

PLANNING COMMISSION MEETING AGENDA

March 7, 2024 THURSDAY 6:00 P.M.

Location: Kalamazoo Charter Township Hall, 1720 Riverview Drive, Kalamazoo, MI 49004

AGENDA:

- #1 Call to Order
- #2 Roll call and recognition of visitors
- #3 Approval of the agenda for the March 7, 2024 meeting.
- #4 Approval of the minutes for the February 1, 2024 meeting.
- #5 Public Comment (3-minute limit)
- #6 Scheduled Reviews: None.
- #7 Public Hearings:
 - 7a. 2130 Ravine Road – Special Land Use
- #8 New Business:
 - 8a. 2130 Ravine Road – Special Land Use Review
 - 8b. 2130 Ravine Road – Site Plan Conceptual Review
- #9 Old Business: None.
- #10 Open Discussion
 - 10a. Members of the Audience
- #11 COMMUNICATIONS:
- #12 REPORT OF THE TOWNSHIP BOARD REPRESENTATIVE.
- #13 REPORT OF THE TOWNSHIP ZBA REPRESENTATIVE.
- #14 COMMENTS FROM PLANNING COMMISSION MEMBERS.
- #15 REPORT OF THE PLANNER.
- #16 REPORT OF THE ZONING ADMINISTRATOR.
- #17 REPORT OF THE TOWNSHIP ATTORNEY.
- #18 ADJOURNMENT.

The public may attend this meeting for your information and comments. Please contact the Planning & Zoning Department if you have any questions at (269) 381-8085.

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**Charter Township of Kalamazoo
Minutes of a Planning Commission Regular Meeting
Held on February 1, 2024**

8 A regular meeting of the Charter Township of Kalamazoo Planning Commission was conducted
9 on February 1, 2024, commencing at 6:00 p.m. at the Charter Township of Kalamazoo Hall.

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Call to Order:

12 Chairman Nagler called the meeting to order at 6:00 p.m.

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14

Roll Call and Recognition of Visitors

15 Nagler welcomed those in attendance.

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Present were:

18 Christopher Mihelich
19 Michael Seals
20 Steve Leuty
21 Denise Hartsough
22 Warren Cook
23 William Chapman
24 Fred Nagler, Chairman

25
26 Also present were Township Planner Danielle Bouchard, Township Attorney Seth Koches, Fire
27 Marshal, Todd Kowalski; and four (4) interested members from the public.

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Absent was:

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None.

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Approval of the Agenda

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35 A copy of the meeting agenda was provided to the Commissioners in their agenda packets. The
36 Commissioners agreed to add "8.b. Site Plan Review" as an agenda item regarding 1251
37 Shakespeare Ave.

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39 Upon motion by Seals, supported by Hartsough, and unanimous vote, the agenda was approved
40 as revised.

1 **Approval of the minutes for the December 7, 2023, regular Planning Commission Meeting**

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3 The next item on the agenda was approval of the minutes of the December 7, 2023, regular
4 Planning Commission meeting.

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6 A copy of the draft minutes of the December 7, 2023, regular Planning Commission meeting was
7 provided to the Commissioners in their agenda packets. Several revisions were recommended to
8 the draft minutes.

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10 Upon motion by Cook, supported by Seals, and unanimous vote, the minutes of the December 7,
11 2023, regular Planning Commission meeting were approved as revised.

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13 **Public Comment**

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15 None.

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17 **Scheduled Reviews**

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19 None.

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21 **Public Hearings**

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23 **1251 Shakespeare Avenue – Special Land Use**

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25 The next item on the agenda was the public hearing and special land use request of Cargo Heavy
26 Duty, 1251 Shakespeare Ave., to construct a new 17,595 square-foot building intended for the
27 repair and maintenance of trucks and semi-truck trailers. The subject property is located in the
28 I-1, Light Industrial District Zoning Classification; is approximately 2.51 acres in area; and is
29 located south of Lake Street. There are RM-2 residential land uses located to the west. Bouchard
30 prepared a staff report, which was contained in the Commissioners’ agenda packet and
31 summarized it. Bouchard said that the applicant received approval from the Township Assessor
32 to combine the multiple parcels into one parcel.

33
34 Bouchard summarized the standards for granting special land use requests, which are contained
35 in Section 26.03.C. of the Township Zoning Ordinance. Bouchard discussed the compatibility of the
36 proposed use with adjacent land uses. Bouchard said that the site plans include several trees to
37 be placed along the southern portion of the property adjacent to residential uses. Bouchard said
38 that the site plans indicate that all work is to be done within the building. Bouchard said that the
39 applicant’s request aligns with the intent of the Township’s 2014 master plan and future land use
40 map. Bouchard said that the Township is working to update the master plan and future land use
41 map but is not expecting any changes that would impact the subject property.

42
43 Bouchard discussed public services available at the subject property and noted that the site has
44 appropriate utilities, including fire protection. Bouchard said that the Township Engineer did not

1 have any concerns regarding the grading of the property. Bouchard discussed the potential
2 impact on traffic. Bouchard noted that the applicant should provide more information regarding
3 the anticipated traffic that may be generated on the subject property. Bouchard discussed
4 sidewalks and indicated that the applicant needs to further discuss any plans regarding the
5 installation of sidewalks on the site plan. Bouchard discussed the detrimental effects of the
6 proposed use and asked that the applicant discuss and mitigating measures on potential impacts
7 of adjacent residential uses. Bouchard did not expect the potential use to have a detrimental
8 impact to the economic well-being of the Township or the natural environment.

9
10 Brian Webster (applicant’s engineer) addressed the Commission. Webster said this is a third-
11 generation business and the proposed project is an improvement to the existing site. Seals and
12 Webster discussed potential light pollution impacting adjacent properties. Webster discussed
13 light shielding and a lighting plan to prevent light flooding onto nearby properties. The
14 Commission confirmed that the hours of operation are from 7:00 a.m. – 7:00 p.m. Nagler
15 discussed the potential of increased traffic flow to and from the site. Webster said that there may
16 be a few more trucks per day but the overall increase in traffic flow should not be significant.
17 Webster said that the proposed design of the new building will allow for future indoor expansion
18 to accommodate more trucks to be repaired indoors as the business grows in the future. The
19 applicant prepared an expansion plan for the next generation of his family.

20
21 Nagler opened the public comment portion of the public hearing and invited an interested person
22 to submit public comment in support of or in opposition to the applicant’s request for special
23 land use approval. Hearing no public comments, Nagler closed the public hearing. The
24 Commissioners discussed the standards of review for approving a special land use and concluded
25 that all standards contained in Section 26.03.C of the Township Zoning Ordinance were satisfied.

26
27 Upon motion by Cook, supported by Seals, and unanimous vote, to approve the request of Cargo
28 Heavy Duty for special land use approval to operate a vehicle repair facility for heavy-duty trucks
29 and trailers, per Article 8 and Article 19 of the Kalamazoo Township Zoning Ordinance at 1251
30 Shakespeare Avenue (parcel number 06-23-435-350) because the standards contained in Section
31 26.03.C. of the Township Zoning Ordinance are satisfied.

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34 **New Business**

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36 **1251 Shakespeare Avenue – Site Plan Review**

37
38 The next item on the agenda was site plan review submitted by the applicant CBK Construction
39 (submitted by Paul Warnick, PLA of Abonmarche Engineering) to construct a 17,595 square-foot
40 facility to conduct truck repair services on 1251 Shakespeare Ave, within the Township. The
41 subject property is located in the I-1, Light Industrial District Zoning Classification; is
42 approximately 2.51 acres in area; and is located south of Lake Street and west of the I-94 Business
43 Loop. There are RM-2 residential land uses located to the west. Bouchard prepared a staff report,

1 which was contained in the Commissioners' agenda packet regarding site plan and summarized
2 it.

3
4 Bouchard said that Section 26.02 of the Township Zoning Ordinance regulates site plan review.
5 Bouchard said that minimum lot area, maximum height, setback requirements and maximum lot
6 coverage requirements were all satisfied. Bouchard said that the applicant should provide a letter
7 from Consumer's Energy stating that construction within the existing easement is acceptable and
8 will not pose a hazard to the electrical easement. Bouchard discussed parking standards, site
9 layout and construction plans. Bouchard said that the parking lot will need to be striped to
10 delineate parking areas and spaces. Bouchard said that the surface and driveway areas need to
11 be hard-surfaced with concrete or plant-mixed bituminous materials. The site plan notes asphalt
12 millings will be used and Bouchard asked that a maintenance plan be submitted for review
13 regarding the proposed use of millings. Bouchard discussed landscaping standards and the
14 proposed irrigation system. Bouchard said that trash details need to be provided and sidewalk
15 plans should be further discussed with the Commissioners. Bouchard recommended that the
16 applicant obtain Kalamazoo County Road Commission approval regarding ingress and egress
17 access to the site.

18
19 Todd Kowalski noted that the site plans had no signature of an engineer or seal on the plan set;
20 that the township engineer needs to provide an opinion regarding whether the gravel and asphalt
21 drives can hold 70,000 pounds; a maintenance plan for the asphalt drives; and approval from
22 Consumer's Energy indicating there are no issues with the structure's location being 15 feet from
23 the existing power lines.

24
25 Webster discussed the site plan and layout, and referenced a site plan dated January 24, 2024.
26 Webster discussed the dumpster location and confirmed that he reached out to Consumer's
27 Energy. Webster said that the structure must not be built on the easement. Webster said that he
28 will submit a maintenance plan regarding the millings that will be used on the subject property.
29 Webster discussed the access points to the subject property and indicated that sidewalks are not
30 compatible. Webster noted that sidewalks are available across the street for the public to use.
31 Hartsough and Webster discussed sidewalks and the landscaping plan.

32
33 Upon motion by Hartsough, supported by Mihelich, and unanimous vote, the Planning
34 Commission approved the site plan review submitted by the applicant CBK Construction
35 (submitted by Paul Warnick, PLA of Abonmarche Engineering) to construct a 17,595 square-foot
36 facility to conduct truck repair services on 1251 Shakespeare Ave, within the Township, with the
37 following conditions:

- 38
39 1. That documentation from Consumer's Energy indicating construction
40 may commence within/near the electrical easement be provided to
41 Township staff for review.
42 2. That the Planning Commission accepts the proposed banked parking
43 arrangement in which 25 spaces will be constructed and 14 set aside
44 for a future installation date.

- 1 3. That the parking lot is clearly striped to delineate the required parking
- 2 spaces.
- 3 4. That the off-street loading facility is located in either the side or rear
- 4 yard.
- 5 5. That trash removal and disposal is shown on the site plan for review
- 6 and approval administratively.
- 7 6. That the Kalamazoo County Road Commission approves driveway
- 8 permits.
- 9 7. That any other conditions and regulates as required by other reviewing
- 10 agencies are satisfied.

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12 **2023 Annual Planning Report and 2024 Work Plan**

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14 A copy of the Planning Commission and Zoning Board of Appeals 2023 Annual Planning Report
15 was provided to the Commissioners in their agenda packets. Bouchard summarized the report
16 for the Commissioners.

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18 Upon motion by Hartsough, supported by Seals, and unanimous vote, to recommend approval of
19 the 2023 Annual Planning Report and 2024 Work Plan to the Township Board.

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22 **Old Business**

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24 **Master Plan**

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26 Bouchard said that the Master Plan will be ready by the March 7, 2024 meeting for the
27 Commission to consider.

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29 **Open Discussion – Members of the Audience**

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31 **Master Plan**

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33 **Communications**

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35 **GPI – 2016 N. Pitcher – Site Work Status Update**

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37 Bouchard provided general updates on 2016 N. Pitcher.

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39 **Alamo Township Master Plan Update**

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41 Bouchard provided an update regarding Alamo Township’s Master Plan.

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43 **Report of the Township Board Representative**

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1 Leuty provided general Township Board updates for the Commission.

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3 **Report of the Zoning Board of Appeals Representative**

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5 Nagler discussed the recent business of the ZBA.

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7 **Comments of the Planning Commission Members**

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9 The Commissioners generally discussed planning and zoning updates.

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11 **Report of the Planner/Zoning Administrator**

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13 The Planning Commission discussed the next meeting date.

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15 **Report of the Township Attorney**

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17 None.

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19 **Adjournment**

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21 The February 1, 2024, regular Planning Commission meeting was adjourned at 8:13 p.m.

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, Secretary

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SUMMARY OF ACTIONS

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31 The Charter Township of Kalamazoo Planning Commission undertook the following actions at its
32 regular Planning Commission meeting held on February 1, 2024:

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- 1. Approved the special land use and site plan for 1251 Shakespeare Ave, with conditions.

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- 2. 2023 Annual Planning Report and 2024 Work Plan to the Township Board.

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, Secretary

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Memorandum

TO: Kalamazoo Charter Township Planning Commission

FROM: Danielle Bouchard, AICP, Principal Planner (Township Planner)
 Kyle Mucha, AICP, Senior Planner (Township Zoning Administrator)

SUBJECT: **Special Land Use Review #1 – AZON Properties/AZON USA, 2130 Ravine Road**

DATE: February 22, 2024

The applicant, **AZON Properties/AZON USA**, seeks **Special Land Use** approval for the development of an office (headquarters) building at 2130 Ravine Road.

SUMMARY OF REQUEST

The applicant is requesting special land use approval to construct and operate a 5,608 square-foot office facility.

The property is currently zoned I-2, General Industrial and is approximately 3.97 acres in size. Office operations are considered special land uses within the I-2 District, per Section 20.02.B.28.

STANDARDS FOR GRANTING SPECIAL LAND USE APPROVAL

Pursuant to Section 26.03.C., of the Township’s Zoning Ordinance, the following standards apply for granting special land use approval:

1. **Compatibility with Adjacent Uses**

The proposed special land use shall be designed, constructed, operated and maintained to be compatible with uses on surrounding land. The site design of the proposed special land use shall minimize the impact of site activity on surrounding properties. In determining whether this requirement has been met, consideration shall be given to:

a. The location and screening of vehicular circulation and parking areas in relation to surrounding development.





The subject site proposes to install two new parking areas to the east and west of the office facility. Access to the site is proposed via an easement, with access to Ravine Road. It is noted during the site plan review that the Township Zoning Ordinance requires parcels to have frontage along a public or private roadway. Due to the applicant proposing to demolish the existing facility and construct a new facility, staff has recommended that parcels within the subject area be combined. Such a combination would then provide direct access to Ravine Road and remove the need for the private easement.

Without direct access to Ravine Road, we find that this provision is not satisfied. Should the applicant, who owns the parcel adjacent to Ravine Road, sell said parcel, access to the subject site could become problematic. Properties in the surrounding area have direct access to Ravine Road and do not rely on easement agreements and having to traverse separate parcels for site access.

Further site enhancements, such as parking lot screening and right-of-way landscaping will be reviewed in the site plan portion of this development application. As referenced, we find that this provision has not been satisfied.

- b. *The location and screening of outdoor storage, outdoor activity or work areas, and mechanical equipment in relation to surrounding development.*

The site plan does not note any outdoor storage nor outdoor activity for this particular project. The property owner has adjacent building facilities that appear to house their equipment and other business operations. This provision can be satisfied, subject to the applicant providing confirmation that no outdoor storage/activity is taking place.

- c. *The hours of operation of the proposed use. Approval of a special land use may be conditioned upon operation within specified hours considered appropriate to ensure minimal impact on surrounding uses.*

The application and supporting materials does not address proposed hours of operation. The applicant shall provide and updated narrative detailing the proposed hours of operation.

- d. *The bulk, placement, and materials of construction of the proposed use in relation to surrounding uses.*

The submission material indicates that the existing facility will be demolished and the new proposed 5,608 square-foot facility will be erected in the same approximate footprint. Subject to meeting the applicable setback regulations of the Zoning Ordinance, this provision can be satisfied.



- e. *Proposed landscaping and other site amenities. Additional landscaping over and above the requirements of this Ordinance may be required as a condition of approval of a special land use.*

The submitted site plan does not meet the minimum requirements of the landscaping regulations of the Township Zoning Ordinance. The site plan review analysis notes the deficiencies and where the applicant will need to make adjustments.

2. Compatibility with the Master Plan

The proposed special land use shall be consistent with the general principles and objectives of the Township's Master Plan.

The 2014 Future Land Use Map designates this site as Mixed Development (MUD), as well as adjacent sites. The mixed use development classification is as follows:

The Multiple Use Development (MUD) designation supports the ability to establish a mixture of compatible land uses within a coordinated development plan. It is not limited to just residential, but can be a residential development, an industrial development, a mixed commercial/residential development, or a public use site. The concept for implementing this type of land use is based upon a Planned Unit Development (PUD) concept, with density and open space calculations critical to preserve natural areas. These types of development options should be considered based upon the compatibility of the proposed uses with surrounding land use and zoning. The MUD is a tool not only for new development, but for redevelopment as well. It provides opportunities for new ideas and creativity in the Township that would not be possible under conventional zoning standards or districts. It is not just applicable to large sites, either. Smaller sites such as a strip of commercial uses, a prominent intersection, or a portion of a residential block could all be candidates for use of the MUD.

The proposal of establishing an office facility for the industrial uses within the development area appears to meet the general intent of this classification. Industrial developments are permitted and the proposed office facility would support the industrial operations on site. As referenced in earlier sections, the applicant proposes to construct a new office facility to replace the current footprint, which is that of an office use. Therefore, we find that the proposal is not more intensive than the existing use.

3. Public Services

The proposed special land use shall be located so as to be adequately served by essential public facilities and services, such as highways, roads, police and fire protection, drainage systems, water and sewage facilities, and schools, unless the proposal contains an acceptable plan for providing necessary services or evidence that such services will be available by the time the special land use is established.



Water, sewer, natural gas, and electric power are available in this vicinity. The applicant proposes to construct a new office facility in place of the existing office use. It is not anticipated that the new facility will lack adequate public services, nor be a detriment to existing facilities.

4. Impact of Traffic

The location of the proposed special land use within the zoning district shall minimize the impact of the traffic generated by the proposed use. In determining whether this requirement has been met consideration shall be given to the following:

a. *Proximity and access to major thoroughfares.*

The subject site does not have direct access to a major thoroughfare. An existing parcel, owned by the applicant, separates the proposed facility location from that of Ravine Road. As referenced earlier, staff is recommending that the applicant combine these parcels to bring the site into compliance with Zoning regulations. Further analysis of this access to major thoroughfares is discussed within the site plan review analysis. In its current form, this provision is not satisfied. Should the applicant combine the parcels, we find that this provision can be satisfied.



b. *Estimated traffic generated by the proposed use.*

The applicant has not submitted details pertaining to the estimated traffic generated from the proposed office facility. The applicant is recommended to provide further information regarding the anticipated traffic generation of the site.



c. Proximity and relation to intersections.

The site is situated away from significant intersections. Traffic generated from the site has not been adequately addressed by the applicant. The applicant should provide an updated narrative regarding traffic generation.

d. Adequacy of driver sight distances.

While no sight distances have been provided, it is not anticipated that driver sight lines will be impacted by the proposed location of the new facility, subject to meeting all setback requirements.

e. Location of and access to off-street parking.

The applicant proposes to provide off-street parking between the existing building and the proposed facility. An additional parking area is proposed to be constructed to the east of the new office facility. This provision can be satisfied upon compliance with the off-street parking regulations.

f. Required vehicular turning movements.

The plans note vehicle maneuvering lanes of 24 feet. Further review considerations will be analyzed in the site plan review.

g. Provisions for pedestrian traffic.

There are no indicated provisions for pedestrian traffic. The applicant indicated there are no existing sidewalks on the site and does not propose any new sidewalks.

The Township Zoning Ordinance does require sidewalk installation for changes in uses and new residential & commercial development. It is noted that by installing a sidewalk with this special land use request, pedestrian pathways will begin to be created. Though at this time, the Township is not aware of any current plans by the Road Commission of Kalamazoo County to install additional sidewalks along Ravine Avenue. The applicant will need to either provide additional pedestrian pathways or be granted an alternative form of connection by the Planning Commission.

5. Detrimental Effects

The proposed special land use shall not involve any activities, processes, materials, equipment, or conditions of operation, and shall not be located or designed so as to be detrimental or hazardous to persons or property or to public health, safety, and welfare. In determining whether this requirement has been met, consideration shall be given to the level of traffic, noise, vibration, smoke, fumes, odors, dust, glare, and light.

The applicant proposes to construct a new office facility to serve as a headquarters for AZON USA. Based on the material submitted, it is not anticipated that the special use (office facility) will be designed so as to be detrimental to the public health, safety and welfare of the area. The site currently hosts an



office building; the applicant proposes to construct a new facility to better meet their needs and business growth.

6. Economic Well-Being of the Community

The proposed special land use shall not be detrimental to the economic well-being of those who will use the land, residents, businesses, landowners, and the community as a whole.

It is not anticipated that the proposed special land use will cause any detrimental effects to the economic well-being of those who will use the land, residents, businesses, landowners, and the community as a whole. The proposed use is anticipated to increase the economic wellbeing of the area due to an increase in property maintenance and employment levels. Further, an increase in general on-site maintenance and site improvements will also increase the value of the property.

7. Compatibility with Natural Environment

The proposed special land use shall be compatible with the natural environment and conserve natural resources and energy.

The subject site does not currently have any significant natural environment resources. The proposed office facility expansion/construction will require landscaping elements to be incorporated (right-of-way, parking lot, general area) which are currently lacking. Due to these site enhancements, it is anticipated that the natural environment will be supplemented and not detracted from.

RECOMMENDATIONS

In review of the Special Land Use application, it is noted that the applicant complies with portions of the above provisions. However, there are items underlined within this review that are lacking and therefore, it is recommended that the following occur:

The applicant should revise their site plan and submission material to better address and bring into compliance the subject site, as outlined within this review memorandum. Such revisions would take place prior to any action occurring from the Kalamazoo Township Planning Commission.

Recommendation: The Planning Commission **TABLE** the special land use request, after the public hearing, in order to provide the applicant additional time to address the concerns outlined within.

Respectfully Submitted,
McKenna

Danielle Bouchard, AICP
Principal Planner

Kyle Mucha, AICP
Senior Planner

Charter Township of Kalamazoo - Special Land Use Application

AZON Building – Ravine Road

1. Is the use compatible with adjacent land uses? – Yes, adjacent land uses are industrial facilities owned and operated by AZON. AZON is replacing their office building on the same site.
2. Is the use compatible with the Master Plan? – Yes – office use in I-2 district is allowed under special use and the use is in conjunction with the adjacent industrial facilities owned by AZON.
3. Are adequate public utilities and services available to this site for this use? – Yes, all utilities are available already at the site. The existing utilities servicing the existing building will be reused for this proposed building.
4. Is the use designed to insure minimal impact of traffic generation? Yes – the office building is replacing the existing office building. The site already has two drives off Ravine Road that this new building will continue to use.
5. Is the use free of any activities, processes, materials, equipment or conditions of operation that may be detrimental or hazardous to persons, property or to the public health, safety and welfare? – Yes
6. Will the use be detrimental to the economic well-being of the community? – No, the use will not be detrimental to the economic well-being of the community. The office building will continue the use of the existing building.
7. Is the proposed use compatible with the natural environment and does it conserve natural resources and energy? The use is compatible with the natural environment and it conserves natural resources and energy not only by updated the existing office facility, it keeps the offices of AZON adjacent to their industrial facilities limiting drives and trips between so that all workers or adjacent to directly each other.



Memorandum

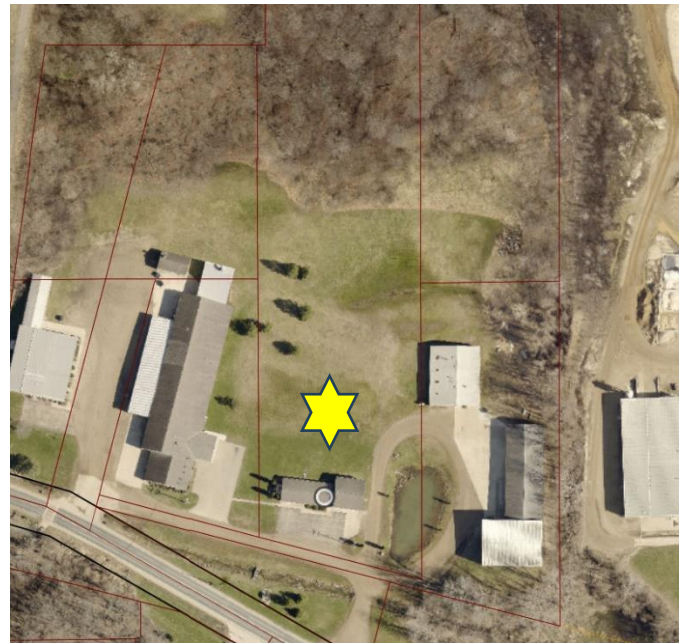
TO: Kalamazoo Charter Township Planning Commission
FROM: Kyle Mucha, AICP – Township Zoning Administrator
 Danielle Bouchard, AICP – Township Planner
SUBJECT: **2130 Ravine Road – Site Plan Review #1**
DATE: February 15, 2024

The applicant, **AZON (submitted by Patrick Muessig)**, proposes to construct a **5,608 square-foot office building and associated parking lot at 2130 Ravine Road.**

OVERVIEW

The subject site is located at 2130 Ravine Road and comprises approximately 3.97 acres of land. The subject site is located in the I-2, General Industrial District.

Per the application submission, AZON proposes to demolish the existing structure and build a new 5,608 square-foot office facility that will be connected to the adjacent western facility. Office uses in the I-2 Industrial District are classified as Special Land Uses (SLU) and require a formal hearing before the Planning Commission. A separate memorandum will review the proposed project with the established special use review criteria.



EXISTING AND SURROUNDING CONDITIONS

The site is located along the northern portion of Ravine Road, west of Douglas Avenue, and east of Nichols Road. The subject site is surrounded by I-2, General Industrial zoned properties.

We note that the subject site is composed of multiple properties, all owned by AZON Properties, LLC. Due to the proposed construction crossing property boundaries, the applicant will need to submit a land combination form to the Township.



SITE PLAN REVIEW CRITERIA

The following analysis is conducted per the provisions as established in Section 26.02 of the Township Zoning Ordinance.

A. Floodplain

The subject site does not appear to be located within a known floodplain area.

B. Schedule of Regulations

Article 25 of the Kalamazoo Township Zoning Ordinance regulates lot area, dimensions, and setback requirements for structures. The following table reviews the I-2 District Standards to that proposed by the applicant.

District: I-1 Light Industrial	Min. Lot Area (sq. ft.)	Maximum Height	Front Setback	Side Setback	Rear Setback	Maximum Lot coverage
Standard	43,560	45'	50'	30'	50'	75%
Proposed	172,933	17.5'	>50'	0'	>50'	<75%

As noted previously, the subject site consists of multiple parcels that are owned by the applicant, AZON. The western side yard setback is not met due to the delineated parcel boundary traversing north/south through the proposed building location. The applicant shall either apply for a land combination or the building will need to be redesigned to meet the minimum side yard setback requirement for the I-2 District.

C. Off-Street Parking

Required Parking

Section 4.01(D)(6) of the Kalamazoo Township Zoning Ordinance requires one (1) space per 250 square feet of Usable Floor Area (UFA). The Zoning Ordinance defines Usable Floor Area as the following:

The sum of the horizontal areas of each floor, measured from the interior faces of the exterior walls, including all areas used for, intended to be used for, and accessible for the sale of merchandise, provision of services, or service to patrons, clients or customers. Floor area which is used for or intended to be used for the storage or processing of merchandise, or for utilities shall be excluded from the computations of Usable Nonresidential Floor Area.

While the site plan notes a total building square footage and includes a building rendering, no apparent calculations have been provided that detail the UFA of the office facility. The applicant will need to provide a calculation of UFA in order to determine the minimum number of off-street parking spaces required.

General Requirements

- i. **Within Yards.** *Off-street parking in industrial districts may only be located in a side or rear yard or non-required front yard, provided that all landscaping requirements in Article 5 are complied with.*

The site plan notes eight (8) spaces to be located along the western portion of the office facility; 17 spaces to be located along the eastern portion of the office facility; three (3) spaces to be located along the southern portion of the office facility. The proposed three (3) spaces are shown



to be located immediately adjacent to an easement on the subject site. This will require vehicles to back into a dedicated maneuvering access area. The three (s) spaces are encouraged to be relocated to the eastern parking area to avoid potential conflict with traffic traversing the easement area.

- ii. **Banked Parking.** *If the minimum number of required parking spaces exceeds the amount necessary to serve a proposed use, the Planning Commission may approve the construction of a lesser number of parking spaces, subject to the banked parking being shown on the site plan and set aside as landscaped open space; banked parking shall be located in areas suitable for future parking and that meet Ordinance requirements. (Note: the Township may require construction of the banked parking area upon finding that vehicles are regularly parked on unpaved surfaces, on the road, or off-site.*

The applicant has not provided any reference to banked parking on site. The applicant is advised that banked parking could be explored at a later date, if desired. The number of required parking spaces are calculated by the UFA. Staff is unable to determine if the proposed number of spaces is compliant with Ordinance requirements, given the lack of UFA provided.

- iii. **Bicycle Parking.** *Parking facilities for short and long-term bicycle parking shall be provided to meet the needs of the business or residential use.*

The site plan does not appear to make any note for bicycle parking. The site plan shall be amended to include a provision for bicycle parking.

Layout & Construction

Off-street parking facilities containing four (4) or more spaces shall be designed, constructed and maintained in accordance with the following:

- i. **Dimensions.** *The minimum width of parking spaces shall be 9.0 feet with a wall depth of 18.5 feet. The minimum drive aisle width shall be 24 feet. The site plan notes parking spaces to be a minimum of 20 feet in length and nine (9) feet in width, with a drive aisle width of 24 feet. Based on the proposed parking sizes and maneuvering lane, this provision has been satisfied.*
- ii. **Ingress/Egress.** *The site plan notes two access points to the site from Ravine Road. The western access includes a 50' wide entrance and the eastern access includes a 20' wide entrance with a 20' drive, over an existing culvert, to access the site. The applicant shall indicate whether the driveways are intended to accommodate one-way traffic. If so, signage indicating the intended traffic flow direction should be provided. Further, the applicant should clarify is the eastern driveway is intended to accommodate truck traffic. Main access driveways shall be a minimum of 31' wide.*
- iii. **Surface and drainage.** *All off-street parking areas, access lanes, driveways and other vehicle maneuvering areas shall be hard-surfaced with concrete or plant-mixed bituminous material. porous paving materials may be permitted at the discretion of the Planning Commission, provided that installation and maintenance plans are in accordance with the manufacturer's guidelines. A written maintenance plan must be submitted for the Planning Commission's review. The site plan*



notes the use of hot mixed asphalt, which will satisfy this requirement. Surface and drainage conditions are subject to review and approval by the Township Engineer.

D. Off-Street Loading Facilities

Off-Street loading areas shall be located to the rear or side of the building being served such that it is screened from view from adjoining roads (Section 4.02.B). Loading spaces shall be a minimum of ten (10) feet in width and fifty (50) feet in length. The site plan does not indicate a designated loading/unloading area. While it is noted that areas of the site may serve as unofficial loading/unloading areas, the site plan shall be amended to clearly delineate the required loading/unloading area.

E. Landscaping Plan

In accordance with Section 5, Landscaping and Screening, the site is required to have the following landscaping:

Landscaping: General Requirements	Requirements	Site Plan Conditions	Compliance with Ordinance Standards
General Landscaping Ratio	1 tree per 3,000 sq. ft. of unpaved open area	0	No
Landscaping Adjacent to Roads	1 tree per 40 ft. (D) 1 tree per 100 ft. (O) 8 shrubs per 40 ft.	0	No
Berms In Front Yard	Maximum of 3 ft. height	None	Yes

The submitted site plan with landscaping notes does not adequately address the Kalamazoo Township Zoning Ordinance requirements. As indicated in previous sections, the subject site sits across multiple parcels and is recommended to execute a land combination application. Until such a time as either the landscape elements are updated to meet the provisions of this section OR a land combination application is executed and landscaping elements amended, this ordinance requirement has not been satisfied.

Parking Lot Landscaping

In addition to required landscaping, all off-street parking areas shall be landscaped as follows:

Parking Lot Landscaping	Requirements	Site Plan Conditions	Compliance with Ordinance Standards
General Landscaping Ratio	30 sq. ft. per parking space *24 parking spaces = 720 sq. ft.	Site plan note: not dimensioned	No
Minimum Planting Area Width	9 feet	Not dimensioned	No
Deciduous or Evergreen Trees	One (1) shade tree per 10 vehicle parking spaces in the lot – 24	Two provided	No



	spaces equals 3 shade trees		
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*The parking lot landscaping calculations were reviewed based on the number of spaces proposed. This number may change once a total Usable Floor Area has been provided (see reference to earlier parking section).

The submitted parking lot landscaping plan does not meet the Township Zoning requirements. Further revisions will be required.

Irrigation

In accordance with Section 5.02.K – Irrigation – required landscaping shall be served by an in-ground irrigation/sprinkler system. The Planning Commission may approve an alternate irrigation system provided that all landscape material is within one hundred (100) feet of a spigot.

No apparent reference has been made to an irrigation system – the applicant shall provide details pertaining to an irrigation system or maintenance plan for landscaping elements.

F. Lighting

The applicant has provided a photometric (lighting) plan for review by the Township. While the photometric plan shows proposed foot-candle levels, no details have been provided on the type of light fixture nor their mounting height. Further details pertaining to the type of fixtures to be utilized on site is required.

G. Stormwater

Stormwater calculations and review will be conducted by the Township Engineer.

H. Sidewalks

Section 2.18.A. of the Township Zoning Ordinance requires sidewalks to be constructed with any new residential and commercial development. The submitted site plan does not provide for sidewalks along Ravine Road. The site plan will need to be amended to show this requirement.

I. Trash Removal & Disposal

The site plan does not provide any indications of trash removal/disposal from the property. The applicant is advised to review Section 2.22 for further guidance and make the required modifications within the resubmission.

J. Screening

A screening wall or fence shall be provided along property lines that abut a lot in a residentially-zoned district or a lot in any zoning district that is used for residential purposes (Section 6.01.C.). Based on an area review, property located to the east of parcels #06-08-265-040 & #06-08-265-023 are zoned residential. A screening wall or fence shall be provided along this property boundary; the site plan shall be amended to include this information.



ADDITIONAL STANDARDS

In accordance with Section 2.20 – Streets, Roads, and Other Means of Access – subsection B, Public Access Required/Minimum Frontage, the following regulations apply:

The front lot line of all lots shall abut onto a publicly dedicated road right-of-way or approved private road. The required frontage of an approved road right-of-way shall be equal to or greater than the minimum lot width for the district in which the lot is located.

Based on the submitted site plan, the applicant proposes to demolish the existing building at 2130 Ravine Road and construct a new facility that is also connected to the existing structure at 2204 Ravine Road and which provides access to 2200 Ravine Road. A review of the subject site and its surrounding/adjacent parcels, 2130 Ravine Road does not have access to a public right-of-way, nor a private road system. Further, additional parcels (06-08-265-020; 06-08-265-021; 06-08-265-023; 06-08-265-032; 06-08-265-033; 06-08-265-040) do not have road frontage. Parcel #06-08-265-051 does not have the required minimum lot area per the Township’s Zoning Ordinance Schedule of Regulations. In order to mitigate these shortcomings (having no road frontage as required in Section 2.20.B), a land combination of the aforementioned parcels will need to take place.

ADDITIONAL AGENCY REVIEW

The following reviews have been conducted in addition to the planning/zoning review listed above.

- 1. **Kalamazoo Township Fire Marshal**
Included in a separate communication.
- 2. **Kalamazoo Township Engineer – Prein & Newhof**
Included in a separate communication.

RECOMMENDATION

Based on the above analysis conducted regarding a new office facility at 2130 Ravine Road, there are significant provisions of the Kalamazoo Township Zoning Ordinance that have not been addressed satisfactorily. Items that need to be addressed are underlined within this review. Unless the items underlined within this review analysis have been adequately addressed, it is recommended that the Kalamazoo Township Planning Commission **DENY** the proposed site plan.

Please feel free to contact Kyle Mucha, AICP at kmucha@mcka.com or Danielle Bouchard, AICP at dbouchard@mcka.com regarding this review.

Respectfully,

McKenna

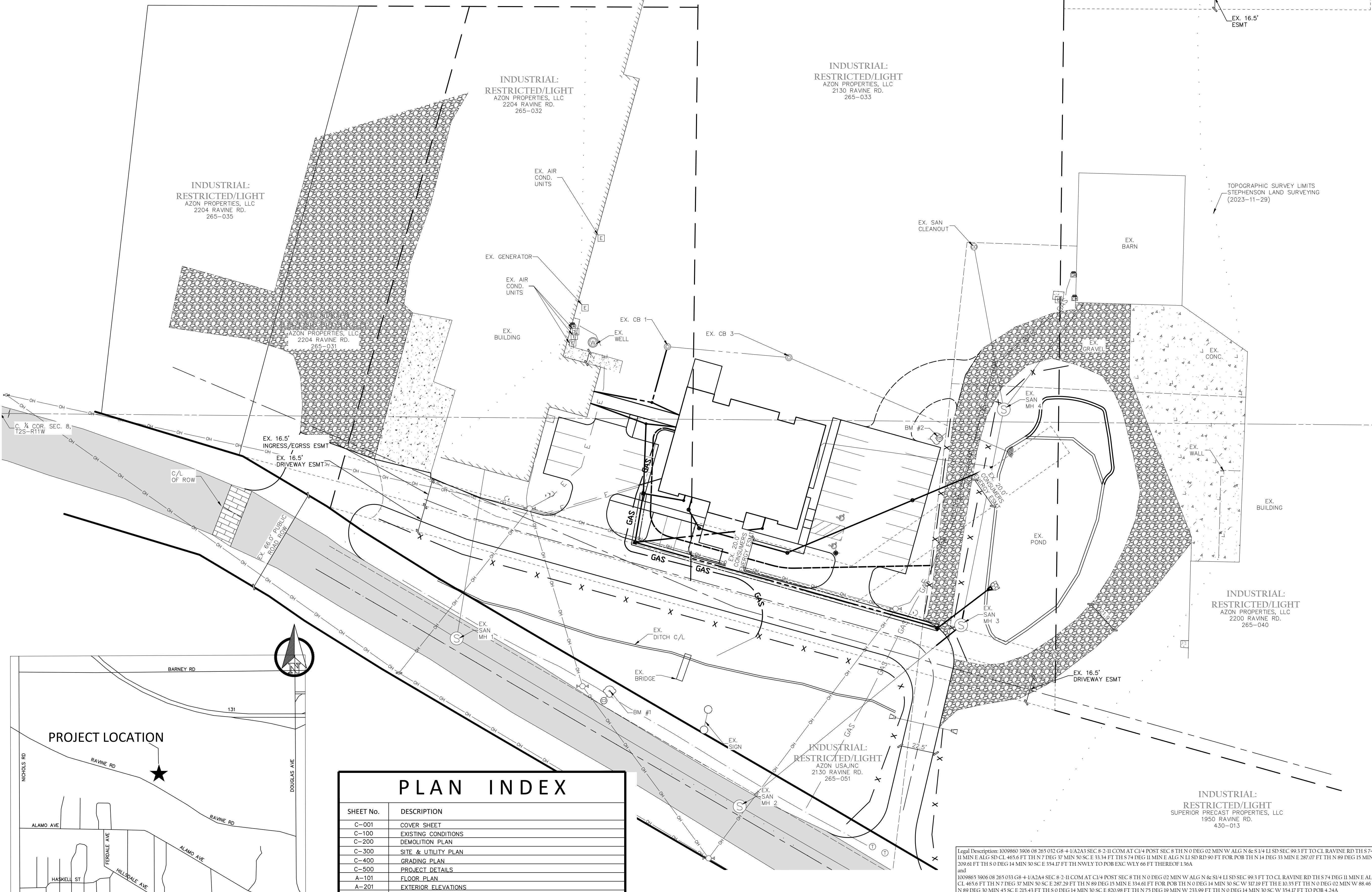
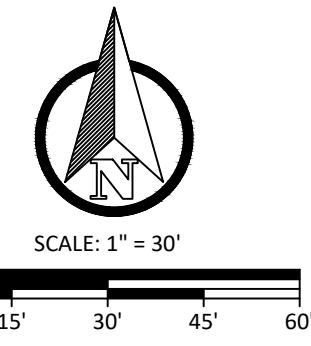
Kyle Mucha, AICP
Senior Planner/Township Zoning Administrator

Danielle Bouchard, AICP
Principal Planner/Township Planner

KALAMAZOO TOWNSHIP KALAMAZOO COUNTY, MICHIGAN AZON RAVINE ROAD

VK CIVIL
Vriesman & Korhorn
www.VKcivil.com
JOB NO. 1172

Schley Nelson Architects
4200 S. 9th Street,
PO Box 239
Oshtemo, MI 49077
(269) 375-8350
Architect Seal

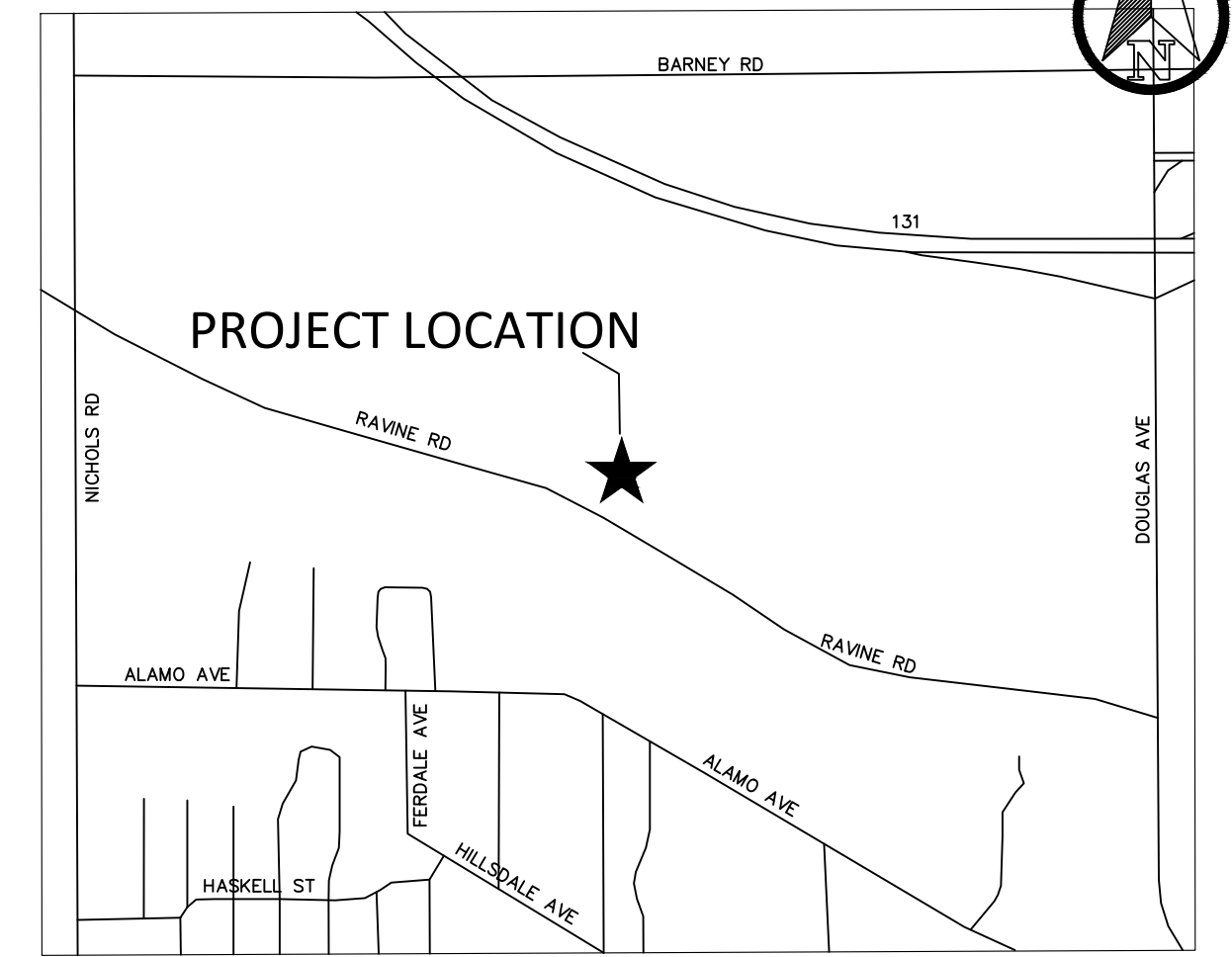


EX. STRUCTURE TABLE

EX. SAN MH #1 RIM-845.18 20' E CONC. INV-835.85 18' W CONC. INV-833.35 8' N CONC. INV-836.35	EX. SAN MH #4 RIM-841.34 8' N PLASTIC INV-837.26 8' NE PLASTIC INV-837.42 8' S PLASTIC INV-837.17 8' SW PLASTIC INV-837.26
EX. SAN MH #2 RIM-844.68 20' W CONC. INV-834.93 8' N CONC. INV-834.43 24' E CONC. INV-832.68	EX. STM CB #1 RIM-841.74 BOTTOM-839.07 EX. STM CB #2 RIM-842.05 8' N PLASTIC INV-840.40
EX. SAN MH #3 RIM-840.32 8' N PLASTIC INV-835.57 8' SW PLASTIC INV-835.32	EX. STM CB #1 RIM-841.33 BOTTOM-838.76

BENCHMARKS

BM #1 FIRE HYDRANT BOLT WITH 'N' ELEV - 845.52
BM #2 FIRE HYDRANT BOLT WITH WASHER ELEV - 845.54



PLAN INDEX

SHEET No.	DESCRIPTION
C-001	COVER SHEET
C-100	EXISTING CONDITIONS
C-200	DEMOLITION PLAN
C-300	SITE & UTILITY PLAN
C-400	GRADING PLAN
C-500	PROJECT DETAILS
A-101	FLOOR PLAN
A-201	EXTERIOR ELEVATIONS
EXHIBIT FRONT	COLOR ELEVATIONS FRONT
EXHIBIT BACK	COLOR ELEVATIONS BACK
E-003	SITE LIGHTING LEVELS

CONSTRUCTION SCHEDULE:
EARTHWORK AND PAVING - APRIL 2024 THROUGH NOVEMBER 2024
BUILDING CONSTRUCTION - MAY 2024 THROUGH DECEMBER 2024

Legal Description: 1009860 3906 08 265 032 GR 4 1/2 A23 SEC 8 2 11 COM AT C14 POST SEC 8 TH N 0 DEG 02 MIN W ALG N & S 1/4 LI SD SEC 99 3 FT TO CL RAVINE RD TH S 74 DEG 11 MIN E ALG SD CL 465.6 FT TH N 7 DEG 17 MIN 30 SEC E 287.29 FT TH N 89 DEG 15 MIN E 334.61 FT FOR POB TH N 0 DEG 14 MIN 30 SEC W 312.19 FT TH E 80.35 FT TH N 0 DEG 02 MIN W 86.46 FT TH N 89 DEG 30 MIN 45 SEC E 215.43 FT TH S 0 DEG 14 MIN 30 SEC E 820.98 FT TH N 75 DEG 19 MIN W 233.99 FT TH N 0 DEG 14 MIN 30 SEC W 354.17 FT TO POB 4.24A and 1009870 3906 08 265 040 G 8 4 1A2B SEC 8 2 11 COM AT C14 POST SEC 8 TH N 0 DEG 02 MIN W ALG N & S 1/4 LI SD SEC 99 3 FT TO CL RAVINE RD TH S 74 DEG 11 MIN E ALG SD CTR LI 465.6 FT TH N 7 DEG 17 MIN 30 SEC E 33.34 FT TO NLY LI SD RD TH S 74 DEG 11 MIN E THEREON 95.44 FT TH S 60 DEG 12 MIN E THEREON 60.45 FT TO NLY LI NYCRB ROW TH S 75 DEG 19 MIN E THEREON 2.24 FT FOR POB TH N 14 DEG 33 MIN E 16.5 FT TH S 75 DEG 19 MIN E 460.6 FT TH N 0 DEG 14 MIN 30 SEC W 416.45 FT TH N 89 DEG 15 MIN E 189.54 FT TH S 0 DEG 14 MIN 30 SEC E 485.73 FT TO NLY LI SD ROW TH N 75 DEG 19 MIN W 660.11 FT TO BEG TOGETHER WITH A ROW DESC. AS BEG AT SW COR ABOVE DESC TH N 14 DEG 33 MIN E 16.5 FT TH N 78 DEG 00 MIN 45 SEC W 60.56 FT TO NLY LI RAVINE RD TH S 60 DEG 12 MIN E THEREON 60.45 FT TH S 75 DEG 19 MIN E 2.24 FT TO BEG 2 31A

OWNER
AZON PROPERTIES, LLC
NAME: PATRICK MUESSIG
PHONE: 269-492-1363
EMAIL: PMUESSIG@AZONUSA.COM

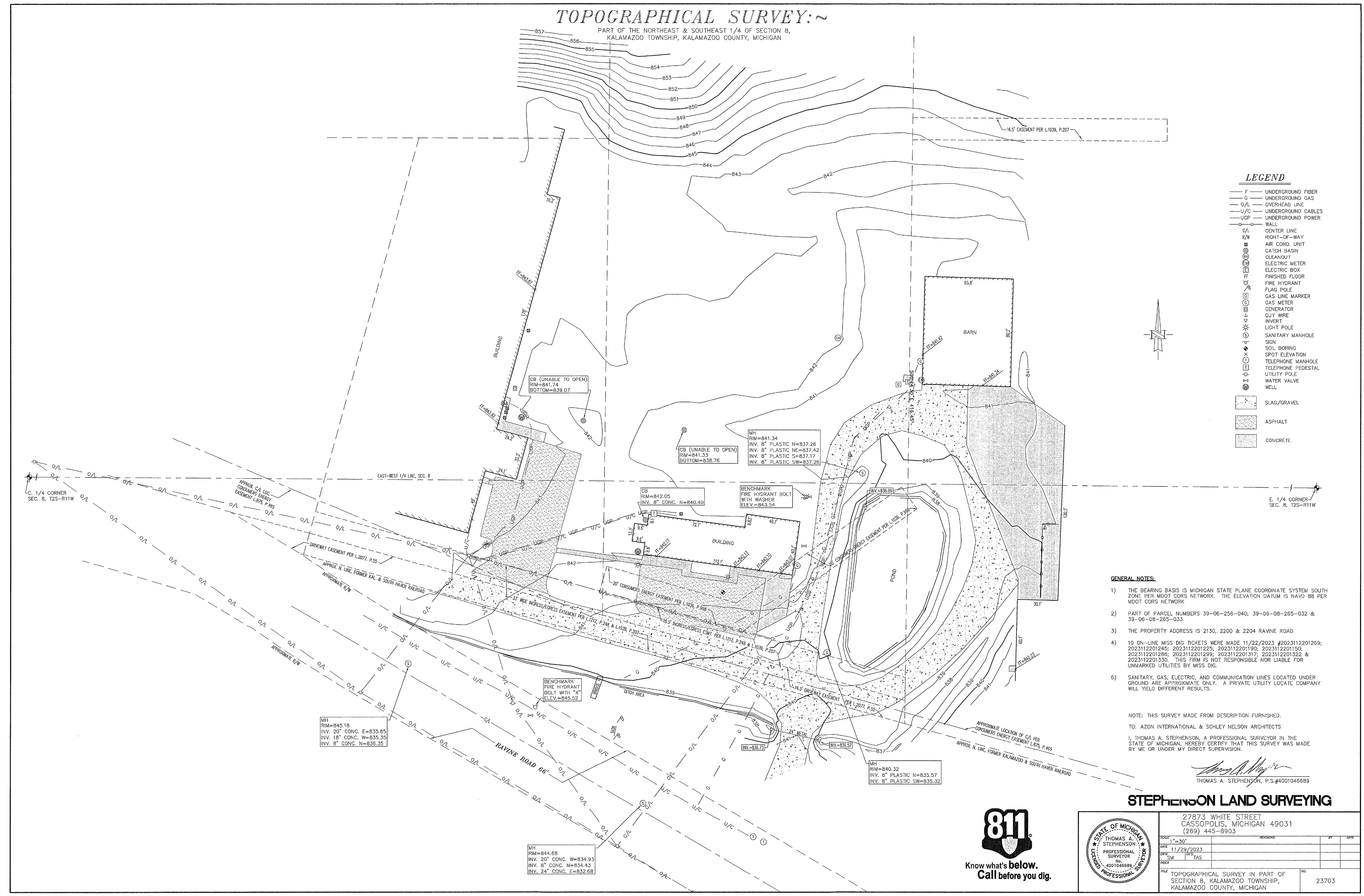
DESIGN ENGINEER
VK CIVIL
COLIN FINCH, P.E.
616-277-2185
COLIN@VKCIVIL.COM

Project:

AZON

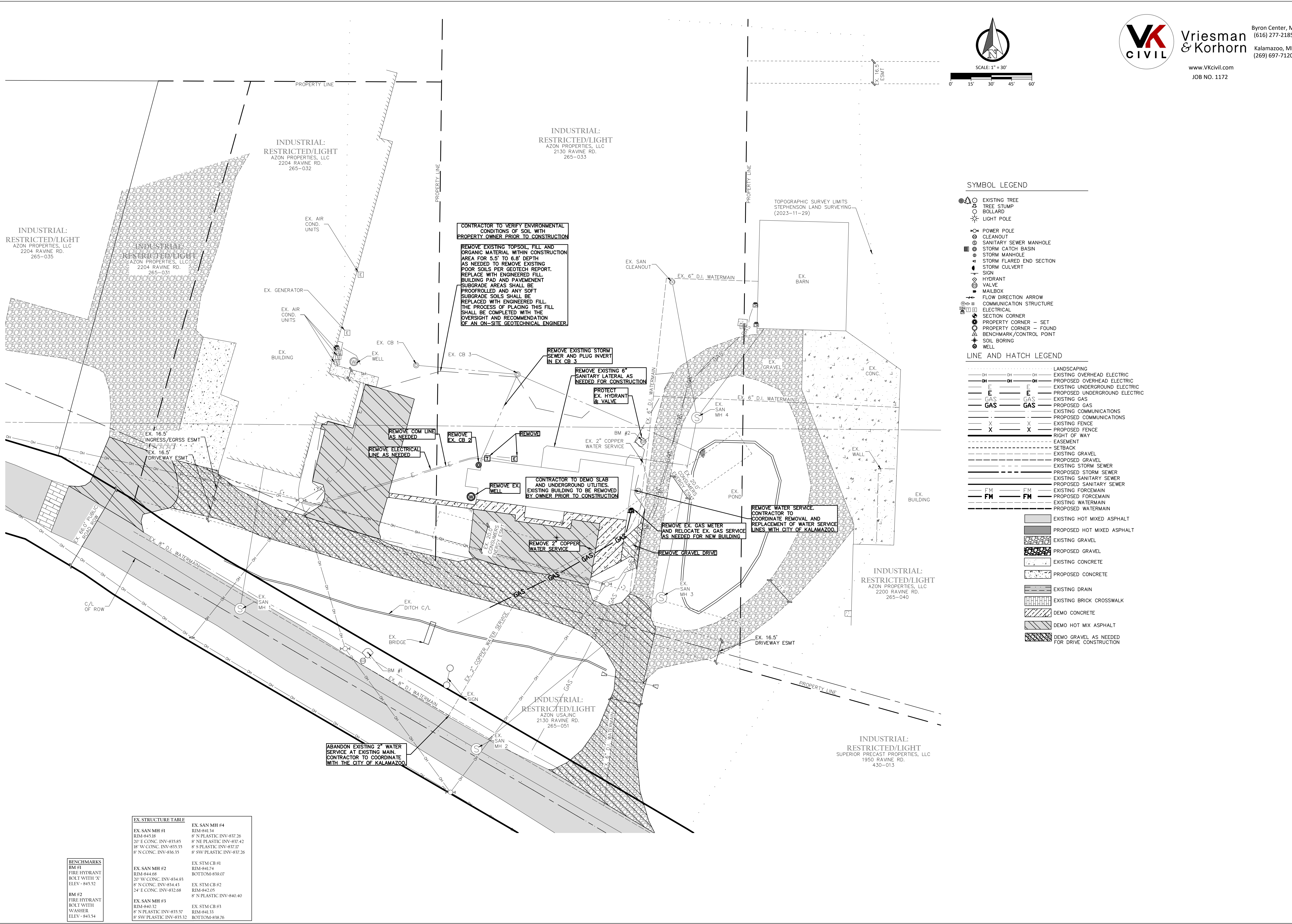
NEW HEADQUARTERS
BUILDING FOR AZON
Ravine Road Kalamazoo, MI 49004

Rev. Date:	
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Rev. Date:	
Rev. Date:	
Rev. Date:	
Rev. Date:	
Issue Date: Jan. 15, 2024	
Schley Nelson Architects	
Project No.	23-110
Sheet Name:	COVER SHEET
Sheet No.	C000
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23-110
Sheet Name:
DEMOLITION PLAN
Sheet No.
C200
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SYMBOL LEGEND

- ⊙ EXISTING TREE
- ⊙ TREE STUMP
- BOLLARD
- ⊙ LIGHT POLE
- ⊙ POWER POLE
- ⊙ CLEANOUT
- ⊙ SANITARY SEWER MANHOLE
- ⊙ STORM CATCH BASIN
- ⊙ STORM MANHOLE
- ⊙ STORM FLARED END SECTION
- ⊙ STORM CULVERT
- ⊙ SIGN
- ⊙ HYDRANT
- ⊙ VALVE
- ⊙ MAILBOX
- FLOW DIRECTION ARROW
- ⊙ COMMUNICATION STRUCTURE
- ⊙ ELECTRICAL
- ⊙ SECTION CORNER
- ⊙ PROPERTY CORNER - SET
- ⊙ PROPERTY CORNER - FOUND
- ⊙ BENCHMARK/CONTROL POINT
- ⊙ SOIL BORING
- ⊙ WELL

LINE AND HATCH LEGEND

- LANDSCAPING
- EXISTING OVERHEAD ELECTRIC
- PROPOSED OVERHEAD ELECTRIC
- EXISTING UNDERGROUND ELECTRIC
- PROPOSED UNDERGROUND ELECTRIC
- EXISTING GAS
- PROPOSED GAS
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- PROPOSED COMMUNICATIONS
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- EXISTING CONCRETE
- PROPOSED CONCRETE
- EXISTING DRAIN
- EXISTING BRICK CROSSWALK
- DEMO CONCRETE
- DEMO HOT MIX ASPHALT
- DEMO GRAVEL AS NEEDED FOR DRIVE CONSTRUCTION

CONTRACTOR TO VERIFY ENVIRONMENTAL CONDITIONS OF SOIL WITH PROPERTY OWNER PRIOR TO CONSTRUCTION

REMOVE EXISTING TOPSOIL, FILL AND ORGANIC MATERIAL WITHIN CONSTRUCTION AREA FOR 5.5' TO 6.8' DEPTH AS NEEDED TO REMOVE EXISTING POOR SOILS PER GEOTECH REPORT. REPLACE WITH ENGINEERED FILL. BUILDING PAD AND PAVEMENT SUBGRADE AREAS SHALL BE PROOFROLLED AND ANY SOFT SUBGRADE SOILS SHALL BE REPLACED WITH ENGINEERED FILL. THE PROCESS OF PLACING THIS FILL SHALL BE COMPLETED WITH THE OVERSIGHT AND RECOMMENDATION OF AN ON-SITE GEOTECHNICAL ENGINEER

REMOVE EXISTING STORM SEWER AND PLUG INVERT IN EX. CB 3

REMOVE EXISTING 6" SANITARY LATERAL AS NEEDED FOR CONSTRUCTION

PROTECT EX. HYDRANT & VALVE

REMOVE EX. 2" COPPER WATER SERVICE

REMOVE EX. 2" COPPER WATER SERVICE

REMOVE EX. GAS METER AND RELOCATE EX. GAS SERVICE AS NEEDED FOR NEW BUILDING

REMOVE EX. 2" COPPER WATER SERVICE

REMOVE GRAVEL DRIVE

REMOVE WATER SERVICE. CONTRACTOR TO COORDINATE REMOVAL AND REPLACEMENT OF WATER SERVICE LINES WITH CITY OF KALAMAZOO

REMOVE EX. GAS METER AND RELOCATE EX. GAS SERVICE AS NEEDED FOR NEW BUILDING

REMOVE EX. 2" COPPER WATER SERVICE

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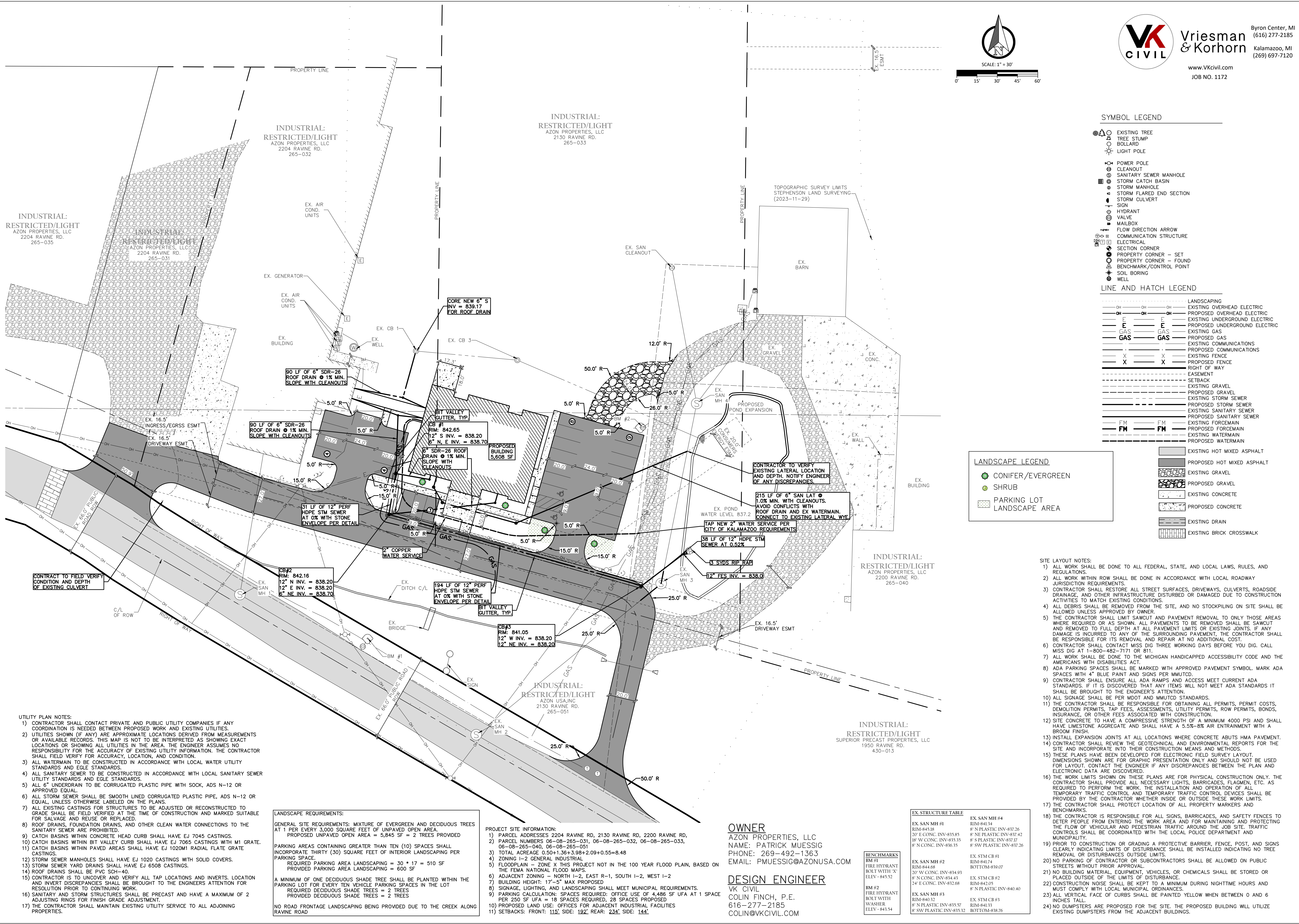
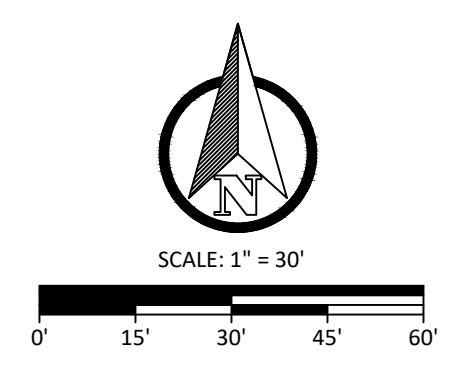
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8" SW PLASTIC INV-833.32	BOTTOM-838.76

BENCHMARKS

BM #1	EX. SAN MH #4
FIRE HYDRANT BOLT WITH 'X' ELEV - 845.52	
BM #2	EX. SAN MH #3
FIRE HYDRANT BOLT WITH WASHER ELEV - 843.54	



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- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING FORCEMAIN
- PROPOSED FORCEMAIN
- EXISTING WATERMAIN
- PROPOSED WATERMAIN

LANDSCAPE LEGEND

- CONIFER/EVERGREEN
- SHRUB
- PARKING LOT LANDSCAPE AREA
- EXISTING HOT MIXED ASPHALT
- PROPOSED HOT MIXED ASPHALT
- EXISTING GRAVEL
- PROPOSED GRAVEL
- EXISTING CONCRETE
- PROPOSED CONCRETE
- EXISTING DRAIN
- EXISTING BRICK CROSSWALK

- SITE LAYOUT NOTES:**
- 1) ALL WORK SHALL BE DONE TO ALL FEDERAL, STATE, AND LOCAL LAWS, RULES, AND REGULATIONS.
 - 2) ALL WORK WITHIN ROW SHALL BE DONE IN ACCORDANCE WITH LOCAL ROADWAY JURISDICTION REQUIREMENTS.
 - 3) CONTRACTOR SHALL RESTORE ALL STREET SURFACES, DRIVEWAYS, CULVERTS, ROADSIDE DRAINAGE, AND OTHER INFRASTRUCTURE DISTURBED OR DAMAGED DUE TO CONSTRUCTION ACTIVITIES TO MATCH EXISTING CONDITIONS.
 - 4) ALL DEBRIS SHALL BE REMOVED FROM THE SITE, AND NO STOCKPILING ON SITE SHALL BE ALLOWED UNLESS APPROVED BY OWNER.
 - 5) THE CONTRACTOR SHALL SAWCUT AND PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE REQUIRED OR AS SHOWN. ALL PAVEMENTS TO BE REMOVED SHALL BE SAWCUT AND REMOVED TO FULL DEPTH AT ALL PAVEMENT LIMITS OR EXISTING JOINTS. IF ANY DAMAGE IS INCURRED TO ANY OF THE SURROUNDING PAVEMENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR AT NO ADDITIONAL COST.
 - 6) CONTRACTOR SHALL CONTACT MISS DIG THREE WORKING DAYS BEFORE YOU DIG. CALL MISS DIG AT 1-800-482-7171 OR 811.
 - 7) ALL WORK SHALL BE DONE TO THE MICHIGAN HANDICAPPED ACCESSIBILITY CODE AND THE AMERICANS WITH DISABILITIES ACT.
 - 8) ADA PARKING SPACES SHALL BE MARKED WITH APPROVED PAVEMENT SYMBOL. MARK ADA SPACES WITH 4" BLUE PAINT AND SIGNS PER MMDOT.
 - 9) CONTRACTOR SHALL ENSURE ALL ADA RAMP AND ACCESS MEET CURRENT ADA STANDARDS. IF IT IS DISCOVERED THAT ANY ITEMS WILL NOT MEET ADA STANDARDS IT SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION.
 - 10) ALL SIGNAGE SHALL BE PER MDOT AND MMDOT STANDARDS.
 - 11) THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS, PERMIT COSTS, DEMOLITION PERMITS, TAP FEES, ASSESSMENTS, UTILITY PERMITS, ROW PERMITS, BONDS, INSURANCE, OR OTHER FEES ASSOCIATED WITH CONSTRUCTION.
 - 12) SITE CONCRETE TO HAVE A COMPRESSIVE STRENGTH OF A MINIMUM 4000 PSI AND SHALL HAVE LIMESTONE AGGREGATE AND SHALL HAVE A 5.5%-8% AIR ENTRAINMENT WITH A BROOM FINISH.
 - 13) INSTALL EXPANSION JOINTS AT ALL LOCATIONS WHERE CONCRETE ABUTS HMA PAVEMENT.
 - 14) CONTRACTOR SHALL REVIEW THE GEOTECHNICAL AND ENVIRONMENTAL REPORTS FOR THE SITE AND INCORPORATE INTO THEIR CONSTRUCTION MEANS AND METHODS.
 - 15) THESE PLANS HAVE BEEN DEVELOPED FOR ELECTRONIC FIELD SURVEY LAYOUT. DIMENSIONS SHOWN ARE FOR GRAPHIC PRESENTATION ONLY AND SHOULD NOT BE USED FOR LAYOUT. CONTACT THE ENGINEER IF ANY DISCREPANCIES BETWEEN THE PLAN AND ELECTRONIC DATA ARE DISCOVERED.
 - 16) THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY LIGHTS, BARRICADES, FLAGMEN, ETC. AS REQUIRED TO PERFORM THE WORK. THE INSTALLATION AND OPERATION OF ALL TEMPORARY TRAFFIC CONTROL AND TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE PROVIDED BY THE CONTRACTOR WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.
 - 17) THE CONTRACTOR SHALL PROTECT LOCATION OF ALL PROPERTY MARKERS AND BENCHMARKS.
 - 18) THE CONTRACTOR IS RESPONSIBLE FOR ALL SIGNS, BARRICADES, AND SAFETY FENCES TO DETER PEOPLE FROM ENTERING THE WORK AREA AND FOR MAINTAINING AND PROTECTING THE FLOW OF VEHICULAR AND PEDESTRIAN TRAFFIC AROUND THE JOB SITE. TRAFFIC CONTROLS SHALL BE COORDINATED WITH THE LOCAL POLICE DEPARTMENT AND MUNICIPALITY.
 - 19) PRIOR TO CONSTRUCTION OR GRADING A PROTECTIVE BARRIER, FENCE, POST, AND SIGNS CLEARLY INDICATING LIMITS OF DISTURBANCE SHALL BE INSTALLED INDICATING NO TREE REMOVAL OR DISTURBANCES OUTSIDE LIMITS.
 - 20) NO PARKING OF CONTRACTOR OR SUBCONTRACTORS SHALL BE ALLOWED ON PUBLIC STREETS WITHOUT PRIOR APPROVAL.
 - 21) NO BUILDING MATERIAL, EQUIPMENT, VEHICLES, OR CHEMICALS SHALL BE STORED OR PLACED OUTSIDE OF THE LIMITS OF DISTURBANCE.
 - 22) CONSTRUCTION NOISE SHALL BE KEPT TO A MINIMUM DURING NIGHTTIME HOURS AND MUST COMPLY WITH LOCAL MUNICIPAL ORDINANCES.
 - 23) ALL VERTICAL FACE OF CURBS SHALL BE PAINTED YELLOW WHEN BETWEEN 0 AND 6 INCHES TALL.
 - 24) NO DUMPSTERS ARE PROPOSED FOR THE SITE. THE PROPOSED BUILDING WILL UTILIZE EXISTING DUMPSTERS FROM THE ADJACENT BUILDINGS.

- UTILITY PLAN NOTES:**
- 1) CONTRACTOR SHALL CONTACT PRIVATE AND PUBLIC UTILITY COMPANIES IF ANY COORDINATION IS NEEDED BETWEEN PROPOSED WORK AND EXISTING UTILITIES.
 - 2) UTILITIES SHOWN (IF ANY) ARE APPROXIMATE LOCATIONS DERIVED FROM MEASUREMENTS OR AVAILABLE RECORDS. THIS MAP IS NOT TO BE INTERPRETED AS SHOWING EXACT LOCATIONS OR SHOWING ALL UTILITIES IN THE AREA. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF EXISTING UTILITY INFORMATION. THE CONTRACTOR SHALL FIELD VERIFY FOR ACCURACY, LOCATION, AND CONDITION.
 - 3) ALL WATERMAIN TO BE CONSTRUCTED IN ACCORDANCE WITH LOCAL WATER UTILITY STANDARDS AND EGLE STANDARDS.
 - 4) ALL SANITARY SEWER TO BE CONSTRUCTED IN ACCORDANCE WITH LOCAL SANITARY SEWER UTILITY STANDARDS AND EGLE STANDARDS.
 - 5) ALL 6" UNDERDRAIN TO BE CORRUGATED PLASTIC PIPE WITH SOCK, ADS N-12 OR APPROVED EQUAL.
 - 6) ALL STORM SEWER SHALL BE SMOOTH LINED CORRUGATED PLASTIC PIPE, ADS N-12 OR EQUAL, UNLESS OTHERWISE LABELED ON THE PLANS.
 - 7) ALL EXISTING CASTINGS FOR STRUCTURES TO BE ADJUSTED OR RECONSTRUCTED TO GRADE SHALL BE FIELD VERIFIED AT THE TIME OF CONSTRUCTION AND MARKED SUITABLE FOR SALVAGE AND REUSE OR REPLACED.
 - 8) ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED.
 - 9) CATCH BASINS WITHIN CONCRETE HEAD CURB SHALL HAVE EJ 7045 CASTINGS.
 - 10) CATCH BASINS WITHIN BIT VALLEY CURB SHALL HAVE EJ 6508 CASTINGS WITH M1 GRATE.
 - 11) CATCH BASINS WITHIN PAVED AREAS SHALL HAVE EJ 1020M1 RADIAL FLATE GRATE CASTINGS.
 - 12) STORM SEWER MANHOLES SHALL HAVE EJ 1020 CASTINGS WITH SOLID COVERS.
 - 13) STORM SEWER YARD DRAINS SHALL HAVE EJ 6508 CASTINGS.
 - 14) ROOF DRAINS SHALL BE PVC SCH-40.
 - 15) CONTRACTOR IS TO UNCOVER AND VERIFY ALL TAP LOCATIONS AND INVERTS. LOCATION AND INVERT DISCREPANCIES SHALL BE BROUGHT TO THE ENGINEERS ATTENTION FOR RESOLUTION PRIOR TO CONTINUING WORK.
 - 16) SANITARY AND STORM STRUCTURES SHALL BE PRECAST AND HAVE A MAXIMUM OF 2 ADJUSTING RINGS FOR FINISH GRADE ADJUSTMENT.
 - 17) THE CONTRACTOR SHALL MAINTAIN EXISTING UTILITY SERVICE TO ALL ADJOINING PROPERTIES.

LANDSCAPE REQUIREMENTS:

GENERAL SITE REQUIREMENTS: MIXTURE OF EVERGREEN AND DECIDUOUS TREES AT 1 PER EVERY 3,000 SQUARE FEET OF UNPAVED OPEN AREA.
 PROPOSED UNPAVED OPEN AREA = 5,845 SF = 2 TREES PROVIDED

PARKING AREAS CONTAINING GREATER THAN TEN (10) SPACES SHALL INCORPORATE THIRTY (30) SQUARE FEET OF INTERIOR LANDSCAPING PER PARKING SPACE.
 REQUIRED PARKING AREA LANDSCAPING = 30 * 17 = 510 SF
 PROVIDED PARKING AREA LANDSCAPING = 600 SF

A MINIMUM OF ONE DECIDUOUS SHADE TREE SHALL BE PLANTED WITHIN THE PARKING LOT FOR EVERY TEN VEHICLE PARKING SPACES IN THE LOT
 REQUIRED DECIDUOUS SHADE TREES = 2 TREES
 PROVIDED DECIDUOUS SHADE TREES = 2 TREES

NO ROAD FRONTAGE LANDSCAPING BEING PROVIDED DUE TO THE CREEK ALONG RAVINE ROAD

- PROJECT SITE INFORMATION:**
- 1) PARCEL ADDRESSES 2204 RAVINE RD, 2130 RAVINE RD, 2200 RAVINE RD.
 - 2) PARCEL NUMBERS 06-08-265-031, 06-08-265-032, 06-08-265-033, 06-08-265-040, 06-08-265-051
 - 3) TOTAL ACREAGE 0.50+1.36+3.98+2.09+0.55=8.48
 - 4) ZONING I-2 GENERAL INDUSTRIAL
 - 5) FLOODPLAIN - ZONE X THIS PROJECT NOT IN THE 100 YEAR FLOOD PLAIN, BASED ON THE FEMA NATIONAL FLOOD MAPS.
 - 6) ADJACENT ZONING - NORTH I-2, EAST R-1, SOUTH I-2, WEST I-2
 - 7) BUILDING HEIGHT: 17'-5" MAX PROPOSED
 - 8) SIGNAGE, LIGHTING, AND LANDSCAPING SHALL MEET MUNICIPAL REQUIREMENTS.
 - 9) PARKING CALCULATION: SPACES REQUIRED: OFFICE USE OF 4,486 SF UFA AT 1 SPACE PER 250 SF UFA = 18 SPACES REQUIRED, 28 SPACES PROPOSED
 - 10) PROPOSED LAND USE: OFFICES FOR ADJACENT INDUSTRIAL FACILITIES
 - 11) SETBACKS: FRONT: 112' SIDE: 192' REAR: 234' SIDE: 144'

OWNER
 AZON PROPERTIES, LLC
 NAME: PATRICK MUESSIG
 PHONE: 269-492-1363
 EMAIL: PMUESSIG@AZONUSA.COM

DESIGN ENGINEER
 VK CIVIL
 COLIN FINCH, P.E.
 616-277-2185
 COLIN@VKCIVIL.COM

EX. STRUCTURE TABLE

EX. SAN MH #1 RIM-84518 20" E CONC. INV-835.85 18" W CONC. INV-835.35 8" N CONC. INV-836.35	EX. SAN MH #4 RIM-84134 8" N PLASTIC INV-837.26 8" N PLASTIC INV-837.42 8" S PLASTIC INV-837.17 8" SW PLASTIC INV-837.26
EX. SAN MH #2 RIM-84468 20" W CONC. INV-834.93 8" N CONC. INV-834.43 24" E CONC. INV-832.68	EX. STM CB #1 RIM-84174 BOTTOM-839.07
EX. SAN MH #3 RIM-84032 8" N PLASTIC INV-835.57 8" SW PLASTIC INV-833.32	EX. STM CB #2 RIM-84205 8" N PLASTIC INV-840.40
	EX. STM CB #3 RIM-84133 BOTTOM-838.76

BENCHMARKS

BM #1 FILE HYDRANT BOLT WITH 'X' ELEV = 845.52
BM #2 FIRE HYDRANT BOLT WITH WASHER ELEV = 845.54



- GRADING PLAN NOTES:**
- SOILS EXPOSED IN THE BASE OF ALL SATISFACTORY FOUNDATION EXCAVATIONS SHOULD BE PROTECTED AGAINST ANY DETRIMENTAL CHANGES IN CONDITION SUCH AS FROM DISTURBANCE, RAIN AND FREEZING. SURFACE RUN-OFF WATER SHOULD BE DRAINED AWAY FROM THE EXCAVATION AND NOT ALLOWED TO POND. IF POSSIBLE, ALL FOOTING CONCRETE SHOULD BE POURED THE SAME DAY THE EXCAVATION IS MADE. IF THIS IS NOT PRACTICAL, THE FOOTING EXCAVATIONS SHOULD BE ADEQUATELY PROTECTED.
 - REMOVE ALL SUBGRADE MATERIAL THAT MAY BE SOFTENED BY RAINS, FREEZING, OR CONSTRUCTION TRAFFIC, ETC. AND REPLACE WITH COMPACTED GRANULAR FILL.
 - ALL CONSTRUCTION METHODS SHALL BE DONE IN COMPLIANCE WITH MDOT-EGLE. THE OWNER SHALL BE RESPONSIBLE FOR OBTAINING A "SOIL EROSION PERMIT" FROM THE COUNTY AND A "PERMIT BY RULE/NOTICE OF COVERAGE" FROM EGLE IF APPLICABLE, PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL REQUIREMENTS OF THE COUNTY "SOIL EROSION PERMIT" AND FOR ALL CERTIFIED STORM WATER INSPECTION SERVICE REQUESTED BY THE "PERMIT BY RULE." EROSION CONTROL MEASURES SHOWN ON THE PLANS ARE THE MINIMUM REQUIREMENTS AND SHALL NOT RELIEVE THE CONTRACTORS RESPONSIBILITY FOR PROVIDING ALL REQUIRED EROSION CONTROL MEASURES.
 - AVOID UNNECESSARY DISTURBING OR REMOVING OF EXISTING VEGETATED TOPSOIL OR EARTH COVER. THESE COVER AREAS ACT AS SEDIMENT FILTERS.
 - ALL TEMPORARY SOIL EROSION PROTECTION SHALL REMAIN IN PLACE UNTIL REMOVAL IS REQUIRED FOR FINAL CLEAN UP AND APPROVAL.
 - GEOTEXTILE SILT FENCE SHALL BE INSTALLED AS REQUIRED WHEN CROSSING CREEKS OR WHEN ADJACENT TO WETLANDS OR SURFACE WATER BODIES TO PREVENT SILTATION AND ELSE WHERE AS DIRECTED BY THE ENGINEER. SEEDING AND/OR SODDING SHALL BE INSTALLED ON CREEK BANKS IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION.
 - CONTRACTOR SHALL TAKE PRECAUTIONS TO AVOID TRACKING SOIL ONTO ADJACENT ROADWAYS. CONTRACTOR SHALL SWEEP IMMEDIATELY IF THIS OCCURS.
 - ANY DISTURBED AREA WHICH WILL BE LEFT UNWORKED 20 DAYS OR LONGER MUST BE SEEDDED TO ESTABLISH VEGETATION FOR TEMPORARY STABILIZATION. BASINS TO BE SEEDDED AND MULCH BLANKETS APPLIED IMMEDIATELY TO PROVIDE A STABLE BASE AND AVOID EXCESSIVE EROSION.
 - ALL SOIL EROSION CONTROL MEASURES ARE TO BE IN PLACE PRIOR TO THE START OF ANY GRADING.
 - ALL NON PAVED AREAS TO BE TOPSOILED (6" MIN.) & SEEDDED.
 - VARIATION IN EXISTING SOIL CONDITIONS MAY IMPACT THE EARTHWORK QUANTITIES IF UNSUBSANTIAL SOILS ARE ENCOUNTERED DURING CONSTRUCTION.
 - DUST CONTROL: THE CONTRACTOR SHALL SUPPLY ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY SUCH AS CALCIUM CHLORIDE, WATER OR A MOTORIZED DUST-FREE STREET SWEEPING DEVICE TO MAINTAIN ALL ROADWAYS BEING USED FOR ACCESS TO THE CONSTRUCTION SITE AND SHALL ADHERE TO ALL ORDINANCES OF THE TOWNSHIP, COUNTY, MICHIGAN OR ANY OTHER GOVERNMENT AGENCY.
 - IF MUD, SOIL OR OTHER DEBRIS IS DEPOSITED ON ADJACENT STREETS, ROADS OR OTHER PROPERTY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF SUCH AT THE END OF EACH WORK DAY OR AS REQUIRED DURING THE WORK DAY.
 - STORMWATER POLLUTION PREVENTION ITEMS SHALL BE IN PLACE PRIOR TO COMMENCING CLEARING OPERATIONS, EARTHWORK GRADING, OR ANY OTHER TYPE OF CONSTRUCTION ACTIVITY.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH THE SOIL EROSIONS AND SEDIMENT CONTROL PERMIT.
 - PLACE TEMPORARY EROSION CONTROL MEASURES PRIOR TO EARTH MOVING ACTIVITIES.
 - MULCH BLANKETS SHALL BE PLACED, STAPLED, AND OVERLAPPED ON ALL SLOPES THAT ARE 1 ON 3 OR GREATER AFTER.
 - CONTRACTOR TO INSTALL SILT SACK IN ALL CATCH BASINS ONCE THEY ARE CONSTRUCTED.
 - ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED BY A CERTIFIED STORM WATER OPERATOR AND MAINTAINED BY CONTRACTOR EVERY 7 DAYS AND AFTER EVERY SIGNIFICANT RAIN EVENT IN ACCORDANCE WITH NPDES PERMIT BY RULE REQUIREMENTS IF APPLICABLE.
 - EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL VEGETATION IS ESTABLISHED.
 - BEST MANAGEMENT PRACTICES WILL BE UTILIZED DURING AND AFTER CONSTRUCTION OF THE PROJECT. MEASURES WILL INCLUDE THE USE OF SILT FENCING, SEEDING AND MULCHING, SEDIMENT INLET FILTERS, COMPACTION AND PAVING. THE OWNER OF THE SUBJECT PARCEL SHALL HAVE THE RESPONSIBILITY TO MAINTAIN THE PERMANENT SOIL EROSION PROTECTION MEASURES.
 - ANY POND AREA LABELED AS "INFILTRATION" OR "RETENTION" SHALL BE CONSTRUCTED IN A MANNER AS TO MINIMIZE COMPACTION OF EXISTING SUBGRADE. CONTRACTOR SHALL PROTECT AREA FROM COMPACTION PRIOR TO INSTALLATION AND THROUGHOUT CONSTRUCTION. IF NECESSARY, EXCAVATE BASIN BOTTOM TO AN UNCOMPACTED SUBGRADE FREE OF RACKS AND DEBRIS AND ENSURE A SANDY BOTTOM. DO NOT COMPACT SUBGRADE. SEED AND STABILIZE THE BASIN WITH AN MDOT TDS SEED MIXTURE OR MEADOW MIX AS APPROVED BY THE ENGINEER.

- CONTROL MEASURE KEY**
- SELECTIVE GRADING & SHAPING, PERMANENT
 - HYDROSEEDING, PERMANENT. TYPICAL IN ALL NON-PAVED AREAS DISTURBED BY CONSTRUCTION ACTIVITIES
 - AGGREGATE COVER, TEMPORARY. TYPICAL ON ALL STREETS DISTURBED BY CONSTRUCTION ACTIVITIES
 - PAVING, PERMANENT, TYPICAL ON ALL STREETS DISTURBED BY CONSTRUCTION ACTIVITIES.
 - SEDIMENT BASIN BMP EXHIBIT 2, SEDIMENT BASIN, TEMPORARY REQUIRED FOR DE-WATERING ACTIVITIES, SEVERE SLOPES, AND LARGE DISTURBED AREAS.
 - SILTSACK, TEMPORARY, TYPICAL AT ALL CATCH BASINS WITHIN OR DISTURBED BY CONSTRUCTION ACTIVITIES
 - CULVERT SEDIMENT TRAP, TEMPORARY. TYPICAL AT ALL STORM OUTLETS AND STREAMS DISTURBED BY CONSTRUCTION ACTIVITIES
 - FILTER BMP EXHIBIT 8A, SILT FENCE, TEMPORARY. TYPICAL IN ALL AREAS, ESPECIALLY ADJACENT TO STREAMS, PONDS, ETC. AND ALONG PROJECT UNITS.
 - TREE PROTECTION, INCLUDES TUNNELING UNDER TREES, TYPICAL FOR ALL TREES ENCOUNTERED UNLESS TREE REMOVAL IS DIRECTED BY THE ENGINEER.
 - DENOTES GRAVEL ACCESS APPROACH. APPROACH SHALL BE INSTALLED TO PROVIDE STABLE ACCESS TO ROADWAYS AND MINIMIZE DUST AND TRACKING OF MATERIALS ONTO PUBLIC STREETS AND HIGHWAYS. THE APPROACH SHALL BE A MIN. OF 12" WIDE, 6" DEEP, AND CONSIST OF 2"-4" AGGREGATE.

- LEGEND**
- MICHIGAN UNIFIED KEYING SYSTEM (MUKS)
 - BEST MANAGEMENT PRACTICE (BMP)
 - TEMPORARY CONTROL MEASURE (DURING CONSTRUCTION AND UNTIL PERMANENT MEASURES ARE ESTABLISHED)
 - PERMANENT CONTROL MEASURE

NOTE:
 SOIL EROSION AND SEDIMENTATION CONTROL MEASURES INDICATED ARE KNOWN OR ANTICIPATED CONTROL MEASURES NEEDED DURING TYPICAL CONSTRUCTION ACTIVITIES. ADDITIONAL CONTROL MEASURES MAY BE REQUIRED DUE TO CONSTRUCTION ACTIVITY, LOCATION, SOIL TYPE, WEATHER EVENT, ETC. ALL ADDITIONAL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE INCIDENTAL TO THE CONSTRUCTION CONTRACT.

- GENERAL SOIL EROSION MEASURES (APPLICABLE TO ENTIRE SITE)**
- -
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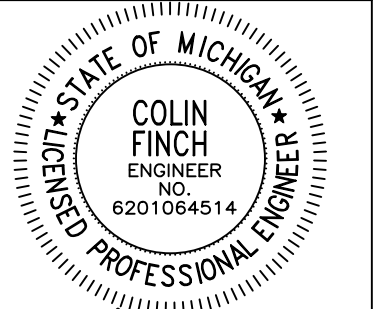
Vriesman & Korhorn

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 JOB NO. 1172



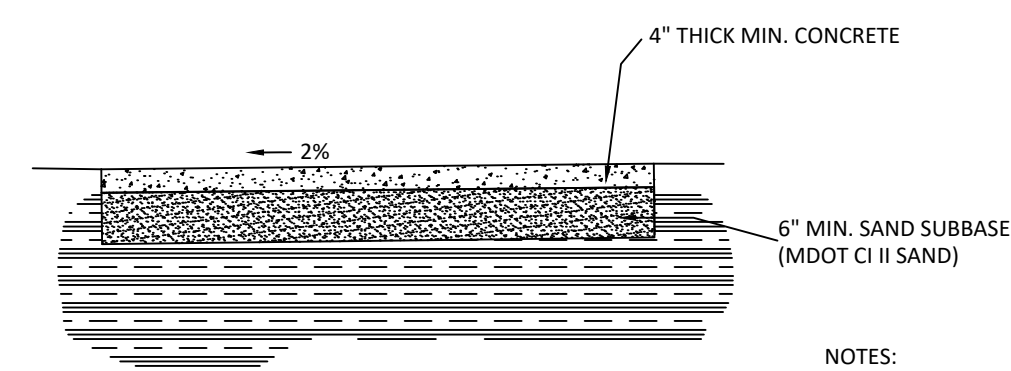
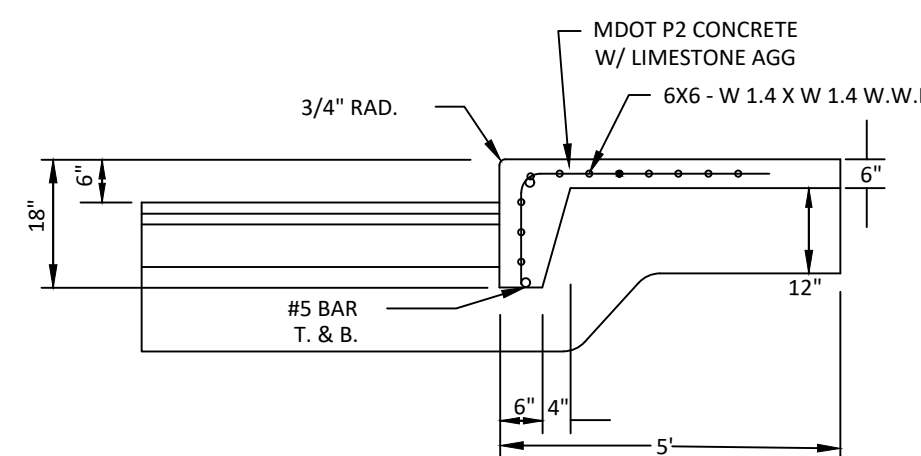
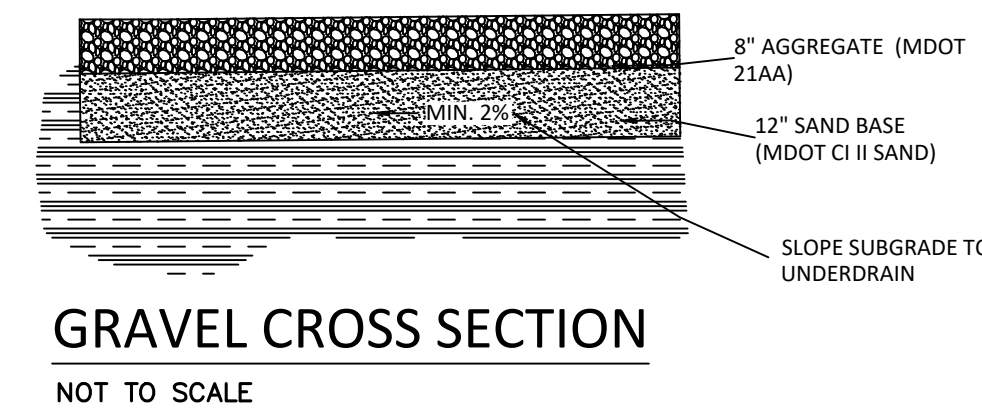
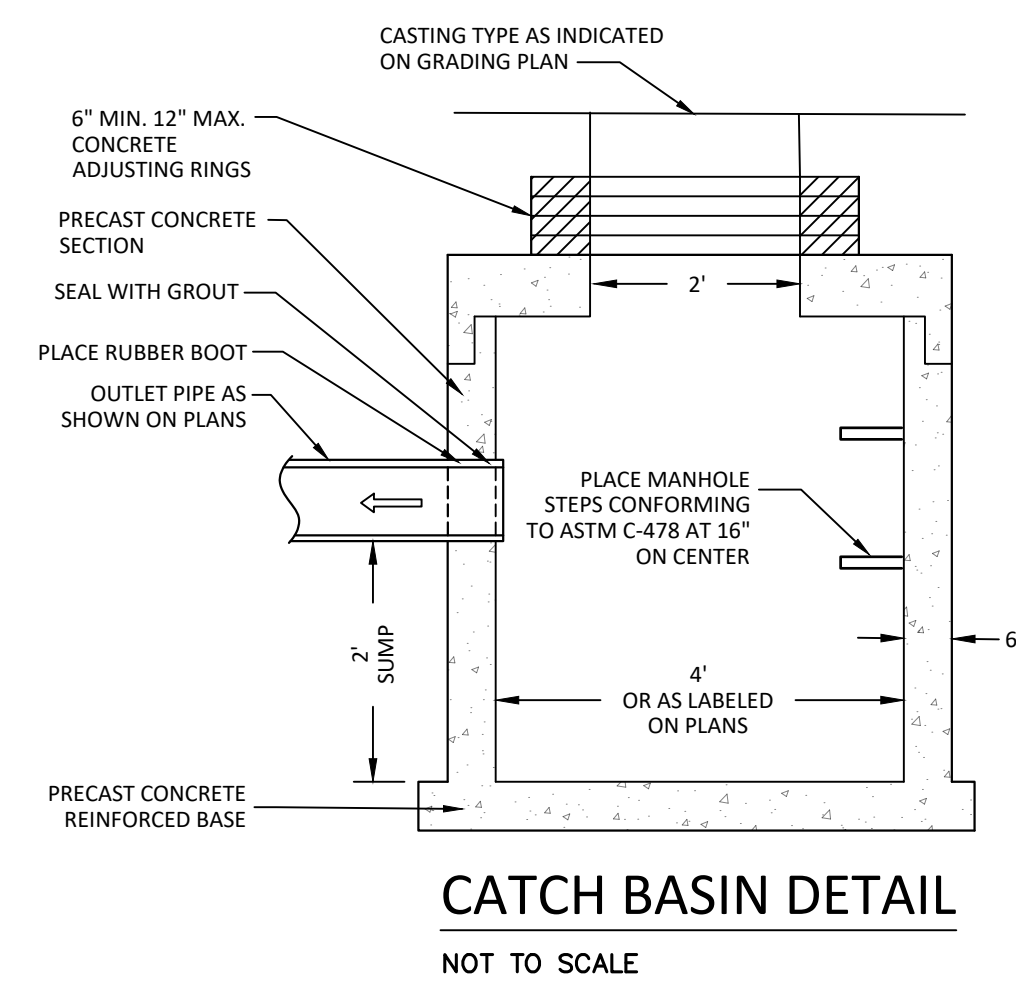
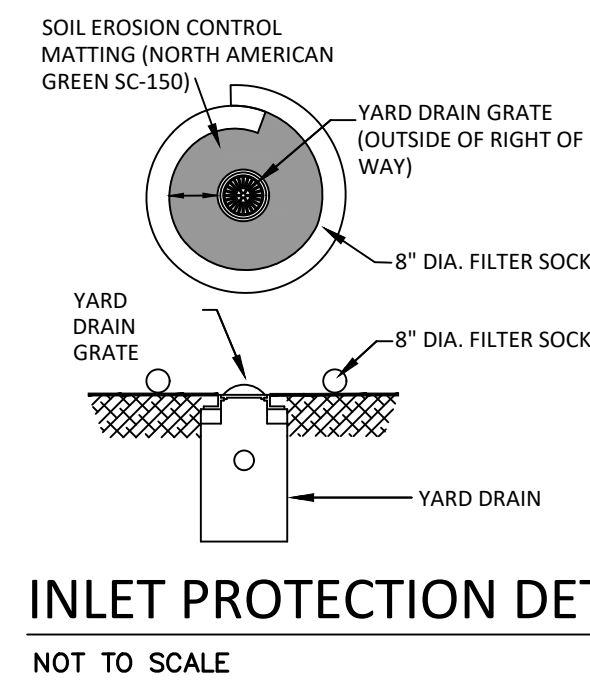
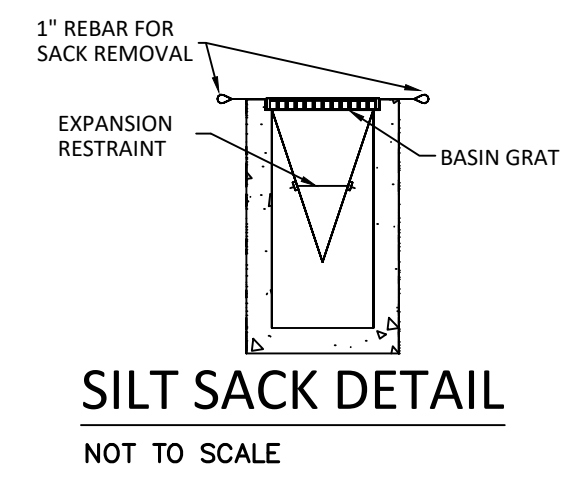
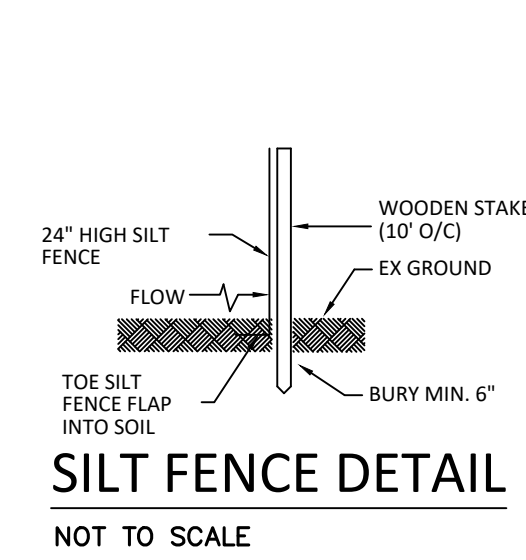
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 PO Box 239
 Oshtemo, MI 49077
 (269) 375-8350
 Architect Seal



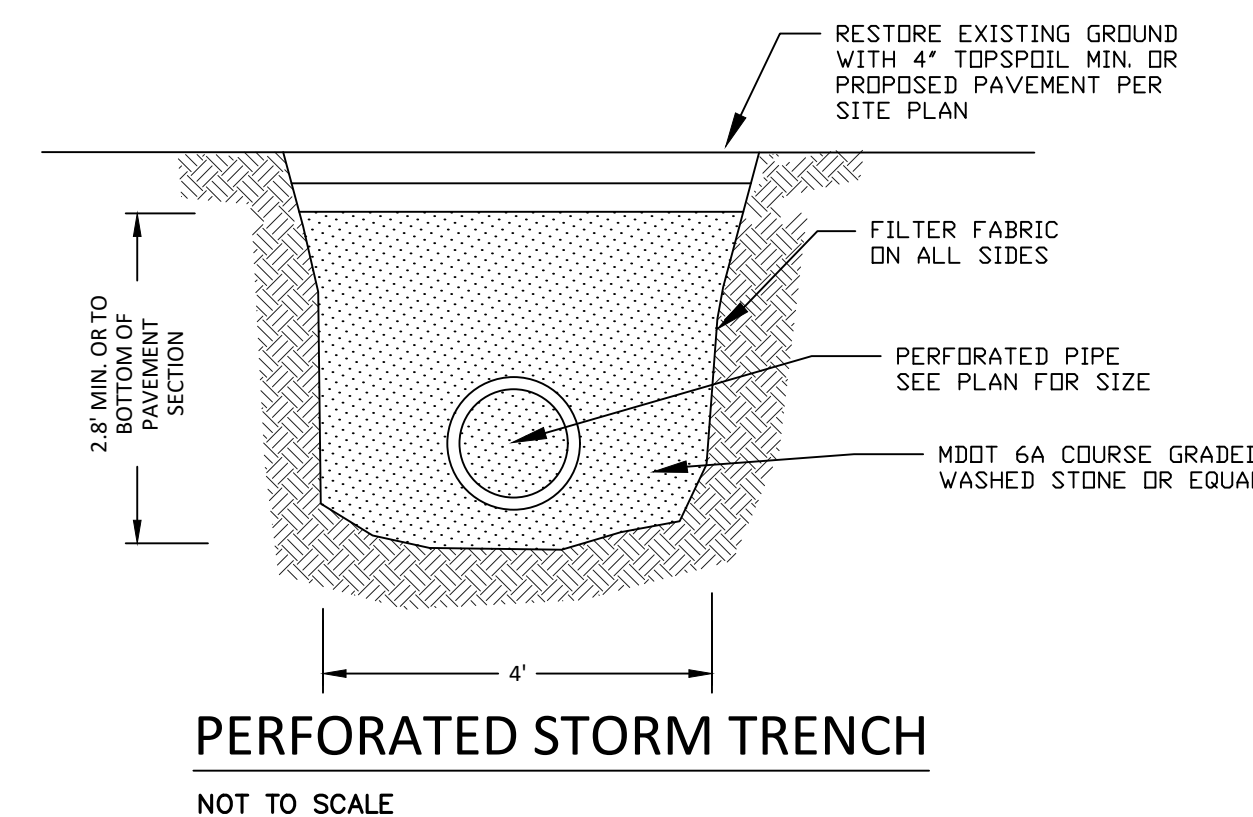
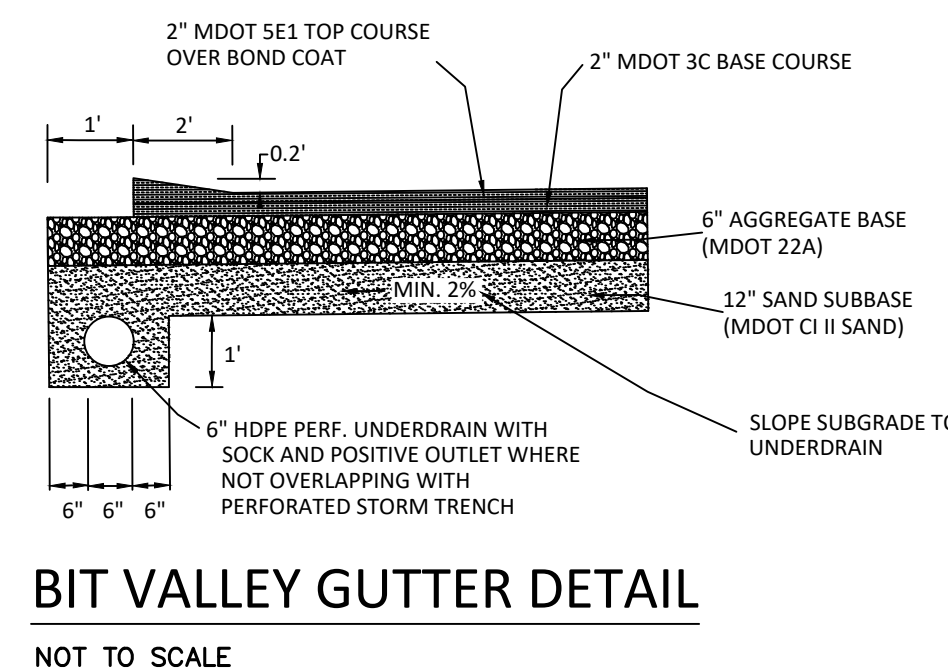
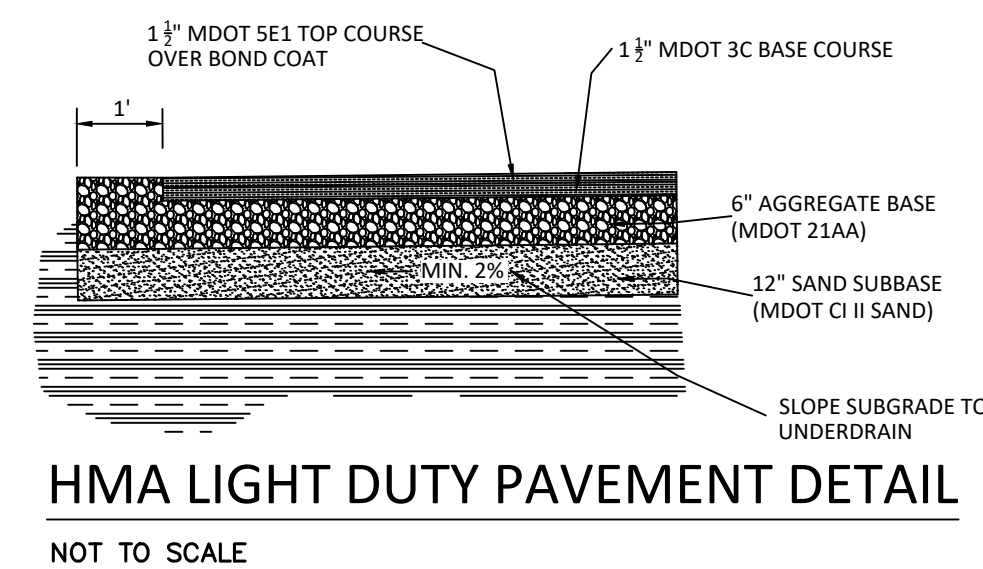
Project:



NEW HEADQUARTERS
 BUILDING FOR AZON
 Ravine Road Kalamazoo, MI 49004



- NOTES:
- 1/4" WIDE TOOLED CONTRACTION JOINTS TO 1" DEPTH AT 5 FOOT INTERVALS.
 - WHERE SIDEWALK IS PLACED ADJACENT TO CURB AND GUTTER, CONTRACTION JOINTS SHALL LINE UP WITH CURB AND GUTTER JOINTS.
 - ISOLATION JOINTS WHERE PAVEMENT ABUTS PROPOSED STRUCTURES OR OTHER PAVEMENTS.



Rev. Date:	
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Rev. Date:	
Issue Date:	Jan. 15, 2024
Schley Nelson Architects Project No.	

23-110

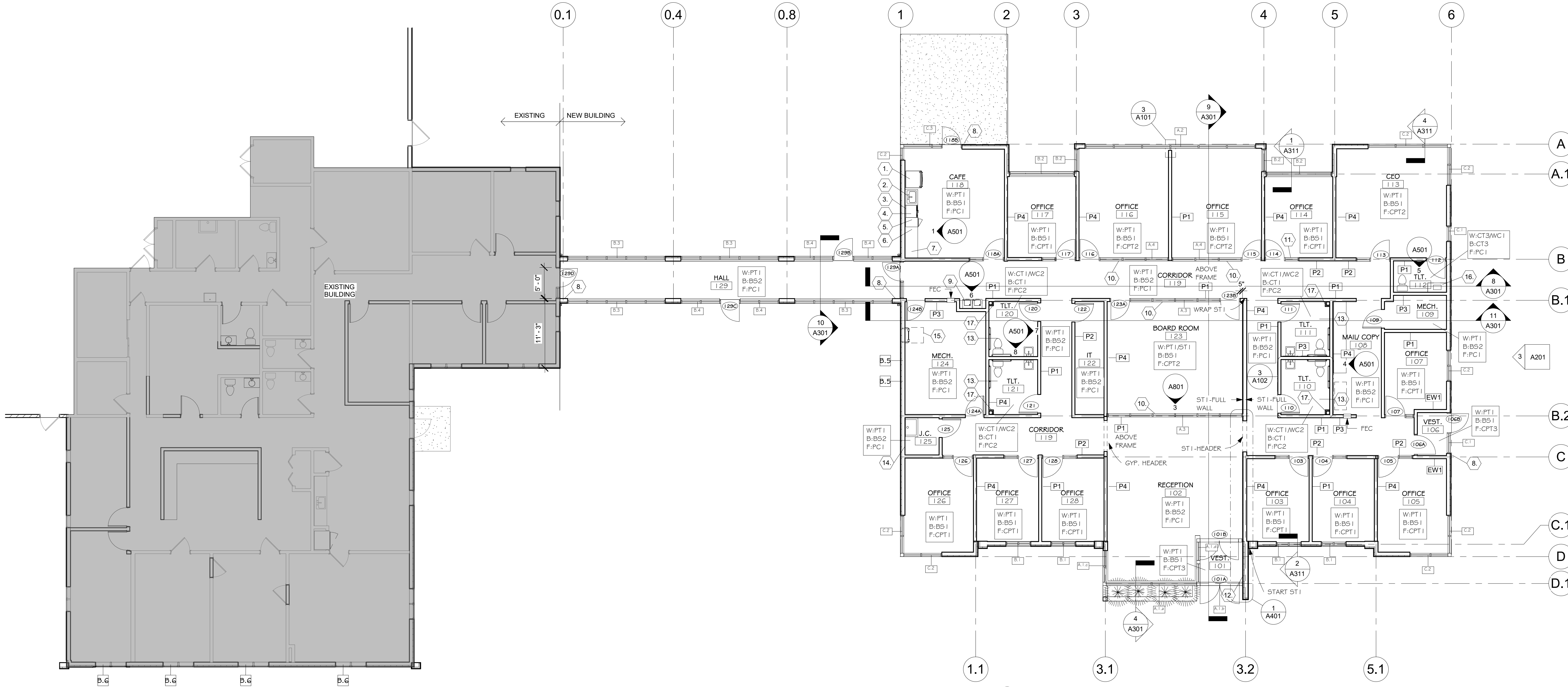
Sheet Name:

PROJECT
 DETAILS

Sheet No.

C500

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1 FLOOR PLAN
 1/8" = 1'-0"

NEW BUILDING AREA: 5,594 GSF
NEW CONNECTION HALL: 342 GSF
TOTAL NEW BUILD: 5,936 GSF

GENERAL NOTES:

- 1. (sp)REFRIGERATOR BY OWNER
- 2. SOLID SURFACE COUNTER TOP- UNDERMOUNT SS SINK
- 3. 1/4" WATER LINE FOR COFFEE-VIF
- 4. U.C. DISHWASHER
- 5. U.C. ICE MAKER
- 6. U.C. MICROWAVE
- 7. O.H. MICROWAVE
- 8. CARD READER
- 9. HILOW WATER FOUNTAIN
- 10. ALUMINUM DOOR & CURTAIN WALL FRAME- MATCH EXTERIOR
- 11. ALUMINUM DOOR AND SIDELITE FRAME TYP @ OFFICES
- 12. CARD READER & DOOR BELL
- 13. EACH PUBLIC TLT ROOM INCLUDES: SEE 3/A102 BY C.G.- INSTALL BY G.C.; ADA GRAB BARS TOILET PAPER DISPENSER SANITARY NAPKIN DISPOSAL SINK W/TOUCHLESS FAUCET AND SOAP DISP. BY OWNER- INSTALL BY G.C.; PAPER TOWEL DISP.
- 14. MOP STRIP AND SHELF
- 15. LADDER TO ROOF HATCH
- 16. VANITY W/SOLID SURFACE TOP
- 17. FRAME AROUND TO ENCLOSE ROOF DRAIN

REVISIONS	DESCRIPTION
#	ISSUE DATE

Issue Date: 1/18/2024

Schley Nelson Architects
 Project No.

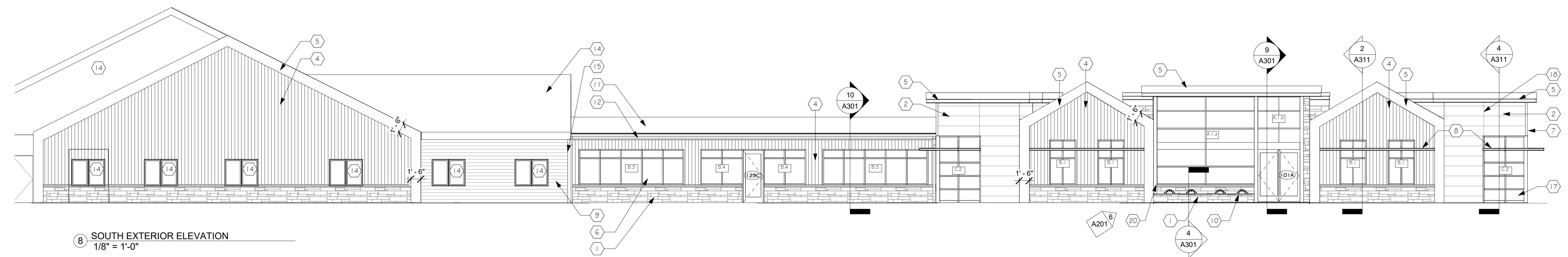
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FLOOR PLAN

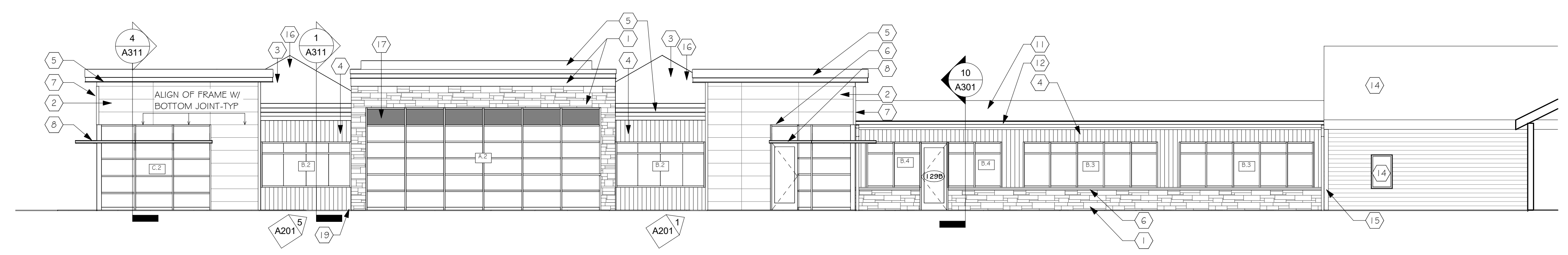
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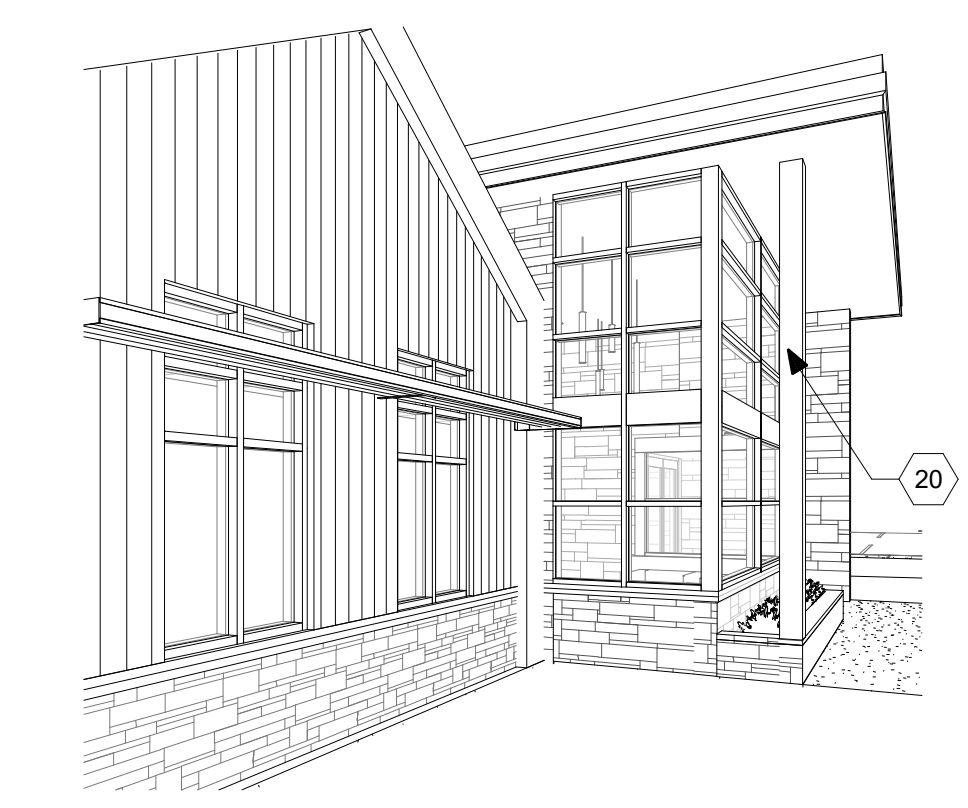
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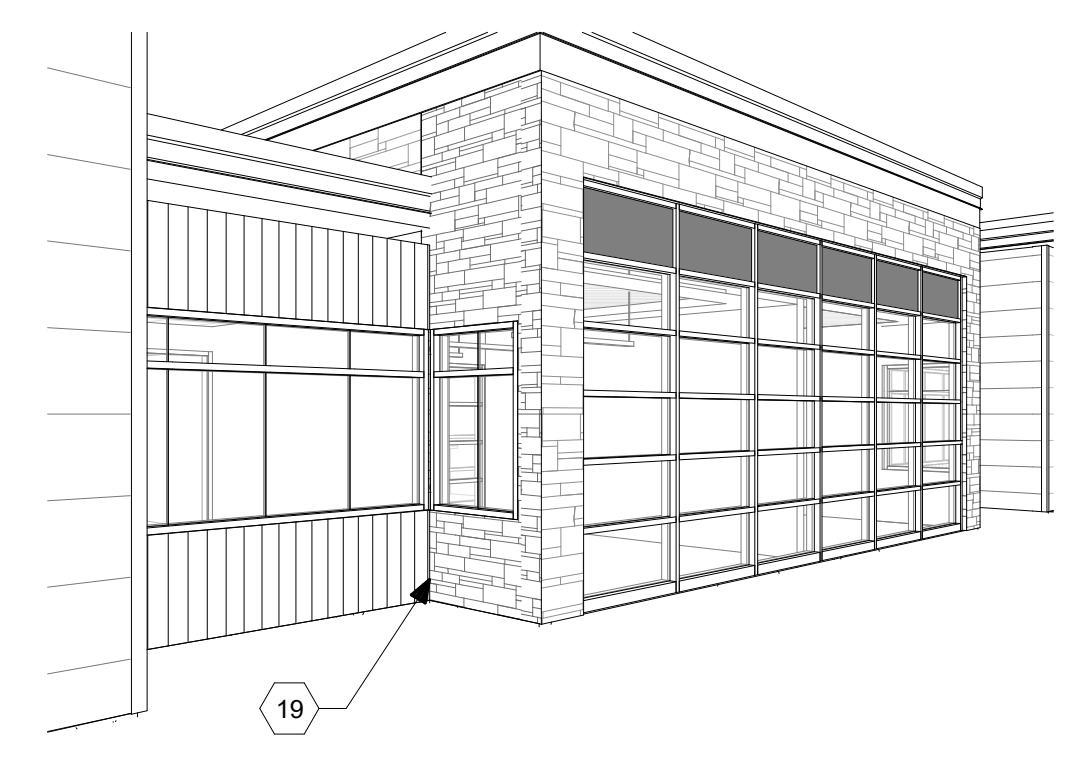
8 SOUTH EXTERIOR ELEVATION
 1/8" = 1'-0"



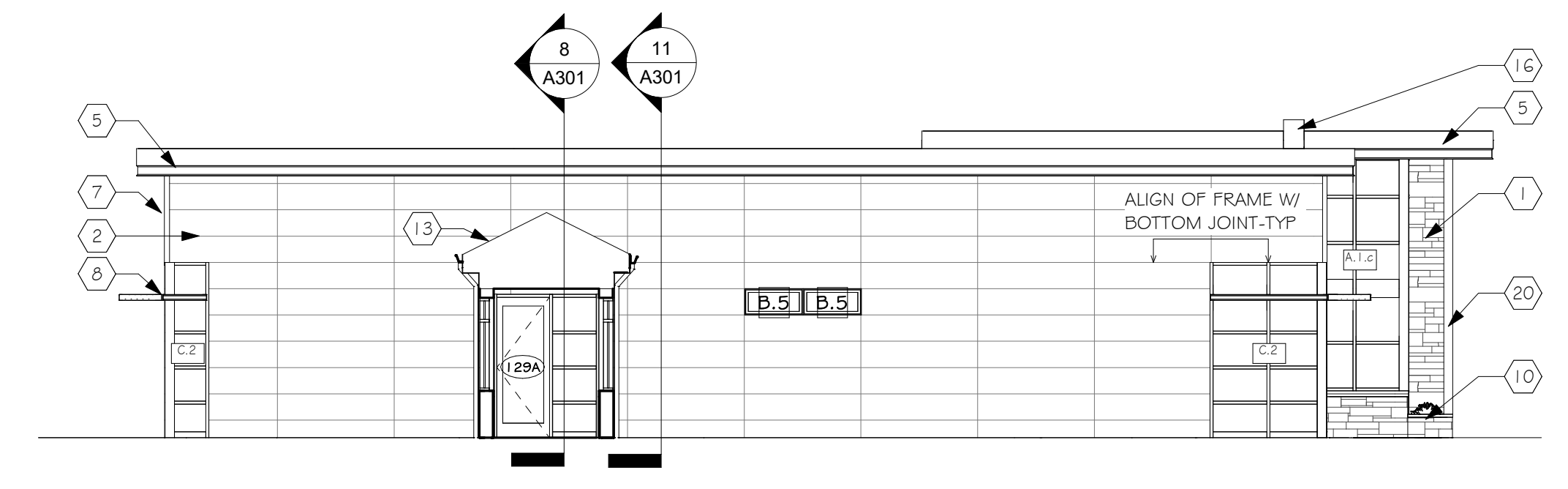
7 NORTH EXTERIOR ELEVATION
 1/8" = 1'-0"



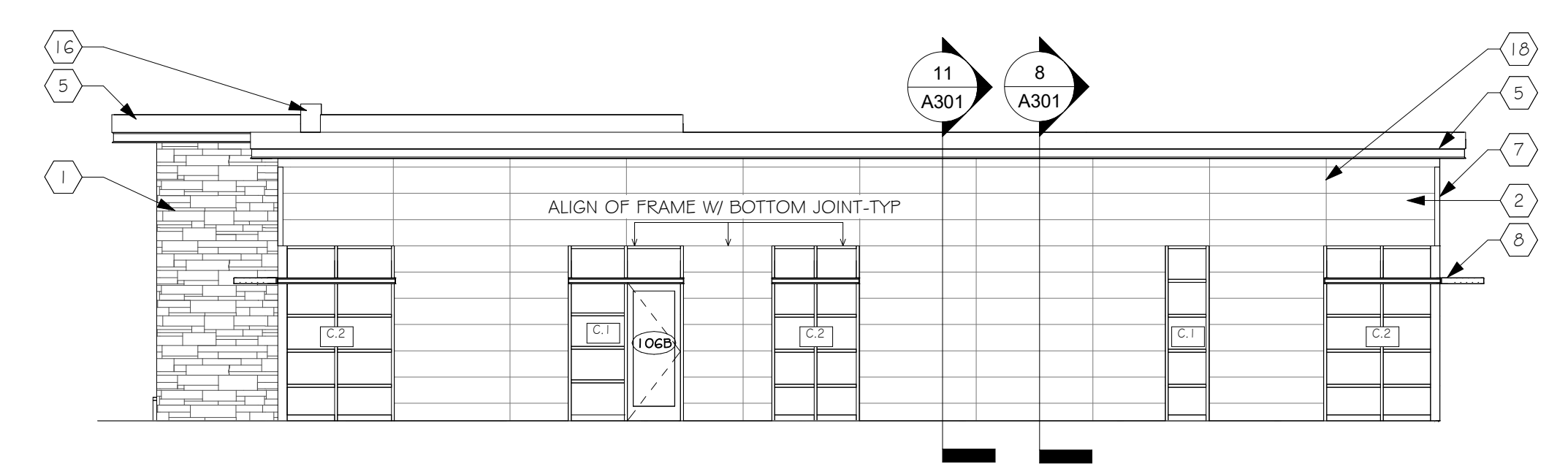
6 FRONT GABLE



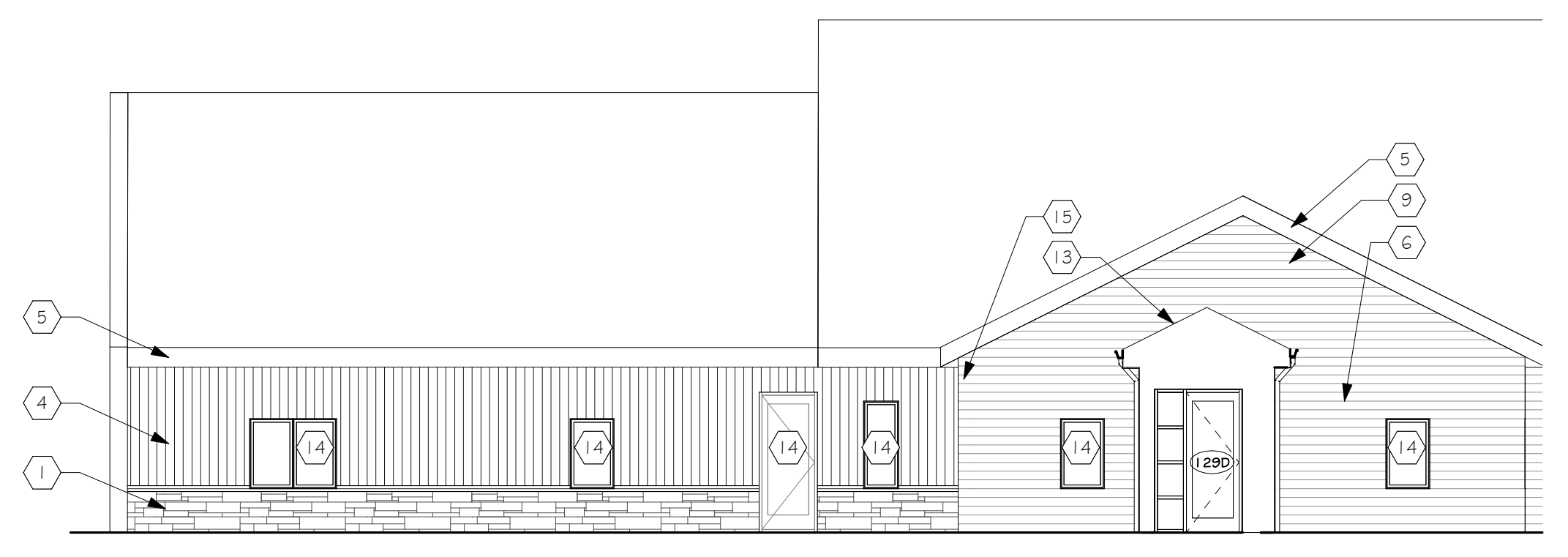
5 BACK OFFICE



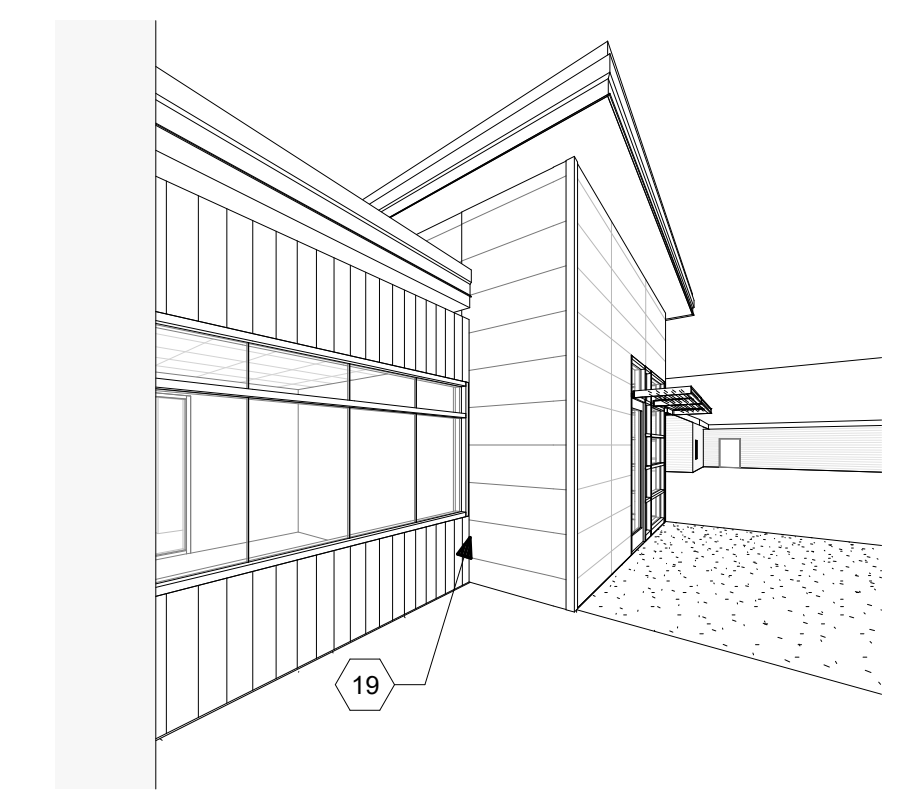
4 WEST EXTERIOR ELEVATION
 1/8" = 1'-0"



3 EAST EXTERIOR ELEVATION
 1/8" = 1'-0"



2 EAST EXTERIOR EXISTING BUILDING
 1/8" = 1'-0"



1 CAFE

ELEVATION KEYED NOTES	
1	LEDGER STONE PANEL ST-1
2	NICHHA INDUSTRIAL BLOCK FIBER CEMENT PANELS
3	SMOOTH METAL SIDING
4	1 1/2" SMOOTH METAL PANEL WRIBS @ 4' OC
5	METAL CAP AND FASCIA TRIM
6	J TRIM AROUND WINDOWS AND DOORS
7	NICHHA INDUSTRIAL BLOCK PANEL CORNER
8	PREFABRICATED SUN SCREEN (YJK)
9	4" DOUBLE LAP VINYL SIDING (MATCH EXIST. BUILDING 'B')
10	STONE CAP AT PLANTER REFER TO DRAWING 2/A301
11	DIMENSIONAL SHINGLES- MATCH EXIST. BUILDING 'B'
12	GUTTER AND DOWNSPOUT- CONNECT TO UNDERGROUND DRAIN SEE CIVIL DWGS.
13	OUTLINE OF INTERIOR OF CONNECTOR
14	EXISTING TO REMAIN
15	VINYL OUTSIDE CORNER TRIM
16	PEAK OF GABLE BEYOND SIDE OR BACK BEYOND
17	INSULATED SPANDREL GLASS
18	NICHHA 'H-MOLD' VERTICAL BETWEEN PANELS
19	INSIDE CORNER TRIM
20	FURR OUT 6" COLUMN (TYPE 'C') W/1X TREATED WOOD TO 8" FINISH SQUARE- WRAP W/ STEEL COLUMN WRAP- SMOOTH BLACK- MATCH ATAS SIDING



FRONT VIEW FROM WEST



FRONT ELEVATION

SCALE = 1/4" = 1'-0"

OCTOBER 17TH 2023



NEW HEADQUARTERS BUILDING FOR AZON





FRONT VIEW FROM SOUTH



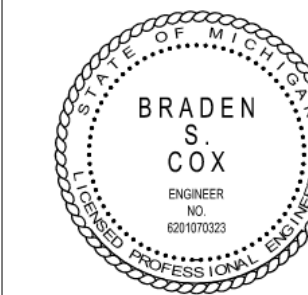
BACK VIEW FROM EAST

OCTOBER 17TH 2023

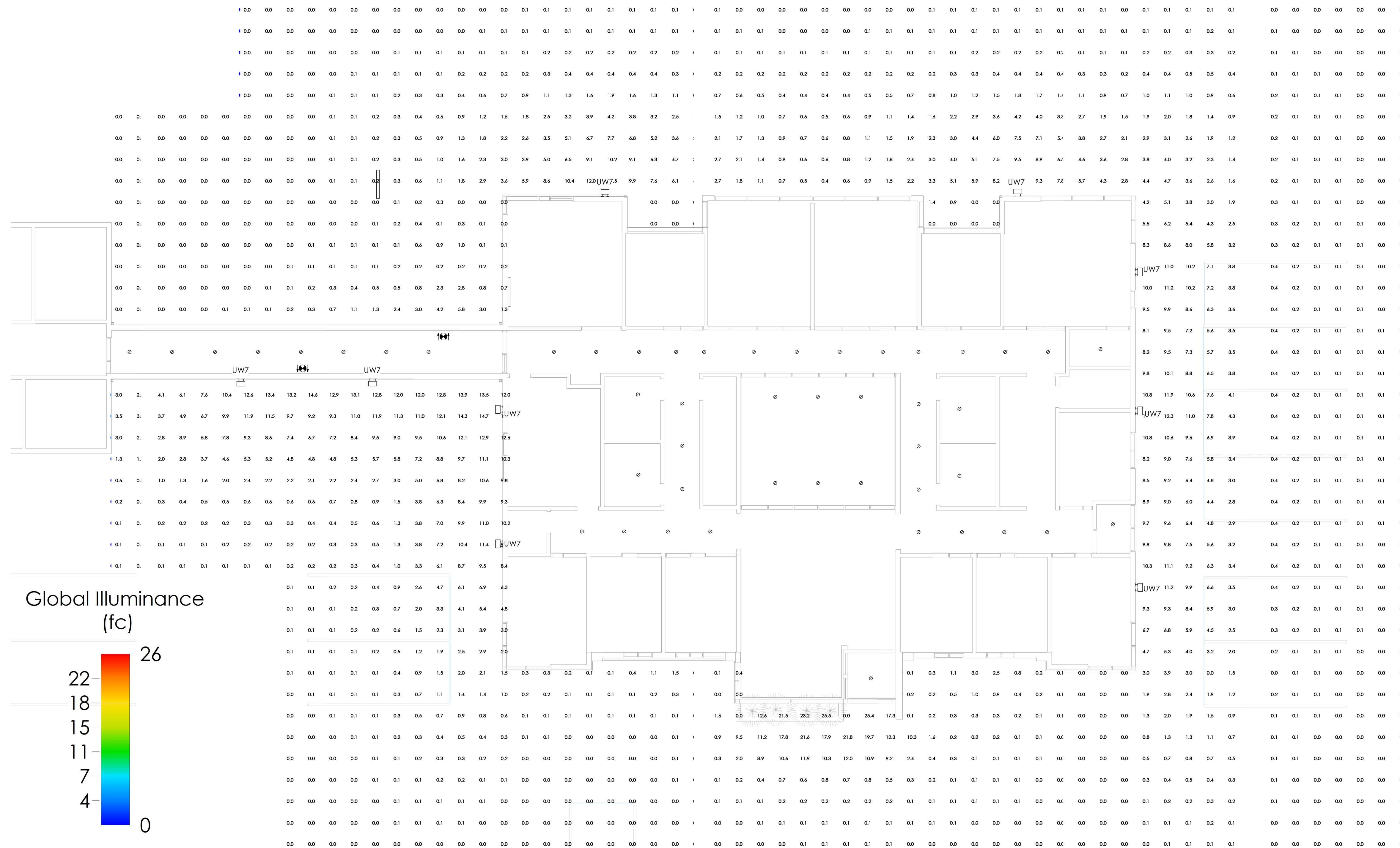


NEW HEADQUARTERS BUILDING FOR AZON

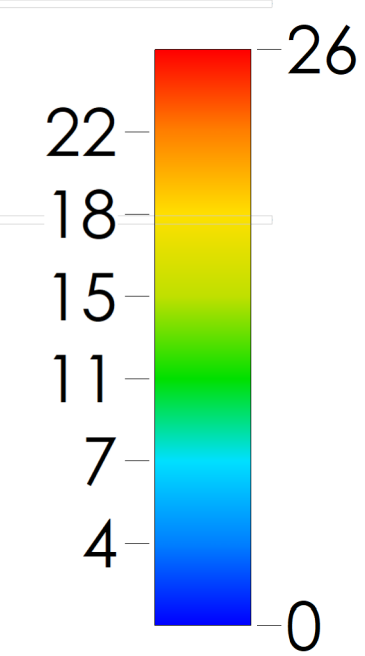




**NEW HEADQUARTERS
 BUILDING FOR AZON**
 Ravine Road / Kalamazoo, MI 49004



Global Illuminance (fc)



ElumTools
 Default
 Analysis

ELECTRICAL SITE PLAN
 SCALE: 1/8" = 1'-0"

GENERAL SITE PLAN NOTES
 A REFER TO THE SITE LIGHTING PLAN FOR CIRCUITRY INFORMATION.
 B LIGHT LEVELS SHOWN ARE CALCULATED FROM SPECIFIED FIXTURE INFORMATION AND ASSUMED SITE INFORMATION.

#	ISSUE DATE	DESCRIPTION

Issue Date: 01/09/2024
 Schley Nelson Architects
 Project No.

23-110
 Sheet Name:

SITE LIGHTING
 LEVELS

Sheet No.

E003

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Vriesman
& Korhorn

AZON BUILDING – KALAMAZOO TOWNSHIP, MI **Storm Water Narrative**

Introduction

This memo summarizes the storm water management plan for the AZON Building project in the Kalamazoo Township, MI on the north side of Ravine Road west of Douglas Avenue. The proposed project will remove the existing building and gravel drives with the new proposed building, paved parking areas and drives. The project involves a 5,608 SFT building, parking lots, and paving the existing gravel drives.

This storm water management plan was prepared in accordance with the requirements of Kalamazoo Township and Kalamazoo County Drain Commission stormwater standards. Precipitation frequency data from NOAA Atlas 14 were used, the rational method was used along and Manning's formulas for the storm sewer calculations. The project is designed for no stormwater to leave the site. The existing site runoff all sheet flows to the southeast to the existing retention basin. There is a run of existing storm sewer on the north side of the building which empties to the retention basin that mostly collects the rear yard drainage which will remain. For the proposed project the existing retention pond will be expanded and the proposed storm sewers will be oversized with perforated pipe and a stone envelope to compensate for the added runoff from the project.

Storm Sewer and Detention Analysis

The proposed building and parking lot will utilize three catch basins and a run of storm sewer connecting them to the existing retention basin. Exhibit 1 shows the proposed runoff areas to each of the 3 proposed catch basins and the direct runoff areas to the retention basin and exhibit 2 shows the calculations made to determine the runoff coefficient for each basin area. The rational method was used to calculate the design capacity of the storm sewer as shown in Exhibit 3. The rational method storm storage volume needed calculations are shown in exhibit 4. The total volume of retention from both the existing and expanded retention basins as well as the volume provided in the stone envelope around the proposed storm sewer system is shown in Exhibit 5. The proposed expansion of the retention pond volume plus the volume of the void space in the stone envelope around the proposed storm sewer has more than enough capacity to retain and infiltrate the increase in runoff volume from the proposed construction over the existing area.

The soils on site are sandy and classified in hydrologic soil group A primarily as Coloma Loamy Sand. This has a high infiltration rate and will be sufficient for the proposed stone trench and expanded retention basin to infiltrate the runoff into the subsoil. The soil groups map and ratings is included as Exhibit 6. For the purposes of these calculations, an infiltration rate of 1 in/hr was used to be conservative.

Overland flow route

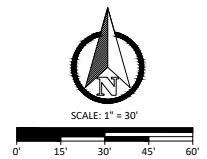
If the retention basin becomes inundated and overflows, stormwater will overflow from the southeast corner of the retention basin at elevation 839.5. From there, it will sheet flow southeast offsite to the existing ditch and low area the same as it does currently.

Conclusion

The proposed storm water management plan for the AZON Building meets all the requirements for storm sewer sizing as set forth by Kalamazoo Township and Kalamazoo County Drain Commission stormwater standards. The proposed retention basin expansion and stone envelope will have the necessary infiltration capacity and storage volume required to mitigate the increase in stormwater runoff of the proposed project and will not increase the runoff from the site compared to existing conditions.

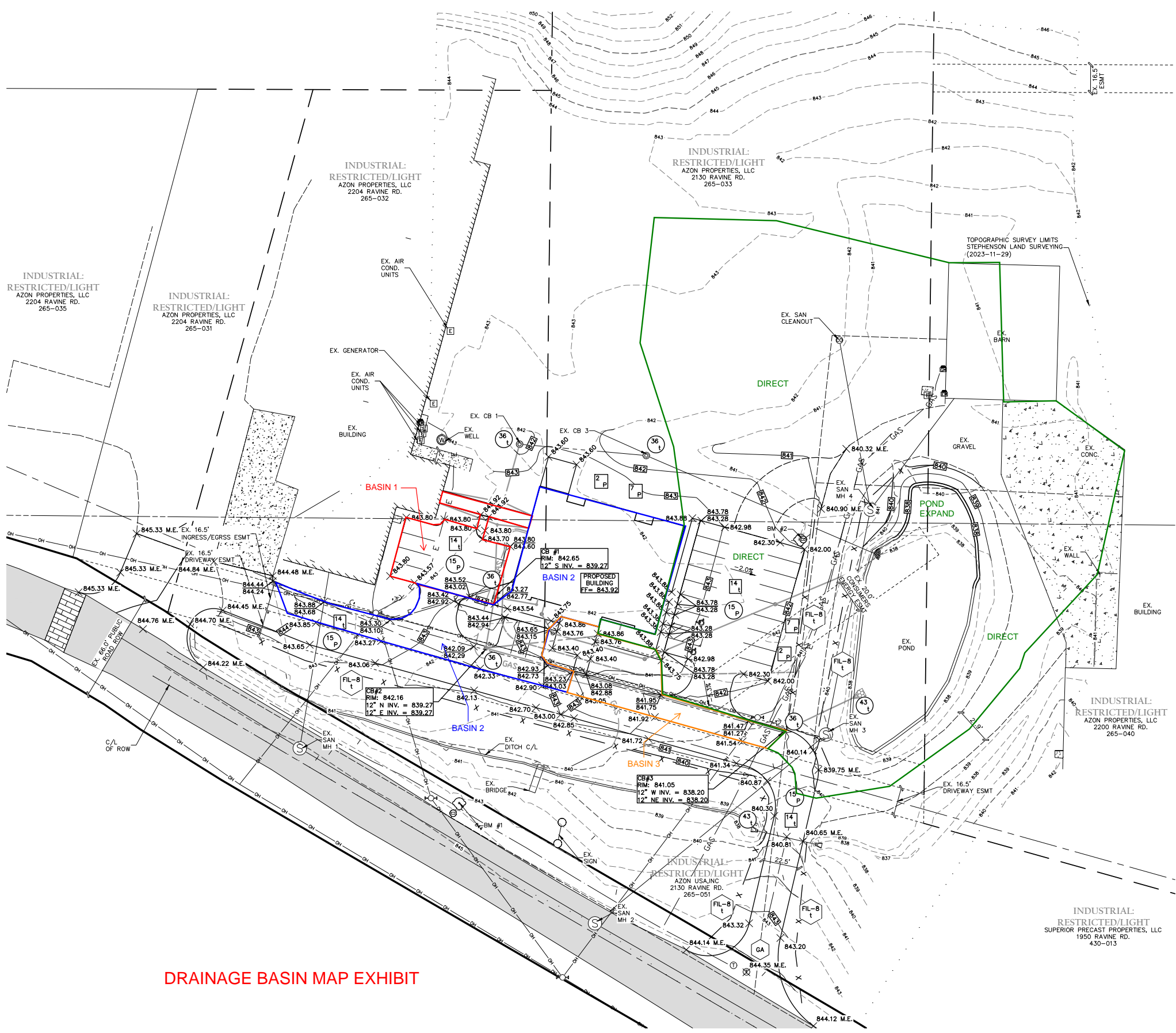
Attachments

1. Drainage Basin Map
2. Runoff Coefficient Calculations
3. Storm Sewer System Calculations
4. Storm Storage Volume Calculation
5. Proposed Retention Pond Volume Calculation
6. NRCS Hydrologic Soil Group



Not for Construction

Project:
AZON



- GRADING PLAN NOTES:**
- SOILS EXPOSED IN THE BASE OF ALL SATISFACTORY FOUNDATION EXCAVATIONS SHOULD BE PROTECTED AGAINST ANY DETRIMENTAL CHANGES IN CONDITION SUCH AS FROM DISTURBANCE, RAIN AND FREEZING. SURFACE RUN-OFF WATER SHOULD BE DRAINED AWAY FROM THE EXCAVATION AND NOT ALLOWED TO POND. IF POSSIBLE, ALL FOOTING CONCRETE SHOULD BE POURED THE SAME DAY THE EXCAVATION IS MADE. IF THIS IS NOT PRACTICAL, THE FOOTING EXCAVATIONS SHOULD BE ADEQUATELY PROTECTED.
 - REMOVE ALL SUBGRADE MATERIAL THAT MAY BE SOFTENED BY RAINS, FREEZING, OR CONSTRUCTION TRAFFIC, ETC. AND REPLACE WITH COMPACTED GRANULAR FILL.
 - ALL CONSTRUCTION METHODS SHALL BE DONE IN COMPLIANCE WITH MDOT-EGL, THE OWNER SHALL BE RESPONSIBLE FOR OBTAINING A "SOIL EROSION PERMIT" FROM THE COUNTY AND A "PERMIT BY RULE/NOTICE OF COVERAGE" FROM EGLE IF APPLICABLE, PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL REQUIREMENTS OF THE COUNTY "SOIL EROSION PERMIT" AND FOR ALL CERTIFIED STORM WATER INSPECTION SERVICE REQUESTED BY THE "PERMIT BY RULE." EROSION CONTROL MEASURES SHOWN ON THE PLANS ARE THE MINIMUM REQUIREMENTS AND SHALL NOT RELIEVE THE CONTRACTORS RESPONSIBILITY FOR PROVIDING ALL REQUIRED EROSION CONTROL MEASURES.
 - AVOID UNNECESSARY DISTURBING OR REMOVING OF EXISTING VEGETATED TOPSOIL OR EARTH COVER. THESE COVER AREAS ACT AS SEDIMENT FILTERS.
 - ALL TEMPORARY SOIL EROSION PROTECTION SHALL REMAIN IN PLACE UNTIL REMOVAL IS REQUIRED FOR FINAL CLEAN UP AND APPROVAL.
 - GEOTEXTILE SILT FENCE SHALL BE INSTALLED AS REQUIRED WHEN CROSSING CREEKS OR WHEN ADJACENT TO WETLANDS OR SURFACE WATER BODIES TO PREVENT SILTATION AND ELSE WHERE AS DIRECTED BY THE ENGINEER. SEEDING AND/OR SODDING SHALL BE INSTALLED ON CREEK BANKS IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION.
 - CONTRACTOR SHALL TAKE PRECAUTIONS TO AVOID TRACKING SOIL ONTO ADJACENT ROADWAYS. CONTRACTOR SHALL SWEEP IMMEDIATELY IF THIS OCCURS.
 - ANY DISTURBED AREA WHICH WILL BE LEFT UNWORKED 20 DAYS OR LONGER MUST BE SEED TO ESTABLISH VEGETATION FOR TEMPORARY STABILIZATION. BASINS TO BE SEED AND MULCH BLANKETS APPLIED IMMEDIATELY TO PROVIDE A STABLE BASE AND AVOID EXCESSIVE EROSION.
 - ALL SOIL EROSION CONTROL MEASURES ARE TO BE IN PLACE PRIOR TO THE START OF ANY GRADING.
 - ALL NON PAVED AREAS TO BE TOPSOILED (6" MIN.) & SEEDED.
 - VARIAION IN EXISTING SOIL CONDITIONS MAY IMPACT THE EARTHWORK QUANTITIES IF UNUSABLE SOILS ARE ENCOUNTERED DURING CONSTRUCTION.
 - DUST CONTROL: THE CONTRACTOR SHALL SUPPLY ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY SUCH AS CALCIUM CHLORIDE, WATER OR A MOTORIZED DUST-FREE STREET SWEEPING DEVICE TO MAINTAIN ALL ROADWAYS BEING USED FOR ACCESS TO THE CONSTRUCTION SITE AND SHALL ADHERE TO ALL ORDINANCES OF THE TOWNSHIP, COUNTY, MDOC OR ANY OTHER GOVERNMENT AGENCY.
 - IF MUD, SOIL OR OTHER DEBRIS IS DEPOSITED ON ADJACENT STREETS, ROADS OR OTHER PROPERTY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF SUCH AT THE END OF EACH WORK DAY OR AS REQUIRED DURING THE WORK DAY.
 - STORMWATER POLLUTION PREVENTION ITEMS SHALL BE IN PLACE PRIOR TO COMMENCING CLEARING OPERATIONS, EARTHWORK GRADING, OR ANY OTHER TYPE OF CONSTRUCTION ACTIVITY.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH THE SOIL EROSIONS AND SEDIMENT CONTROL PERMIT.
 - PLACE TEMPORARY EROSION CONTROL MEASURES PRIOR TO EARTH MOVING ACTIVITIES.
 - MULCH BLANKETS SHALL BE PLACED, STAPLED, AND OVERLAPPED ON ALL SLOPES THAT ARE 1 ON 3 OR GREATER AFTER.
 - CONTRACTOR TO INSTALL SILT SACK IN ALL CATCH BASINS ONCE THEY ARE CONSTRUCTED.
 - ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED BY A CERTIFIED STORM WATER OPERATOR AND MAINTAINED BY CONTRACTOR EVERY 7 DAYS AND AFTER EVERY SIGNIFICANT RAIN EVENT IN ACCORDANCE WITH NPDES PERMIT BY RULE REQUIREMENTS IF APPLICABLE.
 - EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL VEGETATION IS ESTABLISHED.
 - BEST MANAGEMENT PRACTICES WILL BE UTILIZED DURING AND AFTER CONSTRUCTION OF THE PROJECT. MEASURES WILL INCLUDE THE USE OF SILT FENCING, SEEDING AND MULCHING, SEDIMENT INLET FILTERS, COMPACTION AND PAVING. THE OWNER OF THE SUBJECT PARCEL SHALL HAVE THE RESPONSIBILITY TO MAINTAIN THE PERMANENT SOIL EROSION PROTECTION MEASURES.
 - ANY POND AREA LABELED AS "INFILTRATION" OR "RETENTION" SHALL BE CONSTRUCTED IN A MANNER AS TO MINIMIZE THE RISK OF EXISTING SUBGRADE. CONTRACTOR SHALL PROTECT AREA FROM COMPACTION PRIOR TO INSTALLATION AND THROUGHOUT CONSTRUCTION. IF NECESSARY, EXCAVATE BASIN BOTTOM TO AN UNCOMPACTED SUBGRADE FREE OF RACKS AND DEBRIS AND ENSURE A SANDY BOTTOM. DO NOT COMPACT SUBGRADE. SEED AND STABILIZE THE BASIN WITH AN MDOT TDS SEED MIXTURE OR MEADOW MIX AS APPROVED BY THE ENGINEER.

- CONTROL MEASURE KEY**
- SELECTIVE GRADING & SHAPING, PERMANENT
 - HYDROSEEDING, PERMANENT. TYPICAL IN ALL NON-PAVED AREAS DISTURBED BY CONSTRUCTION ACTIVITIES
 - AGGREGATE COVER, TEMPORARY. TYPICAL ON ALL STREETS DISTURBED BY CONSTRUCTION ACTIVITIES
 - PAVING, PERMANENT. TYPICAL ON ALL STREETS DISTURBED BY CONSTRUCTION ACTIVITIES.
 - SEDIMENT BASIN BMP EXHIBIT 2, SEDIMENT BASIN, TEMPORARY REQUIRED FOR DE-WATERING ACTIVITIES, SEVERE SLOPES, AND LARGE DISTURBED AREAS.
 - SILTSACK, TEMPORARY, TYPICAL AT ALL CATCH BASINS WITHIN OR DISTURBED BY CONSTRUCTION ACTIVITIES
 - CULVERT SEDIMENT TRAP, TEMPORARY. TYPICAL AT ALL STORM OUTLETS AND STREAMS DISTURBED BY CONSTRUCTION ACTIVITIES
 - FILTER BMP EXHIBIT 8A, SILT FENCE, TEMPORARY. TYPICAL IN ALL AREAS, ESPECIALLY ADJACENT TO STREAMS, PONDS, ETC. AND ALONG PROJECT UNITS.
 - TREE PROTECTION, INCLUDES TUNNELING UNDER TREES, TYPICAL FOR ALL TREES ENCOUNTERED UNLESS TREE REMOVAL IS DIRECTED BY THE ENGINEER.
 - DENOTES GRAVEL ACCESS APPROACH. APPROACH SHALL BE INSTALLED TO PROVIDE STABLE ACCESS TO ROADWAYS AND MINIMIZE DUST AND TRACKING OF MATERIALS ONTO PUBLIC STREETS AND HIGHWAYS. THE APPROACH SHALL BE A MIN. OF 12" WIDE, 6" DEEP, AND CONSIST OF 2"-4" AGGREGATE.

- LEGEND**
- MICHIGAN UNIFIED KEYING SYSTEM (MUKS)
 - BEST MANAGEMENT PRACTICE (BMP)**
 - t TEMPORARY CONTROL MEASURE (DURING CONSTRUCTION AND UNTIL PERMANENT MEASURES ARE ESTABLISHED)
 - P PERMANENT CONTROL MEASURE

NOTE:
 SOIL EROSION AND SEDIMENTATION CONTROL MEASURES INDICATED ARE KNOWN OR ANTICIPATED CONTROL MEASURES NEEDED DURING TYPICAL CONSTRUCTION ACTIVITIES. ADDITIONAL CONTROL MEASURES MAY BE REQUIRED DUE TO CONSTRUCTION ACTIVITY, LOCATION, SOIL TYPE, WEATHER EVENT, ETC. ALL ADDITIONAL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE INCIDENTAL TO THE CONSTRUCTION CONTRACT.

- GENERAL SOIL EROSION MEASURES (APPLICABLE TO ENTIRE SITE)**
- SELECTIVE GRADING & SHAPING, PERMANENT
 - HYDROSEEDING, PERMANENT
 - AGGREGATE COVER, TEMPORARY
 - PAVING, PERMANENT
 - SEDIMENT BASIN BMP EXHIBIT 2, TEMPORARY
 - SILTSACK, TEMPORARY
 - CULVERT SEDIMENT TRAP, TEMPORARY
 - FILTER BMP EXHIBIT 8A, TEMPORARY
 - TREE PROTECTION, TEMPORARY
 - DENOTES GRAVEL ACCESS APPROACH, TEMPORARY

DRAINAGE BASIN MAP EXHIBIT

NEW HEADQUARTERS BUILDING FOR AZON
 Ravine Road Kalamazoo, MI 49004

Rev. Date:	
Rev. Date:	
Rev. Date:	
Rev. Date:	
Rev. Date:	
Rev. Date:	
Issue Date:	Jan. 15, 2024
Schley Nelson Architects Project No.	

**Runoff Coefficient and Runoff Curve Number Calculation
(Changing Areas Only)**

Job Information

Description: AZON Building
Entity: Kalamazoo Township
Job #: 1273
Date: 1/29/2024

	Runoff Coefficient	Runoff Curve Number
Impervious	0.9	98
Grass	0.2	77
Gravel	0.5	80

Existing Drainage Areas

Basin	Structure	Impervious Area	Grass Area	Gravel Area	Total Area	Weighted Runoff Coefficient	Weighted Curve Number
		(acres)	(acres)	(acres)		C	CN
1	1	0.09	0.00	0.00	0.09	0.90	98
2	2	0.12	0.00	0.00	0.12	0.90	98
3	3	0.12	0.00	0.00	0.12	0.90	98
4	4	0.00	0.00	0.17	0.17	0.50	80
5	5	0.00	0.10	0.00	0.10	0.20	77

Existing Area 0.60 0.64 77.0

Proposed Drainage Areas

Basin	Structure	Impervious Area	Grass Area	Gravel Area	Total Area	Weighted Runoff Coefficient	Weighted Curve Number
		(acres)	(acres)	(acres)		C	CN
1	1	0.06	0.00	0.00	0.06	0.90	98
2	2	0.21	0.00	0.00	0.21	0.90	98
3	3	0.07	0.00	0.00	0.07	0.90	98
4	4	0.14	0.07	0.04	0.25	0.64	89
5	5	0.00	0.00	0.00	0.00	-	-

Proposed Area 0.60 0.79 56.6

STORM STORAGE VOLUME
RATIONAL METHOD

Job Information

Description: AZON
Reviewing Entity: Kalamazoo Township
Job #: 1273
Date: 1/29/2024

Design Parameter:	Infiltrate 1 in/hr	
Design Storm:	25-yr	
Existing C*A:	0.38	Existing C = 0.64, Existing A = 0.6
Proposed C*A	0.47	Proposed C = 0.79, Existing A = 0.6
Allowable Release Rate (cfs):	0.020	Infiltrate 1 in/hr

Detention Volume Required: 2,093 cft

Storm Duration		Intensity (in./hr)	Inflow Rate (cfs)	Outflow Rate (cfs)	Required Storage (cft)
(min)	(hr)				
5	0.08	7.92	1.42	0.020	423.6
10	0.17	5.82	1.04	0.020	619.4
15	0.25	5.21	0.93	0.020	829.1
20	0.33	4.59	0.82	0.020	972.0
25	0.42	3.98	0.71	0.020	1048.2
30	0.50	3.36	0.60	0.020	1057.6
60	1.00	2.20	0.39	0.020	1360.2
120	2.00	1.37	0.25	0.020	1639.7
180	3.00	1.02	0.18	0.020	1776.1
240	4.00	0.89	0.16	0.020	2021.0
270	4.50	0.82	0.15	0.020	2078.3
275	4.58	0.81	0.15	0.020	2083.7
280	4.67	0.80	0.14	0.020	2087.8
285	4.75	0.79	0.14	0.020	2090.7
290	4.83	0.78	0.14	0.020	2092.4
295	4.92	0.76	0.14	0.020	2093.0
300	5.00	0.75	0.14	0.020	2092.3
305	5.08	0.74	0.13	0.020	2090.4
310	5.17	0.73	0.13	0.020	2087.3
315	5.25	0.72	0.13	0.020	2083.0
320	5.33	0.71	0.13	0.020	2077.4
325	5.42	0.70	0.13	0.020	2070.7
330	5.50	0.69	0.12	0.020	2062.8
360	6.00	0.62	0.11	0.020	1990.0
720	12.00	0.36	0.06	0.020	1949.0
1440	24.00	0.21	0.04	0.020	1554.5

**PROPOSED STORMWATER SYSTEM
PROPOSED DETENTION VOLUME AND OUTLET**

Job Information

Description: AZON
Reviewing Entity: Kalamazoo Township
Job #: 1273
Date: 1/29/2024

Required Storage Volume: 2,093 (CF) to Retain Proposed over Existing

Volume Provided in Storm Pipe		
Pipe Diameter (in)	Length (ft)	Volume (cf)
12	214	168

Volume Provided in Stone						
Length (ft)	Height (ft)	Width (ft)	Pipe Volume (cf)	Stone Volume (cf)	Void Ratio	Storage Volume (cf)
214	2.7	4.0	168	2,143	0.4	857

Existing Pond

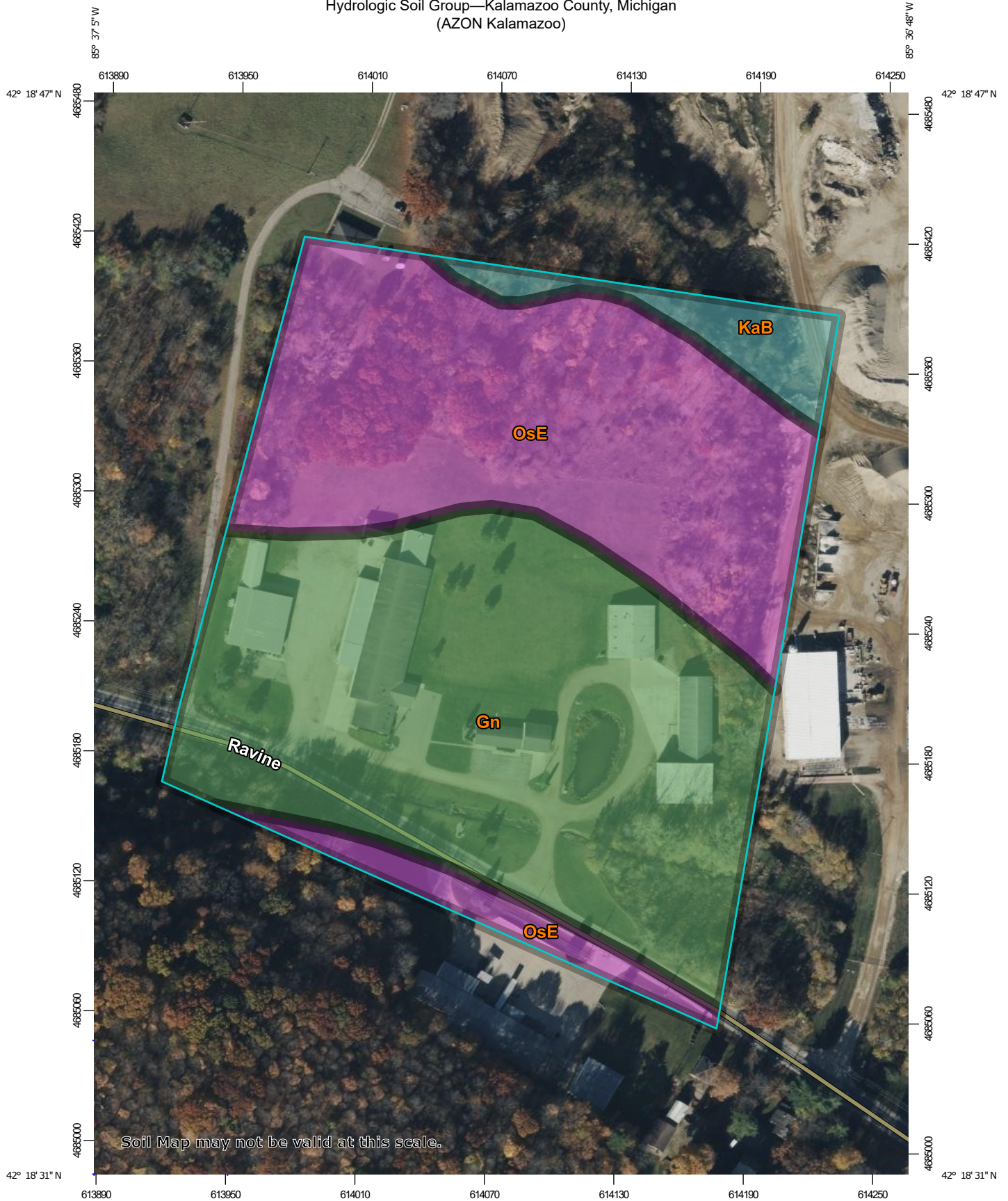
Elevation (ft)	Area (sf)	Incremental Volume (cf)	Total Volume (cf)
837.5	6310	0.0	0.0
838	7750	3515.0	3515.0
839	9300	8525.0	12040.0
839.5	11720	5255.0	17295.0

Proposed Pond

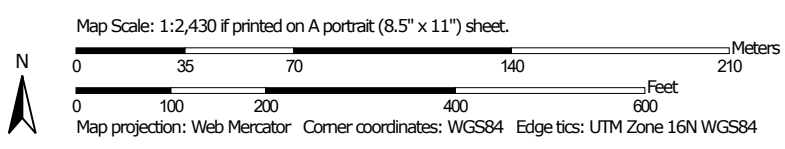
Elevation (ft)	Area (sf)	Incremental Volume (cf)	Total Volume (cf)	Increased Volume (cf)
837.5	7040	0.0	0.0	0.0
838	8525	3891.3	3891.3	376.3
839	10105	9315.0	13206.3	1166.3
839.5	12360	5616.3	18822.5	1527.5

Total Volume Provided (cf)	Total Volume Required (cf)
2,553 >	2,093

Hydrologic Soil Group—Kalamazoo County, Michigan
(AZON Kalamazoo)




Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Kalamazoo County, Michigan
 Survey Area Data: Version 18, Aug 25, 2023

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

Date(s) aerial images were photographed: Oct 4, 2022—Nov 7, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Gn	Glendora sandy loam	A/D	10.1	52.3%
KaB	Kalamazoo loam, 2 to 6 percent slopes	C	1.0	4.9%
OsE	Oshtemo sandy loam, 18 to 35 percent slopes	A	8.3	42.8%
Totals for Area of Interest			19.4	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher