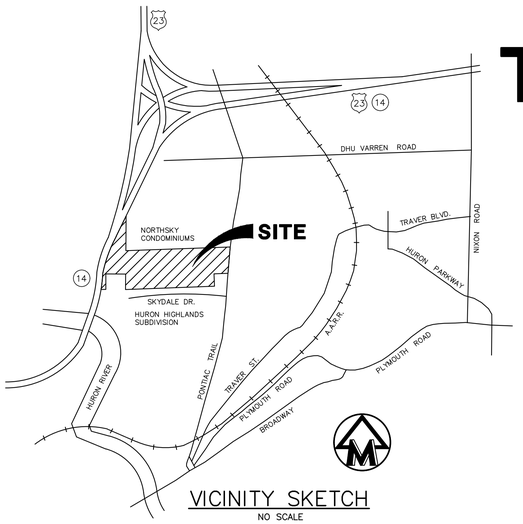
THE COTTAGES AT BARTON GREEN

LOCATED IN THE NW 1/4 OF SECTION 16, T2S, R6E, CITY OF ANN ARBOR, WASHTENAW COUNTY, MICHIGAN

SITE PLAN FOR CITY COUNCIL



VICINITY SKETCH

NO SCALE

GENERAL PROJECT DESCRIPTION

This project site is located at 2601 Pontiac Trail, on the west side of Pontiac Trail between the Huron Highlands subdivision and the proposed Northsky development, and is currently vacant. The development program includes the construction of 211 fully furnished, market rate, rental apartments and cottages with 682 bedrooms, 422 parking spaces, a Community Building, a Maintenance Building, and site amenities include pools/deck area, basketball court, sand volleyball court, play area, and pathways into the proposed park area. A private shuttle bus service will also be provided. A new public road segment will be constructed to connect from Pontiac Trail to the proposed stub of St. Regis Way on the south edge of the Northsky development. Primary site access will be via four parking lot entries on St. Regis Way. A secondary emergency connection to Skydale Drive is provided at the southeast corner of the site. A significant portion of the wooded west end of the site will be preserved as open space and a 9.86 acre parkland dedication. A 1.95 acre portion of the park dedication area is to be restored as woodland. Landmark and Woodland Tree mitigation is proposed. Tree clearing must be completed before March 31, 2018. Construction of site improvements is scheduled to begin April 1, 2020 and be complete by July 31, 2021.

SITE DATA CHART:

	EX./REQ.	PROPOSED
ZONING:	R4A	R4A
GROSS SITE AREA:	0.5 ACRES	31.93 ACRES
NET SITE AREA (W/0 R.O.W.S)	0.5 AC; 21,780 SF	30.59 ACRES[1]
LOT WIDTH:	120 FT	454 FT
LOT AREA / UNIT	4,300 SF MIN.	6,315 SF
DENSITY	10.0 DUA MAX.	6.90 DUA
	314 DU MAX.	211 DU
SPACE USE SUMMARY:		
BUILDING FOOTPRINTS		142,860 SF
PARKING, DRIVES, TRASH AREAS		158,681 SF
USEABLE OPEN SPACE	65% MIN.	1,011,013 SF[2]
		23.2 AC/75.9%
ZONING COMPARISON INFORMATION:		
FRONT SETBACK: East, West, St. Regis W	15 - 40 FT	15 - 40 FT
SIDE SETBACK: North, South	20 FT+[3]	23.50 FT MIN.
REAR SETBACK: West	30 FT+[4]	324.0 FT MIN.
BUILDING HEIGHT:	35 FT[5]	34.75 FT MAX.
BUILDING SPACING:	20 FT MIN.	20 FT MIN.
CONFLICTING LAND USE BUFFER:	15 FT MIN.[6]	15 FT MIN.

1. Pontiac Trail r.o.w. dedication = 22,715 sf; St. Regis Way r.o.w. dedication = 36,003 sf.
2. Open Space includes 9.86 acre park dedication.
3. 20 foot minimum side setback plus:
   3 inches per foot of building height over 35 feet abutting residentially zoned land.
   There are no such buildings proposed.
   1 1/2 inches per foot of building length over 50 feet abutting residentially zoned land.
   See Building Sideyard Additional Setbacks Table.
4. 30 foot minimum rear setback plus:
   1 1/2 inches per foot of building height over 35 feet abutting residentially zoned land.
   There are no such proposed buildings.
   1 1/2 inches per foot of building length over 50 feet abutting residentially zoned land.
   There are no such proposed buildings.
5. 35 feet or 45 feet maximum height with parking below at least 35% of the building.
6. C.L.U.B. required adjacent to residential use or zoning.

DEVELOPER

TRINITAS DEVELOPMENT, LLC
201 MAIN STREET, SUITE 1000
LAFAYETTE, INDIANA 47901
ATTN: DAMIAN VANMATRE
PH: (765) 807-2713

OWNER

MW LAND, LLC
1419 BURGUNDY COURT
ANN ARBOR, MI 48105
ATTN: SANTOSH MEHRA
PH: (734) 996-0482

ARCHITECT

KJG ARCHITECTURE, INC.
527 SAGAMORE PKWY. W.
SUITE 101
WEST LAFAYETTE, IN 47906
ATTN: BARRY KNECHTEL
PH: (765) 497-4598

ENGINEER/SURVEYOR

MIDWESTERN CONSULTING, L.L.C.
3815 PLAZA DR.
ANN ARBOR, MI. 48108
CONTACT: SCOTT BETZOLDT, P.E.
PH: (734) 995-0200

VEHICULAR PARKING

Type of Space	Required	Provided
9' spaces	413	408
BF spaces	7	8
BFV spaces	2	6
TOTAL	422*	422*

* 2 spaces / unit required
2 spaces / unit provided
0.69 spaces / bedroom

**Plan depicts 137 deferred parking spaces to be constructed at a later date if developer demonstrates additional parking is warranted.

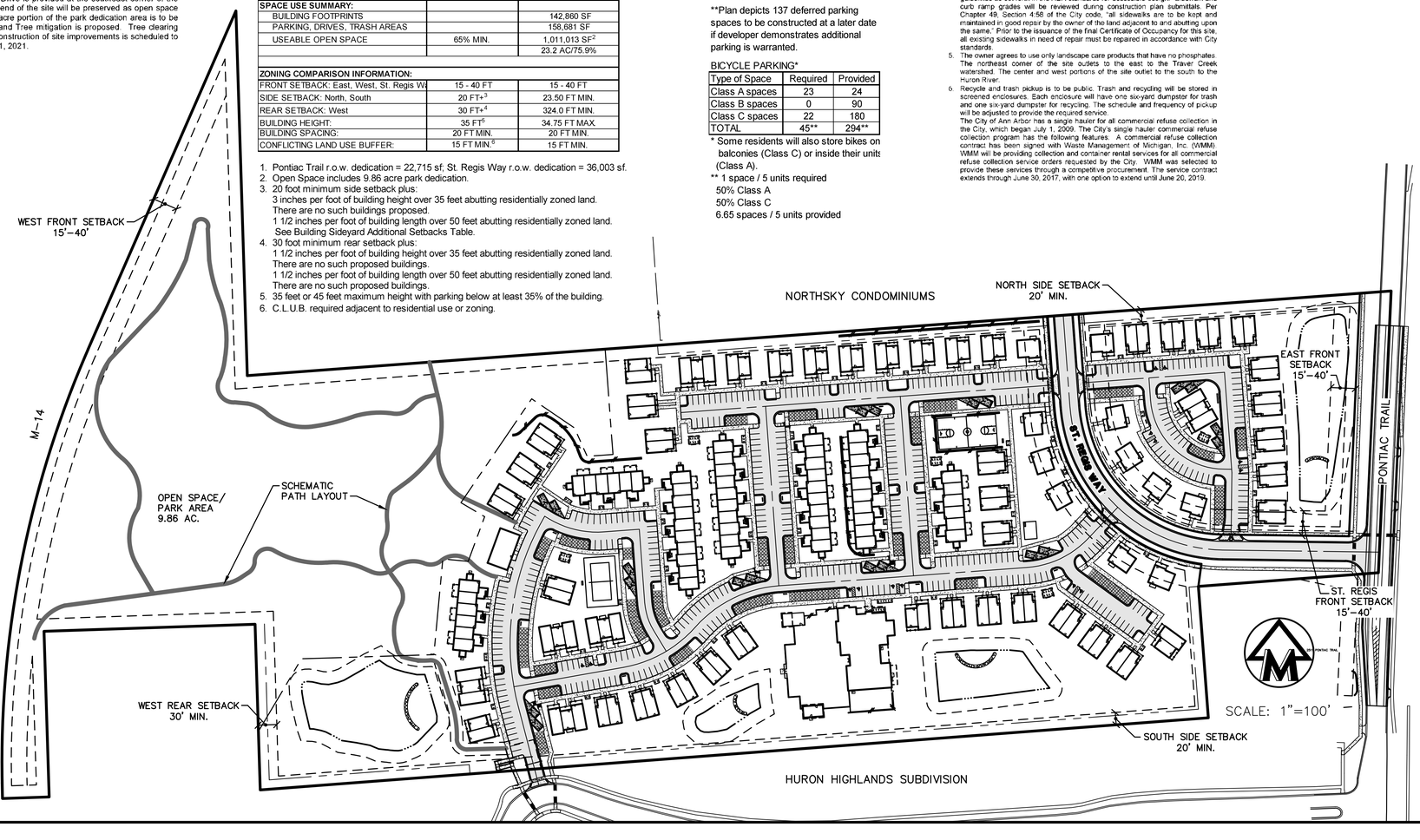
BICYCLE PARKING*

Type of Space	Required	Provided
Class A spaces	23	24
Class B spaces	0	90
Class C spaces	22	180
TOTAL	45**	294**

* Some residents will also store bikes on balconies (Class C) or inside their units (Class A).
** 1 space / 5 units required
50% Class A
50% Class C
6.65 spaces / 5 units provided

NOTES:

1. Per Chapter 49, Section 4:58 of the City code, "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 shall meet all requirements and guidelines as set forth in the ADA standards for accessible design. Sidewalk and curb ramp grades will be reviewed during construction plan submittals. Per Chapter 49, Section 4:58 of the City code, "all sidewalks are to 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.
5. The owner agrees to use only landscape care products that have no phosphates. The northeast corner of the site outlets to the east to the Traver Creek watershed. The center and west portions of the site outlet to the south to the Huron River.
6. Recycle and trash pickup is to be public. Trash and recycling will be stored in screened enclosures. Each enclosure will have one six-yard dumpster for trash and one six-yard dumpster for recycling. The schedule and frequency of pickup will be adjusted to provide the required service.
   The City of Ann Arbor has a single hauler for all commercial refuse collection in the City, which began July 1, 2009. The City's single hauler commercial refuse collection program has the following features. A commercial refuse collection contract has been signed with Waste Management of Michigan, Inc. (WMM). WMM will be providing collection and container rental services for all commercial refuse collection service orders requested by the City. WMM was selected to provide these services through a competitive procurement. The service contract extends through June 30, 2017, with one option to extend until June 20, 2019.



Sheet List Table

SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	SITE PLAN NOTES AND TABLES
3	EXISTING CONDITIONS AND SURVEY PLAN (EAST)
4	EXISTING CONDITIONS AND SURVEY PLAN (CENTER)
5	EXISTING CONDITIONS AND SURVEY PLAN (WEST)
6	TREE INDEX
7	TREE INDEX
8	SITE ANALYSIS AND NATURAL FEATURES PROTECTION PLAN (EAST)
9	SITE ANALYSIS AND NATURAL FEATURES PROTECTION PLAN (CENTER)
10	SITE ANALYSIS AND NATURAL FEATURES PROTECTION PLAN (WEST)
11	DIMENSIONAL SITE PLAN (EAST)
12	DIMENSIONAL SITE PLAN (WEST)
13	UTILITY PLAN (EAST)
14	UTILITY PLAN (WEST)
14A	OVERALL UTILITY PLAN
15	WETLAND MITIGATION AND MONITORING PLAN
16	GRADING & SOIL EROSION CONTROL PLAN (EAST)
17	GRADING & SOIL EROSION CONTROL PLAN (WEST)
18	SOIL EROSION CONTROL DETAILS AND STORMWATER MANAGEMENT PLAN
19	STORMWATER MANAGEMENT PLAN
20	PHASING NARRATIVE & CONSTRUCTION SEQUENCE
21	LANDSCAPE AND MITIGATION PLAN (EAST)
22	LANDSCAPE AND MITIGATION PLAN (WEST)
23	LANDSCAPE NOTES AND DETAILS
24	WOODLAND RESTORATION PLAN AND TRASH/RECYCLE TRUCK ACCESS DIAGRAM
25	MISCELLANEOUS SITE DETAILS
26	ALTERNATIVES ANALYSIS (1 & 2)
27	ALTERNATIVES ANALYSIS (3 & 4)
28	FIRE PROTECTION PLAN
29	PHOTOMETRIC PLAN
30	OVERLAY PLAN
A110	BUILDING FLOOR PLANS
A111	BUILDING FLOOR PLANS
A113	TOWNHOME T1 BUILDING PLAN
A114	TOWNHOME T2 BUILDING PLAN
A115	CLUBHOUSE FLOOR PLAN
A116	POOL DECK PLAN & DETAILS
A120	UNIT PLANS
A121	UNIT PLANS
A122	TH UNIT PLANS
A200	EXTERIOR ELEVATIONS
A201	EXTERIOR ELEVATIONS
A202	EXTERIOR ELEVATIONS
A203	TH T2 EXTERIOR ELEVATIONS
A204	TH T1 EXTERIOR ELEVATIONS
A205	CLUBHOUSE EXTERIOR ELEVATIONS
A206	CLUBHOUSE EXTERIOR ELEVATIONS
A500	AMENITY PLANS AND ELEVATIONS

REVISED PER AGREEMENT	6/20/19
REVISED PER AGREEMENT	6/7/19
ADDED PLANTINGS TO SKYDALE	5/3/18
PER CITY REVIEW	2/8/18

COTTAGES AT BARTON GREEN

JOB No. 16223

DATE: 5/25/17

SHEET 1 OF 49

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	7/12/17
REV. PER COUNTY	8/16/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18

CADD: DAG, WAJ
ENG: JCA
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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
SITE PLAN SUBMITTAL	5/25/17
WCWRC	8/16/17

STATE OF MICHIGAN
SCOTT W. BETZOLDT
ENGINEER
No. 38141
REGISTERED PROFESSIONAL ENGINEER

SCOTT W. BETZOLDT
P.E. # 38141

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AREA PLAN REQUIREMENTS

1. DEVELOPMENT PROGRAM SUMMARY

The Cottages at Barton Green is a proposed residential community in northeast Ann Arbor, at 2601 Pontiac Trail, conveniently located with respect to North Campus, the UM Medical Campus, VA Hospital and the North Campus Research Center. The developer of this project is Trinitas Development, LLC from Lafayette, Indiana. Trinitas Development was established in 2002. They currently own and manage nearly $300 million in student housing assets consisting of more than 2,800 student housing beds. Consultants include Midwestern Consulting and KJG Architecture, Inc. The proposed housing consists of fully furnished, market rate, rental apartments in 65 buildings, plus a Community Building and a Maintenance Building. The apartments will include a mix of one to five bedroom units. Exterior elevations and design will be cottage style.

Major design and environmental considerations include the following:

- The improvements are located almost entirely in the open and previously cleared portion of the site thus preserving the more significant wooded and wetland areas in the western portion of the site. Placing the improvements where they are proposed allows for the preservation of almost 10 acres of wetland and woodlands in an Open Space and Parkland Dedication area at the west end of the site. The preserved area provides a link from the NorthSky development to the north to the Huron Highlands subdivision to the south.
- The Site Plan provides a density in the developed area that is consistent with the 7-10 Dwelling Units per Acre specified in the Master Plan and is conducive to utilizing mass transportation. There is an existing public bus route on the Pontiac Trail frontage, and a private shuttle bus service will be provided.
- The Development Program provides a range of unit sizes and types, to attract primarily students and young professionals.
- The project provides a variety of amenities including a resort style resident Community Building, deck and pools area, a basketball court, a sand volleyball court, a tot lot, extensive sidewalks, and trails in the open space area.

(a) Proposed Land Use

The Cottages at Barton Green will be developed as a market rate rental apartment complex with 211 units / 682 bedrooms contained in 65 residential use buildings. A Community Building (leasing/management offices, computer lounge, television lounge, game lounge, yoga room, fitness center, tanning room, kitchen and study rooms), a deck and pool area, a basketball court, a sand volleyball court, a tot lot, and on-site walks and trails will constitute the amenity package for the development.

(b) Phasing and Construction Cost

(b.1) Preliminary Phasing: The Cottages at Barton Green will be developed in multiple phases starting March 1, 2020. Construction is expected to be complete by July 31, 2021. The phasing narrative explains this process in detail.

(b.2) Preliminary Cost Estimate: The combined estimated total project construction cost, including on-site and off-site improvements, structures, landscaping and site amenities is approximately $28 million.

2. COMMUNITY ANALYSIS

(a) Impact on Public Schools

The Petitioners experience with this type of residential housing would suggest that a very low number of school-age children would be residing within the development (20-25). However, because of the shortage of new market rate, rental apartment housing within the City of Ann Arbor, the number of school-age children may be higher.

(b) Relationship with Neighboring Uses

The proposed development is in accordance with the existing Master Plan for the City of Ann Arbor, which is based on existing and projected uses.

North of Site: The north side of the site is the Northsky development, approved but not yet constructed; 6.36 Dwelling Units per Acre; a mix of 139 single family and 56 multifamily units. Construction is expected to begin in 2017.

West of Site: M-14 expressway right-of-way and an existing house on an Ann Arbor Township parcel that is zoned R-2.

South of Site: Huron Highlands subdivision; single family.

East of Site: Across Pontiac Trail is Study Area 5, a 93- acre area that includes 7 parcels along Pontiac Trail and 4 along Dhu Varren Road. The parcels include single-family homes, small industrial facilities, vacant land and an abandoned landfill. A mix of housing types with a density of 7-10 Dwelling Units per Acre is recommended.

(c) Impact on Adjacent Uses

The proposed development will have no negative impact on existing uses around the site and will provide an open space/parkland link between developments north and south of the site

(d) Impact of Development on Air and Water Quality, and on Existing Natural Features of the Site and Neighboring Sites:

Air Quality: Only a minimal effect of the development on air quality would arise from an increase in traffic.

Water Quality: All on-site drainage will be detained on-site until it is discharged in accordance with City of Ann Arbor and Washtenaw County Water Resources Commissioner standards. The stormwater discharges to the existing public storm sewers in Pontiac Trail (northeast) and in Skydale Drive (south). Detention basins will collect storm water, infiltrate some of the water into the ground where soils are permeable, and allow sediment to be filtered out of the runoff prior to discharge into the storm sewers. Water quality will not be adversely impacted by this development.

Natural Features: the Site Analysis Plans provide a graphic description of the natural features that are found on the site. The area that is proposed for development is almost entirely land that was cleared during planning for the Barton Green, the multifamily development previously intended to be constructed on this site.

Wetlands: The site contains two identified wetlands. The larger one (0.19 acres of it is on-site) is located in the park / open space area to be preserved near the west edge of the site and extends onto the parcel to the west. This is a higher quality wetland, partially wooded, and is to remain undisturbed in the open space area.

A smaller one is a finger wetland (0.05 acres) along a portion of the south property line. This wetland is lower quality and is the result of grading activities for the Huron Highlands subdivision. There may be a field tile that discharges into the east end of this area. That tile will be removed during mass grading operations. This wetland terminates at the west end at an existing storm sewer end section and drains to the public storm sewer in Skydale Drive. The on-site portion of this wetland is to be removed.

A third potential wetland is also a tiny wet area located approximately in the center of the site. This is less than 0.02 acres, has very little wetland vegetation, no hydric soils, is likely the result of a buried farm tile, and does not qualify as a wetland. This area will be removed during mass grading.

Steep Slopes: There is a small area of 20% steep slopes on the Pontiac Trail frontage that will be impacted by the development. This area will be mass graded to provide a storm water detention basin. Adjacent buildings will have walk out basement levels to take advantage of the grade change. The revised slope will be stabilized with retaining walls and landscaping. Several small areas of steep slopes are located in the central portion of the site and will be removed. Additional steep slopes are located within the open space area at the west end of the site and will remain undisturbed.

Floodplains: There are no 100 year floodplains or watercourses that will be impacted by the development.

Endangered Species or Habitat: There are no known endangered species or habitat on the site. The pioneer woodland areas of the site are a potential habitat for the Indiana bat but they generally prefer larger more mature trees with cavities and larger areas of loose bark for nesting.

Woodlands: There are five woodlands (labeled Woodland A-E) on the site that are of variable level quality. Basal area and species are noted in detail on the Site Analysis Plans. Most of the woodlands with the exception of the hedgerows are comprised of 6-inch to 15-inch cherry, elm, ash, box elder, shagbark hickory and locust. There is an area identified by city staff as a native forest fragment that is shown on the natural features plan as Woodland C. There are Landmark Trees on the site, located predominantly along the perimeter boundary that would have once been the hedgerows of the farm field. Most of these Landmark Trees will remain.

(e) Impact on Historic Sites or Structures: There are no historical sites, structures or districts impacted by the proposed development.

3. SITE ANALYSIS

(a) Existing Land Use

The existing land use of the parcel is vacant. The land has been tilled for decades with the exception of areas that have been taken out of the farm lands for various reasons. Farming ceased in the late 1950's and early 1960's.

(b) Site Conditions

Soils: The Custom Soil Resource Report for Washtenaw County shows the site soils to be mostly type B soils:

WawabB- Wawasee loam, 2-6%
WawabC- Wawasee loam, 6-12%
WawabD- Wawasee loam, 12-18%

Smaller areas of the site are type D soils:

FoC- Fox sandy loam, 6-12%
MdA- Matherton sandy loam, 0-4%

Topography ranges from 936 USGS down to 857 USGS.

Site Vegetation: most of the site has been cleared. The remaining vegetation is shown on the natural features plan as landmark trees and woodlands.

Existing Topography: see the Existing Conditions and Survey Plans.

(c) Natural Features Description:

(i) No endangered species or habitat are known to exist on-site.
(ii) There is no 100-year floodplain on-site.
(iii) The Landmark Trees on site are shown on the Existing Conditions Plans.
(iv) Steep slopes are shown on the Existing Conditions Plans.
(v) There are no permanent watercourses on the site.
(vi) The site contains three potential wetlands. The largest one is located in the open space area to be preserved near the west edge of the site. A small finger wetland exists along the south property line. This wetland is the result of grading activities for the Huron Highlands subdivision. The west end of this wetland terminates at an existing storm sewer end section that leads to the existing public storm sewer in Skydale Drive. A tiny, low quality wet area is located approximately in the center of the site. It has little wetland vegetation, no hydric soils, and is likely the result of a buried farm tile and is not considered to be a wetland.
(vii) There are five woodlands (labeled Woodland A-E) on the site that are of variable level quality. Basal area and species are noted in detail on the Site Analysis Plans. Most of the woodlands with the exception of the hedgerows are comprised of 6-inch to 15-inch cherry, elm, ash, box elder, shagbark hickory and locust. There is an area identified by city staff as a native forest fragment that is shown on the natural features plan as Woodland C. There are landmark trees on the site, located predominantly along the perimeter boundary that would have once been the hedgerows of the farm field. Most of these landmark trees will remain.

(d) Existing Structures: there are no existing structures on the site.

(e) Existing and Proposed Vehicular, Pedestrian and Bicycle Ways and Access Points:

Vehicular: The site has access through on a proposed public street that will connect from Pontiac Trail to the stub of St. Regis Way (shown as proposed on the Northsky site plan). A secondary emergency access is proposed to connect to Skydale Drive near the southwest corner of the site. There is a public bus route on Pontiac Trail and a bus stop on the site frontage. The development will also operate a private shuttle bus service:

Two shuttles operating 5 days per week – campus 7AM – 7PM daily (approximately)
One late night shuttle operating Thur/Fri/Sat – 9 AM. to 2 or 3 AM (depending on when bars close)
One weekend shuttle offering run to campus and grocery store – 9 AM – 2 PM
Approximately 20 to 30 min cycles each shuttle

Pedestrian and Bicycle: There are currently no paths or walks along Pontiac Trail in the general vicinity of the site for pedestrians or bicycles. There will be walks and paths internally throughout the site, along Pontiac Trail, and connecting to Skydale Drive. Public road right-of-way will allow the general public to enter the development and have access to the public streets within the Northsky development.

(f) Utilities

Water: Water will be available through connection to an existing 24" watermain along the west side of Pontiac Trail and a proposed 12" main along the west side St. Regis Way. The watermain will be looped through the site to link to Northsky and to Huron Highlands. A second watermain connection on the west side of the Northsky south detention basin will provide an additional loop. Off-site water main improvements will also be constructed at the Pontiac Trail / Skydale Drive and Hilldale Drive / Cloverdale Drive intersections. Hydrants will supply fire protection.

Sanitary Sewer: the site will be served sanitary sewer through a connection to an existing sanitary sewer in Pontiac Trail and another at the curb cut on Skydale Drive.

Storm Sewer: Storm sewer will collect and drain stormwater runoff to the detention basins at the northeast, southeast, south and southwest areas of the site. These will discharge into existing public storm sewers in Pontiac Trail and Skydale Drive. A public storm sewer in a 30 foot wide easement will provide drainage from the Northsky detention basin, bypassing the proposed Cottages detention system, and connecting to the existing public storm sewer in Skydale Drive.

(g) Existing and Proposed General Drainage Pattern of the Site and Adjoining Area:

Existing drainage patterns are shown on the Site Analysis Plans. The northeast part of the site drains to the Pontiac Trail right-of-way. Central portion of the site where most of the proposed development will be located drains to the south towards Skydale Drive. The majority of the proposed park and open space area at the west end of the site drains to the southwest. The proposed drainage system will follow the same general pattern and will be completely internal to the site and will utilize sheet flow, underground storm sewer, and detention basins that filter the storm water and release the runoff at a pre-developed rate of discharge.

(h) Summary in Form of Overlay of Proposed Land Use on Existing Conditions and Natural Features: see Overlay Plan.

4. SCHEMATIC DESIGN

(a) Comparison Chart Showing Proposed Development and City Regulations: See Dimensional Site Plans.
(b) Existing Topography and Limits of Soil Disturbance: See Existing Conditions Plan and Grading Plans.
(c) Orientation and General Location of All Proposed Improvements: See Dimensional Site Plans and Natural Features Overlay Plan
(a) Vertical Sections through Site Showing Existing and Proposed Elevations when Development Program will Result in Significant Change in a Steep Slope: See Site Cross Sections.
(b) Proposed Circulation Patterns On-Site (pedestrian, vehicular, service, etc.): See Dimensional Site Plans.
(f) Proposed Lot Lines and Setback Lines: See Dimensional Site Plans
(g) Areas of Natural Features Proposed to be Removed or Disturbed and General Description of Mitigation Plans:

Landmark and Woodland Trees to be Removed: see Landscape Requirements on the Landscape Plans. See proposed Mitigation on the Landscape Plans.

Steep slopes: There is a small area of 20% steep slopes on the Pontiac Trail frontage that will be impacted by the development. This area will be mass graded to provide a storm water detention basin. Adjacent buildings will have walk out basement levels to take advantage of the grade change. The revised slope will be stabilized with retaining wall and landscaping. Several small areas of steep slopes are located in the central portion of the site and will be removed. Additional steep slopes are located within the open space area at the west end of the site and will remain undisturbed.

(h) Wetlands to be Removed: The on-site portion of Wetland 'A' is to be removed. See proposed Mitigation and Monitoring Plan on sheet 15.

5. GENERAL INFORMATION

5. GENERAL INFORMATION: In addition to the above, the following shall be made a part of the total submission.

(a) Project Name: The Cottages at Barton Green
(b) Name, Address and Telephone Number of the Petitioner, Architect, Engineer or Designer. See Cover Sheet.
(c) North Indicator and Drawing Scale in Bar Graph Form: See all drawings.
(d) Existing and Proposed Zoning: R4A.
(e) Total Approximate Floor Area of the Proposed Buildings: 340,416 sf gross floor area; this includes 65 apartment buildings with 2 or 3 levels of units, a Community Building that is 1-story, and a 1-story Maintenance Building.
(f) Approximate Proposed Height Of The Structures: 34.75 foot ht. maximum - See Building Elevations.
(g) Statement of Interest in Land, including conditions for sale or purchase of parcel such as deed restrictions, reservation of land for other uses or other conditions which may have bearing on the total land development: Property is under contract to Trinitas Development, LLC, 201 Main Street, Suite 1000, Lafayette, IN 47901, which is an Indiana corporation.
(h) Maps of Applicant's Entire Holding and Interest in Land Contiguous to Proposed Development: The applicant's entire holding includes the project site only. See Existing Conditions Plan.
(i) Vicinity Map of All Property within 250 ft of Development, showing streets, easements, zoning, drainage, and land uses: See Cover sheet and Existing Conditions Plans.
(j) Time Schedule Indicating Anticipated Starting and Completion Dates of Development: Start: March 1, 2020; Complete: July 31, 2021.
(k) Location and Identification of All Public Areas and Municipal Corporation Lines within or adjacent to Site: The site is entirely in the City of Ann Arbor. See Existing Conditions Plans.
(l) Legal Description of Parcel, including total acreage of the parcel and total acreage of public roads contained in the legal description: See Existing Conditions for legal descriptions.
(m) One High Quality Copy of the Proposed Plan Reduced to 8-1/2" by 11" format: Included in package; electronic files are now provided.

SITE PLAN REQUIREMENTS:

(1) Comparison Chart Showing Proposed Development and City Regulations: See the site data charts and tables on the Cover Sheet.

(2) Number and Type of Dwelling Units Proposed, including the number of bedrooms: the Development Program includes 211 fully furnished, market rate, rental apartments including a mix of one bedroom to five bedroom units, with a total of 682 bedrooms.

(3) Height, Number of Stories, and Placement of Proposed Structures and Accessory Structures, together with scaled massing elevation drawing showing the existing and proposed exterior dimensions as viewed from all public streets, and including the elevations of the adjacent buildings within 100 feet: See Site Cross Section. The proposed single, duplex and quadraplex apartment buildings are 2-story, maximum 24.5 foot height. The proposed townhouse apartment buildings (TH1 and TH2) are 3-story, maximum 34.75 foot height. The Community Building is 1-story, maximum 22.5 foot height. The Maintenance Building is 1-story, maximum 14 foot height. The only buildings within 100 feet of the site are the 1 and 2-story single family homes in the Huron Highlands subdivision to the south.

(4) Number and Dimensions of Parking Spaces, a Photometric Plan, and Other Requirements in Compliance with Chapter 59, Off-Street Parking, of the Ann Arbor Code of Ordinances: See Cover Sheet Development Summary, Dimensional Site Plans and Photometric Plan. Required vehicular parking is 2 spaces per unit / 422 spaces. Vehicular parking is provided at the rate of 2 spaces per unit/0.62 spaces per bedroom, with a total of 422 spaces. 137 additional spaces have been indicated as "deferred" on the Dimensional Site Plan and may be paved with porous material at a later time. Bicycle parking is provided at the rate of 1.33 spaces per unit including 22 spaces at the Community Building; 24 Class A spaces, 90 Class B spaces, 180 Class C spaces; total of 294 spaces. Some residents will also likely store their bikes on balconies (Class C) or inside their units (Class A).

(5) Required and Proposed Front, Rear and Side Open Space and Setback Lines, and Any Proposed Lot Lines: See Dimensional Site Plans. All requirements of the R4A zoning district are met.

(6) Placement, Height and Type of Construction of All Fences and Walls, in Compliance with Chapter 104, Fences, of the Ann Arbor Code of Ordinances: See architectural plans for code required fence around the deck / pool area. Retaining walls are proposed in various areas throughout this hilly site as shown on the Dimensional Site Plan. Fences are proposed at the top of wall where wall height exceeds 30 inches. See fence details on the Landscape Notes and Details sheet. Six-foot height screen walls are provided around the trash areas.

(7) Refuse Collection and Storage Stations, Number of Receptacles, and Screening in Compliance with Chapter 26, Refuse, of the Ann Arbor Code of Ordinances, and a Statement as to Whether Public or Private Pick-Up will be provided: See Dimensional Site Plans and Miscellaneous Site Details. Trash areas are located throughout the site as shown on the Dimensional Site Plans. Each trash area has a dumpster for trash and a dumpster for recycling. Screening is provided as described in item (6) above. Trash pickup is to be public.

(8) Location of Existing Structures and Driveway Curb Cuts Adjacent to the Property: See Existing Conditions Plans.

(9) Existing and Proposed Topographic Contours at 1 foot Intervals, including area for a minimum 50 feet beyond property line. With permission of Building Director, spot elevations may be substituted for contours on developed sites where limited changes are proposed to existing drainage pattern: See Existing Conditions Plans proposed Grading Plans and Soil Erosion Control Plans.

(10) Proposed Landscaping in Compliance with Chapter 62, Landscape and Screening, of the Ann Arbor Code of Ordinances: See Landscape Requirements notes and calculations on Landscape Notes and Details.

(11) A Soil Erosion and Sedimentation Control Plan in Compliance with Chapter 63, Soil Erosion and Sedimentation Control, of the Ann Arbor Code of Ordinances: See the Soil Erosion Control Plans.

(12) Drainage Area and Direction of Flow of Land Tributary to Site and Proposed Storm water Management Plan in Compliance with Chapter 63, Soil Erosion and Sedimentation Control, of the Ann Arbor Code of Ordinances: See Stormwater Management Plan and Soil Erosion Control Plans.

(13) All Existing and Proposed Streets, Driveways, and Curb Cuts with Dimensions, in Compliance with Chapter 47, Streets, of the Ann Arbor Code of Ordinances, and Public Services Department Standards: See Existing Conditions Plans and Dimensional Site Plans. A new public road is proposed to connect from Pontiac Trail to the proposed stub of St. Regis Way that is part of the Northsky development. Four curb cuts are proposed along this new road segment. A secondary, gated, emergency access curb cut is proposed in the southwest area of the site at Skydale Drive.

(14) All Existing and Proposed Water Lines, Sanitary Sewer Lines, and Storm Sewer Lines, together with Proposed Size, Elevations, Easements and Other Information as Required by the Public Services Director, in Compliance with the Public Services Department Standards: See Existing Conditions Plans and Utility Plans.

(15) Provision of Street Trees as Required in the Street Tree Escrow Regulations, Attachment C of the Land Development Regulations: See Landscape Notes and Details for Street Tree Escrow calculation for Pontiac Trail and St. Regis Way frontages.

(16) Information Required in Traffic Impact Analysis Regulations, Attachment D of the Land Development Regulations: The Traffic Study has been submitted separately.

(17) A Field Survey of Archaeological Resources, if Determined Necessary by City Staff Following the Archaeological Review Process, Attachment B of the Land Development Regulations: To follow if required.

(18) In Addition to a General Description of All Site Natural Features and within 50 feet beyond property line shown as part of required site analysis, the 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:

(a) Limits of Soil Disturbance: See Grading Plan.
(b) Boundary and Description of any Endangered Species Habitat: Not applicable.
(c) Boundary and Elevation of Any 100-Year Floodplain: See Existing Conditions Plan; there is no FEMA mapped flood plain on the site.
(d) Location, Species, Critical Root Zone and Conditions of Landmark Trees: See Existing Conditions Plan, Natural Features Analysis, and Landmark Tree Health reports.
(e) Location of All Steep Slopes and Cross Section through the Site Showing Proposed Activity in Relationship to topography: See Existing Conditions Plans and the Site Cross Section. There is a small area of 20% steep slopes on the Pontiac Trail frontage that will be impacted by the development. This area will be mass graded to provide a storm water detention basin. Adjacent buildings will have walk out basement levels to take advantage of the grade change. The revised slope will be stabilized with retaining wall and landscaping. Several small areas of steep slopes are located in the central portion of the site and will be removed. Additional steep slopes are located within the open space area at the west end of the site and will remain undisturbed.
(f) Existing and Proposed Watercourses Showing Depths, Normal Water Levels, Shore Gradients, type of Bank Retention and Shore Vegetation: Not applicable.
(g) Boundary and Character of All Wetlands, as required by Chapter 60, Wetlands Preservation, of the Ann Arbor Code of Ordinances: See Existing Conditions Plans – Overall for wetland locations. The site contains two identified wetlands. The larger one (0.19 acres is on-site) is located in the open space area to be preserved near the west edge of the site and extends onto the parcel to the west. This is a higher quality wetland, partially wooded, and to remain undisturbed in the park / open space area. A small finger wetland (0.05 acres) exists along the south property line. This wetland is lower quality and is the result of grading activities for the Huron Highlands subdivision. It appears that an existing farm field drain tile may discharge into the east end of the wetland. This tile will be removed during mass grading of the site. This wetland terminates at the west end at an existing storm sewer end section. The on-site portion of this wetland is to be removed. A third potential wetland of less than 0.02 acres located approximately in the middle of the site was evaluated and determined to not be a wetland. It has little wetland vegetation, no hydric soils and is likely also the result of a buried farm tile. This area will also be removed during mass grading.
(h) Boundary and Basal Area of Any Woodland, with Location, Species, and DBH of all Trees 6 inches DBH or Greater within the Woodland Area: There are five woodlands (labeled Woodland A-E) on the site that are of variable level quality. Basal area and species are noted in detail on Site Analysis Plans. Most of the woodlands with the exception of the hedgerows are comprised of 6-inch to 15-inch cherry, elm, ash, box elder, shagbark hickory and locust. There is an area identified by city staff as a native forest fragment that is shown on the natural features plan as Woodland C. There are landmark trees on the site, located predominantly along the perimeter boundary that would have once been the hedgerows of the farm field. Most of these landmark trees will remain.

(19) Location and Extent of Required Natural Features Open Space, in Compliance with Chapter 55, Zoning, of the Ann Arbor Code of Ordinances: See Existing Conditions Plan – Overall.

(20) Natural Features Statement of Impact, including a Natural Features Protection Plan, an Alternative Analysis, and a Natural Features Mitigation Plan, as required by Chapter 57, Attachment A to the Land Development Regulations, Guidelines for the Protection and Mitigation of Natural Features, shall be used by City Staff when reviewing proposed site plans and plats for site containing natural features:

Wetland Impacts: The site contains two identified wetlands. The larger one (0.19 acres of it is on-site) is located in the open space area to be preserved near the west edge of the site and extends onto the parcel to the west. This is a higher quality wetland, partially wooded, and is to remain undisturbed within the proposed park/open space area. A small finger wetland (0.05 acres) exists along the south property line. This wetland is lower quality and is the result of grading activities for the Huron Highlands subdivision. This wetland terminates at the west end at an existing storm sewer end section. The on-site portion of this wetland is to be removed.

The Natural Features Open Space around Wetland 'B' will be disturbed and restored for construction of the wetland mitigation area.

Wetlands to be Removed: The on-site portion of Wetland 'A' is to be removed. See proposed Mitigation and Monitoring Plan on sheet 15. A third potential wetland of less than 0.02 acres is located approximately in the center of the site. It has little wetland vegetation, no hydric soils, is likely the result of a buried farm tile, and does not qualify as a wetland. This area will be removed during mass grading. Wetland areas to remain will be protected during construction with silt fencing and construction fencing as shown on the Site

Analysis and Natural Features Protection Plans and the Grading and Soil Erosion Control Plans. A City of Ann Arbor Wetland Use application has been submitted with this Site Plan submittal.

Tree Impacts: There are five woodlands (labeled Woodland A-E) on the site that are of variable level quality. Basal area and species are noted in detail on the Site Analysis Plans. Most of the woodlands with the exception of the hedgerows are comprised of 6-inch to 15-inch cherry, elm, ash, box elder, shagbark hickory and locust. There is an area identified by city staff as a native forest fragment that is shown on the natural features plan as Woodland C. There are landmark trees on the site, located predominantly along the perimeter boundary that would have once been the hedgerows of the farm field. Most of these landmark trees will remain. Tree removals are shown on the Existing Conditions Plans. Proposed mitigation calculations and plantings are shown on the Landscape Plans. Silt fence and construction fence will be provided to protect trees to remain where shown on the Site Analysis and Natural Features Protection Plans and the Grading and Soil Erosion Control Plans.

Steep Slope Impacts: There is a small area of 20% steep slopes on the Pontiac Trail frontage that will be impacted by the development. This area will be mass graded to provide a storm water detention basin. Adjacent buildings will have walk out basement levels to take advantage of the grade change. The revised slope will be stabilized with retaining wall and landscaping. Several small areas of steep slopes are located in the central portion of the site and will be removed. Additional steep slopes are located within the open space area at the west end of the site and will remain undisturbed. Limits of disturbance will be defined by the silt fence and construction fence locations shown on the Site Analysis and Natural Features Protection Plans and the Grading and Soil Erosion Control Plans.

Public Interest: In order to determine that the proposed disturbance of the Natural Features is in the public interest, the benefit that would reasonably be expected to accrue from the proposal was evaluated according to the criteria listed in the referenced section as follows:

(a) The private need is to remove the small, low quality finger wetland, to remove and mitigate Landmark and Woodland Trees, and to impact small areas of steep slopes to create a useable development site for market rate, rental housing with a mix of one to four bedroom units, and to provide a public storm sewer within a 30-foot wide easement to drain the Northsky detention basin to the public sewer at Skydale Drive. The public need is to provide needed additional apartments, add to the tax base, support local commercial uses, provide storm water management for the site, improve the water quality, loop the water main through the site, link the water main to the subdivision to the south and the development to the north, and construct off-site water main improvements at the intersections of Pontiac Trail / Skydale Drive, and Hilldale Drive / Cloverdale Drive.
The public need is served by providing additional infill housing within the City rather than by additional suburban development. The public need is also served by allowing the removal of invasive species, and the removal and mitigation of Landmark and Woodland Trees to permit appropriate mass grading of the site. The public need is served by allowing impacts on the steep slopes at the northeast bedrooms corner of the site to create a storm water treatment detention facility that will reduce the rate of runoff and improve water quality.

(b) There are no feasible alternatives that would be less disruptive or more prudent.
MAXIMUM DEVELOPMENT CONCEPT ALTERNATIVE:
The Master Plan indicates a density of 7 to 10 units per acre on this site that would permit 217 to 310 apartments. Assuming these are all six-bedroom units, there could be 1,302 to 1,860 on this site. Parking would be an issue for such a development program and providing only the required 2 spaces per unit (434 to 620 spaces) would be well under the number of parking spaces actually required. Constructing close to the typical one space per bedroom in this type of development would require acres of additional tree removals, mass grading and paving. This maximum development alternative is perhaps the least feasible and the least prudent for this location.

ALTERNATIVE 1, THE PREVIOUS BARTON GREEN SITE PLAN;
This is the previously approved Barton Green Site Plan. The development program was 260 units of upscale condominiums, townhouses and stacked flats, intended for first time buyers, empty nesters, and trade-up condominium buyers. The apartment buildings were larger and taller than the currently proposed cottages and included interior parking. The building height exceeded the R4A zoning district maximum and required a Planned Project Site Plan. The units were a mix of two and three bedrooms, each with two full baths, and ranging from 980 to 2,577 square feet in floor area. The Barton Green Site Plan is void.

ALTERNATIVE 2 (dated 10/14/16): This concept was done after the previous Site Analysis was updated to show revision of the Northsky site plan and improvements to Pontiac Trail. The concept was done prior to doing new soil borings and infiltration test pits. The intent is to create a village atmosphere with all residential buildings being two-story cottages. In order to achieve anything like the density of 7-10 dwelling units per acre indicated in the City's Master Plan, the developed area is of necessity larger than that of the Barton Green Site Plan. In addition, the program is revised to provide rental apartments primarily for students and young professionals. This requires a higher ratio of parking per units than the 2 spaces per unit specified in the R4A district. The smaller residential units to reduce the overall mass grading required by stepping this buildings down the slopes. The smaller buildings are also more compatible with the existing adjacent Huron Highlands subdivision to the south and proposed Northsky development to the north. Additional impacts on natural features include removals of more Landmark and Woodland trees.

ALTERNATIVE 3 (dated 2/2/16 s.i.c.): This concept was also done prior to completion of soil borings and infiltration test pits. The development concept is a village like collection of smaller cottage style units. Apartments are all two story cottages and include one, two and four unit buildings. Buildings adjacent to Huron Highlands are two story cottages rather than three story townhouses as shown on the previously approved Barton Green site plan. The proposed 6.61 dwelling units per acre density (DUA) is less than the 7-10 DUA recommended in the Master Plan. Buildings 61 to 70 were placed with minimum setbacks along the south property line, adjacent to existing homes in Huron Highlands. This concept includes a proposed public road segment from Pontiac Trail to the St. Regis Way stub shown on the Northsky site plans. The storm detention basin locations are based on the existing topography, without having the results of the infiltration tests. The most suitable soils for infiltration were found later in the locations of buildings 62 to 75 and the Community Building. Other areas where some infiltration could occur are east of buildings 5 to 8 (northeast corner of the site), and west of buildings 48-50 (southwest portion of the site). This alternative provides smaller open spaces within the area of the site to be developed and has a greater impact on the natural features by disturbing an additional 1,000 sf of wetlands, 20,100 sf of woodland, and .74 ac of the 1 ac native forest fragment.

ALTERNATIVE 4: This concept was submitted to the City for review. The layout had been adjusted per soils infiltration testing results. The proposed density was increased to 7+ DUA by adding two 3-story townhouse buildings. These larger buildings are located interior to the site. All residential structures adjacent to Huron Highlands and Northsky are one or two stories. The proposed vehicular access to Skydale Drive was revised to be a gated fire lane / emergency access only as preferred by the Huron Highland residents. All of The Cottages at Barton Green alternatives provide smaller open spaces within the area of the site to be developed as compared to the previous Barton Green Site Plan. They also have a greater impact on the natural features by removing the 0.05-acre wetland along the south edge of the site, and removing and mitigating additional Landmark and Woodland trees.

ALTERNATIVE 5: This is the current "The Cottages at Barton Green" proposed Site Plan. The proposed density has been increased to 6.90 DUA by adding additional 3-story townhouse buildings and revising duplex types. The larger buildings are all located interior to the site. All structures adjacent to Huron Highlands and Northsky are one or two stories. The proposed vehicular access to Skydale Drive has been revised to be an open curb cut per City staff comments. The site layout has been revised to reduce impacts on woodlands and landmark trees, particularly north of building 56, and west of buildings 57 and 58. The proposed park dedication area in the western portion of the site has been increased from 7.12 acres to 9.86 acres.

(c) The probable impact of construction in relation to the cumulative effect created by other existing and anticipated activities in or near the "natural feature" to be protected is positive. The low quality finger wetland mosquito breeding area will be removed. The Landmark and Woodland Trees that will be removed will be replaced with new tree plantings. Runoff that now drains from the proposed areas of development and over steep slopes will be intercepted, treated, and released at a controlled rate from detention basins. The steep slopes will be reconfigured and stabilized. There will be minimal soil erosion.
The probable impact on recognized historic, cultural, scenic, ecological, or recreational values is limited to the removal of the small wetland, removal and replacement of some Landmark and Woodland Trees, and regrading and stabilization of small areas of steep slopes. The impact on fish, wildlife and public health will be positive since the large open space and park area will create a consolidated natural area in perpetuity along the west end of the site. This will provide habitat and opportunity for wildlife populations to increase.

(d) The runoff that feeds the wetland at the southwest corner will continue to sustain that feature. The removal of the small finger wetland results in a loss of 0.05 acres (2,178 square feet) of wetland/mosquito breeding area adjacent to the Huron Highlands subdivision.

(e) The total wetland area is decreased by less than 0.07 acres, approximately 2,878 square feet.

(f) The Natural Features Open Space (NFOS) area associated with the finger wetland will remain as an open space area. The quality of the NFOS will be improved and the area will be reestablished with a native seed mix.
The proximity of the proposed activity in relation to the natural feature is shown on the plans.

Soils: The Custom Soil Resource Report for Washtenaw County shows the site soils to be mostly type B soils:

WawabB- Wawasee loam, 2-6%
WawabC- Wawasee loam, 6-12%
WawabD- Wawasee loam, 12-18%

Smaller areas of the site are type D soils:

FoC- Fox sandy loam, 6-12%
MdA- Matherton sandy loam, 0-4%

These soils should not create any extraordinary excavation problems. Typical soil profiles are shown in the boring logs on the plans. These soils should not create any extraordinary excavation problems. Hydric or wetland type soils are limited to areas that are not in proposed building or pavement areas. Test pits show primary infiltration opportunities to be where the storm detention basin is proposed in the southeast portion of the site.

(g) The economic value, both public and private, of the proposed activity and economic value, both public and private, if the proposed activity were not permitted is a multimillion dollar property tax loss for the City, loss of new market rate, rental apartments, and loss of income for the developer. The conclusion of the alternatives analysis is that the site plan proposes reasonable environmental impacts and appropriate Landmark and Woodland Tree mitigation that improves the environment. From an economic value point of view, the wetland impact and the disturbance of the NFOS creates a feasible building site for a viable market rate rental apartment development.

BUILDING HEIGHT, FOOTPRINT AND GROSS FLOOR AREA TABLE

Building Type	Number of Buildings	Number of Units per Bldg.	Subtotal Number of Units	Basement Floor S.F.	First Floor S.F.	Second Floor S.F.	Third Floor S.F.	Subtotal Floor Area S.F.	Floor Area S.F.	Subtotal Footprint S.F.	Footprints S.F.	Height	Unit S.F. 601-1,200	Unit S.F. >1,200
Single E2	11		11					2,181	23,991	1,187	13057	23'-5"		11
Unit E2		1			1187	994		2181						
Duplex DP3	13		26					3,316	43,108	1,658	21554	24'-6"		26
Unit C1		1			775	775		1550						
Unit D4		1			883	883		1766						
Duplex DP5	28		56					4,048	113,344	1,770	49560	23'-8"*		56
Unit E1		2		376	885	763		1648						
Quad QU1	6		24					5,070	30,420	1,772	10632	24'-6"	12	12
Unit D1		2			885	763		1648						
Unit A1		1			887			887						
Unit A2		1				887		887						
Townhome TH1	3		30					12,145	36,435	3,769	11307	34'-9"	12	18
Unit TH1		4			607			607						
Unit TH2		4				707	607	1314						
Unit TH4		2			570	670	570	1810						
Townhome TH2	4		64					20,217	80,868	6,125	24500	34'-9"	24	40
Unit TH1		6			607			607						
Unit TH2		6				707	607	1314						
Unit TH4		4			570	670	570	1810						
Community Bldg. CH	1							10,450	10,450	10,450	10450	22'-6"		
Maintenance Bldg. MB	1							1,800	1,800	1,800	1800	14'-0"		
TOTALS	67		211						340,416		142,860		48	163

* Height at walkout/rear = 34'-2".

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COTTAGES AT BARTON GREEN

SITE PLAN
SITE PLAN NOTES AND TABLES

2

JOB No. 16223
DATE: 5/25/17
SHEET 2 OF 49

REVISIONS:	REV. DATE	
REV. PER COUNTY	8/16/17	CADD: WAJ
REV. PER CITY/COUNTY	9/5/17	ENG: JCA
REV. PER CITY	10/12/17	PM: SWB
REV. PER CITY	11/15/17	TECH:
REV. PER CITY	1/23/18	16223NT.dwg
REVISED PER AGREEMENT	6/7/19	FB#460
REVISED PER AGREEMENT	6/20/19	

M:\Civil3d_Proj\16223\Site Plan\16223NT.dwg, 6/21/2019 9:51 AM, Jim Ahnert, None
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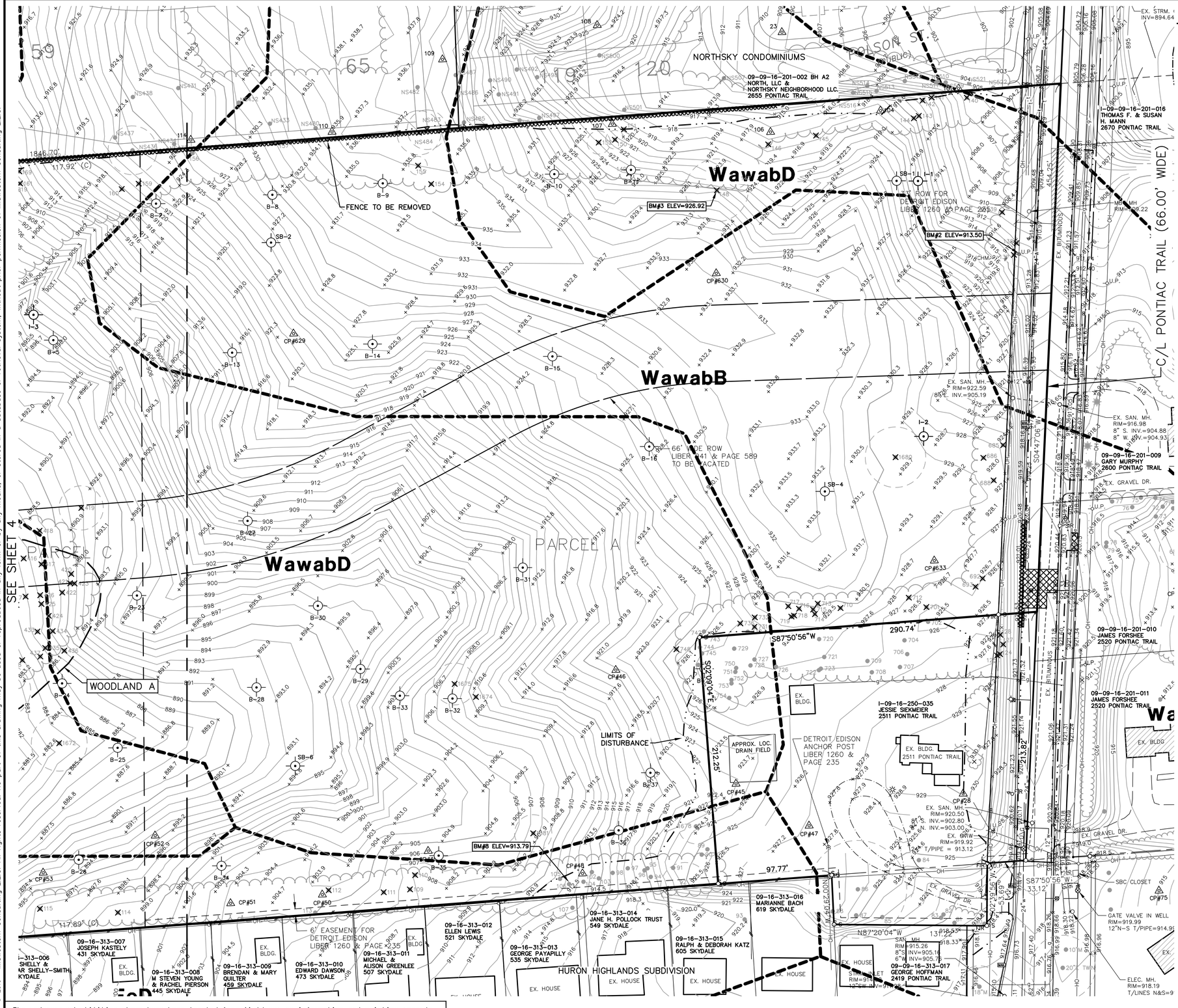

SOIL TYPE LEGEND

BnB	BOYER LOAMY SAND, 0 TO 6 PERCENT SLOPES
FoC	FOX SANDY LOAM, 6 TO 12 PERCENT SLOPES
FoD	FOX SANDY LOAM, 12 TO 18 PERCENT SLOPES
MdA	MATHERTON SANDY LOAM, 0 TO 4 PERCENT SLOPES
WawabB	WAWASEE LOAM, 2 TO 6 PERCENT SLOPES
WawabD	WAWASEE LOAM, 6 TO 12 PERCENT SLOPES

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

SCALE: 1" = 40'

0 40 80 120

LEGEND

838	EXIST. CONTOUR
×836.2	EXIST. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
GP	EXIST. GUY POLE
	GUY WIRE
	ELEC. TRANSFORMER
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
t	EXIST. TELEPHONE LINE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
g	EXIST. GAS VALVE
w	EXIST. WATER MAIN
	EXIST. HYDRANT
	EXIST. GATE VALVE IN BOX
	EXIST. GATE VALVE IN WELL
	EXIST. CURB STOP & BOX
r	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	EXIST. BEEHIVE INLET
	END SECTION
	CULVERT
s	EXIST. SANITARY SEWER
	EXIST. CLEANOUT
	C/L OF DITCH
	DRAINAGE DIRECTION
	SIGN
MB	MAILBOX
	TELEPHONE RISER
catv	CABLE TELEVISION RISER
	ELECTRIC METER
w	WATER METER
g	GAS METER
	POST
W	WELL
	FENCE
	GUARDRAIL
	SINGLE TREE
	LANDMARK TREE
	TREE OR BRUSH LIMIT
B	EXIST. BOULDER
	SECTION CORNER
I-2 / B-32 SB-1	SOIL BORING/TEST PIT LOCATION
○ S	SET IRON PIPE
○ F	FOUND IRON PIPE
⊙ S	SET MONUMENT
⊙ F	FOUND MONUMENT
○IR	SET IRON ROD
○FIR	FOUND IRON ROD
	CONTROL PT.
	TREE TO BE REMOVED
	PAVEMENT TO BE REMOVED
	CURB TO BE REMOVED
	LIMITS OF DISTURBANCE

LEGAL DESCRIPTION OF A 31.93 ACRE PARCEL OF LAND

Beginning at the W 1/4 corner of Section 16, T2S, R6E, Ann Arbor Township, Washtenaw County, Michigan;

thence N 00°24'44" E 267.00 feet along the West line of said Section 16;
thence N 89°42'29" W 340.00 feet parallel with the E–W 1/4 line of Section 17, T2S, R6E, Ann Arbor Township, Washtenaw County, Michigan;
thence S 00°24'44" W 267.00 feet parallel to the West line of said Section 16;
thence N 89°42'29" W 75.20 feet along the E–W 1/4 line of said Section 17;
thence N 01°01'18" E 25.02 feet along the Easterly right–of–way line of M–14 Hwy;
thence continuing along said ROW line 717.32 feet in the arc of a circular curve to the right, radius 1660.08 feet, central angle 24°45'27", and chord N 13°24'01" E 711.76 feet;
thence continuing along said ROW line N 25°46'45" E 595.13 feet;
thence S 00°24'44" W 587.84 feet along the West line of said Section 16;
thence N 87°57'55" E 1846.70 feet along the South line of the N 1/2 of the S 1/2 of the NW 1/4 of said Section 16;
thence S 04°47'06" W 454.25 feet along the centerline of Pontiac Trail (66.00 feet Wide), as monumented;
thence S 87°50'56" W 290.74 feet;
thence S 02°09'04" E 212.25 feet;
thence S 87°50'56" W 1530.95 feet along the E–W 1/4 line of said Section 16 to the POINT OF BEGINNING, being a part of Sections 16 and 17, T2S, R6E, Washtenaw County, Michigan, and containing 31.93 acres of land, more or less, subject to easements and restrictions of record, if any.

PREPARED BY
MIDWESTERN CONSULTING, LLC

PATRICK L. HASTINGS, PS, #37277

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.

M:\Civil\16_Proj\16223\Site Plan\16223EX1.dwg, 4/20/2019 1:23 PM, Jim Ahnert, MCLLC PDF.pc3
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COTTAGES AT BARTON GREEN

SITE PLAN
EXISTING CONDITIONS AND SURVEY PLAN (EAST)

3

JOB No. 16223

DATE: 5/25/17
SHEET 3 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223EX1.dwg

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	6/16/17
REV. PER COUNTY	9/5/17
REV. PER CITY/COUNTY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	

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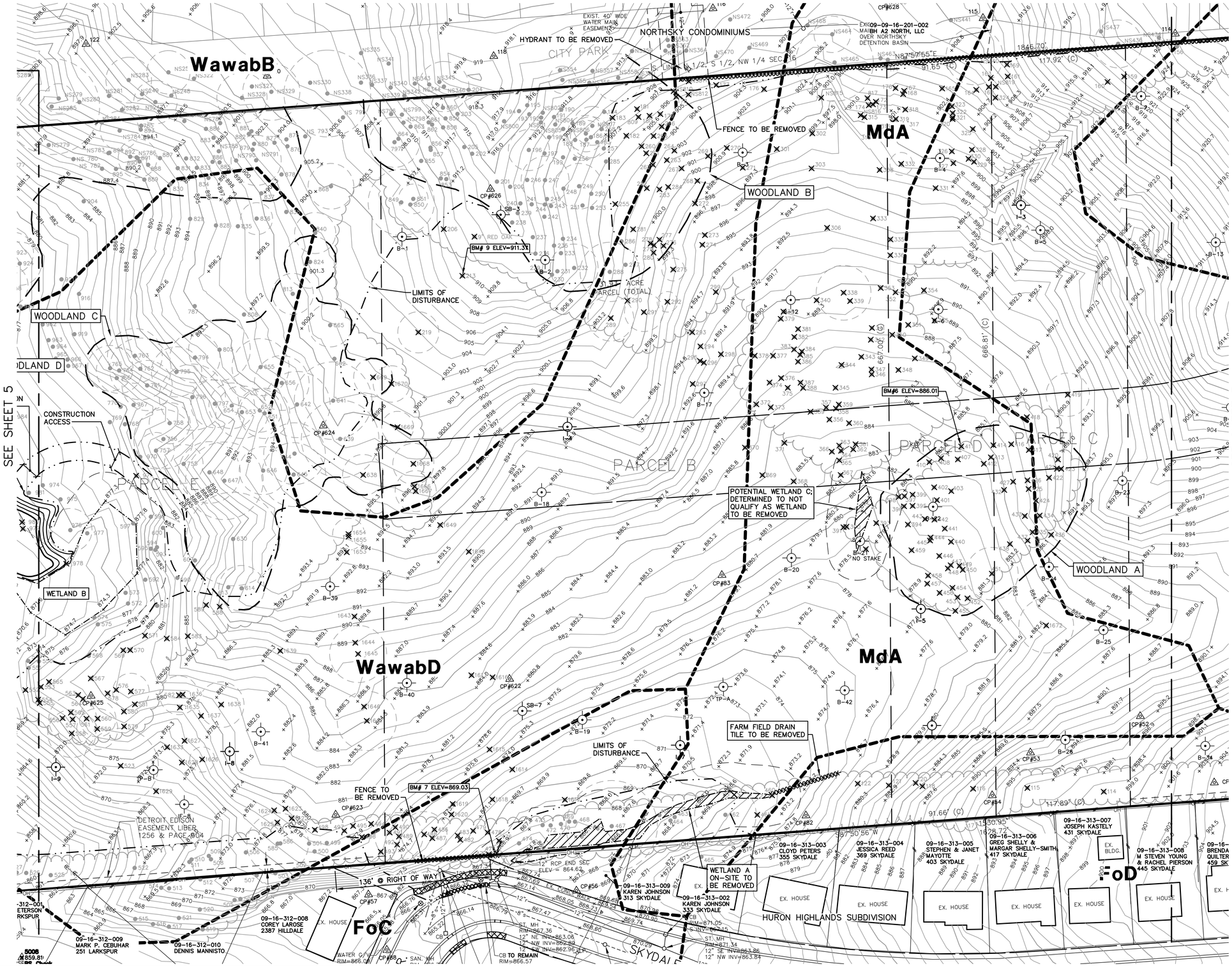

811 Know what's below. Call before you dig.

SCALE: 1" = 40'
0 40 80 120

LEGEND

838	EXIST. CONTOUR
×836.2	EXIST. SPOT ELEVATION
-o- U.P.	EXIST. UTILITY POLE
- GP	EXIST. GUY POLE
	GUY WIRE
	ELEC. TRANSFORMER
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
t	EXIST. TELEPHONE LINE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
g	EXIST. GAS VALVE
w	EXIST. WATER MAIN
	EXIST. HYDRANT
	EXIST. GATE VALVE IN BOX
	EXIST. GATE VALVE IN WELL
	EXIST. CURB STOP & BOX
r	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	EXIST. BEEHIVE INLET
	END SECTION
	CULVERT
s	EXIST. SANITARY SEWER
	EXIST. CLEANOUT
	C/L OF DITCH
	DRAINAGE DIRECTION
	SIGN
MB	MAILBOX
	TELEPHONE RISER
catv	CABLE TELEVISION RISER
	ELECTRIC METER
w	WATER METER
g	GAS METER
	POST
W	WELL
	FENCE
	GUARDRAIL
	SINGLE TREE
	LANDMARK TREE
	TREE OR BRUSH LIMIT
	EXIST. BOULDER
	SECTION CORNER
B-32 I-2 SB-1	SOIL BORING/TEST PIT LOCATION
S	SET IRON PIPE
F	FOUND IRON PIPE
S	SET MONUMENT
F	FOUND MONUMENT
SIR	SET IRON ROD
FIR	FOUND IRON ROD
	CONTROL PT.
	TREE TO BE REMOVED
	PAVEMENT TO BE REMOVED
	CURB TO BE REMOVED
	LIMITS OF DISTURBANCE

BENCHMARKS:

2.) RR SPIKE N.E. SIDE UTILITY POLE W. SIDE OF PONTIAC TRAIL ±100' S. OF N.E. PROP. COR. – ELEV = 913.50'
3.) RR SPIKE E. FACE 30" CHERRY TREE (#148) ±250' W. OF N.E. PROP. COR. – ELEV = 926.92'
6.) RR SPIKE N. SIDE 8" HICKORY TREE (#411) LOCATED ±340' S. OF N. PROP. LINE, ±240' N.E. OF CP#83, AND ±920' W. OF PONTIAC TRAIL RD. – ELEV = 886.01
7.) RR SPIKE W. SIDE UTILITY POLE ALONG S. PROP. LINE ±60' N. OF CENTERLINE SKYDALE DR. AT BEND IN RD. – ELEV = 869.03
8.) RR SPIKE N. SIDE 10" BOX ELDER TREE (#106) LOCATED ±8' N. OF S. PROP. LINE, ±400' W. OF PONTIAC TRAIL RD., AND ±15' S.W. OF CP#48. – ELEV = 913.79'
9.) 60-D SPIKE N.W. SIDE 8" OAK TREE (#213) LOCATED ±150' S. OF N. PROP. LINE, ±470' E. OF W. PROP. LINE, AND ±75' S.W. OF CP#626. – ELEV = 911.37

SOIL TYPE LEGEND

BnB	BOYER LOAMY SAND, 0 TO 6 PERCENT SLOPES
FoC	FOX SANDY LOAM, 6 TO 12 PERCENT SLOPES
FoD	FOX SANDY LOAM, 12 TO 18 PERCENT SLOPES
MdA	MATHERTON SANDY LOAM, 0 TO 4 PERCENT SLOPES
WawabB	WAWASEE LOAM, 2 TO 6 PERCENT SLOPES
WawabD	WAWASEE LOAM, 6 TO 12 PERCENT SLOPES

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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(734) 995-0200 • www.midwesternconsulting.com
Land Development • Land Survey • Institutional • Municipal
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CLIENT
TRINITAS DEVELOPMENT, LLC
201 MAIN STREET, SUITE 1000
LAFAYETTE, INDIANA 47901
ATTN: DAMIAN VANMATRE
(765) 807-2713

COTTAGES AT BARTON GREEN

SITE PLAN
EXISTING CONDITIONS AND SURVEY PLAN (CENTER)

4

JOB No. 16223

DATE: 5/25/17
SHEET 4 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223EX1.dwg

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	8/16/17
REV. PER COUNTY	9/5/17
REV. PER CITY/COUNTY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	6/7/19
REVISED PER AGREEMENT	6/20/19

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SEE LEFT

SEE RIGHT

SEE SHEET 4

MmC

WawabD

BnB

FoC

FoD

M-14

S'ELY R.O.W. LINE M-14

595.13'

N23°46'45"E

587.84'

W. LINE SEC. 16, T2S, R6E

S00°24'44"W

905.00'

PARCEL F

L= 717.32'
R= 1660.08'
Delta= 24°45'27"
Chord= S13°24'01"E
711.76'

N89°42'29"W

267.00'

N00°24'44"E

N01°01'16"E
251.20'

75.20'

340.00'

E-W 1/4 LINE, SEC. 17

E. BARYON LANE

WOODLAND

CONSTRUCTION ACCESS

LIMITS OF DISTURBANCE

WETLAND 'B'

EX. BLDG.

EX. BLDG.

CP#658 — CONTROL POINT #658

CP#94 — CONTROL POINT #94

CP#26 — CONTROL POINT #26

CP#92 — CONTROL POINT #92

CP#90 — CONTROL POINT #90

W 1/4 CORNER SECTION 16 T2S, R6E

5008
859.61'
CPSP BS_Check

09-16-100-014
DALE PETERSON
265 BARTON LANE

09-16-312-001
DALE PETERSON
243 LARKSPUR

09-17-425-002
230 E. BARYON LANE LLC
230 E. BARYON LANE

09-17-425-001
EAST BARTON PROPERTIES LLC
242 E. BARTON LANE

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SCALE: 1" = 40'

0 40 80 120

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

LEGEND

838	EXIST. CONTOUR
×836.2	EXIST. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
GP	EXIST. GUY POLE
	GUY WIRE
	ELEC. TRANSFORMER
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
t	EXIST. TELEPHONE LINE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
g	EXIST. GAS VALVE
w	EXIST. WATER MAIN
	EXIST. HYDRANT
	EXIST. GATE VALVE IN BOX
	EXIST. GATE VALVE IN WELL
	EXIST. CURB STOP & BOX
r	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	EXIST. BEEHIVE INLET
	END SECTION
	CULVERT
s	EXIST. SANITARY SEWER
	EXIST. CLEANOUT
	C/L OF DITCH
	DRAINAGE DIRECTION
	SIGN
MBX	MAILBOX
	TELEPHONE RISER
catv	CABLE TELEVISION RISER
E	ELECTRIC METER
W	WATER METER
G	GAS METER
	POST
W	WELL
	FENCE
	GUARDRAIL
	SINGLE TREE
	LANDMARK TREE
	TREE OR BRUSH LIMIT
	EXIST. BOULDER
	SECTION CORNER
I-2 / B-32 SB-1	SOIL BORING/TEST PIT LOCATION
S	SET IRON PIPE
F	FOUND IRON PIPE
S	SET MONUMENT
F	FOUND MONUMENT
SIR	SET IRON ROD
FIR	FOUND IRON ROD
	CONTROL PT.
	TREE TO BE REMOVED
	PAVEMENT TO BE REMOVED
	CURB TO BE REMOVED
	LIMITS OF DISTURBANCE

SOIL TYPE LEGEND

BnB	BOYER LOAMY SAND, 0 TO 6 PERCENT SLOPES
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FoD	FOX SANDY LOAM, 12 TO 18 PERCENT SLOPES
MdA	MATHERTON SANDY LOAM, 0 TO 4 PERCENT SLOPES
WawabB	WAWASEE LOAM, 2 TO 6 PERCENT SLOPES
WawabD	WAWASEE LOAM, 6 TO 12 PERCENT SLOPES

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LAFAYETTE, INDIANA 47901
ATTN: DAMIAN VANMATRE
(765) 807-2713

COTTAGES AT BARTON GREEN

SITE PLAN
EXISTING CONDITIONS AND SURVEY PLAN (WEST)

5

DATE: 5/25/17
SHEET 5 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223EX1.dwg

JOB No. 16223

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	8/16/17
REV. PER COUNTY	9/5/17
REV. PER CITY/COUNTY	10/12/17
REV. PER CITY	11/15/17

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEM	SCORE	LM	INV	REMOVE	MITIGATE
89	14"	Box Elder	Acer negundo						
90	8"	Box Elder	Acer negundo	2					
91	9"	Black Cherry	Prunus serotina						
92	21"	Black Cherry	Prunus serotina			X			
93	18"	Siberian Elm	Ulmus pumila				X		
94	11"	Box Elder	Acer negundo						
95	8"	Box Elder	Acer negundo						
96	9"	Box Elder	Acer negundo						
97	7"	Box Elder	Acer negundo	2					
98	8"	Box Elder	Acer negundo						
102	8"	Box Elder	Acer negundo						
103	8"	Box Elder	Acer negundo						
104	20"	Box Elder	Acer negundo						
105	11"	Box Elder	Acer negundo					X	
106	10"	Box Elder	Acer negundo						
107	16"	Blue Spruce	Picea pungens						
109	13"	Box Elder	Acer negundo					X	
110	12"	Black Cherry	Prunus serotina	2				X	
111	7"	Box Elder	Acer negundo	2				X	
112	11"	Box Elder	Acer negundo					X	
113	12"	Box Elder	Acer negundo	2					
114	13"	Siberian Elm	Ulmus pumila				X	X	
115	8"	American Elm	Ulmus americana					X	
116	6"	Red Cedar	Juniperus virginiana					X	
117	14"	Siberian Elm	Ulmus pumila				X		
118	13"	Box Elder	Acer negundo	2				X	
120	8"	Box Elder	Acer negundo					X	
121	12"	Black Cherry	Prunus serotina					X	
122	9"	Common Apple	Malus pumila					X	
123	22"	American Elm	Ulmus americana	2		X			
124	9"	American Elm	Ulmus americana					X	
125	8"	American Elm	Ulmus americana					X	
126	8"	American Elm	Ulmus americana						
127	19"	Black Locust	Robinia pseudoacaci				X	X	
128	7"	American Elm	Ulmus americana					X	
137	7"	American Elm	Ulmus americana					X	
138	11"	American Elm	Ulmus americana					X	
139	8"	Red Cedar	Juniperus virginiana					X	
140	8"	Black Cherry	Prunus serotina	2				X	
141	6"	White Mulberry	Morus alba				X	X	
142	7"	White Mulberry	Morus alba				X	X	
143	6"	American Elm	Ulmus americana					X	
144	10"	Black Cherry	Prunus serotina					X	
145	8"	Black Cherry	Prunus serotina					X	
146	6"	Black Cherry	Prunus serotina					X	
147	10"	Red Cedar	Juniperus virginiana		21	X		X	X
148	28"	Black Cherry	Prunus serotina		14	X		X	
149	6"	American Elm	Ulmus americana					X	
150	8"	Red Cedar	Juniperus virginiana		21	X		X	X
151	6"	Red Cedar	Juniperus virginiana					X	
152	11"	Red Cedar	Juniperus virginiana		21	X		X	X
154	6"	Hawthorn	Crataegus	2				X	
155	8"	Red Cedar	Juniperus virginiana		21	X		X	X
156	6"	White Oak	Quercus alba						
157	6"	Shagbark Hickory	Carya ovata						
159	7"	Red Cedar	Juniperus virginiana					X	
160	6"	Shagbark Hickory	Carya ovata					X	
161	6"	White Oak	Quercus alba					X	
162	6"	White Mulberry	Morus alba				X	X	
163	10"	Red Oak	Quercus rubra					X	
164	7"	Black Cherry	Prunus serotina					X	
165	7"	Shagbark Hickory	Carya ovata					X	
167	8"	American Elm	Ulmus americana					X	
168	8"	Shagbark Hickory	Carya ovata					X	
169	18"	Red Oak	Quercus rubra			X		X	
170	7"	Shagbark Hickory	Carya ovata					X	
171	6"	Shagbark Hickory	Carya ovata						
172	11"	Shagbark Hickory	Carya ovata					X	
173	12"	Shagbark Hickory	Carya ovata					X	
174	6"	Shagbark Hickory	Carya ovata					X	
176	7"	American Elm	Ulmus americana					X	
177	7"	American Elm	Ulmus americana					X	
178	9"	Shagbark Hickory	Carya ovata					X	X
179	10"	Shagbark Hickory	Carya ovata					X	X
180	6"	Shagbark Hickory	Carya ovata					X	
181	6"	Shagbark Hickory	Carya ovata					X	X
182	14"	Red Oak	Quercus rubra					X	X
183	10"	Shagbark Hickory	Carya ovata					X	X
184	8"	Shagbark Hickory	Carya ovata						
185	10"	Black Cherry	Prunus serotina						
186	19"	Red Oak	Quercus rubra		21	X			
187	19"	Red Oak	Quercus rubra		22	X			
188	7"	American Elm	Ulmus americana						
189	6"	Black Cherry	Prunus serotina						
190	6"	Shagbark Hickory	Carya ovata						
191	11"	Shagbark Hickory	Carya ovata						
192	8"	Shagbark Hickory	Carya ovata						
193	8"	Shagbark Hickory	Carya ovata						
194	7"	Shagbark Hickory	Carya ovata						
195	6"	Shagbark Hickory	Carya ovata						
196	18"	Black Cherry	Prunus serotina		20	X			
197	12"	Red Oak	Quercus rubra						
198	9"	Shagbark Hickory	Carya ovata						
199	10"	Shagbark Hickory	Carya ovata						
200	13"	Pignut Hickory	Carya glabra						
201	11"	Red Oak	Quercus rubra						
202	7"	Black Walnut	Juglans nigra						
203	7"	Shagbark Hickory	Carya ovata						
204	9"	Red Oak	Quercus rubra						
205	6"	Shagbark Hickory	Carya ovata						
206	14"	Silver Maple	Acer saccharinum					X	
213	8"	Red Oak	Quercus rubra					X	
219	20"	Black Cherry	Prunus serotina		19	X		X	X
229	9"	Black Cherry	Prunus serotina						
230	6"	Red Oak	Quercus rubra						
231	6"	Red Oak	Quercus rubra						
232	21"	Red Oak	Quercus rubra		21	X			
233	7"	Red Oak	Quercus rubra						
234	18"	Red Oak	Quercus rubra		21	X			
235	6"	American Elm	Ulmus americana						
236	7"	American Elm	Ulmus americana						
237	10"	American Elm	Ulmus americana						
238	6"	Red Oak	Quercus rubra						
239	7"	Pignut Hickory	Carya glabra						
240	12"	Black Cherry	Prunus serotina						
241	12"	Black Cherry	Prunus serotina						
242	7"	American Elm	Ulmus americana						
243	6"	Red Oak	Quercus rubra						
244	14"	Shagbark Hickory	Carya ovata						
245	6"	American Elm	Ulmus americana						

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEM	SCORE	LM	INV	REMOVE	MITIGATE
246	8"	Shagbark Hickory	Carya ovata						
247	21"	Red Oak	Quercus rubra		19	X			
248	8"	American Elm	Ulmus americana						
249	20"	Red Oak	Quercus rubra		21	X			
250	7"	Shagbark Hickory	Carya ovata						
251	6"	Shagbark Hickory	Carya ovata						
253	9"	Shagbark Hickory	Carya ovata						
255	7"	American Elm	Ulmus americana					X	
256	7"	Red Oak	Quercus rubra						
257	8"	Black Cherry	Prunus serotina						
258	7"	Shagbark Hickory	Carya ovata						
260	9"	Shagbark Hickory	Carya ovata					X	X
261	10"	Shagbark Hickory	Carya ovata					X	X
262	6"	Shagbark Hickory	Carya ovata					X	
263	6"	Shagbark Hickory	Carya ovata					X	
264	8"	Red Oak	Quercus rubra					X	
265	9"	American Elm	Ulmus americana					X	
266	6"	Shagbark Hickory	Carya ovata					X	
267	7"	American Elm	Ulmus americana					X	
268	7"	Shagbark Hickory	Carya ovata					X	
269	6"	Shagbark Hickory	Carya ovata					X	
270	10"	Box Elder	Acre negundo					X	
271	7"	Black Cherry	Prunus serotina					X	
272	7"	Black Cherry	Prunus serotina					X	
273	9"	Shagbark Hickory	Carya ovata					X	
274	7"	American Elm	Ulmus americana					X	
275	10"	Red Cedar	Juniperus virginiana		22	X		X	X
276	10"	Red Oak	Quercus rubra					X	
277	8"	Red Oak	Quercus rubra					X	
278	6"	Red Oak	Quercus rubra					X	
279	9"	Red Oak	Quercus rubra					X	
280	10"	Red Oak	Quercus rubra					X	
281	13"	Red Oak	Quercus rubra					X	X
282	13"	Black Cherry	Prunus serotina					X	X
283	6"	Red Cedar	Juniperus virginiana					X	
284	6"	Shagbark Hickory	Carya ovata					X	
285	9"	Shagbark Hickory	Carya ovata						
286	7"	Shagbark Hickory	Carya ovata						
287	7"	American Elm	Ulmus americana						
288	31"	Black Cherry	Prunus serotina		15	X			
289	20"	Red Oak	Quercus rubra		21	X		X	X
290	7"	Red Oak	Quercus rubra					X	
291	17"	Red Oak	Quercus rubra		21	X		X	X
292	9"	Red Cedar	Juniperus virginiana		19	X		X	X
293	6"	Black Cherry	Prunus serotina	2				X	
294	8"	Red Oak	Quercus rubra					X	
295	8"	Shagbark Hickory	Carya ovata	2				X	
296	8"	Shagbark Hickory	Carya ovata					X	
297	7"	Shagbark Hickory	Carya ovata					X	
298	7"	Sweet Cherry	Prunus avium				X	X	
299	6"	Shagbark Hickory	Carya ovata					X	
301	6"	Black Cherry	Prunus serotina					X	
302	7"	White Mulberry	Morus alba				X	X	
303	12"	White Mulberry	Morus alba				X	X	
306	6"	White Mulberry	Morus alba				X	X	
308	9"	Red Oak	Quercus rubra					X	
313	12"	Red Oak	Quercus rubra					X	
315	12"	Pignut Hickory	Carya glabra					X	
316	7"	Shagbark Hickory	Carya ovata					X	
317	7"	Shagbark Hickory	Carya ovata					X	
318	6"	Shagbark Hickory	Carya ovata					X	
319	6"	American Elm	Ulmus americana					X	
320	9"	Shagbark Hickory	Carya ovata					X	
321	7"	Shagbark Hickory	Carya ovata					X	
322	9"	Shagbark Hickory	Carya ovata					X	
323	9"	Shagbark Hickory	Carya ovata					X	
324	6"	Shagbark Hickory	Carya ovata					X	
325	9"	Shagbark Hickory	Carya ovata					X	
326	7"	Shagbark Hickory	Carya ovata					X	
327	6"	Shagbark Hickory	Carya ovata					X	
328	6"	Shagbark Hickory	Carya ovata					X	
329	7"	Shagbark Hickory	Carya ovata					X	
330	6"	American Elm	Ulmus americana					X	
331	6"	Hawthorn	Crataegus	2				X	
332	10"	Red Cedar	Juniperus virginiana		21	X		X	X
333	6"	Red Oak	Quercus rubra					X	
335	10"	Shagbark Hickory	Carya ovata					X	
336	7"	American Elm	Ulmus americana					X	
338	24"	Red Oak	Quercus rubra		21	X		X	X
339	7"	Dogwood	Cornus	2				X	
340	7"	Swamp White Oak	Quercus bicolor					X	
341	8"	American Elm	Ulmus americana					X	
342	6"	Shagbark Hickory	Carya ovata					X	
343	6"	Shagbark Hickory	Carya ovata					X	
344	15"	Black Cherry	Prunus serotina					X	
345	9"	Black Cherry	Prunus serotina					X	
346	6"	Shagbark Hickory	Carya ovata					X	
347	7"	Shagbark Hickory	Carya ovata					X	
348	6"	Shagbark Hickory	Carya ovata					X	
349	8"	American Elm	Ulmus americana					X	
350	10"	Shagbark Hickory	Carya ovata					X	
351	12"	Shagbark Hickory	Carya ovata					X	
352	6"	Shagbark Hickory	Carya ovata					X	
353	7"	Shagbark Hickory	Carya ovata					X	
354	7"	Black Cherry	Prunus serotina					X	
355	8"	Black Cherry	Prunus serotina					X	
356	8"	Red Oak	Quercus rubra					X	
357	7"	Red Oak	Quercus rubra					X	
358	8"	Shagbark Hickory	Carya ovata					X	
359	10"	Shagbark Hickory	Carya ovata					X	
360	10"	Shagbark Hickory	Carya ovata					X	
361	7"	Shagbark Hickory	Carya ovata					X	
362	7"	Shagbark Hickory	Carya ovata					X	
363	12"	White Mulberry	Morus alba				X	X	
364	10"	Red Oak	Quercus rubra					X	
365	8"	Shagbark Hickory	Carya ovata					X	
366	6"	Shagbark Hickory	Carya ovata					X	
367	6"	Shagbark Hickory	Carya ovata					X	
368	9"	Scotch Pine	Pinus sylvestris				X	X	
369	9"	Scotch Pine	Pinus sylvestris				X	X	
370	8"	Scotch Pine	Pinus sylvestris	3			X	X	
371	12"	Scotch Pine	Pinus sylvestris				X	X	
372	7"	Scotch Pine	Pinus sylvestris				X	X	
373	8"	Scotch Pine	Pinus sylvestris				X	X	
374	13"	Scotch Pine	Pinus sylvestris				X	X	
375	11"	Scotch Pine	Pinus sylvestris				X	X	
376	11"	Scotch Pine	Pinus sylvestris				X	X	
377	6"	Scotch Pine	Pinus sylvestris				X	X	
378	11"	Scotch Pine	Pinus sylvestris				X	X	
379	8"	Scotch Pine	Pinus sylvestris				X	X	

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEM	SCORE	LM	INV	REMOVE	MITIGATE
380	6"	Scotch Pine	Pinus sylvestris				X	X	
381	7"	Scotch Pine	Pinus sylvestris				X	X	
382	8"	Scotch Pine	Pinus sylvestris				X	X	
383	8"	Scotch Pine	Pinus sylvestris				X	X	
384	7"	Scotch Pine	Pinus sylvestris				X	X	
385	7"	Scotch Pine	Pinus sylvestris				X	X	
386	17"	Scotch Pine	Pinus sylvestris				X	X	
387	8"	Scotch Pine	Pinus sylvestris				X	X	
388	7"	Scotch Pine	Pinus sylvestris				X	X	
389	9"	Scotch Pine	Pinus sylvestris				X	X	
390	11"	Shagbark Hickory	Carya ovata					X	
391	9"	Shagbark Hickory	Carya ovata					X	
392	10"	Black Cherry	Prunus serotina					X	
393	6"	Shagbark Hickory	Carya ovata					X	
394	8"	Shagbark Hickory	Carya ovata					X	X
395	8"	Shagbark Hickory	Carya ovata					X	X
396	6"	Shagbark Hickory	Carya ovata					X	
397	6"	Shagbark Hickory	Carya ovata					X	
398	9"	American Elm	Ulmus americana					X	X
399	8"	American Elm	Ulmus americana					X	X
401	7"	Shagbark Hickory	Carya ovata					X	
402	8"	Shagbark Hickory	Carya ovata					X	X
403	9"	Shagbark Hickory	Carya ovata					X	X
407	7"	Shagbark Hickory	Carya ovata					X	
408	9"	Shagbark Hickory	Carya ovata					X	X
410	7"	American Elm	Ulmus americana					X	
411	9"	Shagbark Hickory	Carya ovata					X	X
412	6"	Shagbark Hickory	Carya ovata					X	
413	10"	Shagbark Hickory	Carya ovata					X	X
414	8"	Pignut Hickory	Carya glabra					X	X
416	8"	Pignut Hickory	Carya glabra					X	X
417	9"	Pignut Hickory	Carya glabra					X	X
418	6"	Common Apple	Malus pumila					X	
419	19"	Black Cherry	Prunus serotina		14	X		X	
420	15"	Black Cherry	Prunus serotina					X	X
421	8"	Black Cherry	Prunus serotina					X	X
422	17"	Black Cherry	Prunus serotina					X	X
423	15"	American Elm	Ulmus americana					X	X
424	6"	Shagbark Hickory	Carya ovata					X	
425	6"	Shagbark Hickory	Carya ovata					X	
426	7"	Shagbark Hickory	Carya ovata					X	
427	8"	Shagbark Hickory	Carya ovata					X	X
432	7"	Shagbark Hickory	Carya ovata					X	
433	9"	Red Oak	Quercus rubra					X	X
434	9"	American Elm	Ulmus americana					X	X
435	10"	Red Oak	Quercus rubra					X	X
436	7"	Black Cherry	Prunus serotina					X	
437	8"	Shagbark Hickory	Carya ovata					X	X
438	7"	Black Cherry	Ulmus americana					X	
440	6"	Shagbark Hickory	Carya ovata					X	
441	12"	American Elm	Ulmus americana					X	X
442	6"	Shagbark Hickory	Carya ovata					X	
443	6"	Shagbark Hickory	Carya ovata					X	
444	7"	Shagbark Hickory	Carya ovata					X	
445	7"	Shagbark Hickory	Carya ovata					X	
446	8"	Shagbark Hickory	Carya ovata					X	X
447	10"	Shagbark Hickory	Carya ovata					X	X
448	10"	Shagbark Hickory	Carya ovata					X	X
449	10"	Shagbark Hickory	Carya ovata					X	X
450	10"	Shagbark Hickory	Carya ovata					X	X
451	23"	Red Oak	Quercus rubra		20	X		X	X
452	8"	Shagbark Hickory	Carya ovata					X	X
453	10"	Shagbark Hickory	Carya ovata					X	X
454	11"	Shagbark Hickory	Carya ovata					X	X
455	9"	Shagbark Hickory	Carya ovata					X	X
456	6"	Shagbark Hickory	Carya ovata					X	
457	8"	Shagbark Hickory	Carya ovata	2				X	X
458	8"	Shagbark Hickory	Carya ovata					X	X
459	8"	Shagbark Hickory	Carya ovata					X	X
460	10"	Pignut Hickory	Carya glabra					X	
461	10"	Shagbark Hickory	Carya ovata					X	
462	27"	Cottonwood	Populus deltoides			X			
463	13"	Black Willow	Salix nigra						
464	11"	Black Willow	Salix nigra						
465	13"	Scotch Pine	Pinus sylvestris						
466	11"	Red Maple	Acer rubrum						
467	40"	Cottonwood	Populus deltoides			X			
468	6"	Shagbark Hickory	Carya ovata						
469	6"	Shagbark Hickory	Carya ovata						
470	7"	Shagbark Hickory	Carya ovata						
472	9"	Black Cherry	Ulmus americana						
473	8"	Black Cherry	Ulmus americana						
474	12"	Black Cherry	Ulmus americana						
475	7"	Shagbark Hickory	Carya ovata					X	
476	6"	Shagbark Hickory	Carya ovata					X	
477	6"	Shagbark Hickory	Carya ovata					X	
478	11"	Shagbark Hickory	Carya ovata					X	
479	15"	Red Oak	Quercus rubra					X	
482	7"	Shagbark Hickory	Carya ovata					X	
483	11"	Black Cherry	Ulmus americana	2				X	
486	10"	Shagbark Hickory	Carya ovata					X	
487	6"	American Elm	Ulmus americana					X	
488	20"	Red Oak	Quercus rubra		20	X		X	X
489	21"	Red Oak	Quercus rubra			X		X	X
490	7"	American Elm	Ulmus americana					X	
491	8"	Shagbark Hickory	Carya ovata					X	
492	7"	Shagbark Hickory	Carya ovata					X	
493	7"	White Mulberry	Morus alba				X	X	
494	8"	Shagbark Hickory	Carya ovata					X	
495	6"	Shagbark Hickory	Carya ovata					X	
496	6"	Shagbark Hickory	Carya ovata					X	
497	8"	Red Oak	Quercus rubra					X	
498	13"	Red Oak	Quercus rubra					X	
499	10"	Red Oak	Quercus rubra	2					
500	6"	Shagbark Hickory	Carya ovata						
501	7"	Shagbark Hickory	Carya ovata						
502	9"	Linden	Tilia americana						
503	10"	American Elm	Ulmus americana						
504	8"	Cottonwood	Populus deltoides						
505	16"	Cottonwood	Populus deltoides						
506	10"	Shagbark Hickory	Carya ovata						
507	8"	Common Apple	Malus pumila						
508	9"	Red Oak	Quercus rubra						
509	6"	Shagbark Hickory	Carya ovata						
510	8"	Red Oak	Quercus rubra						
511	7"	Red Oak	Quercus rubra						
512	7"	Black Walnut	Juglans nigra	2					
513	7"	Black Cherry	Prunus serotina						
514	8"	Black Cherry	Prunus serotina	2					
515	16"	Cottonwood	Populus deltoides						

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEM	SCORE	LM	INV	REMOVE	MITIGATE
516	14"	Cottonwood	Populus deltoides	2					
517	16"	Cottonwood	Populus deltoides	2					
518	14"	Cottonwood	Populus deltoides						
519	12"	Cottonwood	Populus deltoides						
520	9"	Cottonwood	Populus deltoides						
521	16"	Cottonwood	Populus deltoides						
522	11"	White Oak	Quercus alba						
523	33"	White Oak	Quercus alba		21	X		X	X
525	18"	Red Oak	Quercus rubra			X			
526	6"	Black Cherry	Prunus serotina						
527	10"	Black Cherry	Prunus serotina						
528	8"	Shagbark Hickory	Carya ovata						
529	7"	Shagbark Hickory	Carya ovata						
530	10"	Black Cherry	Prunus serotina						
531	21"	Red Oak	Quercus rubra	2		X			
532	11"	Shagbark Hickory	Carya ovata						
533	7"	Black Walnut	Juglans nigra						
534	9"	Red Oak	Quercus rubra						
535	25"	Red Oak	Quercus rubra			X			
536	10"	American Elm	Ulmus americana						
537	7"	Black Walnut	Juglans nigra						
538	6"	Linden	Tilia americana						
539	8"	American Elm	Ulmus americana						
540	6"	Hop-Hornbeam	Ostrya virginia	2					
541	15"	Black Walnut	Juglans nigra						
542	7"	Black Walnut	Juglans nigra						
543	6"	American Elm	Ulmus americana						
544	13"	Black Walnut	Juglans nigra						
545	9"	Hop-Hornbeam	Ostrya virginia			X			
546	18"	White Oak	Quercus alba			X			
547	10"	Linden	Tilia americana						
548	11"	American Elm	Ulmus americana						
549	8"	Pin Oak	Quercus palustris						
550	10"	Red Oak	Quercus rubra						
551	6"	American Elm	Ulmus americana						
552	16"	Black Cherry	Prunus serotina					X	
553	17"	Black Cherry	Prunus serotina					X	
554	6"	Red Oak	Quercus rubra					X	
555	11"	Red Oak	Quercus rubra					X	
556	12"	Red Oak	Quercus rubra					X	
557	22"	Red Oak	Quercus rubra		21	X		X	X
558	21"	Black Cherry	Prunus serotina		17	X		X	X
559	18"	Red Oak	Quercus rubra		21	X		X	X
560	16"	Red Oak	Quercus rubra		16	X		X	X
561	6"	American Elm	Ulmus americana					X	
562	7"	American Elm	Ulmus americana					X	
563	6"	Linden	Tilia americana					X	
564	6"	Linden	Tilia americana					X	
565	7"	White Mulberry	Morus alba				X	X	
567	6"	Red Oak	Quercus rubra					X	
568	7"	Red Oak	Quercus rubra						
569	12"	Black Walnut	Juglans nigra					X	
570	7"	American Elm	Ulmus americana					X	
571	15"	Red Maple	Acer rubrum					X	
572	11"	American Elm	Ulmus americana						
573	14"	Red Maple	Acer rubrum						
574	12"	American Elm	Ulmus americana						
575	7"	American Elm	Ulmus americana						
576	7"	Red Oak	Quercus rubra					X	
577	16"	Red Oak	Quercus rubra		18	X		X	X
578	7"	Black Cherry	Prunus serotina					X	
579	12"	Red Oak	Quercus rubra					X	
580	7"	Shagbark Hickory	Carya ovata					X	
581	6"	Linden	Tilia americana					X	
582	17"	Red Oak	Quercus rubra		19	X		X	X
583	7"	Black Cherry	Prunus serotina					X	
584	10"	Black Walnut	Juglans nigra					X	
585	27"	Red Oak	Quercus rubra			X			
586	6"	Shagbark Hickory	Carya ovata						
588	8"	Shagbark Hickory	Carya ovata					X	
589	10"	American Elm	Ulmus americana					X	
590	9"	Red Oak	Quercus rubra						
591	9"	American Elm	Ulmus americana						
592	10"	White Mulberry	Morus alba				X		
593	7"	American Elm	Ulmus americana						
594	6"	American Elm	Ulmus americana						
595	8"	Hawthorn	Crataegus						
596	12"	Red Maple	Acer rubrum						
597	8"	Sassafras	Sassafras albidum						
599	8"	Red Maple	Acer rubrum						
600	12"	Red Maple	Acer rubrum						
607	13"	Red Oak	Quercus rubra						
613	13"	Red Oak	Quercus rubra						
614	20"	Red Oak	Quercus rubra			X			
630	41"	Red Oak	Quercus rubra			X			
638	22"	Red Oak	Quercus rubra		21	X		X	X
639	35"	Red Oak	Quercus rubra		18	X			
641	36"	White Oak	Quercus alba		20	X			
642	29"	Red Oak	Quercus rubra			X			
644	27"	Red Oak	Quercus rubra			X			
645	28"	Red Oak	Quercus rubra			X			
646	21"	Red Oak	Quercus rubra			X			
647	34"	Red Oak	Quercus rubra			X			
648	27"	Red Oak	Quercus rubra			X			
651	22"	Red Oak	Quercus rubra			X			
652	19"	Red Oak	Quercus rubra			X			
653	23"	Red Oak	Quercus rubra			X			
654	20"	Red Oak	Quercus rubra			X			
655	25"	Red Oak	Quercus rubra			X			
656	24"	Red Oak	Quercus rubra			X			
662	16"	Black Walnut	Juglans nigra						
665	22"	Black Walnut	Juglans nigra		19	X			
669	21"	Red Oak	Quercus rubra		20	X		X	X
685	6"	Box Elder	Acre negundo					X	
686	11"	Box Elder	Acre negundo	2				X	
688	8"	Box Elder	Acre negundo					X	
692	7"	Box Elder	Acre negundo					X	
693	6"	Box Elder	Acre negundo					X	
701	8"	White Mulberry	Morus alba	2			X	X	
702	6"	White Spruce	Picea glauca						
704	12"	Bigtooth Aspen	Populus grandidentata						
706	17"	American Elm	Ulmus americana						
707	15"	American Elm	Ulmus americana						
709	26"	Norway Spruce	Picea abies						
710	10"	Box Elder	Acre negundo					X	
712	9"	Box Elder	Acre negundo					X	
713	8"	Box Elder	Acre negundo					X	
714	7"	Box Elder	Acre negundo					X	
715	8"	Box Elder	Acre negundo					X	
716	7"	Box Elder	Acre negundo					X	

LM = LANDMARK TREE
INV = INVASIVE
SCORE: LM WITH SCORE OF ≥ 16 REQUIRES MITIGATION

*NOTE:
THE TREE INVENTORY WAS UPDATED IN THE FIELD IN APRIL 2017.

TREE REMOVAL AND MITIGATION NOTES

1. WOODLAND TREE REMOVALS
   44 trees / 428 caliper inches removed
   (does not include Landmark Trees)
2. LANDMARK TREE REMOVALS
   34 trees removed / 627 caliper inches
3. TOTAL REGULATED TREE REMOVALS
   78 trees / 1,055 caliper inches
4. TREE MITIGATION
   1,055 cal. inches x 0.50 mitigation = 527.5 caliper inches mitigation required;
   225 trees / 528.5 caliper inches provided

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201 MAIN STREET, SUITE 1000
LAFAYETTE, INDIANA 47901
ATTN: DAMIAN VANMATRE
(765) 807-2713

COTTAGES AT BARTON GREEN

SITE PLAN
TREE INDEX

6

JOB No. 16223

DATE: 5/25/17
SHEET 6 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223EX2.dwg
FB#460

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	7/12/17
REV. PER COUNTY	8/16/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REVISED PER AGREEMENT	6/7/19

M:\Civil3d_Proj\16223\Site Plan\16223EX2.dwg, 6/20/2019 1:24 PM, Jim Ahnert, None
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TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEM	SCORE	LM	INV	REMOVE	MITIGATE
717	7"	Box Elder	Acre negundo					X	
718	9"	Box Elder	Acre negundo					X	
719	10"	Box Elder	Acre negundo					X	
720	15"	Box Elder	Acre negundo						
721	13"	Box Elder	Acre negundo						
722	8"	Box Elder	Acre negundo						
723	7"	Box Elder	Acre negundo						
726	13"	Box Elder	Acre negundo						
727	7"	Box Elder	Acre negundo						
728	8"	Box Elder	Acre negundo						
729	7"	Box Elder	Acre negundo						
730	7"	Box Elder	Acre negundo						
731	9"	Box Elder	Acre negundo					X	
732	8"	Box Elder	Acre negundo					X	
736	6"	Box Elder	Acre negundo					X	
742	6"	Box Elder	Acre negundo						
743	6"	Box Elder	Acre negundo						
744	6"	Box Elder	Acre negundo						
745	9"	Box Elder	Acre negundo						
748	9"	Box Elder	Acre negundo					X	
749	8"	Box Elder	Acre negundo						
750	6"	Box Elder	Acre negundo						
751	8"	Box Elder	Acre negundo						
752	7"	Box Elder	Acre negundo						
753	7"	Box Elder	Acre negundo						
754	12"	Box Elder	Acre negundo						
755	17"	Red Oak	Quercus rubra			X			
756	26"	Red Oak	Quercus rubra			X			
757	16"	Red Oak	Quercus rubra			X			
758	18"	Red Oak	Quercus rubra	2		X			
761	22"	Red Oak	Quercus rubra			X			
762	27"	Red Oak	Quercus rubra			X			
763	24"	Red Oak	Quercus rubra			X			
764	20"	Red Oak	Quercus rubra			X			
765	20"	Red Oak	Quercus rubra			X			
766	10"	Black Cherry	Prunus serotina						
767	7"	Red Maple	Acer rubrum						
768	9"	Red Maple	Acer rubrum						
769	12"	American Elm	Ulmus americana						
770	9"	American Elm	Ulmus americana						
787	14"	Red Oak	Quercus rubra						
794	22"	Red Oak	Quercus rubra			X			
795	22"	Red Oak	Quercus rubra			X			
796	28"	Red Oak	Quercus rubra			X			
797	25"	Bur Oak	Quercus macrocarpa		19	X			
805	27"	Red Oak	Quercus rubra			X			
808	15"	Red Oak	Quercus rubra						
809	16"	White Ash	Fraxinus americana		dead			X	
817	14"	Pignut Hickory	Carya glabra		dead				
813	21"	Red Oak	Quercus rubra		18	X			
824	23"	Red Oak	Quercus rubra		21	X			
828	13"	Black Cherry	Prunus serotina						
829	7"	Red Maple	Acer rubrum						
830	15"	Black Cherry	Prunus serotina						
831	6"	American Elm	Ulmus americana						
832	7"	Shagbark Hickory	Carya ovata						
833	8"	American Elm	Ulmus americana						
834	8"	Red Oak	Quercus rubra						
835	10"	Black Cherry	Prunus serotina	2					
836	14"	Black Cherry	Prunus serotina	2	15	X			
837	8"	Black Walnut	Juglans nigra						
838	14"	Black Cherry	Prunus serotina						
840	19"	Black Cherry	Prunus serotina		20	X			
849	29"	Red Oak	Quercus rubra		21	X			
850	7"	Shagbark Hickory	Carya ovata						
851	13"	Shagbark Hickory	Carya ovata	2	18	X			
853	8"	Shagbark Hickory	Carya ovata						
854	8"	Shagbark Hickory	Carya ovata						
855	13"	Black Cherry	Prunus serotina						
856	10"	Black Cherry	Prunus serotina						
857	9"	American Elm	Ulmus americana						
858	6"	Shagbark Hickory	Carya ovata						
859	9"	Black Cherry	Prunus serotina						
860	8"	Shagbark Hickory	Carya ovata						
861	7"	Shagbark Hickory	Carya ovata						
862	9"	Shagbark Hickory	Carya ovata						
863	10"	Black Cherry	Prunus serotina						
864	9"	Shagbark Hickory	Carya ovata						
868	23"	Red Oak	Quercus rubra		19	X			
875	9"	Shagbark Hickory	Carya ovata						
876	8"	Shagbark Hickory	Carya ovata						
877	7"	Shagbark Hickory	Carya ovata						
878	15"	Red Oak	Quercus rubra						
879	7"	Shagbark Hickory	Carya ovata						
880	7"	Shagbark Hickory	Carya ovata						
881	8"	Shagbark Hickory	Carya ovata						
882	8"	Shagbark Hickory	Carya ovata						
883	8"	Shagbark Hickory	Carya ovata						
884	7"	Shagbark Hickory	Carya ovata						
885	10"	Shagbark Hickory	Carya ovata						
886	9"	American Elm	Ulmus americana						
887	6"	Red Maple	Acer rubrum						
888	8"	American Elm	Ulmus americana						
889	9"	American Elm	Ulmus americana						
890	6"	Red Maple	Acer rubrum						
891	17"	Red Oak	Quercus rubra			X			
892	6"	Shagbark Hickory	Carya ovata						
893	7"	Shagbark Hickory	Carya ovata						
894	7"	Shagbark Hickory	Carya ovata						
895	8"	Shagbark Hickory	Carya ovata						
904	16"	Black Cherry	Prunus serotina						
916	12"	Black Cherry	Prunus serotina	2					
919	15"	Red Maple	Acer rubrum						
921	15"	Black Walnut	Juglans nigra						
923	18"	Black Walnut	Juglans nigra			X			
924	19"	Black Walnut	Juglans nigra			X			
927	8"	American Elm	Ulmus americana						
928	8"	Black Walnut	Juglans nigra						
929	7"	Black Walnut	Juglans nigra						
930	6"	Northern Hackberry	Celtis occidentalis						
931	9"	American Elm	Ulmus americana	2					
932	16"	Black Walnut	Juglans nigra						
938	12"	Northern Hackberry	Celtis occidentalis						
939	17"	Black Walnut	Juglans nigra						
940	7"	Red Maple	Acer rubrum						
941	12"	Black Walnut	Juglans nigra						
942	17"	Black Walnut	Juglans nigra						
943	15"	Black Walnut	Juglans nigra						
947	19"	Black Walnut	Juglans nigra			X			
948	12"	American Elm	Ulmus americana						

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEM	SCORE	LM	INV	REMOVE	MITIGATE
949	14"	Linden	Tilia americana						
950	20"	Northern Hackberry	Celtis occidentalis			X			
951	8"	Northern Hackberry	Celtis occidentalis						
952	7"	American Elm	Ulmus americana						
953	19"	American Elm	Ulmus americana			X			
954	14"	Black Cherry	Prunus serotina						
955	10"	Black Cherry	Prunus serotina						
956	12"	Black Walnut	Juglans nigra						
957	6"	Northern Hackberry	Celtis occidentalis						
958	8"	Black Cherry	Prunus serotina						
959	7"	Red Maple	Acer rubrum						
960	10"	Red Maple	Acer rubrum						
961	15"	Black Walnut	Juglans nigra						
962	9"	Red Oak	Quercus rubra						
963	12"	Red Oak	Quercus rubra						
964	10"	Black Cherry	Prunus serotina						
965	13"	Red Maple	Acer rubrum						
966	16"	Black Cherry	Prunus serotina						
967	8"	Black Walnut	Juglans nigra						
970	9"	Black Cherry	Prunus serotina						
971	9"	Norway Maple	Acer platanoides			X		X	
974	8"	Northern Hackberry	Celtis occidentalis						
975	13"	American Elm	Ulmus americana						
976	19"	Linden	Tilia americana			X			
977	12"	American Elm	Ulmus americana						
978	12"	American Elm	Ulmus americana					X	
979	9"	Norway Maple	Acer platanoides			X		X	
980	15"	Black Walnut	Prunus serotina					X	
981	14"	Black Walnut	Prunus serotina						
982	12"	Black Walnut	Juglans nigra					X	
984	8"	Black Walnut	Juglans nigra						
986	7"	Box Elder	Acre negundo						
987	11"	Black Walnut	Juglans nigra					X	
989	13"	Black Walnut	Juglans nigra						
990	20"	Black Walnut	Juglans nigra			X			
991	8"	Black Walnut	Juglans nigra						
992	16"	Black Walnut	Juglans nigra						
994	19"	Linden	Tilia americana			X			
995	14"	Black Walnut	Juglans nigra						
996	17"	Black Walnut	Juglans nigra						
997	13"	American Elm	Ulmus americana						
998	6"	Norway Maple	Acer platanoides			X			
999	33"	Black Walnut	Juglans nigra			X			
1000	43"	Sugar Maple	Acer saccharum			X			
1001	10"	American Elm	Ulmus americana						
1002	15"	American Elm	Ulmus americana						
1003	8"	Northern Hackberry	Celtis occidentalis						
1004	32"	Black Walnut	Juglans nigra			X			
1007	7"	Red Maple	Acer rubrum						
1008	8"	Tree-of-Heaven	Ailanthus altissima				X		
1009	18"	Black Walnut	Juglans nigra			X			
1010	21"	Black Walnut	Juglans nigra			X			
1011	12"	American Elm	Ulmus americana						
1012	22"	Black Walnut	Juglans nigra			X			
1013	14"	White Mulberry	Morus alba				X		
1014	43"	Black Walnut	Juglans nigra			X			
1015	7"	Red Maple	Acer rubrum						
1016	9"	Red Maple	Acer rubrum						
1017	9"	Red Maple	Acer rubrum						
1018	9"	Red Maple	Acer rubrum						
1019	9"	Red Maple	Acer rubrum						
1020	22"	American Elm	Ulmus americana			X			
1021	7"	American Elm	Ulmus americana						
1022	37"	Cottonwood	Populus deltoides			X			
1023	9"	American Elm	Ulmus americana						
1024	10"	American Elm	Ulmus americana						
1025	29"	Cottonwood	Populus deltoides			X			
1026	20"	Cottonwood	Populus deltoides						
1027	7"	American Elm	Ulmus americana						
1028	8"	American Elm	Ulmus americana						
1029	17"	Black Walnut	Juglans nigra						
1030	9"	Black Cherry	Prunus serotina						
1031	6"	American Elm	Ulmus americana						
1032	12"	American Elm	Ulmus americana						
1033	22"	Cottonwood	Populus deltoides						
1034	14"	Cottonwood	Populus deltoides						
1035	20"	Cottonwood	Populus deltoides						
1036	9"	American Elm	Ulmus americana						
1037	26"	Cottonwood	Populus deltoides			X			
1038	6"	Red Maple	Acer rubrum						
1039	10"	American Elm	Ulmus americana						
1040	8"	American Elm	Ulmus americana						
1041	7"	American Elm	Ulmus americana						
1042	10"	Tree-of-Heaven	Ailanthus altissima				X		
1043	6"	Tree-of-Heaven	Ailanthus altissima				X		
1044	8"	American Elm	Ulmus americana						
1046	11"	Cottonwood	Populus deltoides						
1047	7"	American Elm	Ulmus americana						
1048	10"	Black Walnut	Juglans nigra						
1049	6"	American Elm	Ulmus americana						
1050	7"	American Elm, twin	Ulmus americana	2					
1051	8"	American Elm	Ulmus americana						
1052	8"	American Elm	Ulmus americana						
1612	10"	Shagbark Hickory	Carya ovata					X	
1614	12"	Black Cherry	Prunus serotina					X	
1615	14"	Black Cherry	Prunus serotina					X	
1616	17"	Black Cherry	Prunus serotina					X	
1617	21"	Catalpa	Catalpa speciosa				X	X	
1618	11"	Shagbark Hickory	Carya ovata					X	
1619	14"	Black Cherry	Prunus serotina					X	
1620	10"	American Elm	Ulmus americana					X	
1622	8"	Red Oak	Quercus rubra					X	
1623	10"	Shagbark Hickory	Carya ovata					X	
1624	9"	Shagbark Hickory	Carya ovata					X	
1625	8"	Shagbark Hickory	Carya ovata					X	
1626	12"	Shagbark Hickory	Carya ovata	2	21	X		X	X
1627	10"	Shagbark Hickory	Carya ovata					X	
1628	12"	Shagbark Hickory	Carya ovata					X	
1629	13"	American Elm	Ulmus americana					X	
1633	9"	Red Maple	Acer rubrum					X	
1635	11"	Red Oak	Quercus rubra					X	
1636	9"	Red Oak	Quercus rubra					X	
1637	11"	Red Oak	Quercus rubra					X	
1638	20"	Red Oak	Quercus rubra		21	X		X	X
1639	13"	American Elm	Ulmus americana					X	
1643	16"	Black Cherry	Prunus serotina					X	
1644	15"	Black Cherry	Prunus serotina	2				X	
1645	25"	Black Cherry	Prunus serotina		19	X		X	X
1646	15"	Black Cherry	Prunus serotina					X	
1647	26"	Black Cherry	Prunus serotina		15	X		X	

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEM	SCORE	LM	INV	REMOVE	MITIGATE
1648	18"	Silver Maple	Acre saccharinum					X	
1649	16"	Black Cherry	Prunus serotina					X	
1653	14"	Black Cherry	Prunus serotina					X	
1654	14"	Black Cherry	Prunus serotina	2	17	X		X	X
1655	14"	Red Oak	Quercus rubra					X	
1666	19"	Red Oak	Quercus rubra		20	X		X	X
1667	22"	Red Oak	Quercus rubra		20	X		X	X
1668	23"	Red Oak	Quercus rubra		21	X		X	X
1669	17"	Red Oak	Quercus rubra	2	20	X		X	X
1670	16"	Black Cherry	Prunus serotina	2	18	X		X	X
1672	24"	Black Willow	Salix nigra		14	X		X	
1674	14"	White Mulberry	Morus alba	2			X	X	
1675	18"	Black Cherry	Prunus serotina	2	13	X		X	
1676	14"	Black Cherry	Prunus serotina	2					
1678	15"	Box Elder	Acre negundo	2		X			
1680	33"	Silver Maple	Acre saccharinum		18	X		X	X
1681	16"	Black Cherry	Prunus serotina	2	20	X		X	X
NS440	25"	Shagbark Hickory	Carya ovata			X			
NS483	18"	Pignut Hickory	Carya glabra		21	X		X	
NS484	21"	Pignut Hickory	Carya glabra		21	X		X	
NS788	12"	Shagbark Hickory	Carya ovata						
NS791	25"	Red Oak	Quercus rubra		21	X			
NS793	10"	Black Cherry	Prunus serotina					X	X
NS798	16"	Black Cherry	Prunus serotina						
NS800	11"	Black Cherry	Prunus serotina						
NS801	13"	Red Oak	Quercus rubra						
NS802	10"	Pignut Hickory	Carya glabra						
NS804	11"	Red Oak	Quercus rubra						
NS805	16"	Red Oak	Quercus rubra		21	X			
NS806	16"	Red Oak	Quercus rubra		21	X			
NS807	17"	Red Oak	Quercus rubra		21	X			
NS812	10"	White Ash	Fraxinus americana		dead			X	
NS815	10"	Green Ash	Fraxinus pennsylvanica		dead			X	
NS816	13"	Pignut Hickory	Carya glabra					X	
NS819	12"	Pin Oak	Quercus palustris					X	

LM = LANDMARK TREE
INV = INVASIVE
SCORE: LM WITH SCORE OF ≥ 16
REQUIRES MITIGATION

*NOTE:
THE TREE INVENTORY WAS UPDATED IN THE FIELD IN APRIL 2017.

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COTTAGES AT BARTON GREEN

SITE PLAN
TREE INDEX

7

JOB No. 16223

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	7/7/17
REV. PER COUNTY	8/16/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17

DATE: 5/25/17
SHEET 7 OF 49
CADD: DAG, WAJ
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PM: SWB
TECH:
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SEE SHEET 9

PROPOSED LIMITS OF DISTURBANCE

SILT FENCE

STEEP SLOPE >20%

2.0%

WawabD

MdA

WawabB

+HIGH POINT

PUBLIC ROAD LINK

WETLAND 'A' AS LOCATED IN FIELD

C/L PONTIAC TRAIL (66.00' WIDE)

EX. BITUMINOUS

454.25'

S04°47'06"W

EX. BLDG

EX. GRAVEL DR.

VEHICULAR & PEDESTRIAN ACCESS TO PONTIAC TRAIL; PONTIAC TRAIL HALF RIGHT-OF-WAY TO EXPAND FROM 33' TO 50'

TREE PROTECTION FENCE

S87°50'56"W 290.74'

S02°09'04"E 212.25'

PROPOSED GRADING EASEMENT

EX. BLDG. 2511 PONTIAC TRAIL

APPROX. LOC. DRAIN FIELD

PROPOSED LIMITS OF DISTURBANCE

1.83 ACRES

213.82'

S87°50'56"W 33.12'

S02°39'56"W 53.69'

N87°20'04"W 131.22'

N02°09'04"W 97.77'

HURON HIGHLANDS SUBDIVISION

EX. HOUSE

ELEC. MH. RIM=918.19 T/LINES N&S=913.9±

SCALE: 1" = 40'

0 40 80 120

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

LEGEND

838	EXIST. CONTOUR
U.P.	EXIST. UTILITY POLE
GP	EXIST. GUY POLE
	GUY WIRE
	ELEC. TRANSFORMER
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
t	EXIST. TELEPHONE LINE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
g	EXIST. GAS VALVE
w	EXIST. WATER MAIN
	EXIST. HYDRANT
	EXIST. GATE VALVE IN BOX
	EXIST. GATE VALVE IN WELL
	EXIST. CURB STOP & BOX
r	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	EXIST. BEEHIVE INLET
	END SECTION
	CULVERT
s	EXIST. SANITARY SEWER
	EXIST. CLEANOUT
	C/L OF DITCH
	DRAINAGE DIRECTION
P	SIGN
MBX	MAILBOX
T	TELEPHONE RISER
CATV	CABLE TELEVISION RISER
E	ELECTRIC METER
W	WATER METER
G	GAS METER
	POST
W	WELL
	FENCE
	GUARDRAIL
	SINGLE TREE
	SINGLE TREE
	TREE OR BRUSH LIMIT
B	EXIST. BOULDER
	SECTION CORNER
S	SET IRON PIPE
F	FOUND IRON PIPE
S	SET MONUMENT
F	FOUND MONUMENT
SIR	SET IRON ROD
FIR	FOUND IRON ROD
	SOIL TYPE BOUNDARY
	STEEP SLOPES
	PROP. SILT FENCE
	PROP. TREE PROTECTION FENCE
	LIMITS OF DISTURBANCE

NATURAL FEATURES PROTECTION PLAN

1. The limits of disturbance will be defined with silt fence and construction fence as shown on the Site Analysis and Natural Features Protection Plans and the Grading and Soil Erosion Control Plans.
2. Wetland areas to remain will be protected with silt fence and/or construction fence as shown on the plans.
3. Trees to remain will be protected with construction fence as shown on the plans.

SOIL TYPE LEGEND

BnB	BOYER LOAMY SAND, 0 TO 6 PERCENT SLOPES
FoC	FOX SANDY LOAM, 6 TO 12 PERCENT SLOPES
FoD	FOX SANDY LOAM, 12 TO 18 PERCENT SLOPES
MdA	MATHERTON SANDY LOAM, 0 TO 4 PERCENT SLOPES
WawabB	WAWASEE LOAM, 2 TO 6 PERCENT SLOPES
WawabD	WAWASEE LOAM, 6 TO 12 PERCENT SLOPES

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.

SEE SHEET 10 FOR WOODLAND AND WETLAND ANALYSIS DESCRIPTIONS

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COTTAGES AT BARTON GREEN

SITE PLAN

SITE ANALYSIS AND NATURAL FEATURES PROTECTION PLAN (EAST)

8

DATE: 5/25/17
SHEET 8 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
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JOB No. 16223

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	7/7/17
REV. PER CITY/COUNTY	8/16/17
REV. PER CITY	11/15/17

16P460

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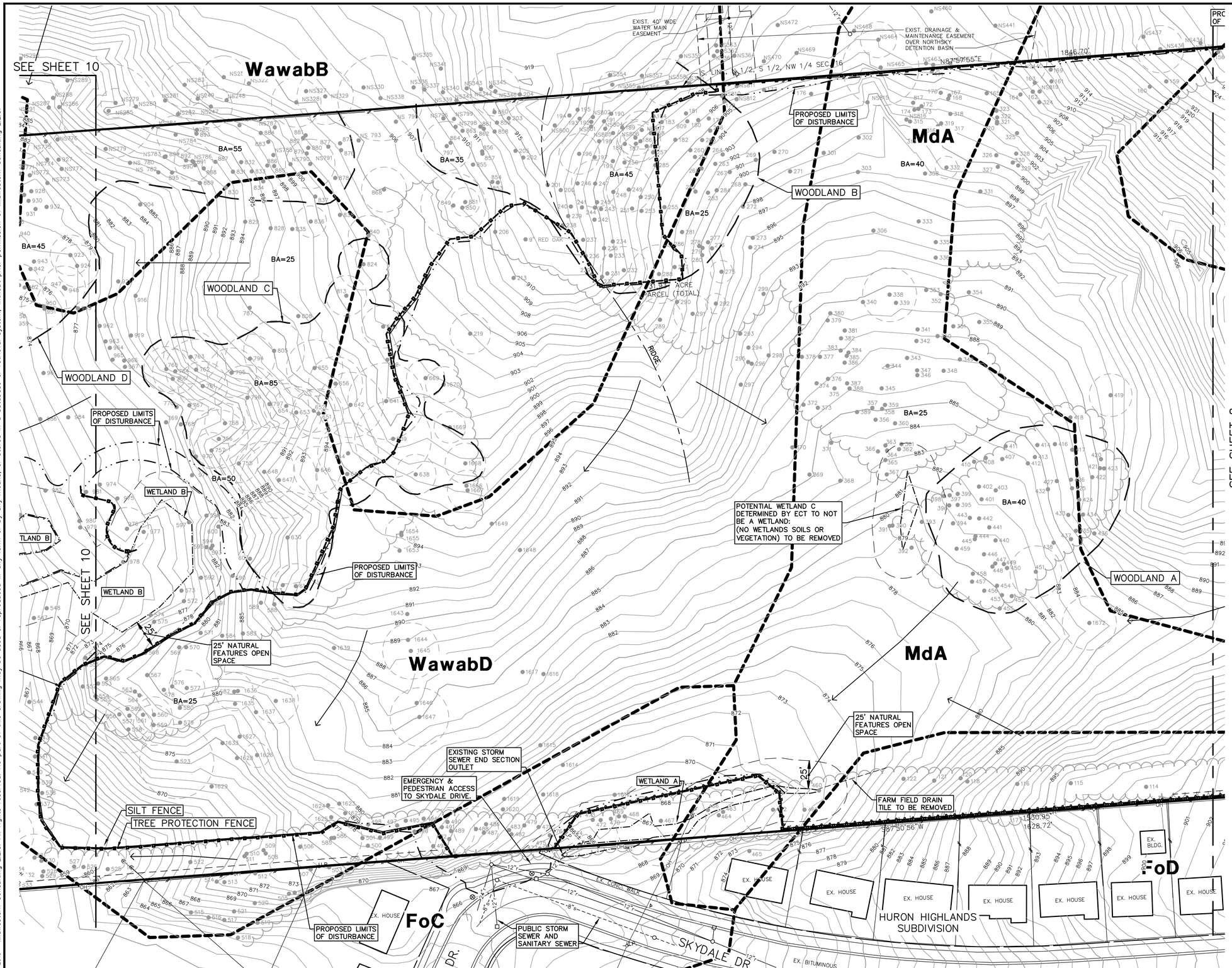

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground 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.

SEE SHEET 10 FOR WOODLAND AND WETLAND ANALYSIS DESCRIPTIONS

SCALE: 1" = 40'

0 40 80 120

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

LEGEND

- EXIST. CONTOUR
- EXIST. UTILITY POLE
- EXIST. GUY POLE
- GUY WIRE
- ELEC. TRANSFORMER
- EXIST. OVERHEAD UTILITY LINE
- EXIST. LIGHT POLE
- EXIST. TELEPHONE LINE
- EXIST. ELECTRIC LINE
- EXIST. GAS LINE
- EXIST. GAS VALVE
- EXIST. WATER MAIN
- EXIST. HYDRANT
- EXIST. GATE VALVE IN BOX
- EXIST. GATE VALVE IN WELL
- EXIST. CURB STOP & BOX
- EXIST. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- EXIST. BEEHIVE INLET
- END SECTION
- CULVERT
- EXIST. SANITARY SEWER
- EXIST. CLEANOUT
- C/L OF DITCH
- DRAINAGE DIRECTION
- SIGN
- MAILBOX
- TELEPHONE RISER
- CABLE TELEVISION RISER
- ELECTRIC METER
- WATER METER
- GAS METER
- POST
- WELL
- FENCE
- GUARDRAIL
- SINGLE TREE
- SINGLE TREE
- TREE OR BRUSH LIMIT
- EXIST. BOULDER
- SECTION CORNER
- SET IRON PIPE
- FOUND IRON PIPE
- SET MONUMENT
- FOUND MONUMENT
- SET IRON ROD
- FOUND IRON ROD
- SOIL TYPE BOUNDARY
- STEEP SLOPES
- PROP. SILT FENCE
- PROP. TREE PROTECTION FENCE
- LIMITS OF DISTURBANCE

SOIL TYPE LEGEND

BnB	BOYER LOAMY SAND, 0 TO 6 PERCENT SLOPES
FoC	FOX SANDY LOAM, 6 TO 12 PERCENT SLOPES
FoD	FOX SANDY LOAM, 12 TO 18 PERCENT SLOPES
MdA	MATHERTON SANDY LOAM, 0 TO 4 PERCENT SLOPES
WawabB	WAWASEE LOAM, 2 TO 6 PERCENT SLOPES
WawabD	WAWASEE LOAM, 6 TO 12 PERCENT SLOPES

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COTTAGES AT BARTON GREEN

SITE PLAN

SITE ANALYSIS AND NATURAL FEATURES PROTECTION PLAN (CENTER)

9

JOB No. 16223

DATE: 5/25/17
SHEET 9 OF 49
CADD: DWG, WAJ
ENG: JCA
PM: SWB
TECH:
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REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	8/16/17
REV. PER CITY/COUNTY	11/15/17
REV. PER CITY	

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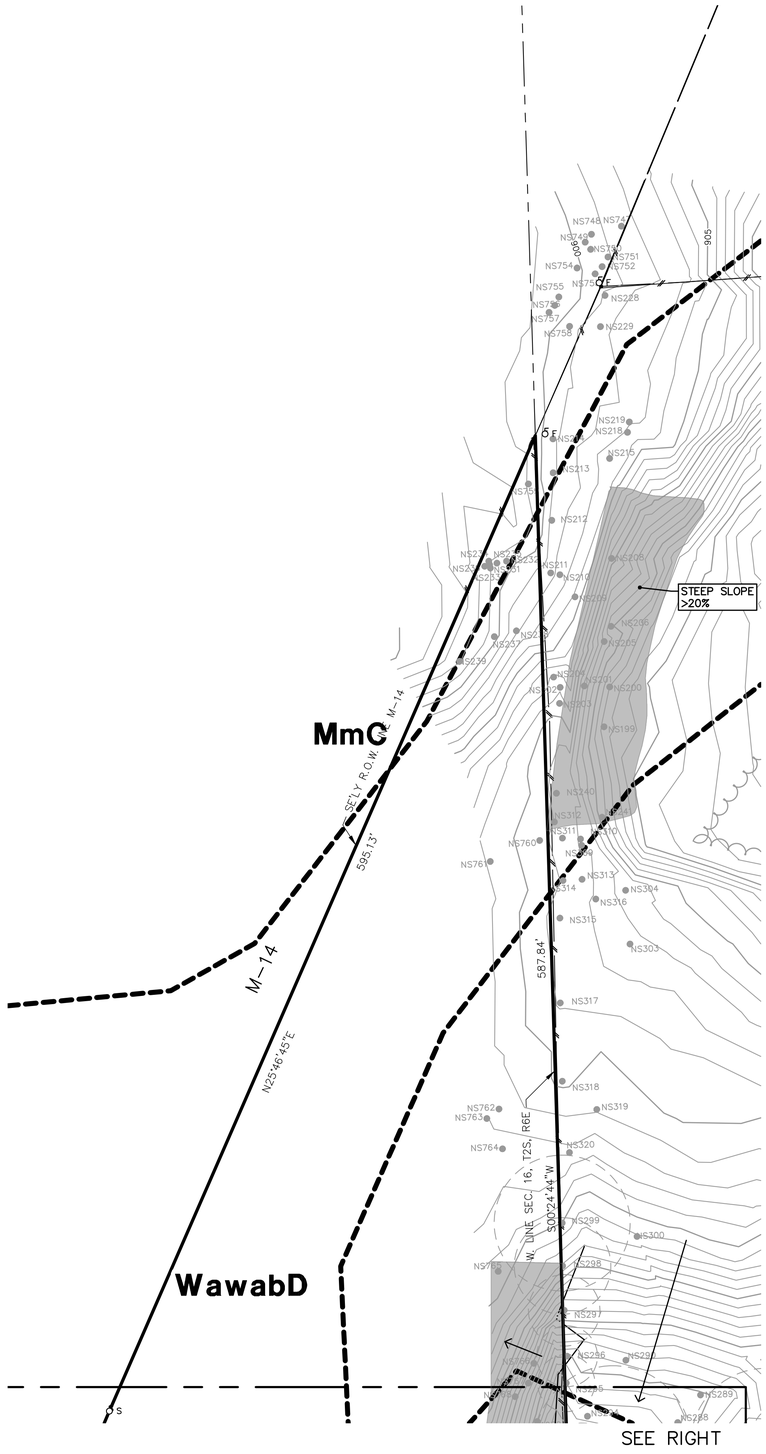

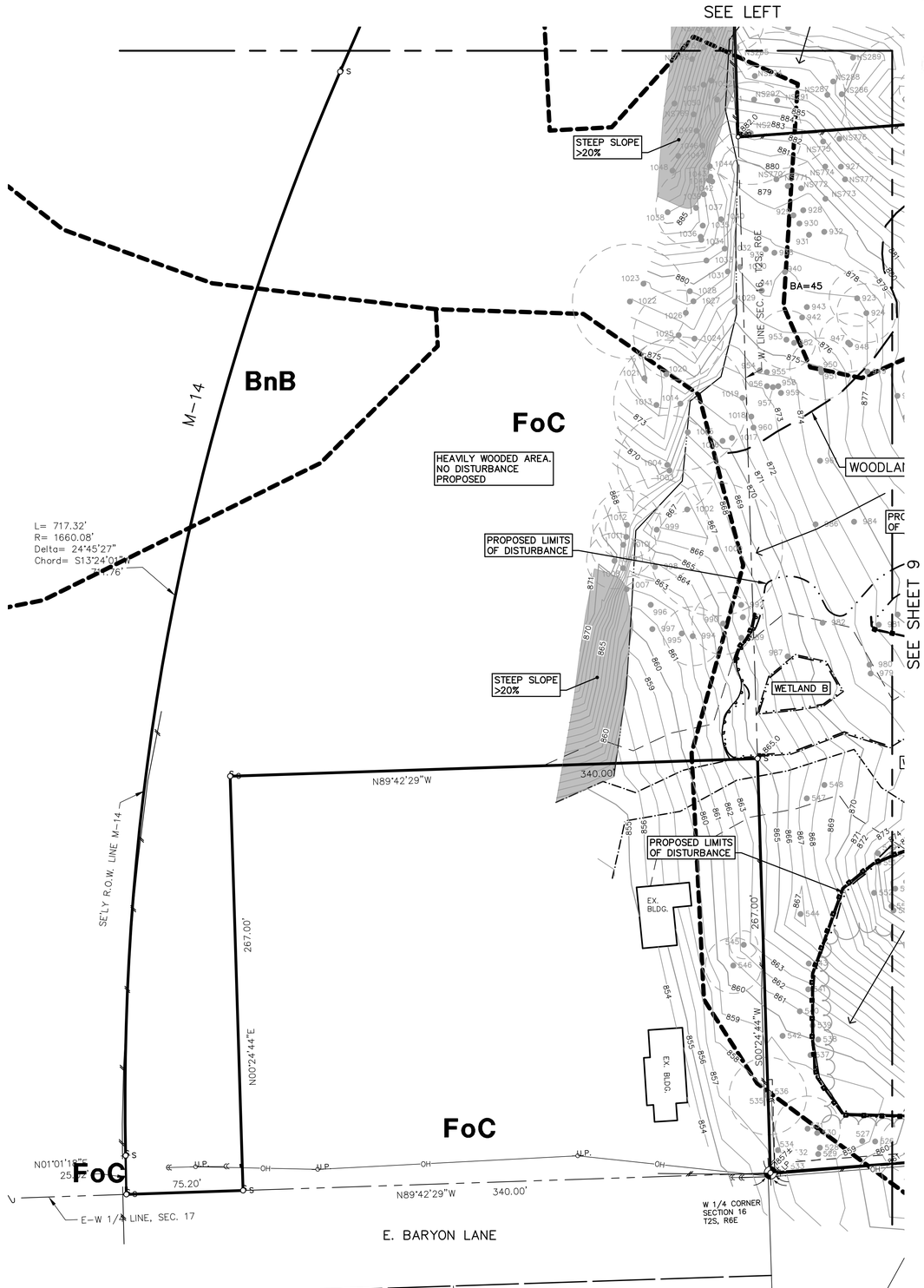

811 Know what's below. Call before you dig.

SCALE: 1" = 40'

0 40 80 120

LEGEND

- EXIST. CONTOUR
- EXIST. UTILITY POLE
- EXIST. GUY POLE
- GUY WIRE
- ELEC. TRANSFORMER
- EXIST. OVERHEAD UTILITY LINE
- EXIST. LIGHT POLE
- EXIST. TELEPHONE LINE
- EXIST. ELECTRIC LINE
- EXIST. GAS LINE
- EXIST. GAS VALVE
- EXIST. WATER MAIN
- EXIST. HYDRANT
- EXIST. GATE VALVE IN BOX
- EXIST. GATE VALVE IN WELL
- EXIST. CURB STOP & BOX
- EXIST. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- EXIST. BEEHIVE INLET
- END SECTION
- CULVERT
- EXIST. SANITARY SEWER
- EXIST. CLEANOUT
- C/L OF DITCH
- DRAINAGE DIRECTION
- SIGN
- MAILBOX
- TELEPHONE RISER
- CABLE TELEVISION RISER
- ELECTRIC METER
- WATER METER
- GAS METER
- POST
- WELL
- FENCE
- GUARDRAIL
- SINGLE TREE
- SINGLE TREE
- TREE OR BRUSH LIMIT
- EXIST. BOULDER
- SECTION CORNER
- SET IRON PIPE
- FOUND IRON PIPE
- SET MONUMENT
- FOUND MONUMENT
- SET IRON ROD
- FOUND IRON ROD
- SOIL TYPE BOUNDARY
- STEEP SLOPES
- PROP. SILT FENCE
- PROP. TREE PROTECTION FENCE
- LIMITS OF DISTURBANCE

SITE ANALYSIS NOTES

WOODLAND ANALYSIS

The site consists of 31 acres of land between Pontiac Trail and M-14. Approximately 24 acres was tilled land and pastures until the late 1950s and early 1960s. The majority of the site contained scrubby undergrowth and regenerative tree species. Brushing and selective clearing of dead, invasive, and diseased trees was done after the previous Barton Green Site Plan was approved. Few regulated woodlands exist on the site in the areas where development is proposed. The highest quality woodlands exist at the western portion of the site that will remain undisturbed and therefore area not analyzed as part of this proposed site plan. Most of the Landmark Trees are contained wihin the original hedgerows of the old farm homestead. The following is a summary of the woodlands that exist within the portion of the site that will be developed.

Woodland A – This woodland contains a stand of regenerative deciduous trees consisting of 6-12 inch shagbark hickory, elm and black cherry. This woodland is of low quality.
Woodland B – This woodland contains primarily early growth deciduous trees and several smaller Landmark Trees. Species include shagbark hickory, oak, elm and black cherry. This woodland is of medium quality.
Woodland C – This woodland consists of older growth native hardwoods, primarily red oak with some hickory and black cherry. This woodland is of highest concern and is identified by the City staff as a native forest fragment.
Woodland D – This woodland consists of regenerative and pioneer growth along with the remainder of some original hedgerows. A wide variety of hardwoods and softwoods predominate this area. This area is of mid-level concern.
Woodland E – This woodland consists of small diameter regenerative vegetation. Species include cherry, elm, box elder, and willow. This woodland is of low quality.

All mitigation for Landmark Tree and Woodland Tree removal shall be in the form of tree replacement on the site.

WETLAND ANALYSIS

There are two wetlands identified on the site.
Wetland A – This wetland is located along the south edge of the site and is an approximately 0.05 acre finger shaped area extending along a swale from a storm sewer outlet. The wetland is the result of grading activities for the Huron Highlands subdivision and may receive drainage from a farm tile at the east end of the wetland. The storm sewer end section at the west end of this wetland is the outlet location for a portion of the existing site and drains to the public storm sewer in Skydale Drive. The on-site portion of this wetland will be removed during mass grading of this site.
Wetland B – This wetland is located near the west end of the site and extends west onto the adjacent parcel. The on-site portion of this wetland is approximately 0.19 acres. This wetland is a higher quality wetland is and partially wooded. This wetland will not be disturbed by the proposed site development and will remain with the proposed open space/park area on the site.
Potential Wetland C - A third small wet area of less than 0.02 acres is located approximately in the middle of the site. It has very little wetland vegetation; no hydric soils, is likely also the result of a buried farm tile, and does not qualify as a wetland. This area will be removed during mass grading.

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BARTON GREEN

SITE PLAN
SITE ANALYSIS AND NATURAL FEATURES PROTECTION PLAN (WEST)

10

JOB No. 16223

DATE: 5/25/17
SHEET 10 OF 49
CADD: DAG, WAJ
ENG.: JCA
PM: SWB
TECH:
16223SA1.dwg

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	8/16/17
REV. PER CITY/COUNTY	11/15/17
REV. PER CITY	

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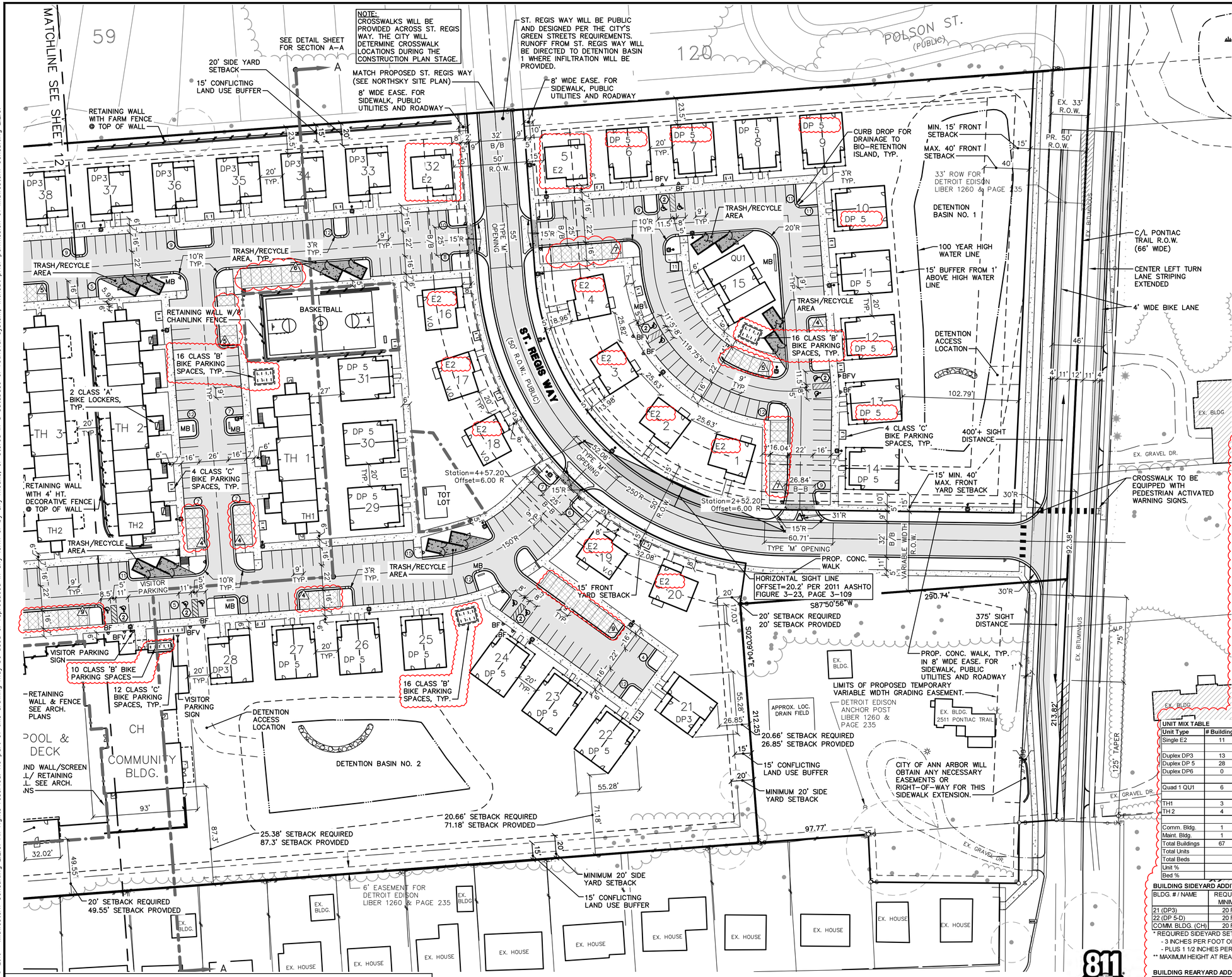

LEGEND

- NUMBER OF STANDARD PARKING SPACES IN ROW
- NUMBER OF BARRIER FREE PARKING SPACES IN ROW
- NUMBER OF SMALL CAR PARKING SPACES IN ROW
- NUMBER OF DEFERRED PARKING SPACES IN ROW
- BF — BARRIER FREE PARKING SIGN
- BFV — VAN ACCESSIBLE BARRIER FREE PARKING SIGN
- PV — PARK VISITOR PARKING SIGN
- R — BARRIER FREE SIDEWALK RAMP
- PROP. CURB & GUTTER
- PROP. BITUMINOUS PAVEMENT
- PROP. CONCRETE PAVEMENT
- PROP. HEAVY DUTY CONCRETE
- DEFERRED PARKING AREAS (TO BE INSTALLED AS POROUS MATERIAL)
- SIGN
- PROP. SINGLE LIGHT
- MB — PROP. MAILBOXES
- ACTIVE USE OPEN SPACE
- TYPICAL CURB DROP FOR DRAINAGE INTO BIO–RETENTION ISLAND

Dimensional Site Plan Notes:

1. There are six types of apartment buildings. See the Unit Mix Table on this Sheet. All Single (E2), Duplex (DP3 and DP 5) and Quad (QU1) types are two stories. The Townhouse (TH1 and TH2) types are three stories. Units range from one to five bedrooms, are designed primarily for adults, couples, and young professionals, but may be occupied by others as well. The Community Building and Maintenance Building are one story in height.
2. Vehicular parking: 422 spaces are provided including 408 nine-foot spaces, 8 barrier free spaces and 6 barrier free van spaces. The plan depicts 137 deferred spaces to be constructed at a later date if the developer demonstrates additional parking is warranted. In the event deferred parking is constructed, it will be placed as porous material.
3. Bicycle parking: 180 Class C, 90 Class B and 24 Class A spaces are provided including 272 spaces throughout the site and 22 additional spaces at the Community Building.
4. All curb radii are 5' unless otherwise noted.
5. Trash and recycling will be in stored in dumpster enclosures. See the locations shown on the Dimensional Site Plan. Trash pickup will be public.
6. A City of Ann Arbor Local Wetland Use Permit is required. An application was submitted as part of this Site Plan application.
7. Active use open space areas include the hot lot, basketball court, volleyball court, porches and decks or patios on all units. Additional site amenities include a Community Building with a large deck and multiple pools, and jogging/walking sidewalk system. An approximately 9.88 acre wooded open space/park dedication area is proposed at the west end of the site. Miscellaneous site furnishings such as picnic tables, benches, and other items will also be provided. See the miscellaneous details.
8. The City is to install a "Stop" sign at the proposed intersection of St. Regis Way and Pontiac Trail and at the four proposed curb cuts on St. Regis Way after the required Traffic Control Order has been authorized. The developer shall pay all associated costs.
9. A public sidewalk is proposed within the expanded right-of-way of Pontiac Trail. Where the public sidewalk along St. Regis Way is outside of the 50 foot right-of-way, it will be in 8 foot wide easements adjacent to the right-of-way.
10. The alignment of the proposed path in the open space at the west end of the site is to be determined in the field by the owner and a representative of the City of Ann Arbor Parks department and may include routes or pathways that are different than those shown on the approved Site Plans. An easement will then be prepared if necessary to reflect the final pathway alignment. A schematic path alignment and two schematic pathway links to the proposed development are shown on the Cover Sheet.
11. St. Regis Way is a proposed public street that is designed in accordance with the City of Ann Arbor's Green Streets Policy. Storm water runoff from this street is captured in public storm sewer and directed to detention Basin #1 (east of Buildings 6-10). See the Stormwater Management Plan.

UNIT MIX TABLE

Unit Type	# Buildings	1-bed	2-bed	3-bed	4-bed	5-bed	6-bed	# Units	Bds./Bldg	# Beds
Single E2	11					11		11	5	55
Duplex DP3	13			13	13			26	7	91
Duplex DP 5	28					56		56	10	280
Duplex DP6	0							0	0	0
Quad 1 QU1	6	12			12			24	10	60
TH1	3	12	12		6			30	20	60
TH 2	4	24	24		16			64	34	136
Comm. Bldg.	1									
Maint. Bldg.	1									
Total Buildings	67									
Total Units		48	36	13	47	67	0	211		
Total Beds		48	72	39	188	335	0			682
Unit %		22.75%	17.06%	6.16%	22.27%	31.75%	0.00%			
Bed %		7.04%	10.56%	5.72%	27.57%	49.12%	0.00%			

BUILDING SIDEYARD ADDITIONAL SETBACKS*

BLDG. # / NAME	REQUIRED MINIMUM	BUILDING HEIGHT	ADDL. SETBACK	BUILDING LENGTH	ADDL. SETBACK	TOTAL MIN. SETBACK	MIN. PROVIDED
21 (DP3)	20 FT	24'-6" MAX.	NONE	55.28 FT	0.66 FT	20.66 FT	23.50 FT
22 (DP 5-D)	20 FT	34'-2" MAX.**	NONE	55.28 FT	0.66 FT	20.66 FT	71.18 FT
COMM. BLDG. (CH)	20 FT	22'-6" MAX.	NONE	93.0 FT	5.38 FT	25.38 FT	87.3 FT

* REQUIRED SIDEYARD SETBACK INCREASES:
- 3 INCHES PER FOOT OF HEIGHT OVER 35 FT
- PLUS 1 1/2 INCHES PER FOOT FOR LENGTH OVER 50 FT PARALLEL TO PROPERTY LINE

** MAXIMUM HEIGHT AT REAR WALKOUT

BUILDING REARYARD ADDITIONAL SETBACKS*

NONE REQUIRED.

* REQUIRED REARYARD SETBACK INCREASES:
- 1 FT PER FOOT OF HEIGHT OVER 30 FT ABUTTING RESIDENTIALLY ZONED LAND
- PLUS 1 1/2 INCHES PER FOOT OF BUILDING HEIGHT OVER 35 FT
- PLUS 1 1/2 INCHES PER FOOT FOR WIDTH OVER 50 FT

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

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COTTAGES AT BARTON

SITE PLAN
DIMENSIONAL SITE PLAN (EAST)

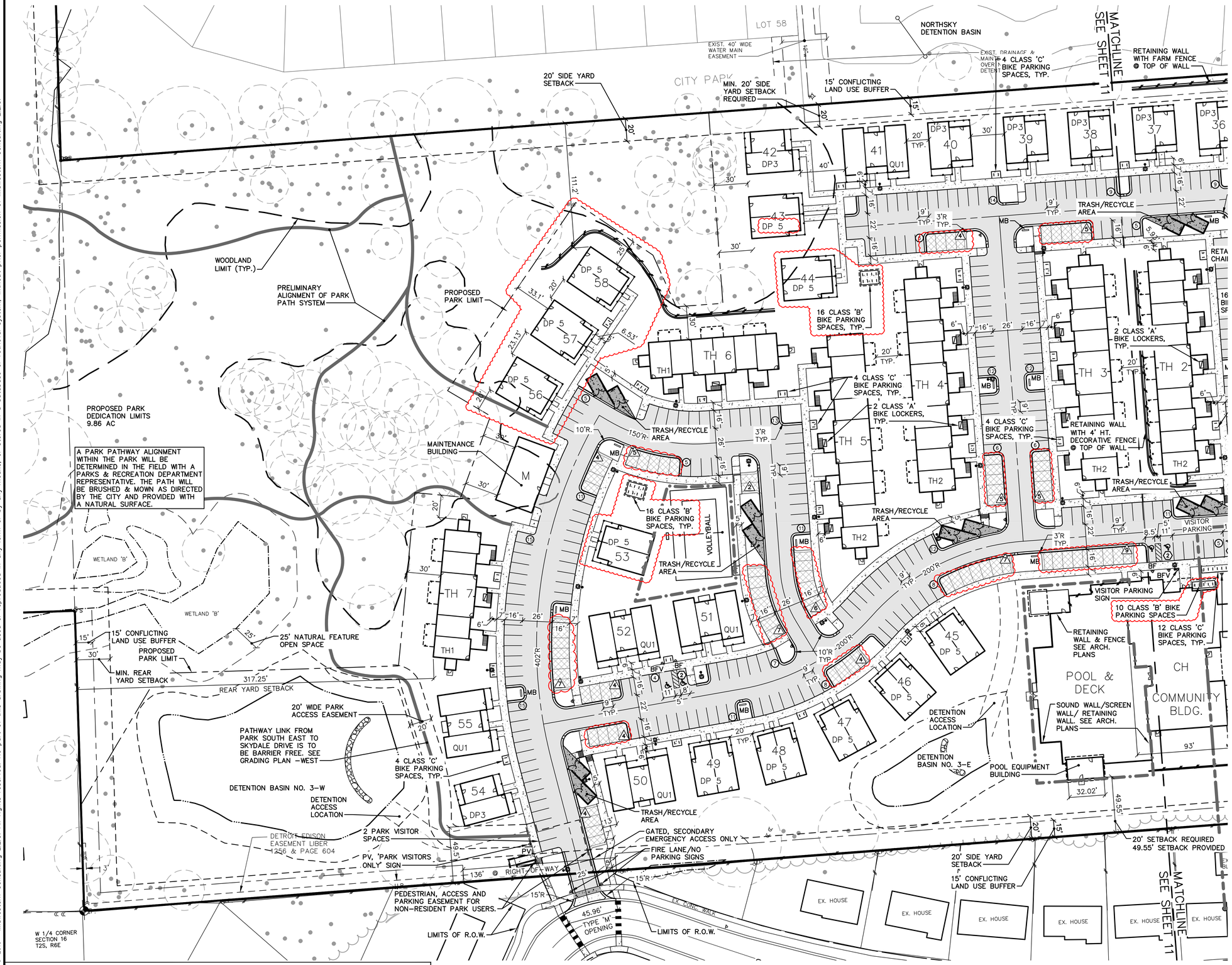
11

JOB No. 16223

DATE: 5/25/17
SHEET 11 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223SP1.dwg
6/20/19
EB#400

REVISIONS:	REV. DATE
REV. PER CITY	9/15/17
REV. PER CITY/COUNTY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	6/20/18
REVISED PER AGREEMENT	6/20/19

2/6/18
REV. PER CITY



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SCALE: 1" = 40'

0 40 80 120

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- MB PROP. MAILBOXES
- ACTIVE USE OPEN SPACE
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PARK ACCESS AND PATHWAY NOTES:

1. A pathway link is proposed to link from Skydale Drive (south of Building 54) to the south edge of the proposed park dedication (west of the south end of Building 55) as shown on the plan. This pathway link will be within a 20-foot wide ingress/egress easement and will be barrier free. See Grading Plan (West).
2. A preliminary alignment of pathways within the proposed park dedication are shown on the plan. These pathways will link to the proposed apartments and to the City Park/open space to the north of Building 58. The final alignment of pathways within the park will be determined in the field with the Parks and Recreation Department (Hillary Hanzel) and may include routes or pathways that are different than those shown on the approved Site Plans. Because of the existing topography, the pathways within the park may not be barrier free.

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COTTAGES AT BARTON GREEN

SITE PLAN
DIMENSIONAL SITE PLAN (WEST)

12

JOB No. 16223

DATE: 5/25/17
SHEET 12 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
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REVISIONS:	REV. DATE
REV. PER COUNTY	8/4/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REVISED PER AGREEMENT	6/7/19

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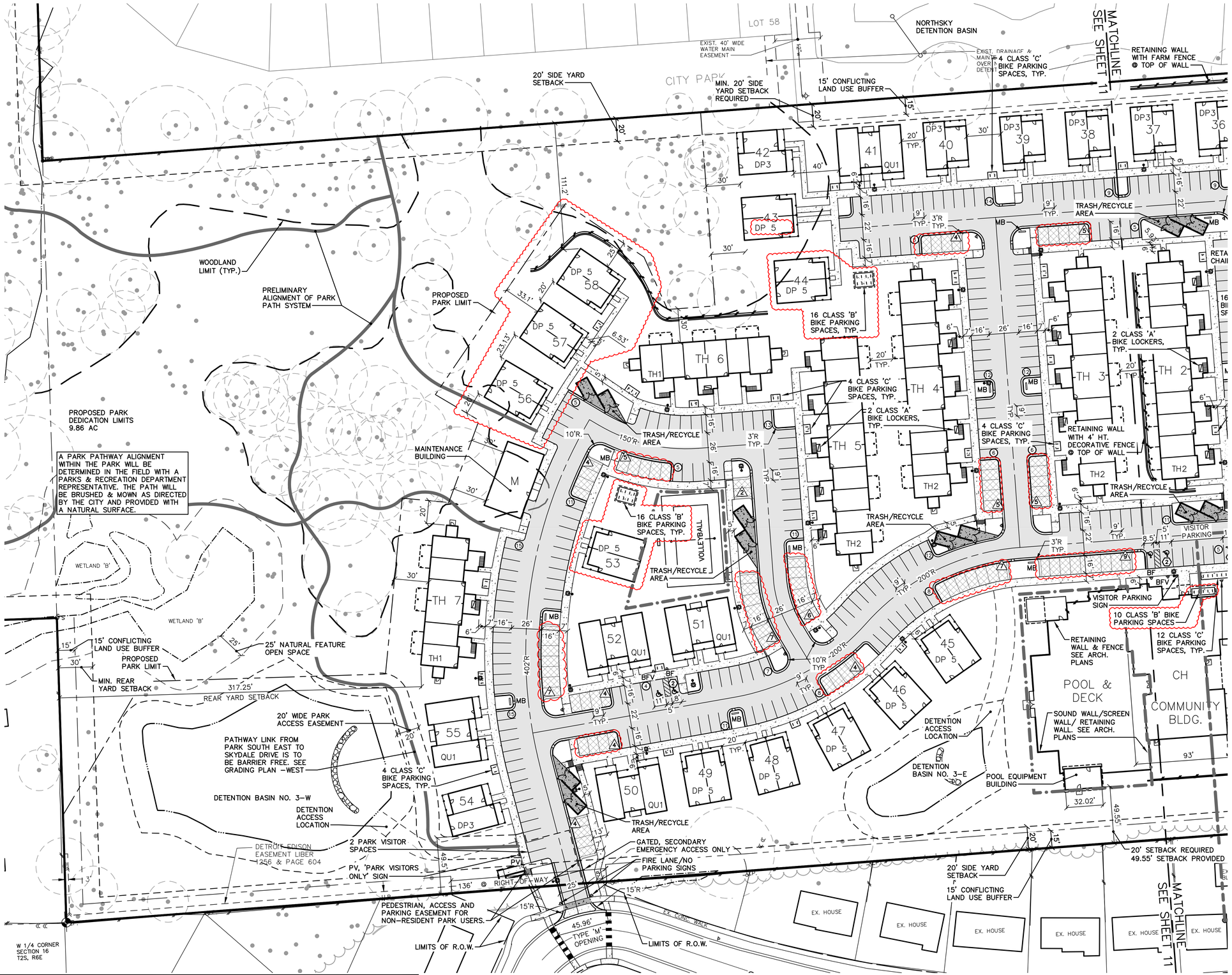

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COTTAGES AT BARTON GREEN

SITE PLAN
DIMENSIONAL SITE PLAN (WEST)

12

JOB No. 16223

DATE: 5/25/17
SHEET 12 OF 49
CADD: DAG, WAJ
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TECH:
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REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REVISED PER AGREEMENT	6/7/19

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CONNECTION TO EXISTING STORM SEWER. ACTUAL ALIGNMENT WILL BE COORDINATED AT THE CONSTRUCTION PLAN STAGE WITH THE NORTH SKY DEVELOPMENT.

MATCHLINE SEE SHEET 14

SCALE: 1" = 40'
0 40 80 120

LEGEND

U.P.	EXIST. UTILITY POLE
U.P.	EXIST. UTILITY POLE W/ TRANS.
GP	EXIST. GUY POLE
	GUY WIRE
	ELEC. TRANSFORMER
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
t	EXIST. TELEPHONE LINE
T	PROP. TELEPHONE LINE
e	EXIST. ELECTRIC LINE
E	PROP. ELECTRIC LINE
g	EXIST. GAS LINE
G	PROP. GAS LINE
g	EXIST. GAS VALVE
f.o.	EXIST. FIBER OPTIC LINE
F.O.	PROP. 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
	EXIST. GATE VALVE IN WELL
	PROP. GATE VALVE IN WELL
	EXIST. CURB STOP & BOX
	PROP. CURB STOP & BOX
	REDUCER
	EXIST. BLOW-OFF
	PROP. BLOW-OFF
P.I.V.	POST INDICATOR VALVE
	THRUST BLOCK
KB	PROP. KNOXBOX
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
	EXIST. BEEHIVE INLET
	PROP. BEEHIVE INLET
RD	PROP. ROOF DRAIN
	END SECTION
	HEAD WALL
	CULVERT
ds	EXIST. DOWNSPOUT
ps	PROP. DOWNSPOUT
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
t	TELEPHONE RISER
catv	CABLE TELEVISION RISER
e	ELECTRIC METER
w	WATER METER
scb	SPRINKLER CONTROL BOX
g	GAS METER
glm	GAS LINE MARKER
fiber	FIBER OPTIC MARKER
W	WELL
PED	PEDESTRIAN CROSSING SIGNAL
tscb	TRAFFIC SIGNAL CONTROL BOX
	PROPOSED LIGHT

STORM DETENTION OUTLET PIPE TO BE PRIVATELY OWNED AND MANTAINED.

33' ROW FOR DETROIT EDISON LIBER 1260 & PAGE 235

LIMITS OF STORM DRAINAGE EASE.

100 YR STORM HIGH WATER LINE

25' WIDE ACCESS ABOVE HIGH WATER LINE

DETENTION BASIN #1

ACTUAL SANITARY SEWER EASE. WIDTH TO BE DETERMINED DURING THE DETAILED ENGINEERING DESIGN

DETENTION ACCESS LOCATION

EXIST. 12"w STUB INCLUDING TEE TO BE REMOVED. MAIN TO BE REPAIRED.

C/L PONTIAC TRAIL (66.00' WIDE)

EX. 33' R.O.W.

PR. 50' R.O.W.

CONNECTION TO EXISTING SANITARY SEWER

CONNECTION TO EXISTING WATERMAIN

STORM SEWER WITHIN ST. REGIS WAY INCLUDING INLET TO DETENTION BASIN TO BE PUBLIC.

HYDRANT TO BE RELOCATED TO ACCOMMODATE ROAD WIDENING

PROPOSED TEMPORARY VARIABLE WIDTH GRADING EASEMENT

DETROIT EDISON ANCHOR POST LIBER 1260 & PAGE 235

APPROX. LOC. DRAIN FIELD

POOL DISCHARGE TO STORM SEWER

POOL & DECK

CH COMMUNITY BLDG.

DETENTION ACCESS LOCATION

DETENTION BASIN #2

DISCHARGE ROUTE FROM

6' EASEMENT FOR DETROIT EDISON LIBER 1260 & PAGE 235

30' EASEMENT PUBLIC

BUILDINGS 19-24 WATERMAIN TURNOVER CALCULATIONS

Dead end watermain serving units 19 - 24
Estimated time for water volume turnover in dead end main

Dead end watermain has
4 duplex units = 8 units at 300 gpd = 2400 gpd
2 single units = 2 units at 300 gpd = 600 gpd

3000 gpd
401.0 CF/day

Dead end watermain diameter is 8 "
Length of dead end is 149 LF
A = 0.349 SF

Volume of watermain 0.349 SF x 149 LF = 52 CF

The volume of the water with turn over 7.7 times daily

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COTTAGES AT BARTON GREEN

SITE PLAN
UTILITY PLAN (EAST)

13

JOB No. 16223

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	8/25/17
REV. PER CITY/COUNTY	9/25/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REVISED PER AGREEMENT	6/20/19

DATE: 5/25/17
SHEET 13 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECHS:
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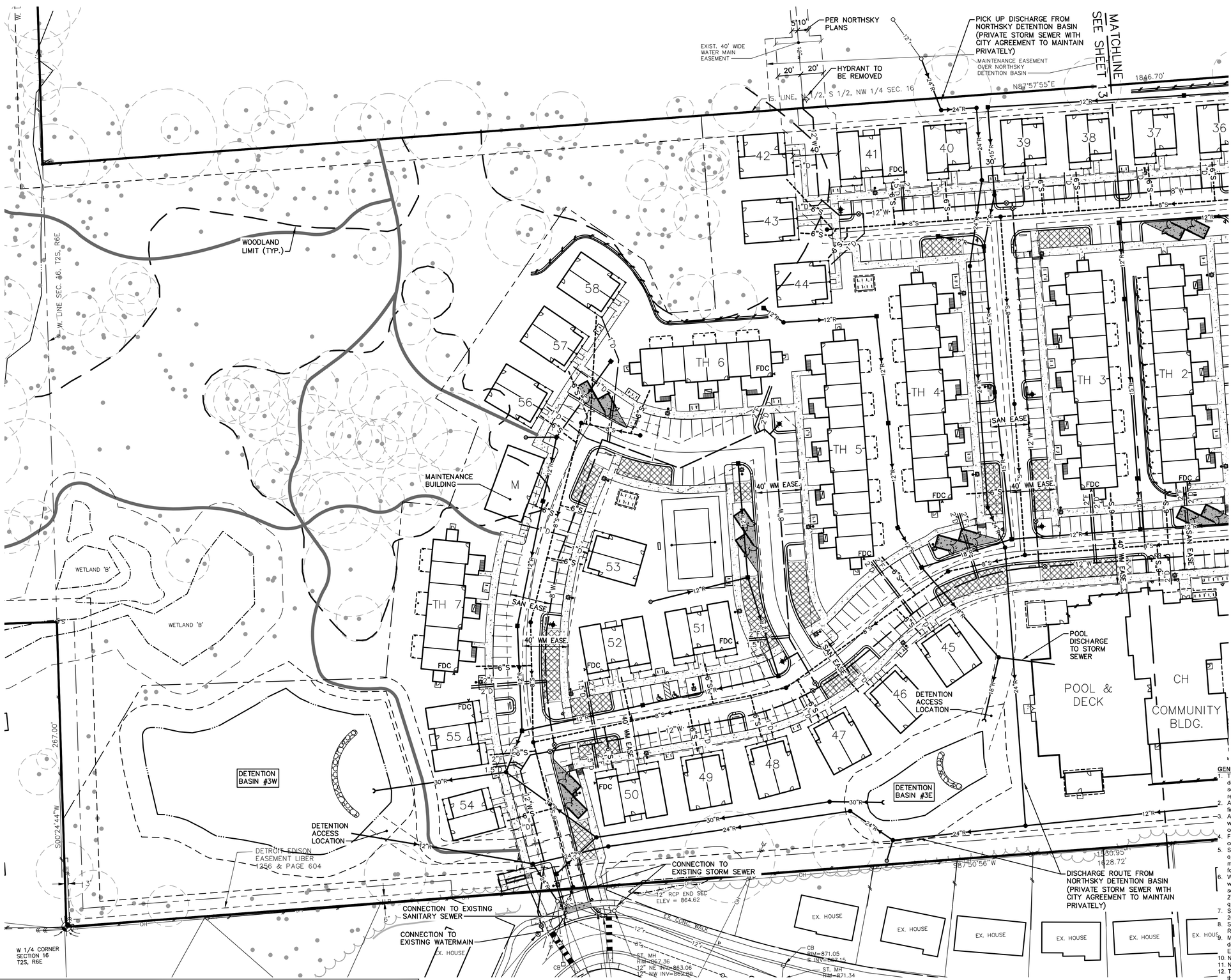

SCALE: 1" = 40'
0 40 80 120

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	GUY WIRE
	ELEC. TRANSFORMER
OH	EXIST. OVERHEAD UTILITY LINE
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t	EXIST. TELEPHONE LINE
T	PROP. TELEPHONE LINE
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E	PROP. ELECTRIC LINE
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	PROP. CLEANOUT
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catv	CABLE TELEVISION RISER
e	ELECTRIC METER
w	WATER METER
scb	SPRINKLER CONTROL BOX
g	GAS METER
glm	GAS LINE MARKER
fiber	FIBER OPTIC MARKER
W	WELL
PED	PEDESTRIAN CROSSING SIGNAL
tscb	TRAFFIC SIGNAL CONTROL BOX
	PROPOSED LIGHT

GENERAL NOTES FOR UTILITIES

1. The depth of the sewer and the width of the required sanitary easement will be determined during Detailed Engineering. All public (City) water mains and sanitary sewers shall be in utility specific easements whose widths meet the current City requirements.
2. All townhome and quadruplex buildings will be fire suppressed. There are no firewalls in the buildings.
3. A Knox Box emergency access system with keys to the fire sprinkler system controls will be provided. The box with proper keys shall be in place prior to issuance of certificates of occupancy for each building.
4. Fire department connections (FDC's) are to be 4 inch Storz or (2) 2.5 NST threaded connections.
5. Supporting fire hydrant(s) and access routes to the hydrant(s) shall be in place, operational and acceptable to the Fire Marshal prior to bringing combustible materials onto the site and before beginning vertical construction above the foundations and slab on grade.
6. Water main pipe shall be CL 50 DIP. All hydrant leads are to be 8 inch diameter. All water service lead stop boxes are to be within water main easement. Domestic water service sizes will be 1-1/2" to all duplex buildings, 1-1/2" for quadruplex buildings and 2" for townhome buildings. Fire service leads will be 2" for townhome and quadruplex buildings.
7. Storm sewer piping shall be RCP Cl. IV. Sanitary sewer piping shall be PVC SDR 26. Sanitary sewer service leads will be 6".
8. Storm water management is provided per the current Washtenaw County Water Resources Commission requirements.
9. Maintenance of the stormwater detention facilities is the responsibility of the development. See also the Permanent Maintenance Task Schedule on the Soil Erosion Control Details and Stormwater Management Plan sheet.
10. Natural stone rip rap is to be provided at the ends of all storm sewer pipe outlets.
11. No booster pumps are anticipated to be used on this project.
12. The pool backwash water shall not drain to the sanitary sewer. The discharge from the pool will be run through a de-chlorination system prior to discharge to the storm sewer.
13. Utility pipe alignments will need to be coordinated with the approved Northsky Construction Plans.
14. The developer will execute an agreement with the City whereby bypass storm sewer piping will be private, will carry public and private storm water, and will be maintained by the development.

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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LAFAYETTE, INDIANA 47901
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(765) 807-2713

COTTAGES AT BARTON GREEN

SITE PLAN
UTILITY PLAN (WEST)

14

DATE: 5/25/17
SHEET 14 OF 49
CADD: DMG, WAJ
ENG: JCA
PM: SWB
TECH:
16223SP1.dwg
6/7/19 ENGR SET

2/8/18

REVISIONS:	REV. DATE
REV. PER CITY REVIEW	8/15/17
REV. PER COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REVISED PER AGREEMENT	6/7/19

JOB No. 16223

PER CITY REVIEW

SANITARY SEWER FLOW MITIGATION CALCULATIONS

Note: There will be no backwash discharge from the pool to the sanitary sewer system.

Design Flow

Based on the City of Ann Arbor's sanitary sewer flow evaluation Table 'A', the design dry weather flow rate will be:

48	Apartments (601-1200 Square Feet) @	250	gpd =		12000 gpd
163	Apartments (1200+ Square Feet) @	300	gpd =		48900 gpd
10450	SF Clubhouse @ 0.30 gpd/ gsf		=		3135 gpd
2700	SF Pool x 1 person/ 50 sf X	20	gpd/per =		1080 gpd
1800	SF Maint Bldg @ 0.15 gpd/ gsf				270 gpd
			Total		65385 gpd

Mitigation Flow

Mitigation Peak Flow = 65385 gpd x 4(peaking factor) x 1.1(recovery) = 287694 gpd = 199.8 gpm

Sanitary Flow breakdown by Discharge location

Flow to Pontiac Trail sewer

3	Apartments (601-1200 Square Feet) @	250	gpd =		750 gpd
22	Apartments (1200+ Square Feet) @	300	gpd =		6600 gpd
			Total		7350 gpd

Flow to Skydale sewer

46	Apartments (601-1200 Square Feet) @	250	gpd =		11500 gpd
140	Apartments (1200+ Square Feet) @	300	gpd =		42000 gpd
10450	SF Clubhouse @ 0.30 gpd/ gsf		=		3135 gpd
2700	SF Pool x 1 person/ 50 sf X	20	gpd/per =		1080 gpd
			Total		57715 gpd

BUILDING HEIGHT, FOOTPRINT AND GROSS FLOOR AREA TABLE

Building Type	Number of Buildings	Number of Units per Bldg.	Subtotal Number of Units	Basement Floor S.F.	First Floor S.F.	Second Floor S.F.	Third Floor S.F.	Subtotal Floor Area S.F.	Floor Area S.F.	Subtotal Footprint S.F.	Footprints S.F.	Height	Unit S.F. 601-1,200	Unit S.F. >1,200
Single E2-D	11		11					2,181	23,991	1,187	13057	23'-5"		11
Unit E2-D		1			1187	994		2181						
Duplex DP3	13		26					3,316	43,108	1,658	21554	24'-6"		26
Unit C1		1			775	775		1550						
Unit D4		1			883	883		1766						
Duplex DP5-D	28		56					4,048	113,344	1,770	49560	23'-8"*		56
Unit E1		2		376	885	763		1648						
Quad QU1	6		24					5,070	30,420	1,772	10632	24'-6"	12	12
Unit D1		2			885	763		1648						
Unit A1		1			887			887						
Unit A2		1				887		887						
Townhome TH1	3		30					12,145	36,435	3,769	11307	34'-9"	12	18
Unit TH1		4			607			607						
Unit TH2		4				707	607	1314						
Unit TH4		2			570	670	570	1810						
Townhome TH2	4		64					20,217	80,868	6,125	24500	34'-9"	24	40
Unit TH1		6			607			607						
Unit TH2		6				707	607	1314						
Unit TH4		4			570	670	570	1810						
Community Bldg. CH	1							10,450	10,450	10,450	10450	22'-6"		
Maintenance Bldg. MB	1							1,800	1,800	1,800	1800	14'-0"		
TOTALS	67		211						340,416		142,860		48	163

* Height at walkout/rear = 34'-2".

LEGEND

U.P.	EXIST. UTILITY POLE	S	EXIST. SANITARY SEWER
GP	EXIST. GUY POLE	S	PROP. SANITARY SEWER
	GUY WIRE		EXIST. CLEANOUT
OH	EXIST. OVERHEAD UTILITY LINE		PROP. CLEANOUT
t	EXIST. TELEPHONE LINE	t	TELEPHONE RISER
e	EXIST. ELECTRIC LINE	catv	CABLE TELEVISION RISER
g	EXIST. GAS LINE	e	ELECTRIC METER
w	EXIST. WATER MAIN	w	WATER METER
W	PROP. WATER MAIN	scb	SPRINKLER CONTROL BOX
	EXIST. HYDRANT	g	GAS METER
	PROP. HYDRANT	glm	GAS LINE MARKER
	EXIST. GATE VALVE IN WELL	fiber	FIBER OPTIC MARKER
	PROP. GATE VALVE IN WELL	W	WELL
r	EXIST. STORM SEWER		
R	PROP. STORM SEWER		
	EXIST. CATCH BASIN OR INLET		
	PROP. CATCH BASIN OR INLET		
	END SECTION		
	CULVERT		

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

SCALE: 1" = 60'

0 60 120 180

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COTTAGES AT BARTON GREEN

SITE PLAN
OVERALL UTILITY PLAN

14A

JOB No. 16223

DATE: 5/25/17
SHEET 14A OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223SP3.dwg
PROJECT #16223

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	6/5/17
REV. PER CITY	9/25/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REVISED PER AGREEMENT	6/7/19

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WETLAND MITIGATION CONSTRUCTION NOTES:

GRADING AND FILLING:
Strip and mass grade the proposed wetland mitigation area to 6 inches below finish grades shown on the plans. Provide hydric soils suitable for proposed wetland planting to bring the elevations up to finish grade. Soil placement and contouring will follow the grading plans contained herein. Topsoil will not be compacted to more than 83% in any wetland mitigation area.

SOIL PREPARATION:
Clear plant debris and all stones greater than 2" diameter from planting areas. Level finish grade to eliminate small depressions. Roll the finished level surface with a spiked roller (gill rig) to eliminate soil clods. Kill any volunteer vegetation with "Round-up" herbicide seven days before all seeding operations.

SEED SOURCES:
An attempt to secure as much native seed from Michigan sources will be made. Many wetland species are not available through Michigan sources and will require out-state growers to be utilized.

INSTALLATION:
Drill seeding is required for all permanent seed mstrices to ensure direct soil-seed contact. No seed will be planted with more than 1/4" soil cover. Keep soils saturated during the first 6-8 weeks. Planting area should receive approximately 1 inch of water per week for the first 6-8 weeks. Optimum seeding time is October 1st to July 1st.

STABILIZATION:
Apply wheat straw at a rate of 1500 lbs /acre to all seeded areas. Secure straw with crimping implement. Install erosion blanket as manufactured by, North American Green Excelsior Company (or approved equal) to all shallow channels and points where overland flows focus.

MAINTENANCE AND REPAIRS:
The use of chemical fertilizer to establish or promote the establishment of the specified plantings is not allowed. All seeded areas damaged by wash outs or other conditions that prohibit a dense establishment of the specified plants will be prepared by the contractor at no cost expense to the owner.

WARRANTEE STATEMENT:
Native Seeding-A diverse matrix of plant species will be determined established from seeding in the following manner. The seeded areas will be observed and reponed on for three growing seasons. Each season will determine the following year's management practices to be followed. After the fifth season, a transect will be conducted by the owners natural features restoration contractor. It will be determined that 45% of the original planted species exist over 80% of the restored area. If this does not exist, an over-seeding of the original planting will be made with the appropriate species mix, determined at the 5 year inspection.

DESCRIPTION OF AREA FOR MITIGATION:
The area proposed for mitigation is immediately adjacent to and contiguous with existing Wetland #2 on the north side of the property. The proposed location is in an area that is easily accessible for monitoring and maintenance, and is a full-sun location for optimal establishment and stabilization. Current use of the area is tilled agriculture.
SHORT TERM & LONG TERM GOALS – WETLAND MITIGATION

VEGETATION - The short-term objective for the site is to re-establish native herbaceous vegetation within the proposed wetland. The intended management will be accomplished through selectively clearing and a program of herbicide maintenance. The long-term objective for the site is to re-establish and stabilize the plant communities within newly established area. The focus of this management is to maintain this area as a natural ecosystem.

HYDROLOGY - The short-term objective is not to negatively influence the existing hydrology of the existing wetland during the wetland mitigation plan. Long-term, it is the intent of the mitigation plan to create and maintain adequate hydrology for newly created wetlands, continue to facilitate clean flow of surface water to existing wetlands, and encourage infiltration of surface water on-site.

GRADING - Short-term objectives are to provide soil erosion and sediment controls while the site is re-established. Long term objectives are to facilitate the storm water management of the site and to maintain the general character of the original landform.

MONITORING - Annual site inspections will be conducted for a period of three growing seasons. These annual inspections shall begin upon the growing season of the first construction year and extend for five growing seasons.

1st Year
Condition of temporary erosion control measures.
Development of the seeded plants, both temporary and permanent matrix.
Surface water flow and erosion protection.
Sub-surface hydrology will be noted.
Inspect for invasive weed growth.

2nd thru 4th Years
Condition of temporary erosion control mulches.
Development of the seeded plants, both temporary and permanent matrix.
Surface water flow and erosion protection.
Sub-surface hydrology will be noted.
Inspect for invasive weed growth.

5th Year
Development of the seeded plants, both temporary and permanent matrix.
Identify and note the number of species established
Surface water flow and erosion
Note necessary repairs.
Sub-surface hydrology will be noted.
Inspect for invasive weed growth.

PERFORMANCE STANDARDS FOR WETLAND MITIGATION:

The administrative rules for Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, require that performance standards be established for all wetland mitigation projects. These are the criteria by which the mitigation wetland will be evaluated to determine if the wetland mitigation requirements of the permit have been met. If the mitigation wetland does not satisfactorily meet these standards by the end of the monitoring period, or is not satisfactorily progressing during the monitoring period, the permittee will be required to take corrective actions. The following are considered standard performance standards for wetland mitigation projects:

1. Construction has been completed in accordance with the Geological and Land Management Division approved plans and specifications referenced in the permit.
2. The mitigation wetland is characterized by the presence of water at a frequency and duration sufficient to support a predominance of wetland vegetation and the wetland types specified in the mitigation plan at the end of the monitoring period.
3. A layer of high-quality soil, from the A horizon of an organic or loamy surface texture soil, is placed over the entire created wetland area at a minimum thickness of 6 inches.
4. The mitigation wetland shall be free of oil, grease, debris, and all other contaminants.
5. Mean percent cover of native wetland species in the herbaceous layer at the end of the monitoring period is not less than:
   80 percent for forested wetland.
   80 percent for scrub-shrub wetland.
   60 percent for emergent wetland.
   80 percent for wet meadow wetland.

   Extensive open water and submergent vegetation areas having no emergent and/or floating vegetation shall not exceed 20 percent of the mitigation wetland area. Extensive areas of bare soil shall not exceed 5 percent of the mitigation wetland area. For the purposes of these performance standards, extensive refers to areas greater than 0.01 acre in size.

   The total percent cover of wetland species in each plot shall be averaged for plots taken in the same wetland type to obtain a mean percent cover value for each wetland type. Plots within identified extensive open water and submergent areas, bare soil areas, and areas without a predominance of wetland vegetation shall not be included in this average. Wetland species refers to species listed as Facultative and wetter (FAC, =FAC+, FACW-, FACW, FACW+, OBL) on the U.S. Fish and Wildlife Service's "National List of Plant Species That Occur in Wetlands" for Region 3.

6. The mitigation wetland supports a predominance of wetland vegetation (as defined in the "MDEQ Wetland Identification Manual") in each vegetative layer, represented by a minimum number of native wetland species, at the end of the monitoring period. The minimum number of native wetland species per wetland type shall not be less than:
   15 species within the forested wetland.
   15 species within the scrub-shrub wetland.
   15 species within the emergent wetland.
   20 species within the wet meadow wetland.

   The total number of native wetland plant species shall be determined by a sum of all species identified in sample plots of the same wetland type.

7. At the end of the monitoring period, the mitigation wetland supports a minimum of:

   300 individual surviving, established, and free-to-grow trees per acre in the forested wetland that are classified as native wetland species and consisting of at least three different plant species.

   300 individual surviving, established, and free-to-grow shrubs per acre in the scrub-shrub wetland that are classified as native wetland species and consisting of at least four different plant species.

   8 native wetland species of grasses, sedges, or rushes in the wet meadow wetland.

8. The mean percent cover of invasive species including, but not limited to, Phragmites australlis (Common Reed), Lythrum salicaria (Purple Loosestrife), and Phalaris arundinacea (Reed Canary Grass) shall in combination be limited to no more than 10 percent within each wetland type. Invasive species shall not dominate the vegetation in any extensive area of the mitigation wetland.

   If the mean percent cover of invasive species is more than 10 percent within any wetland type or if there are extensive areas of the mitigation wetland in which an invasive species is one of the dominant plant species, the permittee shall submit an evaluation of the problem to the MDEQ. If the permittee determines that it is infeasible to reduce the cover of invasive species to meet the above performance standard, the permittee must submit an assessment of the problem, a control plan, and the projected percent cover that can be achieved for review by the city and the MDEQ. Based on this information, the city and the MDEQ may approve an alternative invasive species standard. Any alternative invasive species standard must be approved in writing by the city and the MDEQ. The intent of this requirement is that invasive species should be removed.

MONITORING OF WETLAND MITIGATION:

The administrative rules for Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, require that a monitoring plan be established for all wetland mitigation projects. Monitoring is necessary to determine if the mitigation wetland meets the performance standards. Permittees are required to monitor the wetland mitigation for a minimum of 5 years (depending on the type of wetland) following the year that construction is completed, as follows:

1. Measure inundation and saturation at all staff gauges, monitoring wells, and other stationary points shown in the mitigation plan monthly during the growing season. Hydrology data shall be measured and provided at sufficient sample points to accurately depict the water regime of each wetland type.
2. Sample vegetation in plots located along transects shown in the wetland mitigation plan once between July 15 and August 31. The number of sample plots necessary within each wetland type shall be determined by use of a species-area curve or other approach approved by the Michigan Department of Environmental Quality (MDEQ). The minimum number of sample plots for each wetland type shall be no fewer than five (5). Sample plots shall be located on the sample transect at evenly spaced intervals or by another approach acceptable to the MDEQ. If additional or alternative sample transects are needed to sufficiently evaluate each wetland type, they must be approved in advance in writing by the MDEQ.

   The herbaceous layer (all non-woody plants and woody plants less than 3.2 feet in height) shall be sampled using a 3.28 foot by 3.28 foot (one square meter) sample plot. The shrub and tree layer shall be sampled using a 30-foot radius sample plot. The data recorded for each herbaceous layer sample plot shall include a list of all living plant species, and an estimate of percent cover in 5 percent intervals for each species recorded, bare soil areas, and open water relative to the total area of the plot. The number and species of surviving, established, and free-to-grow trees and surviving, established, and free-to-grow shrubs shall be recorded for each 30-foot radius plot. Provide plot data and a list of all the plant species identified in the plots and otherwise observed during monitoring. Data for each plant species must include common name, scientific name, wetland indicator category from the U.S. Fish and Wildlife Service's "National List of Plant Species That Occur in Wetlands" for Region 3, and whether the species is considered native according to the Michigan Floristic Quality Assessment (Michigan Department of Natural Resources, 2001). Nomenclature shall follow Voss (1972, 1985, and 1996) or Gleason and Cronquist (1991).
   The locations of sample transects and plots shall be identified in the monitoring report on a plan view showing the location of wetland types. Sample transects shall be permanently staked at a frequency sufficient to locate the transect in the field.
3. Delineate any extensive (greater than 0.01 acre in size) open water areas, bare soil areas, areas dominated by invasive species, and areas without a predominance of wetland vegetation, and provide their location on a plan view.
4. Document any sightings or evidence of wading birds, songbirds, waterfowl, amphibians, reptiles, and other animal use (lodges, nests, tracks, scat, etc.) within the wetland noted during monitoring. Note the number, type, date, and hour of the sightings and evidence.
5. Inspect the site, during all monitoring visits and inspections, for oil, grease, man-made debris, and all other contaminants and report findings. Rate (e.g., poor, fair, good, excellent) and describe the water clarity in the mitigation wetland.
6. Provide annual photographic documentation of the development of the mitigation wetland during vegetation sampling from permanent photo stations located within the mitigation wetland. At a minimum, photo stations shall be located at both ends of each transect. Photos must be labeled with the location, date photographed, and direction.
7. Provide one-time photographic documentation during construction of the placement of at least six (6) inches of high quality soil, from the A horizon of an organic or loamy surface texture soil, across the site.
8. Provide the number and type of habitat structures placed and representative photographs of each structure type.
9. Provide a written summary of data from previous monitoring periods and a discussion of changes or trends based on all monitoring results including a calculation of the acres of each wetland type established.
10. Provide a written summary of all the problem areas that have been identified and potential corrective measures to address them. A monitoring report, which compiles and summarizes all data collected during the monitoring period, shall be submitted annually by the permittee. Monitoring reports shall cover the period of January 1 through December 31 and be submitted to the city and to MDEQ prior to January 31 of the following year.
    Additional monitoring may be required to document that performance standards are met.

CONSTRUCTION SEQUENCE FOR MITIGATION (Construction to be complete Prior to Building Permits):

1. Sediment Controls:
   - Maintain existing controls
   - Install silt fence around the site as shown if not complete
2. Prepare Mitigation Site:
   - Strip and mass grade proposed wetland location, hold-down 6" from finish grade.
   - Install hydric soil to proposed finish grade
4. Restoration:
   - Seed, plant, and mulch as shown on planting plans
   - Maintain existing controls
5. Follow-Up After the Site is Stabilized:
   - Remove silt fence

WETLAND MITIGATION CALCULATIONS:

Wetland mitigation is proposed as a combination of new wetland construction, and monitoring of the new wetland for 5 years.

1. Basis of calculations - ECT/Dr. Don Tilton provided the following average costs for estimating the approximate value of the proposed mitigation.
   - Average cost to monitor and maintain a small wetland like this one per the MDEQ requirements at approximately $5,000 per acre per year.
   - Average cost to construct new wetland is approximately $50,000 per acre.

2. Wetland removals:

Wetland removed from Wetland 'A'	2,200 sf
Total wetland removed	2,200 sf total removed

3. City wetland mitigation requirements:

Mitigation required at 1.5:1st wetland removed	
2,200 sf removed x 150% =	3,300 sf/150% required

4. Proposed wetland:

New construction/addition to Wetland 'B'	4,080 sf
Total proposed wetland	4,080 sf/186% proposed

5. Monitoring of new wetland for 5-years:

Average cost of wetland monitoring	$5,000/ac/year
Average cost of new wetland	$50,000 per ac
New wetland area to be monitored	4,080 sf/0.09 ac
0.09 ac x $5,000/acre	$450 per year
$450/year x 5 years	$2,250
Wetland equivalent calculation:	
$2,250 divided by $50,000/ac wetland	2,178 sf/0.05 ac wetland

6. Total proposed mitigation:

Item 4- proposed wetland	4,080 sf wetland
Item 5- proposed wetland monitoring	2,178 sf wetland
Total proposed mitigation	6,258 sf
6,258 sf /2,200 sf wetland removed	285% mitigation required

WETLAND SEED MIX
(JF New Wetland Pond Mix as revised below, or equal)

For Use in Wetland

Scientific Name	*Common Name*
Carex vulpinoidea	Brown Fox Sedge
Echinochloa crusgalli	Barnyard Grass
Eleocharis obtusa	Blunt Spike Rush
Glyceria striata	Fowl Manna Grass
Juncus effusus	Common Rush
Juncus torreyi	Torrey's Rush
Leersia oryzoides	Rice Cut Grass
Panicum virgatum	Prairie Cord Grass
Scirpus validus creber	Great Bulrush (softstem)
Avena sativa	Seed Oats
Lolium multiflorum	Annual Rye
Actinomeris alternifolia	Wingstem
Alisma subcordatum	Common Water Plantain
Asclepias incarnata	Swamp Milkweed
Bidens sp.	Bidens
Cephalanthus occidentalis	Buttonbush
Hibiscus sp.	Rosemallow
Mimulus ringens	Monkey Flower
Penthorum sedoides	Ditch Stonecrop
Polygonum pennsylvanicum	Smartweed
Sagittaria latifolia	Common Arrowhead

WETLAND BUFFER SEED MIX
(JF New Wetland Edge & Annual/Perennial Forbs Mixes, or equal)

For Use on Wetland Side Slopes

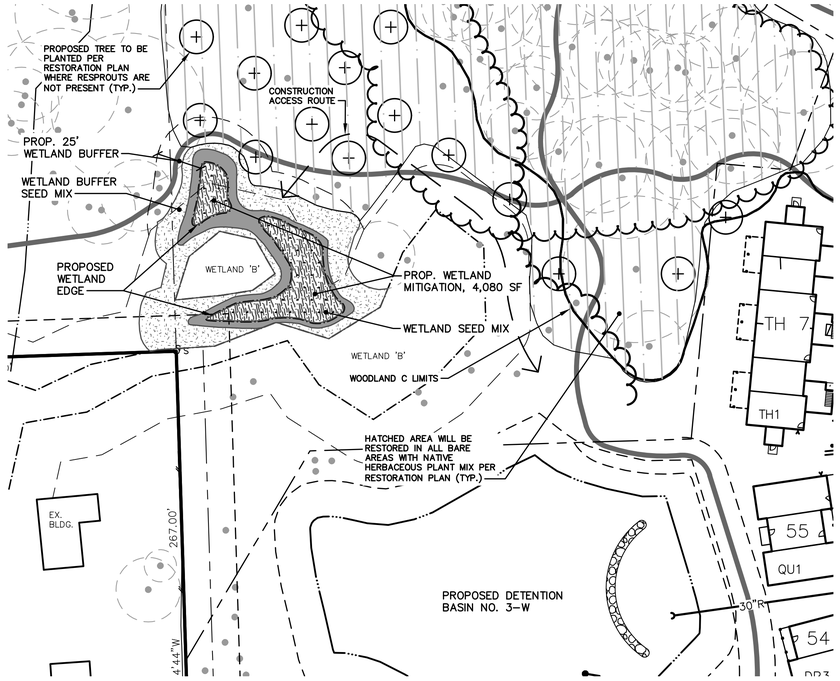
Scientific Name	*Common Name*
Carex lurida	Bottlebrush Sedge
Carex sp.	Sedge
Carex vulpinoidea	Brown Fox Sedge
Eleocharis palustris major	Great Spike Rush
Elymus canadensis	Canada Wild Rye
Glyceria striata	Fowl Manna Grass
Leersia oryzoides	Rice Cut Grass
Scirpus atrovirens	Dark Green Rush
Scirpus pungens	Chairmaker's Rush
Scirpus validus creber	Great Bulrush (softstem)
Avena sativa	Seed Oats
Lolium multiflorum	Annual Rye
Actinomeris alternifolia	Wingstem
Agalinis tenuifolia	Slender False Foxglove
Alisma subcordatum	Common Water Plantain
Asclepias incarnata	Swamp Milkweed
Aster simplex	Panicled Aster
Bidens sp.	Bidens
Cassia hebecarpa	Wild Senna
Eupatorium perfoliatum	Common Boneset
Helenium autumnale	Sneezeweed
Iris virginica shrevei	Blue Flag Iris
Lobelia siphilitica	Great Blue Lobelia
Mimulus ringens	Monkey Flower
Rudbeckia laciniata	Wild Golden Glow
Sagittaria latifolia	Common Arrowhead
Verbena hastata	Blue Vervain
Vernonia sp.	Ironweed

NATURAL AREA SEED MIX
(JF New Slope Stabilization Seed Mix as revised below, or equal)

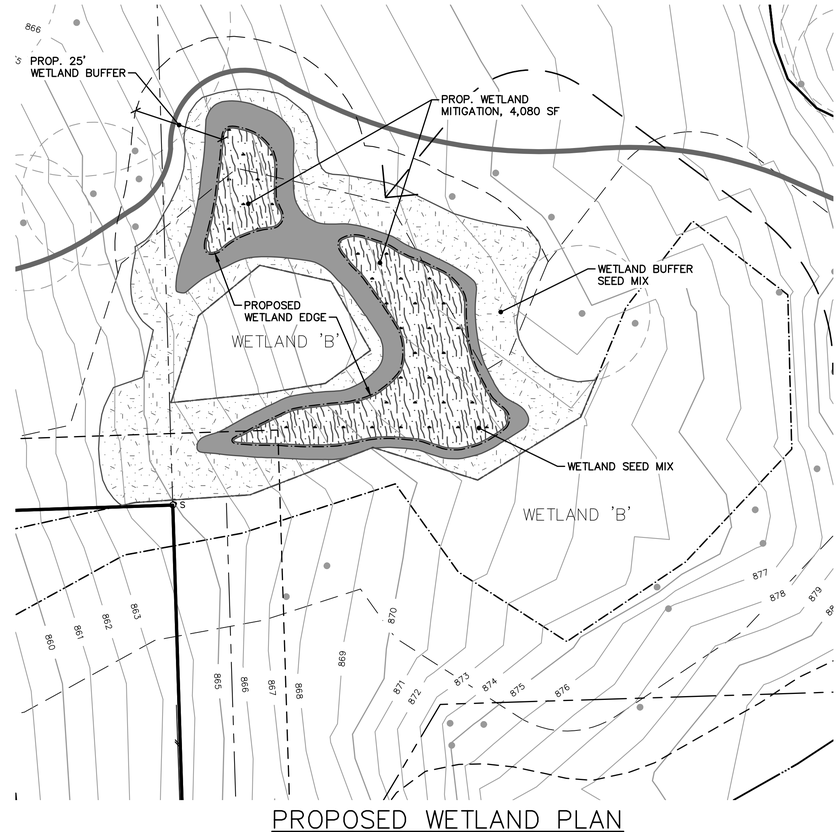
For Use in Natural Feature Buffer Restoration

Scientific Name	*Common Name*
Elymus canadensis	Canada Wild Rye
Panicum virgatum	Switch Grass
Schizachyrium scoparium	Little Blue Stem
Sorghastrum nutans	Indian Grass
Lolium multiflorum	Annual Rye

Note: Seed mix per JF New Nursery (or equal)
Walkerton, ID (574) 586-3400



WETLAND MITIGATION PLAN
SCALE: 1"=40'



PROPOSED WETLAND PLAN
SCALE: 1"=20'

SCALE: 1" = 40'
0 40 80 120

LEGEND

- EXIST. CONTOUR
- PROP. CONTOUR
- CONST. FENCE/TREE PROTECTION FENCE/GRADING LIMITS
- EXIST. WETLAND BUFFER
- EXIST. WETLAND
- PROP. WETLAND
- TREE OR BRUSH LIMIT
- EXIST. TREE TO REMAIN
- PROPOSED WETLAND
- WETLAND SEED MIX
- WETLAND BUFFER SEED MIX
- NATURAL AREA SEED MIX

NOTE:

Wetland Mitigation Plan Notes:
The Natural Features Open Space around Wetland 'B' will be disturbed and restored for construction of the wetland mitigation area.

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CLIENT
TRINITAS DEVELOPMENT, LLC
201 MAIN STREET, SUITE 1000
LAFAYETTE, INDIANA 47901
ATTN: DAMIAN VANMATRE
(765) 807-2713

COTTAGES AT BARTON GREEN

SITE PLAN
WETLAND MITIGATION AND MONITORING PLAN

15

JOB No. 16223
REVISIONS:
REV.- PER CITY

REV.	DATE
	11/15/17

DATE: 9/26/17
SHEET 15 OF 49
CADD: WAJ
ENG: JCA
PM: SWB
TECH:
16223MS1.dwg
FB 480

SCALE: 1" = 40'
0 40 80 120

LEGEND

838	EXIST. CONTOUR
838	PROP. CONTOUR
×836.2	EXIST. SPOT ELEVATION
36.60	PROP. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
U.P.	EXIST. UTILITY POLE W/ TRANS.
	GUY WIRE
	ELEC. TRANSFORMER
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
	PROP. LIGHT POLE
t	EXIST. TELEPHONE LINE
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
	EXIST. GATE VALVE IN WELL
	PROP. GATE VALVE IN WELL
	EXIST. CURB STOP & BOX
	PROP. CURB STOP & BOX
	REDUCER
	EXIST. BLOW-OFF
	PROP. BLOW-OFF
P.I.V.	POST INDICATOR VALVE
	THRUST BLOCK
KB	PROP. KNOXBOX
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
	EXIST. BEEHIVE INLET
	PROP. BEEHIVE INLET
RD	PROP. ROOF DRAIN
	END SECTION
	HEAD WALL
	CULVERT
ds	EXIST. DOWNSPOUT
ps	PROP. DOWNSPOUT
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
	C/L OF DITCH
	DRAINAGE DIRECTION
	SIGN
	SINGLE TREE
	TREE OR BRUSH LIMIT
	FENCE
	SILTFENCE
	LIMITS OF DISTURBANCE
	CONSTRUCTION FENCE
	100-YEAR DETENTION ELEVATION
FF	FINISH FLOOR ELEVATION
GF	GARAGE FLOOR ELEVATION
BFF	BASEMENT FINISH FLOOR ELEVATION

GRADING NOTES:

1. All buildings to be graded with 5% grade away from the foundation starting 6" below the top of foundation. Grading around foundations must conform to the 2003 Michigan Residential Code, sections R401.3, R404.1.6 and R403.1.7.3.
2. An NPDES permit will be obtained from the MDEQ for this project prior to any grading on the site. The required weekly inspections and inspections following rain events will be conducted by a certified storm water operator and written inspection reports will be maintained on-site.
3. There are no proposed sump pumps at this point. If sump pumps are added during detailed engineering, they will be connected to the storm sewer system.
4. Proposed grading is shown with 2' contours except in the detention basins where 1' contours are shown.

SOIL EROSION AND SEDIMENT CONTROL MEASURES

t – INDICATES TEMPORARY CONTROL MEASURE
p – INDICATES PERMANENT CONTROL MEASURE

5	SEEDING	54	CONSTRUCTION FENCE OR SNOW FENCE
6	SEEDING WITH MULCH AND/OR MATTING	55	GEOTEXTILE SILT FENCE
13	RIPRAP, RUBBLE, GABIONS	59	C.B./INLET FILTER
15	PAVING	60	MUD TRACKING MAT
40	INLET SEDIMENT TRAP		

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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COTTAGES AT BARTON GREEN

SITE PLAN
GRADING & SOIL EROSION CONTROL PLAN (EAST)

16

JOB No. 16223

DATE: 5/25/17
SHEET 16 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
FILE: 16223GP1.dwg

REVISIONS:	REV. DATE
REV. PER COUNTY	6/5/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REVISED PER AGREEMENT	5/7/18

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M:\Civil3d_Proj\16223\Site Plan\16223SP1.dwg, 6/20/2019 1:28 PM, Jim Ahnert, None
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SCALE: 1" = 40'

0 40 80 120

LEGEND

838	EXIST. CONTOUR
838	PROP. CONTOUR
×836.2	EXIST. SPOT ELEVATION
36.60	PROP. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
U.P.	EXIST. UTILITY POLE W/ TRANS.
	GUY WIRE
	ELEC. TRANSFORMER
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
	PROP. LIGHT POLE
t	EXIST. TELEPHONE LINE
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
	EXIST. GATE VALVE IN WELL
	PROP. GATE VALVE IN WELL
	EXIST. CURB STOP & BOX
	PROP. CURB STOP & BOX
	REDUCER
	EXIST. BLOW-OFF
	PROP. BLOW-OFF
P.I.V.	POST INDICATOR VALVE
	THRUST BLOCK
KB	PROP. KNOXBOX
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
	EXIST. BEEHIVE INLET
	PROP. BEEHIVE INLET
RD	PROP. ROOF DRAIN
	END SECTION
	HEAD WALL
	CULVERT
ds	EXIST. DOWNSPOUT
ps	PROP. DOWNSPOUT
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
	C/L OF DITCH
	DRAINAGE DIRECTION
	SIGN
	SINGLE TREE
	TREE OR BRUSH LIMIT
	FENCE
	SILTFENCE
	LIMITS OF DISTURBANCE
	CONSTRUCTION FENCE
	100-YEAR DETENTION ELEVATION
FF	FINISH FLOOR ELEVATION
GF	GARAGE FLOOR ELEVATION
BFF	BASEMENT FINISH FLOOR ELEVATION

SOIL EROSION AND SEDIMENT CONTROL MEASURES

t – INDICATES TEMPORARY CONTROL MEASURE
p – INDICATES PERMANENT CONTROL MEASURE

5	SEEDING
6	SEEDING WITH MULCH AND/OR MATTING
13	RIPRAP, RUBBLE, GABIONS
15	PAVING
40	INLET SEDIMENT TRAP

54	CONSTRUCTION FENCE OR SNOW FENCE
55	GEOTEXTILE SILT FENCE
59	CB./INLET FILTER
60	MUD TRACKING MAT

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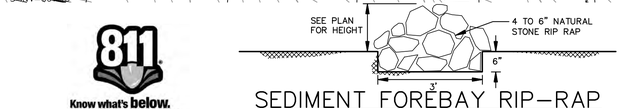
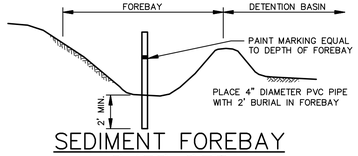


SEDIMENT FOREBAY RIP-RAP BARRIER DETAIL
NO SCALE



SEDIMENT FOREBAY MARKER DETAIL
NO SCALE

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COTTAGES AT BARTON GREEN

SITE PLAN
GRADING & SOIL EROSION CONTROL PLAN (WEST)

17

JOB No. 16223

REVISIONS:	REV. DATE
REV. PER COUNTY	8/15/17
REV. PER COUNTY	9/15/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	12/15/17
REV. PER CITY	REVISED PER AGREEMENT

DATE: 5/25/17
SHEET 17 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
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16223

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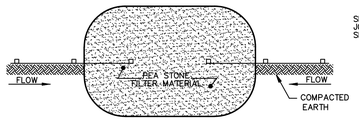
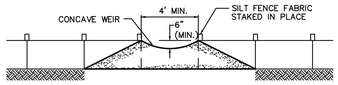
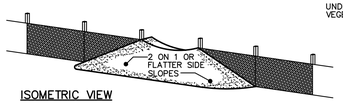


PLAN VIEW

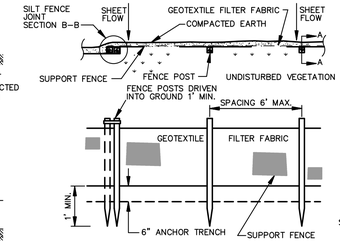


FRONT VIEW

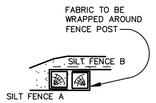


ISOMETRIC VIEW

STONE OUTLET FILTER (62t)
NO SCALE

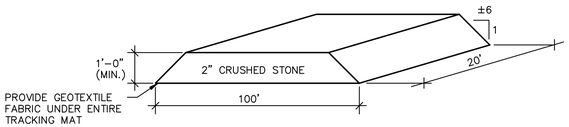


SECTION A – A



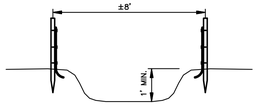
SECTION B – B

SILT FENCE (55t)
NO SCALE

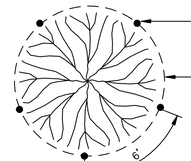


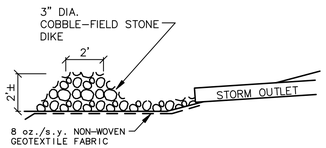
GRAVEL MUD TRACKING MAT (60t)
NO SCALE

NOTES:
1. DO NOT DISCHARGE CONCRETE WASHOUT INTO STORM DRAINS, CATCH BASINS OR TO THE SANITARY SEWER SYSTEM.
2. COMPLETE SURROUND WASHOUT AREA WITH SILT FENCE.
3. CONCRETE IS TO BE BROKEN AND DISPOSED OFF-SITE WHEN WASHOUT AREA IS 75% FULL OR CONCRETE INSTALLATION IS COMPLETE.



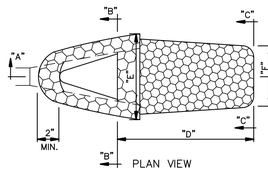
CONCRETE WASHOUT DETAIL
NO SCALE

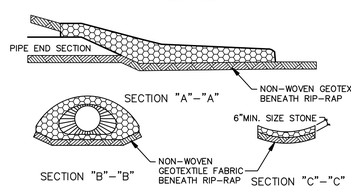




ENERGY DISSAPATOR
NO SCALE

PIPE ø	D	E	F	SQ. YDS.
12"	5'-0"	6'-6"	3'-0"	4
15"	5'-0"	7'-0"	3'-0"	4
18"	5'-0"	7'-6"	3'-6"	4
21"	5'-6"	8'-0"	4'-0"	5
24"	6'-0"	8'-6"	4'-6"	6
27"	6'-6"	9'-0"	5'-0"	7
30"	7'-0"	9'-6"	5'-6"	8
36"	8'-0"	10'-9"	6'-0"	10
42"	9'-0"	11'-9"	6'-6"	12
48"	10'-0"	13'-0"	7'-0"	14



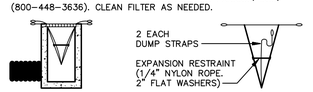


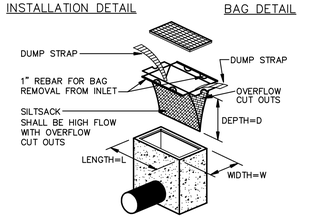
NOTE: USE NATURAL STONE RIP RAP FOR ALL DISCHARGES INTO NATURAL AREAS.

PLAIN STONE RIP–RAP

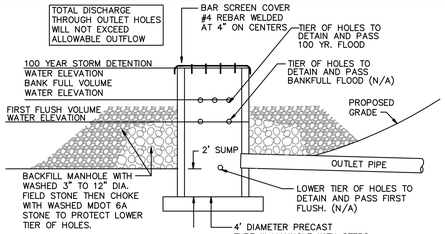
(54t)
TREE PROTECTION DETAIL
NO SCALE

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). CLEAN FILTER AS NEEDED.





TEMPORARY INLET SEDIMENT FILTER DETAIL
NO SCALE



NOTE: HOLES SHALL BE CORED OR PRECAST

	POND #1	POND #2	POND #3
BAR SCREEN ELEV. / 100 YR. STORM LEVEL	910.07	891.75	868.50
BANKFULL ELEV.	908.01	891.20	867.70
TOP TIERS HOLES – # / DIAMETER	N/A	1 – 1.25"	5 – 0.88"
FIRST FLUSH ELEV.	907.20	890.44	866.36
MIDDLE TIER HOLES – # / DIAMETER	N/A	N/A	N/A
LOWER TIER HOLES / OUTLET INVERT	N/A	N/A	N/A
LOWER TIER HOLES – # / DIAMETER	N/A	N/A	N/A

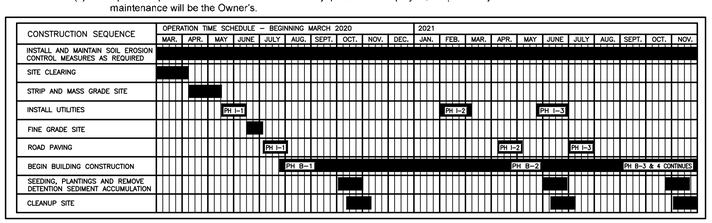
TYPICAL DETENTION BASIN OUTLET
NO SCALE

MAINTENANCE PLAN BUDGET

Annual inspection for sediment accumulation	$300.00
Removal of sediment accumulation every two (2) years, as needed	$700.00
Inspect for floatables and debris annually and after major storms	$100.00
Removal of floatables and debris annually and after major storms	$200.00
Inspect system for erosion annually and after major storms	$100.00
Re-establish permanent vegetation on eroded slopes, as needed	$500.00
Replacement of stone	$400.00
Mowing 0-2 times per year	$400.00
Inspect structural elements during wet weather and compare to as-built plans every two (2) years	$200.00
Make structural adjustments or replacements as determined by inspection, as needed	$500.00
Have professional engineer carry out emergency inspections upon identification of severe problems	$200.00
Total Annual Budget	**$3600.00**

Stormwater Management System Maintenance Plan

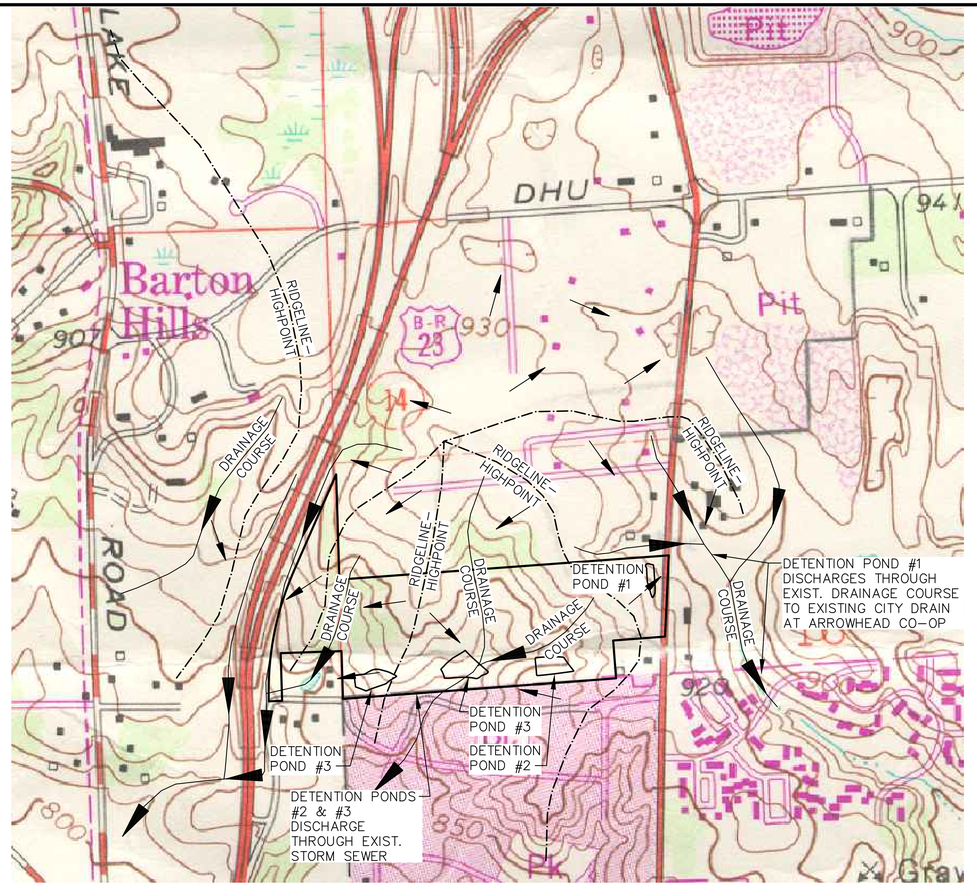
1. Responsibility for Maintenance:
   (a) During construction, it is the developer's responsibility to perform the maintenance.
   (b) Following construction, it will be the responsibility of Owner to perform the maintenance.
   (c) The Master Deed will specify that routine maintenance of the stormwater facilities must be completed within thirty (30) days of receipt of written notification that action is required, unless other acceptable arrangements are made with the Washtenaw County Water Resources Commissioner or successors. Emergency maintenance (i.e., when there is endangerment to public health, safety, or welfare) shall be performed immediately upon receipt of written notice. Should the Owner fail to act within these time frames, the County or successors may perform the needed maintenance and assess the costs against the Owner.
   (d) The use of chemicals are not allowed in the stormwater features or buffer zones with the following exception: invasive species may be treated with chemicals by a certified operator.
2. Source of Financing
   (a) The Owner shall be required to pay for all maintenance activities on a continuing basis.
3. Maintenance Tasks and Schedule
   (a) See the chart on the following page. The chart describes maintenance tasks to be performed by the Owner
   (b) Immediately following construction, the developer will have the stormwater management system inspected by an engineer to verify grades of the detention and filtration areas and to make recommendations for any necessary sediment removal.
   (c) Upon completion of home construction in any phase of the project, responsibility for maintenance will be the Owner's.



Barton Green

Permanent Maintenance Tasks and Schedule

Tasks	Components											
	Streets	Storm Sewer System	Catch Basin Sumps	Catch Basin Inlet Castings	Ditches & Swales	Weir/ Outflow Control Structures	Riprap	Sediment Forebays	Lake Areas	Wetland Discharge Area	Emergency Overflow	Schedule
Inspect for sediment accumulation		X	X		X	X		X	X	X		annually
Removal of sediment accumulation		X	X		X	X		X	X	X		every 2 years, as needed
Inspect for floatables and debris		X	X		X			X	X			annually
Cleaning of floatables and debris		X	X		X			X	X			annually
Inspection for erosion					X	X	X	X	X		X	annually
Re-establish permanent vegetation on eroded slopes					X	X	X	X	X			as needed
Clean streets	X											semi-annually
Mowing					X							0-2 times per year
Inspect storm system components during wet weather and compare to as-built plans (by professional engineer) and report to Barton Green Homeowners Assoc.	X	X	X	X	X	X	X	X	X		X	annually
Make adjustments or replacements as determined by annual wet weather inspection	X	X	X	X	X	X	X	X	X		X	as needed
Keep records of all inspections and maintenance activities and report to Barton Green Homeowners Assoc.	X	X	X	X	X	X	X	X	X	X	X	annually
Keep records of all costs for inspection, maintenance and repairs and report to Barton Green Homeowners Assoc.	X	X	X	X	X	X	X	X	X	X	X	annually



AREA WIDE DRAINAGE MAP
SCALE 1" = 400'

STORMWATER NARRATIVE

In general the stormwater flows from the north to the south toward the Huron River. The proposed North Sky project located directly north provides detention facilities and therefore minimizes offsite flows. The discharges from the North Sky site will be routed through the site.

There are three proposed detention basins on the site. The east portion of the site flows to the northeast and through a culvert across Pontiac Trail. After development, this portion of the site will flow to the easterly detention basin #1 and discharge at the agricultural rate of 0.15 cfs/acre and discharge to the location the existing drainage course currently drains across Pontiac Trial. Across Pontiac Trail, the discharge flows through a small wetland area before reaching a city drain near the Arrowwood Co–op.

The center portion of the site converges to a rolling swale that exits near the center of the south side of the site. This discharge location will be the same as the post developed site. This drainage will be detained in detention basin #2 before exiting the site. Detention basin #2 will discharge through existing storm sewer inlet at Skydale Drive.

The west portion of the site currently drains to a rolling swale exiting near the southwest corner of the site. The developed area on the west portion of the site will be detained in detention basin #3. Detention basin #3 has two different parts. The smaller pert is on the west side of the clubhouse area and the larger is located in the southwest corner of the site. The tow parts will be connected by storm an equalizing pipe and the water levels will rise and fall together. This detention basin will be discharged at agricultural flow through the existing storm sewer inlet at Skydale Drive as does the discharge from detention basin #2.

GRADING AND SOIL EROSION CONTROL NOTES

1. All soil erosion control measures shall comply with the City of Ann Arbor "Soil Erosion and Sedimentation Control" Ordinance, Title V, Chapter 63 of the City's code, Division VII.
2. Permanent seeding shall comply with specifications for "Permanent Seeding" as set forth in the Washtenaw County Standards. Basic requirements consist of 200 lbs/acre of seed, 500 lbs/acre of 10-10-10 analysis fertilizer (or equal), and straw mulch at a rate of 1.5 tons per acre.
3. Temporary seeding and seeding of the topsoil stockpile is to be per City of Ann Arbor Standard Specifications, Division VII Soil Erosion and Sedimentation Control, Section 4 Construction Methods, Item 4A Vegetative Protection and Mulching.
4. The grading contractor will be responsible for implementing the initial soil erosion control measures (curb inlet filter and silt fence) prior to commencing earthmoving operations. Other measure are to be implemented as soon as feasible in the construction sequence.
5. The utility contractor will be responsible for restoring any existing soil erosion control measure that is disturbed during utility construction.
6. Any lawn area which will have a slope steeper than 3:1 (3 horizontal to 1 vertical) shall be sodded and pegged or seeded and mulched using a soil erosion control fabric or blanket within 15 days after establishing the final grade.
7. All construction and material shall conform to City of Ann Arbor public services department standard specifications.
8. Standard details from the City of Ann Arbor Public Service Department have been included on these drawings. All work and materials shall conform to these standards. Omission of any standard from this document does not relieve the contractor of the responsibility of performing the work to the applicable standard.
9. The estimated quantity of earth excavation for this development is 70,000 cy of cut and 100,000 cy of fill. This quantity does not include trench cutfill, pavement base or undercut.
10. The estimated cost of soil erosion control shown on these plans is $29,300 (excluding seeding and sodding).
11. The estimated cost of protecting all exposed surfaces from erosion should construction cease is $23,100. (Re-spread 3" topsoil and surface with seed and mulch.)

SOIL EROSION IMPACT STATEMENT

1. The proposed use for this site is residential in nature. The impact that soil erosion will have on the immediate area is minimal and temporary.
2. All disturbed areas will be re-seeded and sodded upon completion of final grading.
3. The short term consequences of construction will be overcome by using the soil erosion control measures and practices as outlined on this plan and the grading plan. No long term consequences should be encountered.

MAINTENANCE REQUIREMENTS

1. 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.
2. All temporary gravel filters should be adjusted as to location per actual field conditions. The removal of trapped sediment and the cleanout or replacement of clogged stone may be necessary after each storm event during the project.
3. Only upon stabilization of all disturbed areas may the silt fence and temporary gravel filters be removed. Also, all storm sewers must be cleaned of all sediment.
4. All internal and external streets will be cleaned of any mud tracked from the project site immediately following each mud-tracking occurrence

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201 MAIN STREET, SUITE 1000
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COTTAGES AT BARTON GREEN

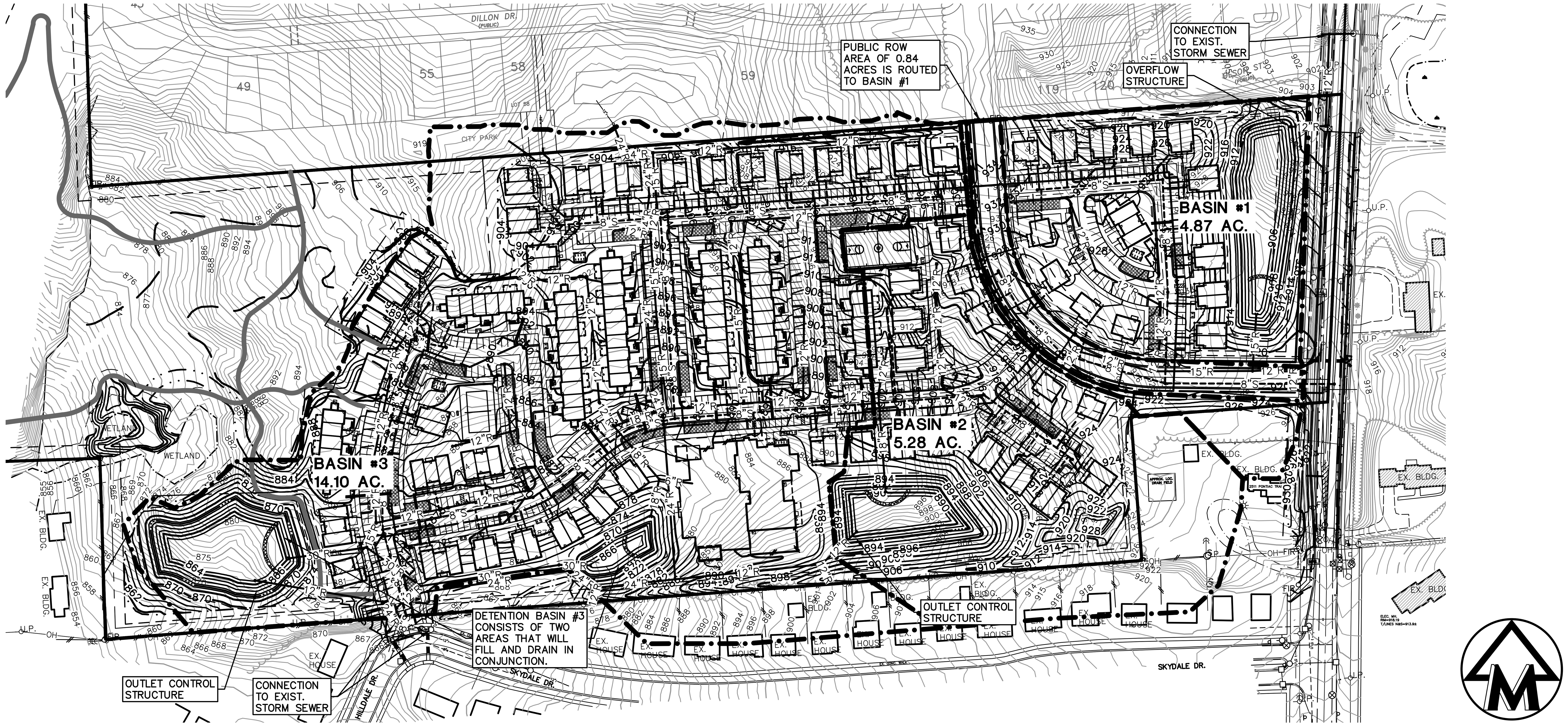
SITE PLAN
SOIL EROSION CONTROL DETAILS AND
STORMWATER MANAGEMENT PLAN

18

DATE: 5/25/17
SHEET 18 OF 49
CADD: DAG, WAJ
ENG: JCK
PM: SWB
TECH:
16223SWP.dwg
F94400

REVISIONS:	REV. DATE
REV. PER CITY COUNTY	1/23/18
REV. PER CITY REVIEW	6/7/19
REVISED PER AGREEMENT	

JOB No. 16223



SCALE: 1" = 100'

0 100 200 300

Storm Water Calculations

Detention Pond #1 - Northeast

1. **Post Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients**

Rational Method Variables

Cover Type	Soil Type	Area (sf)	Area (ac)	Runoff Coeff.	C x A (ac)
Pond		13500	0.31	1	0.31
Paved Surface		74600	1.71	0.95	1.63
Buildings		25020	0.57	0.95	0.55
Grass	B	99150	2.28	0.3	0.68
Grass	C		0.00	0.35	0.00
Grass	D		0.00	0.5	0.00
		212270		Total of C x A	3.17
				Area Total	4.873
				Weighted C	0.65

NCRS Variables (Pervious)

Cover Type	Soil Type	Area (sf)	Area (ac)	Curve Number	CN x A (ac)
Grass	B	99150	2.28	61	138.85
Grass	C	0	0.00	74	0.00
Grass	D	0	0.00	80	0.00
	Total Area =	99150		Total of C x A	138.85
				Area Total	2.28
				Weighted C	61.00

NCRS Variables (Impervious)

Cover Type	Soil Type	Area (sf)	Area (ac)	Curve Number	CN x A
Building		25020	0.57	98	56.29
Pavement		74600	1.71	98	167.83
Pond		13500	0.31	98	30.37
	Total Area =	113120		Total of C x A	254.49
				Area Total	2.60
				Weighted C	98.00

2. **First Flush Calculations**
   A. V_{ff} = (1"/12) x (43560 cf / 1 ac) x A x C
   V_{ff} = (1"/12) x (43560 cf / 1 ac) x 4.873 x 0.65 = 11,490 cf

3. **Standard Runoff Volume Calculations**
   Pre-development Bankfull Runoff Calculations (V_{bf-pre})
   A. 2 year/ 24 hour event P = 2.35 in
   B. Pre-developed land
   Meadow , type B soils, CN= 58 Area = 4.87 ac.
   Meadow , type C soils, CN= 71 Area = ac.
   Meadow , type D soils, CN= 78 Area = ac.
   Weighted CN CN = 58.00
   C. S = (1000/CN) - 10 S = 7.241
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 0.100 in
   E. Total Site Area (sf) excluding Self-Crediting BMP's 212,270 sf
   F. V_{bf-pre} = Q (1/12) Area 1,766 cf

4. **Standard Runoff Volume Calculations**
   Pervious Cover Post-development Bankfull Runoff Calculations ($V_{bf-per-post}$)
   A. 2 year/ 24 hour event P = 2.35 in
   B. Developed land
   Pervious Cover, Weighted CN CN = 61.00
   C. S = (1000/CN) - 10 S = 6.393
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 0.154 in
   E. Pervious Cover Area 99,150 sf
   F. $V_{bf-per-post}$ = Q (1/12) Area 1,270 cf

5. **Standard Runoff Volume Calculations**
   Impervious Cover Post-development Bankfull Runoff Calculations ($V_{bf-imp-post}$)
   A. 2 year/ 24 hour event P = 2.35 in
   B. Developed land
   Buildings CN = 98.00
   Pavement CN = 98.00
   Pond CN = 98.00
   Weighted CN = 98.00
   C. S = (1000/CN) - 10 S = 0.204
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 2.122 in
   E. Pervious Cover Area 113,120 sf
   F. $V_{bf-imp-post}$ = Q (1/12) Area 20,000 cf

6. **Standard Runoff Volume Calculations**
   Pervious Cover Post-development 100 Year Runoff Calculations ($V_{100-per-post}$)
   A. 100 year/ 24 hour event P = 5.11 in
   B. Developed land
   Pervious Cover, Weighted CN CN = 61.00
   C. S = (1000/CN) - 10 S = 6.393
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 1.436 in
   E. Pervious Cover Area 99,150 sf
   F. $V_{100-per-post}$ = Q (1/12) Area 11,862 cf

7. **Standard Runoff Volume Calculations**
   Impervious Cover Post-development 100 Year Runoff Calculations ($V_{100-imp-post}$)
   A. 100 year/ 24 hour event P = 5.11 in
   B. Developed land
   Buildings CN = 98
   Pavement CN = 98
   Pond CN = 98
   Weighted CN = 98.00
   C. S = (1000/CN) - 10 S = 0.204
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 4.873 in
   E. Pervious Cover Area 113,120 sf
   F. $V_{100-imp-post}$ = Q (1/12) Area 45,936 cf

8. **Time of Concentration**
   Due to small site size, Tc of 15 minutes will be used. 0.25 hours

9. **Runoff Summary and Onsite Infiltration Requirement**
   A. **Runoff Summary from Previous Worksheets**
   First Flush Volume V_{ff} = 11,490 cf
   Pre-Development Bankfull Volume V_{bf-pre} = 1,766 cf
   Pervious Cover Post-Development Bankfull Volume $V_{bf-per-post}$ = 1,270 cf
   Impervious Cover Post-Development Bankfull Volume $V_{bf-imp-post}$ = 20,000 cf
   Total Bankfull Volume $V_{bf-post}$ = 21,271 cf
   Pervious Cover Post-Development 100-yr Volume $V_{100-per-post}$ = 11,862 cf
   Impervious Cover Post-Development 100-yr Volume $V_{100-imp-post}$ = 45,936 cf
   Total 100-yr Volume $V_{100-post}$ = 57,798 cf

   B. **Determine Onsite Infiltration Requirement**
   Total Post-Development Bankfull Volume $V_{bf-per-post}$ = 21,271 cf
   Pre-Development Bankfull Volume V_{bf-pre} = 1,766 cf
   Bankfull Volume Difference 19,504 cf
   Infiltration Req't is greater of ΔBankfull Volume or First Flush 19,504 cf

10. **Detention Requirement**
   A. Q_p = 238.6 * Tc^-0.82 743.6 cfs/in-mi²
   B. Total Site Area Excluding "Self-Crediting" BMP's 4.87 ac
   C. Q_{100} = $Q_{100-per}$ + $Q_{100-imp}$ 6.309 in
   D. Peak Flow (PF) = (Q_p x Q_{100} x Area (ac)) / 640 PF = 35.7 cfs
   E. Δ = PF - 0.15 * Area (ac) = Δ = 35.0 cfs
   F. V_{det} = Δ / PF x V_{100} = V_{det} = 56,615 cf

11. **Applicable BMP's and Associated Volume Credits**

Proposed BMP	Area (sf)	Storage Vol. (cf) Surface	Storage Vol. (cf) Soil	Inf. Rate (in/hr)	Inf. Volume During Storm (cf)	Total Volume Reduction (cf)
Infiltration Basin	14,112	56,615	0	10.00	70,560	127,175

Total Volume Reduction Credit by Proposed Structural BMPs (cf) 127,175
Runoff Volume Infiltration Requirement (V_{inf}) from Worksheet 9 19,504
Runoff Volme Credit (cf) 107,671

13. **Summary**
   A. Stormwater Management Summary
   Minimum Onsite Infiltration Requirement, V_{inf}, cf 19,504
   Designed/Provided Infiltration Volume, $V_{inf-prov}$, cf 127,175
   % Minimum Required Infiltration Provided 652%
   Total Calculated Detention Volume, V_{det}, cf 56,615

Detention Outlet Calculations

A. First Flush Volume 11490 cf
Bankfull (2 year/24-hour storm Required) 21271 cf
100 - Year Storage Volume Required 56615 cf

B. Detention Volume Proposed

	Elev.	Area(sf)	Vol (cf)	Acc. Vol.(cf)
$Elev_b$ =	906.0	7685		
	907.0	10576	9092	9092
	908.0	13645	12078	21170
	909.0	16886	15237	36407
	910.0	20294	18564	54971
	911.0	23800	22024	76994
	Total:		76994 CF	

The following interpolations determine the pond water elevations for the three different storm events:

First Flush: (908.0 - 907.0) / (21170 - 9092) = (x - 907.0) / (11490 - 9092); x = $Elev_{ff}$ = 907.20

Bankfull Flood: (909.0 - 908.0) / (36407 - 21170) = (x - 908.0) / (21271 - 21170); x = $Elev_{bf}$ = 908.01

100 Yr. Flood: (911.0 - 910.0) / (76994 - 54971) = (x - 910.0) / (56615 - 54971); x = 910.07

These yield pond water elevations of 907.20 for the First Flush, 908.01 for the Bankfull Flood, and 910.07 for the 100 Yr. Storm Event

Green Streets infiltration volume requirement
Total public ROW Drainage Area 0.84 ac.
Pervious 0.25 ac.
Impervious 0.59 ac.

Standard Runoff Volume Calculations
Pervious Cover Post-development 10 Year Runoff ROW Calculations ($V_{10g-per}$)
A. 10 year/ 24 hour event P = 3.26 in
B. Developed land
Pervious Cover, Weighted CN CN = 61.00
C. S = (1000/CN) - 10 S = 6.393
D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 0.469 in
E. Pervious Cover Area 10,890 sf
F. $V_{10-per-post}$ = Q (1/12) Area 425 cf

Standard Runoff Volume Calculations
Impervious Cover Post-development 10 Year Runoff ROW Calculations ($V_{10g-imp}$)
A. 10 year/ 24 hour event P = 3.26 in
B. Developed land
Pavement CN = 98
C. S = (1000/CN) - 10 S = 0.204
D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 3.027 in
E. Pervious Cover Area 25,700 sf
F. $V_{10-imp-post}$ = Q (1/12) Area 6,484 cf

Total infiltration volume for public ROW green streets ordinance 6,909 cf

Due to the City's requirement for infiltration in the green streets ordinance, the project will propose to infiltrate the entire 100-year volume. The only outlet for detention pond 1 will be an overflow structure set at the 100-year storage

The total 100-year storage volume is = 56615 cf
The overflow structure will be placed at an elevation of 910.07
Using the infiltration rate of 10.00 in/hr the volume will infiltrate in a time of:

10.00 in/hr x 1 ft / 12 in x 14112 sf 11760 cf / hr

56615 cf / 11760 cf / hr = 4.8 hrs

Storm Water Calculations

Detention Pond #2 - South

1. **Post Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients**

Rational Method Variables

Cover Type	Soil Type	Area (sf)	Area (ac)	Runoff Coeff.	C x A (ac)
Pond		10364	0.24	1	0.24
Paved Surface		38120	0.88	0.95	0.83
Buildings		42800	0.98	0.95	0.93
Grass	B	138786	3.19	0.3	0.96
Grass	C		0.00	0.35	0.00
Grass	D		0.00	0.5	0.00
				Total of C x A	2.96
				Area Total	5.282
				Weighted C	0.56

NCRS Variables (Pervious)

Cover Type	Soil Type	Area (sf)	Area (ac)	Curve Number	CN x A (ac)
Grass	B	138786	3.19	61	194.35
Grass	C	0	0.00	74	0.00
Grass	D	0	0.00	80	0.00
	Total Area =	138786		Total of C x A	194.35
				Area Total	3.19
				Weighted C	61.00

NCRS Variables (Impervious)

Cover Type	Soil Type	Area (sf)	Area (ac)	Curve Number	CN x A
Building		42800	0.98	98	96.29
Pavement		38120	0.88	98	85.76
Pond		10364	0.24	98	23.32
	Total Area =	91284		Total of C x A	205.37
				Area Total	2.10
				Weighted C	98.00

2. **First Flush Calculations**
   A. V_{ff} = (1"/12) x (43560 cf / 1 ac) x A x C
   V_{ff} = (1"/12) x (43560 cf / 1 ac) x 5.2817 x 0.56 = 10,739 cf

3. **Standard Runoff Volume Calculations**
   Pre-development Bankfull Runoff Calculations (V_{bf-pre})
   A. 2 year/ 24 hour event P = 2.35 in
   B. Pre-developed land
   Meadow , type B soils, CN= 58 Area = 5.28 ac.
   Meadow , type C soils, CN= 71 Area = ac.
   Meadow , type D soils, CN= 78 Area = ac.
   Weighted CN CN = 58.00
   C. S = (1000/CN) - 10 S = 7.241
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 0.100 in
   E. Total Site Area (sf) excluding Self-Crediting BMP's 230,070 sf
   F. V_{bf-pre} = Q (1/12) Area 1,914 cf

4. **Standard Runoff Volume Calculations**
   Pervious Cover Post-development Bankfull Runoff Calculations ($V_{bf-per-post}$)
   A. 2 year/ 24 hour event P = 2.35 in
   B. Developed land
   Pervious Cover, Weighted CN CN = 61.00
   C. S = (1000/CN) - 10 S = 6.393
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 0.154 in
   E. Pervious Cover Area 138,786 sf
   F. $V_{bf-per-post}$ = Q (1/12) Area 1,778 cf

5. **Standard Runoff Volume Calculations**
   Impervious Cover Post-development Bankfull Runoff Calculations ($V_{bf-imp-post}$)
   A. 2 year/ 24 hour event P = 2.35 in
   B. Developed land
   Buildings CN = 98.00
   Pavement CN = 98.00
   Pond CN = 98.00
   Weighted CN = 98.00
   C. S = (1000/CN) - 10 S = 0.204
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 2.122 in
   E. Pervious Cover Area 91,284 sf
   F. $V_{bf-imp-post}$ = Q (1/12) Area 16,140 cf

6. **Standard Runoff Volume Calculations**
   Pervious Cover Post-development 100 Year Runoff Calculations ($V_{100-per-post}$)
   A. 100 year/ 24 hour event P = 5.11 in
   B. Developed land
   Pervious Cover, Weighted CN CN = 61.00
   C. S = (1000/CN) - 10 S = 6.393
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 1.436 in
   E. Pervious Cover Area 138,786 sf
   F. $V_{100-per-post}$ = Q (1/12) Area 16,604 cf

7. **Standard Runoff Volume Calculations**
   Impervious Cover Post-development 100 Year Runoff Calculations ($V_{100-imp-post}$)
   A. 100 year/ 24 hour event P = 5.11 in
   B. Developed land
   Buildings CN = 98
   Pavement CN = 98
   Pond CN = 98
   Weighted CN = 98.00
   C. S = (1000/CN) - 10 S = 0.204
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 4.873 in
   E. Pervious Cover Area 91,284 sf
   F. $V_{100-imp-post}$ = Q (1/12) Area 37,069 cf

8. **Time of Concentration**
   Due to small site size, Tc of 15 minutes will be used. 0.25 hours

9. **Runoff Summary and Onsite Infiltration Requirement**
   A. **Runoff Summary from Previous Worksheets**
   First Flush Volume V_{ff} = 10,739 cf
   Pre-Development Bankfull Volume V_{bf-pre} = 1,914 cf
   Pervious Cover Post-Development Bankfull Volume $V_{bf-per-post}$ = 1,778 cf
   Impervious Cover Post-Development Bankfull Volume $V_{bf-imp-post}$ = 16,140 cf
   Total Bankfull Volume $V_{bf-post}$ = 17,918 cf
   Pervious Cover Post-Development 100-yr Volume $V_{100-per-post}$ = 16,604 cf
   Impervious Cover Post-Development 100-yr Volume $V_{100-imp-post}$ = 37,069 cf
   Total 100-yr Volume $V_{100-post}$ = 53,673 cf

   B. **Determine Onsite Infiltration Requirement**
   Total Post-Development Bankfull Volume $V_{bf-per-post}$ = 17,918 cf
   Pre-Development Bankfull Volume V_{bf-pre} = 1,914 cf
   Bankfull Volume Difference 16,003 cf
   Infiltration Req't is greater of ΔBankfull Volume or First Flush 16,003 cf

10. **Detention Requirement**
   A. Q_p = 238.6 * Tc^-0.82 743.6 cfs/in-mi²
   B. Total Site Area Excluding "Self-Crediting" BMP's 5.28 ac
   C. Q_{100} = $Q_{100-per}$ + $Q_{100-imp}$ 6.309 in
   D. Peak Flow (PF) = (Q_p x Q_{100} x Area (ac)) / 640 PF = 38.7 cfs
   E. Δ = PF - 0.15 * Area (ac) = Δ = 37.9 cfs
   F. V_{det} = Δ / PF x V_{100} = V_{det} = 52,574 cf

11. **Applicable BMP's and Associated Volume Credits**

Proposed BMP	Area (sf)	Storage Vol. (cf) Surface	Storage Vol. (cf) Soil	Inf. Rate (in/hr)	Inf. Volume During Storm (cf)	Total Volume Reduction (cf)
Infiltration Basin	8,152	17918	0	7.00	28,532	46,450

Total Volume Reduction Credit by Proposed Structural BMPs (cf) 46,450
Runoff Volume Infiltration Requirement (V_{inf}) from Worksheet 9 16,003
Runoff Volme Credit (cf) 30,446

13. **Summary**
   A. Stormwater Management Summary
   Minimum Onsite Infiltration Requirement, V_{inf}, cf 16,003
   Designed/Provided Infiltration Volume, $V_{inf-prov}$, cf 46,450
   % Minimum Required Infiltration Provided 290%
   Total Calculated Detention Volume, V_{det}, cf 52,574
   Net Required Detention Volume, V_{det} - $V_{inf-prov}$, cf 6,125

Detention Outlet Calculations

A. First Flush Volume 10739 cf
Infiltration Volume Required 16003 cf
Bankfull (2 year/24-hour storm Required) 17918 cf
100 - Year Storage Volume Required 6125 cf

B. Detention Volume Proposed

	Elev.	Area(sf)	Vol (cf)	Acc. Vol.(cf)	Detained Vol.(cf)
$Elev_b$ =	889.0	5940			
	890.0	7822	6859	6859	0
	891.0	9919	8850	15709	0
	891.20	10364	2028	17737	0
	892.0	12230	11054	26764	8846
	893.0	14752	13471	40235	22317
	894.0	17468	16091	56326	38408
	895.0	20348	18890	75215	57298
	896.0	23386	21849	97065	79147
	Total:		97065 CF		

The following interpolations determine the pond water elevations for the three different storm events:

First Flush: (891.0 - 890.0) / (15709 - 6859) = (x - 890.0) / (10739 - 6859); x = $Elev_{ff}$ = 890.44

Bankfull Flood: (892.0 - 891.0) / (26764 - 15709) = (x - 891.0) / (17918 - 15709); x = $Elev_{bf}$ = 891.20

100 Yr. Flood: (892.0 - 891.20) / (8846 - 0) = (x - 891.2) / (6125 - 0); x = 891.75

These yield pond water elevations of 890.44 for the First Flush, 891.20 for the Bankfull Flood, and 891.75 for the 100 Yr. Storm Event

C. Outflow Structure

The Detention Pond will have a single-stage outlet. Both the first-flush volume as well as the bankfull volume storm will be retained and allowed to infiltrate. The outlet structure will be designed to detain and discharge the 100 year storm in a timeframe not to exceed 72 hours. The perforated manhole will be surrounded by a stone filter.

1. First Flush
The change in bankfull storm volumes will be retained and will infiltrate. The estimated time for this volume to infiltrate will be as follows:
Volume = 16003 cf
Infiltration rate = 7.00 in / hr
Area of Infiltration = 8,152 sf
Time = Volume / (rate x area)
T = 16003 cf / (7.00 x 1 ft / 12 in x 8,152) sf =
T = 3.37 hrs

2. 100 Year Storm Volume:
The bankfull volume is very close to the volume required to infiltrate for the entire site, therefore no holes will be proposed to discharge the bankfull storm.
The volume to of the 100 year storm will discharge in a time frame not to exceed 72 hours.
The 100 year volume of: 6125 cf will discharge over a target release time of 60 hours.
Q_{100} = (1/60 hrs) x (1 hr./3600 sec) x 6125 CF = 0.03 CFS
Orifice area at Elev. 891.20 to produce this average discharge:
H = 0.55 FT
H_A = (2/3 H) = 0.37 FT
Area of
Orifice = Q_{ff} / (0.62 x (2xgxH_A)^0.5) = 0.0094 SF
Where, H = Head
H_A = Average Head
g = Gravitational Const (32.2 fps)
Area of 1.25 " hole = 0.0085 SF
No. of 1.25 " hole(s) = 0.0094 / 0.0085 = 1.10 hole(s)

Therefore, use
One(1) 1.25 " hole(s) at Elev. = 891.20

The detention time for
One(1) 1.25 " hole(s) is:
$Q(new)_{100}$ = $A(new)_{ff}$ x (0.62(2gH_A)^0.5
$Q(new)_{100}$ = (1 x 0.0085) x (0.62(2gH_A)^0.5
$Q(new)_{100}$ = 0.03 CFS
$T(new)_{100}$ = V_{ff} /$Q(new)_{ff}$
$T(new)_{100}$ = 6125 /(0.03 x 3600) = 66.0 hrs.
The maximum allowable discharge of 0.15 cfs / acre is calculated at:
5.3 acres x 0.15 cfs / acre = 0.79 cfs
The actual discharge of 0.03 cfs is less than the allowable.

Storm Water Calculations

Detention Pond #3 - SW

1. **Post Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients**

Rational Method Variables

Cover Type	Soil Type	Area (sf)	Area (ac)	Runoff Coeff.	C x A (ac)
Pond		23000	0.53	1	0.53
Paved Surface		169350	3.89	0.95	3.69
Buildings		124110	2.85	0.95	2.71
Grass	B	297800	6.84	0.3	2.05
Grass	C		0.00	0.35	0.00
Grass	D		0.00	0.5	0.00
		614260		Total of C x A	8.98
				Area Total	14.101
				Weighted C	0.637

NCRS Variables (Pervious)

Cover Type	Soil Type	Area (sf)	Area (ac)	Curve Number	CN x A (ac)
Grass	B	297800	6.84	61	417.03
Grass	C	0	0.00	74	0.00
Grass	D	0	0.00	80	0.00
	Total Area =	297800		Total of C x A	417.03
				Area Total	6.84
				Weighted C	61.00

NCRS Variables (Impervious)

Cover Type	Soil Type	Area (sf)	Area (ac)	Curve Number	CN x A
Building		124110	2.85	98	279.22
Pavement		169350	3.89	98	381.00
Pond		23000	0.53	98	51.74
	Total Area =	316460		Total of C x A	711.96
				Area Total	7.26
				Weighted C	98.00

2. **First Flush Calculations**
   A. V_{ff} = (1"/12) x (43560 cf / 1 ac) x A x C
   V_{ff} = (1"/12) x (43560 cf / 1 ac) x 14.101 x 0.637 = 32,594 cf

3. **Standard Runoff Volume Calculations**
   Pre-development Bankfull Runoff Calculations (V_{bf-pre})
   A. 2 year/ 24 hour event P = 2.35 in
   B. Pre-developed land
   Meadow , type B soils, CN= 58 Area = 14.10 ac.
   Meadow , type C soils, CN= 71 Area = ac.
   Meadow , type D soils, CN= 78 Area = ac.
   Weighted CN CN = 58.00
   C. S = (1000/CN) - 10 S = 7.241
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 0.100 in
   E. Total Site Area (sf) excluding Self-Crediting BMP's 614,260 sf
   F. V_{bf-pre} = Q (1/12) Area 5,111 cf

4. **Standard Runoff Volume Calculations**
   Pervious Cover Post-development Bankfull Runoff Calculations ($V_{bf-per-post}$)
   A. 2 year/ 24 hour event P = 2.35 in
   B. Developed land
   Pervious Cover, Weighted CN CN = 61.00
   C. S = (1000/CN) - 10 S = 6.393
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 0.154 in
   E. Pervious Cover Area 297,800 sf
   F. $V_{bf-per-post}$ = Q (1/12) Area 3,816 cf

5. **Standard Runoff Volume Calculations**
   Impervious Cover Post-development Bankfull Runoff Calculations ($V_{bf-imp-post}$)
   A. 2 year/ 24 hour event P = 2.35 in
   B. Developed land
   Buildings CN = 98.00
   Pavement CN = 98.00
   Pond CN = 98.00
   Weighted CN = 98.00
   C. S = (1000/CN) - 10 S = 0.204
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 2.122 in
   E. Pervious Cover Area 316,460 sf
   F. $V_{bf-imp-post}$ = Q (1/12) Area 55,952 cf

6. **Standard Runoff Volume Calculations**
   Pervious Cover Post-development 100 Year Runoff Calculations ($V_{100-per-post}$)
   A. 100 year/ 24 hour event P = 5.11 in
   B. Developed land
   Pervious Cover, Weighted CN CN = 61.00
   C. S = (1000/CN) - 10 S = 6.393
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 1.436 in
   E. Pervious Cover Area 297,800 sf
   F. $V_{100-per-post}$ = Q (1/12) Area 35,628 cf

7. **Standard Runoff Volume Calculations**
   Impervious Cover Post-development 100 Year Runoff Calculations ($V_{100-imp-post}$)
   A. 100 year/ 24 hour event P = 5.11 in
   B. Developed land
   Buildings CN = 98
   Pavement CN = 98
   Pond CN = 98
   Weighted CN = 98.00
   C. S = (1000/CN) - 10 S = 0.204
   D. Q = (P - 0.2S)^2 /(P + 0.8S) Q = 4.873 in
   E. Pervious Cover Area 316,460 sf
   F. $V_{100-imp-post}$ = Q (1/12) Area 128,509 cf

8. **Time of Concentration**
   Due to small site size, Tc of 15 minutes will be used. 0.25 hours

9. **Runoff Summary and Onsite Infiltration Requirement**
   A. **Runoff Summary from Previous Worksheets**
   First Flush Volume V_{ff} = 32,594 cf
   Pre-Development Bankfull Volume V_{bf-pre} = 5,111 cf
   Pervious Cover Post-Development Bankfull Volume $V_{bf-per-post}$ = 3,816 cf
   Impervious Cover Post-Development Bankfull Volume $V_{bf-imp-post}$ = 55,952 cf
   Total Bankfull Volume $V_{bf-post}$ = 59,768 cf
   Pervious Cover Post-Development 100-yr Volume $V_{100-per-post}$ = 35,628 cf
   Impervious Cover Post-Development 100-yr Volume $V_{100-imp-post}$ = 128,509 cf
   Total 100-yr Volume $V_{100-post}$ = 164,137 cf

   B. **Determine Onsite Infiltration Requirement**
   Total Post-Development Bankfull Volume $V_{bf-per-post}$ = 59,768 cf
   Pre-Development Bankfull Volume V_{bf-pre} = 5,111 cf
   Bankfull Volume Difference 54,656 cf
   Infiltration Req't is greater of ΔBankfull Volume or First Flush 54,656 cf

10. **Detention Requirement**
   A. Q_p = 238.6 * Tc^-0.82 743.6 cfs/in-mi²
   B. Total Site Area Excluding "Self-Crediting" BMP's 14.10 ac
   C. Q_{100} = $Q_{100-per}$ + $Q_{100-imp}$ 6.309 in
   D. Peak Flow (PF) = (Q_p x Q_{100} x Area (ac)) / 640 PF = 103.4 cfs
   E. Δ = PF - 0.15 * Area (ac) = Δ = 101.3 cfs
   F. V_{det} = Δ / PF x V_{100} = V_{det} = 160,778 cf

11. **Applicable BMP's and Associated Volume Credits**

Proposed BMP	Area (sf)	Storage Vol. (cf) Surface	Storage Vol. (cf) Soil	Inf. Rate (in/hr)	Inf. Volume During Storm (cf)	Total Volume Reduction (cf)
Infiltration Basin	16,684	59768	0	10.00	83,420	143,188

Total Volume Reduction Credit by Proposed Structural BMPs (cf) 143,188
Runoff Volume Infiltration Requirement (V_{inf}) from Worksheet 9 54,656
Runoff Volme Credit (cf) 88,532

13. **Summary**
   A. Stormwater Management Summary
   Minimum Onsite Infiltration Requirement, V_{inf}, cf 54,656
   Designed/Provided Infiltration Volume, $V_{inf-prov}$, cf 143,188
   % Minimum Required Infiltration Provided 262%
   Total Calculated Detention Volume, V_{det}, cf 160,778
   Net Required Detention Volume, V_{det} - $V_{inf-prov}$, cf 17,590

Detention Outlet Calculations

A. First Flush Volume 32594 cf
Infiltration Volume Required 54656 cf
Bankfull (2 year/24-hour storm Required) 59768 cf
100 - Year Storage Volume Required 17590 cf

B. Detention Volume Proposed

	Elev.	Area(sf)	Vol (cf)	Acc. Vol.(cf)	Detained Vol. (cf)
$Elev_b$ =	864.0	10405			
	865.0	12649	11509	11509	0
	866.0	16427	14497	26006	0
	867.0	20117	18241	44247	0
	867.70	22964	15108	59354	0
	868.0	24173	22114	66361	6593
	869.0	28618	26364	92725	32957
	870.0	33416	30986	123711	63943
	Total:		138818 CF		

The following interpolations determine the pond water elevations for the three different storm events:

First Flush: (867.0 - 866.0) / (44247 - 26006) = (x - 866.0) / (32594 - 26006); x = $Elev_{ff}$ = 866.36

Bankfull Flood: (868.0 - 867.0) / (66361 - 44247) = (x - 867.0) / (59768 - 44247); x = $Elev_{bf}$ = 867.70

100 Yr. Flood: (870.0 - 869.0) / (63943 - 32957) = (x - 869.0) / (17590 - 32957); x = 868.50

These yield pond water elevations of 866.36 for the First Flush, 867.70 for the Bankfull Flood, and 868.50 for the 100 Yr. Storm Event

C. Outflow Structure

The Detention Pond will have a single-stage outlet. Both the first-flush volume as well as the bankfull volume storm will be retained and allowed to infiltrate. The outlet structure will be designed to detain and discharge the 100 year storm in a timeframe not to exceed 72 hours. The perforated manhole will be surrounded by a stone filter.

1. First Flush.
The first flush and bankfull storm volumes will be retained and will infiltrate. The estimated time for the first flush volume to infiltrate will be as follows:
Volume = 59768 cf
Infiltration rate = 10.00 in / hr
Area of Infiltration = 16,684 sf
Time = Volume / (rate x area)
T = 59768 cf / (10.00 x 1 ft / 12 in x 16,684) sf =
T = 4.30 hrs

2. 100 Year Storm Volume:
The bankfull volume is very close to the volume required to infiltrate for the entire site, therefore no holes will be proposed to discharge the bankfull storm.
The volume to of the 100 year storm will discharge in a time frame not to exceed 72 hours.
The 100 year volume of: 17590 cf will discharge over a target release time of 60 hours.
Q_{100} = (1/60 hrs) x (1 hr./3600 sec) x 17590 CF = 0.08 CFS
Orifice area at Elev 867.70 to produce this average discharge:
H = 0.80 FT
H_A = (2/3 H) = 0.53 FT
Area of
Orifice = Q_{ff} / (0.62 x (2xgxH_A)^0.5) = 0.0224 SF
Where, H = Head
H_A = Average Head
g = Gravitational Const (32.2 fps)
Area of 0.88 " hole = 0.0042 SF
No. of 0.88 " hole(s) = 0.0224 / 0.0042 = 5.36 hole(s)

Therefore, use
Five(5) 0.88 " hole(s) at Elev. = 867.70

The detention time for
Five(5) 0.88 " hole(s) is:
$Q(new)_{100}$ = $A(new)_{ff}$ x (0.62(2gH_A)^0.5
$Q(new)_{100}$ = (5 x 0.0042) x (0.62(2gH_A)^0.5
$Q(new)_{100}$ = 0.08 CFS
$T(new)_{100}$ = V_{ff} /$Q(new)_{ff}$
$T(new)_{100}$ = 17590 /(0.08 x 3600) = 64.3 hrs.
The maximum allowable discharge of 0.15 cfs / acre is calculated at:
14.1 acres x 0.15 cfs / acre = 2.12 cfs
The actual discharge of 0.08 cfs is less than the allowable.

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COTTAGES AT BARTON GREEN

SITE PLAN
STORMWATER MANAGEMENT PLAN

19

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

REV. PER CITY 1/23/18

JOB No. **16223**

REVISIONS:	REV. DATE	
REV. PER CITY/COUNTY	7/12/17	CADD: DAG, WAJ
REV. PER COUNTY	8/16/17	ENG: JCA
PER WCWRC	9/25/17	PM: SWB
REV. PER CITY	10/12/17	TECH:
PER WCWRC	10/17/17	16223SMP.dwg
REV. PER CITY	11/15/17	FB#460

DATE: 5/25/17
SHEET 19 OF 49

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Site Construction Phasing Narrative

We have depicted the phasing for infrastructure (right), and building construction (right-lower). The phasing for the infrastructure, roads and utilities will be incorporated into infrastructure phases
I-1 to I-3 as defined herein. The detailed engineering plans will provide greater detail for the phasing of these infrastructure improvements.

Grading

The entire site will be mass graded in one phase. Excess topsoil will be stockpiled in the westerly portion of the site. See sheet 15 for stockpile location. All areas disturbed during grading activities will be stabilized until the time that building construction occurs.

Roads

The public and private roads highlighted in the above detail will be constructed in phases I-1 through I-3. The road construction will closely resemble the building phases B-1 through B-4.

Utilities

The underground utilities displayed in the above detail shall be constructed during infrastructure phases I-1, I-2 and I-3. All three detention basins will be constructed in phase I-1. Detention basin construction will include stabilization, discharge structures and outlet piping. Temporary swales will be graded as needed to direct runoff to basins.

Watermain will be constructed per city of Ann Arbor requirements for water services and fire protection. The initial phase will include the watermain loop in along St. Regis Drive and the loop through building phase B-1. Phase I-2 will complete the loop from St. Regis Drive to the connection point in Skydale Drive. The remainder of the water main will be installed in the associated phase depicted in the above detail. Offsite water main improvements shown of sheet 13 will be completed as part of Phase I-1 construction. The city's engineering department will approve all watermain phasing during the detailed engineering review process.

Sanitary sewer for the site all drains in two directions. Phases I-1 will drain to the east to Pontiac Trail. Phases I-2 and I-3 will connect to the existing sewer on Skydale Drive. The city's engineering department will approve all sanitary sewer phasing during the detailed engineering review process.

Storm Water Drainage

Phase I-1 will construct all detention basins as well as the storm sewer in St. Regis Way to the basin as well as the outlet control structure for all three basins. Temporary swales will be run along south side of site as depicted on the Infrastructure Phasing Plan. The storm sewer along the south loop road to the basins and the basin inlets to basins 2 and 3 will be constructed in phase I-2. The connection of the storm sewer to the outlet of the North Sky detention basin will be constructed in phase I-2. The remainder of the storm sewer serving phase I-3 will be constructed in phase I-3.

Building Phases (B-1 TO B-4)

The building construction is divided into building phases B-1 to B-4. Each building phase is depicted in the detail below. The building phases shall consist of buildings, driveways and minor private storm sewer construction. Landscaping and final grading shall occur during each of the sub-phases.

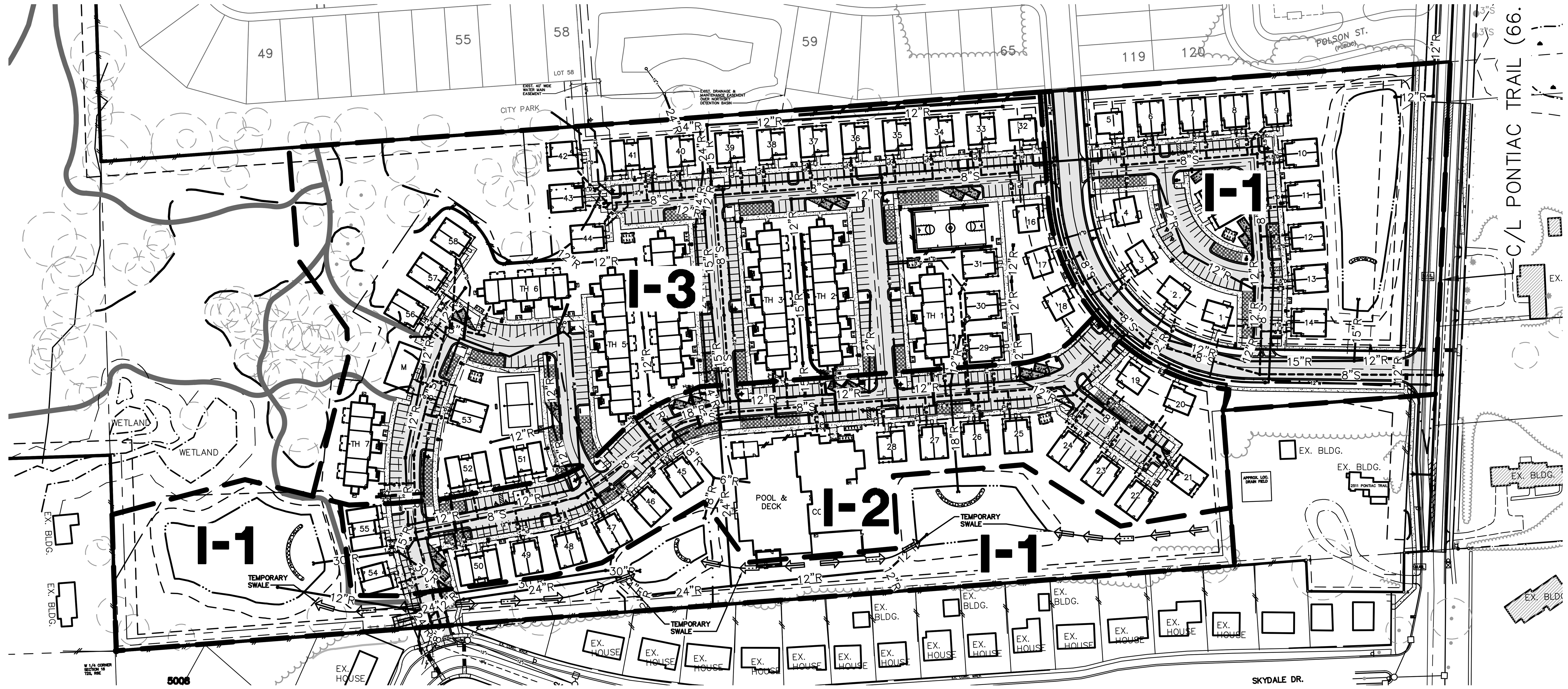
Phase 1: Buildings 1 through 15.
Phase 2: Buildings 19 through 28. The Community Building, deck and pools will be constructed in Phase 2 as well.
Phase 3: Buildings 16 through 18, 29 through 46, and TH1 through TH4.
Phase 4: Buildings 47 through 58 and TH5 through TH7. The Maintenance Building will be constructed in Phase 4 as well.

SEQUENCE OF CONSTRUCTION

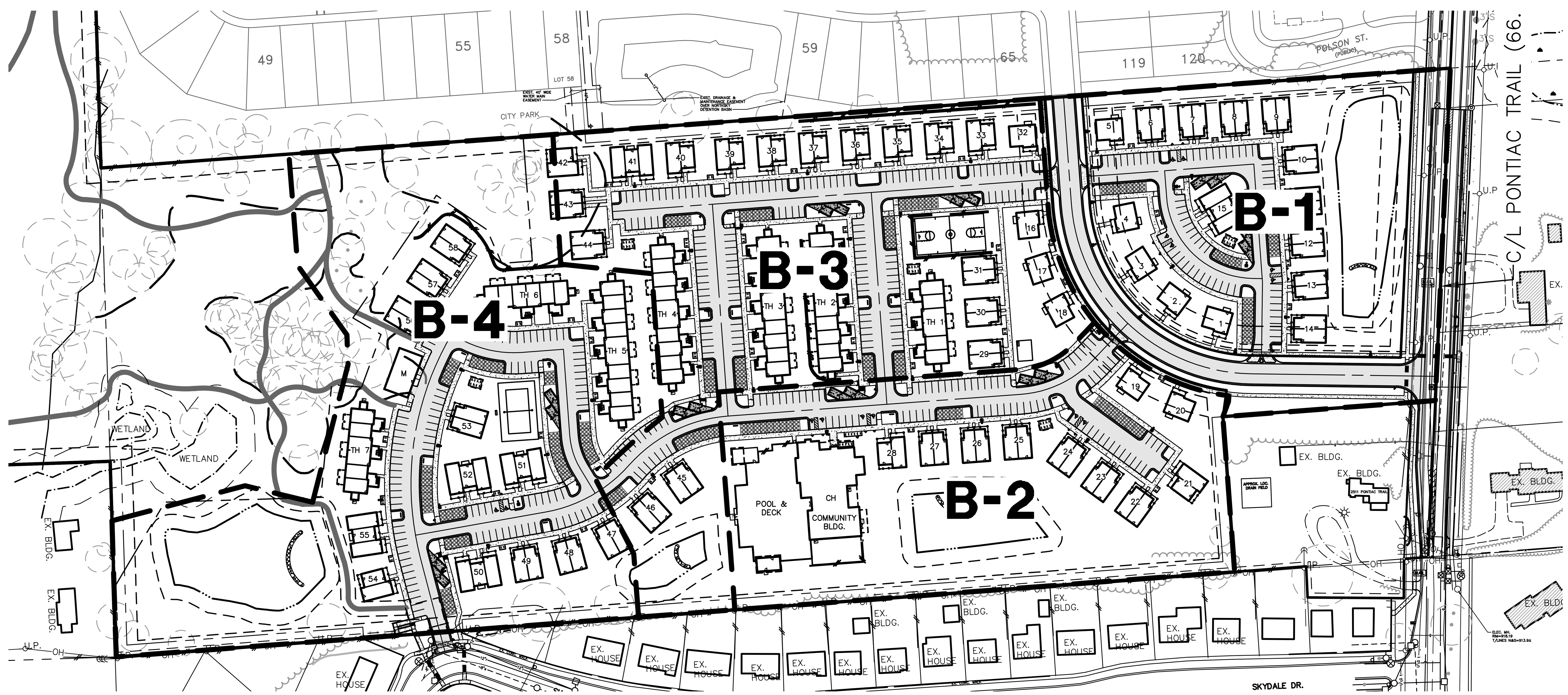
1. Identify tree clearing limits and install natural features protection fencing. For entire site clearing and protection.
2. Remove tree stems (Hydro-ax), across entire site.
3. Install all perimeter soil erosion and sedimentation control measures including mud tracking surfaces throughout entire site.
4. Begin Site Grading:
   - Grub (remove tree root systems) and begin mass grading site, stockpile topsoil in Phase B-4 area (install temporary erosion controls around pile).
   - Construct all detention ponds with inlet and outlet structures, rip-rap, and reinforced overflow. Have engineers furnish the City, in writing, verification that the pond and accompanying structures have been built and will function per plan.
   - Complete mass grading in infrastructure Phase I-1. Grade temporary swales along south side of site to direct all site runoff to detention basins.
   - Stabilize the detention ponds, including the bottom, side slopes, swales and berms with temporary or permanent vegetation.
5. Install sanitary sewer to service infrastructure phase I-1 stub into phase I-2.
6. Install water main and storm sewer to serve phase I-1 and stub into phase I-2. Install inlet filters on storm inlets. Complete offsite water main modifications.
7. Complete testing of underground utilities in infrastructure phase I-1.
8. Install curbing and subbase in areas to be paved, then install leveling coat of asphalt throughout phase.
9. Begin building construction in phase B-1.
10. Install water main, sanitary sewer and storm sewer construction in phase I-2.
11. Complete testing of underground utilities in infrastructure phase I-2.
12. Install curbing and subbase in areas to be paved, then install leveling coat of asphalt throughout phase.
13. Monitor and maintain all erosion controls through construction sequence.
14. Final grade site and redistribute topsoil on a building phase by phase basis. Stabilize all disturbed soils with sod, hydroseed application, or seeding under a crimped straw mulch.
15. Plant landscaping trees and other plantings as per phasing.
16. Remove all temporary soil erosion and sedimentation controls after vegetation has rooted to the point of permanently stabilizing the soils on a building phase by phase basis and when building construction in phase 1 is complete at phase 1 perimeter measures.
17. Install sanitary sewer system and storm sewer system with inlet filter controls in phase 2.
18. Install curbing and subbase of areas to be paved, then install leveling coat of asphalt throughout phase B-2.
19. Begin building construction in phase B2.
20. Monitor and maintain all erosion controls through construction sequence.
21. Final grade site and redistribute topsoil on a building phase by phase basis. Stabilize all disturbed soils with sod, hydroseed application, or seeding under a crimped straw mulch.
22. Plant landscaping trees and permanent plantings on a building phase by phase basis.
23. Remove all temporary soil erosion and sedimentation controls after vegetation has rooted to the point of permanently stabilizing the soils on a building phase by phase basis and when building construction in phase 2 is complete at phase 2 perimeter measures.
24. Install sanitary sewer system and storm sewer system with inlet filter controls in phase I-3.
25. Install water main, fire hydrant and other utilities in phase I-3.
26. Install curbing and subbase of areas to be paved, then install leveling coat of asphalt throughout phase B-3.
27. Begin building construction in phase B-3.
28. Monitor and maintain all erosion controls through construction sequence.
29. Final grade site and redistribute topsoil on a building phase by phase basis. Stabilize all disturbed soils with sod, hydroseed application, or seeding under a crimped straw mulch.
30. Plant landscaping trees and permanent plantings on a building phase by phase basis.
31. Remove all temporary soil erosion and sedimentation controls after vegetation has rooted to the point of permanently stabilizing the soils on a building phase by phase basis and when building construction in phase 3 is complete at phase 3 perimeter measures.
32. Install sanitary sewer system and storm sewer system with inlet filter controls in phase I-4.
33. Install water main, fire hydrant and other utilities in phase I-4.
34. Install curbing and subbase of areas to be paved, then install leveling coat of asphalt throughout phase B-4.
35. Begin building construction in phase B-4.
36. Monitor and maintain all erosion controls through construction sequence.
37. Final grade site and redistribute topsoil on a building phase by phase basis. Stabilize all disturbed soils with sod, hydroseed application, or seeding under a crimped straw mulch.
38. Plant landscaping trees and permanent plantings on a building phase by phase basis.
39. Remove all sediment accumulation in detention basins and storm sewer system.
40. Remove all temporary soil erosion and sedimentation controls after vegetation has rooted to the point of permanently stabilizing the soils on a building phase by phase basis and when building construction in phase 4 is complete at phase 4 perimeter measures.

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

SCALE: 1" = 100'
0 100 200 300



INFRASTRUCTURE PHASING PLAN



BUILDING PHASING PLAN

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COTTAGES AT BARTON GREEN

SITE PLAN
PHASING NARRATIVE & CONSTRUCTION SEQUENCE

20

JOB No. 16223

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	7/12/17
REV. PER COUNTY	8/16/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REV. PER CITY	2/8/18

DATE: 5/25/17
SHEET 20 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
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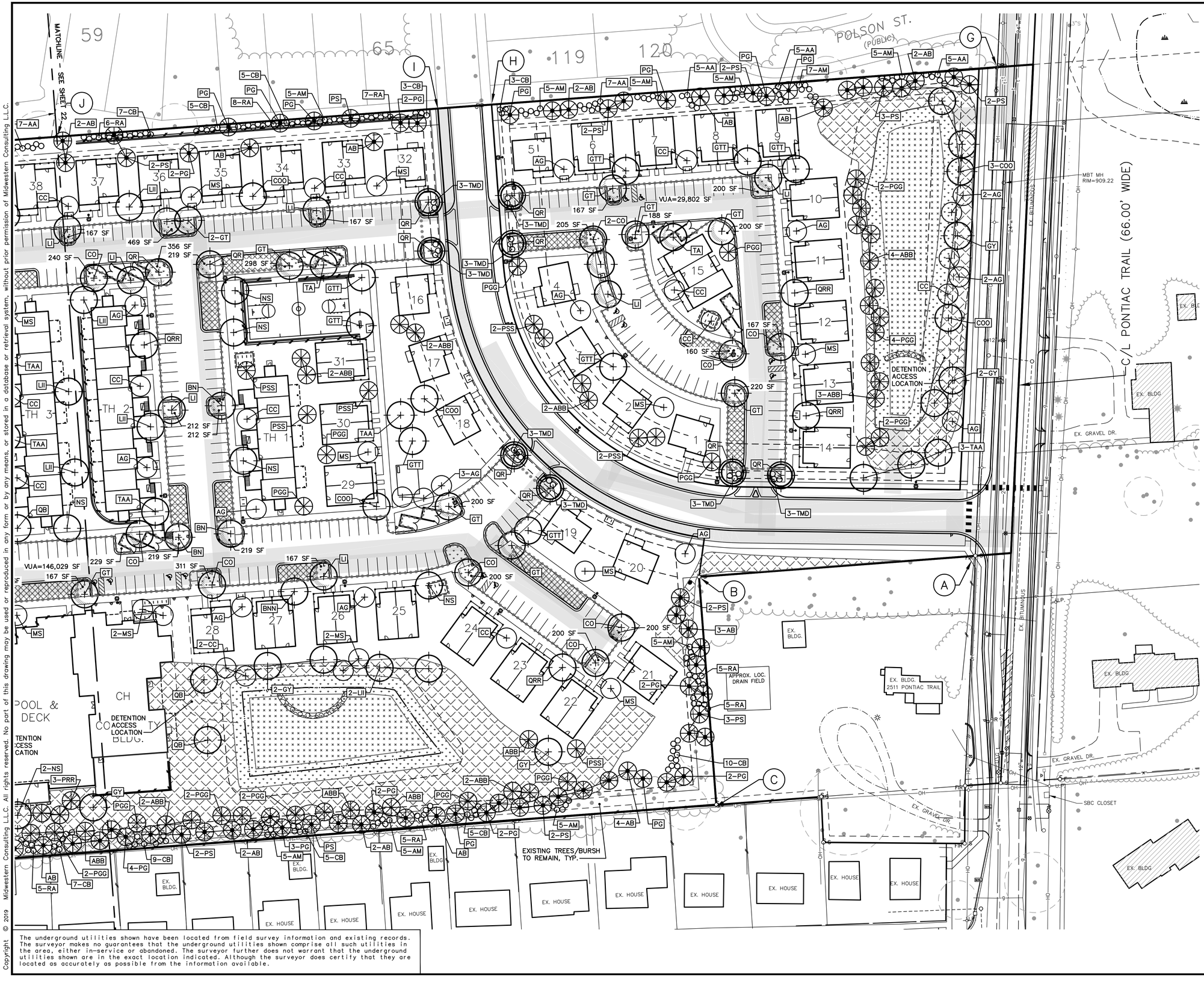

SCALE: 1" = 40'

0 40 80 120

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LEGEND

- EXIST. CONTOUR
- PROP. CONTOUR
- EXIST. UTILITY POLE
- EXIST. UTILITY POLE W/ TRANS.
- GUY WIRE
- EXIST. OVERHEAD UTILITY LINE
- EXIST. LIGHT POLE
- EXIST. TELEPHONE LINE
- 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. GATE VALVE IN WELL
- PROP. GATE VALVE IN WELL
- EXIST. CURB STOP & BOX
- PROP. CURB STOP & BOX
- REDUCER
- EXIST. BLOW-OFF
- PROP. BLOW-OFF
- POST INDICATOR VALVE
- THRUST BLOCK
- PROP. KNOXBOX
- EXIST. STORM SEWER
- PROP. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- PROP. CATCH BASIN OR INLET
- EXIST. BEEHIVE INLET
- PROP. BEEHIVE INLET
- PROP. ROOF DRAIN
- END SECTION
- HEAD WALL
- CULVERT
- PROP. DOWNSPOUT
- EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
- EXIST. CLEANOUT
- PROP. CLEANOUT
- C/L OF DITCH
- SIGN
- SINGLE TREE
- TREE OR BRUSH LIMIT
- FENCE
- LIMITS OF DISTURBANCE
- NO TREE ZONE

LANDSCAPE LEGEND

- PROPOSED CANOPY TREE MITIGATION PLANTINGS
- PROPOSED FLOWERING TREE MITIGATION PLANTINGS
- PROPOSED EVERGREEN TREE MITIGATION PLANTINGS
- PROPOSED SHRUBS
- PROPOSED CANOPY TREE (INTERIOR VUA)
- PROPOSED CANOPY TREE (RIGHT-OF-WAY SCREEN)
- PROPOSED EVERGREEN TREE (CONFLICTING LAND USE BUFFER)
- PROPOSED EVERGREEN TREE (RIGHT-OF-WAY SCREEN)
- EXISTING TREE TO REMAIN
- MDOT STANDARD SEED MIX THM
- PROPOSED BIO-RETENTION ISLANDS NATIVE SEED
- PROPOSED PLANT PLUGS
- VEHICULAR USE AREA LIMITS

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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COTTAGES AT BARTON GREEN

SITE PLAN
LANDSCAPE AND MITIGATION PLAN (EAST)

21

DATE: 5/25/17
SHEET 21 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
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REVISIONS:	REV. DATE
REV. PER COUNTY	8/16/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REVISED PER AGREEMENT	6/7/19

JOB No. 16223

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" = 40'

0 40 80 120

LEGEND

- EXIST. CONTOUR
- PROP. CONTOUR
- EXIST. UTILITY POLE
- EXIST. UTILITY POLE W/ TRANS.
- GUY WIRE
- EXIST. OVERHEAD UTILITY LINE
- EXIST. LIGHT POLE
- EXIST. TELEPHONE LINE
- 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. GATE VALVE IN WELL
- PROP. GATE VALVE IN WELL
- EXIST. CURB STOP & BOX
- PROP. CURB STOP & BOX
- REDUCER
- EXIST. BLOW-OFF
- PROP. BLOW-OFF
- POST INDICATOR VALVE
- THRUST BLOCK
- PROP. KNOXBOX
- EXIST. STORM SEWER
- PROP. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- PROP. CATCH BASIN OR INLET
- EXIST. BEEHIVE INLET
- PROP. BEEHIVE INLET
- PROP. ROOF DRAIN
- END SECTION
- HEAD WALL
- CULVERT
- PROP. DOWNSPOUT
- EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
- EXIST. CLEANOUT
- PROP. CLEANOUT
- C/L OF DITCH
- SIGN
- SINGLE TREE
- TREE OR BRUSH LIMIT
- FENCE
- LIMITS OF DISTURBANCE
- NO TREE ZONE

LANDSCAPE LEGEND

- PROPOSED CANOPY TREE MITIGATION PLANTINGS
- PROPOSED FLOWERING TREE MITIGATION PLANTINGS
- PROPOSED EVERGREEN TREE MITIGATION PLANTINGS
- PROPOSED SHRUBS
- PROPOSED CANOPY TREE (INTERIOR VUA)
- PROPOSED CANOPY TREE (RIGHT-OF-WAY SCREEN)
- PROPOSED EVERGREEN TREE (CONFLICTING LAND USE BUFFER)
- PROPOSED EVERGREEN TREE (RIGHT-OF-WAY SCREEN)
- EXISTING TREE TO REMAIN
- MDOT STANDARD SEED MIX THM
- PROPOSED BIO-RETENTION ISLANDS NATIVE SEED
- PROPOSED PLANT PLUGS
- VEHICULAR USE AREA LIMITS

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LAFAYETTE, INDIANA 47901
ATTN: DAMIAN VANMATRE
(765) 807-2713

COTTAGES AT BARTON GREEN

SITE PLAN
LANDSCAPE AND MITIGATION PLAN (WEST)

22

DATE: 5/25/17
SHEET 22 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223LP1.dwg
FB#460

ADDED PLANTINGS AT SKYDALE 5/03/18

JOB No. 16223

REVISIONS:	REV. DATE
REV. PER COUNTY	8/16/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REVISED PER AGREEMENT	6/7/19

M:\Civil3d_Proj\16223\Site Plan\16223LP1.dwg, 6/20/2019 1:30 PM, Jim Ahnert, None
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LANDSCAPE NOTES

1. Water outlets will be provided within 150 feet of all required plantings.
2. Plant materials shall be selected and installed as detailed. Street trees shall be installed in accordance with standards established by the City of Ann Arbor Parks and Recreation Department and as shown on the Street Tree Planting Detail.
3. 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 as a continuing obligation for the duration of the site plan.
4. Restore all disturbed and proposed landscape areas with a minimum of three (3) inches of topsoil and then sod or seed/fertilize/mulch per the plan. Provide sod or seed and erosion control blankets on all slopes 3:1 or steeper.
5. Seed mixes and fertilizer:
   A. Lawns:
   Lawn seed mix shall be as follows:
   - 15% Rugby Kentucky Bluegrass
   - 10% Park Kentucky Bluegrass
   - 40% Ruby Creeping Red Fescue
   - 15% Pennifine Perennial Ryegrass
   - 20% Scaldis Hard Fescue

   Seed shall be applied at the rate of five pounds (5 lbs) per 1000 sq ft.
   Fertilizer for the initial installation of lawns shall provide not less than one (1) pound of actual nitrogen per 1000 sq ft of lawn area and shall contain not less than two percent (2%) potassium and four percent (4%) phosphoric acid.
   After the first growing season, only fertilizers that contain no phosphorus shall be used on the site.
   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.
   Fertilizer for the initial installation of lawns shall provide not less than one (1) pound of actual nitrogen per 1000 sq ft of lawn area and shall contain not less than two percent (2%) potassium and four percent (4%) phosphoric acid.
   After the first growing season, only fertilizers that contain no phosphorus shall be used on the site.
   B. No Mowing/Natural Areas:
   Natural area seed mix shall be as follows:
   MDOT Standard Specifications for THM (turf loamy to heavy).
   Seed shall be applied at the rate of two hundred and twenty pounds (220 lbs) per acre.
   Fertilizer shall be MDOT Class B applied at the rate of one hundred and twenty pounds (120 lbs) per acre.
   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.
   C. Detention Basin Bottom and Side Slopes:

Detention Basin Bottom and Side Slopes 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 macrantha	June Grass	1 lbs/acre
Panicum virgatum	Switch Grass	2 lbs/acere
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.
   Mulch with straw mulch at the rate of two (2) bales per 1,000 sq ft.
   D. Proposed Bio-retention Island and Wetland Seed Mix:
   See seed mix on this sheet.
6. 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 and September 15.
7. All plants except ground cover are to receive four (4) inches of shredded bark mulch. Ground cover areas are to receive two (2) inches of Canadian peat mulch. All mulch beds to have landscape fabric between mulch and planting soil.
8. All trees to be located a minimum of ten (10) feet from public utilities.
9. 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.
10. 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.
11. Shade trees are to be a minimum of 15 feet on center. Evergreen trees are to be 12 feet on center minimum. Shade trees in the conflicting land use buffer are to be minimum15 feet on center, maximum 30 feet on center.
12. 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.
13. 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. 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 material 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 the 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.
14. Snow cannot be pushed onto interior islands unless they are designated on the plan for snow storage. Bio-retention islands are also snow storage islands.
15. Shrubs and trees are to be a minimum of 5 feet from hydrants.

LANDSCAPE REQUIREMENTS:

I. PARKING LOT LANDSCAPING:
Interior landscape islands required based on V.U.A.
50% of required islands required to be bio-retention
1 tree/250 sf required landscape area
ANALYSIS OF SITE AS TWO SEPARATE PARCELS
EAST OF ST. REGIS WAY
1 sf interior landscape per 20 sf V.U.A. required
V.U.A. = 29,802 sf
Interior landscape = 1,490 sf required / 1,906 sf provided
Trees required= 6 / 10 trees provided
Bio-retention = 745 sf required / 1,471 sf provided

WEST OF ST. REGIS WAY
1 sf interior landscape per 15 sf of V.U.A. required
V.U.A. = 145,727 sf
Interior landscape = 9,715 sf required / 9,735 sf provided
Trees required = 39 required / 49 provided
Bio-retention required = 4,858 sf /7,424 sf provided

II. RIGHT-OF-WAY SCREENING
Buffer Strip 10' avg. required / 5' min.
Trees 1:30 LF, 2" cal. at 6" above root ball, evg. trees 7' ht. min.
Hedge 30" height
St. Regis Way:
4 locations x 32 lf = 128 lf; 5 trees required / 8 provided, 24 shrubs, 10' min width
Skydale Drive:
80 lf, 3 trees required / 3 provided, 12 shrubs, 10' min width

III. STREET TREE ESCROW

Pontiac Trail frontage: 398 lf x $1.30 / lf of street frontage =	$517.40
St. Regis Way frontage:	
East side – 684 lf x $1.30 / lf street frontage =	$889.20
West side – 756 lf x $1.30 / lf street frontage =	$982.80
Skydale Drive: 136 lf x $1.30 / lf street frontage =	$176.80
TOTAL ESCROW	$2,566.20

IV. TREE REMOVAL MITIGATION CALCULATIONS
REMOVALS: see Tree Index

Landmark and Woodland Trees to be removed:	1,055 inches
TOTAL MITIGATION REQUIRED: 1,055 x 50%=	528 inches

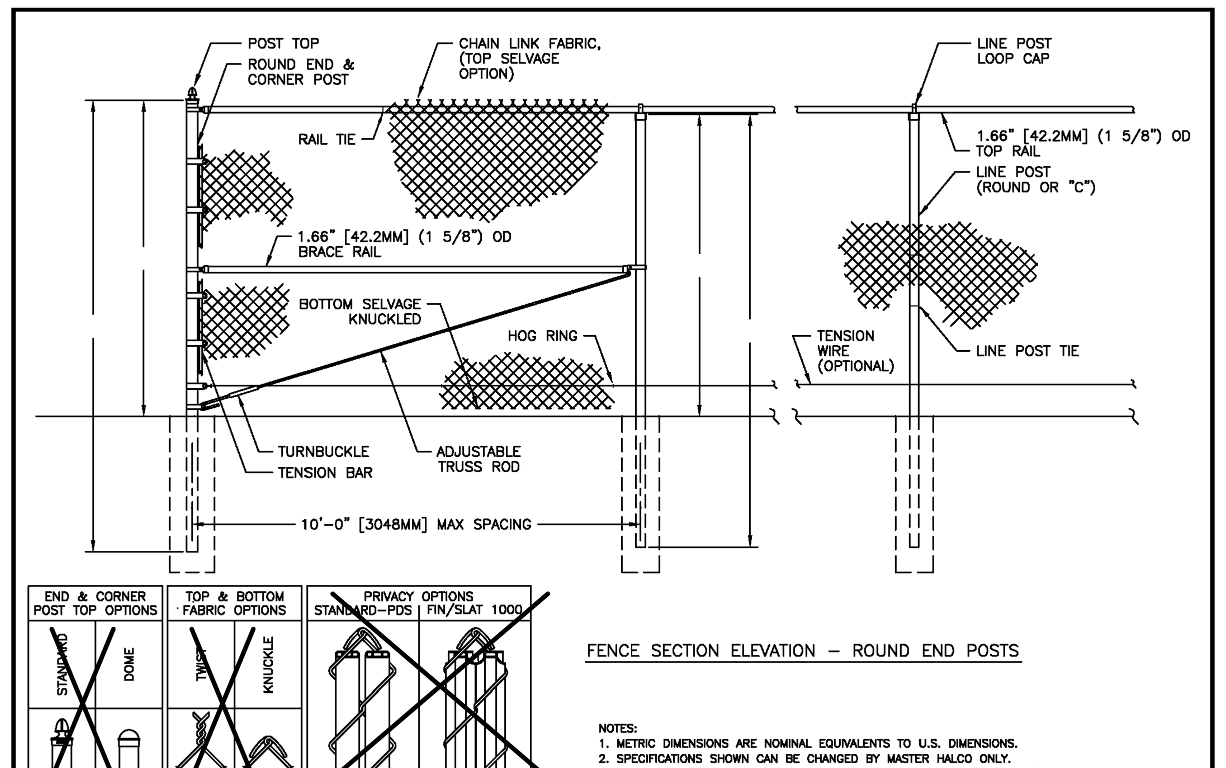
PROPOSED MITIGATION:

Canopy trees: 95 x 2.5" cal.	237.5 inches
Evergreen trees: 83 x 2.5" cal. (8' ht.)	207.5 inches
Flowering trees: 68 x 2" cal.	136 inches
TOTAL PROPOSED MITIGATION	581 inches

V. CONFLICTING LAND USE BUFFER*
Ave. 15' width, 8' min. required / 15' min. provided
Trees 1:30 LF, 2" cal. measured 6" above root ball; evg. trees 7' ht. min., minimum 50% evergreen: minimum caliper and height provided, 100% evergreen.
30" hedge required / 30" hedge provided as noted on the landscape plans.
See the C.L.U.B. diagram for buffer lengths and proposed plantings.

Point 'A' to Point 'B': 240 lf	= St. Regis Way r.o.w.; no C.L.U.B. required
Point 'B' to Point 'C': 212 lf	= 7 trees required 12 trees and 25 shrubs provided
Point 'C' to Point 'D': 1,056 lf	= 35 trees required 45 trees and 112 shrubs provided
Point 'D' to Point 'E': 136 lf	= Skydale Dr. r.o.w.; no C.L.U.B. required
Point 'E' to Point 'F': 548 lf	= 30' minimum undisturbed existing trees, shrubs, and brush*
Point 'G' to Point 'H':453 lf	= 15 trees required 19 trees and 52 shrubs provided
Point 'I' to Point 'J': 350 lf	= 12 trees required 13 trees and 46 shrubs provided
Point 'J' to Point 'K': 275 lf	= 10 trees required 10 trees provided (including 1 existing), 27 shrubs
Total provided:	= 99 trees and 262 shrubs

*Photos of 30 foot buffer were submitted separately and are taken walking East-West. East end is mainly made up of saplings to 5" Black Cherry, Hickory, Red Oak and Honeysuckle. The west end drops and there are fewer hardwood saplings and more honeysuckle and buckthorn.
Note that there is an existing overhead power line off site about 2 feet that runs along the south of property line. Limited tree pruning, topping or clearing is going to be done. The pictures show fresh white paint on some of the trees. Wright tree Co will be in soon clearing/topping vegetation under the power lines.



FENCE SECTION ELEVATION – ROUND END POSTS

NOTES:
1. METRIC DIMENSIONS ARE NOMINAL EQUIVALENTS TO U.S. DIMENSIONS.
2. SPECIFICATIONS SHOWN CAN BE CHANGED BY MASTER HALCO ONLY.
3. FOOTING WIDTH TO BE (4)X POST WIDTH. MINIMUM DEPTH 36" [914MM].

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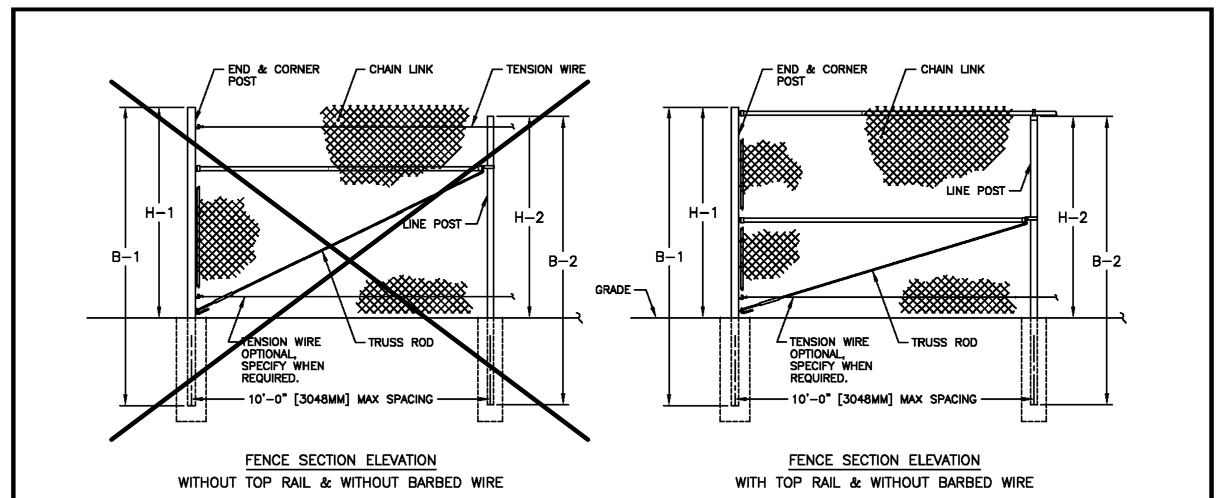
TYPICAL HIGH FENCE	BY: JRR	DWG: 1-1130
ROUND END POSTS, WITH TOP RAIL & WITHOUT BARBED WIRE	DATE: 09-22-95	
	REV: D	LAYER: 1
	REV DATE: 08-25-06	SCALE: 3/8" = 1'-0"



FENCE SECTION ELEVATION
WITHOUT TOP RAIL & WITHOUT BARBED WIRE

FENCE SECTION ELEVATION
WITH TOP RAIL & WITHOUT BARBED WIRE

FENCE HEIGHT	END & CORNER POSTS		LINE POSTS	
NOMINAL HEIGHT	B-1 BAR LENGTH	H-1 HEIGHT ABOVE GRADE	B-2 BAR LENGTH	H-2 HEIGHT ABOVE GRADE
5'-0" [1524MM]	8'-0" [2438MM]	5'-0 5/8" [1540MM]	7'-8" [2337MM]	4'-8 7/8" [1445MM]
6'-0" [1829MM]	9'-0" [2743MM]	6'-0 5/8" [1845MM]	8'-8" [2642MM]	5'-8 7/8" [1749MM]
7'-0" [2134MM]	10'-0" [3048MM]	7'-0 5/8" [2150MM]	9'-8" [2946MM]	6'-8 7/8" [2054MM]
8'-0" [2438MM]	11'-0" [3353MM]	8'-0 5/8" [2454MM]	10'-8" [3251MM]	7'-8 7/8" [2359MM]
9'-0" [2743MM]	12'-0" [3658MM]	9'-0 5/8" [2759MM]	11'-8" [3556MM]	8'-8 7/8" [2664MM]
10'-0" [3048MM]	13'-0" [3962MM]	10'-0 5/8" [3064MM]	12'-8" [3861MM]	9'-8 7/8" [2969MM]
11'-0" [3353MM]	14'-0" [4267MM]	11'-0 5/8" [3369MM]	13'-8" [4166MM]	10'-8 7/8" [3273MM]
12'-0" [3658MM]	15'-0" [4572MM]	12'-0 5/8" [3674MM]	14'-8" [4470MM]	11'-8 7/8" [3578MM]

NOTES:
1. THIS DWG CORRESPONDS WITH DWGS 1-1110 & 1-1130.
2. SPECIFICATIONS SHOWN CAN BE CHANGED BY MASTER HALCO ONLY.

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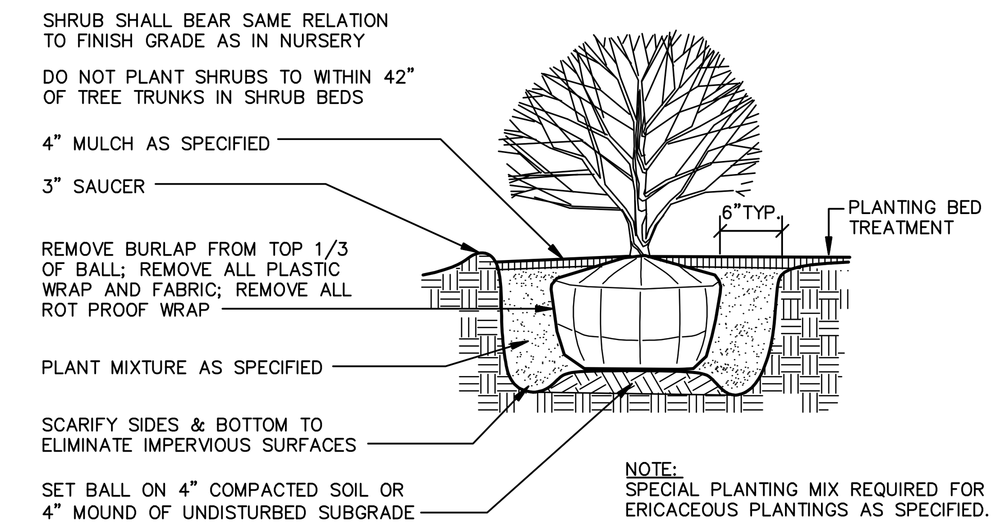
TYPICAL HIGH FENCE WITHOUT BARBED WIRED	BY: JRR	DWG: 1-1000
DIMENSIONS & SPECIFICATIONS	DATE: 09-27-95	
	REV: C	LAYER: 1
	REV DATE: 08-04-06	SCALE: 1/4" = 1'-0"

PLANT MATERIAL SCHEDULE

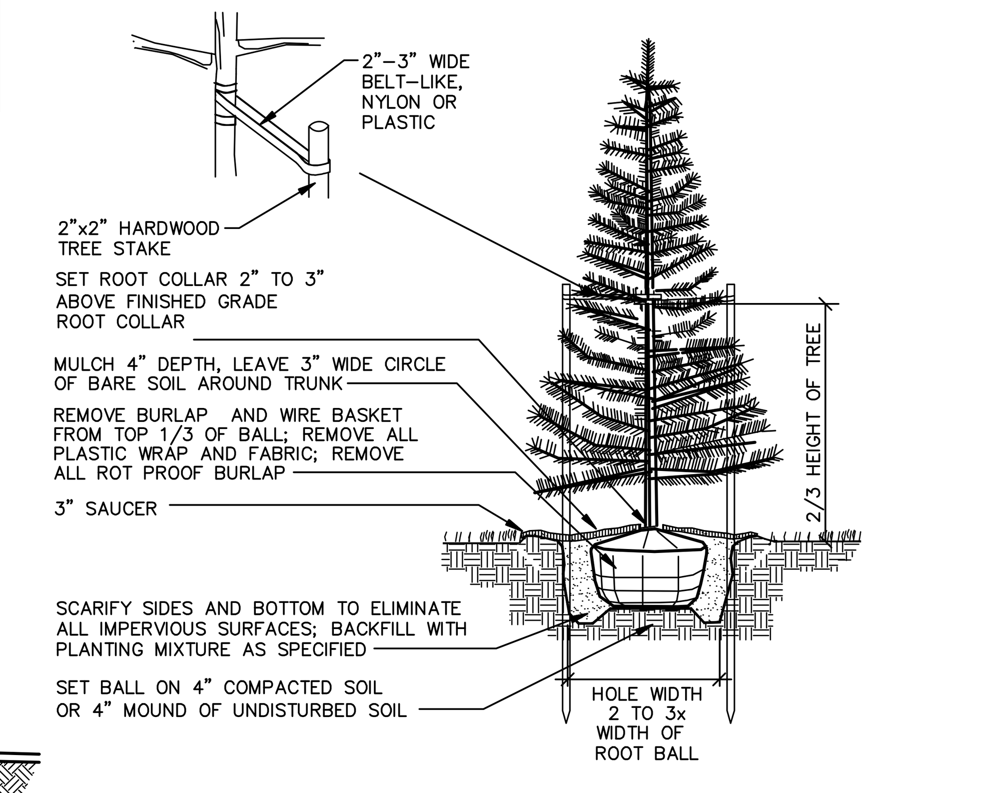
QUANTITIES* 1	2	3	4	5	SYM	BOTANICAL NAME	COMMON NAME	SIZE**	ROOT	REMARKS
						DECIDUOUS TREES				
25				25	AG	Amelanchier g. 'Autumn Brilliance'	Autumn Brilliance serviceberry	2" cal	bb	tree form
12			12		BN	Betula nigra	River birch	2" cal	bb	5' branch ht
13			13		CO	Celtis occidentalis	Hackberry	2" cal	bb	5' branch ht
8				8	COO	Celtis occidentalis	Hackberry	2 1/2" cal	bb	5' branch ht
24				24	CC	Cercis canadensis	Eastern redbud	2" cal	bb	tree form
19			19		GT	Gleditsia t. inermis 'Skycole'	Skyline thornless honeylocust	2" cal	bb	5' branch ht
16				16	GTT	Gleditsia t. inermis 'Skycole'	Skyline thornless honeylocust	2 1/2" cal	bb	5' branch ht
11				11	GY	Gymnocladus dioicus	Kentucky coffee tree	2 1/2" cal	bb	5' branch ht
12			12		LI	Liriodendron tulipifera	Tulip tree	2" cal	bb	5' branch ht
11				11	LII	Liriodendron tulipifera	Tulip tree	2 1/2" cal	bb	5' branch ht
22				22	MS	Malus 'Spring Snow'	Spring Snow crab	2" cal	bb	5' branch ht
10				10	NS	Nyssa sylvatica	Blackgum	2 1/2" cal	bb	5' branch ht
5				5	QB	Quercus bicolor	Swamp white oak	2 1/2" cal	bb	5' branch ht
13		10	3		QR	Quercus rubra	Red oak	2" cal	bb	5' branch ht
8				8	QRR	Quercus rubra	Red oak	2 1/2" cal	bb	5' branch ht
13				13	TAA	Tilia americana	Basswood	2 1/2" cal	bb	5' branch ht
222		10	59	153						
						EVERGREEN TREES				
34	34				AB	Abies balsamea	Balsam fir	7' ht	bb	
22				22	ABB	Abies balsamea	Balsam fir	8' ht	bb	
38	38				PG	Picea glauca	White spruce	7' ht	bb	
35				35	PGG	Picea glauca	Whites spruce	8' ht	bb	
33	32	1			PS	Pinus strobus	Eastern white pine	7' ht	bb	Full
26				26	PSS	Pinus strobus	Eastern white pine	8' ht	bb	Full
188	104	1	0	83						
						SHRUBS				
29	29				AA	Aronia a. 'Brilliantissima'	Brilliant red chokeberry	3' ht	#5 cont	5' o.c.
57	57				AM	Aronia melanocarpa	Black chokeberry	2' ht	#5 cont	5' o.c.
103	97	6			CB	Cornus s. 'Baileyi'	Bailey's red twig dogwood	3' ht	#5 cont	5' o.c.
79	79				RA	Rhus aromatica	Fragrant sumac	3' ht	#5 cont	5' o.c.
30		30			TMD	Taxus x. media 'Tautonii'	Tauton yew	30" ht	bb/cont	5' o.c.
298	262	36	0	0						

*KEY FOR QUANTITY COLUMNS
1. TOTAL QUANTITY REQUIRED.
2. CONFLICTING LAND USE BUFFER PLANTINGS.
3. RIGHT-OF-WAY SCREEN PLANTINGS.
4. INTERIOR PARKING AREA PLANTINGS.
5. LANDMARK AND WOODLAND TREE MITIGATION PLANTINGS.
** NOTE THAT TREE CALIPER INCLUDING LANDMARK AND WOODLAND TREE MITIGATION PLANTINGS IS MEASURED 6 INCHES ABOVE THE ROOT BALL.

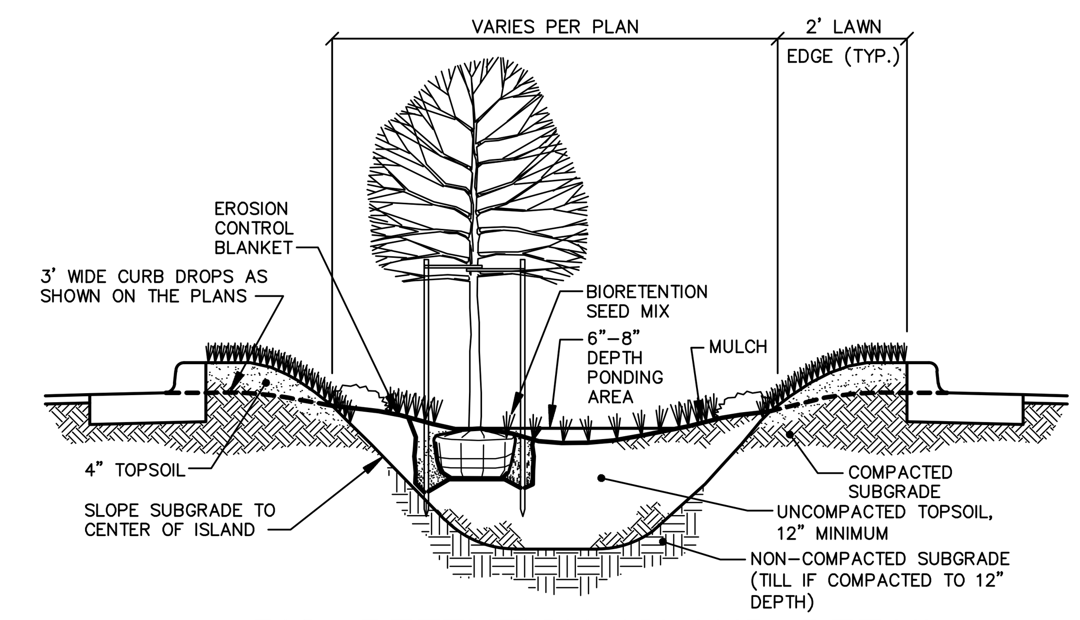


SHRUB PLANTING DETAIL
NOT TO SCALE

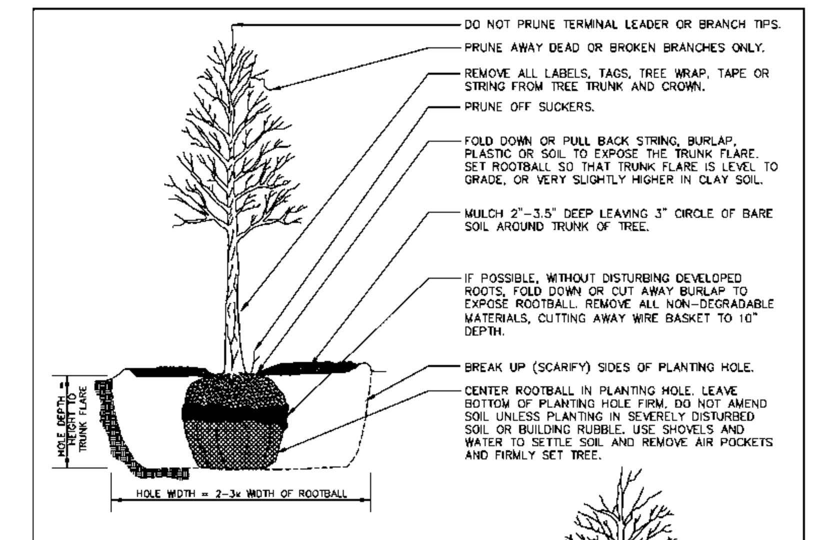
NOTE: A: STAKING IS ONLY REQUIRED IF THE SITE IS WINDY OR THE TREES ARE GREATER THAT 3" CALIPER. IF TREES MUST BE STAKED, THE STAKED SHALL BE REMOVED IN ONE YEAR.



EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE

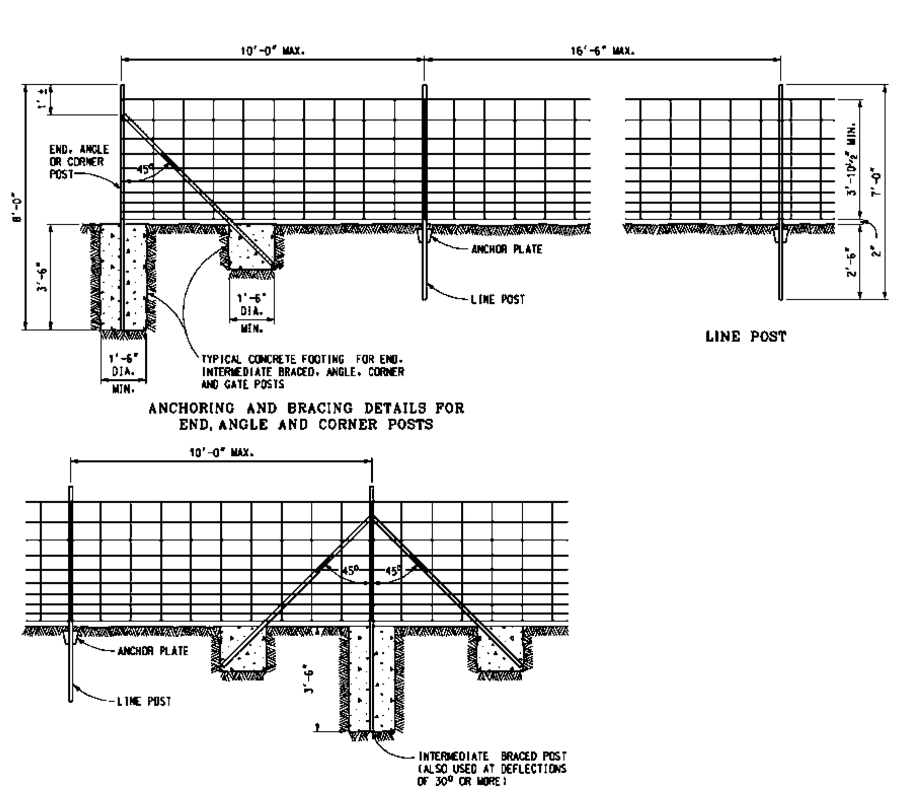


BIO-RETENTION ISLAND DETAIL
NOT TO SCALE



DO NOT STAKE UNLESS IN HEAVY CLAY SOIL, WINDY CONDITIONS, 3" OR GREATER DIAMETER TREE TRUNK OR LARGE CROWN. IF STAKING IS NEEDED DUE TO THESE CONDITIONS:
- STAKE WITH 2 x 2 HARDWOOD STAKES, OR APPROVED EQUAL, DRIVEN 6"-8" OUTSIDE OF ROOTBALL.
- LOOSELY STAKE TREE TRUNK TO ALLOW FOR TRUNK FLEXING.
- STAKE TREES JUST BELOW FIRST BRANCH WITH 2"-3" WIDE BELT-LIKE, NYLON OR PLASTIC STRAPS (2 PER TREE ON OPPOSITE SIDES OF TREE, CONNECT FROM TREE TO STAKE HORIZONTALLY. DO NOT USE ROPE OR WIRE THROUGH A HOSE.)
- REMOVE ALL STAKING MATERIALS AFTER 1 YEAR.

REVISIONS	REV. NO.	DR.BY	CH. BY	DATE
PUBLIC SERVICES DEPARTMENT CITY OF ANN ARBOR				
TREE PLANTING DETAIL				
DR. BY ARG	CH. BY CSS	DRAWING NO. SD-L-3		
SCALE NONE	DATE 7-23-10			
INCH		SHEET NO. ____ OF ____		



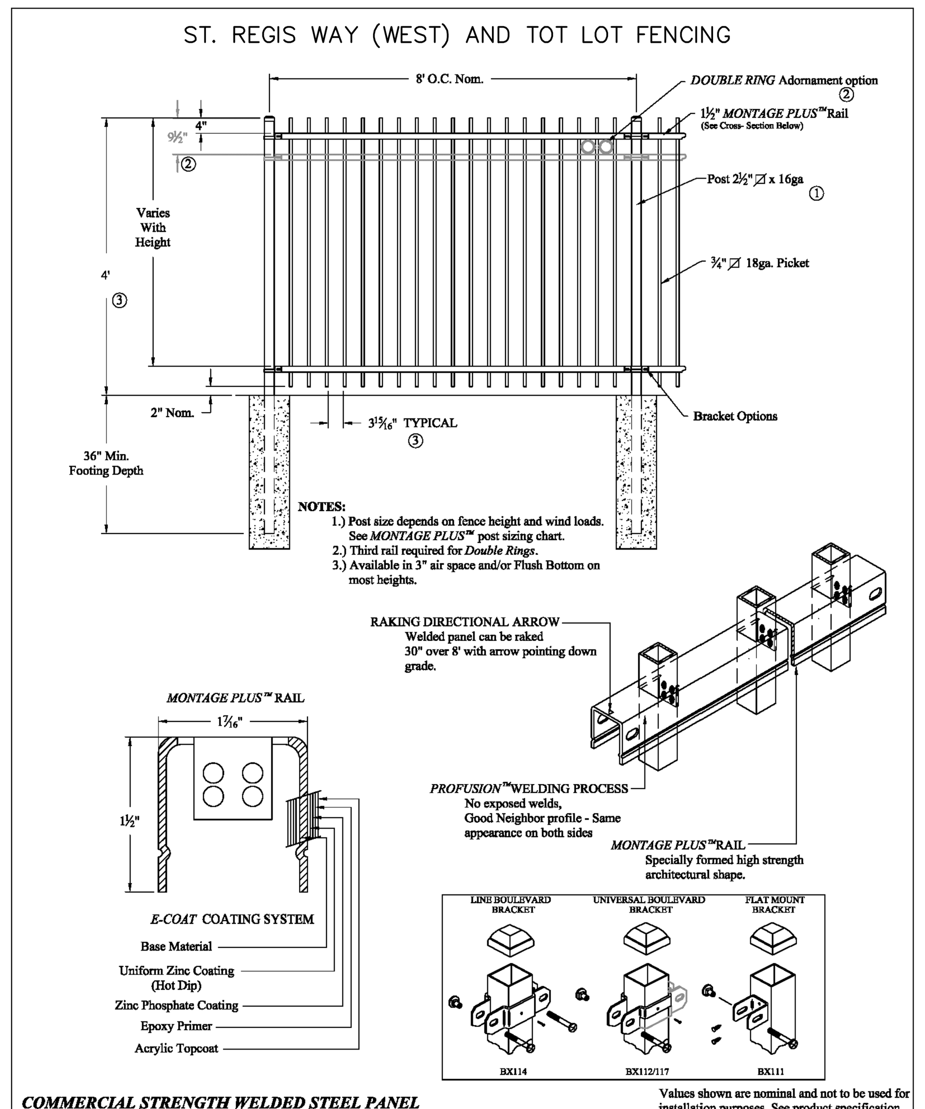
ANCHORING AND BRACING DETAILS FOR END, ANGLE AND CORNER POSTS

LINE POST

ANCHORING AND BRACING DETAILS FOR INTERMEDIATE BRACED, INTERSECTION AND ANGLE POSTS

WOVEN WIRE FENCE
NOT TO SCALE
NORTH RETAINING WALL FENCING

ST. REGIS WAY (WEST) AND TOT LOT FENCING



NOTES:
1.) Post size depends on fence height and wind loads. See *MONTAGE PLUS*™ post sizing chart.
2.) Third rail required for *Double Rings*.
3.) Available in 3" air space and/or Flush Bottom on most heights.

Values shown are nominal and not to be used for installation purposes. See product specification for installation requirements.

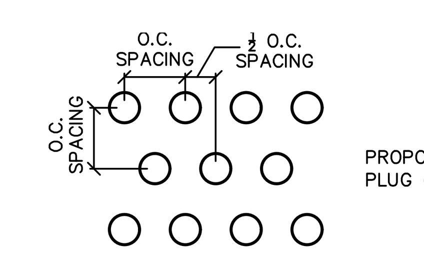
COMMERCIAL STRENGTH WELDED STEEL PANEL
PRE-ASSEMBLED

Title: MONTAGE PLUS GENESIS 2/3-RAIL			
DR: CI	SH. 1of 1	SCALE: DO NOT SCALE	
CK: ME	Date 6/28/10	REV: e	

AMERISTAR® 1555 N. Mingo, Tulsa, OK 74116, 1-888-333-3422, www.ameristarfence.com

Bio-Retention Island & Wetland Seed Mix

Botanical Name	Common Name	Rate Per Acre
Grasses & Sedges		
Andropogon scoparius	Little blue-stem	1 lb./acre
Calamagrostis candensis	Blue joint grass	1 oz./acre
Carex hystericina	Porcupine sedge	2 oz./acre
Carex stipata	Awl-fruited sedge	2 oz./acre
Carex vulpinoidea	Fox sedge	2 oz./acre
Eleocharis obtusa	Blunt spike rush	2 oz./acre
Eleocharis palustris	Spike rush	6 oz./acre
Elymus canadensis	Canada wild rye	5 lb./acre
Elymus villosus	Silky wild rye	8 oz./acre
Leersia oryzoides	Rice cut grass	4 oz./acre
Lolium multiflorum	Annual rye	200 lb./acre
Panicum virgatum	Switch grass	12 oz./acre
Scirpus atrovirens	Dark green rush	2 oz./acre
Scirpus cyperinus	Wool grass	0.5 oz./acre
Scirpus fluviatilis	River bulrush	2 oz./acre
Sorgastrum nutans	Indian grass	4 oz./acre
Forbs		
Angelica atropurpurea	Angelica	2 oz./acre
Asclepias incarnata	Swamp milkweed	9 oz./acre
*Aster laterifloru*s	Calico aster	2 oz./acre
Aster novae-angliae	New England aster	4 oz./acre
Bidens sp.	Bidens	2 oz./acre
Echinacea pallida	Pale cone flower	8 oz./acre
Eupatorium maculatum	Spotted Joe-pye weed	4 oz./acre
Eupatorium perfoliatum	Boneset	6 oz./acre
Helenium autumnale	Sneezeweed	6 oz./acre
Juncus effusus	Soft-stemmed bulrush	2 oz./acre
Lobelia cardinalis	Cardinal flower	0.5 oz./acre
Monarda fistulosa	Bee-balm	3 oz./acre
Penstemon digitalis	Foxglove beardstongue	4 oz./acre
Penstemon hirsutus	Hairy beardstondue	2 oz./acre
Physotegia virginiana	Obedient plant	2 oz./acre
Ratibida pinnata	Yellow headed coneflower	2 oz./acre
Rudbeckia hirta	Black-eyed Susan	4 oz./acre
Rudbeckia lacinata	Cut-leaved coneflower	5 oz./acre
Silphium terebinthinaceum	Prairie dock	15 oz./acre
Solidago grammifolia	Grass-leaved goldenrod	1 oz./acre
Solidago riddellii	Riddell's goldenrod	1 oz./acre
Solidago speciosa	Showy goldenrod	2 oz./acre
Verbena hastata	Blue vervain	3 oz./acre
Veronicastrum virginicum	Culver's root	1 oz./acre
Vernonia missurica	Ironweed	4 oz./acre
Erosion Control		
Botanical Name	**Common Name**	**Rate per Acre**
Lolium multiflorum	Annual Rye	200 lb/acre



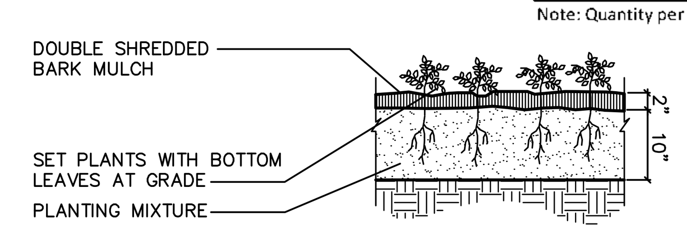
PLANT PLUG SPACING DETAIL

DETENTION PLANT PLUG SCHEDULE

Stormwater Live Plantings - Species to be planted as a mixed composition at bottom of basin

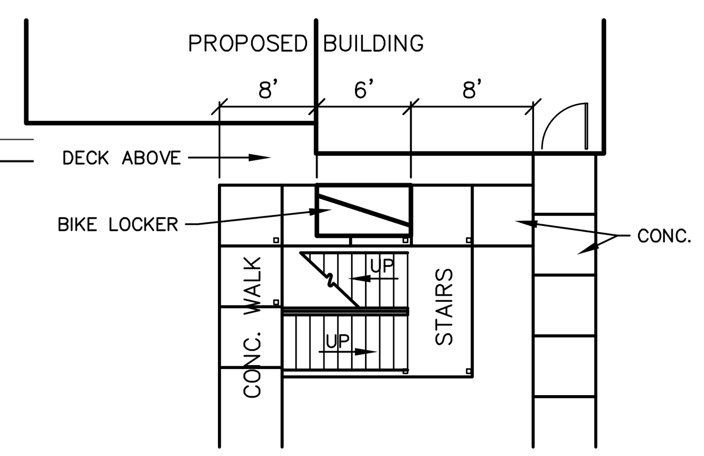
Qty Pond 1	Qty Pond 2	Qty Pond 3	Total	Scientific Name	Common Name	Root	Spacing
466	370	577	1413	Aster novae-angliae	New England Aster	Plug	24" o.c.
466	370	577	1413	Carex hystericina	Porcupine Sedge	Plug	24" o.c.
466	370	577	1413	Carex vulpinoidea	Fox Sedge	Plug	24" o.c.
466	370	577	1413	Glyceria striata	Fowl Manna Grass	Plug	24" o.c.
466	370	577	1413	Helenium autumanle	Sneezeweed	Plug	24" o.c.
466	370	577	1413	Juncus effusus	Soft Rush	Plug	24" o.c.

Note: Quantity per flat varies per supplier

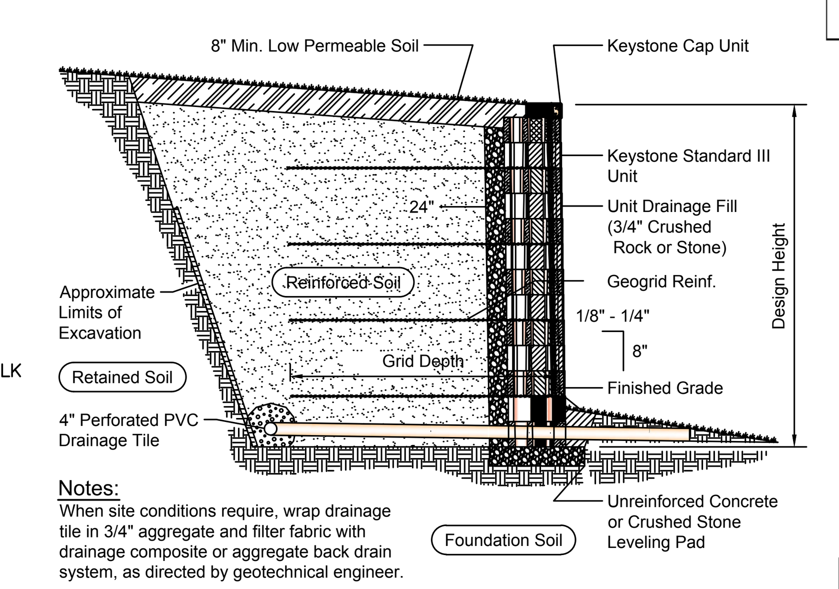


1. HERBACEOUS PLANTS SHOULD BE PEAT POT GROWN. PLANT PLUG WITH PEAT POT INTACT.
2. HERBICIDES SHALL NOT BE USED WITHIN THE BIO-RETENTION AREA TO REMOVE EXISTING WEED GROWTH.
3. FERTILIZERS SHALL NOT BE USED WITHIN THE BIO-RETENTION AREA.
4. PLANTING SHALL TAKE PLACE IMMEDIATELY AFTER PREPARATION.
5. LAYOUT OF SPECIES SHALL BE A MIXED COMPOSITION THROUGHOUT THE SPECIFIED PLANTING AREA. SEE PLANT SCHEDULE FOR SPACING FOR EACH SPECIES.
6. PLANTING MIXTURE SHALL CONSIST OF 30% COMPOST MIXED WITH EXISTING, IN-PLACE OR STOCKPILED TOPSOIL. COMPOST SHALL BE PURCHASED FROM WECARE ORGANICS OR EQUIVALENT. PERMEABLE SOIL SHALL MEET INFILTRATION REQUIREMENTS SET FORTH BY WASHTENAW COUNTY WATER RESOURCES COMMISSIONER OFFICE.

PLUG PLANTING DETAIL



CLASS A BIKE PARKING
(BELOW TOWNHOUSE STAIRS)
NOT TO SCALE

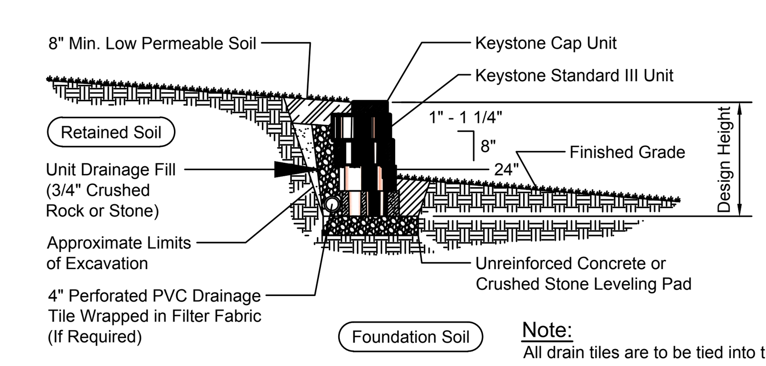


Notes:
When site conditions require, wrap drainage tile in 3/4" aggregate and filter fabric with drainage composite or aggregate back drain system, as directed by geotechnical engineer.

All drain tiles are to be tied into the northeast private storm sewer.

Typical Reinforced Wall Section
Standard III Unit - Near Vertical Setback

KEYSTONE — A CONTECH COMPANY, 4444 W 78th Street, Minneapolis, MN 55435, 952-897-1040



Note:
All drain tiles are to be tied into the northeast private storm sewer.

Typical Gravity Wall Section
Standard III Unit - 1" Setback

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TRINITAS DEVELOPMENT, LLC
201 MAIN STREET, SUITE 1000
LAFAYETTE, INDIANA 47901
ATTN: DAMIAN VANMATRE
(765) 807-2713

COTTAGES AT BARTON GREEN
SITE PLAN
LANDSCAPE NOTES AND DETAILS

23

DATE: 4/24/17
SHEET 23 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223LP1.dwg
FB#460

JOB No. 16223

REVISIONS:	REV. DATE
REV. PER COUNTY	8/16/17
REV. PER CITY/COUNTY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
ADDED PLANTINGS AT SKYDALE	5/03/18
REVISED PER AGREEMENT	6/7/19

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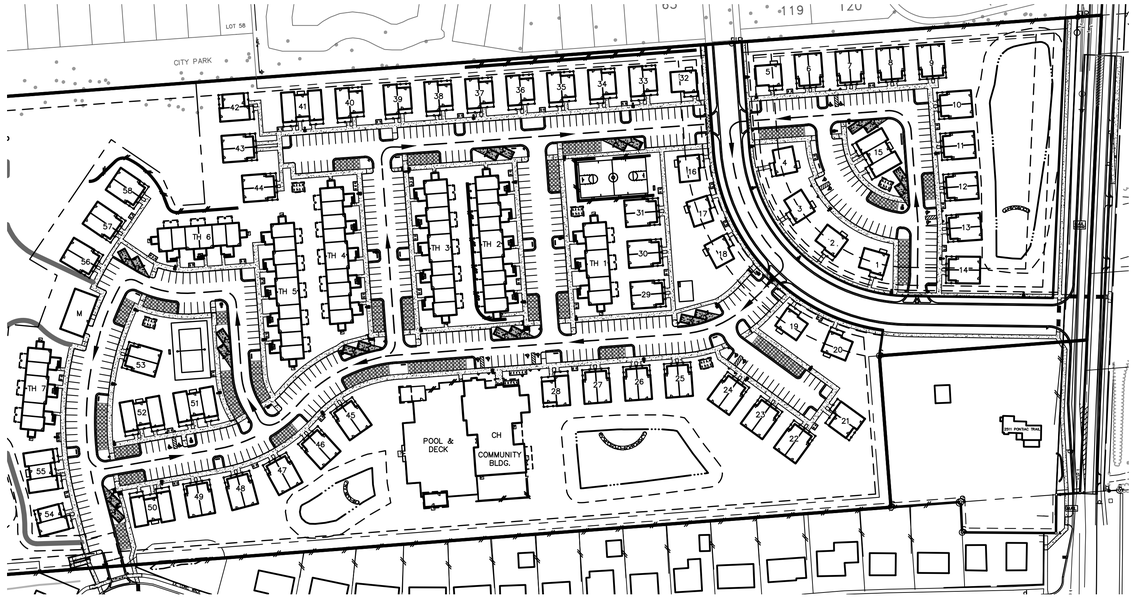
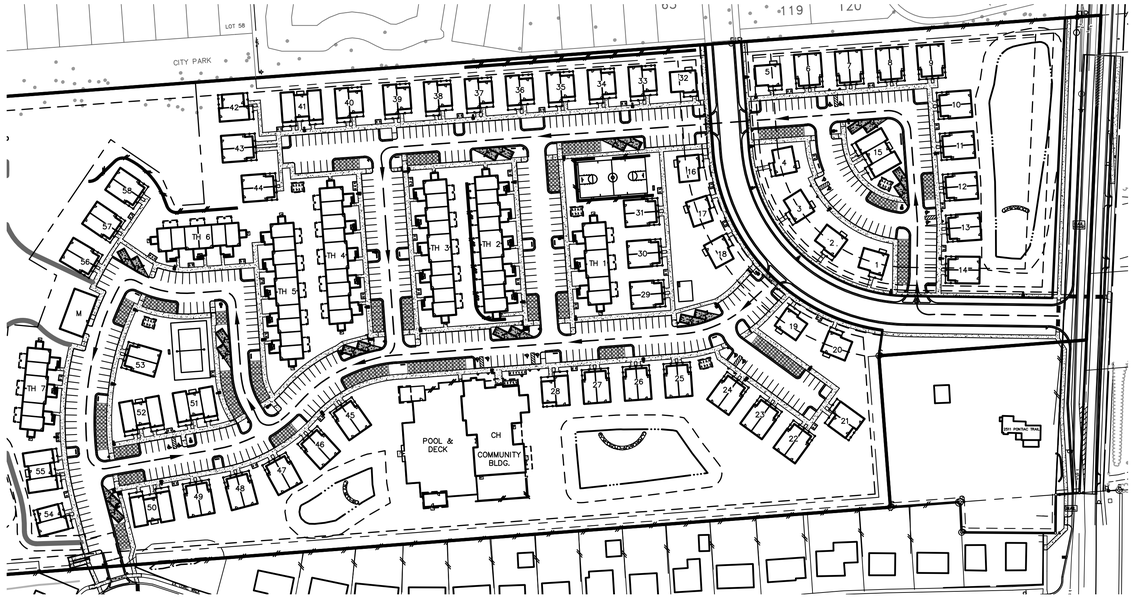


TRASH/RECYCLE TRUCK ACCESS DIAGRAM

SCALE: 1"=100'



PRELIMINARY SHUTTLE BUS CIRCULATION DIAGRAM

SCALE: 1"=100'

Know what's below. Call before you dig.

RESTORATION HERBACEOUS PLANTINGS

Herbaceous Plant List for Barton Green Restoration						
Site:	Barton Green					
Locale:	Pontiac Trail, Ann Arbor					
By:	David Mindell, PlantWise, LLC					
File:	c:\PROGRA~1\FQA\studies\Barton Green.inv					
NOTE:	These species were chosen based on their appropriateness for the site conditions **as well as for their availability in seed from Michigan sources.**					
ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ALLCER	5	Allium cernuum	5	UPL	Nt P-Forb	NODDING WILD ONION
ANDSCO	5	Andropogon scoparius	3	FACU	Nt P-Grass	LITTLE BLUESTEM GRASS
ANEVIR	3	Anemone virginiana	5	UPL	Nt P-Forb	THIMBLEWEED
AQUCAN	5	Aquilegia canadensis	1	FAC-	Nt P-Forb	WILD COLUMBINE
ASTCOR	4	Aster cordifolius	5	UPL	Nt P-Forb	HEART LEAVED ASTER
ASTLAE	5	Aster laevis	5	UPL	Nt P-Forb	SMOOTH ASTER
ASTOOL	4	Aster oolentangiensis	5	UPL	Nt P-Forb	PRAIRIE HEART LEAVED ASTER
ASTSAG	2	Aster sagittifolius	5	UPL	Nt P-Forb	ARROW LEAVED ASTER
DESCAD	3	Desmodium canadense	1	FAC-	Nt P-Forb	SHOWY TICK TREFOIL
EUPRUG	4	Eupatorium rugosum	3	FACU	Nt P-Forb	WHITE SNAKEROOT
MONFIS	2	Monarda fistulosa	3	FACU	Nt P-Forb	WILD BERGAMOT
PANVIR	4	Panicum virgatum	-1	FAC+	Nt P-Grass	SWITCH GRASS
PENDIG	2	Penstemon digitalis	1	FAC-	Nt P-Forb	FOXGLOVE BEARD TONGUE
RATPIN	4	Ratibida pinnata	5	UPL	Nt P-Forb	YELLOW CONEFLOWER
RUDHIR	1	Rudbeckia hirta	3	FACU	Nt P-Forb	BLACK EYED SUSAN
SCRMAR	5	Scrophularia marilandica	4	FACU-	Nt P-Forb	LATE FIGWORT
SENOBO	10	Senecio obovatus	4	FACU-	Nt P-Forb	ROUND LEAVED RAGWORT
SILTER	6	Silphium terebinthinaceum	3	FACU	Nt P-Forb	PRAIRIE DOCK
SOLCAE	7	Solidago caesia	3	FACU	Nt P-Forb	BLUE STEMMED GOLDENROD
SOLJUN	3	Solidago juncea	5	UPL	Nt P-Forb	EARLY GOLDENROD
SOLRIG	5	Solidago rigida	4	FACU-	Nt P-Forb	STIFF GOLDENROD
THADIO	6	Thalictrum dioicum	2	FACU+	Nt P-Forb	EARLY MEADOW RUE
TRAOHI	5	Tradescantia ohiensis	2	FACU+	Nt P-Forb	COMMON SPIDERWORT
VERVIR	8	Veronicastrum virginicum	0	FAC	Nt P-Forb	CULVER'S ROOT
ZIZAUR	6	Zizia aurea	-1	FAC+	Nt P-Forb	GOLDEN ALEXANDERS

WOODLAND RESTORATION PLAN

Woodland Restoration Plan

Responsibility: The restoration of this site will be the responsibility of the developer/owner and/or successor for a period of three years or until the stated efforts are completed, should it take longer than three years. It will be an iterative process in which management efforts in years two and three should be modified based on the success or failure of previous season efforts.

Goal: Establish an oak savanna with extensive native plant diversity that is free of invasive species.

Affected Area: Approximately 1.95 acres in the westerly portion of the 31.93 acre site. The goal will be achieved through these efforts:

Effort 1: Invasive plant control and removal of "woody" native species, such that these plants do not make up more than 10% of total coverage after three years.

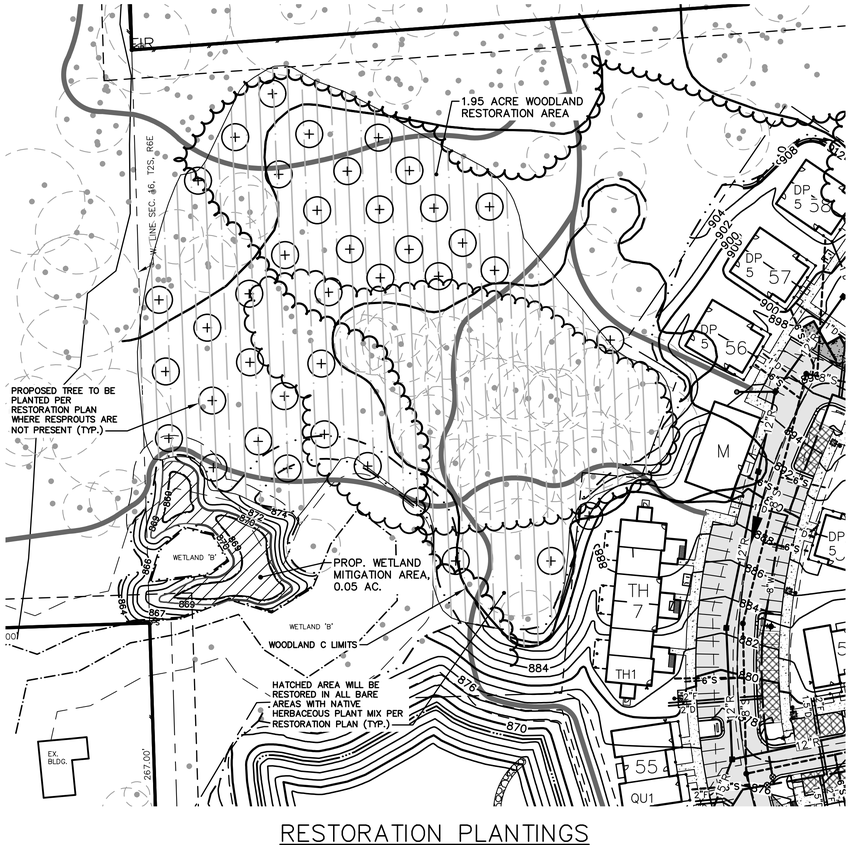
a. Cut and herbicide all woody invaders as well as ash and boxelder throughout the restoration area and black cherries where they are growing under remaining oaks.
   - Most plants will be cut and the cut surface painted with 22-27% active ingredient solution of glyphosate
   - Some invasives that stay green late in the season may be foliar-sprayed with a 2% solution of triclopyr (broad-leaved specific herbicide) following senescence of native vegetation
   - Initial removal will take place between now and early winter; subsequent year efforts will take place during non-spring months
b. Control groundcover invasives to allow spread of native groundcover plants
   - Weeds will be controlled through a combination of hand-pulling and foliar spraying
   - Removal will take place between now and senescence of target vegetation (which for some species may allow control during winter months); subsequent year efforts will take place during active growth months

Effort 2: Establishment of native plant species, such that overstory trees are spaced at 40' intervals and at least 20 species of native groundcover plants to cover the ground (not a cover crop for the sake of temporarily covering the bare area), leaving no bare patches greater than 4 ft² in size after three years.

a. Locate healthy, vigorously growing oak resprouts. Where possible, nurture these trees to become future canopy. Encouraging these resprouts offers these benefits:
   - These are truly native genotype as distinct from what planted trees would be, and would include Quercus rubra/red oak and/or Quercus alba, white oak.
   - By minimizing planting, soil disturbance is avoided, reducing the opportunity for invasives to become established.
   - By focusing on existing resprouts, we encourage faster growth rates, since these trees have extensive root systems
   - By allowing multiple stems to stay on the trees for two years, a buffer is established to protect the primary stem from herbivory and heat from prescribed burns. After two years, a strong central leader will be encouraged by removing and/or cutting back all other shoots during dormant season months.
b. Where resprouts are not present or more widely spaced than the desired 40' intervals, or where their survival to maturity is deemed questionable by a professional forester, plant 4-6' tall bare root trees.
   - These should be from Michigan genotype, if possible
   - Trees should be dug and planted in the spring, following prescribed burning
   - Disturbed soil should be tamped down and wood chip mulch added to planted trees, thereby minimizing weed establishment
   - Tree tubes should be installed to minimize deer or rabbit browse
c. Using local genotype, sow mix of native herbaceous plants in bare soil areas and areas where less conservative native plants dominate. Species list is attached.
   - Seed should be sowed in the fall so that it works its way into the soil through the winter's freeze/thaw cycle, thereby avoiding soil disturbance associated with spring sowing
   - Seed should be sowed at 3 oz per 1,000 ft² of bare area

Effort 3: Prescribed burning should be utilized to both discourage weeds and enhance native species. The site should be burned in the spring of 2018, and then once more in the following two years, with the timing of the second burn dependent on how the site responds to the earlier restoration efforts (kill rate of woody invaders, vigor of native plant establishment, etc.).

Effort 4: The petitioner will provide the City with an annual written report by December 31st of each year detailing the progress made in the restoration plan that year.



RESTORATION PLANTINGS

SCALE: 1"=50'

NOTE

NO HEAVY EQUIPMENT SHALL BE USED FOR THE RESTORATION EFFORTS BEYOND THE APPROVED GRADING LIMITS FOR THE PROJECT.

LEGEND

838	EXIST. CONTOUR
838	PROP. CONTOUR
U.P.	EXIST. UTILITY POLE
U.P.	EXIST. UTILITY POLE W/ TRANS.
	GUY WIRE
	ELEC. TRANSFORMER
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
	PROP. LIGHT POLE
t	EXIST. TELEPHONE LINE
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
	EXIST. GATE VALVE IN WELL
	PROP. GATE VALVE IN WELL
	EXIST. CURB STOP & BOX
	PROP. CURB STOP & BOX
	REDUCER
	EXIST. BLOW-OFF
	PROP. BLOW-OFF
P.I.V.	POST INDICATOR VALVE
	THRUST BLOCK
KB	PROP. KNOXBOX
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
	EXIST. BEEHIVE INLET
	PROP. BEEHIVE INLET
RD	PROP. ROOF DRAIN
	END SECTION
	HEAD WALL
	CULVERT
ds	EXIST. DOWNSPOUT
ps	PROP. DOWNSPOUT
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
	C/L OF DITCH
	DRAINAGE DIRECTION
	SIGN
	SINGLE TREE
	TREE OR BRUSH LIMIT
	FENCE
	LIMITS OF DISTURBANCE
	CONSTRUCTION FENCE

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LAFAYETTE, INDIANA 47901
ATTN: DAMIAN VANMATRE
(765) 807-2713

COTTAGES AT BARTON GREEN

SITE PLAN
WOODLAND RESTORATION PLAN AND
TRASH/RECYCLE TRUCK ACCESS DIAGRAM

24

JOB No. 16223

DATE: 5/25/17
SHEET 24 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223P2.dwg
File#

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	8/16/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY/COUNTY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/22/18

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.

M:\Civil3d_Proj\16223\Site Plan\16223P2.dwg, 6/20/2019 1:31 PM, Jim Ahnert, None
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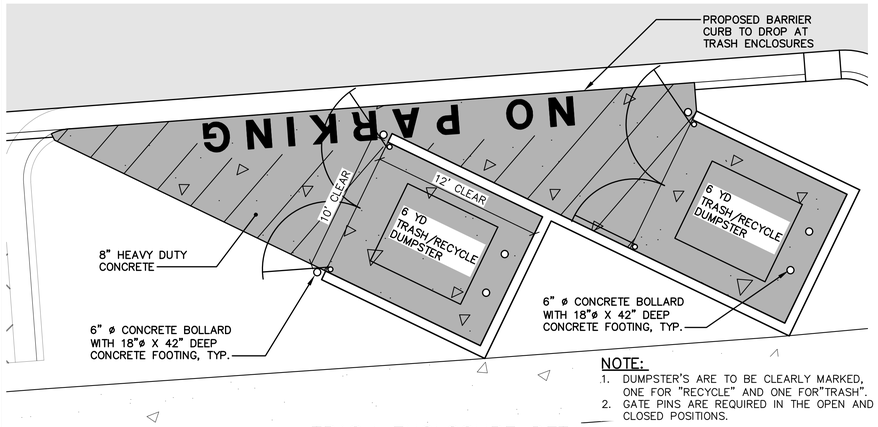
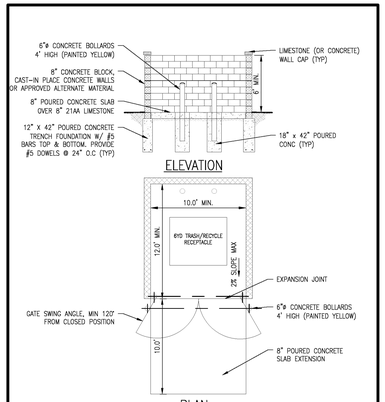


NOTE:
1. DUMPSTER'S ARE TO BE CLEARLY MARKED, ONE FOR "RECYCLE" AND ONE FOR"TRASH".
2. GATE PINS ARE REQUIRED IN THE OPEN AND CLOSED POSITIONS.

TRASH ENCLOSURE DETAIL

SCALE: 1"=5'



SINGLE BIN ENCLOSURE DETAIL

CITY OF ANN ARBOR PUBLIC SERVICES 301 EAST HURON STREET P.O. BOX 8647 ANN ARBOR, MI 48107-8647 734-794-6410 www.a2gov.org

REV. NO.	DATE	DRAWN BY	CHECKED BY

SOLID WASTE STANDARD DETAILS

DR. DHM	CH. CJE	DRAWING NO.
SCALE N.T.S.	DATE 12/29/15	PAGE 1

GENERAL NOTES:

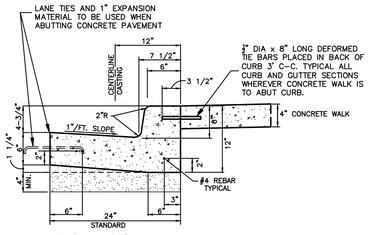
1. A CLEAR SPACE MUST BE MAINTAINED DIRECTLY IN FRONT OF THE SOLID WASTE ENCLOSURE. THE CLEAR SPACE SHALL BE A MINIMUM OF FIFTY (50) FEET LONG BY THE WIDTH OF THE INSIDE DIMENSION OF THE ENCLOSURE PLUS FIVE (5) FEET ON BOTH SIDES. ALONG THE ENTIRE SOLID WASTE VEHICLE ROUTE A VERTICAL CLEARANCE OF AT LEAST TWENTY-FIVE (25) FEET MUST BE PROVIDED.
2. IF FORWARD ACCESS TO THE PUBLIC STREET IS NOT AVAILABLE FOR THE SOLID WASTE TRUCK, THE SITE DEVELOPMENT LAYOUT MUST ACCOMMODATE A TURN-AROUND LOCATION FOR THE SOLID WASTE TRUCK.
3. GATES ON BIN ENCLOSURES MUST BE DESIGNED TO OPEN A MINIMUM OF 120 DEGREES FROM THE CLOSED POSITION. THE GATES SHOULD NOT IMPEDE ON THE REQUIRED BIN ENCLOSURE OPENING WIDTH, SHOULD NOT BLOCK ADJACENT PARKING SPOTS, AND NOT BE IMPEDED BY ADJACENT CURBS OR LANDSCAPING.
4. 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 OVERALL WIDTH OF THE ENCLOSURE.
5. GATE DESIGN SHALL INCLUDE A RELIABLE MEANS TO SECURE THE DOOR IN BOTH THE OPEN AND CLOSED POSITIONS.
6. THE CONCRETE SLAB IN FRONT OF THE BIN ENCLOSURE SHALL HAVE PAVEMENT MARKINGS TO INDICATE "NO PARKING", AS APPROVED BY CITY.
7. REFER TO ASSOCIATED STANDARD DETAILS 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 NEEDS IN REGARDS TO SOLID WASTE PICK-UP.
8. REFUSE EQUIPMENT ACCESS ROADS AND SERVICE AREA SURFACES SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF COLLECTION TRUCKS 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 OF SOLID WASTE VEHICLES.
9. THE SOLID WASTE ENCLOSURE SHALL BE LOCATED A MINIMUM OF TEN (10) FEET AWAY FROM MAJOR ELECTRICAL EQUIPMENT, ABOVE GROUND UTILITY SERVICES, TREE BRANCHES OR OTHER OVERHEAD OBSTRUCTIONS.

CITY OF ANN ARBOR PUBLIC SERVICES 301 EAST HURON STREET P.O. BOX 8647 ANN ARBOR, MI 48107-8647 734-794-6410 www.a2gov.org

REV. NO.	DATE	DRAWN BY	CHECKED BY

SOLID WASTE STANDARD DETAILS

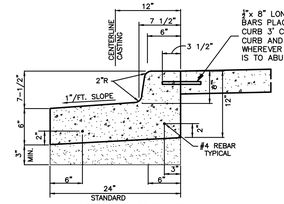
DR. DHM	CH. CJE	DRAWING NO.
SCALE N.T.S.	DATE 01/07/16	PAGE 5



NOTE: #4 BARS 1'-0" LAP ON BARS

SPILL-IN CURB AND GUTTER

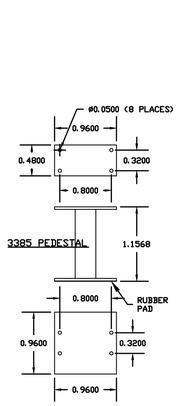
NOT TO SCALE

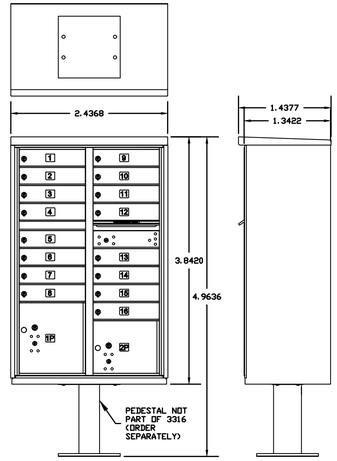


NOTE: #4 BARS 1'-0" LAP ON BARS

SPILL-OUT CURB AND GUTTER

NOT TO SCALE

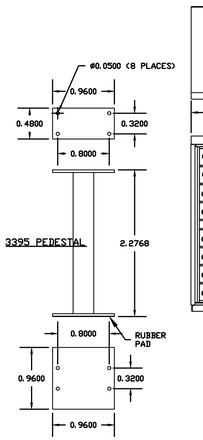


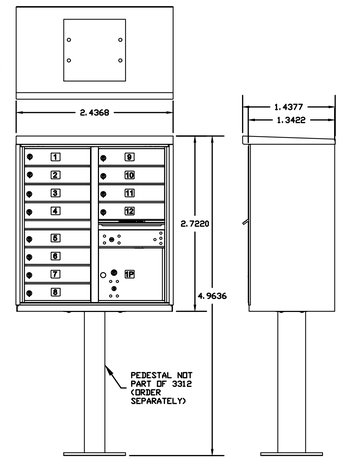


MAILBOX DETAIL

16 UNIT

NOT TO SCALE

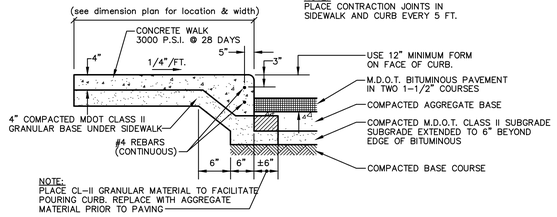




MAILBOX DETAIL

12 UNIT

NOT TO SCALE

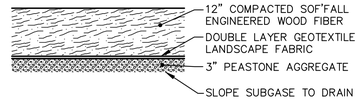


NOTE:
PLACE CONTRACTION JOINTS IN SIDEWALK AND CURB EVERY 5 FT.

NOTE:
PLACE CL-II GRANULAR MATERIAL TO FACILITATE POURING CURB. REPLACE WITH AGGREGATE MATERIAL PRIOR TO PAVING

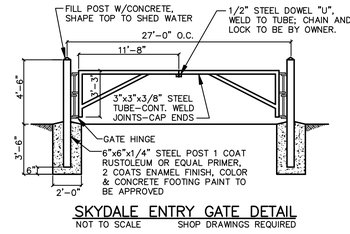
TYPICAL INTEGRAL WALK & CURB

NOT TO SCALE



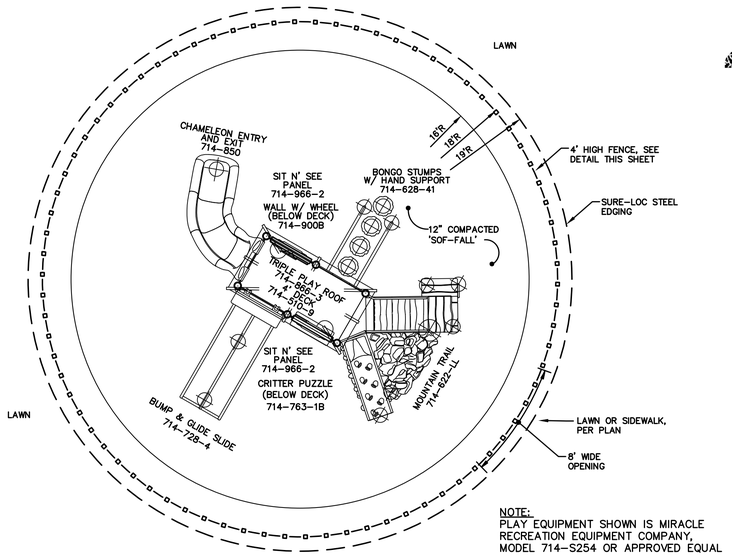
PLAY AREA SURFACE SECTION

NOT TO SCALE



SKYDALE ENTRY GATE DETAIL

NOT TO SCALE SHOP DRAWINGS REQUIRED



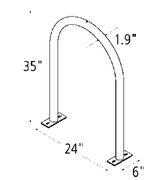
NOTE:
PLAY EQUIPMENT SHOWN IS MIRACLE RECREATION EQUIPMENT COMPANY, MODEL 714-S254 OR APPROVED EQUAL

PLAY AREA DETAIL

SCALE 1"=5'

HOOP RACK

Specifications and Space Use



Product Dero Hoop Rack
As manufactured by Dero Bike Racks

Capacity 7 Bikes

Materials 1.5" schedule 40 pipe (1.9" OD)

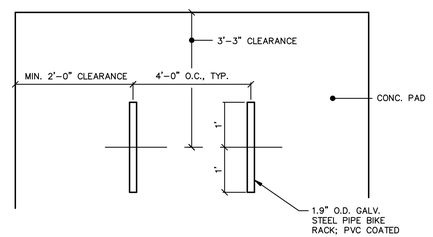
Finishes An after fabrication hot dipped galvanized finish is our standard option. 250 TGIC powder coat color

Our powder coat finish assures a high level of adhesion and durability by following these steps:
1. Sandblast
2. Epoxy primer electrostatically applied
3. Final thick TGIC polyester powder coat

COLOR: BLACK

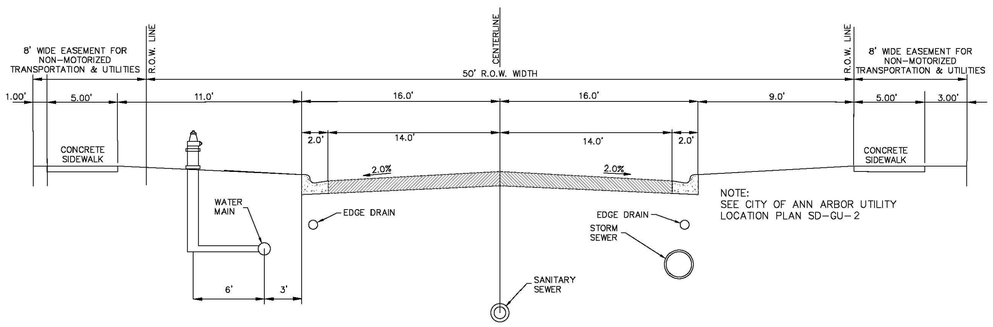
Installation Methods **Foot Mount** has two 2.5"x6"x.25" feet with two anchors per foot. Specify foot mount for this option.

DERO a PEARCONE company www.dero.com 1.800.337.6729



HOOP BIKE RACK (PLAN)

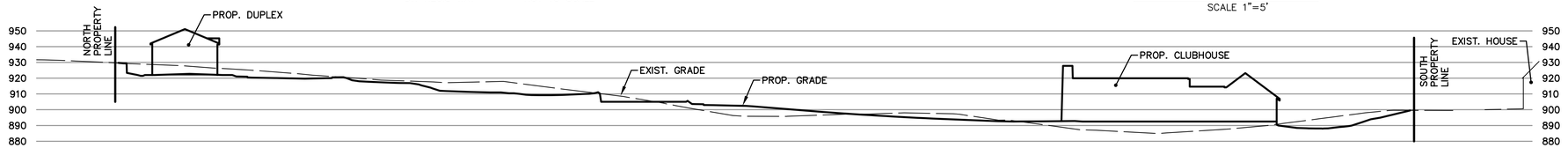
NO SCALE



NOTE:
SEE CITY OF ANN ARBOR UTILITY LOCATION PLAN SD-GU-2

TYPICAL ROAD CROSS-SECTION

ST. REGIS WAY NOT TO SCALE



SITE CROSS SECTION A-A

SCALE: 1"=40'

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COTTAGES AT BARTON GREEN

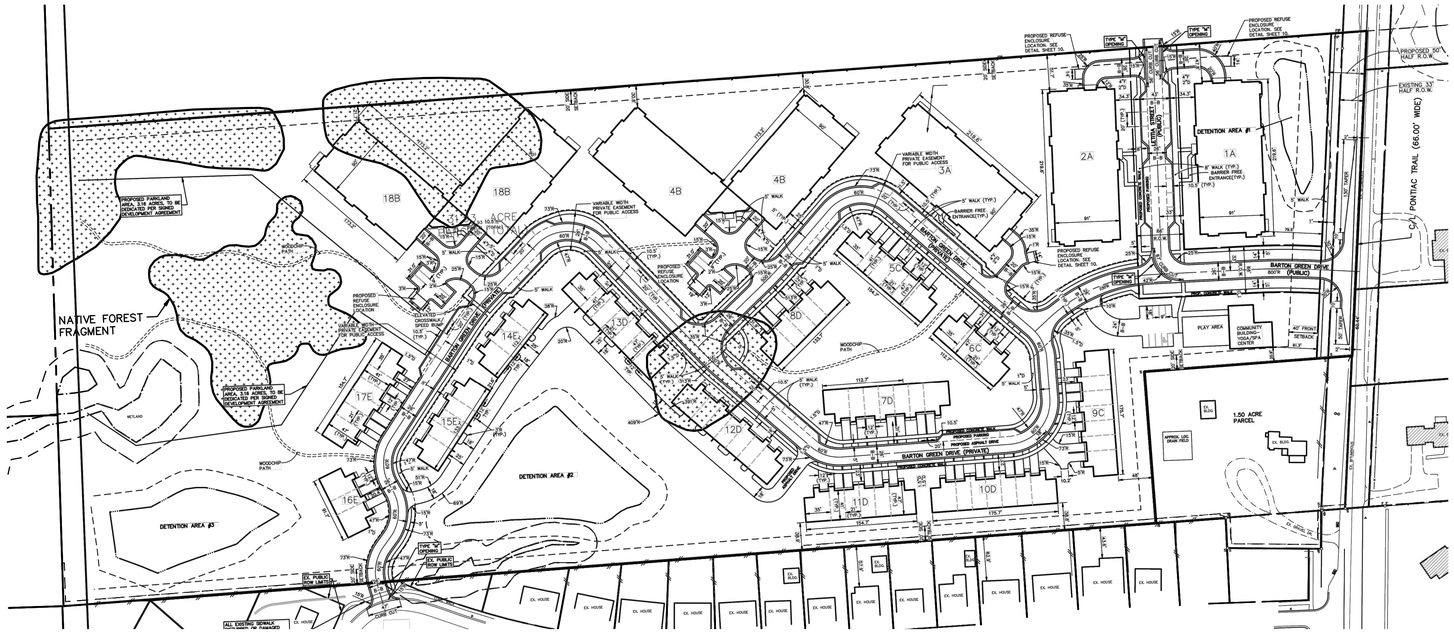
SITE PLAN
MISCELLANEOUS SITE DETAILS

25

DATE: 5/25/17
SHEET 25 OF 49
CADD: DAG, WAJ
ENG.: JCA
PM: SWB
TECH:
16223DT1.dwg
8/24/20

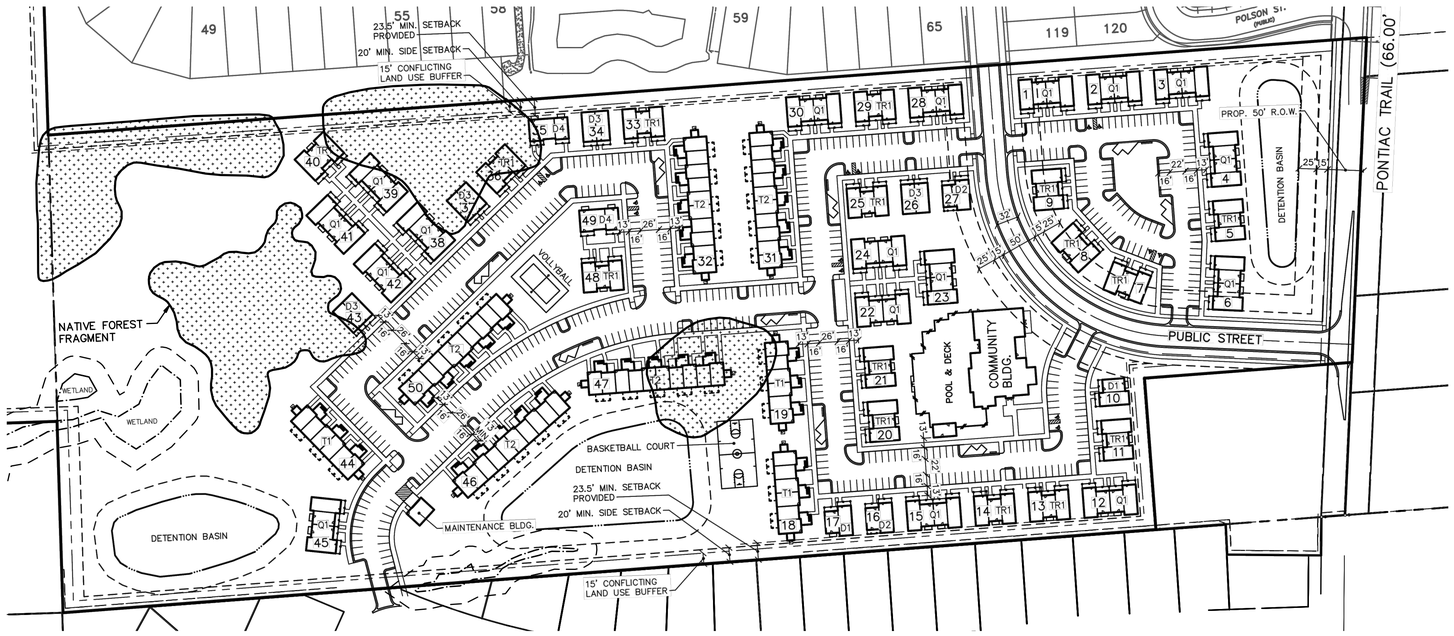
JOB No. 16223

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	7/7/17
REV. PER CITY/COUNTY	8/16/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY/COUNTY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REV. PER CITY	8/24/20



ALTERNATIVE 1

ALTERNATIVE 1, THE PREVIOUS BARTON GREEN SITE PLAN:
This is the previously approved Barton Green Site Plan. The development program was 260 units of upscale condominiums, townhouses and stacked flats, intended for first time buyers, empty nesters, and trade-up condominium buyers. The apartment buildings were larger and taller than the currently proposed cottages and included interior parking. The building height exceeded the R4A zoning district maximum and required a Planned Project Site Plan. The units were a mix of two and three bedrooms, each with two full baths, and ranging from 980 to 2,577 square feet in floor area. The Barton Green Site Plan is void.



ALTERNATIVE 2

ALTERNATIVE 2 (dated 10/14/16): This concept was done prior to new soil borings and infiltration test pits. The concept is to create a village atmosphere with all residential buildings being two-story cottages. In order to achieve anything like the density of 7-10 dwelling units per acre indicated in the City's Master Plan, the developed area is of necessity larger than that of the Barton Green Site Plan. In addition, the program is revised to provide rental apartments primarily for students and young professionals. This requires a higher ratio of parking per units than the 2 spaces per unit specified in the R4A district. The smaller residential units to reduce the overall mass grading required by stepping this buildings down the slopes. The smaller buildings are also more compatible with the existing adjacent Huron Highlands subdivision to the south and proposed Northsky development to the north. Additional impacts on natural features include removals of more Landmark and Woodland trees.

SCALE: 1" = 100'

0 100 200 300

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

WETLAND AREA

WETLAND BUFFER

WOODLAND AREA

NOTES:

MAXIMUM DEVELOPMENT CONCEPT ALTERNATIVE:
The Master Plan indicates a density of 7 to 10 units per acre on this site that would permit 217 to 310 apartments. Assuming these are all six-bedroom units, there could be 1,302 to 1,860 bedrooms on this site. Parking would be an issue for such a development program and providing only the required 2 spaces per unit (434 to 620 spaces) would be well under the number of parking spaces actually required. Constructing close to the typical one space per bedroom in this type of development would require acres of additional tree removals, mass grading and paving. This maximum development alternative is perhaps the least feasible and the least prudent for this location.

SITE ANALYSIS WAS REVISED TO REFLECT CHANGES IN EXISTING CONDITIONS;
The revised Site Analysis includes revisions that have occurred in off-site and adjacent parcels since the Barton Green site plan was approved. The revised Northsky site plan shows relocated utility and public road stubs. The City has made off-site water main and sanitary sewer improvements that provide potential service connections in different locations. The City has also reconstructed and regraded a portion of Pontiac Trail, improving sight distance to the south. Revised storm water management requirements also impact the locations and sizes of the storm sewer and detention basins.

THE COTTAGES AT BARTON GREEN ALTERNATIVES;
The previously approved Barton Green Site Plan was a 260 unit Planned Project in order to permit increased building height. The proposed The Cottages at Barton Green is a 227 unit "by-right" development that does not exceed the permitted building height and does not require a Planned Project.

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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COTTAGES AT BARTON GREEN

SITE PLAN
ALTERNATIVES ANALYSIS (1 & 2)

26

JOB No. 16223

REVISIONS:
REV. PER CITY/COUNTY — REV. DATE 7/12/17

DATE: 5/25/17
SHEET 26 OF 49
CADD: DAC
ENG: JCA
PM: SWB
TECH:
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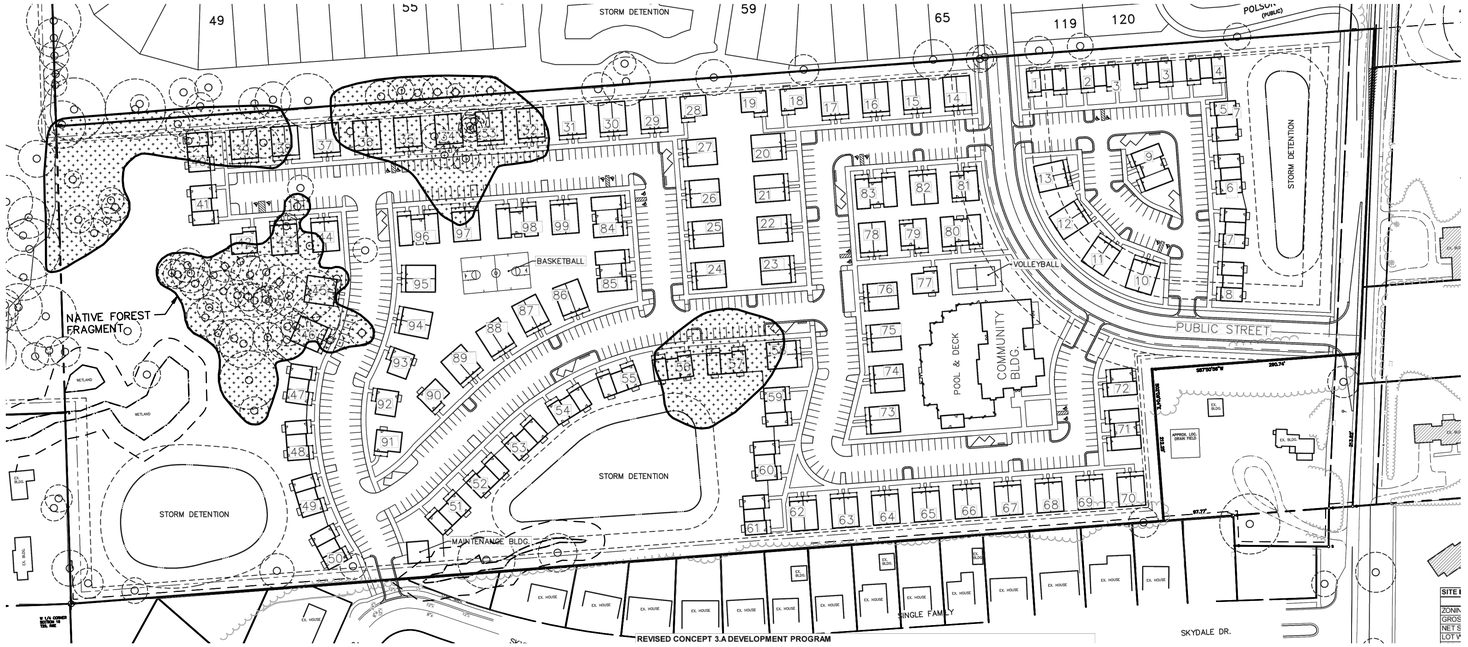
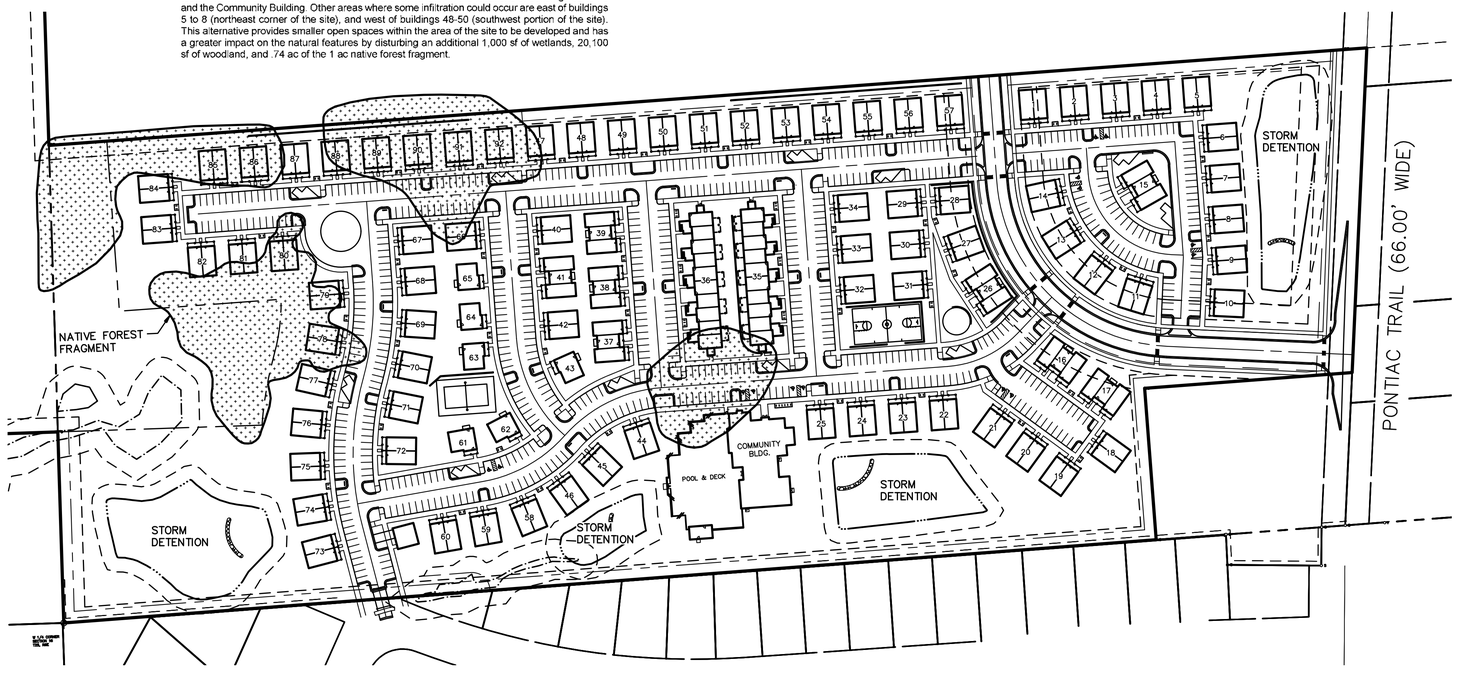


ALTERNATIVE 3

ALTERNATIVE 3 (dated 2/2/16 s.i.c.): This concept was also done prior to completion of soil borings and infiltration test pits. The development concept is a village like collection of smaller cottage style units. Apartments are all two story cottages and include one, two and four unit buildings. Buildings adjacent to Huron Highlands are two story cottages rather than three story townhouses as shown on the previously approved Barton Green site plan. The proposed 6.61 dwelling units per acre density (DUA) is less than the 7-10 DUA recommended in the Master Plan. Buildings 61 to 70 were placed with minimum setbacks along the south property line, adjacent to existing homes in Huron Highlands. This concept includes a proposed public road segment from Pontiac Trail to the St. Regis Way stub shown on the Northsky site plans. The storm detention basin locations are based on the existing topography, without having the results of the infiltration tests. The most suitable soils for infiltration were found later in the locations of buildings 62 to 75 and the Community Building. Other areas where some infiltration could occur are east of buildings 5 to 8 (northeast corner of the site), and west of buildings 48-50 (southwest portion of the site). This alternative provides smaller open spaces within the area of the site to be developed and has a greater impact on the natural features by disturbing an additional 1,000 sf of wetlands, 20,100 sf of woodland, and .74 ac of the 1 ac native forest fragment.



ALTERNATIVE 4

ALTERNATIVE 4: This concept was submitted to the City for review. The layout had been adjusted per soils infiltration testing results. The proposed density was increased to 7+ DUA by adding two 3-story townhouse buildings. These larger buildings are located interior to the site. All residential structures adjacent to Huron Highlands and Northsky are one or two stories. The proposed vehicular access to Skydale Drive was revised to be a gated fire lane / emergency access only as preferred by the Huron Highland residents. All of The Cottages at Barton Green alternatives provide smaller open spaces within the area of the site to be developed as compared to the previous Barton Green Site Plan. They also have a greater impact on the natural features by removing the 0.05-acre wetland along the south edge of the site, and removing and mitigating additional Landmark and Woodland trees.

ALTERNATIVE 5

ALTERNATIVE 5: This is the current "The Cottages at Barton Green" proposed Site Plan. The proposed density has been increased to 7.36 DUA by adding additional 3-story townhouse buildings. These larger buildings are all located interior to the site. All residential structures adjacent to Huron Highlands and Northsky are one or two stories. The proposed vehicular access to Skydale Drive has been revised to be a secondary emergency access only. The site layout has been revised to reduce impacts on woodlands and landmark trees, particularly north of buildings 56 and 57, west of buildings 38-40, and west of buildings 57-58 and the Maintenance Building. The proposed park dedication area in the western portion of the site has also be increased from 7.12 acres to 9.59 acres.

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.

SCALE: 1" = 100'

0 100 200 300

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

WETLAND AREA

WETLAND BUFFER

WOODLAND AREA

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COTTAGES AT BARTON GREEN

SITE PLAN
ALTERNATIVES ANALYSIS (3 & 4)

27

DATE: 5/25/17
SHEET 27 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
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FB#460

JOB No. 16223

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	7/12/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18

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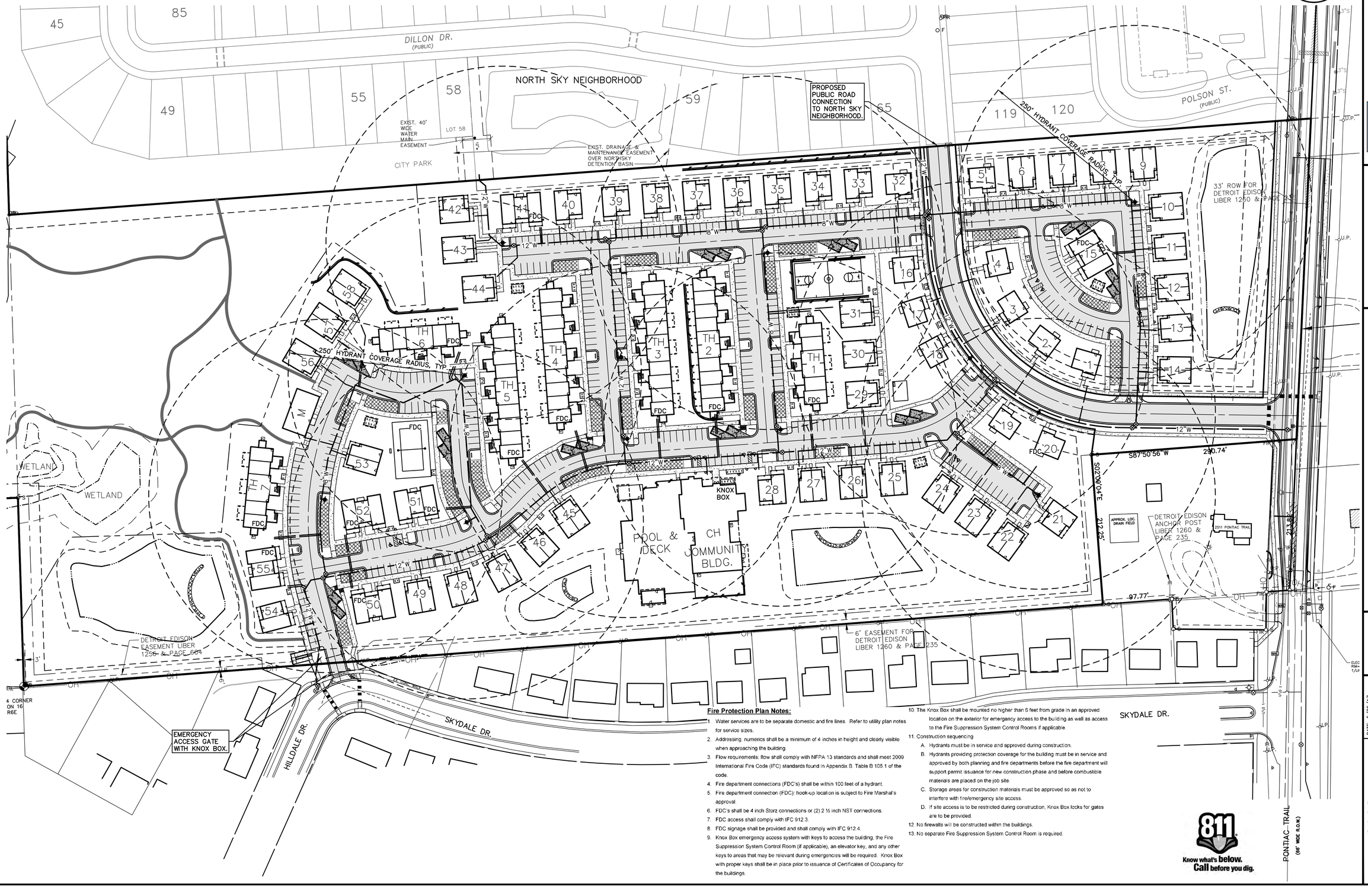

Fire Protection Plan Notes:

1. Water services are to be separate domestic and fire lines. Refer to utility plan notes for service sizes.
2. Addressing: numerics shall be a minimum of 4 inches in height and clearly visible when approaching the building.
3. Flow requirements: flow shall comply with NFPA 13 standards and shall meet 2009 International Fire Code (IFC) standards found in Appendix B. Table B 105.1 of the code.
4. Fire department connections (FDC's) shall be within 100 feet of a hydrant.
5. Fire department connection (FDC): hook-up location is subject to Fire Marshal's approval.
6. FDC's shall be 4 inch Storz connections or (2) 2 ½ inch NST connections.
7. FDC access shall comply with IFC 912.3.
8. FDC signage shall be provided and shall comply with IFC 912.4.
9. Knox Box emergency access system with keys to access the building, the Fire Suppression System Control Room (if applicable), an elevator key, and any other keys to areas that may be relevant during emergencies will be required. Knox Box with proper keys shall be in place prior to issuance of Certificates of Occupancy for the buildings.
10. The Knox Box shall be mounted no higher than 6 feet from grade in an approved location on the exterior for emergency access to the building as well as access to the Fire Suppression System Control Rooms if applicable.
11. Construction sequencing
    A. Hydrants must be in service and approved during construction.
    B. Hydrants providing protection coverage for the building must be in service and approved by both planning and fire departments before the fire department will support permit issuance for new construction phase and before combustible materials are placed on the job site.
    C. Storage areas for construction materials must be approved so as not to interfere with fire/emergency site access.
    D. If site access is to be restricted during construction, Knox Box locks for gates are to be provided.
12. No firewalls will be constructed within the buildings.
13. No separate Fire Suppression System Control Room is required.

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COTTAGES AT BARTON GREEN

SITE PLAN
FIRE PROTECTION PLAN

28

DATE: 5/25/17
SHEET 28 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223FPP.dwg
FB#460

JOB No. 16223

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	7/12/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REVISED PER AGREEMENT	6/7/19

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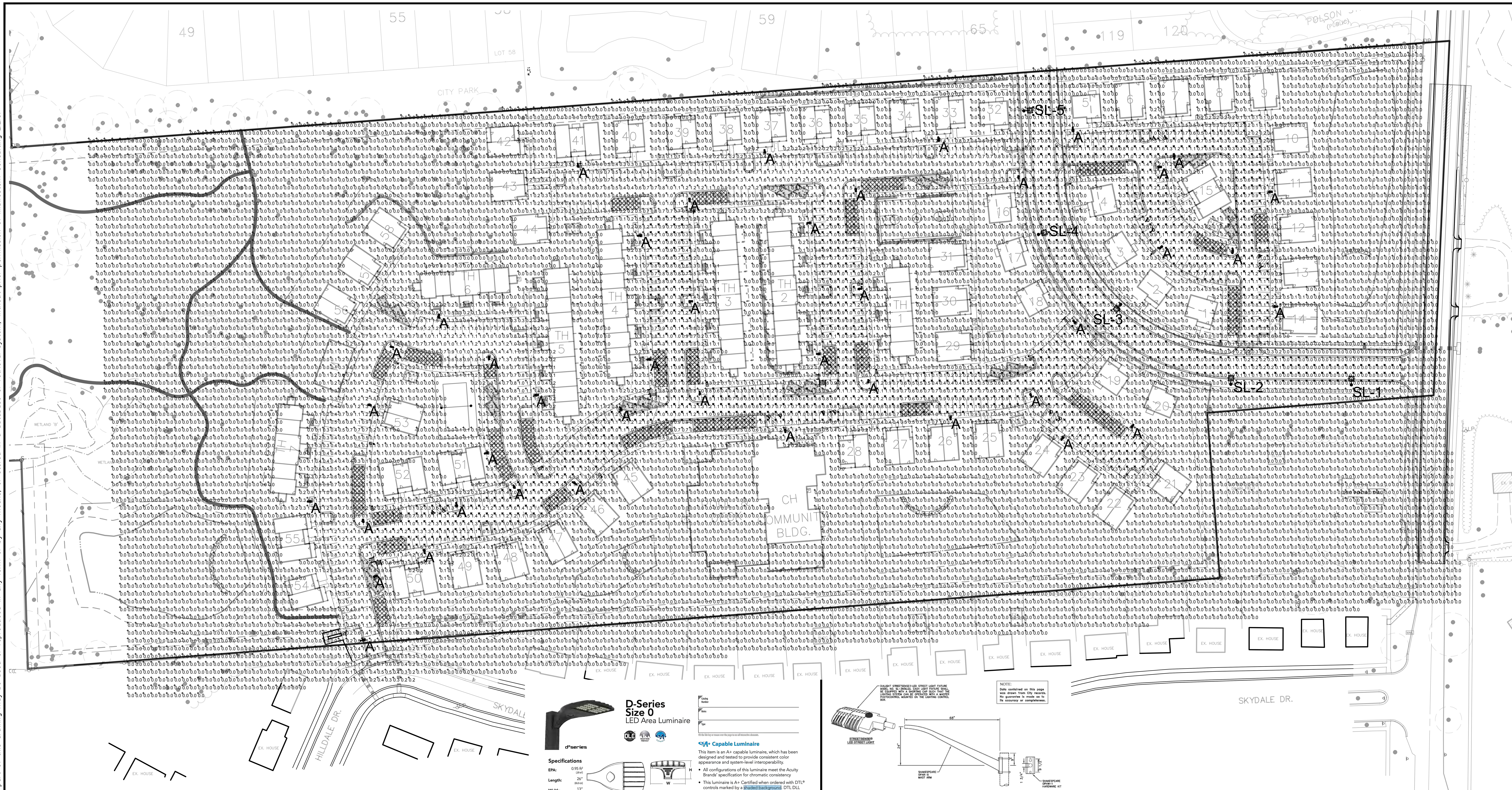

ON–SITE LIGHTING

GENERAL NOTE

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

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.

Luminaire Schedule

Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens per Lamp	LLF	Wattage	Mounting Height
□	A	42	Lithonia Lighting	DSX0 LED 20C 1000 30K T3M MVOLT HS	DSX0 LED with 20 LEDs @1000 mA , 3000K, Type 3 Medium Optics with HOUSE-SIDE SHIELD	LED	1	DSX0_LED_20C_1000_30K_T3M_MVOLT_HS.ies	5715	0.95	72	25'-0"

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D-Series Size 0
LED Area Luminaire

d"series

Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

EPA:	0.95 ft² (.09 m²)
Length:	26" (66.0 cm)
Width:	13" (33.0 cm)
Height:	7" (17.8 cm)
Weight (max):	16 lbs (7.25 kg)

A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability1
- This luminaire is part of an A+ Certified solution for ROAM®2 or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background1

To learn more about A+, visit www.acuitybrands.com/aplus.

1. See ordering tree for details.
2. A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire. Sold Separately: Link to Roam; Link to DTL DLL

A+ Capable options indicated by this color background.

Ordering Information — **EXAMPLE:** DSX0 LED 40C 1000 40K T3M MVOLT SPA DDBXD

DSX0 LED

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting
DSX0 LED	Forward optics: 20C 20 LEDs (one engine); 40C 40 LEDs (two engines); Rotated optics[1]: 30C 30 LEDs (one engine)	530 530 mA; 700 700 mA; 1000 1000 mA (1 A)	30K 3000 K; 40K 4000 K; 50K 5000 K; AMBPC Amber phosphor converted[2]	T1S Type I short; T2S Type II short; T2M Type II medium; T3S Type III short; T3M Type III medium; T4M Type IV medium; TFTM Forward throw medium; T5VS Type V very short; T5S Type V short; T5M Type V medium; T5W Type V wide; BLC Backlight control[2,3]; LCCO Left corner cutoff[2,3]; RCCO Right corner cutoff[2,3]	MVOLT[4]; 120[4]; 208[4]; 240[4]; 277[4]; 347[5]; 480[5]	Shipped included: SPA Square pole mounting; RPA Round pole mounting; WBA Wall bracket; SPUMBA Square pole universal mounting adaptor[6]; RPUMBA Round pole universal mounting adaptor[6]; Shipped separately: KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish)[7]

Control options		Other options	Finish
Shipped installed: PER NEMA twist-lock receptacle only (no controls)[8]; PER5 Five-wire receptacle only (no controls)[8,9]; PER7 Seven-wire receptacle only (no controls)[8,9]; DMG 0-10V dimming extend out back of housing for external control (no controls)[10]; DCR Dimmable and controllable via ROAM® (no controls)[11]; PIR Bi-level, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc[12]; PIRH Bi-level, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 5fc[12]; PIR1FC3V Bi-level, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc[12]	PIRH1FC3V Bi-level, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc[12]; BL30 Bi-level switched dimming, 30%[13,14]; BL50 Bi-level switched dimming, 50%[13,15]; PNMTDD3 Part night, dim till dawn[15]; PNMT5D3 Part night, dim 5 hrs[15]; PNMT6D3 Part night, dim 6 hrs[15]; PNMT7D3 Part night, dim 7 hrs[15]; FAO Field adjustable output[16]	Shipped installed: HS House-side shield[17]; SF Single fuse (120, 277, 347V)[18]; DF Double fuse (208, 240, 480V)[18]; L90 Left rotated optics[1]; R90 Right rotated optics[1]; DDL Diffused drop lens[17]; BS Bird spikes	DDBXD Dark bronze; DBLXD Black; DNAXD Natural aluminum; DWHXD White; DDBTXD Textured dark bronze; DBLBXD Textured black; DNATXD Textured natural aluminum; DWHGXD Textured white

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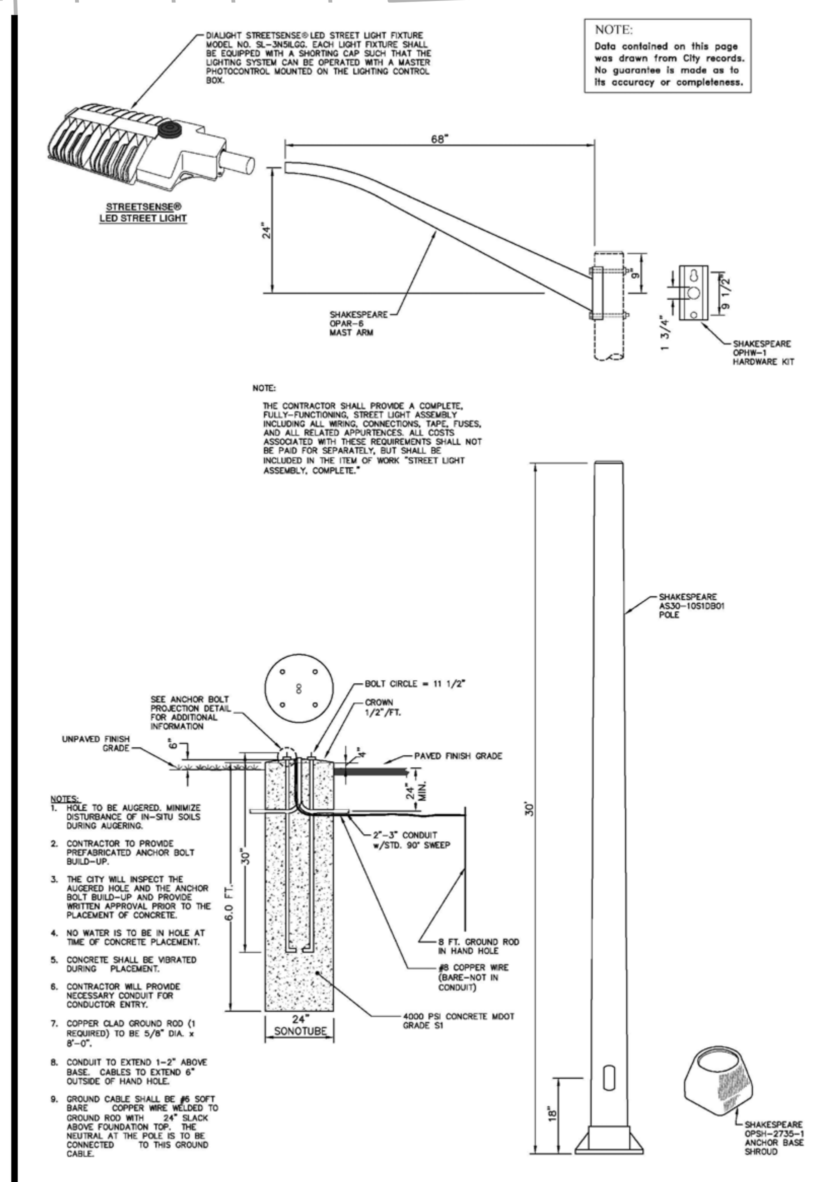
DSX0-LED Rev. 03/29/17 Page 1 of 6

ON–SITE LIGHTING



ST. REGIS WAY LIGHTING

ST. REGIS WAY STREET LIGHTING NOTES:

1. Only the City or its authorized agent will be the maintaining authority of the street lighting.
2. Fixtures: The allowable lighting types are standard D.T.E. Energy or City lighting, with final approval granted by Public Works. Fixtures are to be Dialight StreetSense LED Street Lights - UL, Model No. SL3N5HLGG or approved equal; neutral white (400K color temperature), Type III illumination pattern (lower wattage – 131W fixture, 10,900 lumen), 30' height pole, luminaire 32' above ground or City of Ann Arbor approved equal.
   Details shown are taken from Project Management – Public Services - City of Ann Arbor, Stone School Road Improvements, drawing no. 2011029 – 8.
3. Street lighting shall be designed to meet the ANSI/IES RP-8 standards.
4. Five preliminary streetlight locations are shown on St. Regis Way, numbered SL-1 through SL-5. These locations are based on previous similar plans and are subject to further review and revision during detailed engineering.

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

SCALE: 1" = 60'
0 60 120 180

PHOTOMETRIC PLAN PREPARED BY
GASSER BUSH ASSOCIATES.
GASSER BUSH DRAWING: #17–72319 V3

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LAFAYETTE, INDIANA 47901
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COTTAGES AT BARTON GREEN

SITE PLAN
PHOTOMETRIC PLAN

29

DATE: 5/25/17
SHEET 29 OF 49
CADD: DAG, WAJ
ENG: JCA
PM: SWB
TECH:
16223LT1.dwg
FB#460

JOB No. **16223**

REVISIONS:	REV. DATE
REV. PER CITY/COUNTY	7/12/17
REV. PER CITY/COUNTY	9/5/17
REV. PER CITY	10/12/17
REV. PER CITY	11/15/17
REV. PER CITY	1/23/18
REVISED PER AGREEMENT	6/7/19

M:\Civil3d_Proj\16223\Site Plan\16223OV1.dwg, 6/20/2019 1:33 PM, Jim Ahnert, None

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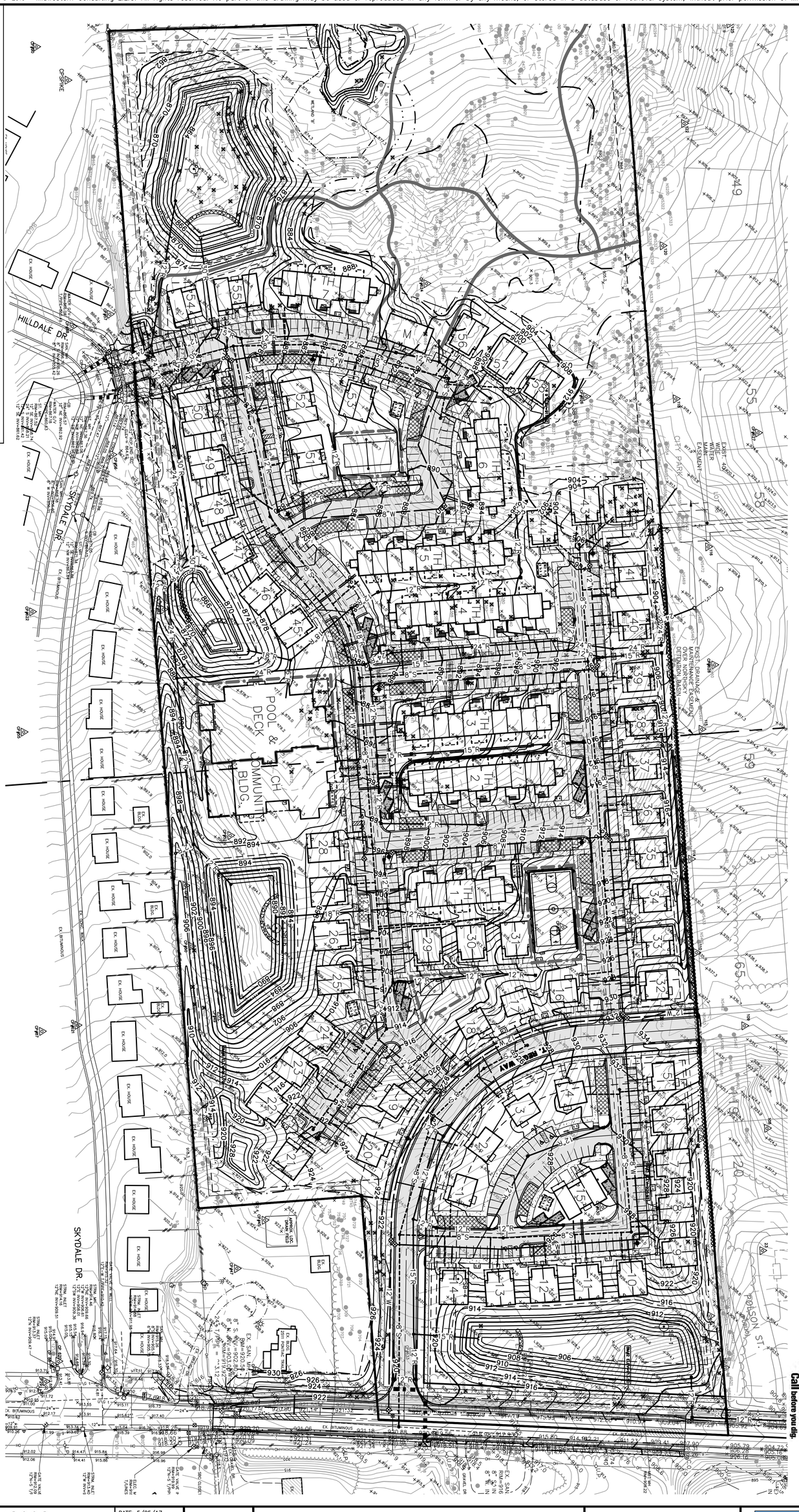
The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground 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.



JOB No. 16223		DATE: 5/25/17
REVISIONS:	REV. DATE	SHEET 30 OF 49
REV. PER COUNTY	8/16/17	CADD: DAG, WAJ
REV. PER CITY/COUNTY	9/5/17	ENG: JCA
REV. PER CITY	10/12/17	PM: SWB
REV. PER CITY	11/15/17	TECH:
REV. PER CITY	1/23/18	16223OV1.dwg
REVISED PER AGREEMENT	6/7/19	FB#460

30

COTTAGES AT BARTON GREEN

SITE PLAN
OVERLAY PLAN

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