committed to increasing attainable housing in the county. One way to achieve this is by providing additional housing options, such as allowing homeowners to construct Accessory Dwelling Units (ADUs) on their property.

ADU's can be a part of a Primary Dwelling Unit (PDU) or can be designed as a detached structure. Homeowners can benefit from installing ADUs in several ways, including providing affordable housing units in a community, creating a housing unit for an elderly relative that needs care, or having an additional resident share housing responsibility.

Zoning ordinances can help regulate the construction and placement of ADUs. The Livingston County Planning Department has created a Sample Rural ADU Ordinance as a starting point for your community to establish or modify an ADU ordinance. However, since every community is unique, the sample ordinance is advisory only and should be modified to meet your community's specific requirements.

In addition to the sample ordinance, we have included other considerations your community may want to contemplate when forming an ADU ordinance, along with resources and the general process of ADU construction.

Please feel free to contact us if you have any questions. We are here to help.

Sincerely,

### Department Information

Administration Building  
304 E. Grand River Avenue  
Suite 206  
Howell, MI 48843-2323

(517) 546-7555  
Fax (517) 552-2347

Web Site

<https://milivcounty.gov/planning/>



## Sample Accessory Dwelling Unit Ordinance RURAL (Minimum 1 acre)

*All language is modifiable and should be reviewed by your  
Municipal Planner or Attorney*



**Modifications that may be unique to your community's zoning ordinance noted in RED.**

**Intent:** By permitting Accessory Dwelling Units the Township seeks to achieve several goals:

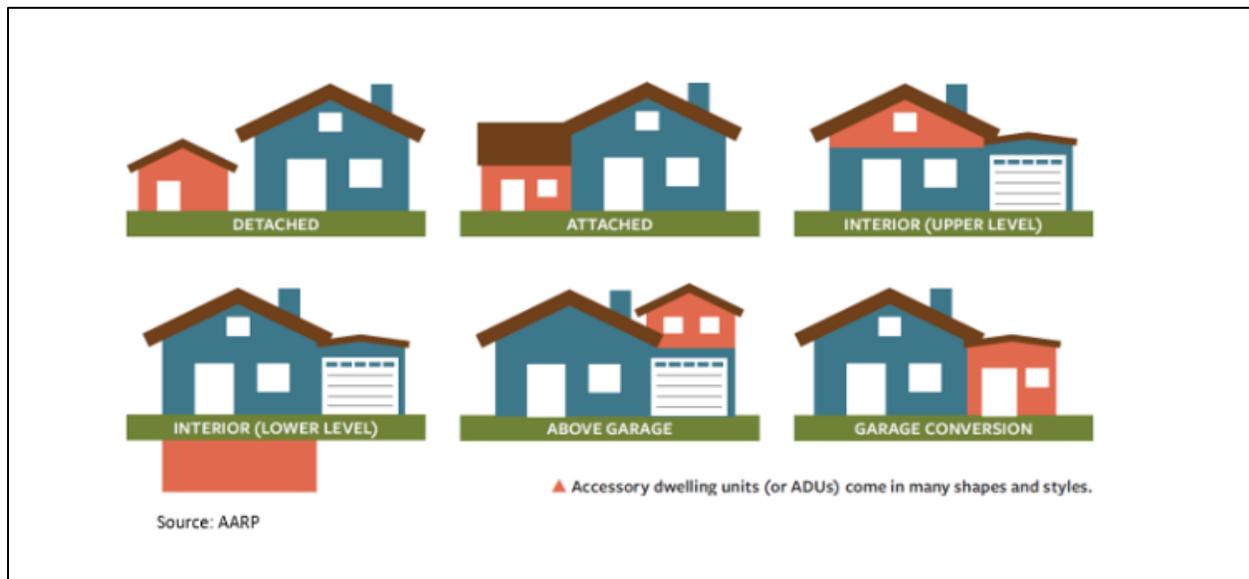
1. Increase flexibility for homeowners to meet the needs of their family including multigenerational members.
2. Create more housing options for smaller households including single professionals or empty nesters.
3. Maintain compatibility with existing housing types.
4. Increase affordable housing options.
5. Provide homeowner with potential extra income to meet rising homeownership costs.

### Definitions:

**Accessory Dwelling Unit (ADU):** is a second, smaller dwelling unit either developed within an existing single-family house (such as a basement, attic or addition) or as a smaller detached accessory building. An attached ADU also shares at least a 15 feet wall with the Principal Dwelling Unit.

**Principal Dwelling Unit (PDU):** The single-family dwelling located on the parcel with an Accessory Dwelling Unit.

Figure 0.00 Reference Image for types of ADUs



**Accessory Dwelling Units** are a permitted use within the **Agricultural (AG) & Single Family Residential (SFR)** District/s with a minimum lot size of **1** acre.

**Attached ADU:** shall be between **400-800** square feet or **40%** of the gross floor area of the PDU whichever is less. Gross floor area of PDU not to include three-season rooms or garages.

**Detached ADUs** shall be between **500-900** square feet or **40%** of the gross floor area of the PDU whichever is less. Gross floor area of PDU not to include three-season rooms or garages.

**Option 1)**

**Dimensions & Setbacks:** ADUs must meet the lot dimensions and setbacks requirements in **Table 0.00**.

**Table 0.00 Dimensional Requirements for ADUs**

Zone	Minimum Lot Size (Feet)	Minimum Lot Width (Feet)	Minimum Front Setback (Feet)	Minimum Side Setback (Feet)	Minimum Rear Setback	Maximum Height (Attached)
AG	1 acre	150	50	30	50	30 ft
SFR	1 acre	100	50	30	40	30 ft

**Option 2)**

**Dimensions & Setbacks:** ADU's must meet lot dimension and setbacks of the corresponding zoning district.

**Lot Coverage:** ADUs shall adhere to the lot coverage requirements of the corresponding zoning district.

**Principal Dwelling Unit**

1. Must be owner occupied.
2. The minimum floor area of the principal dwelling unit may not decrease the minimum floor area requirements of a single family, **960** square feet, with at least **600** square feet on the ground floor.
3. The PDU and the ADU must share common water, septic, and electric facilities, in compliance with state and county codes.

### Detached ADU

1. Are permitted in the rear yard with a minimum   10   feet behind the Principal Dwelling Unit.
2. Are permitted in the side yard provided:
  - a. The ADU is a minimum 10 feet away from principal structure.
  - b. Meets all the required setbacks.
3. Must have a foundation in compliance with Michigan Residential Code and Approved by the Livingston County Building Department.
4. Placement of an ADU in the front setback are prohibited.

### Other Requirements

1. **Amount of ADUs per Parcel:** No more than 1 ADU per parcel shall be constructed. ADUs are only permitted on lots with a single-family dwelling. ADUs are not permitted on parcels with existing duplexes/apartments.
2. **Utilities:**
  - a. An ADU shall be connected to potable water and sanitary facilities in compliance with the County Health Department.
  - b. Utility service to an ADU shall rely on the same metering and service panel as those that serve the PDU except as may be otherwise required by the building inspector.
    - i. Utility Service to be installed according to the State Electrical and Mechanical Code.
  - c. Separate utility billings for an ADU by the utility provider are prohibited.
3. **Design Character:** The ADU shall be designed so the appearance of the building will remain that of a single-family dwelling. Further, it shall not detract from the appearance of the lot as a place of one (1) residence and shall be aesthetically compatible in appearance with other single-family dwellings in the immediate area based on architectural design and exterior materials.
4. **Access: Attached ADUs** are permitted to have up to two access points:
  - a. Access located in a common entrance foyer.
  - b. exterior entrance to be located on the side or rear of the ADU.
5. **Access: Detached ADUs** a main entrance to be located on the front and an additional side/rear yard access are permitted.
6. **Occupancy/Bedroom Requirements:** An ADU shall have no more than   4   individuals including those less than 18 years of age. More than   2   bedrooms is prohibited.

7. **Renting an ADU:** Leasing or renting a ADU for shorter than 30 days is prohibited. The ADU shall not otherwise be made available to any one (1) or more persons for periods less than thirty (30) days.
8. **Driveway and Parking:** Shall provide a combined off-street parking for a minimum of four automobiles for PDU and ADU.
  - a. In no case shall an ADU be permitted to have a separate driveway.
9. **Garage:** A garage may be erected to serve an ADU subject to the following requirements:
  - a. An ADU garage shall be part of the same structure as the ADU.
  - b. An ADU garage shall be no greater than 450 square feet in gross floor area.
  - c. An ADU garage shall be no higher than 17 feet as measured to the highest point of the roof. Shall be maximum one (1) story and at no time taller than the PDU.
  - d. An ADU garage shall comply with the same setback standards as required for an ADU in the corresponding zoning district.
  - e. No more than one (1) ADU garage shall be erected on a lot.
  - f. At no time shall the garage be used as a dwelling.
10. **Authorization:**
  - a. No ADU shall be established prior to the issuance of a land use permit for the ADU.
  - b. The applicant shall submit the following information for review to the Zoning Administrator:
    - i. A plat plan showing the location of the proposed accessory dwelling unit, lot identification (address and property number), size of lot, dimension of lot lines, existing improvements on the lot, location of structures on adjacent lots, abutting streets, driveways, and parking areas.
    - ii. Sufficient architectural drawings or clear photographs to show the exterior building alterations proposed.
    - iii. Interior floor plans showing the floor area of the proposed accessory dwelling unit and the primary dwelling.
  - c. No construction of an ADU, including excavation and clearing, shall be initiated prior to Land Use and Building Permit Issuance.

## Sources

[AARP Graphic](#)

[Ann Arbor Development Code: Section: 5.16.6 \(D\) Accessory Dwelling Unit](#)

[Ann Arbor Accessory Dwelling Unit Guide & Website](#)

[American Planning Association: Accessory Dwelling Units](#)

[Deerfield Township Zoning Ordinance: Section 17.29: Accessory Dwelling Units, ADU Garages](#)

[Hamburg Township Zoning Ordinance: Section 36.238, 339, 240: Accessory Dwelling Units, Accessory dwelling unit regulations, Application Procedure](#)

[Handy Township Zoning Ordinance: Section 2.2 \(F\): Family Accessory Apartment](#)

[Marion Township Zoning Ordinance: Section 6:30 Family Accessory Apartment](#)

### Accessory Dwelling Unit Process

Townships may have unique procedures to process ADUs but the generally it is the same process as building a house or addition to a home.

*General Process to Construct ADU:*

1. *Applicant Submits Land Use Application to Township Zoning Administrator*
2. *Zoning Administrator reviews application and if satisfactory issues-Land Use Permit*
3. *Livingston County Building Department:*
  - a. *Inspections*
  - b. *Directs applicant to Health Department to review Well & Septic connections.*
  - c. *Directs Applicant to Drain Commission: Soil Erosion Permit*
4. *Zoning Administrator: Final Zoning Certificate meets the setbacks.*

### Other Considerations that may be applicable:

- *Relation of the ADU Occupant to the Homeowner of the PDU.*
- *Permit/prohibit renting of ADU.*
- *Special Use Permit requirement near certain features like wetlands, lakes or rivers.*