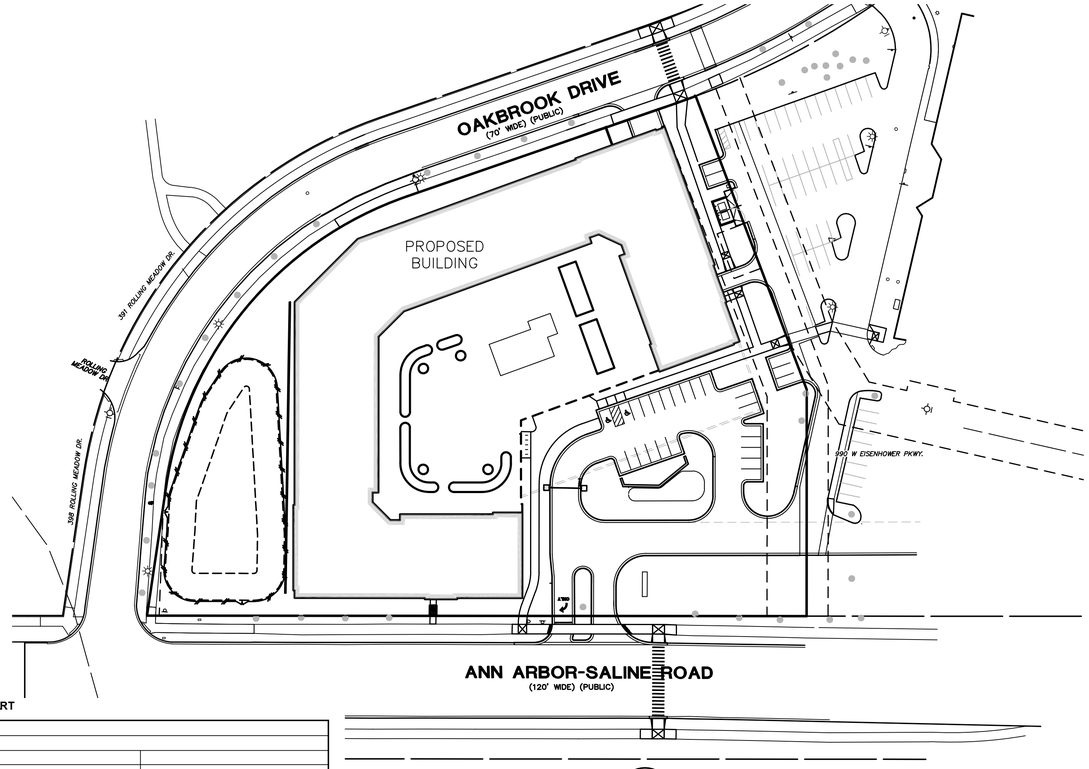
THE CRESCENT

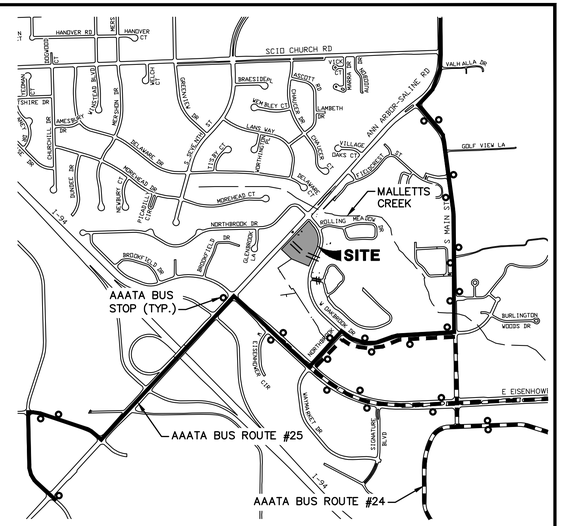
2525 ANN ARBOR-SALINE ROAD

CITY OF ANN ARBOR, WASHTENAW CO. MI

SITE PLAN FOR CITY COUNCIL



SITE MAP
1"=60'



TheRide

VICINITY MAP
SCALE : NTS

Cranbrook Sustainability Initiative Narrative

The Cranbrook Development is aligned with the A²Zero's mission to make a just transition to carbon neutrality by 2030. Cranbrook will achieve significant improvement in the energy efficiency of the building by certifying ENERGY STAR Multifamily New Construction (ESMFNC) and creating an energy efficient building. ENERGY STAR has demonstrated that a ESMFNC certified building in our climate zone (CZ5) can deliver 17% energy savings to the tenants. All-electric high efficiency appliances, LED lighting, and split system heat pumps will be installed along with a high-performance building envelope to help reduce energy consumption. The ESMFNC certification will not only provide design requirements but will also require testing and verification by a third-party to ensure the project will perform efficiently and deliver comfort to the tenants as planned. From the very beginning of the project design, an energy model will be created to help inform the project's design and maximize the synergies between the various systems and components. Besides building an energy-efficient building, Cranbrook will help offset fossil fuel use and power the grid with renewable energy generated on-site through the installation of a maximum capacity PV system on the roof of the new building. Another significant factor in helping to reduce carbon use within the project is the project's location. The project is within walking distance of many basic services allowing residents to avoid the use of automobiles. It is also within a quarter mile of two bus lines that enable residents to easily access the downtown or WCC and St. Joseph's Hospital to the east. In addition to operational carbon use, the project will be conscious of embodied carbon and aim to select materials that are lower in embodied carbon, resilient and durable. Other sustainable site strategies include covered, secure bicycle storage spaces and parking beneath the building to reduce heat island and allow more site area for landscaping. Electric Vehicle chargers will be included with additional EV-ready spaces for future charging stations. Underground stormwater retention will be utilized along with the use of native plants on site. These design elements coupled with the fact that all units within the project will accommodate aging-in-place makes Cranbrook a desirable home for all age demographics and aids in increasing housing diversity. Energy efficiency, carbon reduction, and renewable resources are values of the Cranbrook development that support Ann Arbor's commitment to a carbon-free future and align with the A²Zero's mission.

DEVELOPMENT SUMMARY AND COMPARISON CHART

Zoning Classification	**Existing: O (Office)**		
	Proposed Rezoning: R4E Multiple Family Dwelling District		
Number of Units	262 Units Total: 38 Studio + 164 1-bedroom + 55 2-bedroom + 5 3-bedroom		
SITE INFORMATION	**O Zoning Requirement**	**R4E Zoning Requirement**	**Proposed**
Permitted Use		Dwelling, Multi-Family	Dwelling, Multi-Family
Minimum Lot Area	6,000 sft	14,000 sft	181,236 sft = 4.16 ac
Minimum Lot Area per dwelling unit	N/A	580 sft	181,236 sft / 262 Units = 691 sft/unit
Minimum Lot Width	50 ft	120 ft	553 ft
Maximum Dwelling Unit Density	N/A	75 units/acre	262 units / 4.16 ac = 63 units/ac
Front Setback	15 ft Minimum, 40 ft Maximum	15 ft Minimum, 40 ft Maximum	15 ft - Ann Arbor-Saline Road 15 ft - Oakbrook Drive
Minimum Side Setback	30 ft when abutting R district, Otherwise 0 ft	10' + 3" per each foot of building height over 35' and 1.5" for each foot of building length over 50' = 10' + 0.25' x (58.5'-35') + 0.125' x (332' - 50') = **51.2'**	33.2' (Additionally an 18' no-build easement will be dedicated on adjacent property to accommodate the 51.2 side setback distance)
Minimum Rear Setback	30 ft when abutting R district, Otherwise 0 ft	30' + 1.5" per each foot of building height over 35' and 1.5" for each foot of building width over 50' = 30' + 0.125' x (58.5'-35') + 0.125' x (374'-50') = **73.5'**	N/A
Maximum Building Lot Coverage	N/A	N/A	90,218 sft (49.8% of lot)
Maximum Floor Area Ratio	0.75	N/A	2.09
Maximum Impervious Lot Coverage	N/A	N/A	123,218 sft (68.0% of lot)
Maximum Building Height	55 ft when abutting R zone, otherwise none	N/A	58.5 ft to top of flat roof
Maximum Stories	4 stories when abutting R zone, otherwise none	N/A	5 stories above grade, 1 story below
Total Building Floor Area	N/A	N/A	379,459 sft (8.71 acres)
Minimum Apartment Area	N/A	N/A	595 sft
Maximum Number of Units	N/A	75 units/acre (312 Units)	262 units
Minimum Open Space	N/A	40% of Lot Area, 150 sft per dwelling unit	45.0% (273 sft per dwelling unit)
Vehicle Parking	N/A	N/A	297 total (29 surface + 268 garage), 1.1 spaces per unit
ADA Parking Spaces Required	7 for 201-300 total spaces (ADA Chart)	Exterior: 2 for 26-50 total spaces (ADA Chart) Interior: spaces for 2% of type A units (6 spaces)	Exterior: 2 spaces provided Interior: 6 spaces provided
EV-Installed Parking Spaces	10% of total provided vehicle spaces	10% of total vehicle spaces [299 x 0.1 = 30 min]	8 outside spaces and 22 inside spaces for 30 total spaces
EV-Capable Parking Spaces	40% of total provided vehicle spaces	Remainder of vehicle spaces [269 min]	23 outside and 246 inside spaces for 269 total spaces
Total Bicycle Parking	1 per 1,500 sft of building	53 (1 for every 5 units)	164
CL A (Enclosed) Bicycle Parking	30% of provided spaces	50% of provided spaces (50% of 53 = 27)	82
CL B (Covered) Bicycle Parking	Remainder	Remainder	72
CL C (Open) Bicycle Parking	Remainder	Remainder	10

SHEET INDEX

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6	WATER EASEMENT PLAN
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8	NATURAL FEATURES PLAN
9	LANDSCAPE PLAN
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12	SITE UTILITY PLAN
13	FIRE PROTECTION PLAN
13.1	FIRE TRUCK ANN ARBOR–SALINE ENTRANCE
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15	GRADING PLAN
16	SOIL EROSION AND SEDIMENTATION CONTROL PLAN
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SHEET INDEX

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23	ADJUSTED BASIN CALCULATIONS
24	PROPOSED STORMWATER PLAN
25	PROPOSED DETENTION CALCLUATIONS
26	STORMTECH CHAMBER DETAILS
27	CIVIL DETAILS
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OWNER/APPLICANT

CRANBROOK VILLAGE LIMITED PARTNERSHIP
6735 TELEGRAPH ROAD, SUITE 110
BLOOMFIELD HILLS, MICHIGAN 48301
NOAH JACOB

ARCHITECT

KRIEGER KLATT ARCHITECTS
2120 E. 11 MILE ROAD
ROYAL OAK, MI 48067
248–414–9270

ENGINEER/SURVEYOR/LANDSCAPE ARCH.

MIDWESTERN CONSULTING, LLC
3815 PLAZA DR.
ANN ARBOR, MI 48108
CONTACT: ROB WAGNER
734–995–0200

LEGAL DESCRIPTION

SEE SHEET 3

NOTES:
1. All sidewalks within the City shall be kept and maintained in good repair by the owner of the land adjacent to and abutting upon the same. Prior to the issuance of the final Certificate of Occupancy for this site, all existing sidewalks in need of repair must be repaired in accordance with City standards.
2. All work within the City of Ann Arbor covered by these plans shall be performed in complete conformance with the current City of Ann Arbor Public Services Department Standard Specifications and Details.
3. The omission of any current standard detail does not relieve the contractor from this requirement. The work shall be performed in complete conformance with the current public services standard specifications and details.
4. Sidewalks constructed in the public right-of-way and/or public paths shall meet all requirements and guidelines as set forth in the accessibility guidelines for pedestrian facilities in the public right-of-way published august 8, 2023. Sidewalk and curb ramp grades will be reviewed during construction plan submittals.
5. Pavement markings disturbed due to pavement cuts or construction related activities shall be replaced as directed by Engineering. Replacement during construction of the project may be considered temporary, with final pavement marking restoration to occur at the end of the project.
6. The contractor shall take all necessary precautions to protect the existing public road pavement. Damage to the public road pavement during the course of construction may necessitate milling and resurfacing of the damaged areas prior to issuance of the Certificate of Occupancy.

GIS NOTES:
1. Parcel and building address will remain 2525 AnnArbor-Saline Rd.
2. Residential sub-units must be addressed by floor. 3rd floor 300's, 4th floor 400's ect. (i.e.2525AnnArbor-Saline Rd 302 would be on the 3rd floor).
3. An address drawing (similar to the Arch drawing submitted) labeling the locations of each sub-unit along with a spreadsheet containing all the individual addresses of the site would need to be provided before construction begins.

SITE PLAN SUBMITTAL #7 07/21/25
SITE PLAN SUBMITTAL #6 06/25/25

THE CRESCENT

JOB No. **23351**

DATE: 04/18/24
SHEET 1 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
/23351CV01
FB:

1

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/05/24
SITE PLAN SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

MIDWESTERN CONSULTING
3815 Plaza Drive Ann Arbor, Michigan 48108
(734) 995-0200 • www.midwesternconsulting.com
Land Development • Land Survey • Institutional • Municipal
Wireless Communications • Transportation • Landfill Services

RELEASED FOR:	DATE
PRELIMINARY CITY SUBMITTAL	04/05/24
SITE PLAN SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25
SITE PLAN SUBMITTAL #6	06/25/25

STATE OF MICHIGAN
COLTON M. WALLACE
ENGINEER
No. 6201066649
LICENSED PROFESSIONAL ENGINEER

P.E. # 6201066649

The Crescent - 2525 ANN ARBOR-SALINE ROAD
CITY OF ANN ARBOR REQUIRED SITE PLAN INFORMATION

UDC Required Site Plan Information

A. Required Site Plan Information

1. *Cover Sheet – The following general project information should be provided on the cover sheet of the plan set and all subsequent sheets as appropriate.*

- ***a.*** *Project name, address or location, and type of site plan.*
  2525 Ann Arbor-Saline Road, Ann Arbor MI 48104; Site Plan for City Planning Commission.
- ***b.*** *Petitioner and agent information, including name, address and contact information.*
  Petitioner: Cranbrook Village Limited Partnership, 6735 Telegraph Road, Suite 110, Bloomfield Hills, MI 48301, Attn. Andy Jacob (Mountain View Properties)
  Agent: Midwestern Consulting LLC, 3815 Plaza Drive, Ann Arbor, MI 48108; Ph. (734) 995-0200; Attn. Robert C. Wagner
- ***c.*** *Statement of interest in the land, including conditions for sale or purchases of parcels such as deed restrictions, reservation of land for other uses, or other conditions which may have bearing on the total land Development.*
  Petitioner is the land owner. A portion of the site is drainage easement with detention basin.
- ***d.*** *Vicinity map identifying the location of the Site within the City, including nearest major roads and significant features such as schools, shopping centers and parks.* **See Cover Sheet.**
- ***e.*** *North indicator (pointing up or to the left) and drawing scale in bar graph form.* **Shown on all relevant sheets.**
- ***f.*** *Legal description of the Site, including total acreage of the parcel(s) and total acreage of public or private roads contained in the legal description.* **See ALTA sheet.**
- ***g.*** *Sheet index and date of plan set.* **See Cover Sheet.**
- ***h.*** *Required Statements - A brief written statement addressing the following concerns:*
  - *i) Identification of associated applications such as annexation petition, rezoning petition, PUD Zoning District petition, Special Exception Use petition, planned project modification request, landscape modification request, or variance application. Identification of special circumstances associated with the application that require additional procedures or specific approvals such as Natural Features buffer area.* **The site plan application is under the R4E zoning and the project adheres to the R4E requirements. The parcel is petitioned to be rezoned from O to R4E.**
  - *ii) Proposed development program, including proposed land use, improvements, Floor Area or number of Dwelling Units and bedrooms, access and circulation, off-street parking, preliminary construction phasing and estimated construction costs.* **The site has frontage on Ann Arbor-Saline Road and on Oakbrook Drive.**
    Proposed Development Summary:
    One Building: a 5 story apartment building with a 1 story garage below ground
    262 dwelling units/327 bedrooms
    379,459 sf of floor area
    Building height: 58.5 feet
    Storm water management: an underground chamber located at the southeast part of the site is designed to detain the storm water runoff from the site and discharges to the existing structure at the southwest corner of Ann Arbor-Saline Road & Oakbrook Drive. The site will have 31 surface parking spaces and 268 spaces the underground garage of the building for a total of 299 spaces.

    Proposed Phasing and Probable Construction Cost: **The development will be constructed in one phase, beginning on or before 6/1/2025, with completion on or before 8/1/2027. The estimated construction cost is $40,000,000.**
  - *iii) Community Analysis*
    (a) Impact of proposed Development on public schools. **The units are apartments ranging in size from 1 to 3 bedrooms. The units are designed as student oriented apartments. The number of children living in the building is expected to be minimal so there will be virtually no impact on public elementary and high schools.**
    (b) Relationship of intended use to neighboring uses. **The residential units will provide additional housing. The residents are likely to patronize existing restaurants, retail, and other businesses in the nearby buildings.**
    (c) Impact of adjacent uses on proposed development. **Residents will likely patronize the businesses and institutions in the surrounding area.**
    (d) Impact of proposed Development on the air and water quality, and on existing Natural Features of the Site and neighboring Sites. **There will be no significant impact on air and water quality is expected.**
    (e) Impact of the proposed use on historic Sites or structures which are located within an historic district or listed on the National Register of Historic Places. **The site is not within a historic district and the existing building is not a historic structure.**
    (f) Natural Features General Descriptions and Impacts: A brief summary of the Natural Features (Woodlands, Wetlands, Water Courses, Landmark Trees, Steep Slopes and Endangered Species Habitat) found on the Site. A detailed report of the quality, character and health of all existing Natural Features, and identification of all proposed impacts to them.
    Endangered Species Habitat: **N/A**
    100-Year Floodplain: **none on the site.**
    Landmark Trees: **0**
    Steep Slopes: **none.**
    Existing Watercourses: **none.**
    Wetlands: **none.**
    Woodlands: **none.**
  - *iv) Traffic Statement: The number of vehicle trips per unit per peak hour and supporting documentation from the ITE Manual.* **A Traffic Impact Assessment is included.**
  - *v) Public Sidewalk Maintenance Statement* **See Cover Sheet, General Notes number 1.**
- ***i.*** *Comparison Chart of Requirements and Existing and Proposed Conditions*
  - *i) Zoning Classification.* **Existing-O, Proposed-R4E**
  - *ii) Lot Area.* **4.16 acres, 181,236 square feet.**
  - *iii) Total area of all Floors (measured from exterior faces of the exterior walls or from the center line of walls separating two Buildings), Floor Area and Floor Area Ratio (FAR), or Density*
    379,459 sf gross including residential, leasing and amenity area with a Floor Area Ratio of 2.09
  - *iv) Open Space and Active Open Space.* **1.64 acres (45.0% of parcel area)**
  - *v) Required Setbacks and Yards (front, side and rear).*
    Front (Ann Arbor-Saline Road): 15.0 feet, Front (Oakbrook Drive): 15.0 feet,
    Side: 33.50', Rear: 73.5'
  - *vi) Height and stories.*
    58.5 feet, 5 stories above grade, 1 story below.
  - *vii) Off-street vehicle parking, including accessible and barrier free spaces.*
    299 Total spaces (31 surface + 268 garage)
  - *viii) Bicycle parking, including class.*
    Class A: 30 spaces provided
    Class B: 0 spaces provided
    Class C: 36 spaces provided
    Additional enclosed vertical bicycle spaces: 196 spaces provided
    Total Bicycle Parking: 262 spaces provided.
  - *ix) Notation of variances granted or proposed, planned project modifications approved or proposed.* **N/A.**

2. *Existing Conditions Plan– Drawings and written descriptions of the existing conditions of the Site must be included on the plans, including the following:*

- ***a.*** *ALTA Land Survey.* **See Existing Conditions and Survey Plan.**
  - *i) Exception: Where there are no existing public utilities on the Site, the Planning Manager may waive the requirement to provide an ALTA Land Survey for Site Plans for Administrative Approval or when the combination of existing conditions and proposed Development are so minor that preparing an ALTA Land Survey would be a significant financial hardship to the Applicant. In those cases, an existing conditions plan illustrating the boundaries of the Site, location of all structures and improvements, and any easements, prepared by a professional land surveyor must be provided.* N/A.
- ***b.*** *Existing and proposed contours extending 50 feet beyond the Site at a minimum interval of two feet.* **See Existing Conditions and Survey Plan, and Grading Plan.**
- ***c.*** *If new City public sanitary sewer, water mains, Storm Water Management System, or streets are proposed in conjunction with a site plan, the plans must be referenced to the Ann Arbor Geodetic Reference System.* **The survey is referenced to the AAGRS (State Plane Coordinates, Michigan South Zone (2113).**

3. *Dimensional Layout Plan – Drawings and written descriptions of the proposed Development must be provided on the plans, demonstrating compliance with all applicable Development standards such as building area, height and placement, off-street parking, streets and access, including the following:* **See Dimensional Site Plan.**

- ***a.*** *Existing and proposed Lot lines.* **Shown.**
- ***b.*** *Minimum and maximum Required Setback Lines, including Established Front Building Line and required increases to the normal minimum side and rear setbacks, if applicable; existing and proposed Front, Side and Rear Yards.* **Shown.**
- ***c.*** *Existing and proposed Buildings.* **See Existing Conditions and Survey Plan for existing buildings. See Dimensional Site Plan for proposed building.**
- ***d.*** *Vehicle Parking Spaces, aisles and Driveways. Identify any "no parking" areas or fire lanes and indicate any proposed signage.* **See Dimensional Site Plan.**
- ***e.*** *Bicycle parking, including detail of facilities.* **See Dimensional Site Plan and Architectural Plans, and Civil Details sheet.**
- ***f.*** *Curb Cuts, drive Approaches and curb radii dimensions, including all Curb Cuts on the opposite side of the street from the Site. Dimension of all Fire Department access roads or lanes, if applicable, including width at hydrant, dead end lengths, turn-around location, turning radii, etc.* **See Dimensional Site Plan, Utility Plan and Fire Protection Plan.**
- ***g.*** *Open Space and Active Open Space.* **1.64 acres of open space, 45.0% of site area**
- ***h.*** *Natural features buffer.* **N/A.**
- ***i.*** *Conflicting land use buffer.* **N/A.**
- ***j.*** *Solid waste enclosure, including dimensioned detail.* **See Solid Waste Management Plan and Architectural Plans.**
- ***k.*** *Perspective sketch of building showing Streetwall Height and Offset, if applicable.* **See Architectural Plans.**

4. *Natural Features Plan – Drawings and written descriptions identifying all Natural Features on the Site, proposed protection measures for avoiding disturbance to existing Natural Features, alternatives analysis, and proposed mitigation for any disturbed or removed Natural Features to determine compliance with applicable Development standards must be included on the plan, including the following:* See Natural Features Impact Statement on Existing Conditions and Survey Plan.

- ***a.*** *Accurate location and description of all Natural Features within the Limits of Soil Disturbance and in an area extending 50 feet beyond the Limits of Soil Disturbance, including:*
  - *i) Limits of Soil Disturbance.* **See Grading Plan.**
  - *ii) Boundary and description of any Endangered Species Habitat.* **N/A.**
  - *iii) Boundary and elevation of any 100-year floodplain.* **N/A.**
  - *iv) Location, species and Critical Root Zone and condition of Landmark Trees.* **N/A.**
  - *v) Location of all Steep Slopes and a cross section through the Site showing the proposed activity in relationship to the topography.* **N/A.**
  - *vi) Existing and proposed Watercourses showing depths, normal water levels, shore gradients, type of bank retention and shore vegetation.* **N/A.**
  - *vii) Boundary and character of all Wetlands.* **N/A.**
- ***b.*** *Boundary and basal area of any Woodland, with location, species and DBH of all trees six inches DBH or greater within the Woodland area.* **N/A.**
- ***c.*** *Location and extent of required Natural Features buffer: Identification of any temporary or permanent activity (i.e. impacts or disturbance) within the Natural Features buffer.* **N/A.**
- ***d.*** *When any activity within the Natural Features buffer is proposed, a written justification responding to each general criteria for determining a proposed activity in the Natural Features buffer is in the public interest.* **N/A.**
- ***e.*** *Protection measures for those existing Natural Features proposed to be protected as part of the Development, including protections from the construction of the Development.* **N/A.**
- ***f.*** *Identification of all Natural Features proposed to be impacted, disturbed, or removed by the Development, including the construction of the Development.* **Refer to Natural Features Plan**
- ***g.*** *Alternatives Analysis: When any Natural Features are proposed to be removed or disturbed, drawings and descriptions of at least two alternative plans that were prepared and considered but are not proposed which demonstrate and justify that the proposed Development limits the disturbance or removal of Natural Features on and adjacent to the Site to the minimum necessary to reasonably accomplish the permitted use.* **N/A**
- ***h.*** *Proposed mitigation measures: When any Natural Features are proposed to be removed or disturbed, proposed mitigation measures must be provided including:* **See Landscape Plans**
- ***i.*** *Written description of the mitigation program, identifying the type and appropriate quantity (i.e. basal area, square feet, caliper inches) of Natural Features removed or disturbed and the appropriate quantity of the mitigation proposed.* **See Landscape Plans**
- ***j.*** *Replacement calculations.* **See Landscape Plans**
- ***k.*** *Location of proposed mitigation plantings.* **See Landscape Plans**
- ***l.*** *Chart listing the proposed mitigation plantings, including botanical and common names, caliper sizes, root type and height.* **See Landscape Plans**
- ***m.*** *Timing schedule for implementation of mitigation measures.* **See Landscape Plans**
- ***n.*** *Notation and description of any proposed alternative mitigation measures.* **N/A.**

5. *Natural Features Overlay Plan – A drawing including the dimensional layout and the existing Natural Features on Site.* **See Grading Plan**

6. *Landscape Plan – Drawings and written descriptions of proposed landscaping, screening and buffers demonstrating compliance with applicable Development standards such as interior landscaping of Vehicular Use Areas, Right-of-Way screening, conflicting land use buffers, and Natural Features mitigation in order to determine compliance with applicable Development standards must be provided on the plans, including the following:*

- ***a.*** *Location, size and species of existing trees and vegetation, and Natural Features.* **See Natural Features Plan**
- ***b.*** *Location of light poles, refuse containers and enclosures, mechanical equipment and hydrants.* **See Dimensional Site Plan, Landscape Plan, and Architectural Plans.**
- ***c.*** *Limits of Vehicular Use Area and notation of its size in square feet.* **See Landscape Plan.**
- ***d.*** *Proposed locations of required landscaping, screening and buffers, street trees and plantings.* **See Landscape Plan.**
- ***e.*** *Table identifying Vehicular Use Area, interior landscape islands, Right-of-Way screening, conflicting land use buffer, and street tree planting requirements and proposed plantings and areas to satisfy requirements.* **See Landscape Plan**
- ***f.*** *Proposed plant list, including caliper sizes, root type, height of material, botanical and common name, type and amount of mulch, ground cover and grasses.* **See Landscape Plan.**
- ***g.*** *Notation of requested modifications if any.* **N/A.**
- ***h.*** *Planting and staking details in accordance with the standards established by the PSA Administrator.* **See Landscape Details sheet and SESC Details sheet.**
- ***i.*** *Specification for treatment of compacted soil on the entire Site.* **See Landscape Plan, Landscape Notes, number 9.**
- ***j.*** *Specification for planting media in landscape areas.* **See Landscape Plan, Landscape Notes, number 12.**
- ***k.*** *Irrigation plan or water outlets (hose bibs).* **See Landscape Plan, Landscape Notes, number 3. See also Architectural Plans.**
- ***l.*** *Landscape maintenance program, including a statement that all diseased, damaged, or dead materials shall be replaced in accordance with this Code by the end of the following planting season as a continuing obligation for the duration of the site plan.* **See Landscape Plan, Maintenance Notes.**
- ***m.*** *Identification of snow storage areas, including a statement that snow shall not be pushed onto interior landscape islands unless designed for snow storage.* **See Landscape Plans**
- ***n.*** *Berms, retaining walls, screen walls, fences, tree wells to preserve existing trees, culverts to maintain natural drainage patterns, or any other construction details necessary to resolve specific Site conditions.* **See Architectural Plans.**

7. *Utility Plan – Drawings and written descriptions of the existing and proposed public utilities serving the Site must be provided on the plans, including the following:*

- ***a.*** *Location and size of existing and proposed public water, sanitary sewer and storm sewer mains and leads. Note invert elevations of storm and sanitary mains.* **See Existing Conditions and Survey Plan, and Utility Plan.**
- ***b.*** *Location of existing and proposed fire hydrants. Indicate a 250-foot or 350-foot radius, as appropriate for the type of proposed Development, around each hydrant. Show and dimension hose lay to any external portion of a Structure via an approved fire route from any hydrant or combination of hydrants. Location of fire department connections (FDC) to Buildings. Dimension distance of the hose lay from the FDC to the nearest hydrant via an approved fire route (provide dimension following an actual hose laying route). Location of Knox Box, if applicable. Include a separate Fire Protection and Access Plan sheet if necessary for clarity.* **See Existing Conditions and Survey Plan, Utility Plan, and Fire Protection Plan.**
- ***c.*** *Location of existing Public Utility easements, including liber and page number.* **N/A.**
- ***d.*** *Location and dimension of proposed Public Easements. Notation that legal descriptions of proposed easements will be provided with construction drawings and engineering plan submittals as required.* **N/A.**
- ***e.*** *Sanitary sewer flow mitigation calculations.* **See Utility Plan.**
- ***f.*** *Location and notation of firewalls within existing or proposed Buildings, or notation that none are existing or proposed.* **See Architectural Floor Plans.**

8. *Grading and Soil Erosion Control and Storm Water Management Plan - Drawings and written descriptions demonstrating compliance with the applicable Development standards for Grading and soil Erosion controls must be provided on the plans, including the following:*

- ***a.*** *Vicinity map showing location of Site and all adjacent properties within 500 feet of the Site boundaries showing relationship to any Watercourse.* **See Vicinity Map on the Cover Sheet.**
- ***b.*** *Soil investigation report, survey or profile of data regarding the nature, soil type, distribution, erodibility, and supporting ability of existing soils or rock on the Site in accordance with the United States Department of Agriculture soil survey standards.* **See Soil Boring sheets 30, 31, and 32.**
- ***c.*** *Existing and proposed topography at a maximum of two-foot contour intervals, elevations or similar slope descriptions, extending at least 50 feet beyond Site boundary.* **See Natural Features Plan and Grading Plan.**
- ***d.*** *Location of any existing Structure or Natural Feature on the Site and on land extending at least 50 feet beyond the Site boundary lines.* **See Title Survey, Natural Features Plans, and Survey Plan and Grading Plan.**
- ***e.*** *Location of proposed Structures or Development on the Site including physical limits of each proposed Earth Change and all proposed temporary and permanent soil Erosion and Sedimentation Control Measures.* **See Grading Plan and Soil Erosion Control Plan.**
- ***f.*** *Plans, section and construction –quality details of all soil Erosion and Sedimentation Control Measures, existing and proposed on-site drainage and dewatering facilities, retaining walls, cribbing, planting, anti-Erosion devices or other protective devices to be constructed in connection with, or as part of, the proposed work.* **See Soil Erosion Control Plan details. Dewatering of the site is not required.**
- ***g.*** *Estimated total cost of the required controls during construction, including dust emission control.* **See Soil Erosion Control Plan, Soil Erosion Control Notes, number 5.**
- ***h.*** *Estimated total cost of protecting all exposed oil surfaces from Erosion should construction discontinue.* **See Soil Erosion Control Plan, Soil Erosion Control Notes, number 10.**
- ***i.*** *Estimate of the quantity of excavation and Fill involved.* **See Soil Erosion Control Plan, Soil Erosion Control Notes, number 13.**
- ***j.*** *Amount of impervious area existing and proposed, and square footage of impervious area reconfigured to accommodate new improvements.* **Existing: 9,964 sf / 6.3%; proposed: 123,218 sf / 68.0%.** *If a Storm Water Management System is required, computations and design of the Storm Water Management System, such as:* **See Proposed Stormwater Plan and Proposed Detention Calculations.**
  - *i) Calculations used to derive the run-off coefficients.* **See Proposed Detention Calculations, W1.**
  - *ii) Map showing the drainage area and land tributary to the Site and estimated runoff of the area served by any drain.* **See Proposed Stormwater Plan.**
  - *iii) Required storage volume calculations, including first flush, bankfull, and 100-year storm events.* **See Proposed Detention Calculations, W2-W13.**
  - *iv) Calculations for the provided/proposed storage facility.* **See Adjusted Basin Calculations and Proposed Detention Calculations.**
  - *v) Required and proposed release rate calculations.*
    See Proposed Detention Calculations.
  - *vi) A plan for the continued maintenance of the permanent Storm Water Management System.* **See Soil Erosion Control Plan.**
  - *vii) Any other pertinent calculations as determined necessary by the PSA Administrator.* **To be provided if required.**
  - *viii) If an alternative method of storm water detention is proposed, a written description of the alternative method of storm water detention and a written explanation as to why the proposed alternative conforms to the Development standards of this Code.* **N/A.**
- ***l.*** *Timing and construction sequence of each proposed Earth Change, including: installation of temporary and permanent soil Erosion and Sedimentation Control Measures, striping and Clearing, rough Grading, installation and Stabilization of Storm Water Management Systems, construction of utilities, roads, infrastructure, and Buildings, final Grading and landscaping, and removal of temporary soil Erosion and Sedimentation Control Measures; identify all proposed phasing consistent with the approved site plan or final preliminary plat.* **See Civil Details Sheet: Construction Sequence.**
- ***m.*** *A program proposal for the continued maintenance of all permanent soil Erosion and Sedimentation Control Measures that remain after Project Completion, including: designation of the person or party responsible for the maintenance; maintenance responsibilities shall become part of any sales or exchange agreement for the land on which the permanent soil Erosion and Sedimentation Control Measures are located.* **See Soil Erosion Control Plan, Maintenance Program for Soil Erosion Controls.**
- ***n.*** *Other information or data as may be required to demonstrate compliance, such as a soil Erosion control statement including:* **N/A.**
  - ***i)*** *Consideration of alternative actions with evaluation of each.* **N/A.**
  - ***ii)*** *Description of probable adverse environmental effects that cannot be avoided.* **N/A.**
  - ***iii)*** *Identification of any negative impact to Natural Features, including Woody Plants.* **N/A.**
  - *iv) Analysis of primary and secondary consequences of short-term uses of the environment in relation to the maintenance and enhancement of long-term productivity. Remedial, protective and mitigation measures are to be developed for any environmentally detrimental aspect.* **N/A.**
  - ***v)*** *If determined necessary by the Code Official, a hydrological study may be required where the Clearing, Grading, or addition of Impervious Surface is proposed within a floodplain not regulated by the MDEQ or unmapped flood prone areas or any lake, pond, Watercourse, or Wetlands. The study shall follow the format used by the MDEQ for hydraulic reports and shall demonstrate that the proposed activity complies with the review standards of this Code.* **N/A.**

9. *Massing and Architectural Plans – Drawings and written descriptions of the massing, architectural design and details, and façade materials of proposed Buildings must be provided on the plans, including:*

- ***a.*** *Dimensioned floor plans of each building Floor identifying areas excluded from Floor Area and excluded from FAR calculations.* **See Architectural Plans.**
- ***b.*** *Vertical sections through the Site showing existing and proposed elevations.* **See Architectural Plans.**
- ***c.*** *Dimensioned architectural design and details with labeled materials.* **See Architectural Plans.**
- ***d.*** *Perspective renderings of the proposed Development.* **See Architectural Plans.**

10. *Photometric Plan – Drawings and written descriptions of proposed lighting demonstrating compliance with the applicable Development standards, including:* **Provided.**

- ***a.*** *Location, type and details of proposed lighting fixtures.* **Light pole locations are shown on the Dimensional Site Plan, Utility Plan and Landscape Plan.**
- ***b.*** *Photometric diagram showing predicted maintained lighting levels of the proposed lighting fixtures.* **Provided**

11. *Traffic Impact Analysis – For proposed Developments that will generate more than three vehicle trips per unit per peak hour or 50 vehicle trips per peak hour, a traffic impact traffic impact analysis must be provided including the following:* **A Traffic Impact Assessment is included.**

- ***a.*** *Existing traffic volumes passing on all streets abutting the proposed Development during the peak hour. Traffic from other new and proposed Developments in the area should be considered.*
- ***b.*** *Existing peak hour turning movements of vehicular traffic at all public street intersections within 200 feet of the proposed Development, or those intersections that may be impacted by the proposed Development.*
- ***c.*** *Projected peak our generation rate and peak hours of generation for the proposed Development.*
- ***d.*** *Projected peak hour traffic movements as a result of the establishment of the proposed facility.*
- ***e.*** *A capacity analysis for impacted intersections.*
- ***f.*** *A statement of the total impact the projected generation will have on the existing level of service as determined and certified by a registered engineer.*
- ***g.*** *A sketch plan showing all existing Driveways to public streets within 200 feet of the proposed Development and all on-street parking or loading areas.*
- ***h.*** *Proposed Site access Driveways with a determination if a deceleration lane or taper is necessary based on current City warrant analysis standards, a determination if a left-turn by-pass lane is necessary based on a warrant analysis, and a sight distance study at the Site access Driveway.*
- ***i.*** *A pedestrian circulation plan showing all possible points of conflict between motorized traffic and pedestrian/bicycle traffic on public streets and sidewalks within 200 feet of the proposed Development, or those intersections that may be impacted by the proposed Development.*
- ***j.*** *A gap study for pedestrian or vehicular traffic may be required at non-signalized locations that may be impacted by the proposed Development. The traffic and/or parking impact analysis shall be reviewed by the Department of Transportation for completeness and accuracy. The analysis shall include a determination of the service volume and capacity of adjacent streets including the traffic from the new development. The methodology to be employed in determining street capacities shall conform to the 1985 edition of the Highway Capacity Manual, Special Report Number 209, or the latest revision thereof. Proposals that will contribute traffic to streets or intersections that are or will be as a result of this proposal at a level of Service D, E, or F as defined in the Highway Capacity Manual may be denied by Commission and Council until such time as necessary street or traffic improvements are scheduled for construction.*

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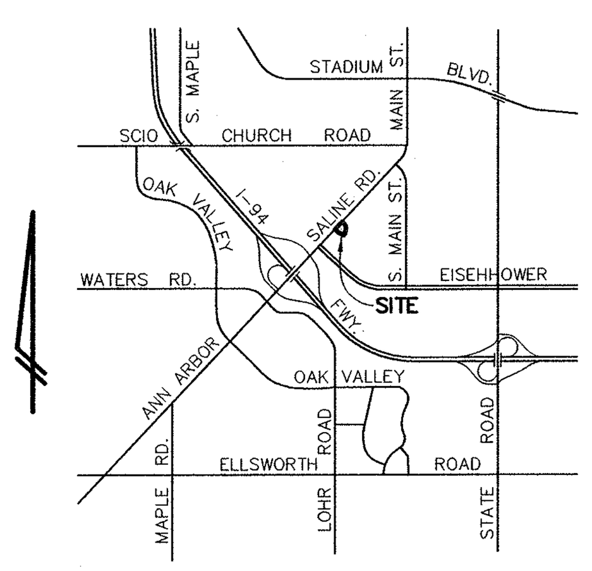
CRANBROOK VILLAGE LIMITED PARTNERSHIP
6735 TELEGRAPH ROAD, SUITE 110
BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

THE CRESCENT
SITE PLAN
GENERAL NOTES

2

JOB No. 23351
DATE: 04/18/24
SHEET 2 OF 35
CADD: CWW
ENG: CWW
PM: ROW
TECH:
FB:

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	06/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	05/28/25
SITE PLAN SUBMITTAL #5	09/22/25



VICINITY MAP
(NO SCALE)

DESCRIPTION

Land in the City of Ann Arbor, County of Washtenaw, State of Michigan described as:

Lot 1, Cranbrook Subdivision, according to the recorded plat thereof, as recorded in Liber 26 of Plats, Page 16, Washtenaw County Records.

CERTIFICATION

To Cranbrook Village Limited Partnership, a Michigan limited partnership and Fidelity National Title Insurance Company.

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 2, 3, 4, 5, 8, 11a, 13, 14 and 16 of Table A thereof. The field work was completed on September 18, 2023.

Date of Plat or Map: September 25, 2023

Thomas L. Sutherland, P.S.
Michigan No. 24620

STATE OF MICHIGAN
THOMAS L. SUTHERLAND PROFESSIONAL SURVEYOR No. 24620
LICENSED PROFESSIONAL SURVEYOR

Subject to the following Easements, Restrictions and Agreements as listed in Schedule B-II, Exceptions, Fidelity National Title Insurance Company Commitment Number GLT2300544 with a commitment date of September 7, 2023.

10. Right(s) of Way and/or Easement(s) and rights incidental thereto as delineated or as offered for dedication on the map of said plat.
Cranbrook Subdivision is recorded in Liber 26 of Plats, Pages 16-20, Washtenaw County Records. Right(s) of Way and Easements from this plat are shown on this survey and noted as "Liber 26 of Plats, Pages 16-20".

12. Terms, covenants, conditions, restrictions and easements of Cranbrook Subdivision Escrow Agreement as recorded in Liber 2155, Page 988.
This is an Agreement between the City of Ann Arbor and Cranbrook Venture, Proprietor of Cranbrook Subdivision for the development of Cranbrook Subdivision and is not plottable.

13. Terms, covenants, conditions, restrictions and easements of Declaration of Covenants and Assessments - Cranbrook Subdivision as recorded in Liber 2279, Page 589.
This Agreement sets up a Maintenance Association created for the purpose of insuring perpetual maintenance of private storm water facilities on Lots 1, 5 and 6 of Cranbrook Subdivision and is not plottable.

14. Rights of others in and to the use of the Easements as described in Declaration of Easement as recorded in Liber 2976, Page 329, and subject to the terms, covenants, conditions and easements contained in said Declaration.
This is an Easement over the subject property for the purpose of vehicular and pedestrian access and for ingress and egress to and from Lot 2 Cranbrook Subdivision and is shown on this survey.

15. Terms, covenants, conditions, restrictions and easements of Restrictive Covenant as recorded in Liber 4623, Page 32.
This restrictive covenant between Cranbrook Village limited partnership, owner of the subject property and Whole Foods Market Group, Inc. is not plottable.

NOTES:

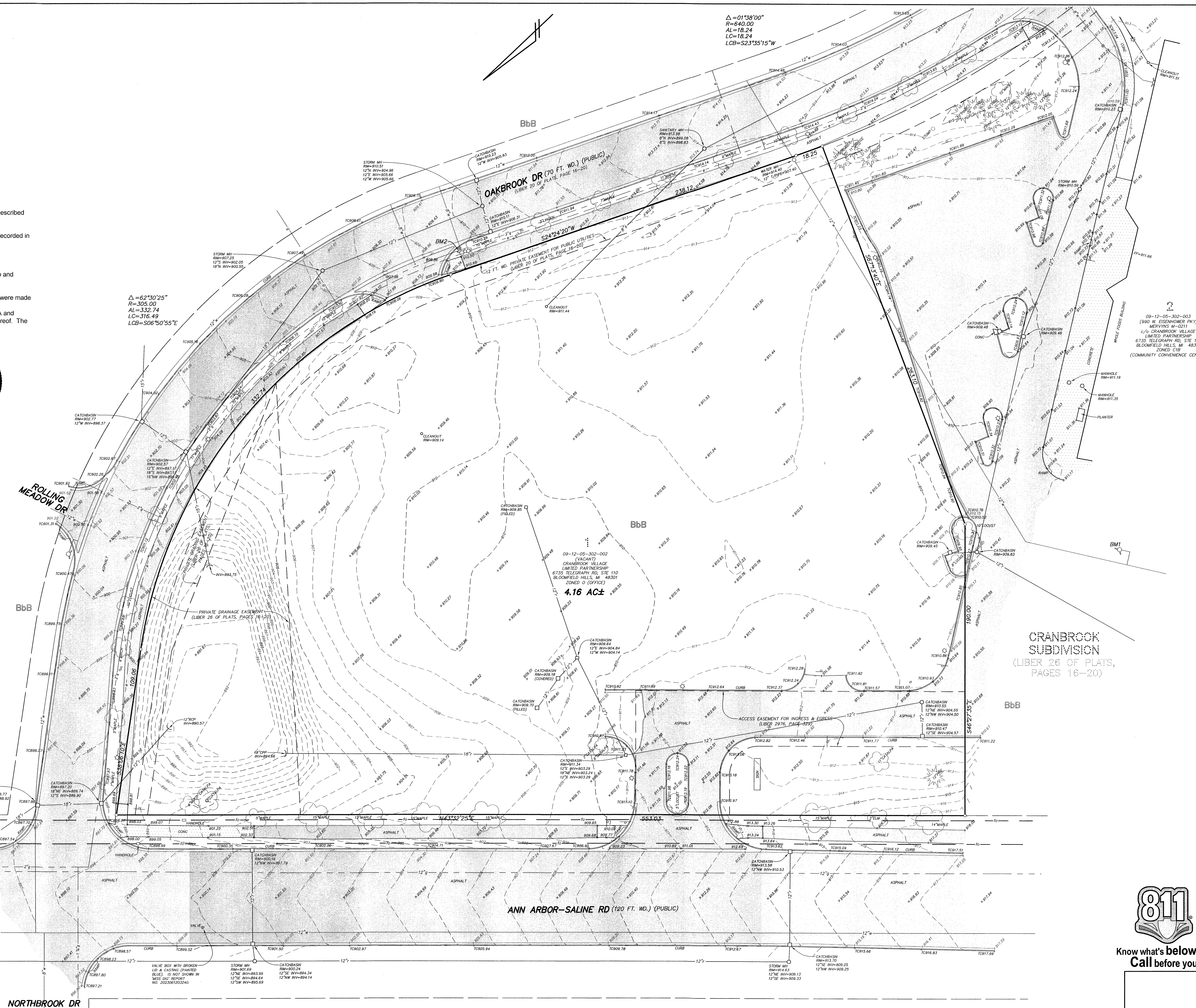
1. FIDELITY NATIONAL TITLE INSURANCE COMPANY COMMITMENT NUMBER GLT2300544 WITH A COMMITMENT DATE OF SEPTEMBER 7, 2023 WAS USED IN THE PREPARATION OF THIS SURVEY.
2. THE SUBJECT PROPERTY IS IN FLOOD ZONE X, AREA OF MINIMAL FLOOD HAZARD - FEMA FLOOD MAPS 26161C0382E AND 26161C0244E WITH AN EFFECTIVE DATE OF APRIL 3, 2012.
3. THERE WAS NO OBSERVED EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS ON THE SUBJECT PROPERTY.
4. A 12 INCH WATER MAIN RUNNING IN A NORTHERLY AND SOUTHERLY DIRECTION CROSSES THE NORTHEASTERLY CORNER OF THE SUBJECT PROPERTY WITHOUT THE BENEFIT OF AN EASEMENT AND IS SHOWN ON THIS SURVEY.

WASHTENAW COUNTY SOIL SURVEY CLASSIFICATION

BbB – BLOUNT LOAM, 2 TO 6 PERCENT SLOPES

• • • • • • • – SOILS BOUNDARY

SOILS ARE BASED ON USDA SOIL SURVEY OF WASHTENAW COUNTY.



Know what's below. Call before you dig.

LEGEND

☼ = LIGHT POLE	x901.23 = SPOT ELEV.	TC = TOP OF CURB	—·:—·:— = GRAVEL
= UTILITY POLE	= POST	TW = TOP OF WALL	—//—//— = FENCE
= GUY ANCHOR	⊗ = GATE VALVE	○ = MANHOLE	= CONCRETE
= HYDRANT	= SIGN	□ = CATCHBASIN	= ASPHALT
		◡ = END SECTION	

—— r ——	= EXISTING STORM
—— s ——	= EXISTING SANITARY
—— w ——	= EXISTING WATER
—— g ——	= EXISTING GAS
—— e ——	= EXISTING ELECTRIC
—— t ——	= EXISTING TELEPHONE

BENCHMARK BM1=STEAMER VALVE ON HYDRANT 66'± NW'LY OF WHOLE FOODS BUILDING, ELEV=912.67. (NAVD88)

BM2=TOP NUT ON HYDRANT SOUTH OF FIRST ENTRANCE OFF OF OAKBROOK DR FROM ANN ARBOR-SALINE RD, ELEV=912.88. (NAVD88)

REVISIONS 10-18-24 VALVE NOTE.

SCALE
0 15 30 60
SCALE: 1"=30'

PREPARED BY

WASHTENAW ENGINEERING
CIVIL ENGINEERS
PLANNERS * SURVEYORS
LANDSCAPE ARCHITECTS
3526 W. LIBERTY RD
SUITE 400
ANN ARBOR, MI 48103
TEL. 734-761-8800

CLIENT
FTA CRANBROOK
6735 TELEGRAPH RD
STE 110
BLOOMFIELD HILLS, MI 48301

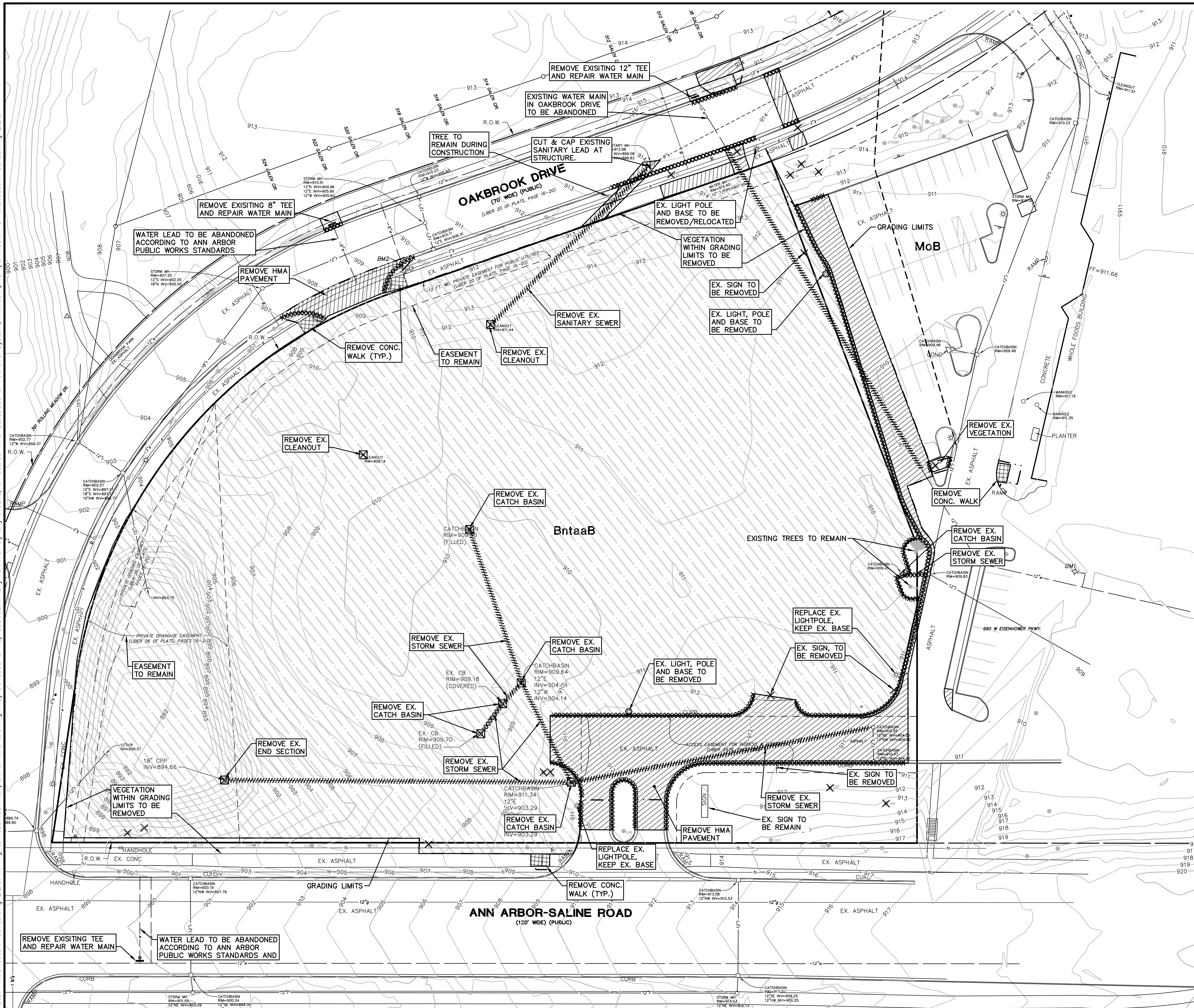
SHEET
ALTA/NSPS LAND TITLE SURVEY

PROJECT
09-12-05-302-002
UNIT 1
CRANBROOK SUBDIVISION

SECTION 5 TOWN 3 SOUTH RANGE 6 EAST
CITY OF ANN ARBOR
WASHTENAW COUNTY * MICHIGAN

DATE 9-25-23
JOB NO. 33047
DWG NO. 33047
FIELD BOOK –
FILE NO. 10820

1
SHEET



The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

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

SCALE: 1" = 30'
0 30 60 90

LEGEND

- 838 — EXIST. CONTOUR
- ×836.2 — EXIST. SPOT ELEVATION
- EXIST. LIGHT POLE
- e — EXIST. ELECTRIC LINE
- g — EXIST. GAS LINE
- g — EXIST. GAS VALVE
- f.o. — EXIST. FIBER OPTIC LINE
- w — EXIST. WATER MAIN
- EXIST. HYDRANT
- EXIST. GATE VALVE IN BOX
- r — EXIST. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- EXIST. END SECTION
- s — EXIST. SANITARY SEWER
- EXIST. CLEANOUT
- SIGN
- CONCRETE TO BE REMOVED
- BITUMINOUS TO BE REMOVED
- VEGETATED AREA TO BE REMOVED
- UTILITY TO BE REMOVED
- CURB TO BE REMOVED
- TREE TO BE REMOVED
- SIGN TO BE REMOVED
- LIGHTPOLE AND BASE TO BE REMOVED
- UTILITY STRUCTURE TO BE REMOVED
- DISCONNECT UTILITY
- EXISTING SOIL TYPE BOUNDARY

EXISTING TREES

#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	LM	SCORE	INV	RM
101	14"	Maple	Acer spp					
102	2"	Elm	Ulmus spp					
103	15"	Maple	Acer spp					
104	12"	Pine	Pinus spp					X
105	11"	Catalpa	Catalpa speciosa				X	X
106	8"	Locust	Gleditsia spp					
107	10"	Locust	Gleditsia spp					
108	5"	Locust	Gleditsia spp					
109	6"	Catalpa	Catalpa spp				X	X
110	7"	Catalpa	Catalpa spp				X	X
111	15"	Maple	Acer spp					X
112	15"	Maple	Acer spp					
113	13"	Maple	Acer spp					
114	15"	Maple	Acer spp					
115	5"	Maple	Acer spp					
116	12"	Catalpa	Catalpa spp				X	X
117	6"	Catalpa	Catalpa spp	Double			X	X
118	7"	Maple	Acer spp					
119	5"	Maple	Acer spp					
120	4"	Birch	Betula spp.					
121	10"	Locust	Gleditsia spp					
122	9"	Maple	Acer spp					
123	11"	Maple	Acer spp					
124	10"	Maple	Acer spp					
125	9"	Maple	Acer spp					
126	10"	Maple	Acer spp					
127	10"	Maple	Acer spp					
128	7"	Linden	Tilla americana					
129	7"	Maple	Acer spp					
130	11"	Maple	Acer spp					
131	6"	Maple	Acer spp					X
132	10"	Maple	Acer spp					X
133	7"	Maple	Acer spp					X
134	11"	Spruce	Picea spp					X
135	11"	Spruce	Picea spp					X
136	10"	Spruce	Picea spp					X
137	7"	Maple	Acer spp					
138	9"	Maple	Acer spp					
139	12"	Pine	Pinus spp					
140	10"	Pine	Pinus spp					
141	7"	Pine	Pinus spp					
142	10"	Pine	Pinus spp					
143	10"	Maple	Acer spp					
144	12"	Pine	Pinus spp					
145	11"	Pine	Pinus spp					
146	13"	Pine	Pinus spp					

DEMOLITION NOTES

1. ANY EXISTING UTILITY SERVICE LEADS SERVICING THE PARCEL NOT PROPOSED TO BE USED SHALL BE PERMANENTLY KILLED AT THEIR RESPECTIVE MAIN PER CITY STANDARDS WITH THIS PROJECT.

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6735 TELEGRAPH ROAD, SUITE 110
BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

THE CRESCENT
SITE PLAN
DEMOLITION PLAN

4

DATE: 04/18/24
SHEET 4 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
/23351RM01
FB:

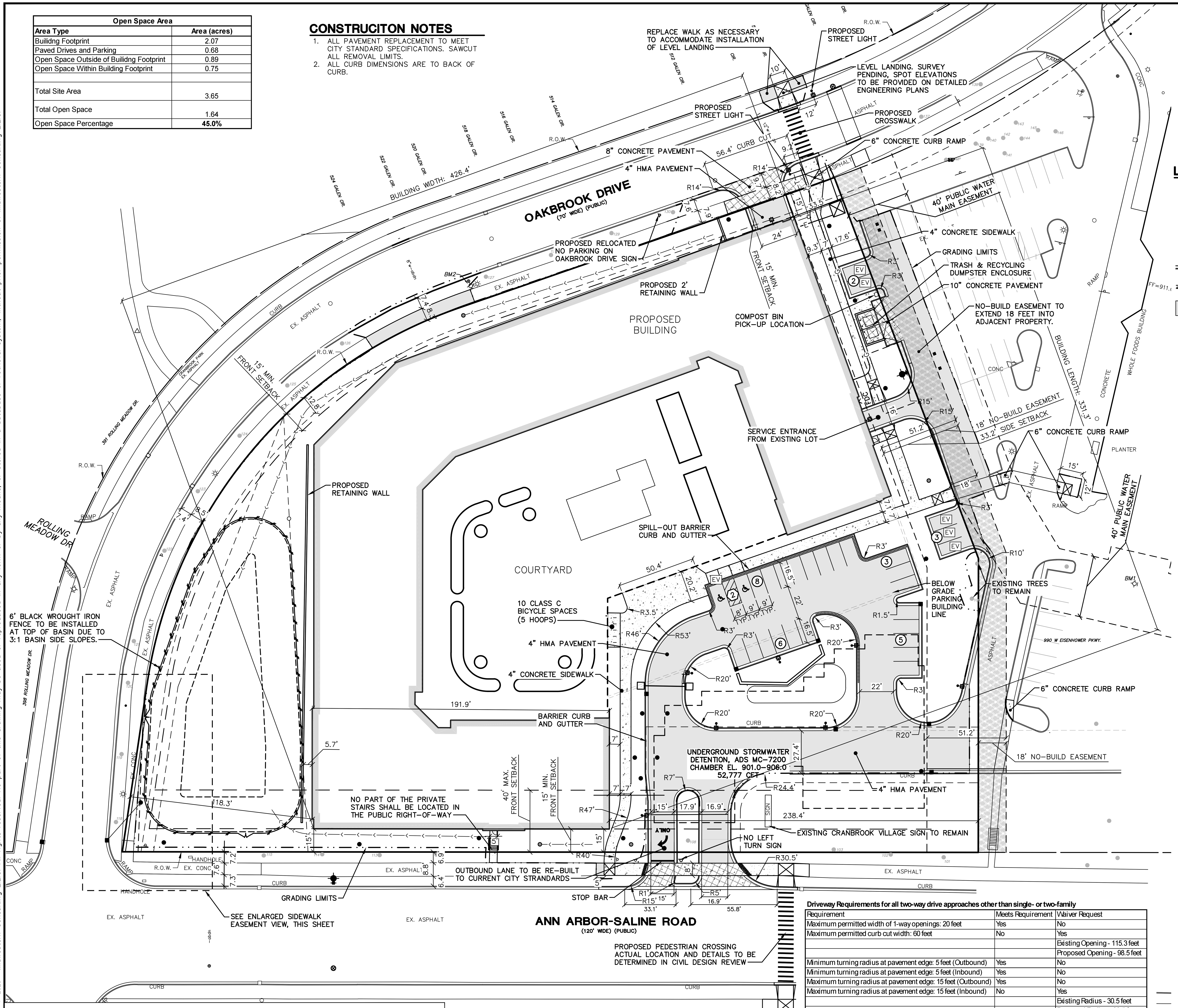
JOB No. 23351

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/05/24
SITE PLAN SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

Open Space Area	
Area Type	Area (acres)
Building Footprint	2.07
Paved Drives and Parking	0.68
Open Space Outside of Building Footprint	0.89
Open Space Within Building Footprint	0.75
Total Site Area	3.65
Total Open Space	1.64
Open Space Percentage	**45.0%**

CONSTRUCITON NOTES

1. ALL PAVEMENT REPLACEMENT TO MEET CITY STANDARD SPECIFICATIONS. SAWCUT ALL REMOVAL LIMITS.
2. ALL CURB DIMENSIONS ARE TO BACK OF CURB.

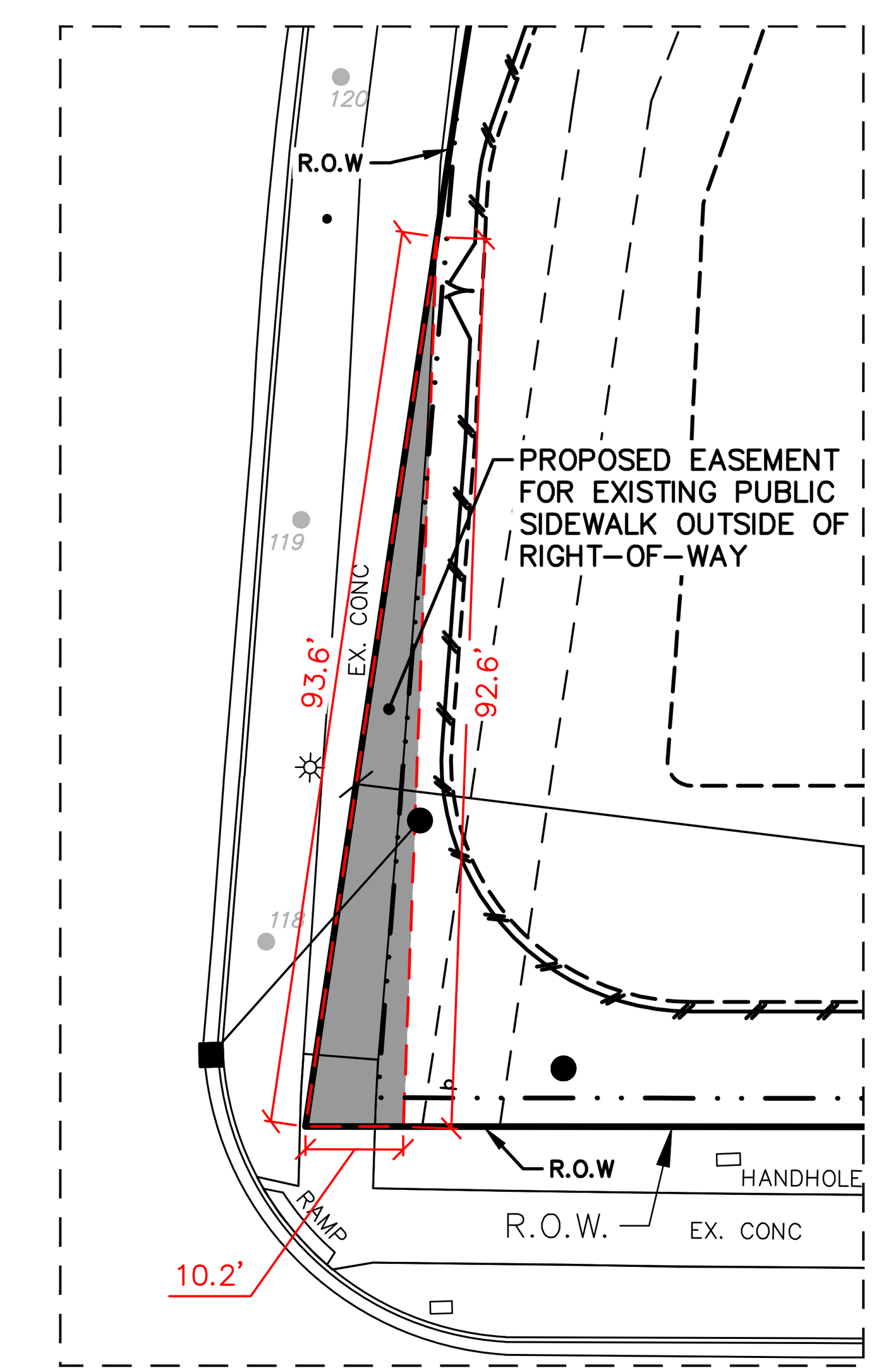


811
Know what's **below.**
Call before you dig.

SCALE: 1" = 30'
0 30 60 90

LEGEND

⓪	NUMBER OF STANDARD PARKING SPACES IN ROW		PROP. CONCRETE PAVEMENT
⬡	NUMBER OF BARRIER FREE PARKING SPACES IN ROW		PROP. 8" (10" AS NOTED) CONCRETE PAVEMENT
	BARRIER FREE SIDEWALK RAMP		PROP. NO-BUILD EASEMENT
☒	SIDEWALK LEVEL LANDING		EX. SIGN
	PROP. CURB & GUTTER		PROP. SIGN
	PROP. SPILL-OUT CURB & GUTTER		PROP. SINGLE LIGHT
	PROP. BITUMINOUS PAVEMENT		PROP. WALL MOUNTED LIGHT
			EX. TREE
		EV	EV PARKING SPACE



ENLARGED SIDEWALK EASEMENT VIEW

CITY OF ANN ARBOR GENERAL NOTES:

1. ALL SIDEWALKS WITHIN THE CITY SHALL BE KEPT AND MAINTAINED IN GOOD REPAIR BY THE OWNER OF THE LAND ADJACENT TO AND ABUTTING UPON THE SAME. PRIOR TO THE ISSUANCE OF THE FINAL CERTIFICATE OF OCCUPANCY FOR THIS SITE, ALL EXISTING SIDEWALKS IN NEED OF REPAIR MUST BE REPAIRED IN ACCORDANCE WITH CITY STANDARDS.
2. ALL WORK WITHIN THE CITY OF ANN ARBOR COVERED BY THESE PLANS SHALL BE PERFORMED IN COMPLETE CONFORMANCE WITH THE CURRENT CITY OF ANN ARBOR PUBLIC SERVICES DEPARTMENT STANDARD SPECIFICATIONS AND DETAILS.
3. THE OMISSION OF ANY CURRENT STANDARD DETAIL DOES NOT RELIEVE THE CONTRACTOR FROM THIS REQUIREMENT. THE WORK SHALL BE PERFORMED IN COMPLETE CONFORMANCE WITH THE CURRENT PUBLIC SERVICES STANDARD SPECIFICATIONS AND DETAILS.
4. SIDEWALKS CONSTRUCTED IN THE PUBLIC RIGHT-OF-WAY AND/OR PUBLIC PATHS SHALL MEET ALL REQUIREMENTS AND GUIDELINES AS SET FORTH IN THE ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY PUBLISHED AUGUST 8, 2023.
5. STANDARDS FOR ACCESSIBLE DESIGN. SIDEWALK AND CURB RAMP GRADES WILL BE REVIEWED DURING CONSTRUCTION PLAN SUBMITTALS.
6. PAVEMENT MARKINGS DISTURBED DUE TO PAVEMENT CUTS OR CONSTRUCTION RELATED ACTIVITIES SHALL BE REPLACED AS DIRECTED BY ENGINEERING. REPLACEMENT DURING CONSTRUCTION OF THE PROJECT MAY BE CONSIDERED TEMPORARY, WITH FINAL PAVEMENT MARKING RESTORATION TO OCCUR AT THE END OF THE PROJECT.
7. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING PUBLIC ROAD PAVEMENT. DAMAGE TO THE PUBLIC ROAD PAVEMENT DURING THE COURSE OF CONSTRUCTION MAY NECESSITATE MILLING AND RESURFACING OF THE DAMAGED AREAS PRIOR TO ISSUANCE OF THE CERTIFICATE OF OCCUPANCY.

Driveway Requirements for all two-way drive approaches other than single- or two-family

Requirement	Meets Requirement	Waiver Request
Maximum permitted width of 1-way openings: 20 feet	Yes	No
Maximum permitted curb cut width: 60 feet	No	Yes
		Existing Opening - 115.3 feet
		Proposed Opening - 98.5 feet
Minimum turning radius at pavement edge: 5 feet (Outbound)	Yes	No
Minimum turning radius at pavement edge: 5 feet (Inbound)	Yes	No
Maximum turning radius at pavement edge: 15 feet (Outbound)	Yes	No
Maximum turning radius at pavement edge: 15 feet (Inbound)	No	Yes
		Existing Radius - 30.5 feet
		Proposed Radius - 30.5 feet

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

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ATTN: NOAH JACOB

THE CRESCENT
SITE PLAN
DIMENSIONAL LAYOUT PLAN

5

SITE PLAN SUBMITTAL #6 06/13/25

JOB No. **23351**

REVISIONS:	REV. DATE	
PRELIMINARY CITY SUBMITTAL	04/05/24	CADD: CMW
SITE PLAN SUBMITTAL	04/18/24	ENG: CMW
SITE PLAN SUBMITTAL #2	08/14/24	PM: RCW
SITE PLAN SUBMITTAL #3	12/12/24	TECH:
SITE PLAN SUBMITTAL #4	03/28/25	/23351SP01
SITE PLAN SUBMITTAL #5	05/23/25	FB:

DATE: 04/18/24
SHEET 5 OF 35

SCALE: 1" = 60'

0 60 120 180

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

LEGEND

- EXIST. WATER MAIN
- PROP. WATER MAIN
- EXIST. HYDRANT
- PROP. HYDRANT
- EXIST. GATE VALVE IN BOX
- PROP. GATE VALVE IN BOX
- REDUCER

NOTES

1. THIS DRAWING IS BASED ON RECORD UTILITY DRAWINGS.
2. WATER MAIN TO BE ELECTROMAGNETICALLY LOCATED DURING DETAILED CONSTRUCTION PLANS PHASE. EASEMENT SHALL BE DRAWN 40 FEET WIDE CENTERED ON LOCATED WATER MAIN.

WATER MAIN EASEMENT REQUIREMENTS

1. SUBMITTED AS AN 8.5" X 11" PDF WITH AT LEAST ½" MARGINS
2. LABELED AS "EXHIBIT A"
3. USE A FONT SIZE NOT LESS THAN 12 FOR THE LEGAL DESCRIPTION
4. USE UPPER AND LOWERCASE LETTERS
5. USE THE DEGREE SYMBOL (°) IN PLACE OF THE WORD DEGREE
6. BE EXTRACTABLE TEXT(I.E., THE TEXT MUST BE ABLE TO BE CUT AND PASTED FROM MICROSOFT WORD WITHOUT TEXT ERRORS). THIS WILL REQUIRE THE LEGAL DESCRIPTION TO BE CONVERTED TO A PDF, AS OPPOSED TO SCANNED.

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CRANBROOK VILLAGE LIMITED PARTNERSHIP
6735 TELEGRAPH ROAD, SUITE 110
BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

THE CRESCENT

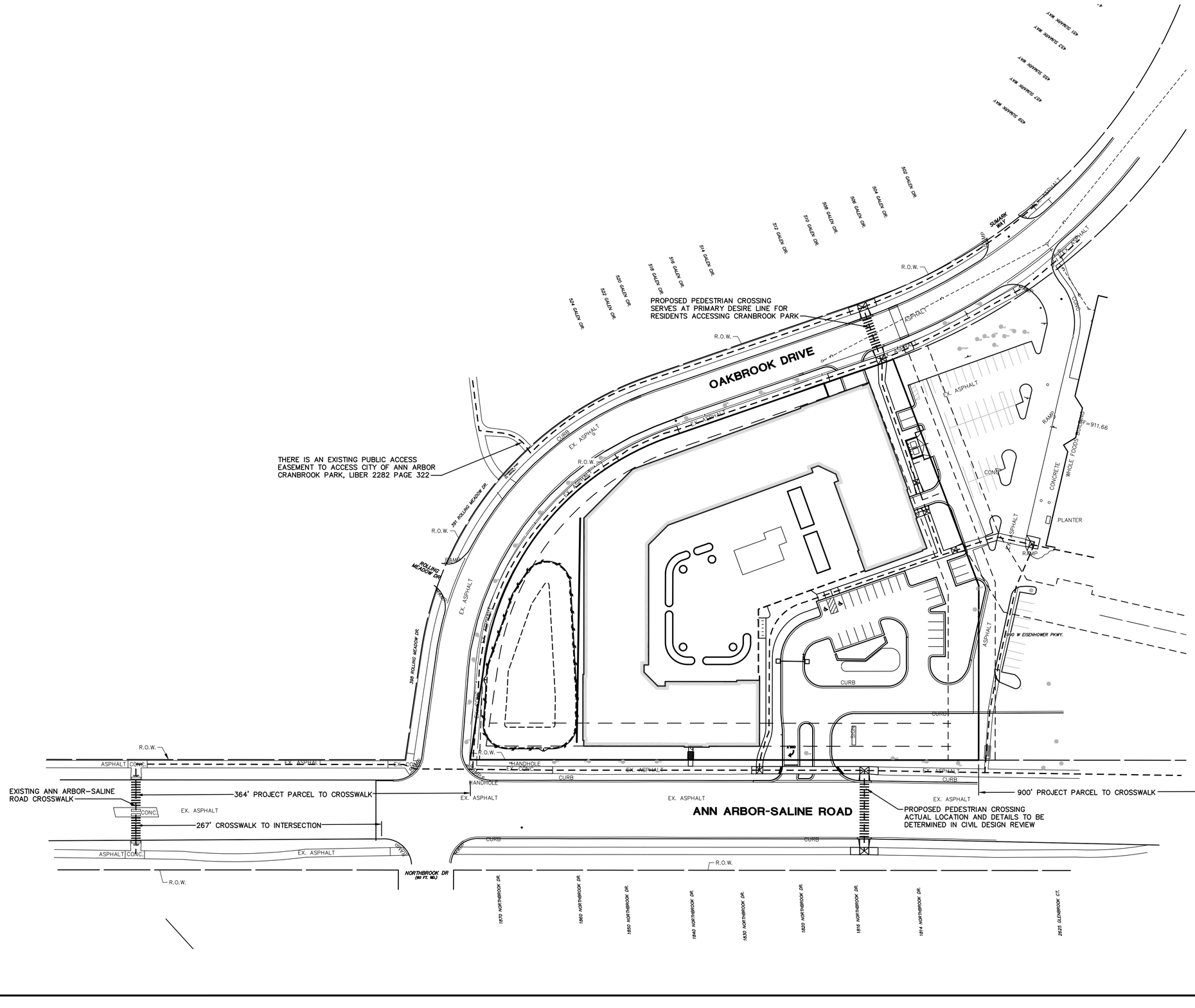
SITE PLAN
WATER EASEMENT PLAN

6

JOB No. 23351

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #4	07/05/25
SITE PLAN SUBMITTAL #5	09/29/25

DATE: 04/18/24
SHEET 6 OF 35
CADD: CMW
ENG: CMW
PM: ROW
TECH:
F:\23351WE\
EBC



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6735 TELEGRAPH ROAD, SUITE 110
BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

THE CRESCENT
SITE PLAN
PEDESTRIAN CIRCULATION PLAN

7

JOB No. 23351

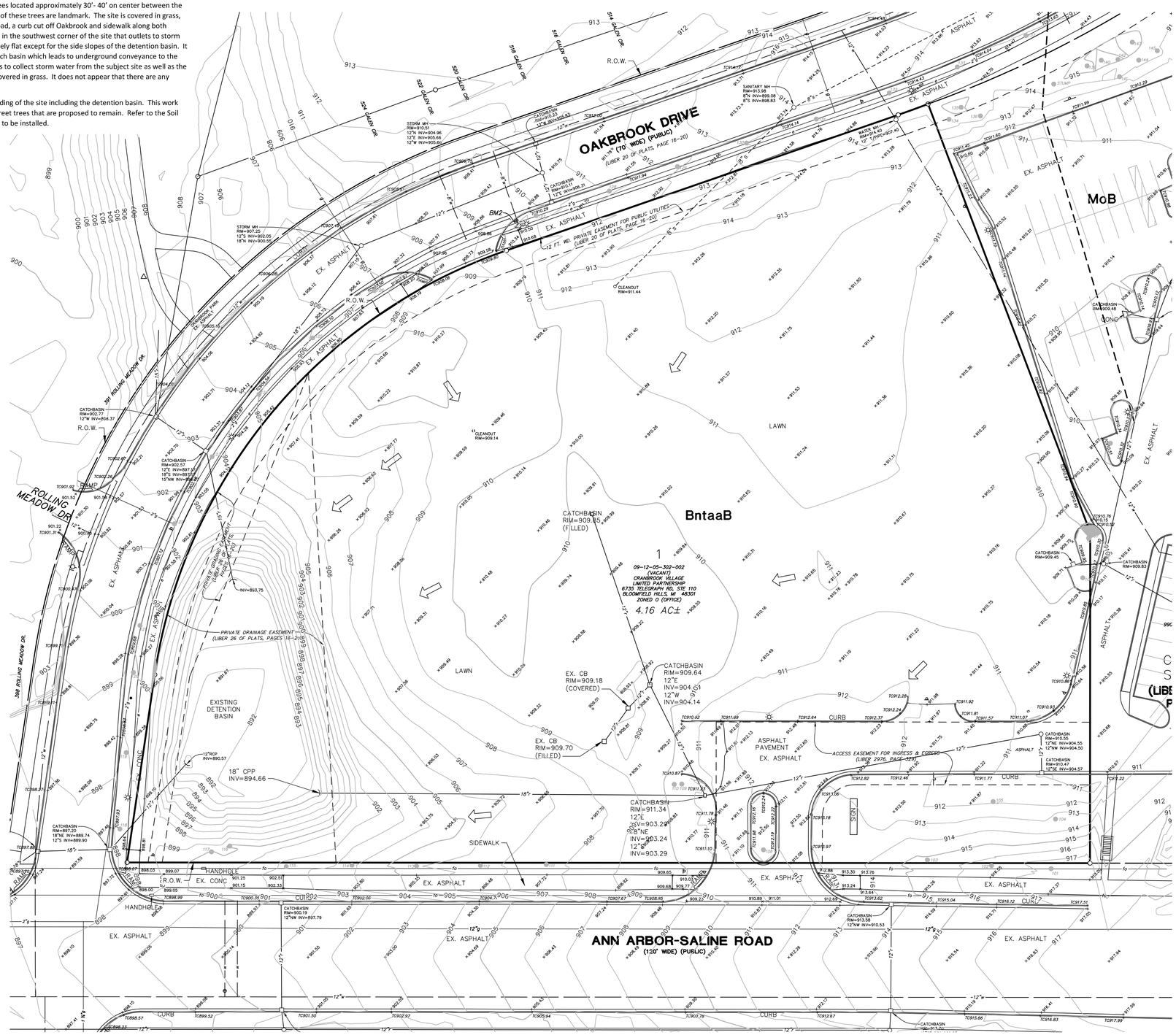
REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	09/12/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25
SITE PLAN SUBMITTAL #6	06/25/25

DATE: 04/18/24
SHEET 7 OF 35
CADD: CMW
ENG: CMW
PM: ROW
TECH:
23351SP02
PB

NATURAL FEATURES ANALYSIS

The subject site is a vacant 4.16 acre site surrounded by paved roadway on the north, west and south sides. The perimeter of the site has street trees located approximately 30'- 40' on center between the back of curb and the right-of-way line. None of these trees are landmark. The site is covered in grass, has one driveway off of Ann Arbor - Saline Road, a curb cut off Oakbrook and sidewalk along both roadways. There is a detention basin located in the southwest corner of the site that outlets to storm sewer in Oakbrook Drive. The parcel is relatively flat except for the side slopes of the detention basin. It appears that drainage flows centrally to a catch basin which leads to underground conveyance to the detention basin. The detention basin appears to collect storm water from the subject site as well as the area adjacent to the east. The basin is also covered in grass. It does not appear that there are any invasive species on the site.

The proposed development anticipates regrading of the site including the detention basin. This work will require tree protection fencing for the street trees that are proposed to remain. Refer to the Soil Erosion Control Plan for protection measures to be installed.



SCALE: 1" = 30'

0 30 60 90

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

LEGEND

- EXIST. ELECTRIC LINE
- EXIST. GAS LINE
- EXIST. GAS VALVE
- EXIST. FIBER OPTIC LINE
- EXIST. WATER MAIN
- PROP. WATER MAIN
- EXIST. HYDRANT
- PROP. HYDRANT
- EXIST. GATE VALVE IN BOX
- PROP. GATE VALVE IN BOX
- EXIST. STORM SEWER
- PROP. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- PROP. CATCH BASIN OR INLET
- PROP. ROOF DRAIN
- END SECTION
- PROP. DOWNSPOUT
- EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
- EXIST. CLEANOUT
- PROP. CLEANOUT

EXISTING TREES

#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	LM	SCORE	INV	RM
101	14"	Maple	Acer spp					
102	2"	Elm	Ulmus spp					
103	15"	Maple	Acer spp					
104	12"	Pine	Pinus spp					X
105	11"	Catalpa	Catalpa speciosa				X	X
106	8"	Locust	Gleditsia spp					
107	10"	Locust	Gleditsia spp					
108	5"	Locust	Gleditsia spp					
109	6"	Catalpa	Catalpa spp				X	X
110	7"	Catalpa	Catalpa spp				X	X
111	15"	Maple	Acer spp					X
112	15"	Maple	Acer spp					
113	13"	Maple	Acer spp					
114	15"	Maple	Acer spp					
115	5"	Maple	Acer spp					
116	12"	Catalpa	Catalpa spp				X	X
117	6"	Catalpa	Catalpa spp	Double			X	X
118	7"	Maple	Acer spp					
119	5"	Maple	Acer spp					
120	4"	Birch	Betula spp.					
121	10"	Locust	Gleditsia spp					
122	9"	Maple	Acer spp					
123	11"	Maple	Acer spp					
124	10"	Maple	Acer spp					
125	9"	Maple	Acer spp					
126	10"	Maple	Acer spp					
127	10"	Maple	Acer spp					
128	7"	Linden	Tilla americana					
129	7"	Maple	Acer spp					
130	11"	Maple	Acer spp					
131	6"	Maple	Acer spp					X
132	10"	Maple	Acer spp					X
133	7"	Maple	Acer spp					X
134	11"	Spruce	Picea spp					X
135	11"	Spruce	Picea spp					X
136	10"	Spruce	Picea spp					X
137	7"	Maple	Acer spp					
138	9"	Maple	Acer spp					
139	12"	Pine	Pinus spp					
140	10"	Pine	Pinus spp					
141	7"	Pine	Pinus spp					
142	10"	Pine	Pinus spp					
143	10"	Maple	Acer spp					
144	12"	Pine	Pinus spp					
145	11"	Pine	Pinus spp					
146	13"	Pine	Pinus spp					

SOIL DESCRIPTIONS

BntaaB – Blount loam, 2 to 6 percent slopes. (97.2% of site)
MoB – Glywood loam, 2 to 6 percent slopes. (2.8% of site)

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BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

THE CRESCENT

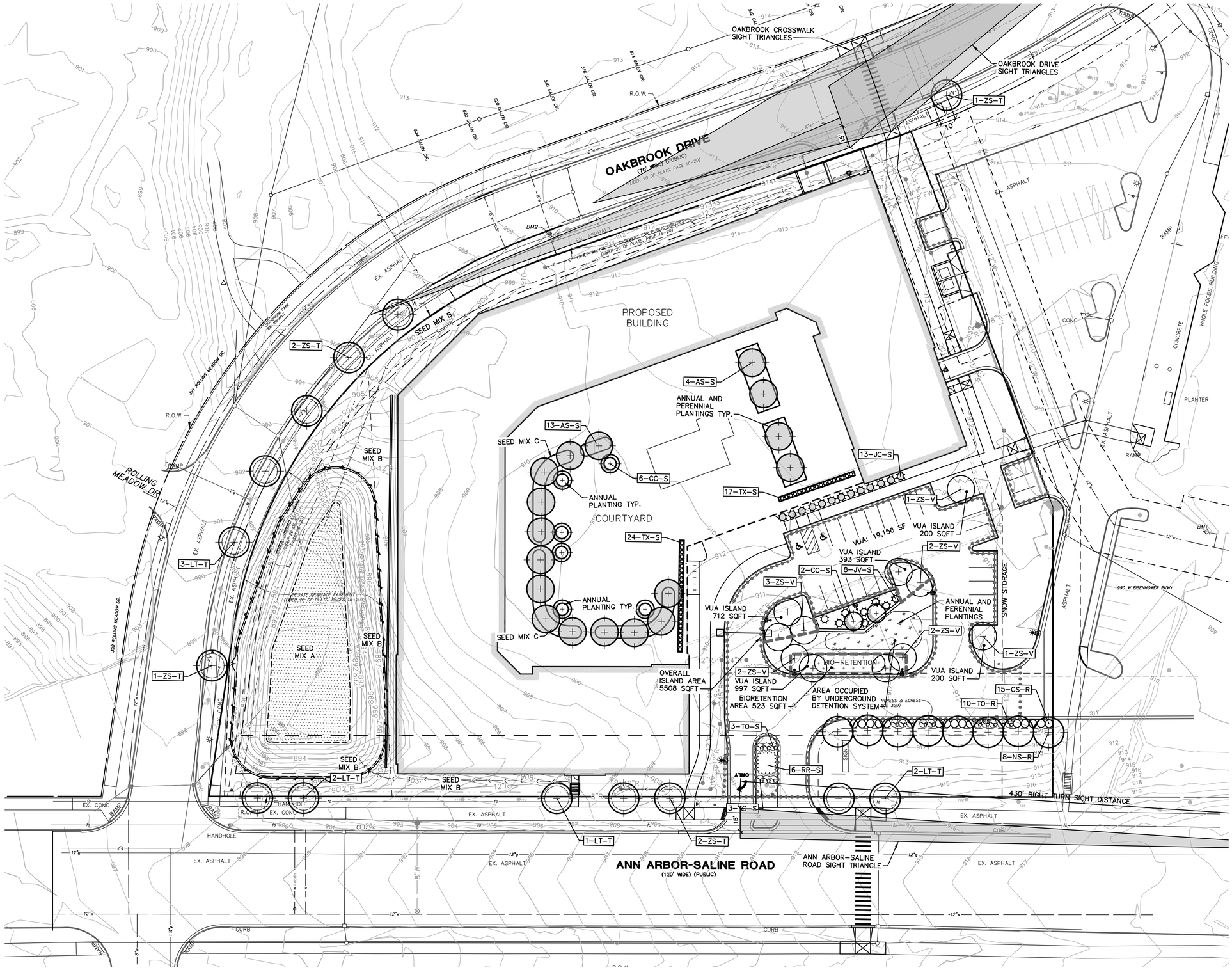
SITE PLAN
NATURAL FEATURES PLAN

8

JOB No. 23351

DATE: 04/18/24
SHEET 8 OF 35
CADD: CMW
ENG: CMW
PM: ROW
TECH:
23351INF01
PB

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	06/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	05/28/25
SITE PLAN SUBMITTAL #5	09/22/25



SCALE: 1" = 30'

0 30 60 90

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

LEGEND

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- EXIST. GAS LINE
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- EXIST. FIBER OPTIC LINE
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- PROP. WATER MAIN
- EXIST. HYDRANT
- PROP. HYDRANT
- EXIST. GATE VALVE IN BOX
- PROP. GATE VALVE IN BOX
- REDUCER
- EXIST. STORM SEWER
- PROP. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- PROP. CATCH BASIN OR INLET
- PROP. ROOF DRAIN
- END SECTION
- PROP. DOWNSPOUT
- EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
- EXIST. CLEANOUT
- PROP. CLEANOUT

LANDSCAPE LEGEND

- PROPOSED ROW SCREENING TREE (-R)
- PROPOSED VUA TREE (-V)
- PROPOSED SITE TREE (-S)
- PROPOSED SITE TREE (-S) (2ND FLOOR COURTYARD)
- PROPOSED STREET TREE (-T)
- PROPOSED VUA SHRUBS (-V)
- PROPOSED VUA SHRUBS (-V)
- PROPOSED EVERGREEN SHRUBS (-S)
- PROPOSED EVERGREEN SHRUBS (-S)
- SEED MIX "A"
- ANNUAL AND PERENNIAL PLANTING
- BIO RETENTION (RAIN GARDEN SEED MIX)
- VEHICULAR USE AREA LIMITS

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ATTN: NOAH JACOB

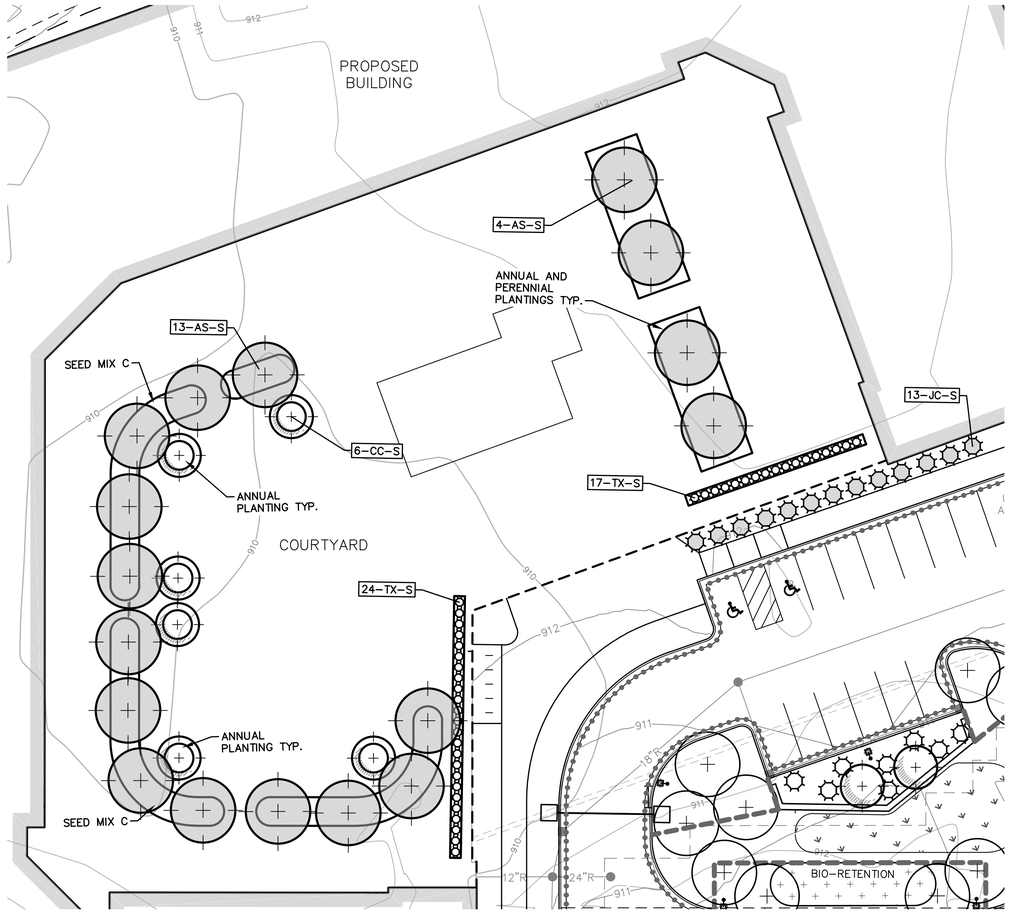
THE CRESCENT
SITE PLAN
LANDSCAPE PLAN

9

JOB No. **23351**

DATE: 04/18/24
SHEET 9 OF 35
CADD:
ENG: CMW
PM: RCW
TECH:
###23351LP01

REVISIONS:	REV. DATE
PRELIMINARY SITE PLAN SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	05/28/25
SITE PLAN SUBMITTAL #5	06/23/25
SITE PLAN SUBMITTAL #6	06/13/25
SITE PLAN SUBMITTAL #7	07/21/25



LEGEND

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LANDSCAPE LEGEND

- PROPOSED ROW SCREENING TREE
- PROPOSED VUA TREE
- PROPOSED CANOPY TREE
- PROPOSED CANOPY TREE (2ND FLOOR COURTYARD)
- PROPOSED VUA SHRUBS
- PROPOSED VUA SHRUBS
- PROPOSED EVERGREEN SHRUBS
- PROPOSED EVERGREEN SHRUBS
- SEED MIX "A"
- VEHICULAR USE AREA LIMITS

SCALE: 1" = 20'

0 20 40 60

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

LANDSCAPE REQUIREMENTS

	Required	Proposed
Right-of-Way Screening		
	10ft when VUA viewed from public ROW 1 tree per 30lf; continuous hedge/screen 30inches in ht 242 ft / 30 = 8 trees	8 Trees Proposed; 25 Shrubs Proposed
Vehicular Use Area		
Interior islands	1:20sf VUA ratio for island, minimum 165 SF per island, 50% required island area as bio-retention Total VUA: 19,156 SF 19,156 SF / 20 = 958 SF Required Islands 958 SF x 50% = 479 SF Required Bio-retention	2,502 SF Proposed 523 SF of Bio-retention Provided
Interior island trees	1 tree per island; 1 tree for every 250 SF of required interior landscape island 958 SF/250 = 4 trees 2,502 SF/250 = 10 trees	11 Trees Proposed
Snow Pile Storage	Identify locations on plan	Identified
Street Trees		
	1 tree per 45lf abutting public street right-of-way; may be satisfied by existing trees 554lf (excluding curb cuts) / 45lf = 13 trees (Ann Arbor Saline Rd) 698lf / 45lf = 16 trees (Oakbrook Drive)	Ann Arbor Saline: 6 Existing to Remain; 7 Proposed Oakbrook: 13 Existing to Remain; 7 Proposed
Street tree canopy loss fee	total dbh removed - caliper replacement trees x $244 per inch (38in - 42in) x $244 = 0	N/A: Proposed street trees provided to replace street trees being removed
Tree Mitigation		
	50% DBH of LM trees removed	N/A
Public Park and Residential Zoning District Buffers		
Where non-residential parcel abuts public park or R zoning district	Min 15' wide strip, one tree for every 15 lf, at least 50% of trees within the buffer will be evergreen, continuous screening 4ft high	N/A: Proposed use is residential
Outdoor Refuse/Recycling		
	6ft high opaque wall or fence when viewed from ROW or adjacent residential use	N/A: Roll out cans stored in building

* When applying for a grading permit, a ROW Street Tree Permit will also be required. There is no cost for this permit. Include the project number on the application. If required, the Canopy Loss Fee will be invoiced through that permit.

PLANT SCHEDULE

	Total	ROW (-R)	VUA (-V)	STREET TREES (-T)	STE (-S)	Code	Scientific Name	Common Name	Root	Size	Spacing	Notes
Deciduous Trees												
	8			8		LT	*Liriendron tulipifera*	Tulip Tree	B&B	3" cal		
	8	8				NS	*Nyssa sylvatica*	Black Gum	B&B	2.5" cal		Single Stem
	11		11			ZS	*Zelkova serrata*	Japanese Zelkova	B&B	2.5" cal		
	6			6		ZS	*Zelkova serrata*	Japanese Zelkova	B&B	3" cal		
Sub Total	**33**	**8**	**11**	**14**	**0**							
Shrubs												
	10	10				TO	*Thuja occidentalis 'Mr. Bowling Ball'*	Mr. Bowling Ball Arborvitae	B&B	30" hgt.		
	15	15				CS	*Cornus sericea 'Kelsey'*	Kelsey's Dwarf Red Twig Dogwood	B&B	30" hgt.		
Sub Total	**25**	**25**	**0**	**0**	**0**							
Perennials												
	6				6	RR	*Rosa 'Radslam'*	Orange Glow Knockout Rose	Cont.	No. 3		
Sub Total	**6**	**0**	**0**	**0**	**6**							
TOTAL												
	64	**33**	**11**	**14**	**6**							

ALL SPECIES DEVIATIONS MUST BE APPROVED IN WRITING BY THE CITY OF ANN ARBOR PRIOR TO INSTALLATION

OPTIONAL PLANT SCHEDULE

	Total	ROW (-R)	VUA (-V)	STREET TREES (-T)	STE (-S)	Code	Scientific Name	Common Name	Root	Size	Spacing	Notes
Deciduous Trees												
	21				21	AS	*Acer saccharum 'Goldspire'*	Goldspire Sugar Maple	B&B	2.5" cal		
	13				13	JC	*Juniperus chinensis 'Blue Point'*	Blue Point Juniper	B&B	4' hgt.		
	10				10	CC	*Cercis Canadensis*	Redbud	B&B	2" Cal.		
Sub Total	**44**	**0**	**0**	**0**	**44**							
Shrubs												
	8				8	JV	*Juniperus virginiana 'Grey Owl'*	Grey Owl Juniper	B&B	30" hgt.		
	41				41	TX	*Taxus x media 'Hicksii'*	Hicks Yew	B&B	30" hgt.		
Sub Total	**49**	**0**	**0**	**0**	**49**							
TOTAL												
	93	**0**	**0**	**0**	**93**							

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THE CRESCENT

SITE PLAN
LANDSCAPE ENLARGEMENTS

10

DATE: 04/18/24
SHEET 10 OF 35
CADD:
ENG: CMW
PM: RCW
TECH:
###23351LP01

REVISIONS:	REV. DATE
SITE PLANS - CITY SUBMITTAL	04/18/24
SITE PLANS SUBMITTAL #1	04/18/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
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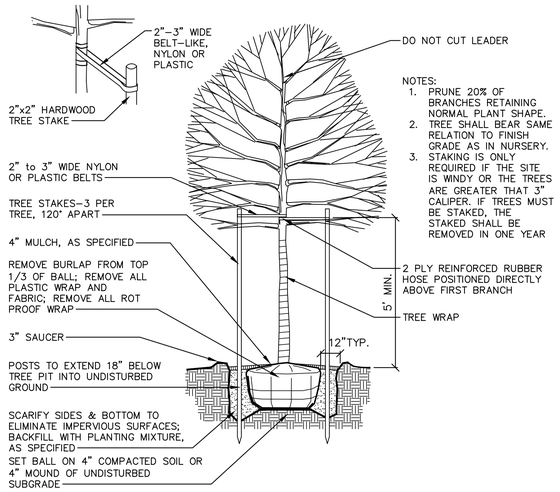
SITE PLAN SUBMITTAL #5	05/23/25
SITE PLAN SUBMITTAL #6	06/13/25
SITE PLAN SUBMITTAL #7	07/21/25

JOB No. 23351

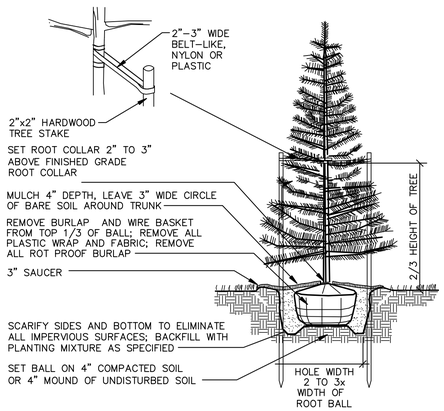
NOTE: REMOVE STAKING/GUYING MATERIAL AFTER ONE YEAR.



DECIDUOUS TREE PLANTING DETAIL

2–1/2" CAL. OR SMALLER
SCALE: NTS

NOTE: REMOVE STAKING/GUYING MATERIAL AFTER ONE YEAR.



EVERGREEN TREE PLANTING DETAIL

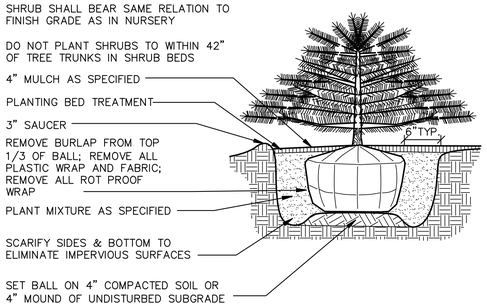
NOT TO SCALE

NOTE:
PRUNE 20% OF BRANCHES AND FOLIAGE RETAINING NORMAL PLANT

SHAPE DO NOT TRIM EVERGREENS

SHRUB SHALL BEAR SAME RELATION TO FINISH GRADE AS IN NURSERY

DO NOT PLANT SHRUBS TO WITHIN 42" OF TREE TRUNKS IN SHRUB BEDS



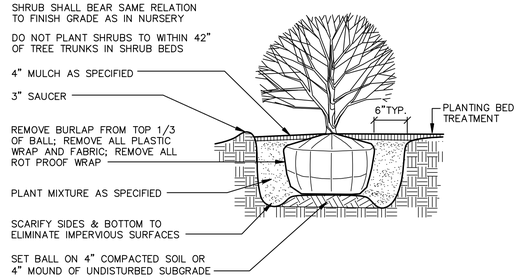
EVERGREEN SHRUB PLANTING DETAIL

NOT TO SCALE

DO NOT TRIM EVERGREENS

SHRUB SHALL BEAR SAME RELATION TO FINISH GRADE AS IN NURSERY

DO NOT PLANT SHRUBS TO WITHIN 42" OF TREE TRUNKS IN SHRUB BEDS



DECIDUOUS SHRUB PLANTING DETAIL

NOT TO SCALE

STORMWATER SEED MIX A

Stormwater Seed Mix

Botanical Name	Common Name	PLS Ounces/Acre
Permanent Grasses/Sedges/Rushes:		
Bolboschoenus fluviatilis	River Bulrush	1.00
Carex cristatella	Crested Oval Sedge	0.50
Carex lurida	Bottlebrush Sedge	3.00
Carex vulpinoidea	Brown Fox Sedge	2.00
Elymus virginicus	Virginia Wild Rye	24.00
Glyceria striata	Fowl Manna Grass	1.00
Juncus effusus	Common Rush	1.00
Leersia oryzoides	Rice Cut Grass	1.00
Panicum virgatum	Switch Grass	2.00
Schoenoplectus tabernaemontani	Great Bulrush	3.00
Scirpus atrovirens	Dark Green Rush	2.00
Scirpus cyperinus	Wool Grass	1.00
	Total	**41.50**
Temporary Cover:		
Avena sativa	Common Oat	512.00
	Total	**512.00**
Forbs & Shrubs:		
Alisma subcordatum	Common Water Plantain	2.50
Asclepias incarnata	Swamp Milkweed	2.00
Bidens spp.	Bidens Species	2.00
Eupatorium perfoliatum	Common Boneset	1.00
Helenium autumnale	Sneezeweed	2.00
Iris virginica v. shrevei	Blue Flag	4.00
Lycopus americanus	Common Water Horehound	0.50
Mimulus ringens	Monkey Flower	1.00
Penthorum sedoides	Ditch Stonecrop	0.50
Persicaria spp.	Pinkweed Species	2.00
Rudbeckia subtomentosa	Sweet Black-Eyed Susan	1.00
Rudbeckia triloba	Brown-Eyed Susan	1.50
Sagittaria latifolia	Common Arrowhead	1.00
Senna hebecarpa	Wild Senna	2.00
Symphyotrichum lanceolatum	Panicled Aster	0.50
Symphyotrichum novae-angliae	New England Aster	0.50
Thalictrum dasycarpum	Purple Meadow Rue	2.00
	Total	**26.00**

LOW PROFILE PRAIRIE SEED MIX B

Low-Profile Prairie Seed Mix

Botanical Name	Common Name	PLS Ounces/Acre
Permanent Grasses:		
Boutelova curtipendula	Side-Oats Grama	16.00
Carex spp.	Prairie Sedge Species	4.00
Elymus canadensis	Canada Wild Rye	32.00
Koeleria macrantha	June Grass	1.00
Panicum virgatum	Switch Grass	1.00
Schizachyrium scoparium	Little Bluestem	36.00
	Total	**90.00**
Temporary Cover:		
Avena sativa	Common Oat	512.00
	Total	**512.00**
Forbs:		
Amorpha canescens	Lead Plant	0.50
Asclepias syriaca	Common Milkweed	2.00
Asclepias tuberosa	Butterfly Weed	2.00
Baptisia alba	White Wild Indigo	2.00
Chamaecrista fasciculata	Partridge Pea	10.00
Coreopsis lanceolata	Sand Coreopsis	5.00
Coreopsis palmata	Prairie Coreopsis	1.00
Dalea candida	White Prairie Clover	1.50
Dalea purpurea	Purple Prairie Clover	1.50
Desmanthus illinoensis	Illinois Sensitive Plant	3.00
Echinacea purpurea	Broad-Leaved Purple Coneflower	8.00
Eryngium yuccifolium	Rattlesnake Master	2.00
Lespedeza capitata	Round-Headed Bush Clover	2.00
Liatris aspera	Rough Blazing Star	0.50
Lupinus perennis v. occidentalis	Wild Lupine	4.00
Monarda fistulosa	Wild Bergamot	0.50
Oligoneuron rigidum	Stiff Goldenrod	1.00
Parthenium integrifolium	Wild Quinine	1.00
Penstemon digitalis	Foxglove Beard Tongue	0.50
Penstemon hirsutus	Hairy Beard Tongue	1.00
Ratibida pinnata	Yellow Coneflower	4.00
Rudbeckia hirta	Black-Eyed Susan	5.00
Rudbeckia subtomentosa	Sweet Black-Eyed Susan	1.00
Silphium terebinthinaceum	Prairie Dock	1.00
Solidago speciosa	Showy Goldenrod	0.50
Symphyotrichum ericoides	Heath Aster	0.25
Symphyotrichum laeve	Smooth Blue Aster	1.00
Symphyotrichum novae-angliae	New England Aster	0.50
Tradescantia ohiensis	Common Spiderwort	1.00
Verbena stricta	Hoary Vervain	1.00
Vernonia gigantea	Smooth Tall Ironweed	1.50
Veronicastrum virginicum	Culver's Root	0.25
	Total	**66.00**

1. For any plant quantity discrepancies between the plan view and the plant schedules, the plant schedule shall take precedence.
2. Plant materials shall be selected and installed in accordance with standards established by City of Ann Arbor.
3. All species deviations from the approved site plan must be approved in writing by the City of Ann Arbor prior to installation.
4. In-ground automatic irrigation shall be provided for all landscaped planting beds. Contractor to provide irrigation shop drawings for review and approval. OR In-ground automatic irrigation shall be provided for all landscaped areas except for the detention basin and naturalized wetland buffer. OR Water outlets shall be provided within 150 feet of all required plantings.
5. All diseased, damaged or dead material shown on the site plan as proposed plantings shall be replaced by the end of the following growing season.
6. Restore disturbed areas with a minimum of four (4) inches of topsoil and then seed/ fertilize/mulch.
7. All disturbed areas not called for planting specifically identified or to be seeded with seed mixes on the Landscape Plan shall be lawn areas. Lawns shall either be sod or seed and seed mix shall meet species composition requirements of MDOT Class 1 Lawn Mixture. Seed shall be installed and stabilized per MDOT standard specifications most current issue. Mulch within 24 hours with two (2) tons of straw per acre, or 71 bales of excelsior mulch per acre. Anchor straw mulch with spray coating of adhesive material applied at the rate of 150 gals. / acre.
   Seed shall be applied at a rate of five pounds (5 lbs) per 1000 sq ft. Mulch within 24 hours with two (2) tons of straw per acre, or 71 bales of excelsior mulch per acre. Anchor straw mulch with spray coating of adhesive material applied at the rate of 150 gals. / acre.
8. After the first growing season, only fertilizers that contain NO phosphorus shall be used on the site.
9. Areas identified on the Landscape Plan with seed mixes shall be seeded with specified seed mixes from Cardno, or equivalent as approved by landscape architect. Temporary cover crop shall be included with all seed mixes. Seeding rates and installation techniques shall be confirmed with supplier.
10. All seeded areas with slopes less than 1:3 (one vertical foot for every 3 horizontal feet) shall be mulched with straw mulch at the rate of two (2) bales per 1,000 square feet. All seeded areas with slopes greater than 1:3 shall be seeded and biodegradable erosion control blanket North American Green SC150, or equivalent, shall be applied with biodegradable stakes.
11. Deciduous plants shall be planted between March 1 and May 15 and from October 1 until the prepared soil becomes frozen. Evergreen plants shall be planted between March 1 and June 1 and from August 15 to September 15.
12. Native seeding areas shall be seeded after May 1, (when soil is free of frost and in workable condition), but before June 15 or after October 1, but before November 30 (or prior to ground freezing) or as approved by Landscape Architect or guaranteed by the supplier. If seeding is performed outside planting window, contractor shall perform regularly scheduled watering for installed seed and as needed based on weather conditions to ensure germination and establishment of seed.
13. All planting beds are to receive four (4) inches of shredded hardwood bark mulch.
14. All trees to be located a minimum of 10 feet from public utilities.
15. All single trunk, deciduous trees shall have a straight and a symmetrical crown with a central leader. One sided trees or those with thin or open crowns shall not be accepted.
16. All evergreen trees shall be branched fully to the ground, symmetrical in shape and have not been sheared in the last three (3) growing seasons.
17. All compacted subgrade soils in proposed landscape areas shall be tilled to a minimum 12-inch depth prior to placement of topsoil, geotextile fabric, or other planting media as specified.
18. Proposed trees will be planted a minimum of 15 feet apart.
19. Topsoil and compost shall meet most recent issue of MDOT standard specifications for Topsoil and Compost.
20. Planting Soil: Existing, in-place or stockpiled topsoil. Supplement with imported topsoil as needed. Verify suitability of existing surface soil to produce viable planting soil. Final approval of soil composition shall be provided by the landscape contractor. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with the following soil amendments to produce planting soil:
    a. Ratio of Loose Compost to Topsoil by Volume: 1:4.
    b. Weight of Lime per 1000 Sq. Ft.: Amend with lime only on recommendation of soil test to adjust soil pH.
    c. Weight of Sulfur or Aluminum Sulfate per 1,000 Sq. Ft.: Amend with sulfur or aluminum sulfate only on recommendation of soil test to adjust soil pH.
    d. Volume of Sand: Amend with sand only on recommendation of Landscape Architect to adjust soil texture.
    e. Weight of Slow-Release Fertilizer per 1,000 Sq. Ft.: Amend with fertilizer only on recommendation of soil test to adjust soil fertility.
21. Native seeding installation shall be performed by a qualified contractor with documented experience of successful established native seeding. Seed shall be installed per manufacturer's specification via hand broadcast
22. At the time of plant and seed delivery for the detention basins, including native seed and live plantings, a Washtenaw County Water Resource Commissioner landscape reviewer must be present. Contact Catie Wytychak at wytychakc@ewashtenaw.org or 734-222-6813 to coordinate.
23. Detention basin and bottom of Bio-retention areas shall be seeded with Wet-Mesic Prairie Mix from Native Connections, or equivalent as approved by landscape architect, as noted on Landscape Plan. Seeding rates and installation techniques shall be confirmed with supplier. Detention basin side slopes and perimeter of Bio-retention areas as noted in Landscape Plan shall be seeded with native grass seed mix below.

Native Grass Seed Mix		
Botanical Name	***Common Name***	***Application***
Andropogon gerardii	Big Blue -Stem	8 oz/acre
Carex vulpinoidea	Fox Sedge	4 oz/acre
Elymus canadensis	Canada Wild Rice	8 oz/acre
Koeleria cristata	Prairie June Grass	1 lbs/acre
Panicum virgatum	Switch Grass	2 lbs/acre
Schizachyrium scoparium	Little Blue Stem	1.5 lbs/acre
Lolium multiflorum	Annual Rye	200 lbs/acre

A bi-annual, mowable, semi-natural, cool-season seed mix suited for basin bottom and side slopes.

24. Snow cannot be pushed onto interior islands unless they are designated on the plan for snow storage. Bio-retention islands can be used for snow storage.
25. Snow storage areas are located along the edges and corners of parking areas as shown on the plan.
26. During the establishment period for the installed deciduous mitigation trees (1-2 years as to be determined by certified arborist):
    a. The trunk of young trees shall be wrapped in late autumn and wrap shall be removed in early spring

Maintenance:

1. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
2. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
3. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.
4. Contractor shall warranty all plant material and trees to remain alive and be in healthy, vigorous and like new condition for the specified period from installation to Substantial Completion. The entire Landscaping Project, including but not limited to: plants (perennials), trees, shrubs, mulches, shrubs, etc are to be under Warranty for One Year after SubstaWntial Completion date of the Project. At the end of the specified One Year Warranty period the Owner's Representative will inspect plant material for compliance. Contractor shall replace, in accordance with the drawings and specifications, all plants, trees, shrubs, etc or as determined by the Owner's Representative, are in an unhealthy or unsightly condition. Warranty shall not include damage or loss of plants, trees, and shrubs caused by fires, floods, freezing rains, lightning storms, or winds over 75 miles per hour, acts of vandalism or negligence on the part of the owner, or any other incident beyond landscape contractor's control.
5. Watering: The contractor shall keep seed moist for optimum plant growth (1" of total water per week, including rainfall) until the grass and/or flowers are four (4) inches high typical.
6. Protection from traffic and erosion in newly seeded areas is the responsibility of the contractor. Safety fences and/or silt fence with appropriate signage may be used at the contractor's expense until the grasses and flowers are fully established.
7. Erosion shall be repaired by the contractor.
8. Native seeding installation areas shall meet the following criteria as determined by Owner:
    a. The contractor shall review native seed sources with owner prior to ordering and shall submit an invoice following purchase and delivery of the seed.
    b. Establishment of a dense stand of perennial grasses and/or flowers as specified is the responsibility of the contractor. Any part of the area that fails to show a uniform germination (80% for Native Planting Areas) shall be re-seeded, and such re-seeding shall continue until a dense planting in these areas is established
    c. Bare spots over three (3) percent of the area or greater than one (1) square foot in size will not be allowed, unless otherwise approved by the owner.
    d. Initial mowing of the native planting areas (using flail mower) shall occur after one season of growth when the weeds are ten (10) inches high or prior to invasive weeds setting seed. Mowed height shall be 5". Weeds on slopes 3:1 or greater shall be mowed with a hand-held flail mower or common weed whacker.
    e. Provisional Acceptance: By the end of the first full growing season, 20% of the native species seeded and 80% total cover shall be established as determined by the Owner.
    f. Second Year Acceptance: By the end of the second growing season, 40% of the native species seeded and 90% total cover shall be established as determined by the Owner.
9. Long-term maintenance of the bio-retention island and rain garden shall be performed by the Owner. Maintenance shall include seasonal trimming and removal of dead foliage, removal of weeds, and removal or mulching of leaves and stems. Spot treatment/removal of invasive weeds may be necessary if localized areas become dominated by invasive weeds. Bio-retention island shall be inspected by owner following any storm event exceeding 1". Trash and debris shall be removed as needed. Shredded hardwood mulch must be re-spread when erosion is evident and be replenished annually. Once every 2 to 3 years, the entire bio-retention/rain garden area may require mulch replacement.
10. Turf installations shall meet the following criteria as determined by Owner:
    a. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
    b. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
    c. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

Native Landscape Maintenance

1. Native seeding areas shall be maintained by contractor for three years after installation to promote establishment of native vegetation and reduce weeds and invasive species. Contractor is responsible for obtaining any necessary permits for herbicide applications. All herbicide applied to native areas shall be suitable for aquatic environments.
2. During the first growing season, the seeded areas shall be mowed monthly to a height of 4 to 6 inches when vegetation reaches 10 to 12 inches in height through September.
   Annual invasive weeds such as crabgrass, purple knapweed, purple loosestrife, yellow or white sweet clover, black medic or other invasive plants shall be spot controlled with herbicide. Do not hand pull invasive weeds during first growing season.
3. During the second growing season, the seeded areas shall be mowed approximately every month to a height of 8 inches when vegetation reaches 12 to 18 inches.
   Annual invasive weeds noted above shall be spot controlled with or hand pulled as appropriate.
4. During the third growing season, the seeded area shall be mowed to 4 inches in height during early spring (between February and April) and raked to remove clippings.
   Annual invasive weeds noted above shall be spot controlled with herbicide appropriate or hand pulled as appropriate.
5. Long-term maintenance of the native seeded areas and detention basin shall be performed by the Owner. Maintenance shall include mowing to 4 inches in height during early spring (between February and April) and raking to remove clippings. Spot treatment/removal of invasive weeds may be necessary if localized areas become dominated by invasive weeds.

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

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BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

THE CRESCENT

SITE PLAN
LANDSCAPE DETAILS

11

JOB No. 23351

REVISIONS:	REV. DATE
PRELIMINARY SITE SUBMITTAL	04/16/24
SITE PLAN SUBMITTAL #1	04/16/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	05/26/25
SITE PLAN SUBMITTAL #5	06/25/25

DATE:
SHEET 11 OF 35
CADD:
ENG: CMW
PM: RCW
TECH:
FB: 23351LP01

Sanitary Sewer Mitigation Calculation

Units

0-600 square foot apartment units (175 gpd)
38 (A1) = 38

601-1200 square foot apartment units (250 gpd)
119 (B1) + 10 (B2) + 21 (B3) + 5 (B4) + 5 (B5) + 4 (B6) + 5 (C2) + 4 (C3) + 5 (C4) + 5 (C5) + 5 (C6) + 5 (C7) = 193

1200+ square foot apartment units (300 gpd)
26 (C1) + 5 (D1) = 31

Clubhouse Area (Country Club - .30 gpd/sft)
3,544 sft

Swimming Pool (20 gpd/capita)
Max Occupancy: 19 occupants

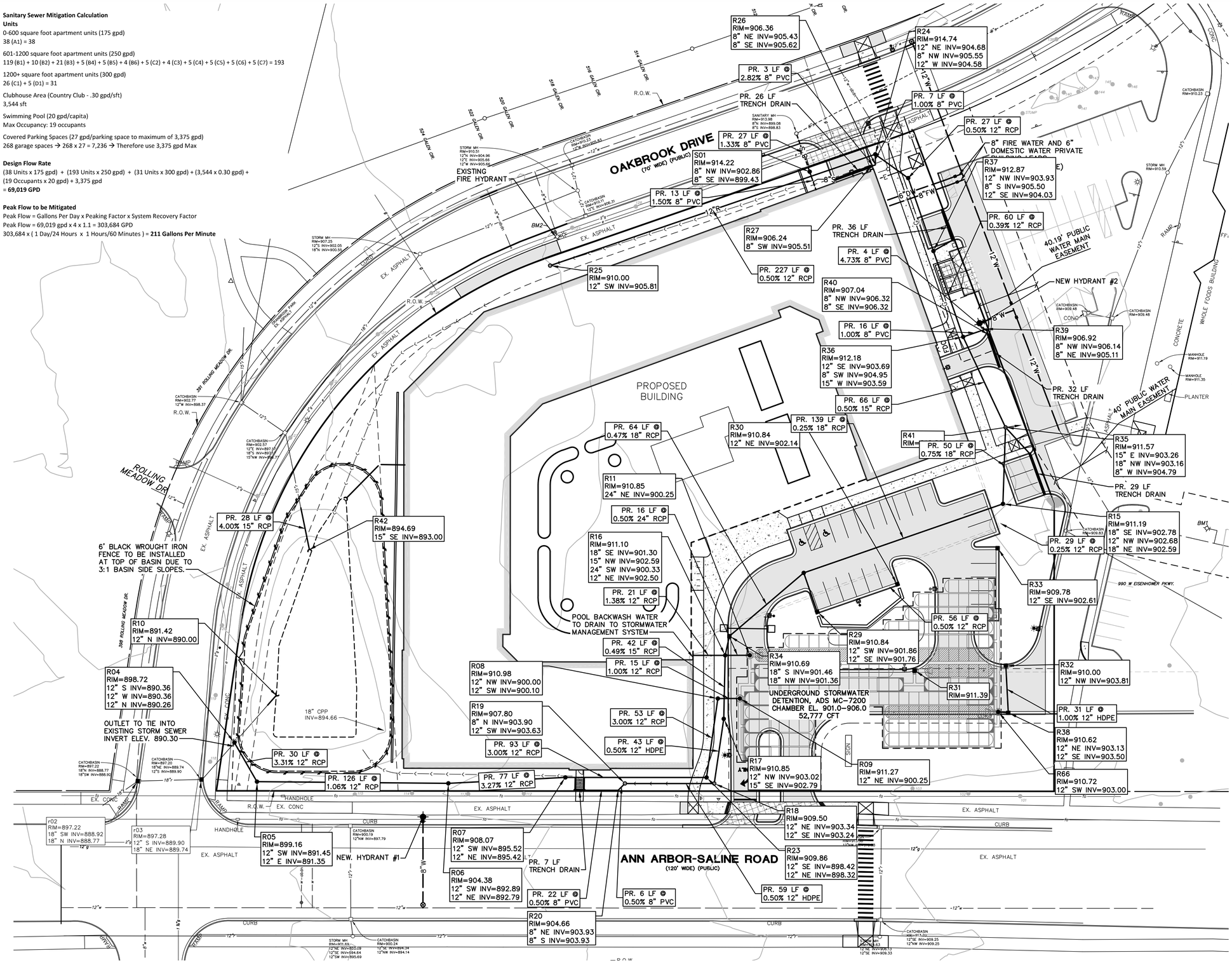
Covered Parking Spaces (27 gpd/parking space to maximum of 3,375 gpd)
268 garage spaces → 268 x 27 = 7,236 → Therefore use 3,375 gpd Max

Design Flow Rate

(38 Units x 175 gpd) + (193 Units x 250 gpd) + (31 Units x 300 gpd) + (3,544 x 0.30 gpd) + (19 Occupants x 20 gpd) + 3,375 gpd
= **69,019 GPD**

Peak Flow to be Mitigated

Peak Flow = Gallons Per Day x Peaking Factor x System Recovery Factor
Peak Flow = 69,019 gpd x 4 x 1.1 = 303,684 GPD
303,684 x (1 Day/24 Hours x 1 Hours/60 Minutes) = **211 Gallons Per Minute**



LEGEND

- EXIST. LIGHT POLE
- EXIST. ELECTRIC LINE
- EXIST. GAS LINE
- EXIST. GAS VALVE
- EXIST. FIBER OPTIC LINE
- EXIST. WATER MAIN
- PROP. WATER MAIN
- EXIST. HYDRANT
- PROP. HYDRANT
- EXIST. GATE VALVE IN WELL
- PROP. GATE VALVE IN WELL
- EXIST. GATE VALVE IN BOX
- PROP. GATE VALVE IN BOX
- REDUCER
- EXIST. STORM SEWER
- PROP. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- PROP. CATCH BASIN OR INLET
- PROP. TRENCH DRAIN
- PROP. ROOF DRAIN
- END SECTION
- PROP. DOWNSPOUT
- EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
- EXIST. CLEANOUT
- PROP. CLEANOUT
- SIGN
- PROPOSED LIGHT
- SIDEWALK LEVEL LANDING

NOTES

1. DOMESTIC WATER AND FIRE SUPPRESSION WATER SERVICES ARE TO TAP INTO THE PROPOSED 12" WATER MAIN IN THE LOT SOUTH OF THE PROPOSED BUILDING.
2. THE SANITARY LEAD WILL TAP INTO THE EXISTING STRUCTURE LOCATED IN OAKBROOK DRIVE EAST OF THE PROPOSED BUILDING.
3. NO PART OF ANY PRIVATE TRENCH DRAIN OR STORM SYSTEM SHALL BE LOCATED IN THE PUBLIC RIGHT OF WAY.
4. THERE WILL BE NO FIRE WALLS WITHIN THE BUILDING.
5. POOL BACKWASH WILL BE DECHLORINATED PRIOR TO BEING DISCHARGED TO THE STORMWATER DETENTION SYSTEM.

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

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ATTN: NOAH JACOB

THE CRESCENT

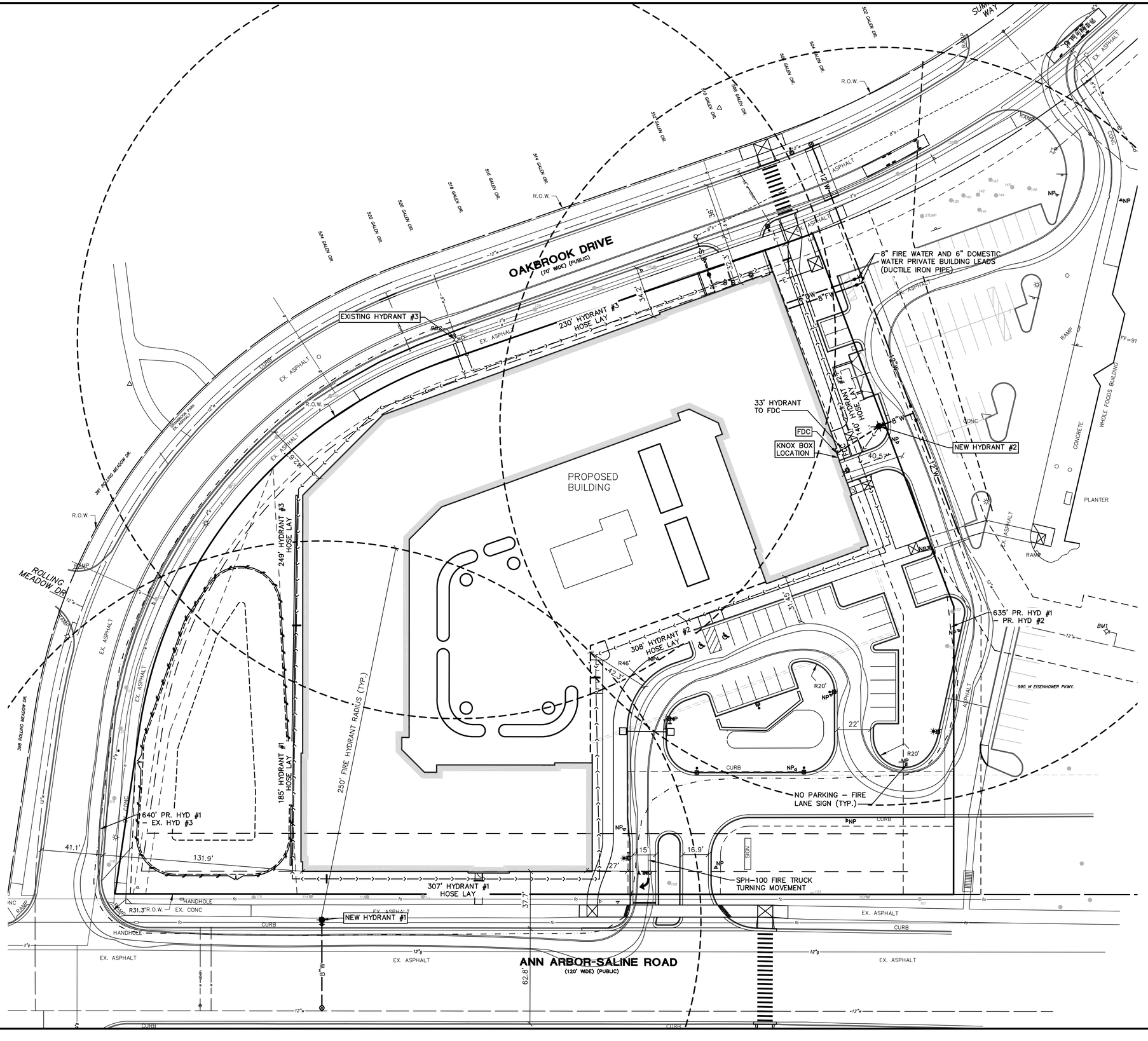
SITE PLAN
SITE UTILITY PLAN

12

DATE: 04/18/24
SHEET 12 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
FB:

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL	06/14/24
SITE PLAN SUBMITTAL #2	12/12/24
SITE PLAN SUBMITTAL #3	05/28/25
SITE PLAN SUBMITTAL #4	07/22/25
SITE PLAN SUBMITTAL #5	

JOB No. 23351



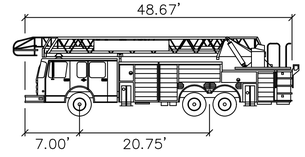
SCALE: 1" = 30'

0 30 60 90

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

LEGEND

- EXIST. UTILITY POLE
- EXIST. OVERHEAD UTILITY LINE
- EXIST. LIGHT POLE
- EXIST. WATER MAIN
- PROP. WATER MAIN
- EXIST. HYDRANT
- PROP. HYDRANT
- EXIST. GATE VALVE IN BOX
- PROP. GATE VALVE IN BOX
- EXIST. GATE VALVE IN WELL
- PROP. GATE VALVE IN WELL
- EXIST. CURB STOP & BOX
- PROP. CURB STOP & BOX
- EXIST. BLOW-OFF
- PROP. BLOW-OFF
- 50' FIRE HOSE LAY LENGTHS
- FIRE HYDRANT 250' COVERAGE RADIUS
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- FCC FIRE COMMAND CENTER
- KB KNOX BOX
- NP NO PARKING – FIRE LANE SIGN



AA FIRE TRUCK

Width	: 10.00'
Track	: 8.00'
Lock to Lock Time	: 6.0
Steering Angle	: 29.1°

NOTES

1. PROJECT SHALL COMPLY WITH 2015 INTERNATIONAL FIRE CODE (IFC)
2. PROJECT SAHLL COMPLY WITH CITY OF ANN ARBOR FIRE PROTECTION REQUIREMENTS.
3. ALL EXTERIOR WALLS OF BUILDING ARE WITHIN 150' OF PAVED PARKING LOT DRIVES DESIGNED TO HANDLE THE WEIGHT OF A FIRE TRUCK.
4. ALL EXTERIOR WALLS OF THE BUILDING FALL WITHIN A 400' HOSE LAY OF A FIRE HYDRANT.
5. RADIAL CURB DIMENSIONS ARE TO BACK OF CURB. DRIVE WIDTH DIMENSIONS ARE TO THE FACE OF CURB OR EDGE OF PAVEMENT WHERE NO CURB IS PRESENT.
6. FDC LOCATION NOT YET DETERMINED, TO BE LOCATED WITHIN 100 FEET OF A HYDRANT LOCATION.
7. STORAGE AREA FOR CONSTRUCTION MATERIALS SHALL NOT INTERFERE WITH FIRE/EMERGENCY SITE ACCESS.
8. HYDRANTS PROVIDING PROTECTION COVERAGE FOR THE BUILDING SHALL BE IN SERVICE AND APPROVED BY BOTH ENGINEERING AND FIRE DEPARTMENT BEFORE FIRE DEPARTMENT WILL SUPPORT PERMIT ISSUANCE FOR NEW CONSTRUCTION PHASE AND BEFORE COMBUSTIBLE MATERIAL ARE PLACED ON THE JOB SITE.
9. "NO PARKING – FIRE LANE" SIGNAGE SHALL BE PLACED IN AREAS WERE A PARKED OR STOPPED VEHICLE WOULD NARROW THE FIRE LANE ACCESS TO LESS THAN A 20' WIDTH. IFC 2015 503.3
10. EMERGENCY RESPONDER RADIO COVERAGE MUST MEET REQUIREMENTS AS SPECIFIED IN THE IFC SECTION 510.

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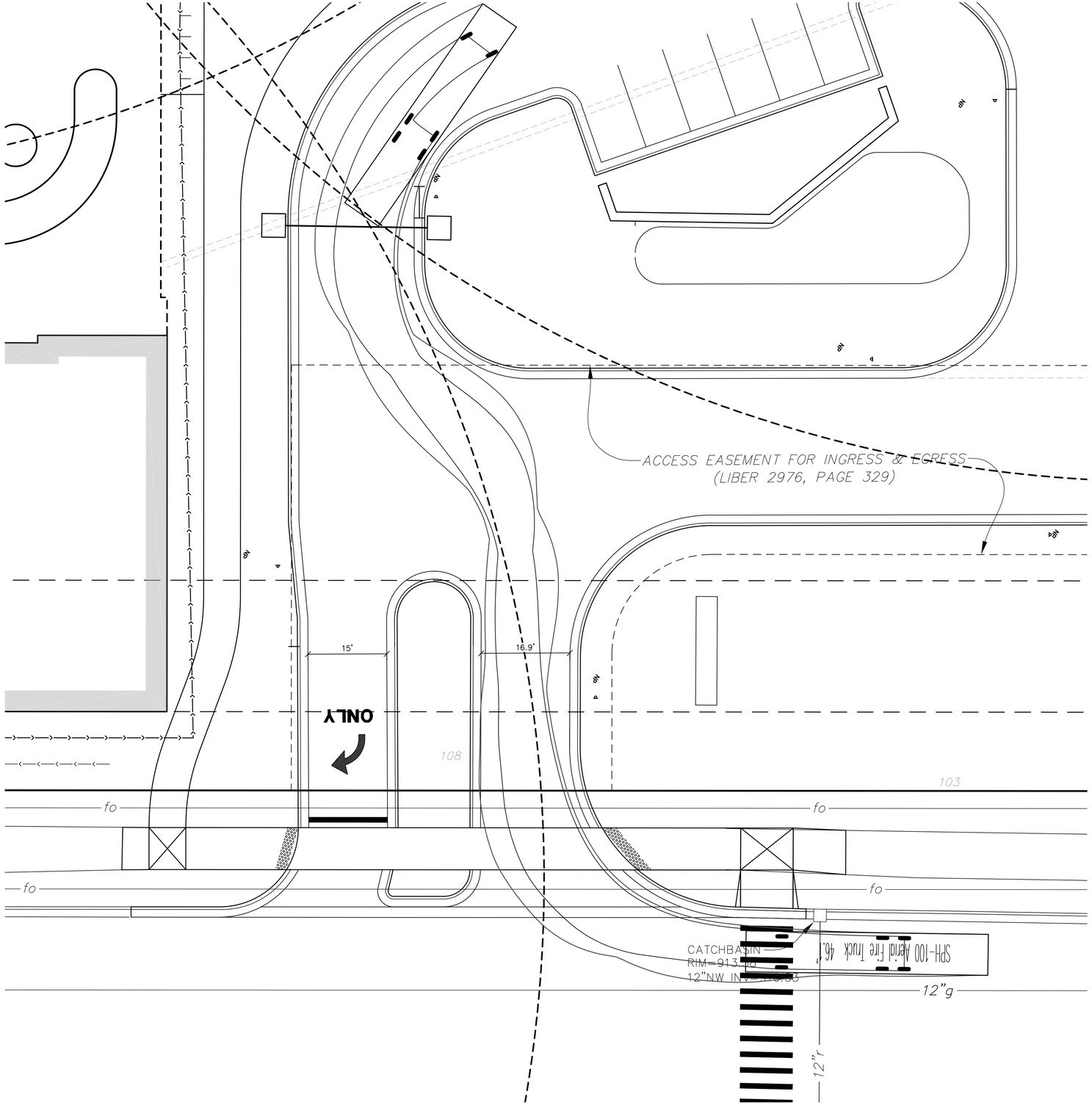
THE CRESCENT
SITE PLAN
FIRE PROTECTION PLAN

13

DATE: 04/18/24
SHEET 13 OF 35
CADD: CMW
ENG.: CMW
PM.: RCW
TECH:
F:\23351\FP01
FB:

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	06/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/22/25

JOB No. 23351



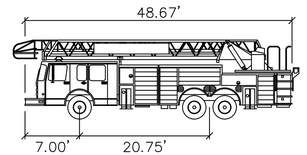
SCALE: 1" = 10'

0 10 20 30

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

LEGEND

U.P.	EXIST. UTILITY POLE
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
W	EXIST. WATER MAIN
W	PROP. WATER MAIN
	EXIST. HYDRANT
	PROP. HYDRANT
	EXIST. GATE VALVE IN BOX
	PROP. GATE VALVE IN BOX
	EXIST. GATE VALVE IN WELL
	PROP. GATE VALVE IN WELL
	EXIST. CURB STOP & BOX
	PROP. CURB STOP & BOX
	EXIST. BLOW-OFF
	PROP. BLOW-OFF
50'	FIRE HOSE LAY LENGTHS
	FIRE HYDRANT 250' COVERAGE RADIUS
	FIRE HYDRANT
	FIRE DEPARTMENT CONNECTION
FCC	FIRE COMMAND CENTER
KB	KNOX BOX
NP	NO PARKING – FIRE LANE SIGN



AA FIRE TRUCK

Width	: 10.00'
Track	: 8.00'
Lock to Lock Time	: 6.0
Steering Angle	: 29.1°

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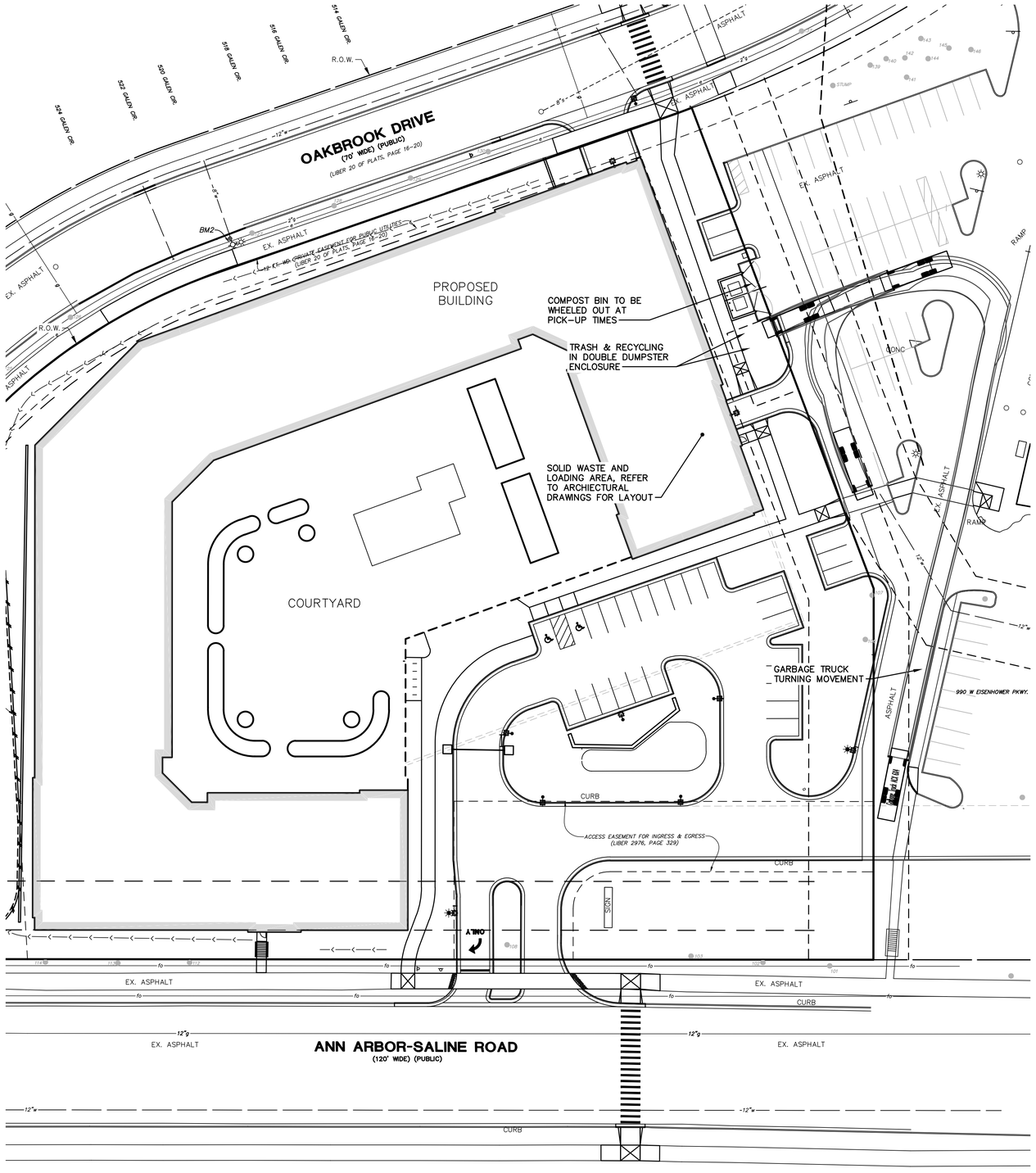
THE CRESCENT
SITE PLAN
FIRE TRUCK ANN ARBOR-SALINE ENTRANCE

13.1

JOB No. **23351**

DATE: 04/16/24
SHEET 13.1 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
23351FP01
FB:

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #4	01/17/25
SITE PLAN SUBMITTAL #5	05/23/25



1. MAINTAIN A CLEAR SPACE DIRECTLY IN FRONT OF THE SOLID WASTE ENCLOSURE. THE CLEAR SPACE SHALL BE A MINIMUM OF FIFTY (50) FEET LONG BY THE WIDTH OF THE INSIDE DIMENSION (I.D.) OF THE ENCLOSURE WALLS PLUS FOUR (4) FEET ON EACH SIDE. A MINIMUM VERTICAL CLEARANCE OF AT LEAST TWENTY-FIVE (25) FEET MUST BE PROVIDED ABOVE THIS AREA.
2. INGRESS AND EGRESS ROUTES MUST BE DEVELOPED BASED ON SOLID WASTE SWEPT PATH REQUIREMENTS PER SD-SW-4. A MINIMUM HORIZONTAL CLEARANCE OF FOUR (4) FEET FROM THE EDGE OF THE SWEPT PATH AND A MINIMUM VERTICAL CLEARANCE OF AT LEAST FIFTEEN (15) FEET MUST BE PROVIDED ALONG THE ENTIRE SOLID WASTE COLLECTION ROUTE.
3. PROVIDE TEN (10) FEET MINIMUM HORIZONTAL CLEARANCE FROM SOLID WASTE ENCLOSURE TO MAJOR ELECTRICAL EQUIPMENT, ABOVE GROUND UTILITY SERVICES, AND EDGE OF OVERHEAD OBSTRUCTIONS SUCH AS TREE BRANCHES, BALCONIES, AND OVERHANGS.
4. IF FORWARD ACCESS TO THE PUBLIC STREET IS NOT AVAILABLE FOR THE SOLID WASTE VEHICLE, THE SITE DEVELOPMENT LAYOUT MUST ACCOMMODATE A TURN-AROUND LOCATION MEETING REQUIREMENTS WITHIN SOLID WASTE REFERENCE SPECIFIC TURN-AROUND DETAIL (SD-SW-5) AND ACCEPTABLE TO THE PSAA.
5. FOR SITES THAT CANNOT ACCOMMODATE A TURN-AROUND, THE FOLLOWING ADDITIONAL REQUIREMENTS MUST BE MET:
   - 5.1. SOLID WASTE VEHICLES MUST BE ABLE TO SERVICE DUMPSTERS WITHOUT IMPEDING THE PUBLIC STREET OR SIDEWALK.
   - 5.2. THE COLLECTION LOCATION SHALL BE CLEARLY DELINEATED AND NOT HAVE A SLOPE GREATER THAN 2% IN ANY DIRECTION.
   - 5.3. BOLLARDS OR ADEQUATE CLEAR SPACE MUST BE PROVIDED BEHIND THE LIFT POINT SO THE DUMPSTERS ARE NOT PUSHED INTO ANY BUILDING OR ACCESS ROUTE.
   - 5.4. ALL SWEPT-PATH CLEARANCE AND VERTICAL CLEARANCE REQUIREMENTS PREVIOUSLY IDENTIFIED SHALL BE PROVIDED.
   - 5.5. SOLID WASTE VEHICLE BACK-UP DISTANCES MUST BE LESS THAN 30' ALONG SERVICING ROUTE.
6. GATES ON BIN ENCLOSURES SHALL OPEN A MINIMUM OF 120 DEGREES FROM THE CLOSED POSITION. THE GATES SHALL NOT IMPEDE ON THE REQUIRED BIN ENCLOSURE OPENING WIDTH, SHALL NOT BLOCK ADJACENT PARKING SPOTS, AND NOT BE IMPEDED BY ADJACENT CURBS OR LANDSCAPING.
7. GATES SHALL BE DESIGNED TO BE FREE STANDING WITHOUT CENTER POLE DESIGN. IF CENTER POLE DESIGN IS NECESSARY, 12 INCHES SHALL BE ADDED TO THE MINIMUM INTERIOR WIDTH OF THE ENCLOSURE.
8. GATE DESIGN SHALL INCLUDE A RELIABLE MEANS TO SECURE THE DOOR IN BOTH THE OPEN AND CLOSED POSITIONS.

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www.a2gov.org

REV. NO.	DATE	DRAWN BY	CHECKED BY

SOLID WASTE GENERAL NOTES

DR. ENG	CH. ENG	DRAWING NO.
SCALE N.T.S.	DATE 12/8/2023	SD-SW-6A

9. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF NO PARKING SIGNS ALONG THE SOLID WASTE INGRESS/EGRESS ROUTE TO ENSURE THE ROUTE REMAINS FREE OF VEHICLES.
10. REFER TO ASSOCIATED STANDARD DETAILS SD-SW-1 AND SD-SW-2 FOR REQUIREMENTS ON SINGLE AND DOUBLE WIDE SOLID WASTE BIN ENCLOSURE LAYOUT AND DESIGN CRITERIA. THE CITY SHALL HAVE THE ABILITY TO MODIFY OR INTERPRET THESE DETAILS AS NECESSARY TO ACCOMMODATE THE CITY OR CITY CONTRACTOR'S NEEDS FOR SOLID WASTE PICK-UP.
11. SOLID WASTE EQUIPMENT ACCESS ROADS AND SERVICE AREA SURFACES SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF COLLECTION VEHICLES WEIGHING UP TO 66,000 LBS GROSS VEHICLE WEIGHT (GVW) AND SHALL BE PROVIDED WITH AN APPROVED SURFACE SO AS TO PROVIDE ALL WEATHER DRIVING CAPABILITIES. PROPERTY OWNER SHALL BE RESPONSIBLE FOR ALL SNOW AND ICE REMOVAL REQUIRED FOR SAFE ACCESS.
12. FOR SITES THAT CANNOT ACCOMMODATE A STANDARD DUMPSTER ENCLOSURE, THE DUMPSTERS MAY BE ROLLED OUT OF A BUILDING OR ALTERNATE ENCLOSURE BY THE PROPERTY OWNER TO AN APPROVED COLLECTION LOCATION.
13. SOLID WASTE COLLECTION LOCATIONS MUST BE LOCATED WITHIN THE BOUNDARIES OF THE PROPERTY UNLESS AN APPROPRIATE EASEMENT IS OBTAINED.

CITY OF ANN ARBOR
PUBLIC SERVICES
301 EAST HURON STREET
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ANN ARBOR, MI 48107-8647
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REV. NO.	DATE	DRAWN BY	CHECKED BY

SOLID WASTE GENERAL NOTES

DR. ENG	CH. ENG	DRAWING NO.
SCALE N.T.S.	DATE 12/8/2023	SD-SW-6B

SCALE: 1" = 30'

0 30 60 90

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

Solid Waste and Recycling Generation
Proposed Residential Building

Building	Units	Generation per Day	Units
2525 Ann Arbor-Saline Rd.	262		7.5 lb/hhld/day*
			1965 total lb/day
		13755 lb/wk	
Recycling	35%	4814 lb/wk	6.88 cyd/wk
Trash	65%	8941 lb/wk	12.77 cyd/wk
Recycling	40%	6740 lb/wk	9.63 cyd/wk
Trash	Peak Factor	12517 lb/wk	17.88 cyd/wk

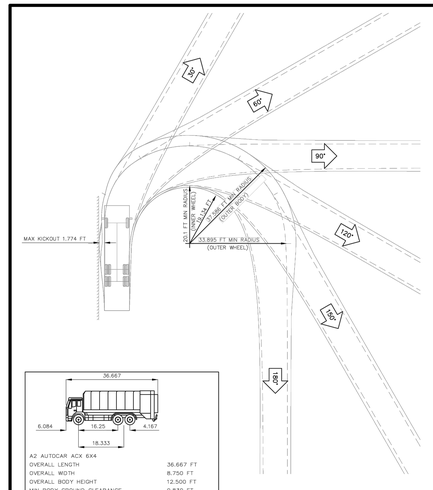
* CalRecycle lists a range of 4.0-8.6 lbs/hhld/day from various sources
https://www2.calrecycle.ca.gov/wastecharacterization/general/rates

Conversion Factor		
1 CY =	700	*lbs/cyd - USEPA*

		Container Requirements	
Container Requirements	Lb	Trash	Recycling
4 cyd Container	2,800	4.47	2.41
6 cyd Container	4,200	2.98	1.60
8 cyd Container	5,600	2.24	1.20

Option 1: 6 cyd trash (3 times/week) + 6 cyd recycling (2 times/week)
Option 2: 4 cyd trash (5 times/week) + 4 cyd recycling (3 times/week)
Option 3: 2x6 cyd trash + 1x6 cyd recycling, twice a week

Container Sizes	Dimensions
4 cyd Container	70" X 50" X 61"
6 cyd Container	72" X 68" X 70"
8 cyd Container	82" X 82" X 74"



A2 AUTOCAR ACX 6X4

OVERALL LENGTH	36.667 FT
OVERALL WIDTH	8.750 FT
OVERALL BODY HEIGHT	12.500 FT
MIN BODY GROUND CLEARANCE	0.830 FT
MAX TRACK WIDTH	8.417 FT
LOCK-TO-LOCK TIME	6.00 S
CURB TO CURB TURNING RADIUS	33.895 FT

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REV. NO.	DATE	DRAWN BY	CHECKED BY

SWEPT PATH REQUIREMENTS FOR FRONT LOAD SOLID WASTE VEHICLE

DR. ENG	CH. ENG	DRAWING NO.
SCALE N.T.S.	DATE 12/8/2023	SD-SW-4

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

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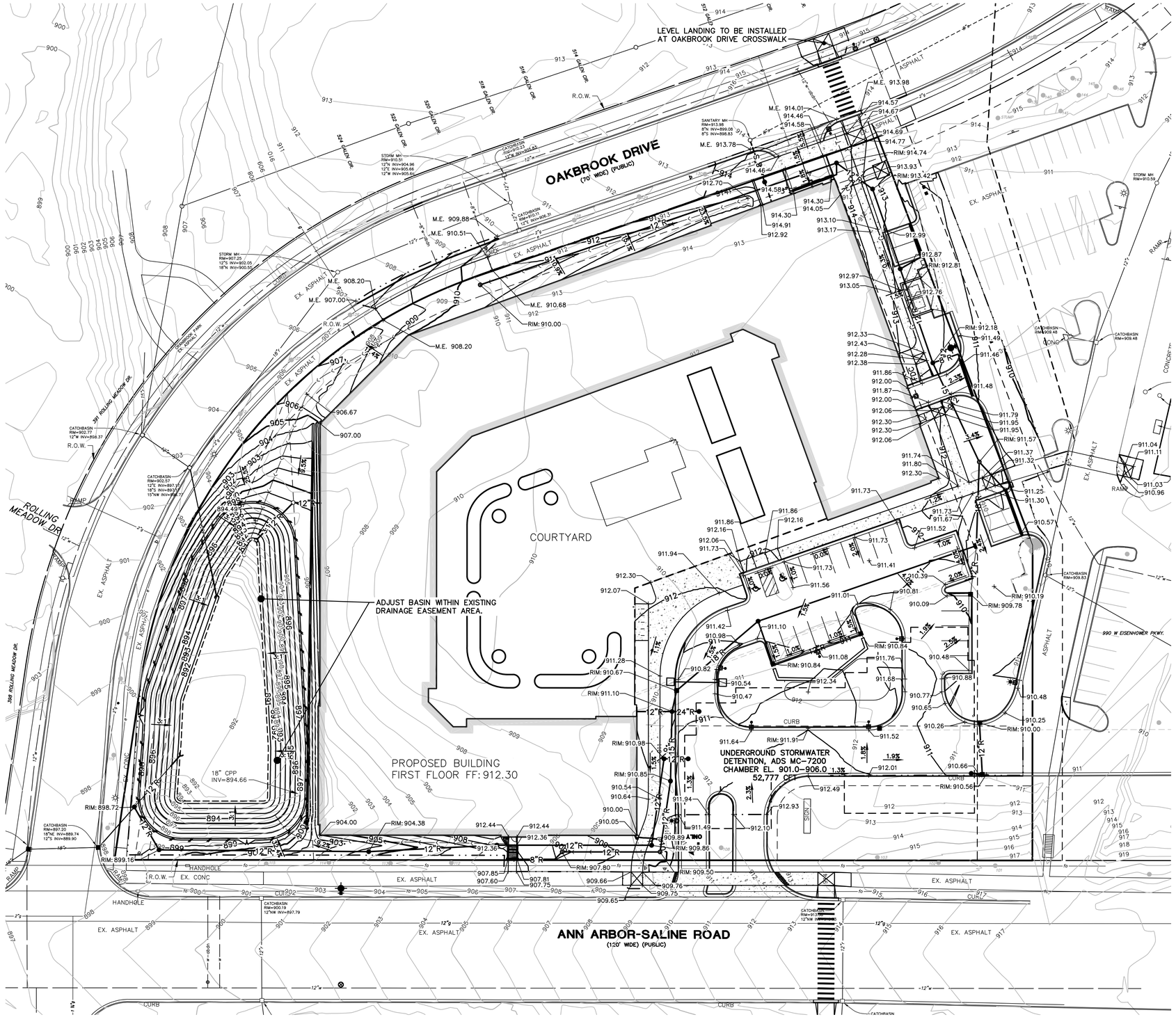
THE CRESCENT
SITE PLAN
SOLID WASTE MANAGEMENT PLAN

14

JOB No. 23351
DATE: 04/18/24
SHEET 14 OF 35

REVISIONS:	REV. DATE	CADD: CMW
PRELIMINARY CITY SUBMITTAL	04/18/24	ENG: CMW
SITE PLAN SUBMITTAL #2	08/14/24	PM: RCW
SITE PLAN SUBMITTAL #3	12/12/24	TECH:
SITE PLAN SUBMITTAL #4	05/20/25	F:\23351SW01
SITE PLAN SUBMITTAL #5	06/25/25	FB:



SCALE: 1" = 30'

0 30 60 90

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

LEGEND

838	PROP. CONTOUR
36.60 x	PROP. SPOT ELEVATION
	EXIST. LIGHT POLE
	PROP. LIGHT POLE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
g	EXIST. GAS VALVE
f.o.	EXIST. FIBER OPTIC LINE
w	EXIST. WATER MAIN
W	PROP. WATER MAIN
	EXIST. HYDRANT
	PROP. HYDRANT
	EXIST. GATE VALVE IN BOX
	PROP. GATE VALVE IN BOX
	REDUCER
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
RD	PROP. ROOF DRAIN
	END SECTION
DS	PROP. DOWNSPOUT
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
	SIGN
	SILTFENCE
FF	FINISH FLOOR ELEVATION

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SITE PLAN
GRADING PLAN

15

JOB No. 23351

DATE: 04/18/24
SHEET 15 OF 35
CADD: CMW
ENG: CMW
PM: ROW
TECH:
23351GP01
PB:

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	06/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	05/28/25
SITE PLAN SUBMITTAL #5	06/25/25

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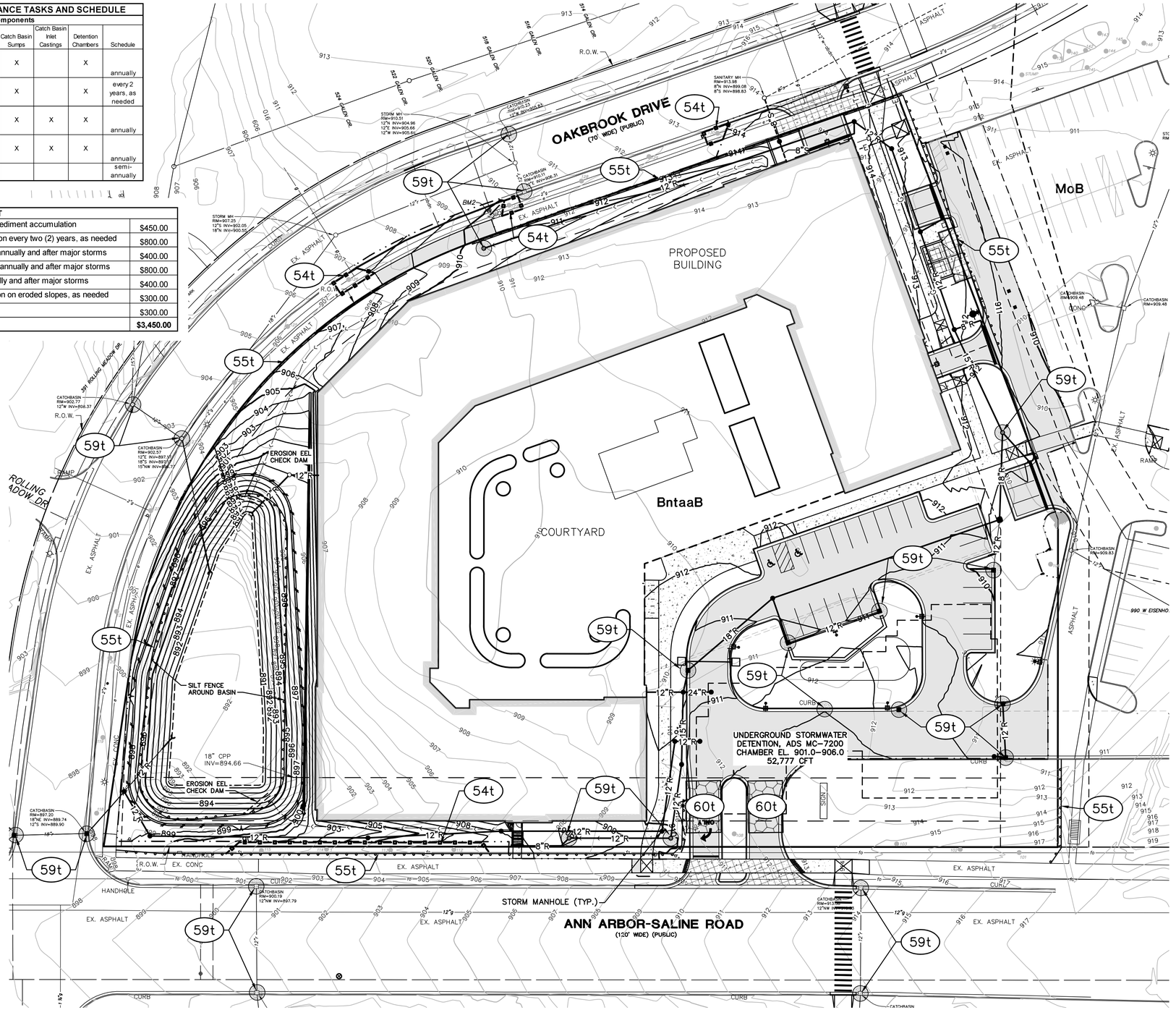
PERMANENT MAINTENANCE TASKS AND SCHEDULE						
	Components					
	Drives and Walks	Storm Sewer System	Catch Basin Sumps	Catch Basin Inlet Castings	Detention Chambers	Schedule
Inspect for sediment accumulation	X	X	X		X	annually
Removal of sediment accumulation		X	X		X	every 2 years, as needed
Inspect for floatables and debris		X	X	X	X	annually
Cleaning of floatables and debris		X	X	X	X	annually
Clean streets	X					semi-annually

MAINTENANCE PLAN BUDGET	
Annual inspection of system for sediment accumulation	$450.00
Removal of sediment accumulation every two (2) years, as needed	$800.00
Inspect for floatables and debris annually and after major storms	$400.00
Removal of floatables and debris annually and after major storms	$800.00
Inspect system for erosion annually and after major storms	$400.00
Re-establish permanent vegetation on eroded slopes, as needed	$300.00
Clean drives semiannually	$300.00
Total Annual Budget	**$3,450.00**



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

LEGEND

- EXIST. ELECTRIC LINE
- EXIST. GAS LINE
- EXIST. GAS VALVE
- EXIST. FIBER OPTIC LINE
- EXIST. WATER MAIN
- PROP. WATER MAIN
- EXIST. HYDRANT
- PROP. HYDRANT
- EXIST. GATE VALVE IN BOX
- PROP. GATE VALVE IN BOX
- REDUCER
- EXIST. STORM SEWER
- PROP. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- PROP. CATCH BASIN OR INLET
- PROP. ROOF DRAIN
- END SECTION
- PROP. DOWNSPOUT
- EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
- EXIST. CLEANOUT
- PROP. CLEANOUT
- SILT FENCE
- CONSTRUCTION FENCE

SOIL EROSION CONTROL NOTES

1. ALL SOIL EROSION CONTROL MEASURES SHALL COMPLY WITH THE CURRENT CITY OF ANN ARBOR ORDINANCES, WASHTENAW COUNTY STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENTATION CONTROL, AND STATE OF MICHIGAN "SOIL EROSION AND SEDIMENTATION CONTROL ACT – P.A. 347".
2. PRIOR TO COMMENCING EARTHMOVING OPERATIONS, THE GRADING CONTRACTOR SHALL INSTALL THE TEMPORARY CATCH BASIN FILTER(S) SHOWN ON THE PLANS.
3. THE REMOVAL OF TRAPPED SEDIMENT AND THE CLEANOUT OR REPLACEMENT OF CLOGGED STORM MAY BE NECESSARY AFTER EACH STORM EVENT DURING THE PROJECT.
4. ALL SILT FENCE SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. IF AT ANY TIME THE DEPTH OF SILT AND SEDIMENT COMES TO WITHIN 12" OF THE TOP OF ANY SILT FENCE, ALL SILT AND SEDIMENT SHALL BE REMOVED TO ORIGINAL GRADE.
5. ONLY UPON STABILIZATION OF ALL DISTURBED AREAS MAY THE TEMPORARY GRAVEL FILTERS BE REMOVED. ALL STORM SEWERS MUST BE ALSO CLEANED OF ALL SEDIMENT.
6. ALL INLETS AND CATCH BASINS WILL HAVE SEDIMENT FILTERS INSTALLED AFTER THEIR CONSTRUCTION. THESE FILTERS WILL BE MAINTAINED UNTIL ALL AREAS AROUND THE STRUCTURE HAVE BEEN STABILIZED.
7. THE CONTRACTOR WILL MAINTAIN ALL NECESSARY SOIL EROSION CONTROL DEVICES UNTIL SOIL STABILIZATION HAS OCCURRED.
8. APPROPRIATE EMERGENCY ACCESS WILL BE PROVIDED DURING CONSTRUCTION.
9. THE ESTIMATED COST OF SOIL EROSION CONTROL MEASURES IS $12,000.
10. THE ESTIMATED COST TO PROTECT ALL SOIL SURFACES FROM EROSION SHOULD CONSTRUCTION DISCONTINUE IS $8,000.
11. DEWATERING OPERATIONS DURING CONSTRUCTION, IF NECESSARY, MUST BE DONE PER CITY REQUIREMENTS INCLUDING SEDIMENT CONTROL AND DISPOSAL.
12. FINAL LOCATIONS AND DIMENSIONS OF THE MUD TRACKING MAT AND CONCRETE WASHOUT AREA ARE TO BE DETERMINED BY THE CONTRACTOR SUBJECT TO A CITY APPROVAL.
13. ESTIMATED PROJECT EARTHWORK IS 2,235 CYD EXCAVATION AND 11,893 CYD FILL. THIS NUMBER IS AN ESTIMATE ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION ESTIMATING PURPOSES.
14. THE PROJECT WORK AREA IS LOCATED, AT IT'S CLOSEST POINT, 265' FROM THE NEAREST WATER OF THE STATE, MALLETTS CREEK, LOCATED NORTHEAST OF THE PROJECT.

MAINTENANCE PROGRAM FOR SOIL EROSION CONTROLS

1. DURING CONSTRUCTION IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE SOIL EROSION CONTROL MEASURES. FOLLOWING CONSTRUCTION THE OWNER SHALL BE RESPONSIBLE FOR MAINTAINING THE PERMANENT SOIL EROSION CONTROL MEASURES. MAINTENANCE RESPONSIBILITIES SHALL BECOME PART OF ANY SALES OR EXCHANGE AGREEMENT FOR THE LAND ON WHICH THE PERMANENT SESC MEASURES ARE LOCATED.

SOIL EROSION CONTROL MEASURES

t = temporary p = permanent

5	SEEDING	55	GEOTEXTILE SILT FENCE	59	C.B./INLET FILTER
54	CONSTRUCTION FENCE OR SNOW FENCE	58	CURB INLET FILTER	60	MUD TRACKING MAT

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THE CRESCENT

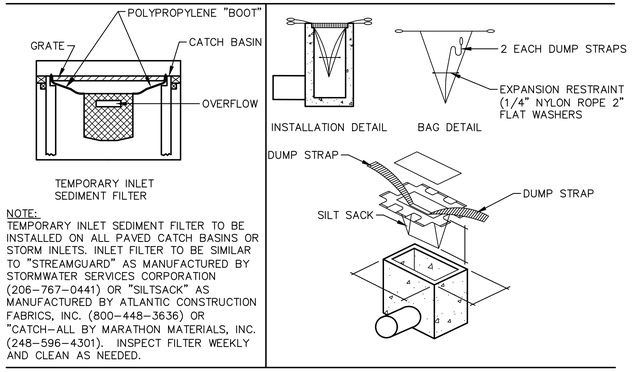
SITE PLAN
SOIL EROSION AND SEDIMENTATION CONTROL PLAN

16

DATE: 04/16/24
SHEET 16 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
23351SE01
PB:

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/16/24
SITE PLAN SUBMITTAL #1	04/16/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/26/25
SITE PLAN SUBMITTAL #5	05/23/25

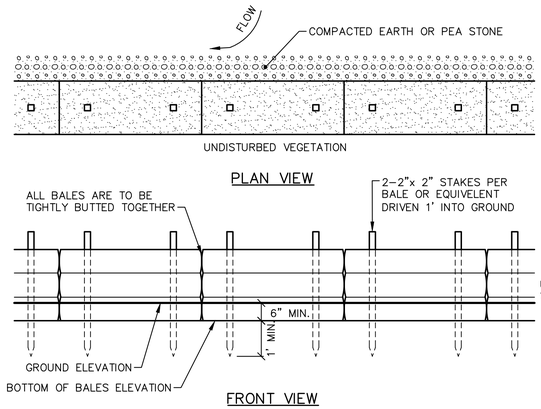
JOB No. 23351



TEMPORARY INLET SEDIMENT FILTER

NOTE:
TEMPORARY INLET SEDIMENT FILTER TO BE INSTALLED ON ALL PAVED CATCH BASINS OR STORM INLETS. INLET FILTER TO BE SIMILAR TO "STREAMGUARD" AS MANUFACTURED BY STORMWATER SERVICES CORPORATION (206-767-0441) OR "SILTSACK" AS MANUFACTURED BY ATLANTIC CONSTRUCTION FABRICS, INC. (800-448-3636) OR "CATCH-ALL BY MARATHON MATERIALS, INC. (248-596-4301). INSPECT FILTER WEEKLY AND CLEAN AS NEEDED.

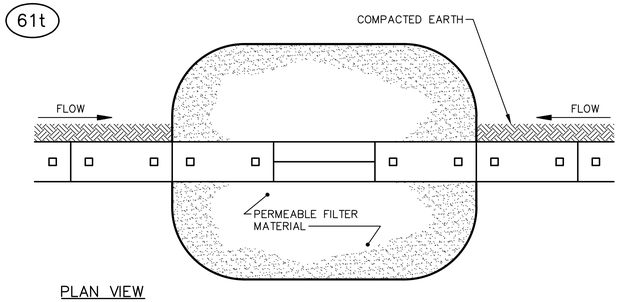
EROSION CONTROL INLET FILTER, SPECIAL
NOT TO SCALE



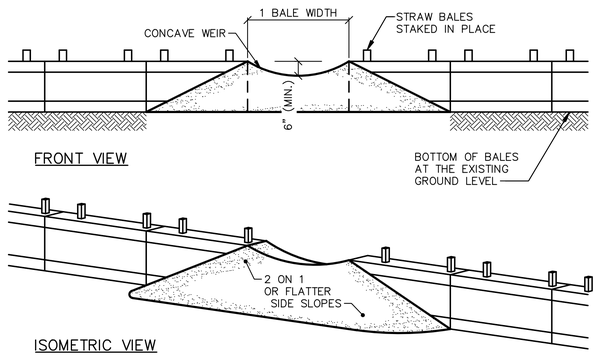
NOTE: A STRAW BALE DIVERSION BERM IS NOT PERMEABLE AND THERFORE CAN NOT BE USED AS A FILTER UNLESS IT IS INSTALLED WITH A STONE OUTLET FILTER.

STRAW BALE FILTER BERM
NOT TO SCALE

61t



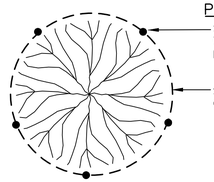
PLAN VIEW

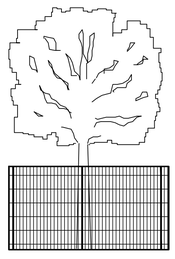


ISOMETRIC VIEW

STONE OUTLET FILTER WITHIN A STRAW BALE BERM
NOT TO SCALE

62t



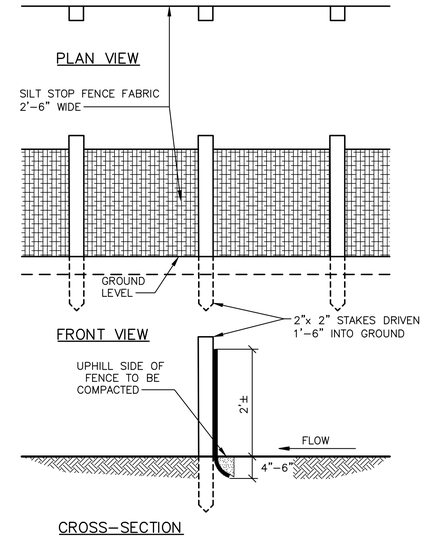


ELEVATION

SNOW FENCE SHALL BE LOCATED AT THE OUTER PERIMETER OF THE CRITICAL ROOT ZONE OR CLOSER AS SHOWN IN THE APPROVED SITE PLAN.

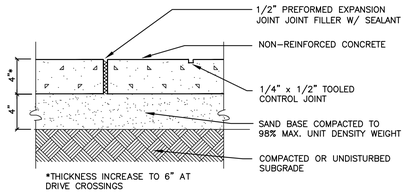
TREE PROTECTION DETAIL
NOT TO SCALE

54t

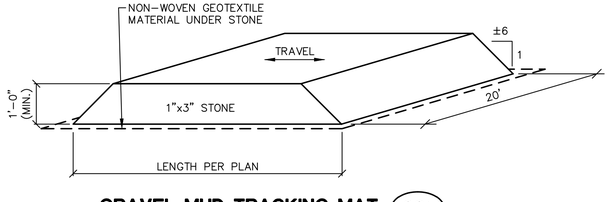


SILT FENCE DETAIL
NOT TO SCALE
BLOCK NAME: SILT FENCE DETAIL-1-55

55t



CONCRETE WALK DETAIL
NO SCALE



GRAVEL MUD TRACKING MAT
NOT TO SCALE

60t

CONSTRUCTION SEQUENCE	OPERATION TIME SCHEDULE BEGINNING JUNE 2025											
	2025						2026					
	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	MAY	JUNE	JULY	AUG.	SEP.	
SESC PRE-GRADING MEETING												
INSTALL AND MAINTAIN SOIL EROSION CONTROL MEASURES AS REQUIRED												
UTILITY INSTALLATION AND SITE DEMOLITION												
MASS EXCAVATION												
FOUNDATION CONSTRUCTION												
STORMWATER MANAGEMENT INSTALLATION												
CURBING AND FIRST COURSE ASPHALT												
BUILDING CONSTRUCTION												
SECOND COURSE ASPHALT												
FINAL GRADE SITE												
PLACE MULCH AND SEEDING												
FINAL CLEAN-UP & REMOVAL OF SOIL EROSION CONTROLS												

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BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

THE CRESCENT
SITE PLAN
SESC DETAILS

17

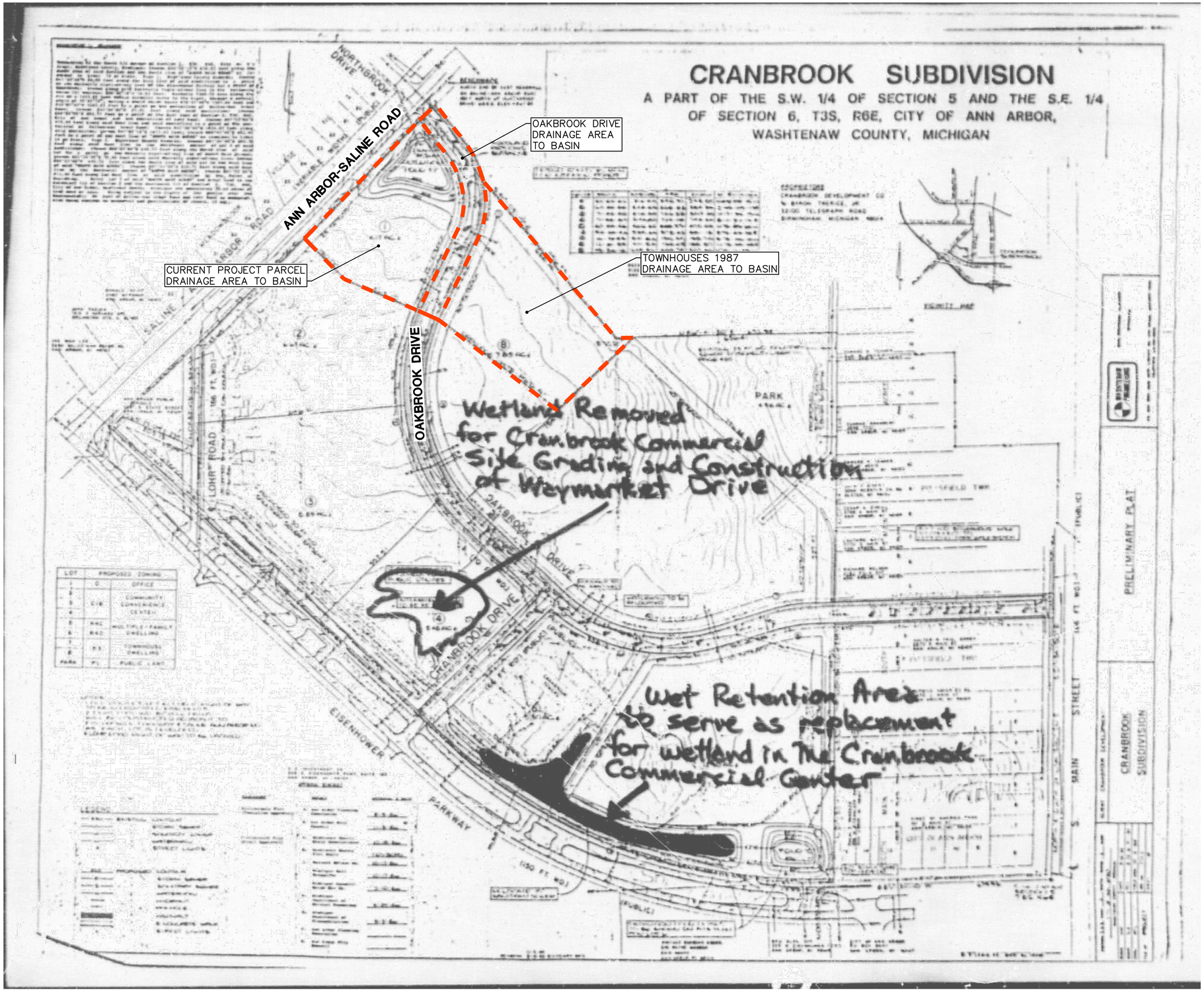
JOB No. 23351

DATE: 04/18/24
SHEET 17 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
23351DT01
FB:

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #1	05/14/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

EXISTING BASIN VOLUME

THE EXCERPT ON THIS SHEET IS FROM HISTORICAL PLANS OF THE CRANBROOK COMMERCIAL PHASE 1 PLANS DATED 1987. THE DRAINAGE AREAS DIRECTED TO THE EXISTING BASIN LOCATED ON THIS PROJECT'S PARCEL ARE OUTLINED. SEE SHEET 22 FOR EXISTING BASIN VOLUME CALCULATIONS.



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THE CRESCENT
SITE PLAN
HISTORIC 1987 BASIN DRAINAGE AREAS

18

JOB No. 23351

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	10/11/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

DATE: 04/18/24
SHEET 18 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
23351SM02
FB:

1987 BASIN VOLUME CALCULATIONS

Based on values used in original calculations for basin (03/02/1987).

Undeveloped Site Runoff Coefficient = 0.2

Drainage Sub-area	Runoff Coefficient	Area (acres)
Oakbrook Drive	0.67	1.47
Townhouses	0.50	4.44
Office Area	0.70	4.17

Required storage for Oakbrook Drive area, Townhouses area, Office (Pond Easement Area), and Office (Current Project) area using data from the original calculations.

$$Average\ Runoff\ Coefficient\ (C) = \frac{(1.47 * 0.67) + (4.44 * 0.50) + (4.17 * 0.70)}{1.47 + 4.47 + 4.17} = 0.61$$

$$Developed\ Volume\ (V_d) = 10.08\text{ac} * \frac{43{,}560\ \text{sft}}{1\ \text{ac}} * 0.61 * 4.3\ \text{in} * \frac{1\ \text{ft}}{12\ \text{in}} = 95{,}976.6\ cft$$

$$Undeveloped\ Volume\ (V_u) = 10.08\text{ac} * \frac{43{,}560\ \text{sft}}{1\ \text{ac}} * 0.20 * 3.1\ \text{in} * \frac{1\ \text{ft}}{12\ \text{in}} = 22{,}686.0\ cft$$

$$Required\ Storage\ (V_r) = 95{,}976\ cft - 22{,}686\ cft = \mathbf{73{,}290.6\ cft}$$

PORTION OF BASIN VOLUME FOR RE-DEVELOPMENT AREA

Based on values used in original calculations for basin (02/20/1989).

$$Runoff\ Coefficient\ (C) = 0.61$$

$$Developed\ Volume\ (V_d) = 4.17\text{ac} * \frac{43{,}560\ \text{sft}}{1\ \text{ac}} * 0.61 * 4.3\ \text{in} * \frac{1\ \text{ft}}{12\ \text{in}} = 39{,}705\ cft$$

$$Undeveloped\ Volume\ (V_u) = 4.17\text{ac} * \frac{43{,}560\ \text{sft}}{1\ \text{ac}} * 0.20 * 3.1\ \text{in} * \frac{1\ \text{ft}}{12\ \text{in}} = 9{,}385\ cft$$

$$Designed\ Portion\ of\ basin\ volume\ for\ redevelopment\ area\ (V) = 39{,}705\ cft - 9{,}385\ cft = \mathbf{30{,}320\ cft}$$

$$Percentage\ of\ basin\ volume\ for\ redevelopment\ area\ (V_{\%}) = \frac{30{,}320\ cft}{66{,}020\ cft} = cft = \mathbf{45.9}\ \%$$

SCALE: 1" = 60'

0 60 120 180

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

LEGEND

838	PROP. CONTOUR
	EXIST. LIGHT POLE
	PROP. LIGHT POLE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
g	EXIST. GAS VALVE
f.o.	EXIST. FIBER OPTIC LINE
w	EXIST. WATER MAIN
W	PROP. WATER MAIN
	EXIST. HYDRANT
	PROP. HYDRANT
	EXIST. GATE VALVE IN BOX
	PROP. GATE VALVE IN BOX
	REDUCER
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
RD	PROP. ROOF DRAIN
	END SECTION
DS	PROP. DOWNSPOUT
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
	SIGN
	SILTFENCE
FF	FINISH FLOOR ELEVATION

STORM WATER NARRATIVE

THE EXISTING SITE DRAINS TO THE EXISTING BASIN TO THE NORTHEAST. THE EXISTING BASIN ALSO SERVES OAKBROOK DRIVE AND THE TOWNHOMES TO THE EAST.

THE NEW DEVELOPMENT PROJECT AREA WILL CONSIST OF A PROPOSED APARTMENT BUILDING AND PARKING LOT THAT WILL DRAIN TO THE EXISTNG BASIN AND UNDERGROUND STORM WATER DETENTION CHAMBERS. THE PROPOSED BUILDING WILL COVER THE MAJORITY OF THE SITE AND STORM DRAINAGE WILL BE PICKED UP BY ROOF CONDUCTORS AND DRAIN INLETS. THIS DRAINAGE WILL BE ROUTED TO THE PROPOSED DETENTION CHAMBERS AND THE EXISTING BASIN. THE OUTLET FROM THE DETENTION CHAMBERS THE STORM WATER WILL BYPASS THE EXISTING DETENTION BASIN AND TIE DIRECTLY INTO THE STORM WATER SYSTEM. THE BUILDING DOES NOT CONTAIN A BASEMENT AND AS SUCH SHOULD NOT POSE A PROBLEM WITH PLACING INFILTRATION FACILITIES WITHIN 10' OF THE BUILDING STRUCTURE.

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ATTN: NOAH JACOB

THE CRESCENT

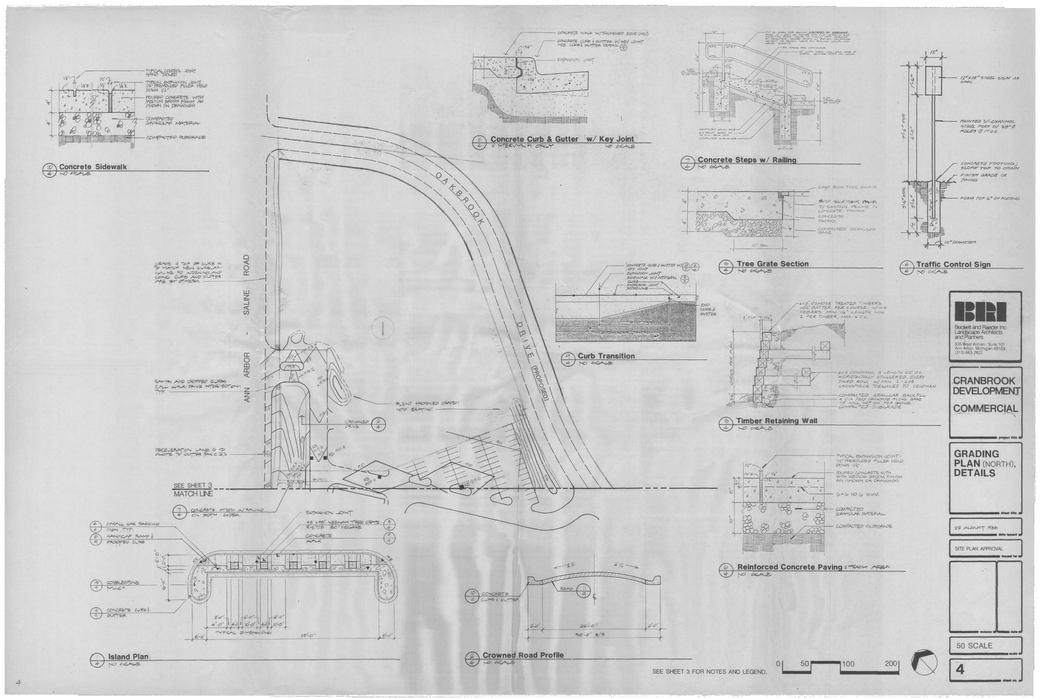
SITE PLAN
1987 BASIN TRIBUTARY AREA

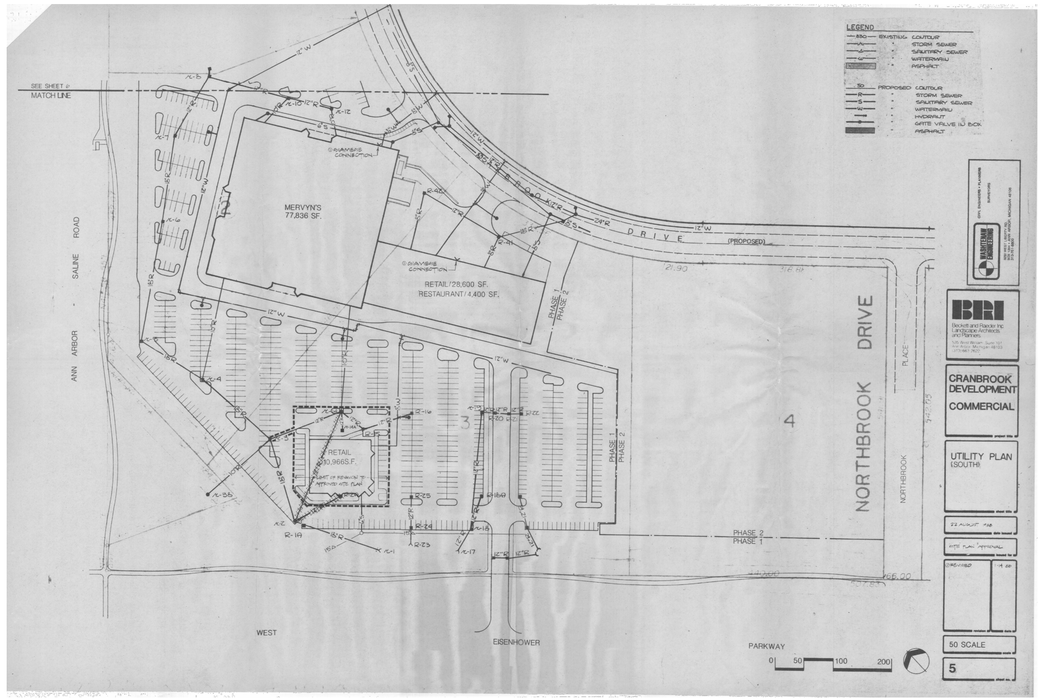
19

JOB No. 23351

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	08/27/24
SITE PLAN SUBMITTAL #3	10/17/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

DATE: 04/16/24
SHEET 19 OF 35
CADD: CMW
ENG: CMW
PM: ROW
TECH:
2335ISM01





CRANBROOK DEVELOPMENT
STORM WATER DETENTION CALCULATIONS

DATED: FEBRUARY 24, 1987

Revised Storm Water Detention Calculations based on the Approved Cranbrook Area Plan.

LOTS	TYPE OF USE	ACRES	COEFFICIENT OF RUNOFF
1)	OFFICE	4.17	0.70
2)	COMMERCIAL	6.67	
3)	COMMERCIAL	8.89	
4)	COMMERCIAL	5.48	
5)	CRANBROOK TOWERS	5.30	
6)	ELDERLY HOUSING	12.90	
7)	TOWNHOUSES	14.82	0.50
8)	TOWNHOUSES	7.85	0.50
	PARK	4.98	
	OAKBROOK DRIVE	5.50	* 0.67
	WAYMARKET DRIVE	0.82	* 0.65

* DENOTES CALCULATED VALVE (SEE ATTACHED SHEET EXHIBIT A)

POND A

TOTAL CONTRIBUTORY RUNOFF AREA

OFFICE	4.17 ACRES
TOWNHOUSES	4.44 ACRES
OAKBROOK DRIVE	1.47 ACRES
TOTAL	10.08 ACRES

RATIONAL FORMULA Q = CIA

ASSUME TIME OF CONCENTRATION 15 MINUTES

I = 170/(15+23) = 4.50 INCHES/HOUR

C = 0.2

MAR 2 1987

ALLOWABLE DISCHARGE Q = 0.2 (4.50 INCHES/HOUR)(10.08 ACRES)

= 9.07 CFS

RUNOFF COEFFICIENTS

UNDEVELOPED SITE 0.2

DEVELOPED SITE

OAKBROOK DRIVE	1.47 ACRES @ 0.67
TOWNHOUSES	4.47 ACRES @ 0.50
OFFICE	4.17 ACRES @ 0.70

$$\frac{1.47\ (0.67) + 4.44\ (0.50) + 4.17\ (0.2)}{1.47 + 4.44 + 4.17} = 0.61$$

AVERAGE DEVELOPED COEFFICIENT = 0.61

REQUIRED STORAGE VOLUME

DEVELOPED SITE =

10.08 ACRES (43,560 SF/ACRE) (0.61) (4.3 IN) (1 FT/12")
= 95,976.6 CU.FT.

UNDEVELOPED SITE =

10.08 ACRES (43,560 SF/ACRE) (0.20) (3.1) (1 FT/12")
= 22,686.0 CU.FT.

REQUIRED STORAGE = 73,290.60 CU.FT.

AVAILABLE STORAGE POND A

CONTOUR 895 AREA = 21,839 SQ.FT.
CONTOUR 890 AREA = 16,523 SQ.FT.

$$\frac{21,839\ \text{SQ.FT.} + 16,523\ \text{SQ.FT.}}{2} = 19,181.0\ \text{SQ.FT.}$$

19,181.0 SQ.FT. (5 FT.) = 95,905 CU.FT.

95,905 CU.FT. > 73,290.60 STORAGE CHECKS

ORIFICE CALCULATION Q = ALLOWABLE RATE OF DISCHARGE
C = 0.6
G = 32.2 FT/SEC
H = HEAD
A = AREA OF OUTLET

Q = 9.07 CFS

$$A = \frac{9.07}{0.6\ \ 2(32.2\ \text{FT/SEC})\ 5\ \text{FT.}} = 0.84$$

0.84 SQ.FT. (144 SQ.IN./SQ.FT.) = 121.3 SQ.IN.

$A = R^2$ R = A

R = 121.3 SQ.IN./3.142

R = 6.21" USE A 12" DIAMETER OUTLET PIPE

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THE CRESCENT
SITE PLAN
1987 BASIN CALCULTIONS

20

JOB No. 23351

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	09/04/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

DATE: 04/18/24
SHEET 20 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
23351HS01
FM

2024 CORRECTED BASIN VOLUME CALCULATIONS

Based on coefficient values used in original calculations for basin (03/02/1987).

Undeveloped Site Runoff Coefficient = 0.2

Drainage Sub-area	Runoff Coefficient	Area (acres)
Oakbrook Drive	0.67	1.47
Townhouses	0.50	3.74
Office Area	0.70	4.17

Required storage for Oakbrook Drive area, Townhouses area, Office (Pond Easement Area), and Office (Current Project) area using data from the original calculations.

$$Average\ Runoff\ Coefficient\ (C) = \frac{(1.47 * 0.67) + (3.74 * 0.50) + (4.17 * 0.70)}{1.47 + 3.74 + 4.17} = 0.616$$

$$Developed\ Volume\ (V_d) = 9.38\text{ac} * \frac{43{,}560\ \text{sft}}{1\ \text{ac}} * 0.616 * 4.3\ \text{in} * \frac{1\ \text{ft}}{12\ \text{in}} = 90{,}190\ cft$$

$$Undeveloped\ Volume\ (V_u) = 9.38\text{ac} * \frac{43{,}560\ \text{sft}}{1\ \text{ac}} * 0.20 * 3.1\ \text{in} * \frac{1\ \text{ft}}{12\ \text{in}} = 21{,}111\ cft$$

$$Required\ Storage\ (V_r) = 90{,}190\ cft - 21{,}111\ cft = \mathbf{69{,}079\ cft}$$

PORTION OF BASIN VOLUME FOR RE-DEVELOPMENT AREA

$Office\ Area = 4.17\ acres$

$Oakbrook\ Drive\ Area + Townhomes\ Area = 5.21\ acres$

$Total\ Area = 9.38\ acres$

$$Percentage\ of\ basin\ volume\ for\ redevelopment\ area\ (V_{\%}) = \frac{4.17\ acres}{9.38\ acres} = \mathbf{44.5\ \%}$$

SCALE: 1" = 60'

0 60 120 180

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

LEGEND

838	PROP. CONTOUR
	EXIST. LIGHT POLE
	PROP. LIGHT POLE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
g	EXIST. GAS VALVE
f.o.	EXIST. FIBER OPTIC LINE
w	EXIST. WATER MAIN
W	PROP. WATER MAIN
	EXIST. HYDRANT
	PROP. HYDRANT
	EXIST. GATE VALVE IN BOX
	PROP. GATE VALVE IN BOX
	REDUCER
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
RD	PROP. ROOF DRAIN
	END SECTION
DS	PROP. DOWNSPOUT
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
	SIGN
	SILTFENCE
FF	FINISH FLOOR ELEVATION

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SITE PLAN
PROPOSED BASIN TRIBUTARY AREA

21

JOB No. 23351

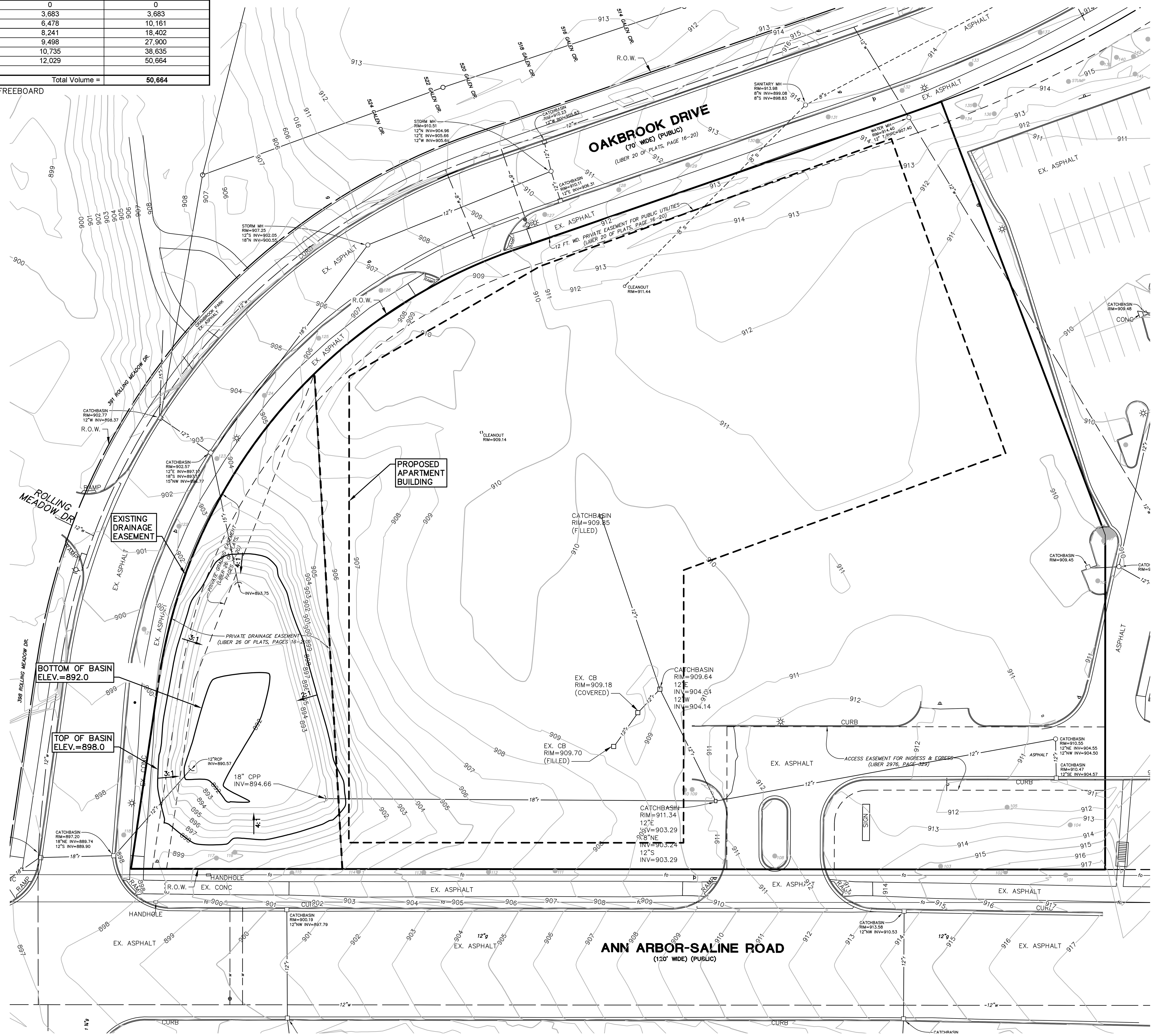
DATE: 04/16/24
SHEET 21 OF 35
CADD: CMW
ENG: CMW
PM: ROW
TECH:
2335ISM01

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	08/12/24
SITE PLAN SUBMITTAL #3	10/17/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

EXISTING BASIN VOLUME

Elevation	Area (sft)	Depth (ft)	Volume (cft)	Cum. Volume (cft)
892.00	1,999	0.00	0	0
893.00	5,367	1.00	3,683	3,683
894.00	7,589	2.00	6,478	10,161
895.00	8,892	3.00	8,241	18,402
896.00	10,104	4.00	9,498	27,900
897.00	11,366	5.00	10,735	38,635
898.00	12,692	6.00	12,029	50,664
			Total Volume =	**50,664**

NOTE: 1987 BASIN DESIGN DID NOT A REQUIRE A FREEBOARD



SCALE: 1" = 30'

0 30 60 90

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

LEGEND

- PROP. CONTOUR
- EXIST. LIGHT POLE
- PROP. LIGHT POLE
- EXIST. ELECTRIC LINE
- EXIST. GAS LINE
- EXIST. GAS VALVE
- EXIST. FIBER OPTIC LINE
- EXIST. WATER MAIN
- PROP. WATER MAIN
- EXIST. HYDRANT
- PROP. HYDRANT
- EXIST. GATE VALVE IN BOX
- PROP. GATE VALVE IN BOX
- REDUCER
- EXIST. STORM SEWER
- PROP. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- PROP. CATCH BASIN OR INLET
- PROP. ROOF DRAIN
- END SECTION
- PROP. DOWNSPOUT
- EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
- EXIST. CLEANOUT
- PROP. CLEANOUT
- SIGN

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SITE PLAN
EXISTING BASIN CALCULATIONS

22

JOB No. 23351

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/05/24
SITE PLAN SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

DATE: 04/18/24
SHEET 22 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
/23351SM02
FB:

ADJUSTED BASIN VOLUME

Elevation	Area (sft)	Depth (ft)	Volume (cft)	Cum. Volume (cft)
890.60	6,018	0.00	0	0
891.00	6,593	0.40	2,522	2,522
892.00	7,784	1.40	7,189	9,711
893.00	9,032	2.40	8,408	18,119
894.00	10,336	3.40	9,684	27,803
985.00	11,697	4.40	11,017	38,819
896.00	13,115	5.40	12,406	51,225
897 [FULL]	**14,589**	**6.40**	**13,852**	**65,077**
898 [FREEBOARD]	16,120	7.40	15,355	80,432
			Total Volume =	**65,077**

BASIN VOLUME AVAILABLE FOR RE-DEVELOPMENT AREA

$$Adjusted\ Basin\ Volume = \mathbf{65{,}077\ cft}$$

$$Percentage\ of\ basin\ volume\ for\ redevelopment\ area\ (V_{\%}) = \mathbf{44.5\%}$$

$$Basin\ volume\ available\ for\ re-development\ area\ (V) = 65{,}077\ cft * 0.445 = \mathbf{28{,}959\ cft}$$

ADJUSTED BASIN NARRATIVE

THE ADJUSTED BASIN LAYOUT HAS REMOVED A PORTION OF THE BASIN THAT WAS OUTSIDE OF THE DRAINAGE EASEMENT. THE RE-GRADED BASIN HAS BEEN DESIGNED TO FIT WITHIN THE DRAINAGE EASEMENT WITH 3:1 SLOPES AND A 6' FENCE SURROUNDING THE BASIN. SEE SHEET 25 FOR PROPOSED DEVELOPMENT VOLUME CALCULATIONS. THE ADJUSTED BASIN WILL HAVE A TOTAL CAPACITY OF 65,077 CFT BELOW FREEBOARD.

LEGEND

838	PROP. CONTOUR
	EXIST. LIGHT POLE
	PROP. LIGHT POLE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
g	EXIST. GAS VALVE
f.o.	EXIST. FIBER OPTIC LINE
w	EXIST. WATER MAIN
W	PROP. WATER MAIN
	EXIST. HYDRANT
	PROP. HYDRANT
	EXIST. GATE VALVE IN BOX
	PROP. GATE VALVE IN BOX
	REDUCER
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
RD	PROP. ROOF DRAIN
	END SECTION
DS	PROP. DOWNSPOUT
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
	SIGN
	SILTFENCE
FF	FINISH FLOOR ELEVATION

SCALE: 1" = 30'

0 30 60 90

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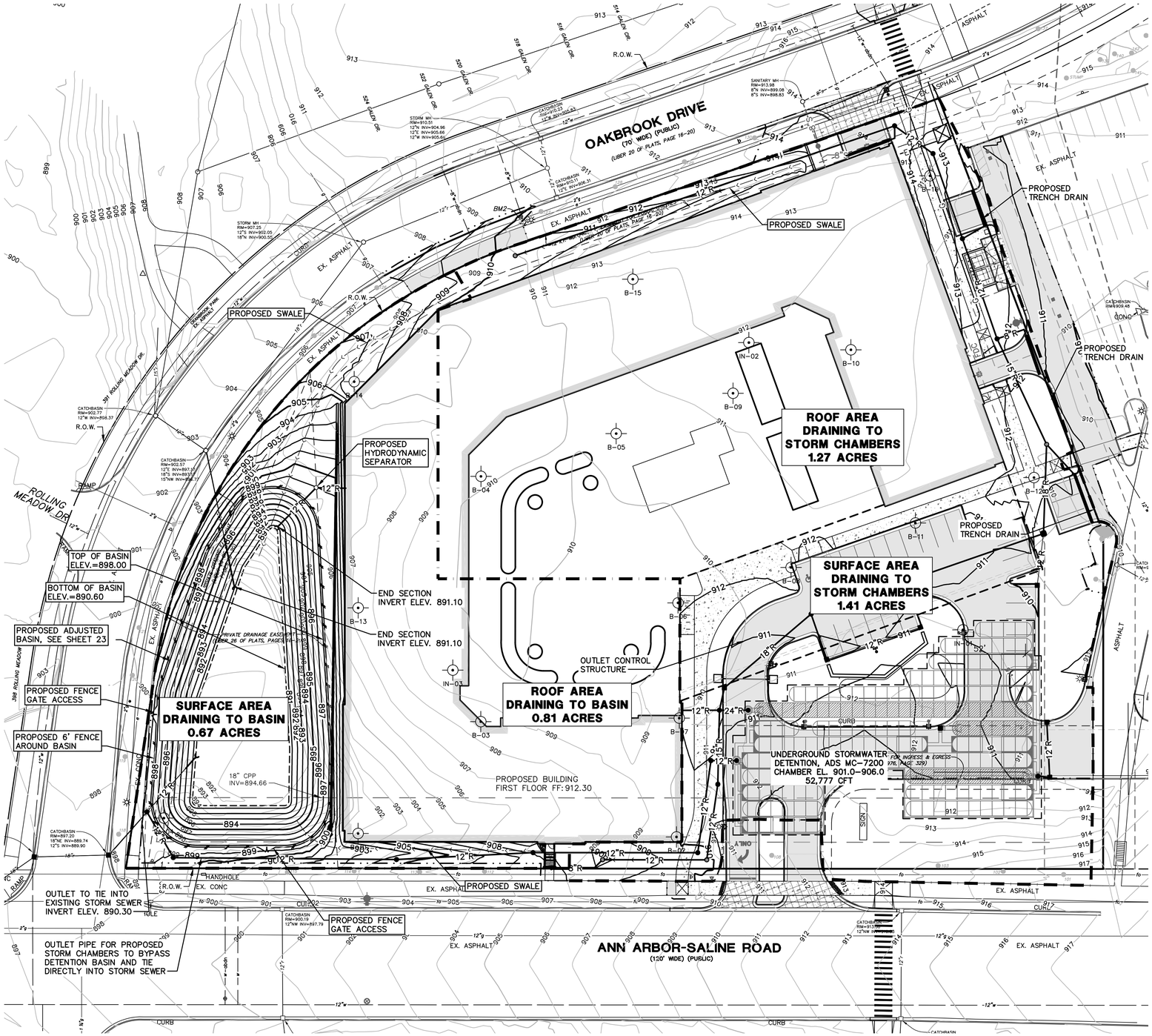
SITE PLAN
ADJUSTED BASIN CALCULATIONS

23

DATE: 04/18/24
SHEET 23 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
F:23351SM03
FB:

JOB No. 23351

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	06/14/24
SITE PLAN SUBMITTAL #3	12/13/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/22/25



SCALE: 1" = 30'

0 30 60 90

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

LEGEND

838	PROP. CONTOUR
☼	EXIST. LIGHT POLE
✱	PROP. LIGHT POLE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
g	EXIST. GAS VALVE
f.o.	EXIST. FIBER OPTIC LINE
w	EXIST. WATER MAIN
W	PROP. WATER MAIN
	EXIST. HYDRANT
	PROP. HYDRANT
	EXIST. GATE VALVE IN BOX
	PROP. GATE VALVE IN BOX
	REDUCER
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
RD	PROP. ROOF DRAIN
	END SECTION
DS	PROP. DOWNSPOUT
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
	SIGN
FF	FINISH FLOOR ELEVATION
	PROP. DRAINAGE BOUNDARY
	SOIL BORING

NOTE: ROOF PIPING WILL BE DESIGNED TO DIRECT THE ROOF DRAINAGE TO THE TWO OUTLETS, WITHIN AN ACCURACY OF +/- 1,000 SFT.

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SITE PLAN
PROPOSED STORMWATER PLAN

24

JOB No. 23351

DATE: 04/16/24
SHEET 24 OF 35
CADD: CMW
ENG: CMW
PM: ROW
TECH:
F:\2351SWO5

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/16/24
SITE PLAN SUBMITTAL	04/16/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	05/28/25
SITE PLAN SUBMITTAL #5	06/23/25

DETENTION CALCULATIONS (AREA TO BASIN)

W1 - Determining Post-Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients
Rational Method Variables

Soil Type	Percent of site	Soil Classification
Blount Loam (BntaaaB)	97.2%	D
Glynwood Loam (MoB)	2.8%	D

Cover Type	Soil Type	Area (sft)	Area (ac)	Runoff Coeff. (C)	(C) x (Area)
Building Roof		36,225	0.83	0.95	0.79
Pavement		0	0.00	0.95	0.00
Grass	D	20,004	0.46	0.5	0.23
Gravel	D	0	0.00	0.85	0.00
Water Surface		9,238	0.21	1.00	0.21
Total		65,467	1.50		1.23
		Weighted C = (Sum(C)x(Area))/(Area Total)=			0.82

NRCS Variables (Pervious)

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) x (Area)
Grass	D	20,004	0.46	80	0.37
Total		20,004	0.46		0.37
		Weighted CN = (Sum(CN)x(Area))/(Area Total)=			80

NCRS Variables (Impervious)

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) x (Area)
Building Roof		36,225	0.83	98	0.81
Pavement		0	0.00	98	0.00
Gravel	D	0	0.00	91	0.00
Water Surface		9,238	0.21	98	0.21
Total		45,463	1.04		1.02
		Weighted CN = (Sum(CN)x(Area))/(Area Total)=			98

W6 - W6 - Pervious Cover Post-Development 100-Year Runoff Calculations ($V_{100\text{-per-post}}$)
A. 100 year / 24 hour storm event: P= 5.11 in
B. Pervious Cover CN From Worksheet 1 CN= 80
C. S = (1000 / CN) - 10 S= 2.500 in
D. Q = [(P-0.2S)^2] / [P+0.8S] Q= 2.989 in
E. Pervious Cover Area from Worksheet 1 20,004 sft
F. $V_{100\text{-per-post}}$ = Q x (1/12) x Area $V_{100\text{-per-post}}$ = 4,983 cft

W7 - W7 - Impervious Cover Post-Development 100-Year Runoff Calculations ($V_{100\text{-imp-post}}$)
A. 2 year / 24 hour storm event: P= 5.11 in
B. Impervious Cover CN From Worksheet 1 CN= 98
C. S = (1000 / CN) - 10 S= 0.204 in
D. Q = [(P-0.2S)^2] / [P+0.8S] Q= 4.873 in
E. Impervious Cover Area from Worksheet 1 45,463 sft
F. $V_{bf\text{-imp-post}}$ = Q x (1/12) x Area $V_{bf\text{-imp-post}}$ = 18,462 cft

W8 - Time of Concentration (Tc-hrs)
A. Assume 15-minute minimum time of concentration Tc= 0.25 hr

W9 - Runoff Summary & On-Site Infiltration Requirement
A. Summary from Previous Worksheets
Pervious Cover Post-Development 100-Year Volume ($V_{100\text{-per-post}}$) *4,983 cft*
Impervious Cover Post-Development 100-Year Volume ($V_{100\text{-imp-post}}$) *18,462 cft*
Total 100-Year Volume (V_{100}) 23,445 cft

W13 - Site Summary of Infiltration & Detention
B. Detention Volume Increase for sites where the required infiltration volume cannot be achieved.
% Required Infiltration NOT Provided 100.0 %
(100% - % Minimum Required Infiltration Provided)
Net % Penalty (20% x % Required Infiltration NOT Provided) 20.0 %
Total Required Detention Volume, including penalty 27,671 cft
[(100% + Net % Penalty) x Net Required Detention Volume)]

DETENTION CALCULATIONS (ENTIRE SITE)

W1 - Determining Post-Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients
Rational Method Variables

Soil Type	Percent of site	Soil Classification
Blount Loam (BntaaaB)	97.2%	D
Glynwood Loam (MoB)	2.8%	D

Cover Type	Soil Type	Area (sft)	Area (ac)	Runoff Coeff. (C)	(C) x (Area)
Building Roof		90,218	2.07	0.95	1.97
Pavement		33,000	0.76	0.95	0.72
Grass	D	48,829	1.12	0.5	0.56
Water Surface		9,238	0.21	1.00	0.21
Total		181,285	4.16		3.46
		Weighted C = (Sum(C)x(Area))/(Area Total)=			0.83

NRCS Variables (Pervious)

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) x (Area)
Grass	D	48,829	1.12	80	0.90
Total		48,829	1.12		0.90
		Weighted CN = (Sum(CN)x(Area))/(Area Total)=			80

NCRS Variables (Impervious)

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) x (Area)
Building Roof		90,218	2.07	98	2.03
Pavement		33,000	0.76	98	0.74
Water Surface		9,238	0.21	98	0.21
Total		132,456	3.04		2.98
		Weighted CN = (Sum(CN)x(Area))/(Area Total)=			98

W2 - W2 - First Flush Runoff Calculations (Vff)
A. Vff = 1" x 1'/12" x 43560 sft/ac x A x C where A= 4.16 and where C= 0.83

Vff = 1" x 1'/12" x 43560 sft/ac x 4.16 x 0.83 = 12,539 cf

W3 - W3 - Pre-Development Bankfull Runoff Calculations ($V_{bf\text{-pre}}$)
A. 2 year / 24 hour storm event: P= 2.35 in
B. Pre-Development CN
(Woods-Grass Combination, Good, Type D Soils) CN= 79
C. S = (1000 / CN) - 10 S= 2.658 in
D. Q = [(P-0.2S)^2] / [P+0.8S] Q= 0.739 in
E. Total Site Area excluding "Self-Crediting" BMPs 181,285 sft
F. $V_{bf\text{-pre}}$ = Q x (1/12) x Area $V_{bf\text{-pre}}$ = 11,158 cft

W4 - Pervious Cover Post-Development Bankfull Runoff Calculations ($V_{bf\text{-per-post}}$)
A. 2 year / 24 hour storm event: P= 2.35 in
B. Pervious Cover CN From Worksheet 1 CN= 80
C. S = (1000 / CN) - 10 S= 2.500 in
D. Q = [(P-0.2S)^2] / [P+0.8S] Q= 0.787 in
E. Pervious Cover Area from Worksheet 1 48,829 sft
F. $V_{bf\text{-per-post}}$ = Q x (1/12) x Area $V_{bf\text{-per-post}}$ = 3,201 cft

W5 - W5 - Impervious Cover Post-Development Bankfull Runoff Calculations ($V_{bf\text{-imp-post}}$)
A. 2 year / 24 hour storm event: P= 2.35 in
B. Impervious Cover CN From Worksheet 1 CN= 98
C. S = (1000 / CN) - 10 S= 0.204 in
D. Q = [(P-0.2S)^2] / [P+0.8S] Q= 2.122 in
E. Impervious Cover Area from Worksheet 1 132,456 sft
F. $V_{bf\text{-imp-post}}$ = Q x (1/12) x Area $V_{bf\text{-imp-post}}$ = 23,419 cft

W6 - W6 - Pervious Cover Post-Development 100-Year Runoff Calculations ($V_{100\text{-per-post}}$)
A. 100 year / 24 hour storm event: P= 5.11 in
B. Pervious Cover CN From Worksheet 1 CN= 80
C. S = (1000 / CN) - 10 S= 2.500 in
D. Q = [(P-0.2S)^2] / [P+0.8S] Q= 2.989 in
E. Pervious Cover Area from Worksheet 1 48,829 sft
F. $V_{100\text{-per-post}}$ = Q x (1/12) x Area $V_{100\text{-per-post}}$ = 12,163 cft

W7 - W7 - Impervious Cover Post-Development 100-Year Runoff Calculations ($V_{100\text{-imp-post}}$)
A. 2 year / 24 hour storm event: P= 5.11 in
B. Impervious Cover CN From Worksheet 1 CN= 98
C. S = (1000 / CN) - 10 S= 0.204 in
D. Q = [(P-0.2S)^2] / [P+0.8S] Q= 4.873 in
E. Impervious Cover Area from Worksheet 1 132,456 sft
F. $V_{bf\text{-imp-post}}$ = Q x (1/12) x Area $V_{bf\text{-imp-post}}$ = 53,788 cft

W8 - Time of Concentration (Tc-hrs)

Upstream Structure	Downstream Structure	Tc (Minutes)	K	Change in Elevaiton	Length (L)	Slope % (S)	$S^{0.5}$	$V=K*S^{0.5}$	Travel Time =L/(V*3600)
	R37	15.00							
R37	R36	15.16	2.1	0.29	74	0.39%	0.063	0.131	0.16
R36	R35	15.23	2.1	0.22	40	0.55%	0.074	0.156	0.07
R35	R34	15.32	2.1	0.69	70	0.99%	0.099	0.208	0.09
R34	R33	15.34	2.1	0.05	10	0.50%	0.071	0.148	0.02
R33	R32	15.49	2.1	0.39	78	0.50%	0.071	0.148	0.15
R32	R31	15.68	2.1	0.52	103	0.50%	0.071	0.149	0.19
R31	R16	15.77	2.1	0.25	50	0.50%	0.071	0.148	0.09
R16	R15	15.85	2.1	0.21	42	0.50%	0.071	0.148	0.08
R15	R14	15.86	2.1	0.88	16	5.50%	0.235	0.492	0.01
R14	R13	15.90	2.1	0.12	23	0.52%	0.072	0.152	0.04
R13	R12	15.93	2.1	0.08	16	0.50%	0.071	0.148	0.03
R12	Detention	**15.95**	2.1	0.05	10	0.50%	0.071	0.148	0.02

Tc= 0.27 hr

W9 - Runoff Summary & On-Site Infiltration Requirement
A. Summary from Previous Worksheets
First Flush Volume (Vff) 12,539 cft
Pre-Development Bankfull Runoff Volume ($V_{bf\text{-pre}}$) 11,158 cft
Pervious Cover Post-Development Bankfull Volume ($V_{bf\text{-per-post}}$) 3,201 cft
Impervious Cover Post-Development Bankfull Volume ($V_{bf\text{-imp-post}}$) 23,419 cft
Total BF Volume ($V_{bf\text{-post}}$) 26,621 cft
Pervious Cover Post-Development 100-Year Volume ($V_{100\text{-per-post}}$) 12,163 cft
Impervious Cover Post-Development 100-Year Volume ($V_{100\text{-imp-post}}$) 53,788 cft
Total 100-Year Volume (V_{100}) 65,951 cft
B. Determine Onsite Infiltration Requirement
Subtract the Pre-Development Bankfull from the Post-Development Bankfull Volume
Total Post-Development Bankfull Volume ($V_{bf\text{-post}}$) 26,621 cft
Pre-Development Bankfull Runoff Volume ($V_{bf\text{-pre}}$) 11,158 cft
Bankfull Volume Difference 15,462 cft
Infiltration Requirement (V_{inf}) 15,462 cft

W10 - Detention/Retention Requirement
A. Q_p = 238.6 Tc^-0.82 707.12 cfs/(in x sq. mi)
B. Total Site Area excluding "Self-Crediting" BMPs 4.16 ac
C. Q_{100} = $Q_{100\text{-per}}$ + $Q_{100\text{-imp}}$ 7.862 in
(from W6 and W7, respectively)
D. Peak Flow (PF) = Q_p x Q_{100} x Area / 640 36.15 cfs
E. Delta = PF - 0.15 x Area (ac) 35.53 cfs
[0.15 x Area (ac)] *0.62 cfs*
F. V_{det} = Delta / PF x V_{100} 64,812 cft
Required Detention not including infiltration credit or penalty.
Sediment Forebay Volume Required (5% of V100) 3,298 cft

Retention
A. Vret = 2 x V_{100} 131,902 cft

W11 - Determine Applicable BMPs and Associated Volume Credits

Proposed BMP	Area (sft)	Storage Volume (cft) Surface	Storage Volume (cft) In Soil	Design Infilt. Rate (in/hr)	Infilt. Volume in 6-hr Drawdown (cft)	Total Volume Reduction (cft)
				Total Volume Reduction Credit by Proposed Structural BMPs (cft)		0
				Runoff Volume Infiltration Requirement (Vinf) from W9 (cft)		15,462
					Runoff Volume Credit (cft)	0

W12 - Natural Features Inventory
Refer to **Sheet 2** for location and size of natural features.

W13 - Site Summary of Infiltration & Detention
A. Stormwater Management Summary
Min Infiltration Requirement (V_{inf}) 15,462 cft
Designed/Provided Infiltration Volume 0 cft
% Minimum Required Infiltration Provided 0 %
Total Calculated Detention Volume, V_{det} 64,812 cft
Net Required Detention Volume (Entire Site) 64,812 cft
(V_{det} - Designed/Provided Infiltration Volume)

100-year Detention Volume to Basin 23,445 cft

Required 100-year Detention Volume to Chambers
(Net Required Detention Volume - Total Detention Volume to Basin) 41,367 cft

B. Detention Volume Increase for sites where the required infiltration volume cannot be achieved.
% Required Infiltration NOT Provided 100.0 %
(100% - % Minimum Required Infiltration Provided)
Net % Penalty (20% x % Required Infiltration NOT Provided) 20.0 %
Total Required Detention Volume, including penalty 77,774 cft
[(100% + Net % Penalty) x Net Required Detention Volume)]

Total Detention Volume to Basin 27,641 cft

Additional Detention chamber volume required **50,133 cft**
Total Required Detention Volume - Basin Volume for re-development area

Detention Outlet Calculcations
A. Required Detention Volumes
Required Detention Volumes (Reduced by Volume to existing Basin)

Storm Event	Req'd Volume	less	Infil. Credit	=	Final Volume to Underground Detention
First Flush (Entire Site)	12,539 cft	-	0 cft	=	**12,539 cft**
Bankfull (Entire Site)	26,621 cft	-	0 cft	=	**26,621 cft**
100 -year (Area to Underground Detention)	41,367 cft	-	0 cft	=	**41,367 cft**
100-year + Req'd Penalty (Area to U.G. Deter	50,133 cft	-	0 cft	=	**50,133 cft**
Forebay Volume Required (5% of 100-yr)				=	**2,068 cft**

B. Underground Detention Volumes Provided

Elevation	Depth (ft)	Volume (cft)	Cum. Volume (cft)
900.25	0.00	0	0
901.00	0.75	3,188	3,188
902.00	1.75	10,993	14,181
903.00	2.75	10,501	24,682
904.00	3.75	9,683	34,365
905.00	4.75	8,379	42,744
906.00	5.75	5,781	48,525
907.00	6.75	4,252	52,777
		Total Volume =	**52,777**

Storage Elevation Calculation
First Flush Elevation (Xff)= 902.0 - 901.0 = Xff - 901.0 Xff = 901.85 ft
14,181 - 3,188 = 12,539 - 3,188
Bankfull Elevation (Xbf)= 905.0 - 903.0 = Xbf - 903.0 Xbf = 903.21 ft
42,744 - 24,682 = 26,621 - 24,682
100-Year Elevation (X100)= 907.0 - 906.0 = X_{100} - 906.0 X100 = 906.38 ft
52,777 - 48,525 = 50,133 - 48,525

C. Two-Stage Outlet Design

First Flush Discharge (24-36 hours for the detention of first flush storm event)
Average Head (Have) = 2/3 (Xff - Xbot) = 2/3 (901.85 - 900.25) = 1.07 ft
First Flush Max. Flowrate ($Q_{ff\text{-max}}$) = Vff / 24 hrs = 12538.88cfs / (24 hrs*3600) = 0.15 cfs
Req Area (Aff) = $Q_{ff\text{-max}}$ / 0.62 / sqrt(2*g*Have) = 0.15/0.62/(2*32.2*1.07)^0.5= 0.029 sft
Orifice Diameter, Proposed 1.250 in
Orifice Area = 0.0085 sft
Number Required for 24 hr drainage = Aff / Orifice Area= 0.029 sft / 0.0085 sft = 3.42 holes
Number of Holes to Use 3 holes
Area of (3) - 1.25 inch Orific Aff 0.0256 sft
Actual Flow (Qff) = 0.62 * Aff * sqrt(2*g*Have) = 0.62 * 0.0256 *sqrt(2*32.2*1.07) = 0.132 cfs
Actual Time (Tff) = Vff / Qff = 12539 cf / 0.132 cfs / 3600 = 26.44 hr

Bankfull Discharge (36-48 hours)
Average Head (Have) = 2/3 (Xbf - Xbot) = 2/3 (903.21 - 900.25) = 1.97 ft
Actual Flow (Qbf) = 0.62 * Aff * sqrt(2*g*Have) = 0.62 * 0.0256 * sqrt(2 * 32.2 * 1.97)= 0.179 cfs
Actual Time (Tbf) = Vbf / Qbf = 26621 cf / 0.179 cfs / 3600 = 41.36 hr
Drawdown Time for Bankfull Volume is between 36 and 48 hours
Therefore use (3) 1.25 inch Diameter Holes at Elev 900.25

100-year Discharge (0.15 cfs/acre max. allowed)
Max Head to Lowest Holes ($H_{max100\text{-ff}}$) = X_{100} - Xbot= 906.38 - 900.25 = 6.13 ft
Max Flow at Lowest Holes ($Q_{max\text{-ff}}$)= 0.62 * Aff * sqrt(2 * g * Hmax) =
= 0.62 * 0.0256 * sqrt(2 * 32.2 * 6.13) = 0.315 cfs
Max Head to 100yr Holes ($H_{max\text{-}100}$) = X_{100} - Xbf = 906.38 - 903.21 = 3.17 ft
QA (Allowable 100-year release rate)= 0.15 cfs/acre = 0.15 cfs * 4.16 ac = 0.624 cfs
Max flow through 100-year holes = $Q_{max\text{-}100}$ = QA - $Q_{max\text{-}ff}$ =0.62 cfs - 0.32 cfs = 0.31 cfs
Max. Area for Orifices (A_{100}) = Q_{max} / 0.62 / sqrt (2*g*h-100_{max}) 0.03 sft
Orifice Diameter 1.500 in
Orifice Area 0.012 sft
Number Required for 0.15 cfs/acre drainage 2.84
Number of holes used 2 ea
Area of (2) - 1.5 inch Orifice (A_{100}) 0.025 sft
100-year orifices - Actual Flow ($Q_{max\text{-}100}$) = 0.62 * A_{100} * sqrt (2 * g * H_{max100})
= 0.62 * 0.025 * sqrt (2 * 32.2 * 3.17) = 0.220 cfs
Actual Max Release Rate (Qmax) = Qmax-100 + Qmax-ff = 0.22 cfs + 0.315 cfs = 0.54 cfs

100-year Drawdown Time (72-hour max. to the lowest orifice)
Average head to first flush holes with all orfice in use ($H_{ff\text{-}ave}$) = 2/3 (X_{100} - Xbf) + (Xbf - Xbot)
$H_{ff\text{-}ave}$ = 2/3 (906.38 - 903.21) + (903.21 -900.25) = 5.07 ft
Average flow through lowest holes to bankfull elevation = 0.62 * Aff * sqrt (2 * g * $H_{ff\text{-}ave}$)
$Q_{ff\text{-}ave}$ = 0.62 * 0.0256 * SQRT(2 * 32.2 * 5.07) 0.287 cfs
Average head to 100-year holes with all orifices in use = 2/3 (X_{100}-Xbf)
$H_{100\text{-}ave}$ = 2/3 * (906.38 - 903.21) = 2.11 ft
Average flow through 100-yr holes with all holes in use = 0.62 * A_{100} * sqrt (2 * g * $H_{100\text{-}ave}$)
$Q_{100\text{-}ave}$ = 0.62 * 0.025 * sqrt(2 * 32.2 * 2.11) = 0.181 cfs
Combined drawdown flow ($Q_{100\text{-}bf}$) = $Q_{ff\text{-}ave}$ + $Q_{100\text{-}ave}$ = 0.287 cfs + 0.181 cfs = 0.467 cfs
Volume of Storage above Bankfull Elev (V_{rem}) = V_{100} - Vbf = 50133 - 26621 = 23,512 cft
Time to drain Volume between 100yr and bankfull elevations = V_{rem}/$Q_{100\text{-}bf}$/3600
= 23512.4842877198 cf / 0.467 cfs / 3600 = 13.97 hr
Total 100-year drawdown time = T100 = T100-bf + Tbf = 41.36 hrs + 13.97 hrs = 55.33 hr
Therefore use (2) 1.5 inch Diameter Holes at Elev 903.21

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ATTN: NOAH JACOB

THE CRESCENT
SITE PLAN
PROPOSED DETENTION CALCULATIONS

25

DATE: 04/16/24
SHEET 25 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
P:\2351SM05

JOB No. 23351

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	05/06/24
SITE PLAN SUBMITTAL	04/16/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/22/25

STORMTECH STORAGE CALCULATION

Project: THE CRESCENT

ADS StormTech

Chamber Model -	MC-7200	
Units -	Imperial	
Number of Chambers -	187	
Number of End Caps -	38	
Voids in the stone (porosity) -	30	%
Base of Stone Elevation -	898.00	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	9	in
Area of system -	14173	sf Min. Area - 12485 sf min. area

StormTech MC-7200 Cumulative Storage Volumes

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch, EC and Stone (cubic feet)	Cumulative System	Elevation
81	0.00	0.00	0.00	0.00	354.33	354.33	52777.77	904.75
80	0.00	0.00	0.00	0.00	354.33	354.33	52423.45	904.67
79	0.00	0.00	0.00	0.00	354.33	354.33	52069.12	904.58
78	0.00	0.00	0.00	0.00	354.33	354.33	51714.80	904.50
77	0.00	0.00	0.00	0.00	354.33	354.33	51360.47	904.42
76	0.00	0.00	0.00	0.00	354.33	354.33	51006.15	904.33
75	0.00	0.00	0.00	0.00	354.33	354.33	50651.82	904.25
74	0.00	0.00	0.00	0.00	354.33	354.33	50297.50	904.17
73	0.00	0.00	0.00	0.00	354.33	354.33	49943.17	904.08
72	0.00	0.00	0.00	0.00	354.33	354.33	49588.85	904.00
71	0.00	0.00	0.00	0.00	354.33	354.33	49234.52	903.92
70	0.00	0.00	0.00	0.00	354.33	354.33	48880.20	903.83
69	0.06	0.01	11.10	0.49	350.85	362.44	48525.87	903.75
68	0.19	0.03	35.56	1.29	343.27	380.12	48163.43	903.67
67	0.28	0.05	51.46	1.97	338.30	391.72	47783.30	903.58
66	0.36	0.07	66.81	2.51	333.53	402.84	47391.58	903.50
65	0.46	0.08	85.72	3.16	327.66	416.54	46988.74	903.42
64	0.74	0.11	138.69	4.00	311.52	454.21	46572.20	903.33
63	1.10	0.13	205.02	5.03	291.31	501.36	46117.99	903.25
62	1.32	0.16	246.56	6.12	278.52	531.20	45616.63	903.17
61	1.50	0.19	280.17	7.17	268.12	555.46	45085.43	903.08
60	1.65	0.22	309.39	8.30	259.02	576.71	44529.97	903.00
59	1.79	0.25	335.47	9.38	250.87	595.72	43953.26	902.92
58	1.92	0.28	358.98	10.46	243.49	612.93	43357.53	902.83
57	2.04	0.30	381.00	11.47	236.58	629.05	42744.60	902.75
56	2.15	0.33	401.18	12.45	230.24	643.86	42115.55	902.67
55	2.25	0.35	420.32	13.47	224.19	657.98	41471.69	902.58
54	2.34	0.38	438.17	14.58	218.50	671.25	40813.71	902.50
53	2.43	0.41	455.05	15.55	213.14	683.75	40142.46	902.42
52	2.52	0.44	471.06	16.75	207.98	695.80	39458.72	902.33
51	2.60	0.47	486.31	17.81	203.09	707.21	38762.92	902.25
50	2.68	0.50	500.86	18.82	198.42	718.10	38055.71	902.17
49	2.75	0.52	514.73	19.79	193.97	728.49	37337.61	902.08
48	2.82	0.54	527.98	20.69	189.72	738.40	36609.12	902.00
47	2.89	0.57	540.69	21.54	185.66	747.89	35870.72	901.92
46	2.96	0.59	552.84	22.36	181.76	756.97	35122.84	901.83
45	3.02	0.61	564.51	23.18	178.02	765.71	34365.87	901.75
44	3.08	0.63	575.71	24.02	174.41	774.13	33600.16	901.67
43	3.14	0.64	586.48	24.44	171.05	781.97	32826.03	901.58
42	3.19	0.68	596.86	25.74	167.55	790.14	32044.06	901.50
41	3.25	0.70	606.82	26.59	164.30	797.71	31253.91	901.42
40	3.30	0.72	616.41	27.45	161.17	805.03	30456.20	901.33
39	3.35	0.74	625.63	28.26	158.16	812.05	29651.17	901.25
38	3.39	0.76	634.51	29.05	155.26	818.82	28839.12	901.17
37	3.44	0.79	643.07	29.85	152.45	825.37	28020.30	901.08
36	3.48	0.80	651.30	30.50	149.78	831.59	27194.94	901.00
35	3.53	0.82	659.24	31.16	147.21	837.60	26363.35	900.92
34	3.57	0.84	666.87	31.86	144.70	843.44	25525.75	900.83
33	3.61	0.85	674.24	32.35	142.35	848.94	24682.31	900.75
32	3.64	0.86	681.33	32.66	140.13	854.12	23833.37	900.67
31	3.68	0.89	688.15	33.80	137.74	859.69	22979.25	900.58
30	3.71	0.90	694.70	34.36	135.61	864.67	22119.56	900.50
29	3.75	0.92	701.01	34.86	133.57	869.43	21254.89	900.42
28	3.78	0.92	707.05	34.95	131.73	873.72	20385.46	900.33
27	3.81	0.94	712.85	35.85	129.71	878.42	19511.74	900.25
26	3.84	0.96	718.40	36.34	127.90	882.64	18633.32	900.17
25	3.87	0.97	723.72	36.81	126.17	886.70	17750.68	900.08
24	3.90	0.98	728.81	37.29	124.49	890.60	16863.98	900.00
23	3.92	0.97	733.69	36.90	123.15	893.74	15973.38	899.92
22	3.95	1.00	738.33	38.12	121.39	897.84	15079.65	899.83
21	3.97	1.01	742.75	38.42	119.97	901.15	14181.81	899.75
20	3.99	1.02	746.98	38.77	118.60	904.35	13280.66	899.67
19	4.02	1.03	750.98	39.15	117.29	907.42	12376.31	899.58
18	4.04	1.04	754.77	39.47	116.05	910.29	11468.89	899.50
17	4.06	1.05	758.36	39.76	114.89	913.01	10558.60	899.42
16	4.07	1.05	761.75	40.05	113.78	915.59	9645.58	899.33
15	4.09	1.05	764.92	39.92	112.87	917.71	8729.99	899.25
14	4.11	1.06	767.95	40.15	111.89	920.00	7812.28	899.17
13	4.12	1.08	770.83	40.87	110.81	922.52	6892.28	899.08
12	4.14	1.08	773.53	41.15	109.92	924.60	5969.76	899.00
11	4.15	1.09	776.05	41.35	109.11	926.50	5045.17	898.92
10	4.17	1.11	779.98	42.04	107.72	929.74	4118.67	898.83
9	0.00	0.00	0.00	0.00	354.33	354.33	3188.93	898.75
8	0.00	0.00	0.00	0.00	354.33	354.33	2834.60	898.67
7	0.00	0.00	0.00	0.00	354.33	354.33	2480.28	898.58
6	0.00	0.00	0.00	0.00	354.33	354.33	2125.95	898.50
5	0.00	0.00	0.00	0.00	354.33	354.33	1771.63	898.42
4	0.00	0.00	0.00	0.00	354.33	354.33	1417.30	898.33
3	0.00	0.00	0.00	0.00	354.33	354.33	1062.98	898.25
2	0.00	0.00	0.00	0.00	354.33	354.33	708.65	898.17
1	0.00	0.00	0.00	0.00	354.33	354.33	354.33	898.08

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

ADS Advanced Drainage Systems, Inc.

ADS SiteAssist FOR STORMTECH INSTALLATION INSTRUCTIONS VISIT OUR APP

THE CRESCENT
ANN ARBOR, MI, USA

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-7200.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

1. STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-7200 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-7200 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

	PROPOSED LAYOUT
187	STORMTECH MC-7200 CHAMBERS
38	STORMTECH MC-7200 END CAPS
12	STONE ABOVE (in)
9	STONE BELOW (in)
30	STONE VOID
52777	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
14173	SYSTEM AREA (SF)
645.9	SYSTEM PERIMETER (ft)

PROPOSED ELEVATIONS:	
MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	910.75
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	906.25
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	905.75
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	905.75
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	905.75
TOP OF STONE:	904.75
TOP OF MC-7200 CHAMBER:	903.75
18" x 18" TOP MANIFOLD INVERT:	901.20
24" ISOLATOR ROW PLUS INVERT:	898.94
24" BOTTOM CONNECTION INVERT:	898.94
18" x 18" BOTTOM MANIFOLD INVERT:	898.91
18" BOTTOM CONNECTION INVERT:	898.91
BOTTOM OF MC-7200 CHAMBER:	898.75
UNDERDRAIN INVERT:	898.00
BOTTOM OF STONE:	898.00

*INVERT ABOVE BASE OF CHAMBER

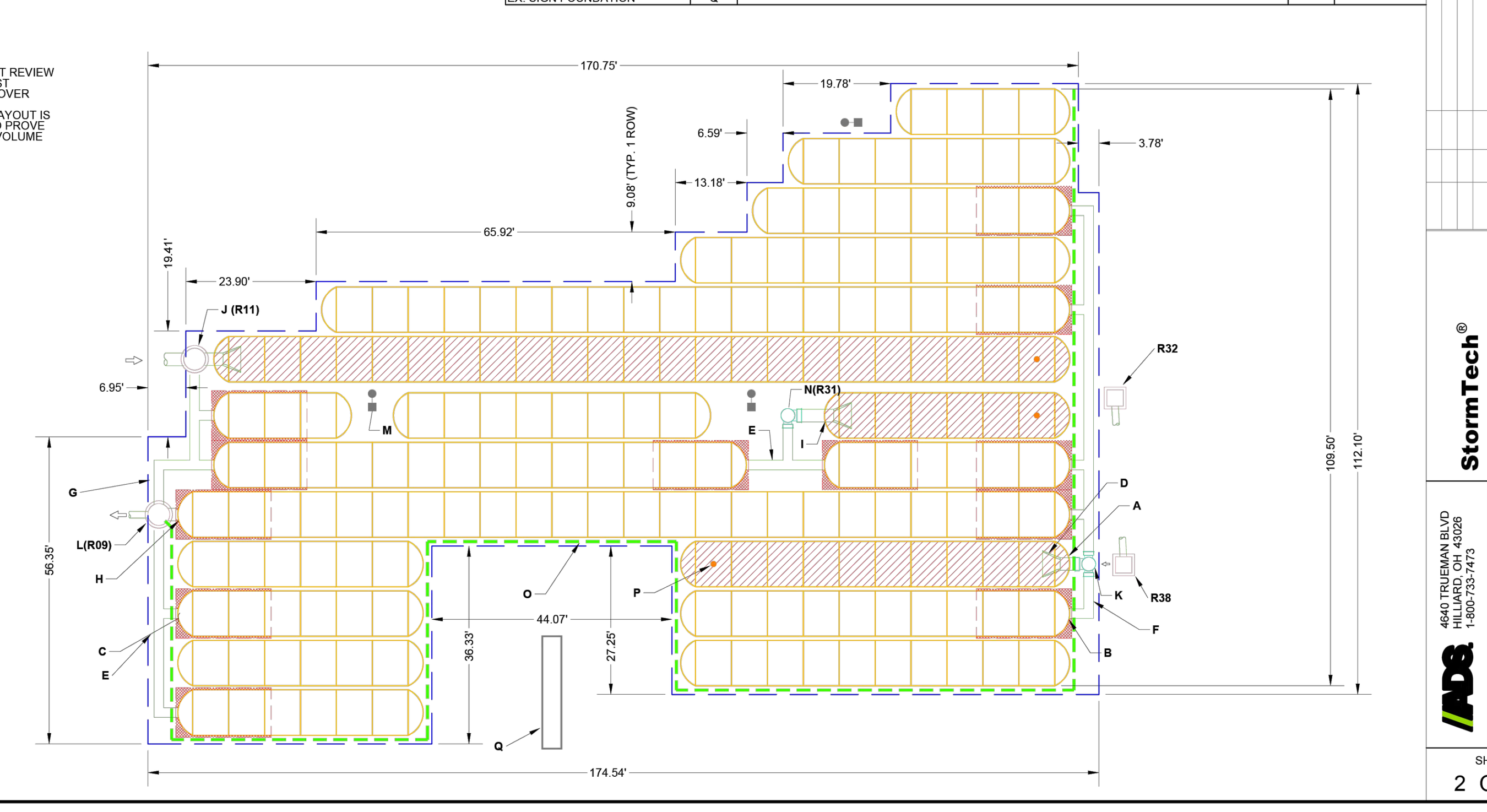
PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	24" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP24B / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.26"	
PREFABRICATED END CAP	B	18" TOP PARTIAL CUT END CAP, PART#: MC7200IEPP18T / TYP OF ALL 18" TOP CONNECTIONS	29.36"	
PREFABRICATED END CAP	C	18" BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP18B / TYP OF ALL 18" BOTTOM CONNECTIONS	1.97"	
FLAMP	D	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MCFLAMP (TYP 4 PLACES)		
MANIFOLD	E	18" x 18" TOP MANIFOLD, ADS N-12	29.36"	
MANIFOLD	F	18" x 18" TOP MANIFOLD, ADS N-12	29.36"	
MANIFOLD	G	18" x 18" TOP MANIFOLD, ADS N-12	29.36"	
PIPE CONNECTION	H	18" BOTTOM CONNECTION	1.97"	
PIPE CONNECTION	I	24" BOTTOM CONNECTION	2.26"	
CONCRETE STRUCTURE	J	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		5.5 CFS IN 5.5 CFS IN
NYLOPLAST (INLET W/ ISO PLUS ROW)	K	30" DIAMETER (24.00" SUMP MIN)		
CONCRETE STRUCTURE	L	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		4.0 CFS OUT
LIGHT FOUNDATION	M	(DESIGN / PROVIDED BY OTHERS, TYP. 2 PLACES)		14.0 CFS OUT
NYLOPLAST (INLET W/ ISO PLUS ROW)	N	30" DIAMETER (24.00" SUMP MIN)		5.5 CFS IN
UNDERDRAIN	O	6" ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		
INSPECTION PORT	P	4" SEE DETAIL (TYP 3 PLACES)		
EX. SIGN FOUNDATION	Q			

ISOLATOR ROW PLUS (SEE DETAIL)

PLACE MINIMUM 17.50' OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.



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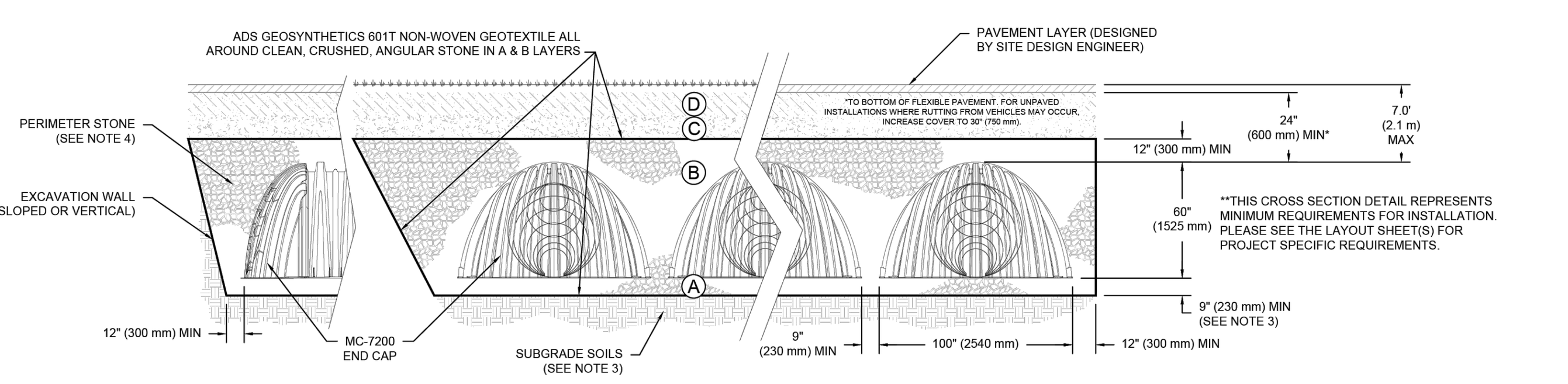
SHEET 2 OF 6

ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-7200 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

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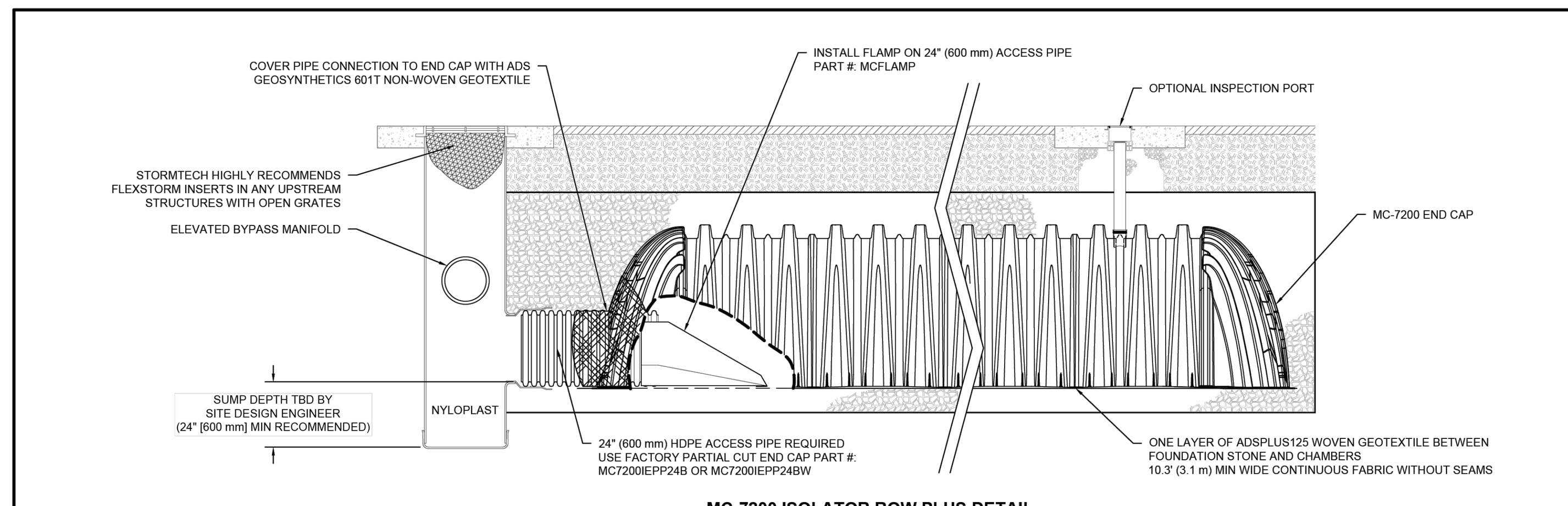
SHEET 3 OF 6



MC-7200 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

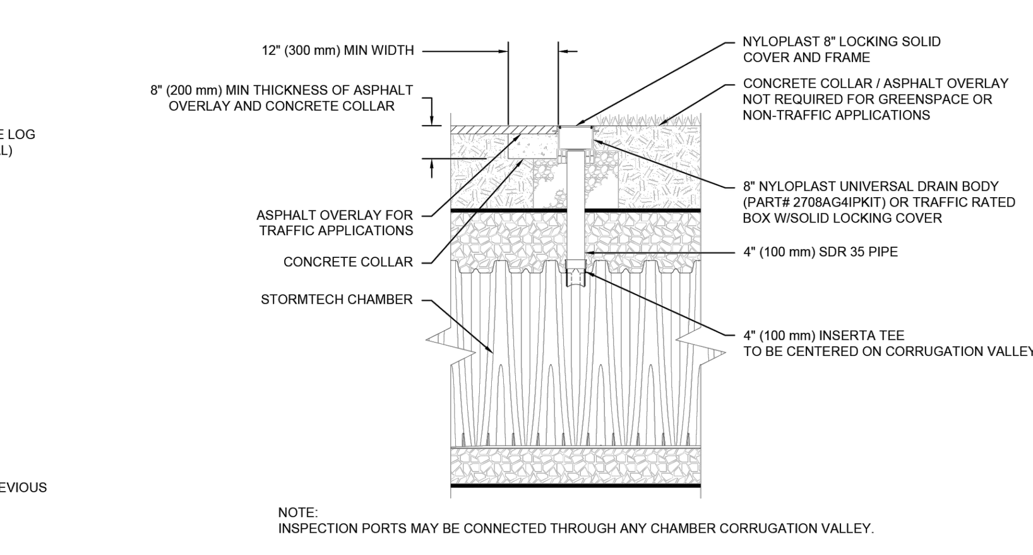
STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.

4" PVC INSPECTION PORT DETAIL (MC SERIES CHAMBER)
NTS

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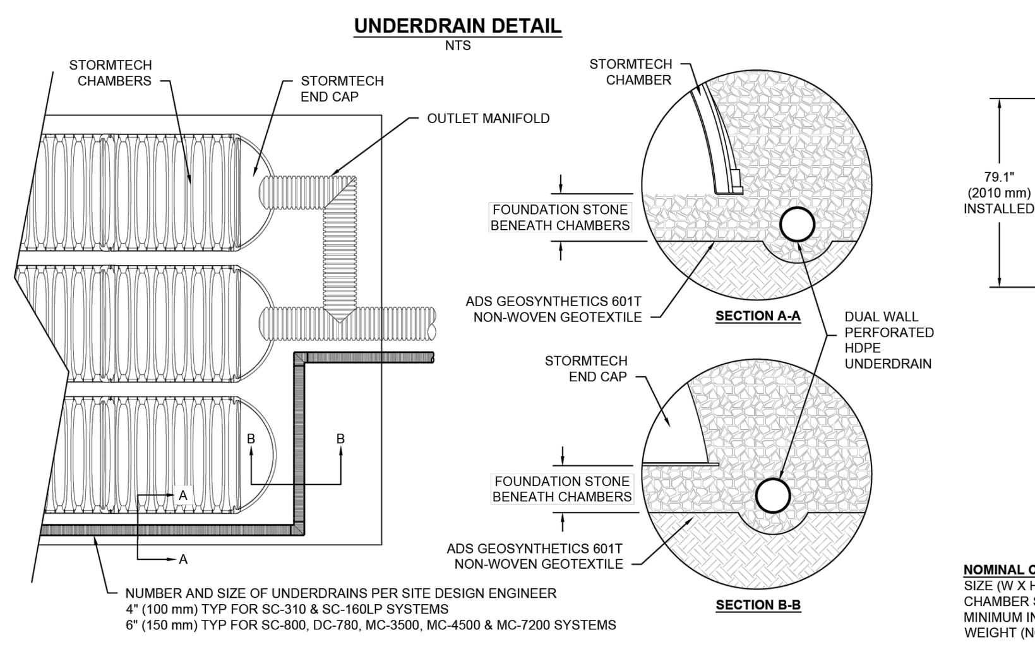
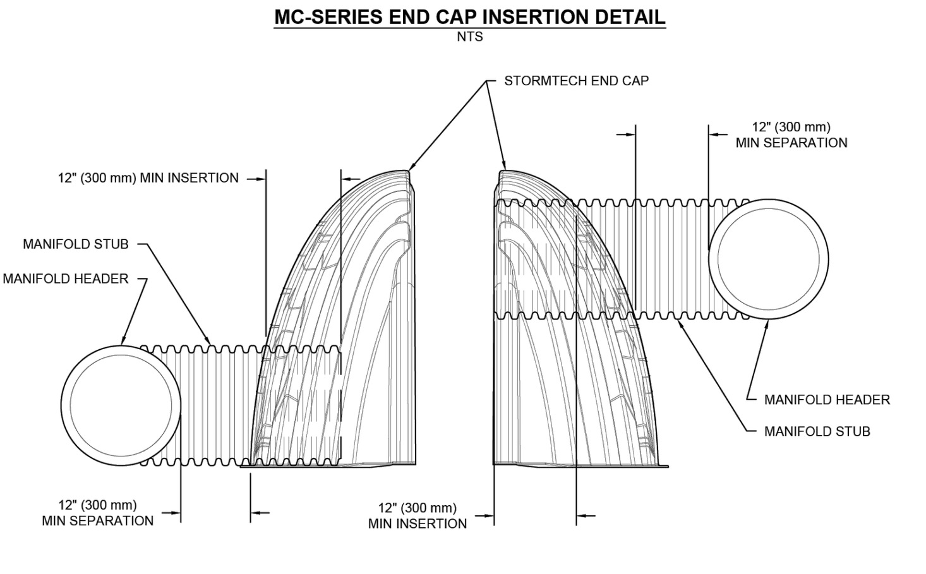
SHEET 4 OF 6

UNDERDRAIN DETAIL
NTS

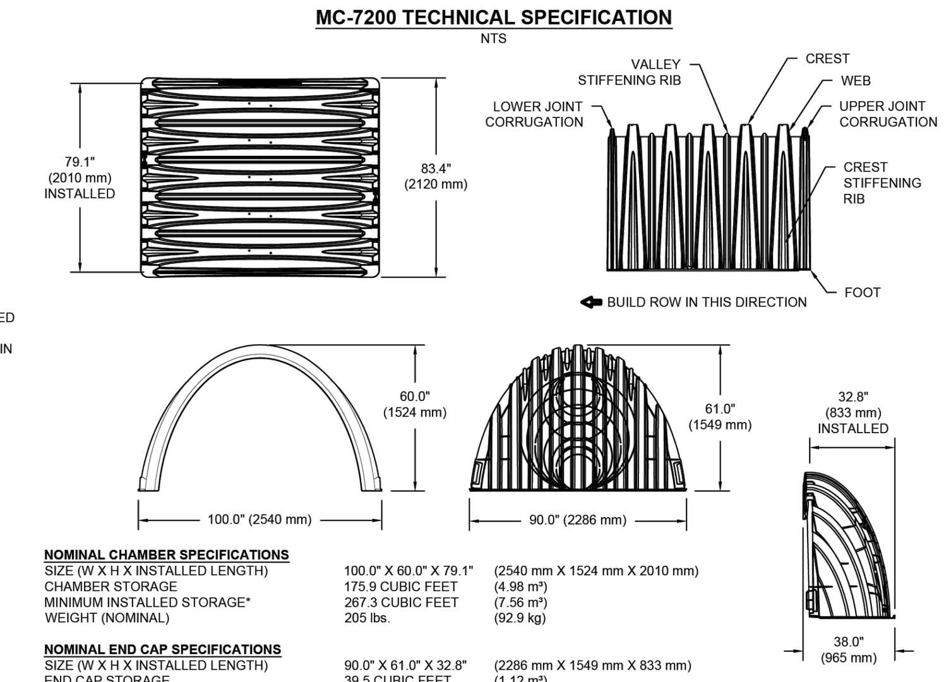


MC-SERIES END CAP INSERTION DETAIL
NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

MC-7200 TECHNICAL SPECIFICATION
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

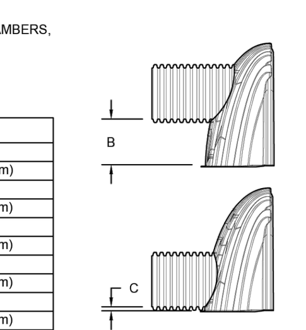
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC7200IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC7200IEPP06B		---	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B		---	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B		---	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC7200IEPP12B		---	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B		---	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEPP18TW			
MC7200IEPP18B		---	1.97" (50 mm)
MC7200IEPP18BW			
MC7200IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC7200IEPP24TW			
MC7200IEPP24B		---	2.26" (57 mm)
MC7200IEPP24BW			
MC7200IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC7200IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC7200IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



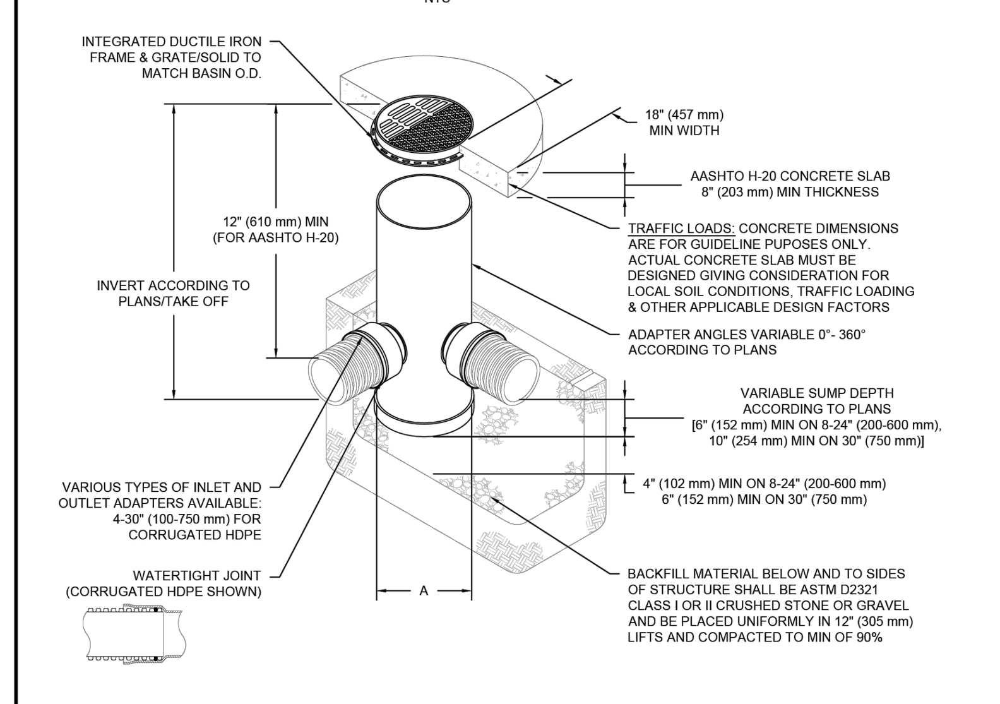
CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

THE CRESCENT ANN ARBOR, MI, USA | DATE: 11/26/2024 | DRAWN: MV | CHECKED: N/A | PROJECT #:

StormTech® Chamber System | 4640 TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473 | 1-800-821-6710 | WWW.STORMTECH.COM

SHEET 5 OF 6

NYLOPLAST DRAIN BASIN
NTS



NOTES
1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

THE CRESCENT ANN ARBOR, MI, USA | DATE: 11/26/2024 | DRAWN: MV | CHECKED: N/A | PROJECT #:

Nyloplast® | 4640 TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473 | 770-932-2443 | WWW.NYLOPLAST-US.COM

SHEET 6 OF 6

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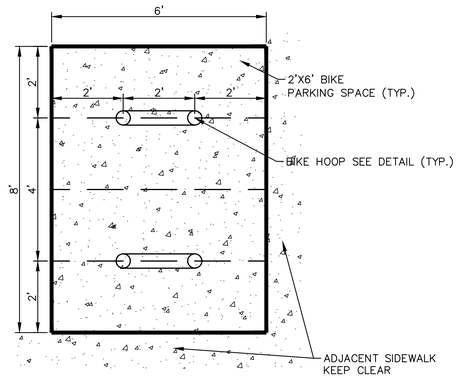
THE CRESCENT
SITE PLAN
STORMTECH CHAMBER DETAILS

26

JOB No. 23351

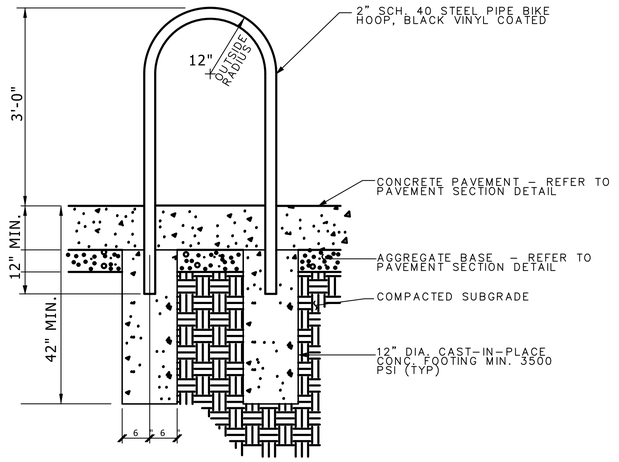
REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/05/24
SITE PLAN SUBMITTAL	04/18/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

DATE: 04/18/24
SHEET 26 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH: /23351SM05
FB:



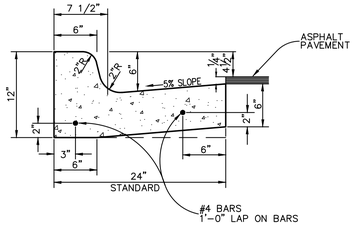
PRIVATE BIKE PARKING DETAIL

NOT TO SCALE



PRIVATE BIKE HOOP DETAIL

NOT TO SCALE

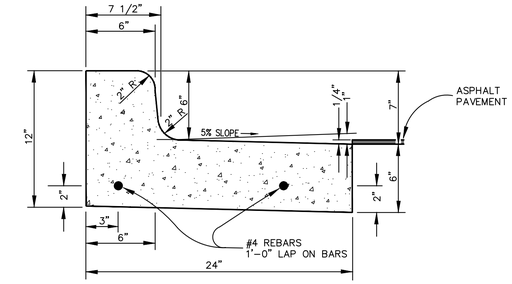


REVISIONS	REV. NO.	DR.BY	CH. BY	DATE

PUBLIC SERVICES DEPARTMENT
CITY OF ANN ARBOR

BARRIER CURB AND GUTTER

DR. BY	DF	CH. BY	CSS
SCALE	NONE	DATE	11-6-92
INCH	0 1	DRAWING NO.	SD-R-1
		SHEET NO. ____ OF ____	

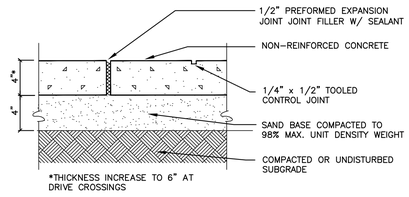


REVISIONS	REV. NO.	DR.BY	CH. BY	DATE

PUBLIC SERVICES DEPARTMENT
CITY OF ANN ARBOR

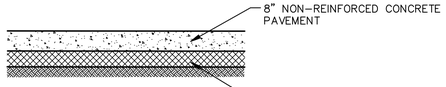
SPILL-OUT BARRIER CURB & GUTTER

DR. BY	DF	CH. BY	CSS
SCALE	NONE	DATE	11-6-92
INCH	0 1	DRAWING NO.	SD-R-3
		SHEET NO. ____ OF ____	



PRIVATE AND PUBLIC CONCRETE WALK DETAIL

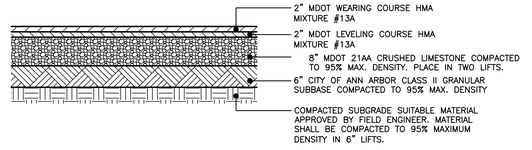
NO SCALE



NOTE: ALL CONCRETE PAVEMENT TO BE SEALED WITH ONE APPLICATION OF A TRANSPARENT CURING COMPOUND APPLIED AT A RATE OF 1 gal. per 200 sq. ft..

PRIVATE AND PUBLIC HEAVY DUTY CONCRETE DETAIL

NOT TO SCALE



PRIVATE BITUMINUOUS PAVEMENT SECTION

BITUMINOUS REPAIR IN THE ROW SHALL MATCH EXIST. SECTION
NOT TO SCALE

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THE CRESCENT

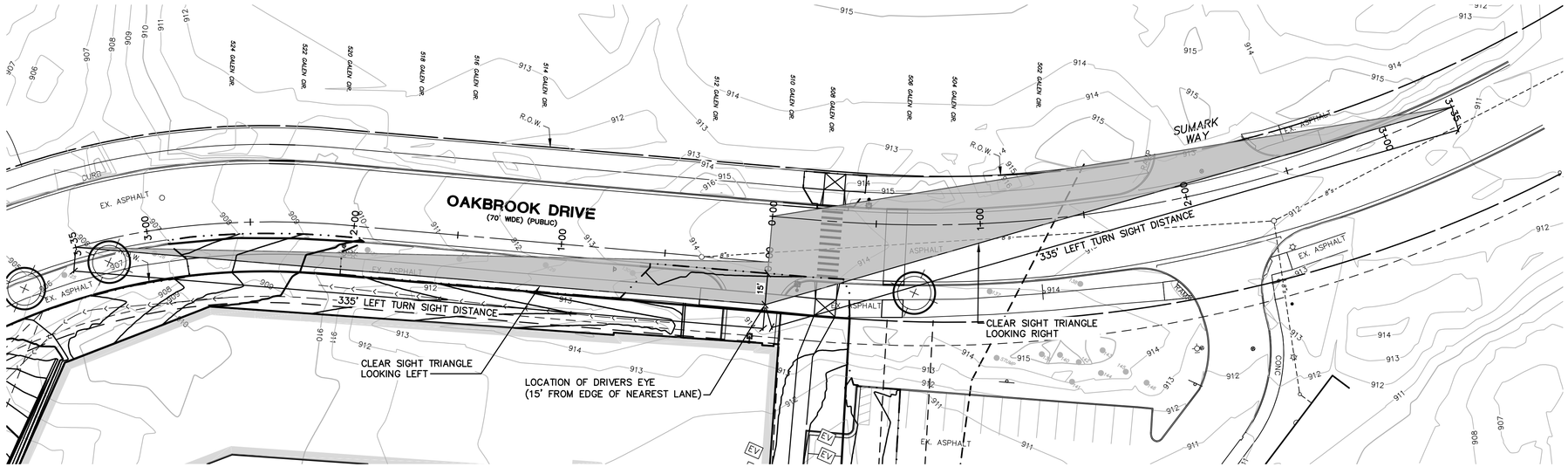
SITE PLAN
CIVIL DETAILS

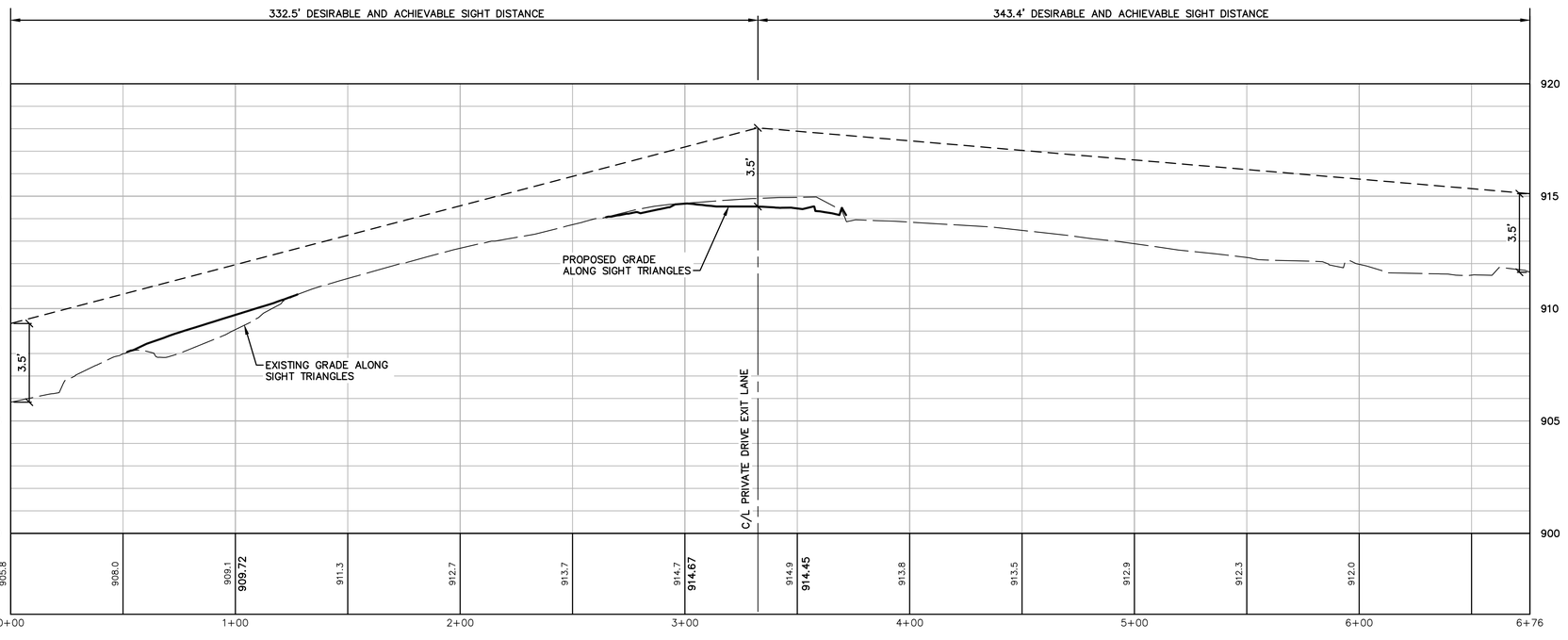
27

JOB No. 23351

DATE: 04/16/24
SHEET 27 OF 35
CADD: CMW
ENG: CMW
PM: ROW
TECH:
P:\2335\DT01
FB:

REVISIONS:	REV. DATE
PRELIMINARY CITY SUBMITTAL	04/16/24
SITE PLAN SUBMITTAL	04/16/24
SITE PLAN SUBMITTAL #2	08/14/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	05/26/25
SITE PLAN SUBMITTAL #5	09/22/25





OAKBROOK SIGHT LINE

NOTES

AASHTO DESIGN INSTERSECTION SIGHT DISTANCE – CASE B1, LEFT TURN FROM STOP & B2, RIGHT TURN FROM STOP.
DESIGN SPEED: 30 MPH
INTERSECTION DESIGN DISTANCE: 335' (LEFT TURN)
INTERSECTION DESIGN DISTANCE: 290' (RIGHT TURN)
DRIVER/OBJECT HEIGHT: 3.5'
POINT OF TRIANGLE ASSUMED TO BE CENTERED ON THE EXITING LANE AND 15' OFFSET OF EDGE OF OUTGOING LANE.

SCALE: 1" = 30'
0 30 60 90

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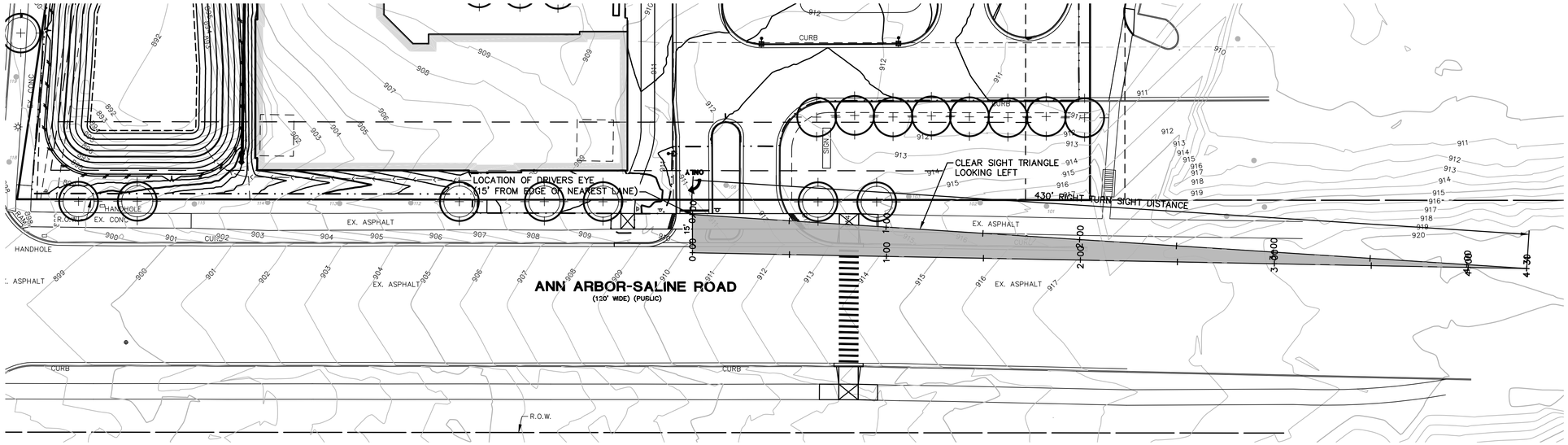
THE CRESCENT
SITE PLAN
OAKBROOK DRIVE SIGHT DISTANCE

28

JOB No. 23351

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	09/17/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

DATE: 04/18/24
SHEET 28 OF 35
CADD: CMW
ENG: CMW
PM: ROW
TECH:
FB: 23351SD01

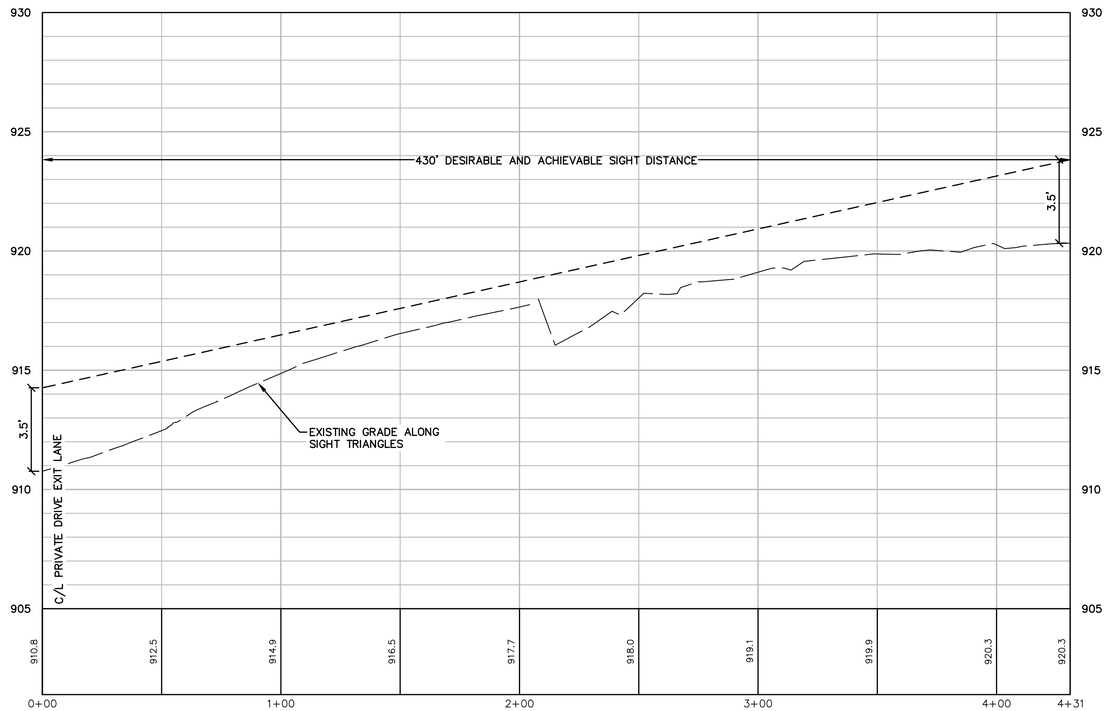


SCALE: 1" = 30'

0 30 60 90

NOTES

AASHTO DESIGN INSTERSECTION SIGHT DISTANCE – CASE B2, RIGHT TURN FROM STOP.
DESIGN SPEED: 45 MPH
INTERSECTION DESIGN DISTANCE: 430' (RIGHT TURN)
DRIVER/OBJECT HEIGHT: 3.5'
POINT OF TRIANGLE ASSUMED TO BE CENTERED ON THE EXITING LANE AND 15' OFFSET OF EDGE OF OUTGOING LANE.



ANN ARBOR-SALINE SIGHT LINE

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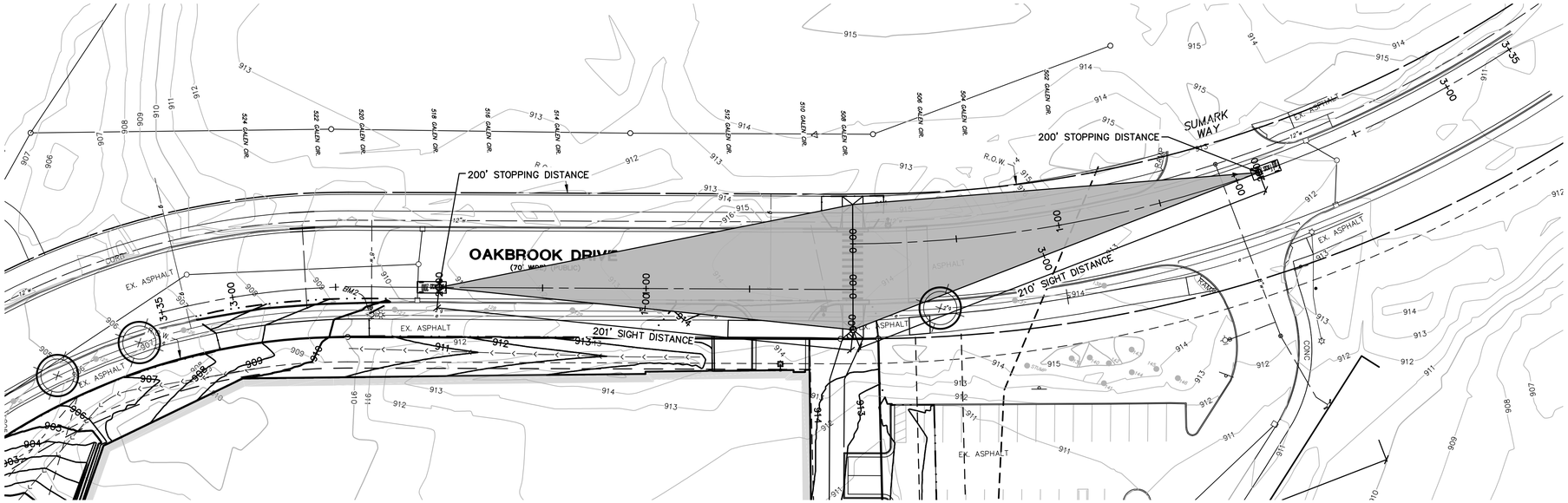
THE CRESCENT
SITE PLAN
ANN ARBOR–SALINE SIGHT DISTANCE

29

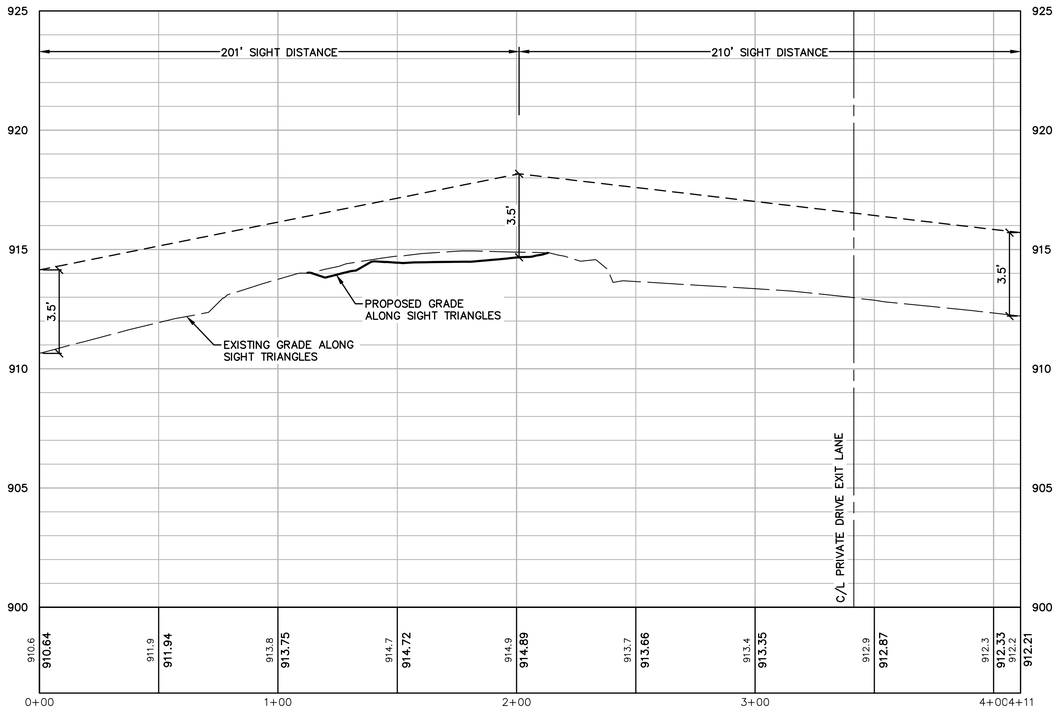
JOB No. 23351
DATE: 04/18/24
SHEET 29 OF 35
CADD: CMW
ENG.: CMW
PM.: RCW
TECH:
23351SD01

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	09/16/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25



SCALE: 1" = 30'

0 30 60 90



CROSSWALK SIGHT LINE

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THE CRESCENT

SITE PLAN
CROSS WALK SIGHT DISTANCE

30

JOB No. 23351

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	09/11/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

DATE: 04/18/24
SHEET 30 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
FILE: 23351SD01

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757103° Longitude: -83.250305°

Soil Boring No. B-01

G2 CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA						
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 902.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Brown Sandy Clay (12 inches) 1.0							
		Fill: Stiff to Very Stiff Brown Sandy Clay with trace gravel		S-01	2 3 4	7	14.3		3000*
897.0			5	S-02	2 3 3	6	15.0		6000*
		7.5		S-03	1 2 7	9	12.3		5000*
		End of Boring @ 7.5 ft							
892.0			10						
887.0			15						
882.0			20						
877.0			25						
872.0			30						
867.0			35						

Total Depth: 7.5 ft
Drilling Date: April 25, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
Dry during and upon completion

Notes:
Struck black PVC pipe around 7 feet, abandoned hole and offset approximately 10 feet west, 4 feet north to boring B-01B
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 1

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757707° Longitude: -83.25032°

Soil Boring No. B-01A

G2 CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA						
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 900.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		(Profile drilled to 6 feet)							
895.0			5						
		6.0		S-03	4 7 11	18	11.3		9000*
		Hard Brown Clay with trace sand and gravel		S-04	5 10 13	23	12.2		9000*
890.0			10						
		13.5		S-05	6 8	12	15.9	119	3260
		Stiff to Very Stiff Gray Clay with trace sand and gravel							
885.0			15						
		23.5		S-06	4 7 8	15	12.8		6500*
		Stiff Brown Sandy Clay with trace gravel							
880.0		27.0	20						
		Medium Compact Gray Clayey Sand with trace gravel		S-07	2 4 8	12	9.4	135	3530
		33.0							
875.0		Very Compact Gray Sand with trace clay and gravel	25	S-08	2 7 12	19			
		35.0							
870.0		End of Boring @ 35 ft	30						
865.0			35	S-09	41 60/4"	---			

Total Depth: 35 ft
Drilling Date: April 25, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
28-1/2 feet during drilling; dry upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 2

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757563° Longitude: -83.249937°

Soil Boring No. B-02

G2 CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA						
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 910.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Brown Sandy Clay (2 inches) 0.2							
		Fill: Stiff Brown Sandy Clay with trace gravel 3.0		S-01	4 5 4	9	16.8		4000*
905.0		Stiff Mottled Brown and Gray Sandy Clay with trace gravel	5	S-02	2 3 4	7	19.2		2000*
		6.0		S-03	4 8 10	18	12.5		9000*
		Hard Brown Clay with trace sand and gravel		S-04	7 12 15	27	17.7		9000*
900.0			10						
				S-05	6 12	24	12.5		9000*
895.0			15						
				S-06	6 12 15	27	15.5		9000*
890.0			20						
		Very Stiff to Hard Gray Clay with trace sand and gravel		S-07	4 6 9	15	15.4	120	6020
885.0			25						
				S-08	20 25 31	56	6.4		9000*
880.0		33.0	30						
		Hard Brown Clay with trace sand and gravel		S-09	17 31 40	71	7.6		9000*
875.0		35.0	35						
		End of Boring @ 35 ft							

Total Depth: 35 ft
Drilling Date: May 1, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
33 feet during drilling; dry upon completion

Notes:
Borehole collapsed at 31 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 3

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757106° Longitude: -83.250040°

Soil Boring No. B-03

G2 CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA						
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 908.5 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Fill: Dark Brown Sandy Clay with trace gravel 1.5							
		Hard Brown Clay with trace sand and gravel 3.0		S-01	3 3 4	7	14.8		9000*
903.5			5	S-02	4 7 9	16	20.8		6000*
		Very Stiff to Hard Mottled Brown and Gray Clay with trace sand and gravel		S-03	7 10 13	23	18.4		9000*
898.5		11.0	10	S-04	4 8 9	17	19.6		6000*
893.5			15	S-05	4 6 8	16	14.6		6500*
		Very Stiff to Hard Gray Clay with trace sand and gravel							
888.5			20	S-06	4 6 9	15	13.2		9000*
		23.5							
883.5		Stiff Brownish Gray Clayey with trace sand and gravel	25	S-07	3 5 7	12	14.0	121	4770
		28.5							
878.5		Hard Brownish Gray Sandy Clay with trace sand and gravel	30	S-08	8 16 20	36	8.0		9000*
		35.0							
873.5		End of Boring @ 35 ft	35	S-09	17 30 55	85	7.4		9000*

Total Depth: 35 ft
Drilling Date: April 26, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
21 feet during drilling; dry upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 4

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757204° Longitude: -83.249580°

Soil Boring No. B-04

G2 CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA						
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 910.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Fill: Dark Brown Clay 1.0							
		Very Stiff Mottled Brown Clay with trace sand and gravel 3.0		S-01	3 5 6	11	16.3		5000*
905.0			5	S-02	4 7 8	15	14.2		3500*
				S-03	6 11 15	26	17.3		9000*
		Hard Brown Clay with trace sand and gravel		S-04	6 13 16	29	17.7		9000*
900.0			10						
		13.5		S-05	6 8 9	17	10.9	241	3450
		Very Stiff to Hard Gray Clay with trace sand and gravel							
895.0			15						
		23.5		S-06	4 8 9	17	10.2		9000*
		Stiff Gray Sandy Clay with trace gravel							
890.0		28.5	20						
				S-07	9 11 9	20	12.6		4000*
885.0			25						
				S-08	11 13 15	28	8.2		9000*
880.0			30						
		Very Stiff to Hard Gray Sandy Clay with trace gravel; occasional sand seams							
875.0		35.0	35	S-09	22 39 51	90	10.8		5000*
		End of Boring @ 35 ft							

Total Depth: 35 ft
Drilling Date: April 29, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
4 feet during drilling; dry upon completion

Notes:
Borehole collapsed at 29 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 5

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.756854° Longitude: -83.249580°

Soil Boring No. B-05

G2 CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA						
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 910.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Brown Sandy Clay (1 inch) 0.1							
		Fill: Dark Brown Clay with trace sand and gravel 1.5		S-01	2 4 5	9	20.8		4500*
905.0		Very Stiff Mottled Brown and Gray Clay with trace sand and gravel	5	S-02	3 5 7	12	20.2		4500*
				S-03	6 7 10	17	14.3		4000*
		8.0							
		Hard Brown Clay with trace sand and gravel		S-04	6 8 12	20	17.6	114	17470
900.0		11.0	10						
		Very Stiff Grayish Brown Clay with trace sand and gravel		S-05	6 8	16	13.6		8000*
895.0			15						
				S-06	5 8 10	18	13.8		6500*
890.0		23.5	20						
				S-07	3 5 8	16	18.3	119	3190
885.0			25						
		Stiff Brown Sandy Clay with trace gravel		S-08	4 9 9	18	11.3		4000*
880.0		33.5	30						
		Very Compact Gray Clayey Sand with trace gravel		S-09	12 15 40	55			
875.0		35.0	35						
		End of Boring @ 35 ft							

Total Depth: 35 ft
Drilling Date: April 29, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
Dry upon completion

Notes:
Borehole collapsed at 31 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 6

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757204° Longitude: -83.249688°

Soil Boring No. B-06

G2 CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA						
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 909.5 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Brown Sandy Clay (2 inches) 0.2							
		Fill: Brown Clay with trace sand and gravel 2.0		S-01	2 3 6	9	19.2		4000*
		Stiff Mottled Brown Clay with trace sand and gravel 3.5							
904.5		Hard Brown Clay with trace sand and gravel	5	S-02	5 9 10	19	13.3		9000*
		6.0		S-03	3 4 6	10	16.1		1000**
		Medium Brown Sandy Clay with trace gravel 7.5							
		Medium Compact Brown Clayey Sand with trace gravel 8.0		S-04	5 9 12	21	19.3		9000*
899.5		Hard Mottled Brown Clay with trace sand and gravel	10						
		12.0		S-05	5 6	11	11.8		4000*
894.5		Stiff Grayish Brown Clay with trace sand and gravel	15						
				S-06	4 6 8	14	15.7	116	4980
889.5		23.5	20						
		Hard Grayish Brown Clay with trace sand and gravel		S-07	6 10 12	22	18.4		9000*
884.5		28.5	25						
				S-08	16 28 35	63			
879.5		Very Compact Gray Clayey Sand with trace gravel	30						
				S-09	23 31 47	78			
874.5		35.0	35						
		End of Boring @ 35 ft							

Total Depth: 35 ft
Drilling Date: May 1, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
33 feet during drilling; dry upon completion

Notes:
Borehole collapsed at 28 ft after auger removal
* Calibrated Hand Penetrometer
** Torvane

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 7

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757362° Longitude: -83.249793°

Soil Boring No. B-07

G2 CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA						
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 910.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Brown Sandy Clay (1 inch) 0.1							
		Fill: Brown Clay with trace sand and gravel 2.0		S-01	2 3 6	9	15.7		6000*
905.0		Very Stiff to Hard Mottled Brown Clay with trace sand and gravel	5	S-02	5 7 6	13	11.8		8500*
		5.5		S-03	6 11 14	25	16.9		9000*
				S-04	10 10 12	22	16.8	115	7280
900.0			10						
		Very Stiff to Hard Brown to Gray Clay with trace sand and gravel		S-05	5 6	21	10.8		9000*
895.0			15						
				S-06	6 7 9	16	15.4		5000*
890.0		23.5	20						
				S-07	7 11 9	20	15.2		1000**
885.0		Medium Brown Sandy Clay with trace gravel 28.0	25						
				S-08	6 16 34	50			
880.0			30						
		Very Compact Gray Clayey Sand with trace gravel							
875.0		35.0	35	S-09	27 50/5"	---			
		End of Boring @ 35 ft							

Total Depth: 35 ft
Drilling Date: May 1, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
28 feet during drilling and upon completion

Notes:
* Calibrated Hand Penetrometer
** Torvane

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 8

PRELIMINARY SUBJECT TO REVISION

MIDWESTERN CONSULTING
3815 Plaza Drive, Ann Arbor, Michigan 48108
(734) 995-0200 • www.midwesternconsulting.com
Land Development • Land Survey • Institutional • Municipal
Wireless Communications • Transportation • Landfill Services

CLIENT
CRANBROOK VILLAGE LIMITED PARTNERSHIP
6735 TELEGRAPH ROAD, SUITE 110
BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

THE CRESCENT

SITE PLAN
SOIL BORINGS 1

31

DATE: 04/18/24
SHEET 31 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
23351SB01
PB

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	10/15/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

JOB No. 23351

SOIL / PAVEMENT BORING_243149.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/13/24

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757310° Longitude: -83.249521°

Soil Boring No. B-08

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 910.5 ft ±

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
			SOIL SAMPLE DATA				
910.5	0	S-01	12 27 20/0"	---			
	3.0		Fill: Clayey Sand, Aggregate, Concrete Debris				
905.5	5	S-02	9 8 8	16	13.4		8000*
	8.0		Hard Brown Clay with trace sand and gravel				
900.5	10	S-03	6 10 12	22	11.5		9000*
		S-04	6 9 11	20	17.5		6000*
895.5	15	S-05	5 6 8	11	11.9	145	4370
	18.5		Stiff to Very Stiff Gray Clay with trace sand and gravel				
890.5	20	S-06	4 6 9	15	13.1		9000*
	23.5		Hard Gray Clay with trace sand and gravel				
885.5	25	S-07	3 4 5	9	15.6	138	2270 600**
	29.0		Soft Gray Clay with trace sand and gravel				
880.5	30	S-08	6 12 14	26	8.6		9000*
	33.0		Hard Gray Clay with trace sand and gravel				
875.5	35	S-09	14 22 32	54			
			End of Boring @ 35 ft				

Total Depth: 35 ft
Drilling Date: April 25, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
33 feet during drilling; dry upon completion

Notes:
* Calibrated Hand Penetrometer
** Torvane

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 9

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.756958° Longitude: -83.24940°

Soil Boring No. B-09

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 911.5 ft ±

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
			SOIL SAMPLE DATA				
911.5	0	S-01	2 3 6	9	15.6		3000*
	0.1		Topsoil: Brown Sandy Clay (1 inch)				
	1.5		Fill: Brown Clay with trace sand and gravel				
	3.0		Stiff Mottled Brown and Gray Clay with trace sand and gravel				
906.5	5	S-02	6 9 10	19	14.3		9000*
		S-03	5 10 13	23	16.3		9000*
	12.0		Hard Brown Clay with trace sand and gravel				
901.5	10	S-04	7 11 13	24	15.9		9000*
896.5	15	S-05	3 5 6	9	13.7	128	3940
891.5	20	S-06	3 5 7	12	11.9		6000*
	23.5		Stiff to Very Stiff Gray Clay with trace sand and gravel				
886.5	25	S-07	5 6 8	14	15.3		5000*
	29.0		Medium Compact Brown to Gray Clayey Sand with trace gravel				
881.5	30	S-08	5 9 16	24			
876.5	35	S-09	7 13 15	28			
			End of Boring @ 35 ft				

Total Depth: 35 ft
Drilling Date: April 29, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 10

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757059° Longitude: -83.249223°

Soil Boring No. B-10

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 911.5 ft ±

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
			SOIL SAMPLE DATA				
911.5	0	S-01	3 4 7	11	14.0		9000*
	0.1		Topsoil: Brown Sandy Clay (1 inch)				
	1.2		Fill: Brown Sandy Clay with trace gravel				
906.5	5	S-02	5 9 11	20	13.6		9000*
		S-03	6 12 17	29	14.8		9000*
	9.0		Hard Mottled Brown Clay with trace sand and gravel				
901.5	10	S-04	8 14 18	32	14.4		9000*
	12.0		Hard Brownish Gray Clay with trace sand and gravel				
896.5	15	S-05	6 8 9	13	17.8	114	2650
891.5	20	S-06	4 6 7	13	12.0		5000*
	23.5		Stiff to Very Stiff Gray Clay with trace sand and gravel				
886.5	25	S-07	4 6 8	14	15.3	120	4220
	28.0		Medium Compact Gray Sand with trace silt and gravel				
881.5	30	S-08	4 8 9	17			
	31.0		Compact Gray Clayey Sand with trace gravel				
876.5	35	S-09	14 21 24	45			
			End of Boring @ 35 ft				

Total Depth: 35 ft
Drilling Date: April 29, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
28 feet during drilling; 27 feet upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 11

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757419° Longitude: -83.249332°

Soil Boring No. B-11

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 910.5 ft ±

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
			SOIL SAMPLE DATA				
910.5	0	S-01	5 7 12	19	13.7		9000*
	2.0		Fill: Brown Clay with trace sand and gravel				
905.5	5	S-02	7 10 13	23	15.4		9000*
	9.5		Hard Brown Clay with trace sand and gravel				
900.5	10	S-03	8 9 11	20	10.8		9000*
		S-04	7 11 9	20	10.7		9000*
895.5	15	S-05	4 5 6	9	12.4	130	2370
890.5	20	S-06	4 5 6	11	11.6		7000*
	23.5		Stiff to Very Stiff Gray Clay with trace sand and gravel				
885.5	25	S-07	4 5 7	12	12.7		7000*
	28.5		Medium Compact Gray Clayey Sand with trace gravel				
880.5	30	S-08	9 13 16	29			
	33.5		Very Compact Gray Clayey Sand with trace gravel				
875.5	35	S-09	21 24 30	54			
			End of Boring @ 35 ft				

Total Depth: 35 ft
Drilling Date: April 30, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
33 feet during drilling; dry upon completion

Notes:
Borehole collapsed at 27 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 12

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.757519° Longitude: -83.249148°

Soil Boring No. B-12

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 910.0 ft ±

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
			SOIL SAMPLE DATA				
910.0	0	S-01	6 11 14	25	13.7		9000*
	2.0		Fill: Brown Sandy Clay with trace gravel				
905.0	5	S-02	5 9 13	22	14.2		9000*
	6.0		Hard Brown Clay with trace sand and gravel				
		S-03	3 5 6	11	19.8		3500*
900.0	10	S-04	4 4 5	9	20.6	107	4700
895.0	15	S-05	5 5 6	11	11.1	126	4490
890.0	20	S-06	4 6 7	13	12.4	131	4530
	23.5		Stiff Gray Clay with trace sand and gravel				
885.0	25	S-07	3 4 7	12	17.0		3500*
	29.0		Medium Compact Gray Clayey Sand with trace gravel				
880.0	30	S-08	4 8 16	24			
	33.5		Very Compact Gray Clayey Sand with trace gravel				
875.0	35	S-09	9 24 40	64			
			End of Boring @ 35 ft				

Total Depth: 35 ft
Drilling Date: April 30, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
31 feet during drilling and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 13

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.756752° Longitude: 42.250061°

Soil Boring No. B-13

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 907.0 ft ±

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
			SOIL SAMPLE DATA				
907.0	0	S-01	5 4 6	10	8.7		9000*
	2.5		Fill: Brown Sandy Clay with trace gravel				
902.0	5	S-02	6 8 10	18	11.2		9000*
	6.0		Hard Brown Clay with trace sand and gravel				
		S-03	8 12 17	29	16.7		9000*
897.0	10	S-04	4 8 10	18	10.0		9000*
892.0	15	S-05	5 6 8	14	11.9		9000*
887.0	20	S-06	4 7 8	15	26.2		7500*
	23.5		Hard Gray Clay with trace sand and gravel				
882.0	25	S-07	4 6 8	14	13.9	115	3890
	28.5		Stiff Brown Clay with trace sand and gravel				
877.0	30	S-08	6 12 16	28			
	33.5		Medium Compact Gray Clayey Sand with trace gravel				
872.0	35	S-09	17 41 50/4"	---			
			Very Compact Gray Clayey Sand with trace gravel				
			End of Boring @ 35 ft				

Total Depth: 35 ft
Drilling Date: April 26, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
29 feet during drilling; dry upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 14

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.756398° Longitude: 42.249824°

Soil Boring No. B-14

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 909.5 ft ±

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
			SOIL SAMPLE DATA				
909.5	0	S-01	2 2 4	4	16.8		2000*
			Fill: Stiff Mottled Brown Clay with trace sand and gravel				
904.5	5	S-02	2 2 4	6	19.9		4000*
	5.7		Medium Compact Brown Silt with trace sand				
	6.5		Medium Compact Brown Clayey Sand with trace gravel				
	8.0		Stiff Mottled Brown Clay with trace sand and gravel				
		S-03	4 6 6	12			
899.5	10	S-04	2 4 6	10	18.3		5000*
894.5	15	S-05	5 6 8	13	11.1	129	4050
889.5	20	S-06	4 6 9	15	1308.1		7000*
	23.5		Very Stiff Gray Clay with trace sand and gravel				
884.5	25	S-07	6 14 16	30	20.4		2000*
	28.5		Stiff Gray Clay with trace sand and gravel; occasional sand layers				
879.5	30	S-08	19 31 60	91			
	33.5		Very Compact Brownish Gray Clayey Sand with trace gravel				
874.5	35	S-09	6 8 17	25			
			Medium Compact Gray Clayey Sand; occasional clayey layers				
			End of Boring @ 35 ft				

Total Depth: 35 ft
Drilling Date: April 26, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
6-1/2 feet during drilling; 20 feet upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 15

Project Name: Proposed Multi-Family Development
Project Location: 2525 Ann Arbor-Saline Road, Ann Arbor, Washtenaw County, Michigan
G2 Project No. 243149
Latitude: 42.756659° Longitude: 42.249381°

Soil Boring No. B-15

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 912.0 ft ±

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
			SOIL SAMPLE DATA				
912.0	0	S-01	3 4 6	10	13.5		7000*
	0.1		Topsoil: Brown Sandy Clay (1 inch)				
	4.0		Fill: Very Stiff Brown Clay with trace sand and gravel				
907.0	5	S-02	5 9 10	19	15.4		9000*
	6.0		Hard Mottled Brown Clay with trace sand and gravel				
		S-03	3 2 2	4			
	8.5		Loose Brown Sand and Clay with trace gravel				
902.0	10	S-04	4 7 8	15	20.1		6500*
897.0	15	S-05	4 5 5	10	20.1	112	2850
892.0	20	S-06	4 7 9	16	12.0		7000*
	23.5		Stiff to Very Stiff Gray Clay with trace sand and gravel				
887.0	25	S-07	3 5 8	13	15.0		4500*
	29.5		Stiff Gray Sandy Clay with trace gravel				
882.0	30	S-08	4 8 10	18	11.7		4000*
877.0	35	S-09	7 10 13	23	11.2		3000*
			End of Boring @ 35 ft				

Total Depth: 35 ft
Drilling Date: April 30, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
30 feet during drilling; 33 feet upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 16

MIDWESTERN CONSULTING
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BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

THE CRESCENT
SITE PLAN
SOIL BORINGS 2

32

JOB No. 23351

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	09/12/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

DATE: 04/18/24
SHEET 32 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH: JAB
23351SB01

Project Name: Proposed Multi-Family Development

Project Location: 2525 Ann Arbor-Saline Road
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 243149

Latitude: 42.248965° Longitude: -83.756885°

Soil Boring No. B-16

CONSULTING GROUP

ELEV. (ft)	PROFILE	GROUND SURFACE ELEVATION: 912.5 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Fill: Brown Clayey Sand with trace gravel (0.5' - 1.2')							
		Fill: Brown Clay with trace sand and gravel		S-01	4 7 10	17	15.2		9000*
907.5		Very Stiff to Hard Brown Clay with trace sand and gravel	5	S-02	9 15 21	36	10.7		9000*
				S-03	8 8 11	19	13.9		7000*
		Medium Gray Clay with trace sand and gravel (8.5' - 9.0')		S-04	9 8 6	14	16.9		1200**
902.5		Medium Compact Gray Silty Sand (11.0')	10						
				S-05	5 6 6	11	21.8		2000**
897.5		Stiff Gray Clay with trace sand and gravel	15						
				S-06	5 9 10	19	11.9		4000*
892.5		(23.5')	20						
		Soft Gray Clay with trace sand and gravel		S-07	5 12 13	25	16.9		800**
887.5		(28.5')	25						
		Stiff Gray Clay with trace sand and gravel		S-08	3 7 11	18	15.4	126	2570
882.5			30						
				S-09	6 9 10	19	8.9	137	2330
877.5		End of Boring @ 35 ft (35.0')	35						

Total Depth: 35 ft
Drilling Date: April 30, 2024
Inspector: ---
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
9 feet during drilling and upon completion

Notes:
* Calibrated Hand Penetrometer
** Torvane

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 17

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development

Project Location: 2525 Ann Arbor-Saline Road
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 243149

Latitude: 42.249391° Longitude: -83.757652°

Soil Boring No. IN-01

CONSULTING GROUP

ELEV. (ft)	PROFILE	GROUND SURFACE ELEVATION: 911.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Fill: Grayish Brown and Brown Gravelly Sand (8 inches) (0.7')							
		Hard Brown Sandy Clay with trace gravel		S-01	5 8 9	17	14.3		9000*
906.0			5	S-02	6 10 12	22	16.1		9000*
		Hard Mottled Brown and Gray Sandy Clay with trace gravel (7.0' - 8.0')		S-03	8 10 13	23	15.1		9000*
901.0			10	S-04	5 8 8	16	12.6		6000*
		Poor Recovery Very Stiff Gray Sandy Clay with trace silt and gravel		S-05	6 9 10	19	18.7		4500*
896.0			15	S-06	5 6 8	13	11.8		4000*
		End of Boring @ 17.5 ft (17.5')		30"	5 6 7	13	11.8		7000*
891.0			20						
886.0			25						
881.0			30						
876.0			35						

Total Depth: 17.5 ft
Drilling Date: April 25, 2024
Inspector: C. Gross
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 18

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development

Project Location: 2525 Ann Arbor-Saline Road
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 243149

Latitude: 42.249332° Longitude: -83.756903°

Soil Boring No. IN-02

CONSULTING GROUP

ELEV. (ft)	PROFILE	GROUND SURFACE ELEVATION: 912.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sandy Clay (4 inches) (0.3')							
		Very Stiff to Hard Mottled Brown and Gray Sandy Clay with trace gravel; occasional sand seams		S-01	4 4 5	9	15.6		6000*
907.0			5	S-02	3 5 6	11	17.3		8000*
		Hard Mottled Brown and Gray Sandy Clay with trace silt and gravel (5.5')		S-03	6 9 10	19	15.9		9000*
902.0		(10.5')	10	S-04	5 8 9	17	20.1		9000*
		Very Stiff Gray Sandy Clay with trace silt and gravel		S-05	4 5 7	12	19.5		5500*
897.0			15	S-06	3 5 6	9	18.1		4500*
		End of Boring @ 17.5 ft (17.5')		30"	4 5 6	11	10.2		4500*
892.0			20						
887.0			25						
882.0			30						
877.0			35						

Total Depth: 17.5 ft
Drilling Date: April 25, 2024
Inspector: C. Gross
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 19

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development

Project Location: 2525 Ann Arbor-Saline Road
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 243149

Latitude: 42.250018° Longitude: -83.756985°

Soil Boring No. IN-03

CONSULTING GROUP

ELEV. (ft)	PROFILE	GROUND SURFACE ELEVATION: 909.5 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Fill: Brown Clayey Sand with gravel (4 inches) (0.3')							
		Fill: Hard Brown Sandy Clay with trace gravel (3.0')		S-01	4 7 6	13	14.1		9000*
904.5		Very Stiff to Hard Mottled Brown and Gray Silty Clay with trace sand and gravel	5	S-02	3 4 5	9	18.8		6000*
				S-03	6 10 14	24	16.4		9000*
899.5		(10.5')	10	S-04	9 12 15	27	18.2		9000*
		Hard Brown Sandy Clay with trace gravel; occasional silt partings		S-05	8 10 12	22	11.7		9000*
894.5		(15.0')	15	S-06	6 9 10	19	11.9		9000*
		End of Boring @ 15 ft							
889.5			20						
884.5			25						
879.5			30						
874.5			35						

Total Depth: 15 ft
Drilling Date: April 25, 2024
Inspector: C. Gross
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 20

PRELIMINARY SUBJECT TO REVISION

Project Name: Proposed Multi-Family Development

Project Location: 2525 Ann Arbor-Saline Road
Ann Arbor, Washtenaw County, Michigan

G2 Project No. 243149

Latitude: 42.250519° Longitude: -83.756797°

Soil Boring No. IN-04

CONSULTING GROUP

ELEV. (ft)	PROFILE	GROUND SURFACE ELEVATION: 898.0 ft ±	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Clayey Sand (1.0')							
		Fill: Loose Brown Sandy Clay with trace gravel (3.0')		S-01	3 4 5	9	11.1		
893.0		Hard Mottled Brown and Gray Silty Clay with trace sand and gravel	5	S-02	3 5 6	11	15.3		9000*
				S-03	6 9 11	20	10.7		9000*
888.0			10	S-04	9 11 15	26	14.6		9000*
		Hard Gray Silty Clay with trace sand (11.5')		S-05	7 11 13	24	14.3		9000*
883.0		Hard Mottled Gray and Brown Sandy Clay with trace gravel; occasional silt partings (15.0')	15	S-06	5 6 8	14	12.7		9000*
		End of Boring @ 15 ft							
878.0			20						
873.0			25						
868.0			30						
863.0			35						

Total Depth: 15 ft
Drilling Date: April 25, 2024
Inspector: C. Gross
Contractor: Strata Drilling Inc.
Driller: B. Sienkiewicz

Drilling Method:
2-1/4 inch inside diameter hollow-stem auger

Water Level Observation:
Dry during and upon completion

Notes:
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Auger cuttings

Figure No. 21

PRELIMINARY SUBJECT TO REVISION

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6735 TELEGRAPH ROAD, SUITE 110
BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

THE CRESCENT

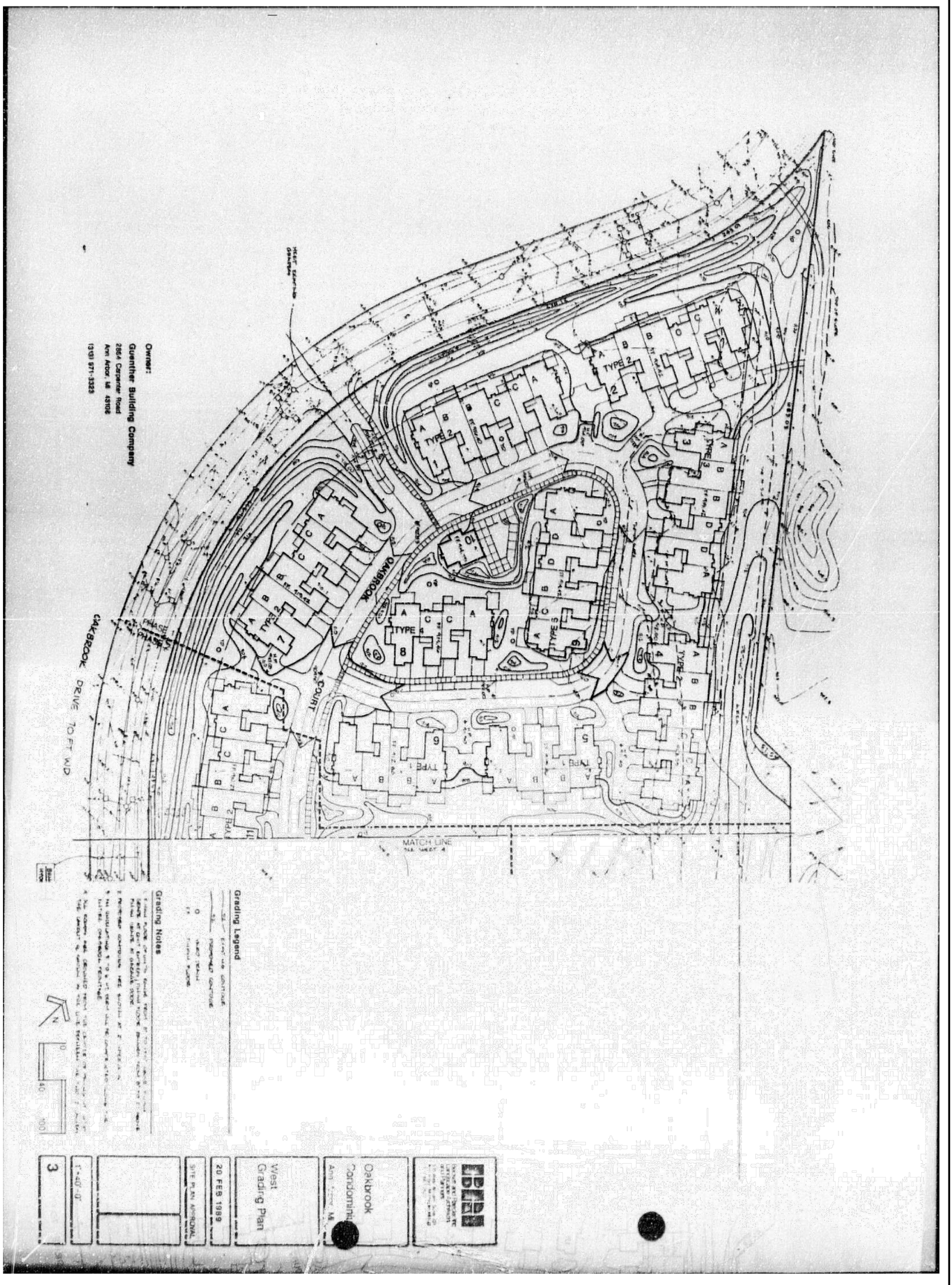
SITE PLAN
SOIL BORINGS 3

33

JOB No. 23351

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	09/12/24
SITE PLAN SUBMITTAL #3	12/16/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25

DATE: 04/18/24
SHEET 33 OF 35
CADD: CMW
ENG: CMW
PM: RCW
TECH:
FB:
23351SB01



JOB No. 23351		DATE: 04/18/24
		SHEET 34 OF 35
REVISIONS:	REV. DATE	CADD: CMW
SITE PLAN SUBMITTAL #2	08/14/24	ENG: CMW
SITE PLAN SUBMITTAL #3	12/12/24	PM: RCW
SITE PLAN SUBMITTAL #4	03/28/25	TECH:
SITE PLAN SUBMITTAL #5	05/23/25	23351HS01
		FB#

34

THE CRESCENT

SITE PLAN

1989 OAKBROOK CONDO GRADING PLAN

CLIENT

CRANBROOK VILLAGE LIMITED PARTNERSHIP
6735 TELEGRAPH ROAD, SUITE 110
BLOOMFIELD HILLS, MICHIGAN 48301
ATTN: NOAH JACOB

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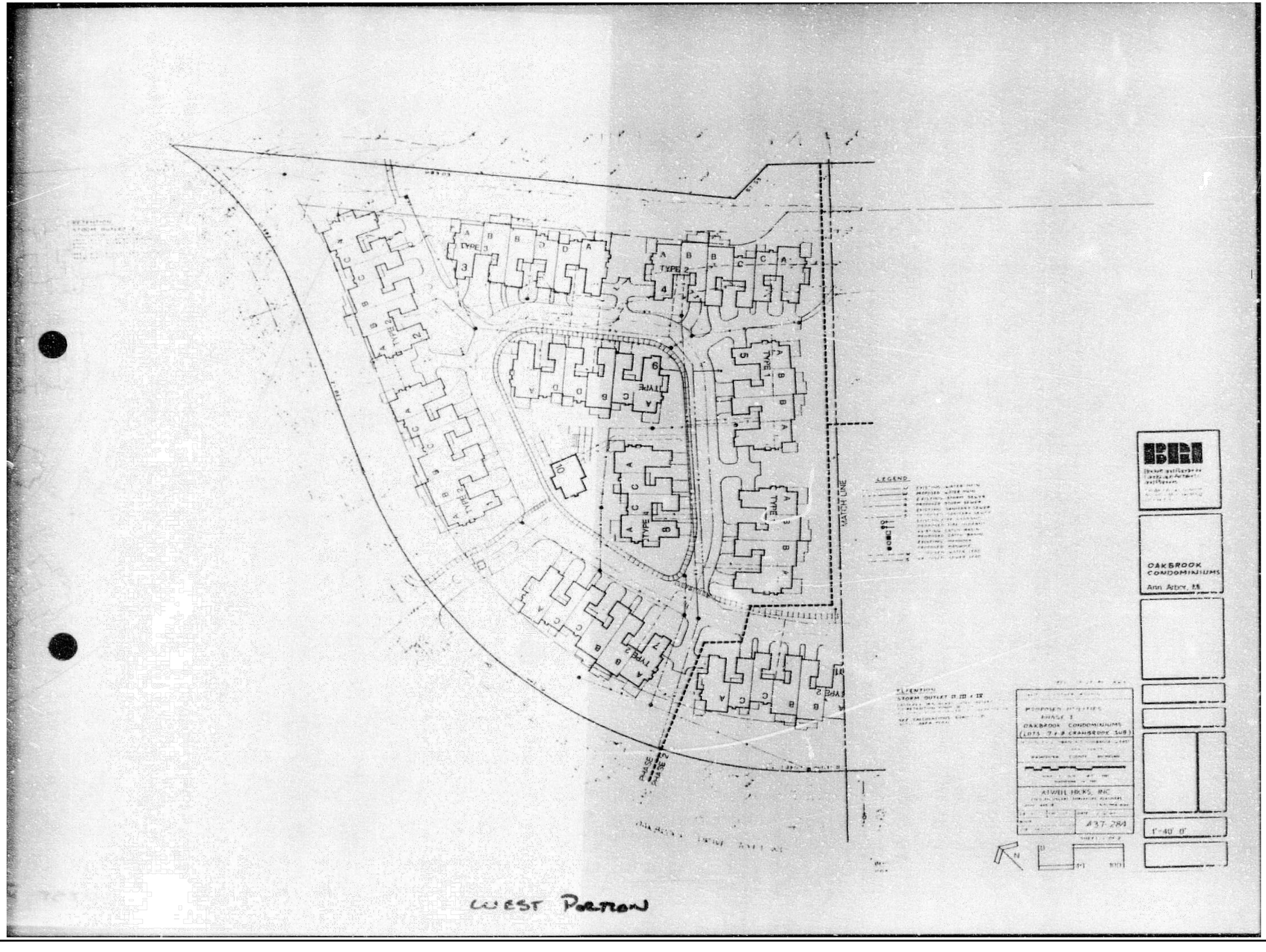

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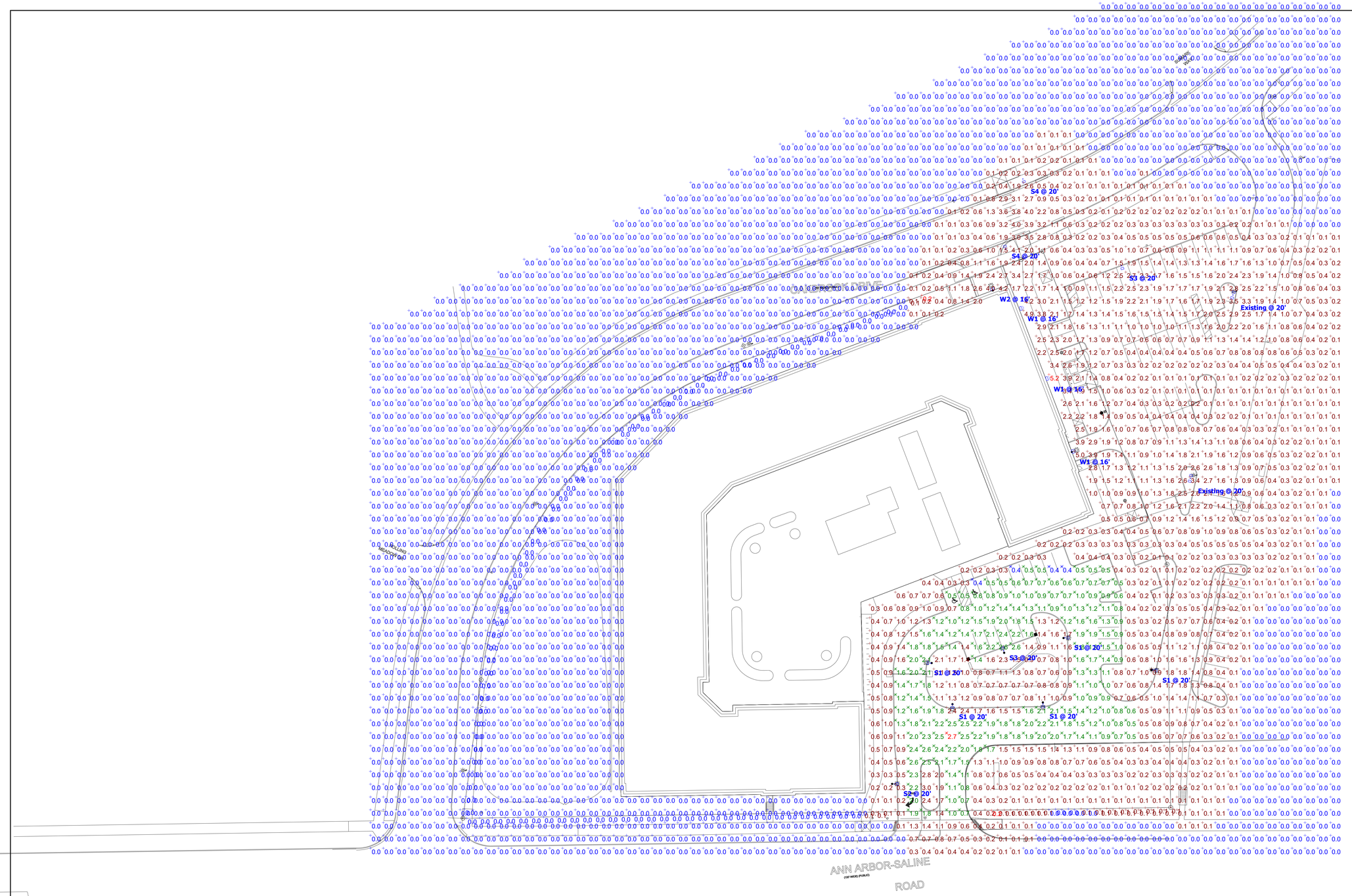
ATTN: NOAH JACOB

THE CRESCENT
SITE PLAN
1989 OAKBROOK CONDO UTILITY PLAN

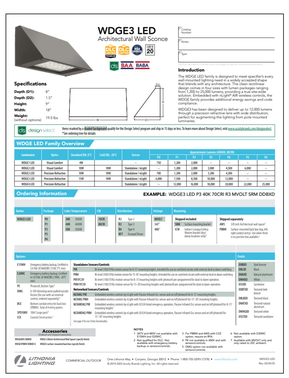
35

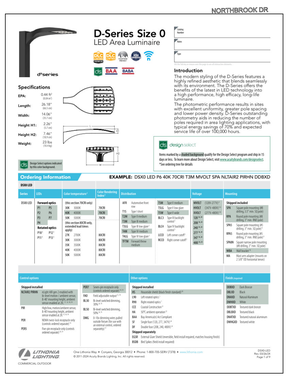
JOB No. 23351
DATE: 04/18/24
SHEET 35 OF 35
CADD:
ENG: CMW
PM: RCW
TECH:
23351HS01

REVISIONS:	REV. DATE
SITE PLAN SUBMITTAL #2	09/4/24
SITE PLAN SUBMITTAL #3	12/12/24
SITE PLAN SUBMITTAL #4	03/28/25
SITE PLAN SUBMITTAL #5	05/23/25



Plan View
Scale - 1" = 30ft





NORTHBROOK DR

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Boundary	+	0.0 fc	0.2 fc	0.0 fc	N/A	N/A
Crosswalk	+	3.9 fc	4.4 fc	3.3 fc	1.3:1	1.2:1
Crosswalk Vertical @ 5'	✳	4.9 fc	5.2 fc	4.4 fc	1.2:1	1.1:1
Overall	+	0.3 fc	5.2 fc	0.0 fc	N/A	N/A
Proposed Parking Lot	✳	1.4 fc	2.7 fc	0.4 fc	6.8:1	3.5:1

Description

Symbol	Label	QTY	Manufacturer	Catalog	Description	Lamp Output	LLF	Input Power
	Existing	2	EXISTING FIXTURE	EXISTING FIXTURE	EXISTING FIXTURE, TO BE VERIFIED BY OTHERS	8439	0.9	137.9
	S1	5	Lithonia Lighting	DSX0 LED P3 30K 70CRI T3M	D-Series Size 0 Area Luminaire P3 Performance Package 3000K CCT 70 CRI Type 3 Medium	8439	0.9	68.95
	S2	1	Lithonia Lighting	DSX0 LED P5 30K 70CRI BLC4	D-Series Size 0 Area Luminaire P5 Performance Package 3000K CCT 70 CRI Type 4 Extreme Backlight Control	8715	0.9	90.12
	S3	2	Lithonia Lighting	DSX0 LED P5 30K 70CRI T4M	D-Series Size 0 Area Luminaire P5 Performance Package 3000K CCT 70 CRI Type 4 Medium	11774	0.9	90.12
	S4	2	Lithonia Lighting	DSX0 LED P2 30K 70CRI LCCO	D-Series Size 0 Area Luminaire P2 Performance Package 3000K CCT 70 CRI Left Corner Cutoff Extreme Backlight Control	4352	0.9	45.14
	W1	3	Lithonia Lighting	WDGE3 LED P1 70CRI R4 30K	WDGE3 LED WITH P1 - PERFORMANCE PACKAGE, 3000K, 70CRI, TYPE 4 OPTIC	7145	0.9	51.1717
	W2	1	Lithonia Lighting	WDGE3 LED P1 70CRI R3 30K	WDGE3 LED WITH P1 - PERFORMANCE PACKAGE, 3000K, 70CRI, TYPE 3 OPTIC	6933	0.9	51.1717

General Note
1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR.
3. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0" & 5' - 0"

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIRMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT CONTROLS@GASSERBUSH.COM OR 734-266-6705.

Alternates Note
THE USE OF FIXTURE ALTERNATES MUST BE RESUBMITTED TO THE CITY FOR APPROVAL.

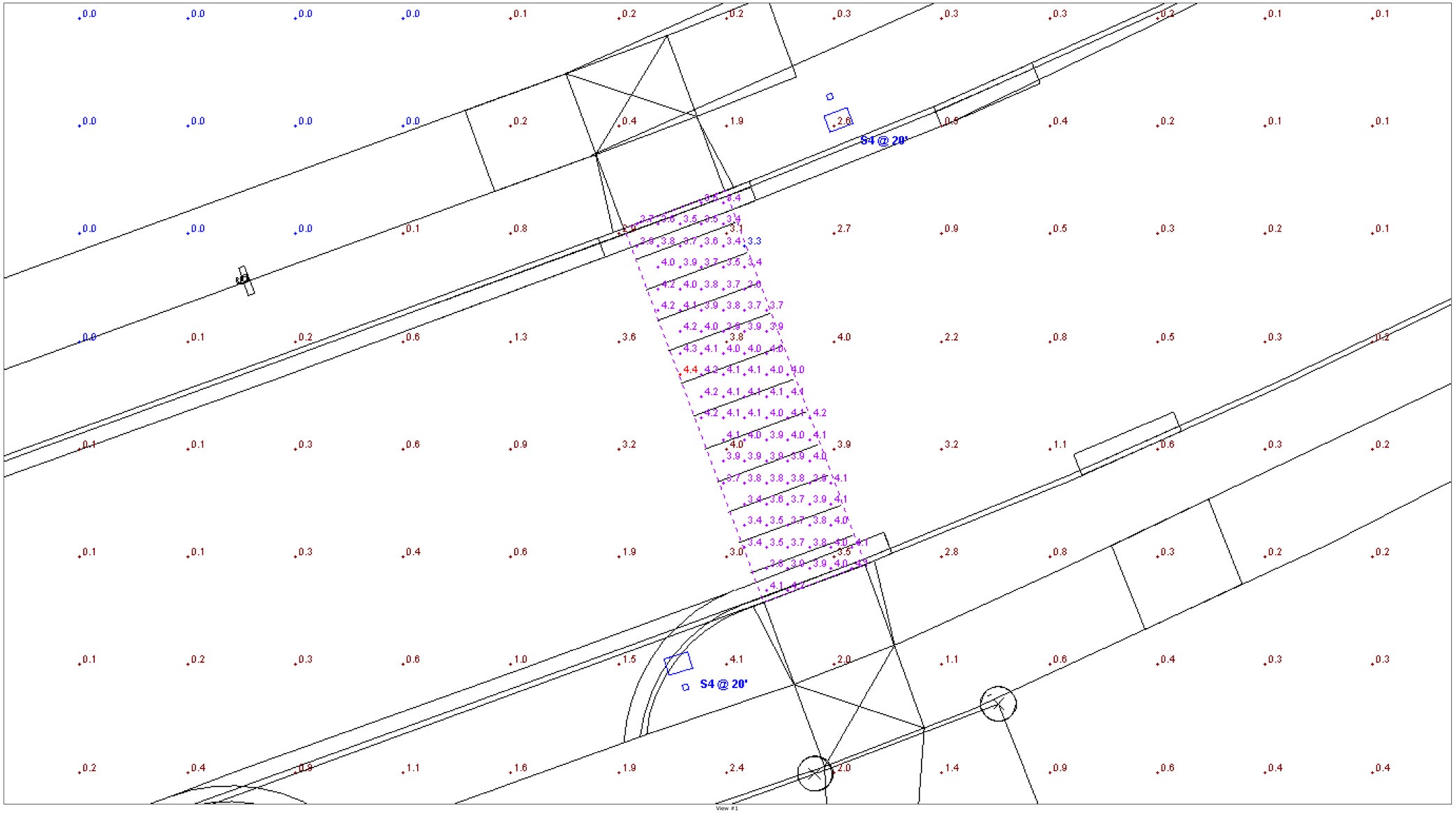
Ordering Note
FOR INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.

Drawing Note
THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.

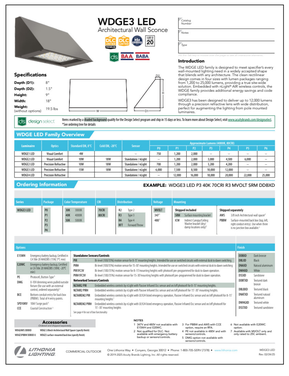
Mounting Height Note
MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.

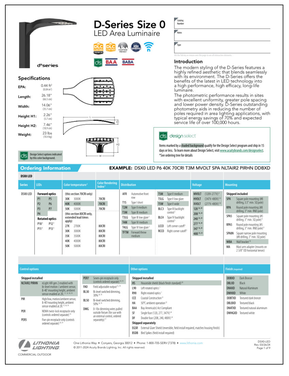
CRANBROOK VILLAGE
PHOTOMETRIC LAYOUT
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

Designer KS
Date 03/19/2025
Scale Not to Scale
Drawing No. #24-27930_V4



View #1





Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Boundary	+	0.0 fc	0.2 fc	0.0 fc	N/A	N/A
Crosswalk	+	3.9 fc	4.4 fc	3.3 fc	1.3:1	1.2:1
Crosswalk Vertical @ 5'	+	4.9 fc	5.2 fc	4.4 fc	1.2:1	1.1:1
Overall	+	0.3 fc	5.2 fc	0.0 fc	N/A	N/A
Proposed Parking Lot	+	1.4 fc	2.7 fc	0.4 fc	6.8:1	3.5:1

Description

Symbol	Label	QTY	Manufacturer	Catalog	Description	Lamp Output	LLF	Input Power
	Existing	2	EXISTING FIXTURE	EXISTING FIXTURE	EXISTING FIXTURE, TO BE VERIFIED BY OTHERS	8439	0.9	137.9
	S1	5	Lithonia Lighting	DSX0 LED P3 30K 70CRI T3M	D-Series Size 0 Area Luminaire P3 Performance Package 3000K CCT 70 CRI Type 3 Medium	8439	0.9	68.95
	S2	1	Lithonia Lighting	DSX0 LED P5 30K 70CRI BLC4	D-Series Size 0 Area Luminaire P5 Performance Package 3000K CCT 70 CRI Type 4 Extreme Backlight Control	8715	0.9	90.12
	S3	2	Lithonia Lighting	DSX0 LED P5 30K 70CRI T4M	D-Series Size 0 Area Luminaire P5 Performance Package 3000K CCT 70 CRI Type 4 Medium	11774	0.9	90.12
	S4	2	Lithonia Lighting	DSX0 LED P2 30K 70CRI LCCO	D-Series Size 0 Area Luminaire P2 Performance Package 3000K CCT 70 CRI Left Corner Cutoff Extreme Backlight Control	4352	0.9	45.14
	W1	3	Lithonia Lighting	WDGE3 LED P1 70CRI R4 30K	WDGE3 LED WITH P1 - PERFORMANCE PACKAGE, 3000K, 70CRI, TYPE 4 OPTIC	7145	0.9	51.1717
	W2	1	Lithonia Lighting	WDGE3 LED P1 70CRI R3 30K	WDGE3 LED WITH P1 - PERFORMANCE PACKAGE, 3000K, 70CRI, TYPE 3 OPTIC	6933	0.9	51.1717

General Note
1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR.
3. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0" & 5' - 0"

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

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Alternates Note
THE USE OF FIXTURE ALTERNATES MUST BE RESUBMITTED TO THE CITY FOR APPROVAL.

Ordering Note
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Drawing Note
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Mounting Height Note
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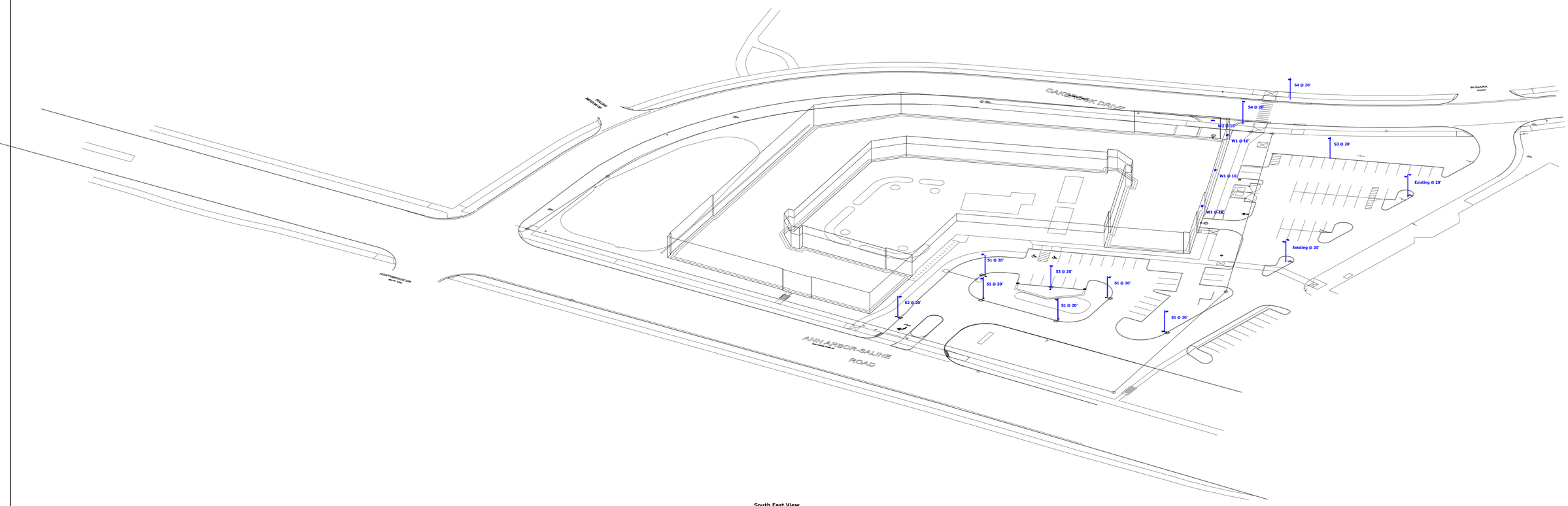
CRANBROOK VILLAGE
PHOTOMETRIC LAYOUT
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

Designer
KS
Date
03/19/2025
Scale
Not to Scale
Drawing No.
#24-27930_V4



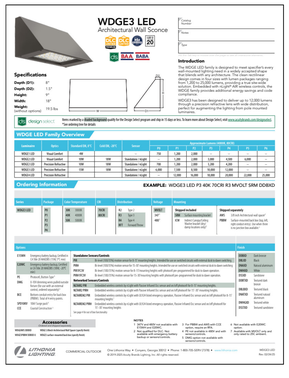
South East View

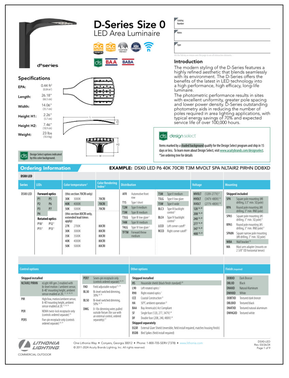
Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Boundary	+	0.0 fc	0.2 fc	0.0 fc	N/A	N/A
Crosswalk	+	3.9 fc	4.4 fc	3.3 fc	1.3:1	1.2:1
Crosswalk Vertical @ 5'	+	4.9 fc	5.2 fc	4.4 fc	1.2:1	1.1:1
Overall	+	0.3 fc	5.2 fc	0.0 fc	N/A	N/A
Proposed Parking Lot	+	1.4 fc	2.7 fc	0.4 fc	6.8:1	3.5:1

Schedule

Symbol	Label	QTY	Manufacturer	Catalog	Description	Lamp Output	LLF	Input Power
	Existing	2	EXISTING FIXTURE	EXISTING FIXTURE	EXISTING FIXTURE, TO BE VERIFIED BY OTHERS	8439	0.9	137.9
	S1	5	Lithonia Lighting	DSX0 LED P3 30K 70CRI T3M	D-Series Size 0 Area Luminaire P3 Performance Package 3000K CCT 70 CRI Type 3 Medium	8439	0.9	68.95
	S2	1	Lithonia Lighting	DSX0 LED P5 30K 70CRI BLC4	D-Series Size 0 Area Luminaire P5 Performance Package 3000K CCT 70 CRI Type 4 Extreme Backlight Control	8715	0.9	90.12
	S3	2	Lithonia Lighting	DSX0 LED P5 30K 70CRI T4M	D-Series Size 0 Area Luminaire P5 Performance Package 3000K CCT 70 CRI Type 4 Medium	11774	0.9	90.12
	S4	2	Lithonia Lighting	DSX0 LED P2 30K 70CRI LCCO	D-Series Size 0 Area Luminaire P2 Performance Package 3000K CCT 70 CRI Left Corner Cutoff Extreme Backlight Control	4352	0.9	45.14
	W1	3	Lithonia Lighting	WDGE3 LED P1 70CRI R4 30K	WDGE3 LED WITH P1 - PERFORMANCE PACKAGE, 3000K, 70CRI, TYPE 4 OPTIC	7145	0.9	51.1717
	W2	1	Lithonia Lighting	WDGE3 LED P1 70CRI R3 30K	WDGE3 LED WITH P1 - PERFORMANCE PACKAGE, 3000K, 70CRI, TYPE 3 OPTIC	6933	0.9	51.1717





General Note

1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR.
3. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0" & 5' - 0"

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIRMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT CONTROLS@GASSERBUSH.COM OR 734-266-6705.

Alternates Note

THE USE OF FIXTURE ALTERNATES MUST BE RESUBMITTED TO THE CITY FOR APPROVAL.

Ordering Note

FOR INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.

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