RACQUET CLUB OF ANN ARBOR

SITE RENOVATIONS

SITE PLAN

CITY OF ANN ARBOR, WASHTENAW CO., MICHIGAN

SITE PLAN SUBMITTAL 3 - 5/15/2015

OWNER/DEVELOPER

RACQUET CLUB OF ANN ARBOR
3010 HICKORY LANE.
ANN ARBOR, MI 48108
PH: (734) 216-0579
ATTN: BRENT SCHOMAKER

ENGINEER/SURVEYOR

MIDWESTERN CONSULTING, LLC
3815 PLAZA DR.
ANN ARBOR, MI 48108
PH: (734) 995-0200
ATTN: SCOTT W. BETZOLDT

ARCHITECT

MITCHELL AND MOUAT ARCHITECTS
113 SOUTH FOURTH AVE.
ANN ARBOR, MI 48104
PH: (734) 662-6070
ATTN: JOHN MOUAT

ANN ARBOR RACQUET CLUB
Narrative Description

I. DEVELOPMENT PROGRAM SUMMARY

The Ann Arbor Racquet Club is a tennis and swim club that began in the mid 1960's and is located at 3010 Hickory lane at the southwest corner of Geddes and Huron Parkway. Facilities at the club include clay and all weather tennis courts, a full size pool, tennis locker rooms, office and pro shop, children's pool, playground amenities and grilling and food vending. The facility is open seasonally during daylight hours only. The original pool and tennis building are 50 years old and lacking modern functionality and accessibility. The tennis building has been particularly problematic in that it has a basement that cannot be utilized due to groundwater flooding. Additionally the building is constructed such that visitor must ascend and descend a half of a flight of stairs to enter and exit the building.

The proposal contained here-in includes the demolition of the existing tennis building and replacing it with a new, single story 3533 SF facility that will be accessible to all. Also included is an addition to the pool building that will facilitate a common, central entry and check in point for all entering and exiting club members as well as new office and laundry facilities. Additional improvements include and addition to the snack shack, patio and pedestrian improvements and storm water detention.

A. Proposed Land Use

The Ann Arbor Racquet Club will continue to operate as a private tennis, swim and recreational facility.

B. Phasing and Construction Cost

(B.1) Preliminary Phasing: All construction shall be completed in one phase beginning in the fall of 2015 and being completed in the spring of 2016.

(B.2) Preliminary Cost Estimate: The combined estimated total project construction cost, including utilities, structures, landscaping and site amenities is approximately $2.5 million.

1. Community Analysis

(a) Impact on Schools

The project will have no impact on the school system.

(b) Relationship with Neighboring Uses

The proposal is consistent with the existing use at this site and should present no objection to neighboring uses.

North of Site: The north side of the site is Geddes Road leading down to the Huron River.
West of Site: Hickory Lane lies west of the site and serves adjacent residential properties that were developed after the club was established.
South of Site: Contains the Huron Hills Golf course.
East of Site: Contains a public ROW for what once was the entrance from Geddes Road onto south bound Huron Parkway. It is now a bike lane.

(c) Impact on Adjacent Uses

The proposed development will have no negative impact on existing uses around the site and is consistent with the current use.

(d) Impact of Development Relevant to Various Issues:

- Air Quality: The proposal will have no impact on air quality.
- Water Quality: The reconstructed parts of this site will be provided with storm water management facilities in accordance with current standards and discharged in accordance with City of Ann Arbor and Washtenaw County Water Resources Commissioner standards. There currently are no stormwater management facilities on the site at all. Stormwater will be collected from the parking lot through an existing network and then directed into a new underground stormwater tank farm for storage and infiltration.
- Natural Features: Sheet 1 of the site plan provide a graphic description of the natural features that are found on the site. Natural features on this site consist solely of landmark trees. The area that is proposed for development is almost entirely existing improvements in the form of buildings and pedestrian improvements. The development program concentrates all of the activities in this area thus eliminating any impact to landmark trees.
- Wetlands: The site contains no wetlands.
- Steep Slopes: the site contains no steep slopes.
- Floodplains: There are no 100 year floodplains or watercourses that will be impacted by the development.
- Endangered Species or Habitat: None known to exist.
- Woodlands: There are no qualifying woodlands on site.
- Solid Waste – Solid waste removal will be contracted privately using the existing facilities.
- There are no historical sites, structures or districts impacted by the proposed development.

1. Site Analysis

(a) Existing Land Use

The existing land zoning is Agricultural while the use of the parcel is recreational. The land has been utilized in this fashion for decades.

(b) Site Conditions

The site is shown in the USDA Soil Conservation Service Soil Survey of Washtenaw County to be primarily Boyer series with 0 to 6% slopes. Site vegetation includes almost exclusively planted trees and shrubs and several native landmark trees that will not be affected. Topography ranges from 785 USGS down to 769 USGS. Sheet 1 of the Area Plan graphically depicts the site conditions.

(c) Natural Features Description

(i) No endangered species are known to exist on-site.
(ii) There is no 100-year floodplain on-site.
(iii) The landmark trees on site are shown on Sheet 1.
(iv) There are no steep slopes on the site.
(v) There are no permanent watercourses on-site.
(vi) There are no wetlands on the site.
(vii) There are no woodlands on the site.

(d) Existing Structures

The site contains a managers residence with a detached garage, a pool building a tennis building, a snack shack grill and two barns for storage.

(e) Access Points

Vehicular: The site has access through two entrances off of Hickory Lane and one off Geddes Road. No other connections to adjacent properties are anticipated.

Pedestrian and Bicycle: There are currently no paths or walks along Geddes in front of this location and none are proposed with this project due to safety reasons. The City is planning to install sidewalks along the north side of Geddes Road in 2016, but not will not be installing any on the south side. There are currently no paths proposed on Hickory Lane as there are no paths or sidewalks in the neighborhood.

Associated with a previous site plan administrative amendment in 2008, City Council Resolution R-08-140 waived the sidewalk requirement for site plan petition file AA08-019. This Resolution does not waive the requirement in perpetuity or run with the land, however we are requesting the waiver to continue as the reasons for requesting it have not changed.

(f) Utilities

Water: Water is received from a public main located in Geddes Road.
Sanitary Sewer: Sewage drains to a public main located in Huron Parkway.

Storm Sewer: Storm sewer will collect and drain stormwater runoff to a new underground storm water detention and infiltration unit on the site.

(g) Drainage

All on-site drainage that is equitable to the new improvements 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 a centeral storm sewer which will divert the flow into an underground detention and infiltration chamber. The proposed drainage system will be completely internal to the site and utilize sheet flow, underground storm sewer and swirl separators that filter the stormwater and release the runoff at a pre-developed rate of discharge.

3. Traffic Impact

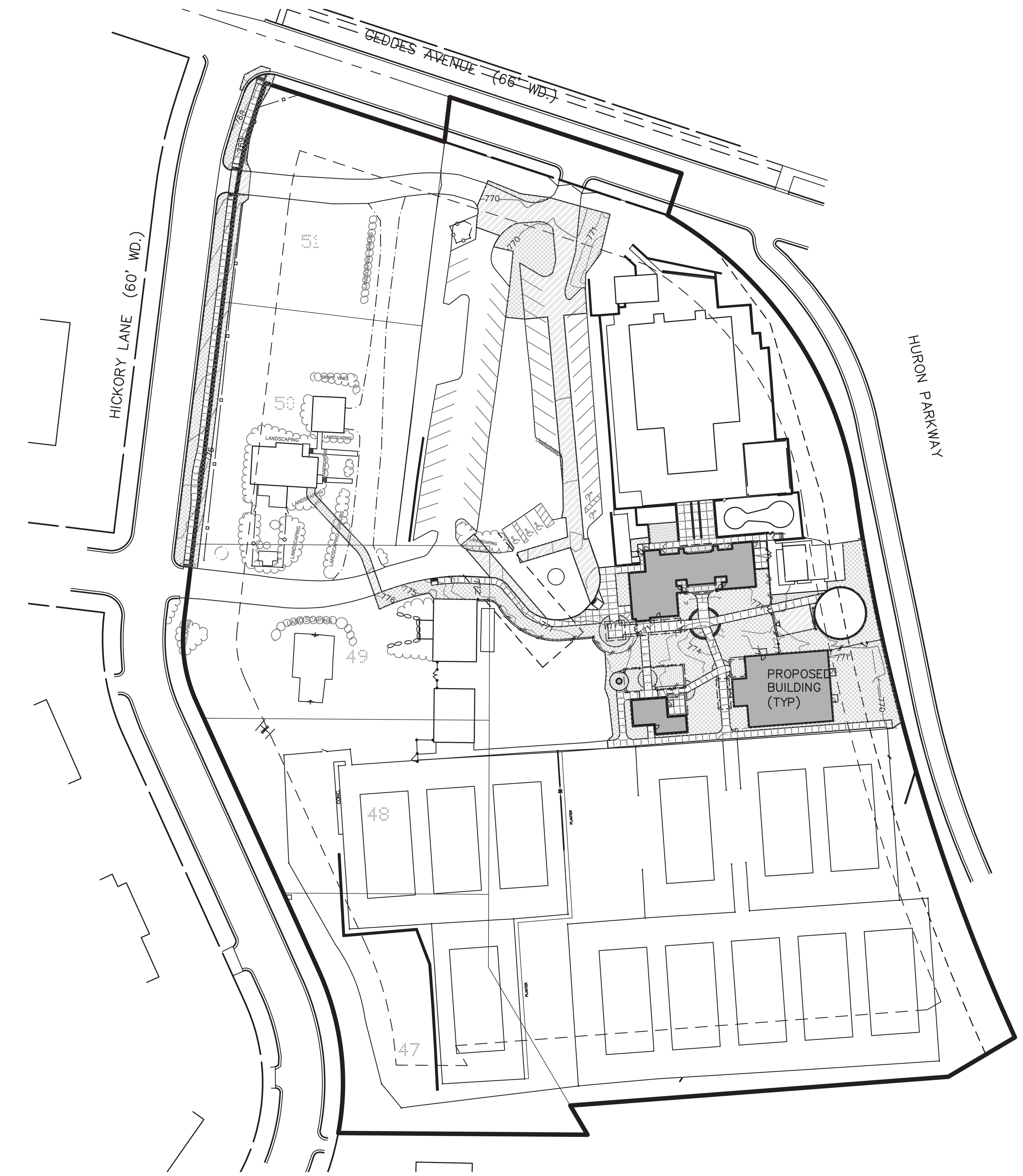
The scope of this project includes the reconstruction of existing facilities only. No new uses or expansion of existing uses is proposed therefore no new trip generation is expected.

GENERAL NOTES:

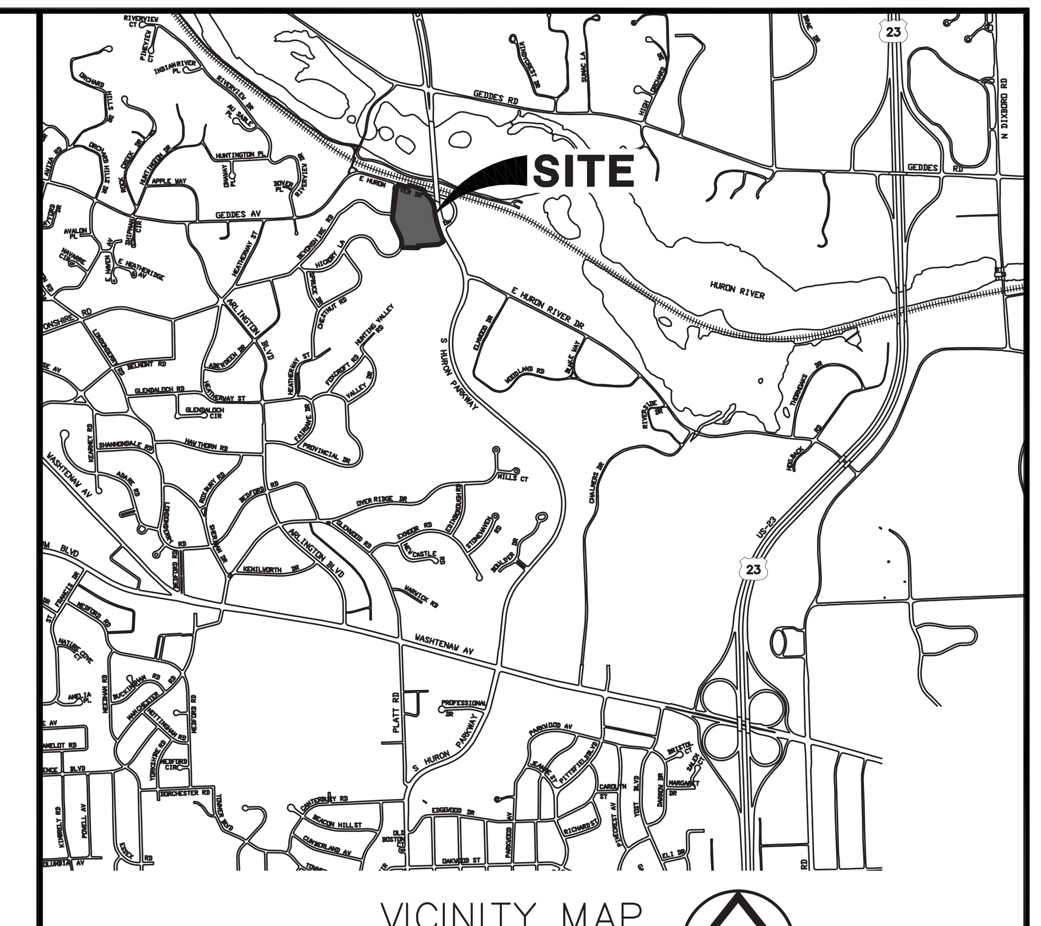
PER CHAPTER 49, SECTION 4:58 OF THE CITY CODE, "ALL SIDEWALKS ARE TO BE KEPT AND MAINTAINED IN GOOD REPAIR BY THE OWNER OF THE LAND ADJACENT TO AND ABUTTING THE SAME." PRIOR TO ISSUANCE OF THE FINAL CERTIFICATE OF OCCUPANCY FOR THIS SITE, ALL EXISTING SIDEWALKS MUST BE REPAIRED IN ACCORDANCE WITH CITY STANDARDS.

THE CONSTRUCTION COVERED BY THESE PLANS SHALL CONFORM TO THE CITY OF ANN ARBOR PUBLIC SERVICES DEPARTMENT STANDARD SPECIFICATIONS AND DETAILS WHICH ARE INCLUDED BY REFERENCE.

THE OMISSION OF ANY STANDARD DETAILS DOES NOT RELIEVE THE CONTRACTORS OF THEIR OBLIGATION TO CONSTRUCT ITEMS IN COMPLETE ACCORDANCE WITH PUBLIC SERVICES DEPARTMENT STANDARD SPECIFICATIONS.



OVERALL SITE PLAN
SCALE: 1" = 60'



VICINITY MAP
NOT TO SCALE

Sheet Index

RACQUET CLUB OF ANN ARBOR

JOB No. **14058**

REVISIONS:	REV. DATE

DATE: 5/15/2015
SHEET 1 OF 22
CADD: WAJ
ENG: JAM
PM: SWB
TECH: WAJ
14058CV1.DWG

1

MIDWESTERN CONSULTING

Civil, Environmental and Transportation Engineers
Planners, Surveyors
Landscape Architects

3815 Plaza Drive
Ann Arbor, Michigan 48108
Phone: 734.995.0200
Fax 734.995.0599

RELEASED FOR:	DATE
SITE PLAN SUBMITTAL 1	1/26/2015
SITE PLAN SUBMITTAL 2	3/2/2015
SITE PLAN SUBMITTAL 2	5/15/2015

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

SCOTT W. BETZOLDT
P.E. # 38141

NATURAL FEATUES DESCRIPTION

The only natural features that exist on this site are landmark trees. Most of these trees are elderly black pine nursery stock with the exception of a few black cherry, locust, walnut and box elder.

NATURAL FEATURES STATEMENT OF IMPACT

There are no natural features on this site with the exception of several landmark trees that are not in the influence of the construction project.

NOTES:

1. ALL WATER SYSTEM WORK IS ON PRIVATE MAIN, DOWNSTREAM OF THE METER PIT AT THE NORTH OF THE SITE.
2. ALL SANITARY AND STORM SEWERS ON SITE ARE PRIVATE SEWERS.
3. GAS AND ELECTRIC SERVICES ENTER THE SITE AND ARE METERED AT AND DISTRIBUTED FROM THE EAST SIDE OF THE POOL BUILDING. COORDINATE ALL NEW CONNECTIONS AT THE MODIFIED METER/DISTRIBUTION AREA. SEE ARCHITECTURAL, MECHANICAL, AND PLUMBING PLANS FOR FURTHER INFORMATION.
4. EXISTING UTILITY SERVICE LOCATIONS OF SANITARY SEWER, WATER MAIN, GAS, AND ELECTRIC ARE APPROXIMATIONS BASED ON BEST AVAILABLE INFORMATION. EXISTING UTILITY LABELED WITH AN ASTERISK (*) HAVE NO WRITTEN RECORDS, AND ARE INFERRED FROM VISIBLE APPURTENANCES AND STANDARD CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LCOATIONS, AND INFORM THE ENGINEER OF ANY SUBSTANTIAL DISCREPANCIES BEFORE CONTINUING.

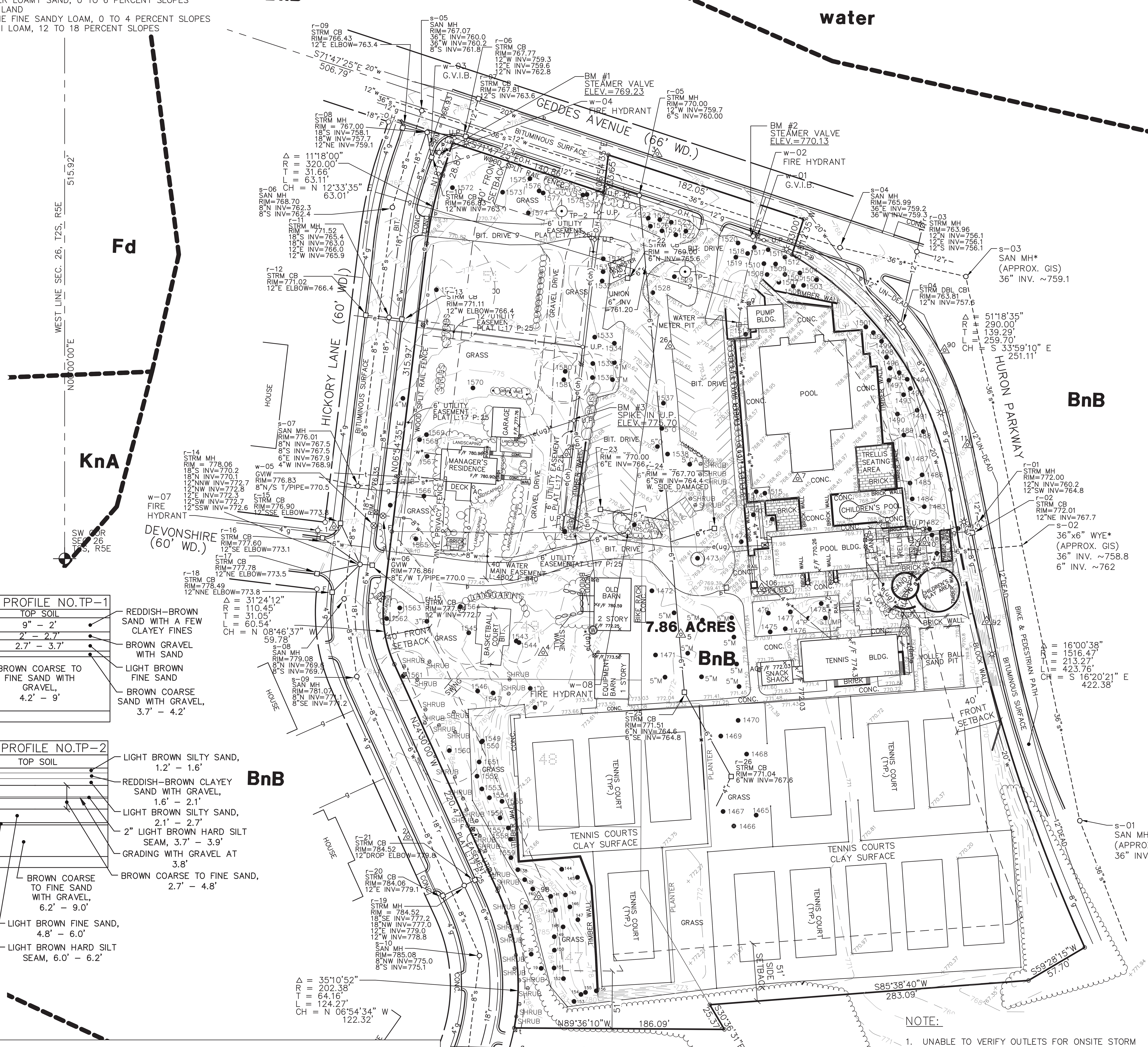
BENCHMARK:

1. TOP OF WEST STEAMER VALVE ON HYDRANT LOCATED AT S.E. COR. OF GEDDES AND HICKORY LANE.
   ELEV. = 769.23
2. TOP OF NORTH STEAMER VALVE ON HYDRANT LOCATED ±50' S. OF GEDDES RD. AND ±275' E. OF HICKORY LANE.
   ELEV. = 770.13

GENERAL SOILS DESCRIPTION

BASED ON SOIL SURVEY OF WASHTENAW COUNTY MICHIGAN

BnB – BOYER LOAMY SAND, 0 TO 6 PERCENT SLOPES
Fd – FILL LAND
KnA – KIBBIE FINE SANDY LOAM, 0 TO 4 PERCENT SLOPES
MmD – MIAMI LOAM, 12 TO 18 PERCENT SLOPES



SOIL PROFILE NO.TP–1	
0'	TOP SOIL
	9" – 2' REDDISH–BROWN SAND WITH A FEW CLAYEY FINES
	2' – 2.7' BROWN GRAVEL WITH SAND
	2.7' – 3.7' LIGHT BROWN FINE SAND
5'	BROWN COARSE SAND WITH GRAVEL, 3.7' – 4.2'
10'	BROWN COARSE TO FINE SAND WITH GRAVEL, 4.2' – 9'

SOIL PROFILE NO.TP–2	
0'	TOP SOIL
	LIGHT BROWN SILTY SAND, 1.2' – 1.6'
	REDDISH–BROWN CLAYEY SAND WITH GRAVEL, 1.6' – 2.1'
5'	LIGHT BROWN SILTY SAND, 2.1' – 2.7'
	2" LIGHT BROWN HARD SILT SEAM, 3.7' – 3.9'
	GRADING WITH GRAVEL AT 3.8'
	BROWN COARSE TO FINE SAND, 2.7' – 4.8'
	LIGHT BROWN FINE SAND, 4.8' – 6.0'
	LIGHT BROWN HARD SILT SEAM, 6.0' – 6.2'
10'	BROWN COARSE TO FINE SAND WITH GRAVEL, 6.2' – 9.0'

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 exactly as possible from the information available.

NOTE:

1. UNABLE TO VERIFY OUTLETS FOR ONSITE STORM DRAINAGE.
2. UNDERGROUND UTILITIES SHOWN ARE BASED ON AVAILABLE RECORDS. NO GUARANTEE IS MADE AS TO ITS ACCURACY OR COMPLETENESS.

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	INV
1465	19"	Honey Locust	Gleditsia triacanthos				
1466	18"	Honey Locust	Gleditsia triacanthos				
1467	15"	Honey Locust	Gleditsia triacanthos				
1468	20"	Honey Locust	Gleditsia triacanthos				
1469	18"	Honey Locust	Gleditsia triacanthos				
1470	20"	Honey Locust	Gleditsia triacanthos				
1471	7"	Honey Locust	Gleditsia triacanthos				
1472	7"	Sugar Maple	Acer saccharum				
1473	7"	Bradford Pear	Pyrus calleryana				
1474	15"	Sugar Maple	Acer saccharum				
1475	11"	Red Pine	Pinus resinosa				
1476	7"	Red Pine	Pinus resinosa				
1477	9"	Red Pine	Pinus resinosa				
1478	9"	White Pine	Pinus strubus				
1479	18"	Black Pine	Pinus nigra		21	X	
1480	15"	Black Pine	Pinus nigra				
1481	8"	Scotch Pine	Pinus sylvestris				X
1482	21"	Box Elder	Acer negundo		20	X	
1483	16"	Black Pine	Pinus nigra				
1484	15"	Black Pine	Pinus nigra				
1485	14"	Black Pine	Pinus nigra				
1486	14"	Black Pine	Pinus nigra				
1487	20"	Black Pine	Pinus nigra		20	X	
1488	16"	Black Pine	Pinus nigra				
1489	12"	Black Pine	Pinus nigra				
1490	19"	Red Pine	Pinus resinosa		19	X	
1491	16"	Black Pine	Pinus nigra				
1492	11"	Red Pine	Pinus resinosa				
1493	18"	Black Pine	Pinus nigra		20	X	
1494	16"	Red Pine	Pinus resinosa				
1495	10"	Black Pine	Pinus nigra				
1496	15"	Black Pine	Pinus nigra				
1497	15"	Black Pine	Pinus nigra				
1498	13"	Black Pine	Pinus nigra				
1499	16"	Black Pine	Pinus nigra				
1500	17"	Black Pine	Pinus nigra				
1501	18"	Red Pine	Pinus resinosa		21	X	
1502	6"	White Spruce	Picea glauca				
1503	6"	White Spruce	Picea glauca				
1504	6"	White Spruce	Picea glauca				
1505	6"	White Spruce	Picea glauca				
1506	7"	White Spruce	Picea glauca				
1507	6"	White Spruce	Picea glauca				
1508	6"	White Spruce	Picea glauca				
1509	6"	White Spruce	Picea glauca				
1510	6"	White Spruce	Picea glauca				
1511	16"	Black Pine	Pinus nigra				
1512	12"	Black Pine	Pinus nigra				
1513	13"	Black Pine	Pinus nigra				
1514	9"	Black Pine	Pinus nigra				
1515	8"	Black Pine	Pinus nigra				
1516	17"	Scotch Pine	Pinus sylvestris				X
1517	14"	Black Pine	Pinus nigra				
1518	11"	Black Pine	Pinus nigra				
1519	14"	Black Pine	Pinus nigra				
1520	14"	Black Pine	Pinus nigra				
1521	19"	Black Pine	Pinus nigra		19	X	
1522	13"	Black Pine	Pinus nigra				
1523	20"	Black Pine	Pinus nigra		19	X	
1524	11"	Black Pine	Pinus nigra				
1525	17"	Black Pine	Pinus nigra				
1526	18"	Black Pine	Pinus nigra		20	X	
1527	12"	Black Pine	Pinus nigra				
1528	8"	Norway Maple	Acer platanoides				X
1529	6"	White Spruce	Picea glauca				
1530	17"	Black Pine	Pinus nigra				
1531	16"	Black Pine	Pinus nigra				
1532	24"	Black Pine	Pinus nigra		20	X	
1533	8"	Red Pine	Pinus resinosa				
1534	6"	Sugar Maple	Acer saccharum				
1535	15"	Scotch Pine	Pinus sylvestris				X
1536	21"	Black Pine	Pinus nigra		13	X	
1537	8"	Sugar Maple	Acer saccharum				
1538	8"	White Pine	Pinus strubus				
1539	7"	Norway Spruce	Picea abies				
1540	8"	White Pine	Pinus strubus				
1541	6"	Crab Apple	Malus coronaria				
1542	7"	Crab Apple	Malus coronaria				
1543	15"	Black Cherry	Prunus serotina				
1544	18"	Black Cherry	Prunus serotina		15	X	
1545	28"	Black Walnut	Juglans nigra		21	X	
1546	22"	Black Walnut	Juglans nigra		21	X	
1547	11"	White Mulberry	Morus alba	twin			X
1548		Lost	Tag				
1549	9"	Red Pine	Pinus resinosa				
1550	8"	Red Pine	Pinus resinosa				
1551	10"	Red Pine	Pinus resinosa				
1552	14"	Red Pine	Pinus resinosa				
1553	9"	Red Pine	Pinus resinosa				
1554	9"	Red Pine	Pinus resinosa				
1555	11"	Red Pine	Pinus resinosa				
1556	10"	Red Pine	Pinus resinosa				
1557	18"	Red Pine	Pinus resinosa		19	X	
1558	16"	Red Pine	Pinus resinosa				
1559	15"	Red Pine	Pinus resinosa				
1560	29"	Cottonwood	Populus deltoides		20	X	
1561	22"	Box Elder	Acer negundo		16	X	
1562	6"	Crab Apple	Malus coronaria				
1563	6"	Crab Apple	Malus coronaria				
1564	6"	Crab Apple	Malus coronaria				
1565	12"	Chinese Elm	Ulmus parvifolia				
1566	11"	Norway Maple	Acer platanoides				X
1567	19"	Sugar Maple	Acer saccharum		20	X	
1568	14"	Catalpa	Catalpa speciosa				X
1569	13"	Catalpa	Catalpa speciosa	twin			X
1570	16"	Black Pine	Pinus nigra				
1571	52"	American Elm	Ulmus americana		21	X	
1572	19"	Black Pine	Pinus nigra				
1573	16"	White Pine	Pinus strubus				
1574	16"	White Pine	Pinus strubus				
1575	15"	White Mulberry	Morus alba				X
1576	13"	Box Elder	Acer negundo				
1577	17"	Box Elder	Acer negundo		18	X	
1578	28"	Black Locust	Robinia pseudoacaci		15	X	X
1579	33"	Black Locust	Robinia pseudoacaci		15	X	X
1580	27"	Black Walnut	Juglans nigra		19	X	
1581	21"	Black Walnut	Juglans nigra		18	X	

TAG#	COMMON NAME
138	14" Pine
139	13" Pine
140	13" Pine
141	9" Pine
142	9" Pine
143	9" Pine
144	10" Pine
145	9" Pine
146	9" Pine
147	9" Pine
148	9" Pine
149	9" Pine
150	9" Pine
151	9" Pine
152	11" Pine
153	15" Spruce
154	8" Spruce
155	8" Spruce
156	8" Spruce

SCALE: 1" = 50'

0 50 100 150

LEGEND

- 773 EXIST. CONTOUR
- ×768.9 EXIST. SPOT ELEVATION
- U.P. EXIST. UTILITY POLE
- GP EXIST. GUY POLE
- ELEC. TRANSFORMER
- OH EXIST. OVERHEAD UTILITY LINE
- EXIST. LIGHT POLE
- t EXIST. TELEPHONE LINE
- e EXIST. ELECTRIC LINE
- g EXIST. GAS LINE
- w EXIST. WATER MAIN
- EXIST. HYDRANT
- EXIST. GATE VALVE IN BOX
- EXIST. GATE VALVE IN WELL
- r EXIST. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- EXIST. CLEANOUT
- s EXIST. SANITARY SEWER
- SIGN
- MAILBOX
- TELEPHONE RISER
- catv CABLE TELEVISION RISER
- ELECTRIC METER
- WATER METER
- GAS METER
- POST
- WELL
- FENCE
- SINGLE TREE
- EXIST. BOULDER
- EXIST. SPRINKLER HEAD
- SECTION CORNER
- FOUND IRON PIPE
- F FOUND MONUMENT
- FIR FOUND IRON ROD
- CONTROL PT.

LEGAL DESCRIPTION

Commencing at the S.W. corner of Section 26, T2S, R6E, City of Ann Arbor, Washtenaw County, Michigan, thence N 00°00'00" E 515.92 feet along the west line of said Section 26, thence S 71°47'25" E 506.79 feet to the POINT OF BEGINNING,

thence S 71°47'25" E 182.05 feet along the centerline of Geddes Ave. (formerly Huron River Drive),
thence S 18°12'35" W 33.00 feet,
thence along the westerly right-of-way line of Huron Parkway in the following two (2) courses:

southeasterly 259.70 feet in the arc of a circular curve to the right, radius 290.00 feet, central angle 51°18'35", chord S 33°59'10" E 251.11 feet,
southeasterly 423.76 feet in the arc of a circular curve to the left, radius 1516.47 feet, central angle 16°00'38", chord S 16°20'21" E 422.38 feet,

thence S 59°28'15" W 57.70 feet,
thence S 85°38'40" W 283.09 feet,
thence S 30°36'31" E 25.37 feet to the S.E. corner of Lot 47 of Riverside Hills Subdivision No. 2, Liber 17 of Plats, Pages 25 and 26, Washtenaw County Records,
thence N 89°36'10" W 186.09 feet along the south line of said Lot 47,
thence along the easterly right-of-way line of Hickory Lane in the following six (6) courses:

northerly 124.27 feet along the arc of a circular curve to the left, radius 202.38 feet, central angle 35°10'52, chord N 06°54'34" W 122.32 feet,
N 24°30'00" W 220.47 feet,
northerly 60.54 feet along the arc of a circular curve to the right, radius 110.45 feet, central angle 31°24'12", chord N 08°46'37" W 59.78 feet,
N 06°54'35" E 315.97 feet,
northerly 63.11 feet along the arc of a circular curve to the right, radius 320.00 feet, central angle 11°18'00", chord N 12°33'35" E 63.01 feet,
N 18°12'35" E 28.87 feet to the N.W. corner of Lot 51 of said Riverside Hills Subdivision No. 2,

thence S 71°47'25" E 140.86 feet along the north line of said Lot 51 to the N.E. corner of said Lot 51,
thence N 06°54°35" E 33.65 feet to the POINT OF BEGINNING, being Lots 47 through 51 inclusive of said Riverside Hills Subdivision No. 2 and a part of the S.W. 1/4 of Section 26, T2S, R6E and a part of the N.W. 1/4 of Section 35, T2S, R6E, City of Ann Arbor, Washtenaw County, Michigan, containing 7.86 acres of land more or less, subject to easements and restrictions of record, if any.

MIDWESTERN CONSULTING

Civil, Environmental and Transportation Engineers
Planners, Surveyors
Landscape Architects

3815 Plaza Drive
Ann Arbor, Michigan 48108
Phone: 734.995.0200
Fax 734.995.0599

CLIENT

RACQUET CLUB OF ANN ARBOR
3010 HICKORY LANE
ANN ARBOR, MI 48104
BRENT SCHOMAKER
(734) 216-0579

RACQUET CLUB OF ANN ARBOR

SITE PLAN

EXISTING CONDITIONS

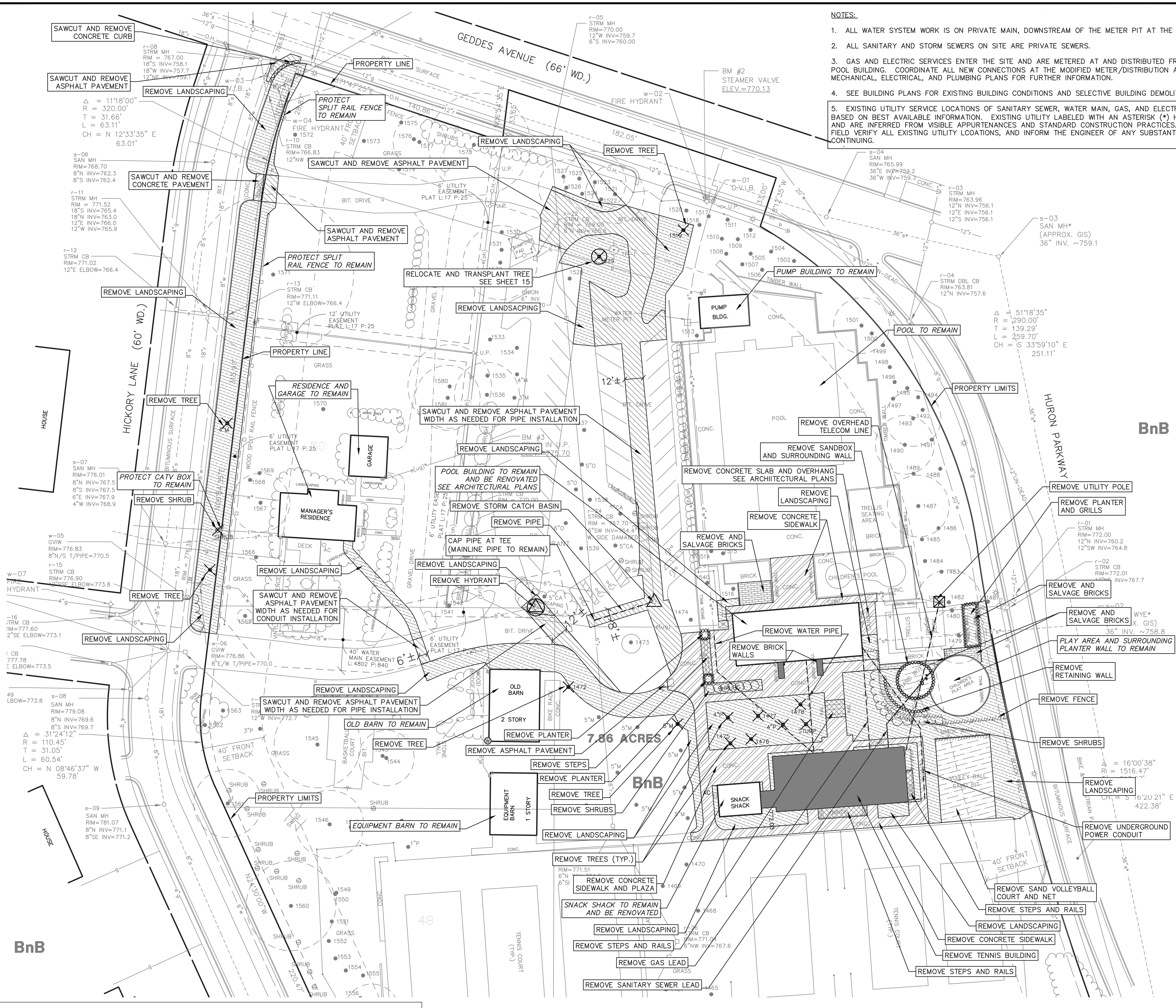
2

DATE: 5/15/2015
SHEET 2 OF 22
CADD: WAJ
ENG: JAM
PM: SWB
TECH:
14058EX1.dwg

REV. DATE

JOB No. 14058

REVISIONS:



NOTES:

1. ALL WATER SYSTEM WORK IS ON PRIVATE MAIN, DOWNSTREAM OF THE METER PIT AT THE NORTH OF THE SITE.

2. ALL SANITARY AND STORM SEWERS ON SITE ARE PRIVATE SEWERS.

3. GAS AND ELECTRIC SERVICES ENTER THE SITE AND ARE METERED AT AND DISTRIBUTED FROM THE EAST SIDE OF THE POOL BUILDING. COORDINATE ALL NEW CONNECTIONS AT THE MODIFIED METER/DISTRIBUTION AREA. SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING PLANS FOR FURTHER INFORMATION.

4. SEE BUILDING PLANS FOR EXISTING BUILDING CONDITIONS AND SELECTIVE BUILDING DEMOLITION.

5. EXISTING UTILITY SERVICE LOCATIONS OF SANITARY SEWER, WATER MAIN, GAS, AND ELECTRIC ARE APPROXIMATIONS BASED ON BEST AVAILABLE INFORMATION. EXISTING UTILITY LABELED WITH AN ASTERISK (*) HAVE NO WRITTEN RECORDS, AND ARE INFERRED FROM VISIBLE APPURTENANCES AND STANDARD CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS, AND INFORM THE ENGINEER OF ANY SUBSTANTIAL DISCREPANCIES BEFORE CONTINUING.

SCALE: 1" = 30'

0 30 60 90

LEGEND

773 / ×768.9	EXIST. CONTOUR / EXIST. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
GP	EXIST. GUY POLE
	ELEC. TRANSFORMER
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
t	EXIST. TELEPHONE LINE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
w	EXIST. WATER MAIN
	EXIST. HYDRANT
	EXIST. GATE VALVE IN BOX
	EXIST. GATE VALVE IN WELL
r	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	EXIST. CLEANOUT
s	EXIST. SANITARY SEWER
	SIGN
	MAILBOX
	TELEPHONE RISER
catv	CABLE TELEVISION RISER
e	ELECTRIC METER
w	WATER METER
g	GAS METER
	POST
	WELL
	FENCE
	SINGLE TREE
	EXIST. BOULDER
	EXIST. SPRINKLER HEAD
	SECTION CORNER
F	FOUND IRON PIPE
F	FOUND MONUMENT
FIR	FOUND IRON ROD
	CONTROL PT.
	REMOVE BUILDING
	REMOVE STEPS AND RAILS
	REMOVE CONCRETE WALK
	SAWCUT AND REMOVE ASPHALT PAVEMENT
	REMOVE AND SALVAGE BRICKS
	REMOVE FENCE
	REMOVE RETAINING WALL OR PLANTER WALL
	REMOVE VOLLEYBALL COURT
	REMOVE VEGETATION
	REMOVE UTILITY LINE
	REMOVE UTILITY POLE
	REMOVE STORM STRUCTURE
	REMOVE FIRE HYDRANT
	REMOVE TREE
	TRANSPLANT TREE

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

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BRENT SCHOMAKER
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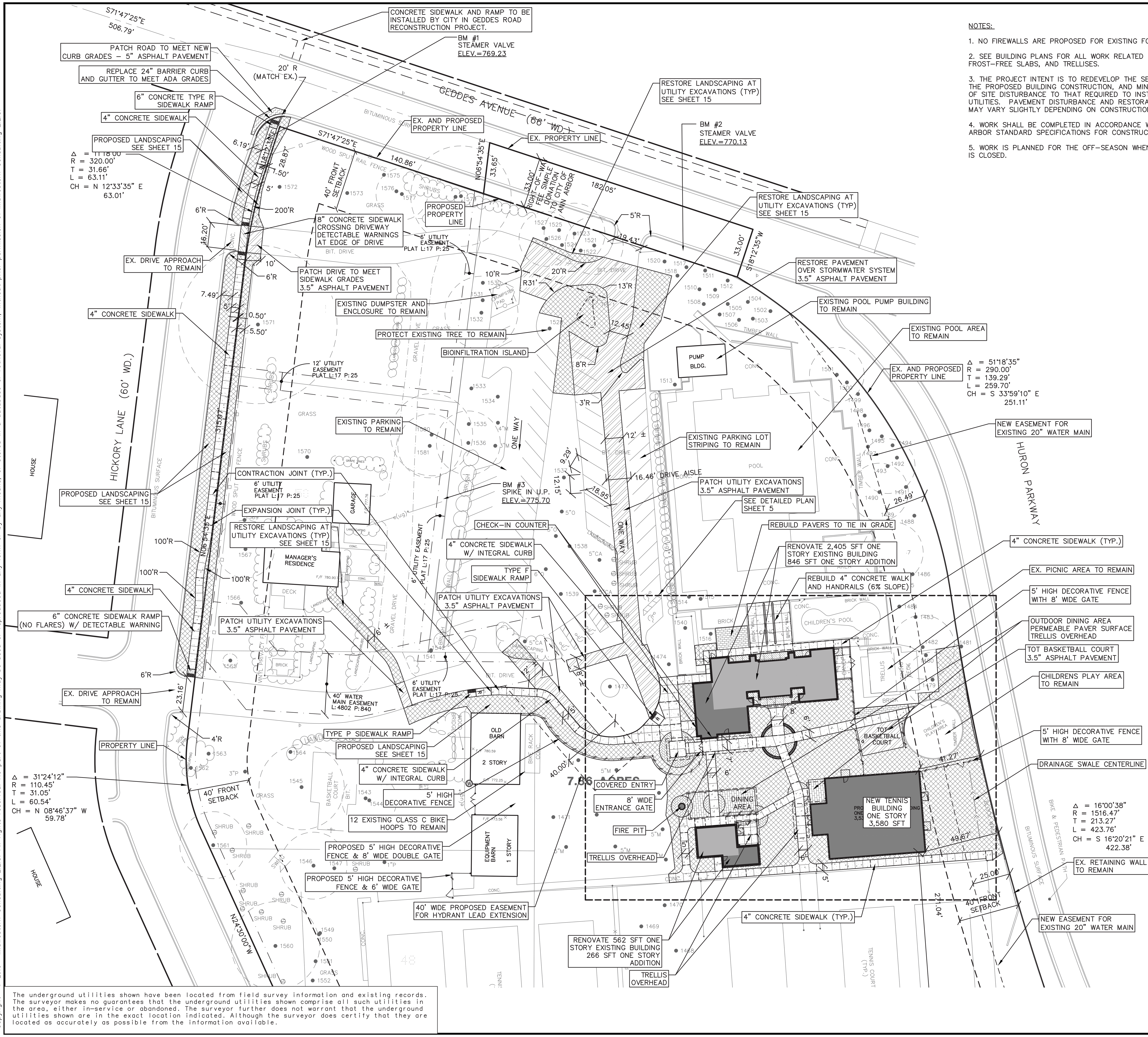
RACQUET CLUB OF ANN ARBOR
SITE PLAN
REMOVAL PLAN

3

DATE: 5/15/2015
SHEET 3 OF 22
CADD: WAJ
ENG: JAM
PM: SWB
TECH:
14058DE1.dwg

REV. DATE
REVISIONS:

JOB No. 14058



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NOTES:

1. NO FIREWALLS ARE PROPOSED FOR EXISTING FOR THIS PROJECT.
2. SEE BUILDING PLANS FOR ALL WORK RELATED TO BUILDINGS, FROST-FREE SLABS, AND TRELLISES.
3. THE PROJECT INTENT IS TO REDEVELOP THE SECTION OF SITE AROUND THE PROPOSED BUILDING CONSTRUCTION, AND MINIMIZE THE REMAINDER OF SITE DISTURBANCE TO THAT REQUIRED TO INSTALL UNDERGROUND UTILITIES. PAVEMENT DISTURBANCE AND RESTORATION IN THESE AREAS MAY VARY SLIGHTLY DEPENDING ON CONSTRUCTION METHODS.
4. WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS FOR CONSTRUCTION.
5. WORK IS PLANNED FOR THE OFF-SEASON WHEN THE RACQUET CLUB IS CLOSED.

SCALE: 1" = 30'

0 30 60 90

LEGEND

- WELL
- FENCE
- SINGLE TREE
- EXIST. BOULDER
- EXIST. SPRINKLER HEAD
- SECTION CORNER
- FOUND IRON PIPE
- FOUND MONUMENT
- FOUND IRON ROD
- CONTROL PT.
- ASPHALT PAVEMENT (PARKING LOT OR BASKETBALL COURT)
- CONCRETE SIDEWALK WITH JOINTS
- SIDEWALK RAMP WITH DETECTABLE WARNING
- PAVERS (RECTILINEAR PATTERN)
- PAVERS (RADIAL PATTERN)
- OVERHANG
- PROPOSED BUILDING
- PROPOSED LANDSCAPED AREA – SEE SHEET 15
- FENCE WITH GATE
- PROPERTY LINE
- SETBACK LINE
- UTILITY EASEMENT LINE

SITE DATA ANALYSIS

I. Site Use

Existing Zoning	AG
Proposed Zoning	AG
Gross Site Area	7.86 Acres
Total Net Site Area	7.86 Acres
Number of Units	1
Space Use Summary	
Managers Residence (GFA)	1,420 SF
Enlarged Pool Blgd*	3,638 SF
Enlarged Snack Shack	851 SF
New Tennis Building*	3,533 SF
	9,442 SF Total

* Used to Calculate Parking Requirements

II. Zoning Comparison Information

	Required	Provided
Minimum Area per Dwelling Unit	100,000 SF	342,382 SF
Front Setback (Min./Max.)	30/40 FT	41.27 FT
Rear Setback	50 FT	N/A
Side Setback (South)	10% LOT WIDTH EQUALS 51 FT	271.21
Maximum Building Height	30 FT	22.5 FT
Minimum Lot Size	100,000 SF	342,382 SF
Minimum Lot Width	200 FT	515 FT

III. Parking Requirements

	Required	Provided
1 space per 200 SF required =	36	59
Barrier Free spaces	2	5
1 bicycle space per 1000 SF	8	12
100% CL C	8	12

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RACQUET CLUB OF ANN ARBOR

SITE PLAN

DIMENSIONAL SITE PLAN

4

DATE: 5/15/2015
SHEET 4 OF 22
CADD: WAJ
ENG: JAM
PM: SWB
TECH:
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REVISIONS:

JOB No. 14058

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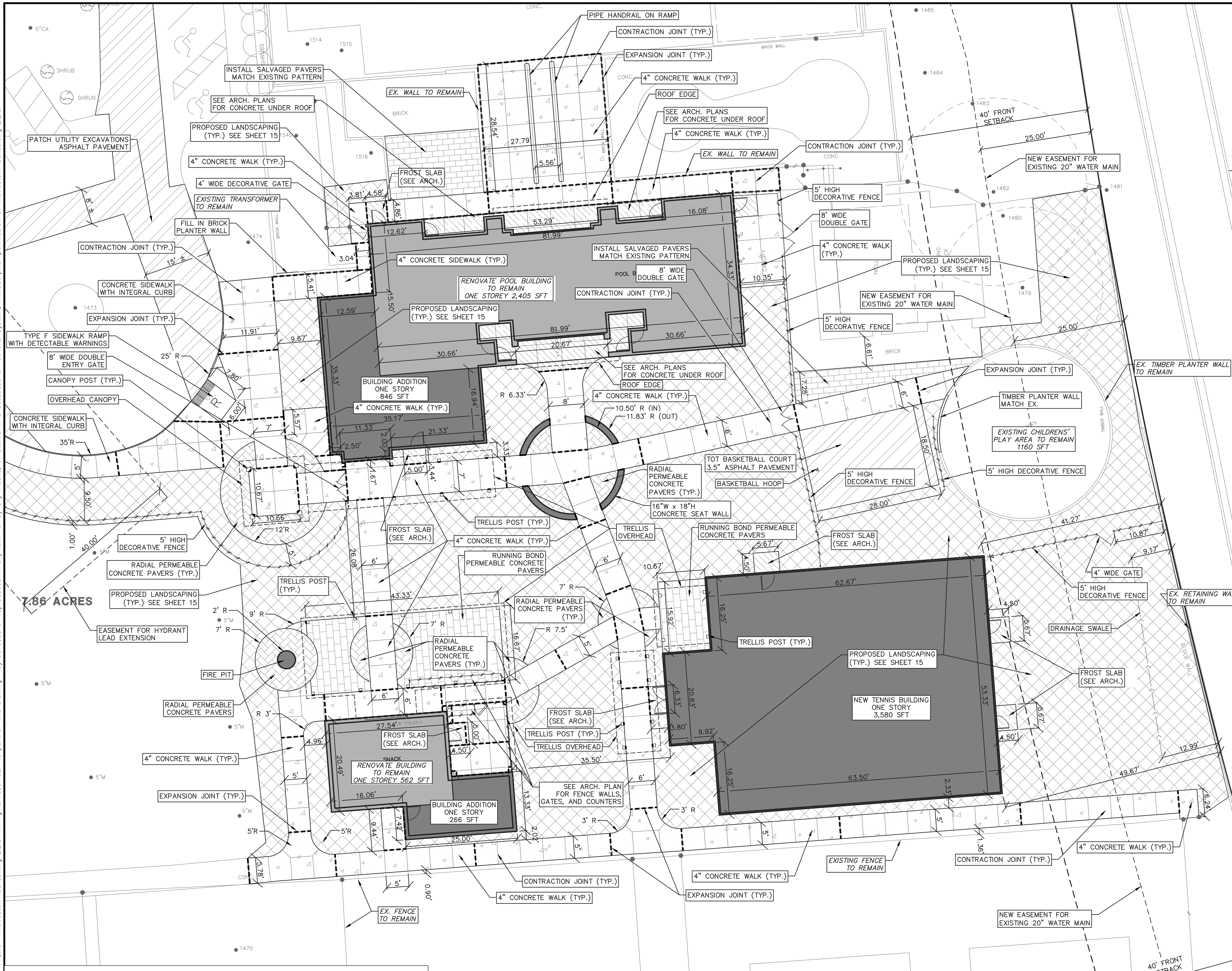

SCALE: 1" = 10'

0 10 20 30

LEGEND

- WELL
- FENCE
- SINGLE TREE
- EXIST. BOULDER
- EXIST. SPRINKLER HEAD
- SECTION CORNER
- FOUND IRON PIPE
- FOUND MONUMENT
- FOUND IRON ROD
- CONTROL PT.
- ASPHALT PAVEMENT (PARKING LOT OR BASKETBALL COURT)
- CONCRETE SIDEWALK WITH JOINTS
- SIDEWALK RAMP WITH DETECTABLE WARNING
- PAVERS (RECTILINEAR PATTERN)
- PAVERS (RADIAL PATTERN)
- OVERHANG
- PROPOSED BUILDING
- PROPOSED LANDSCAPED AREA – SEE SHEET 15
- FENCE WITH GATE
- PROPERTY LINE
- SETBACK LINE
- UTILITY EASEMENT LINE

NOTES:

1. NO FIREWALLS ARE PROPOSED FOR EXISTING FOR THIS PROJECT.
2. SEE BUILDING PLANS FOR ALL WORK RELATED TO BUILDINGS, FROST–FREE SLABS, CANOPIES, AND TRELLISES.
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5. WORK IS PLANNED FOR THE OFF–SEASON WHEN THE RACQUET CLUB IS CLOSED.

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RACQUET CLUB OF ANN ARBOR

SITE PLAN

ENLARGED DIMENSIONAL SITE PLAN

5

DATE: 5/15/2015
SHEET 5 OF 22
CADD: WAJ
ENG: JAM
PM: SWB
TECH:
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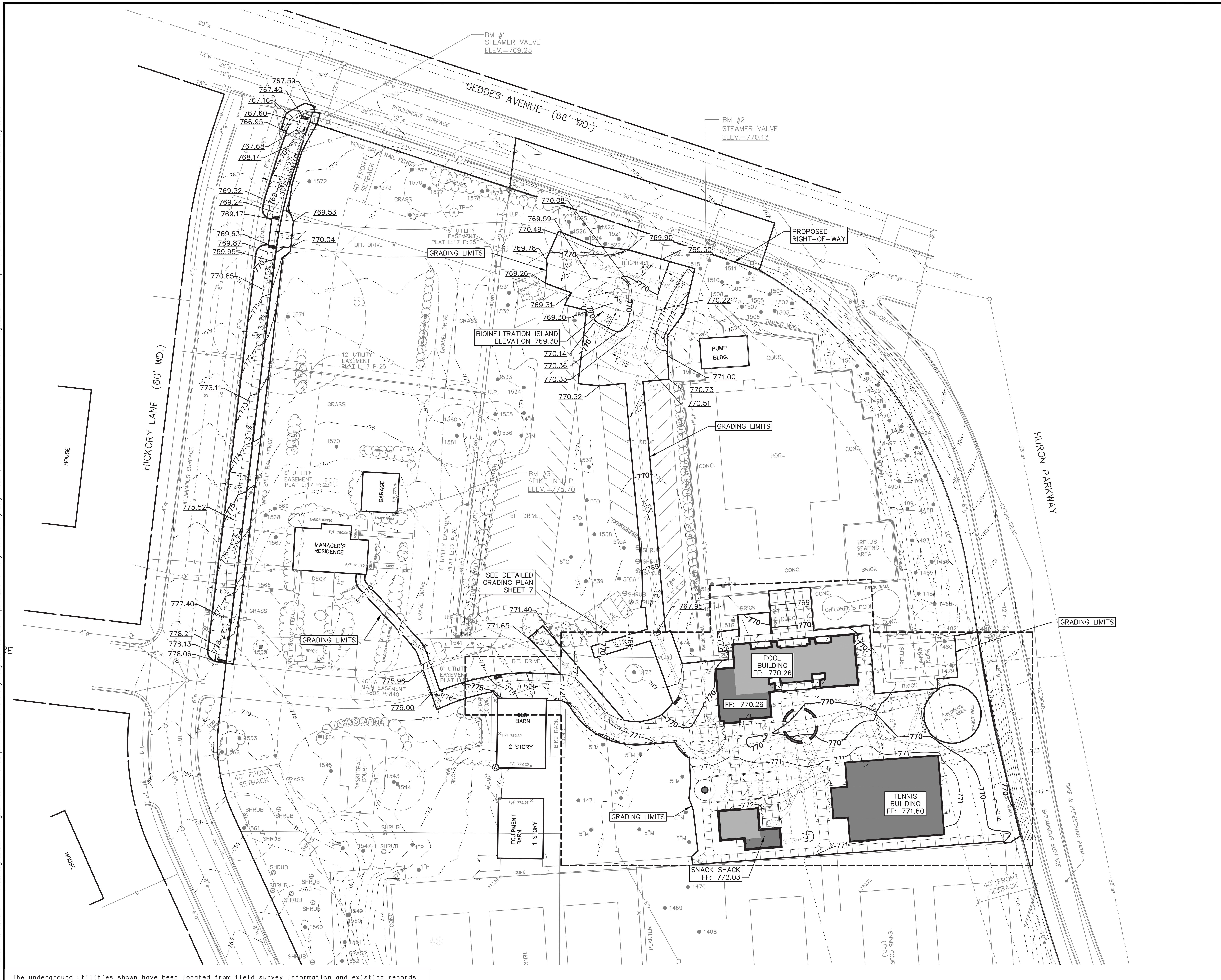
REV. DATE
REVISIONS:

JOB No. 14058



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SCALE: 1" = 30'

0 30 60 90

LEGEND

—838—	EXIST. CONTOUR
—838—	PROP. CONTOUR
×836.2	EXIST. SPOT ELEVATION
36.60	PROP. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
GP	EXIST. GUY POLE
	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
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
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
	SIGN
MAIL	MAILBOX
	TELEPHONE RISER
catv	CABLE TELEVISION RISER
	ELECTRIC METER
	WATER METER
	GAS METER
	POST
W	WELL
	SINGLE TREE
	FENCE
	TREE OR BRUSH LIMIT
	EXIST. BOULDER
	EXIST. SPRINKLER HEAD
	SECTION CORNER
F	FOUND IRON PIPE
F	FOUND MONUMENT
FIR	FOUND IRON ROD
	CONTROL PT.

BENCHMARK:

1. TOP OF WEST STEAMER VALVE ON HYDRANT LOCATED AT S.E. COR. OF GEDDES AND HICKORY LANE. ELEV. = 769.23
2. TOP OF NORTH STEAMER VALVE ON HYDRANT LOCATED ±50' S. OF GEDDES RD. AND ±275' E. OF HICKORY LANE. ELEV. = 770.13

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RACQUET CLUB OF ANN ARBOR

SITE PLAN

OVERALL GRADING PLAN

6

DATE:	5/15/2015
SHEET	6 OF 22
CADD:	WAJ
ENG:	JAM
PM:	SWB
TECH:	
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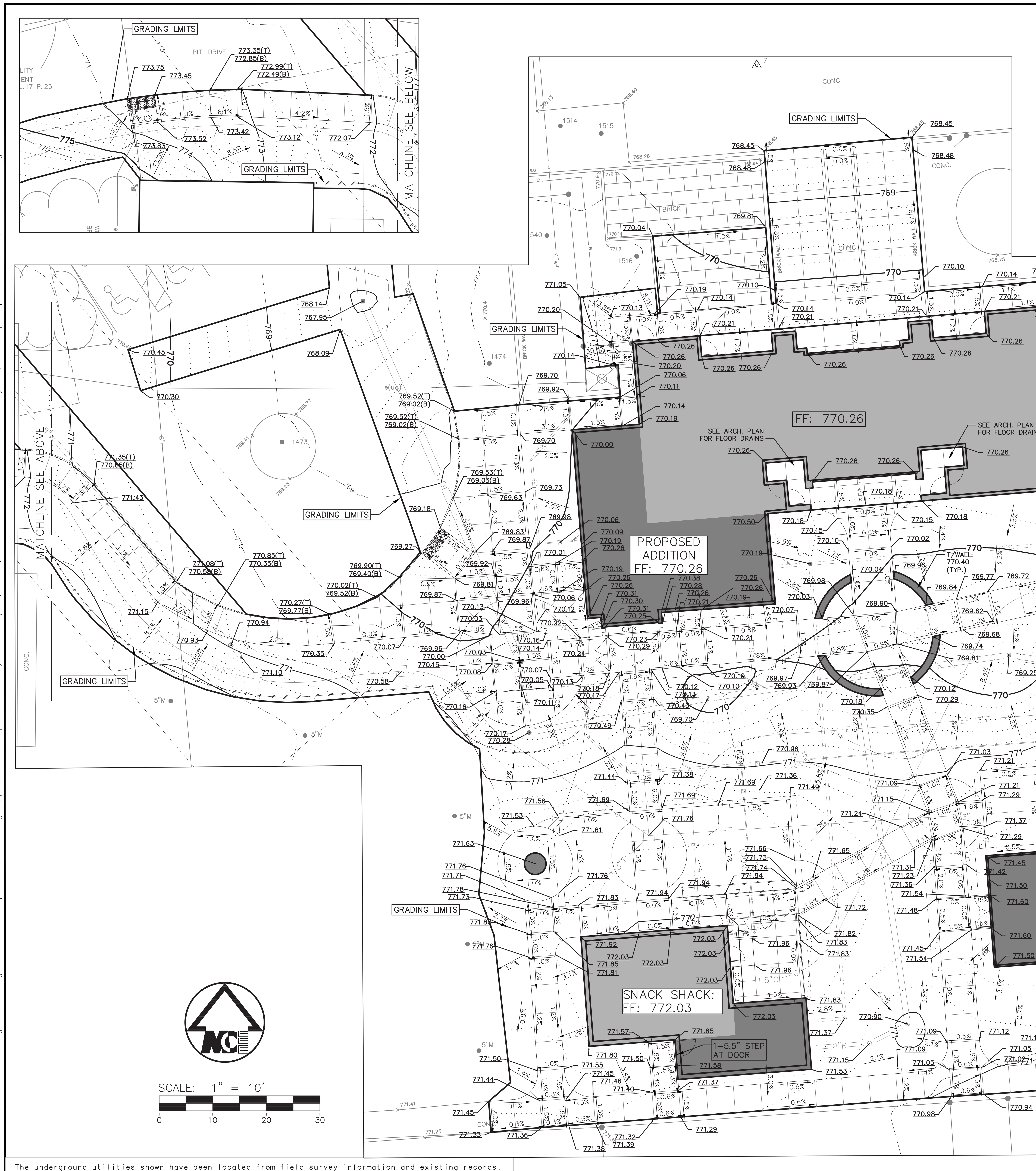
REVISIONS: REV. DATE

JOB No. 14058



LEGEND

838	EXIST. CONTOUR
838	PROP. CONTOUR
×836.2	EXIST. SPOT ELEVATION
36.60	PROP. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
GP	EXIST. GUY POLE
	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
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
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	EXIST. CLEANOUT
	PROP. CLEANOUT
	SIGN
	MAILBOX
t	TELEPHONE RISER
catv	CABLE TELEVISION RISER
e	ELECTRIC METER
w	WATER METER
g	GAS METER
	POST
	WELL
	SINGLE TREE
	FENCE
	TREE OR BRUSH LIMIT
	EXIST. BOULDER
	EXIST. SPRINKLER HEAD
	SECTION CORNER
O F	FOUND IRON PIPE
F	FOUND MONUMENT
FIR	FOUND IRON ROD
	CONTROL PT.

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RACQUET CLUB OF ANN ARBOR

SITE PLAN

SITE DETAILED GRADING PLAN

7

DATE: 5/15/2015
SHEET 7 OF 22
CADD: WAJ
ENG: JAM
PM: SWB
FBCK:
14058GP2.dwg

REV. DATE
REVISIONS:

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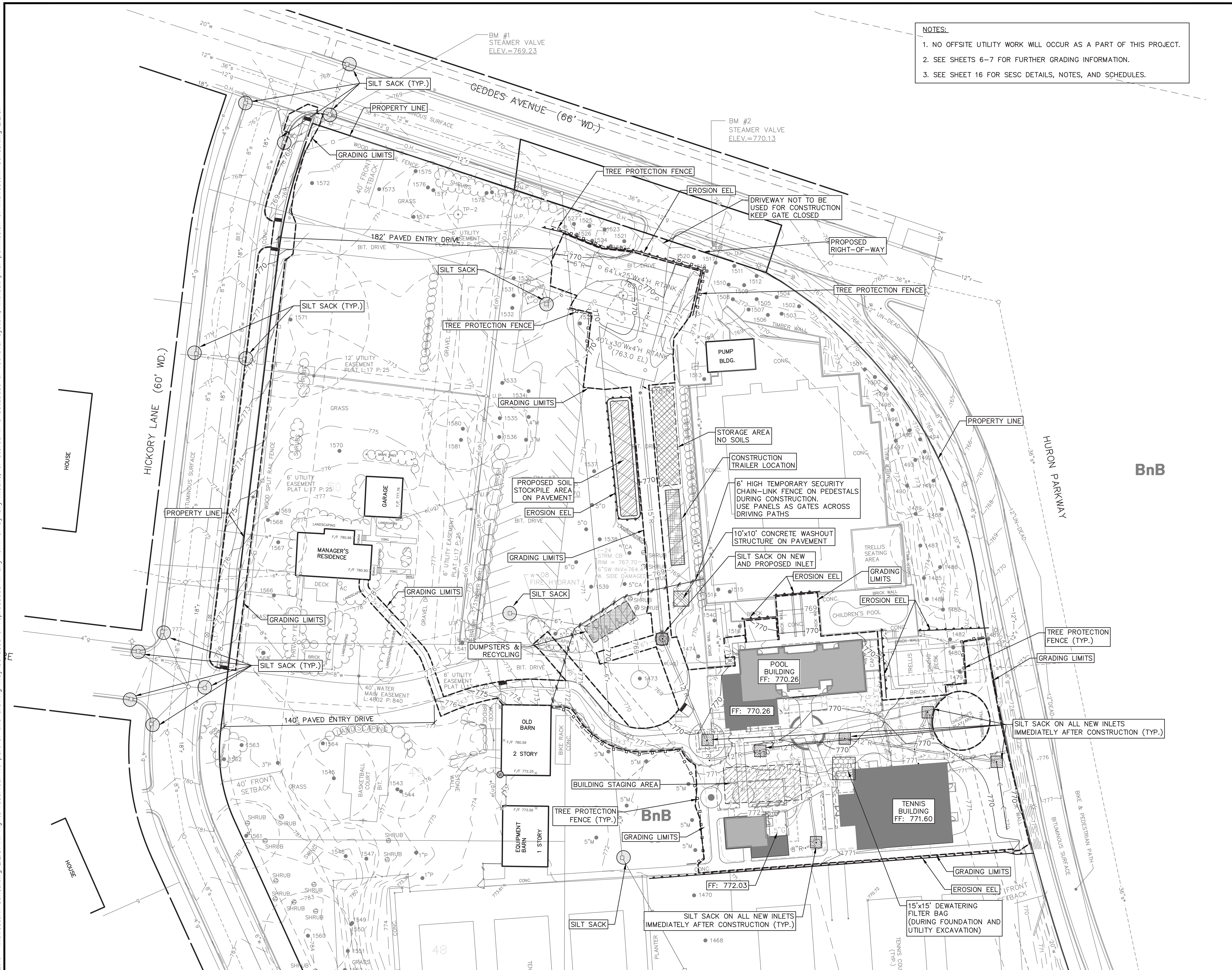

NOTES:

1. NO OFFSITE UTILITY WORK WILL OCCUR AS A PART OF THIS PROJECT.
2. SEE SHEETS 6-7 FOR FURTHER GRADING INFORMATION.
3. SEE SHEET 16 FOR SESC DETAILS, NOTES, AND SCHEDULES.

SCALE: 1" = 30'

0 30 60 90

LEGEND

--772--	EXISTING 1' CONTOUR
--775--	EXISTING 5' CONTOUR
—774—	PROPOSED 1' CONTOUR
—775—	PROPOSED 5' CONTOUR
	PROPERTY LINE
	GRADING LIMITS
	DRAINAGE SWALE CENTERLINE
	EROSION EEL (OR EQUAL)
	TREE PROTECTION FENCE
	TEMPORARY SECURITY CHAIN-LINK PANEL FENCE ON PEDESTALS (USE PANELS AS GATE)
	SILT SACK INLET FILTER ON EXISTING INLET
	SILT SACK INLET FILTER ON NEW INLET IMMEDIATELY AFTER CONSTRUCTION OF INLET
	PROPOSED BUILDING
	BUILDING STAGING AREA
	STORAGE AREA (NO SOILS)
	SOIL STOCKPILE AREA
	CONCRETE WASHOUT STRUCTURE
	DEWATERING FILTER BAG
	CONSTRUCTION TRAILER LOCATION
	DUMPSTER & RECYCLING LOCATION

BENCHMARK:

1. TOP OF WEST STEAMER VALVE ON HYDRANT LOCATED AT S.E. COR. OF GEDDES AND HICKORY LANE. ELEV. = 769.23
2. TOP OF NORTH STEAMER VALVE ON HYDRANT LOCATED ±50' S. OF GEDDES RD. AND ±275' E. OF HICKORY LANE. ELEV. = 770.13

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RACQUET CLUB OF ANN ARBOR

SITE PLAN

SESC AND STAGING PLAN

8

DATE: 5/15/2015
SHEET 8 OF 22
CADD: WAJ
ENG: JAM
PM: SWB
TECH:
14058EC1.dwg

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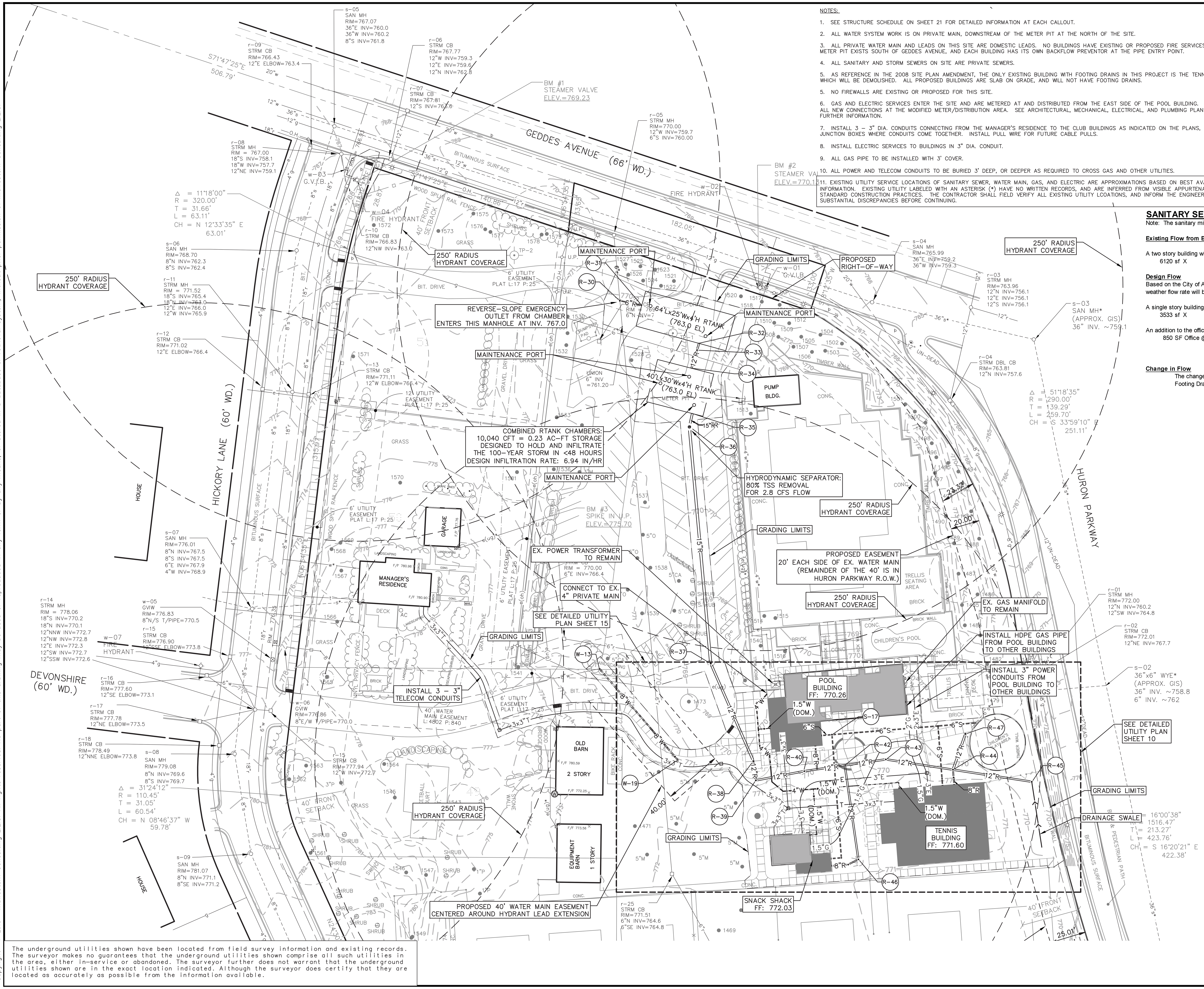

NOTES:

1. SEE STRUCTURE SCHEDULE ON SHEET 21 FOR DETAILED INFORMATION AT EACH CALLOUT.

2. ALL WATER SYSTEM WORK IS ON PRIVATE MAIN, DOWNSTREAM OF THE METER PIT AT THE NORTH OF THE SITE.

3. ALL PRIVATE WATER MAIN AND LEADS ON THIS SITE ARE DOMESTIC LEADS. NO BUILDINGS HAVE EXISTING OR PROPOSED FIRE SERVICES. A SINGLE METER PIT EXISTS SOUTH OF GEDDES AVENUE, AND EACH BUILDING HAS ITS OWN BACKFLOW PREVENTOR AT THE PIPE ENTRY POINT.

4. ALL SANITARY AND STORM SEWERS ON SITE ARE PRIVATE SEWERS.

5. AS REFERENCE IN THE 2008 SITE PLAN AMENDMENT, THE ONLY EXISTING BUILDING WITH FOOTING DRAINS IN THIS PROJECT IS THE TENNIS BUILDING, WHICH WILL BE DEMOLISHED. ALL PROPOSED BUILDINGS ARE SLAB ON GRADE, AND WILL NOT HAVE FOOTING DRAINS.

5. NO FIREWALLS ARE EXISTING OR PROPOSED FOR THIS SITE.

6. GAS AND ELECTRIC SERVICES ENTER THE SITE AND ARE METERED AT AND DISTRIBUTED FROM THE EAST SIDE OF THE POOL BUILDING. COORDINATE ALL NEW CONNECTIONS AT THE MODIFIED METER/DISTRIBUTION AREA. SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING PLANS FOR FURTHER INFORMATION.

7. INSTALL 3 – 3" DIA. CONDUITS CONNECTING FROM THE MANAGER'S RESIDENCE TO THE CLUB BUILDINGS AS INDICATED ON THE PLANS, WITH JUNCTION BOXES WHERE CONDUITS COME TOGETHER. INSTALL PULL WIRE FOR FUTURE CABLE PULLS.

8. INSTALL ELECTRIC SERVICES TO BUILDINGS IN 3" DIA. CONDUIT.

9. ALL GAS PIPE TO BE INSTALLED WITH 3' COVER.

10. ALL POWER AND TELECOM CONDUITS TO BE BURIED 3' DEEP, OR DEEPER AS REQUIRED TO CROSS GAS AND OTHER UTILITIES.

11. EXISTING UTILITY SERVICE LOCATIONS OF SANITARY SEWER, WATER MAIN, GAS, AND ELECTRIC ARE APPROXIMATIONS BASED ON BEST AVAILABLE INFORMATION. EXISTING UTILITY LABELED WITH AN ASTERISK (*) HAVE NO WRITTEN RECORDS, AND ARE INFERRED FROM VISIBLE APPURTENANCES AND STANDARD CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LCOATIONS, AND INFORM THE ENGINEER OF ANY SUBSTANTIAL DISCREPANCIES BEFORE CONTINUING.

SCALE: 1" = 30'

0 30 60 90

SANITARY SEWER FLOW MITIGATION CALCULATIONS

Note: The sanitary mitigation accounts only to changes made to the existing site.

Existing Flow from Buildings to Be Removed

A two story building will be removed

6120 sf X	0.3 gpd/ SF floor area for Spa/ Country Club =		1836 gpd

Design Flow

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

A single story building is being proposed

3533 sf X	0.3 gpd/ SF floor area for Spa/ Country Club =		1060 gpd

An addition to the office space is proposed

850 SF Office @ 0.06 gpd/ gsf		=	51 gpd
		Total	1111 gpd

Change in Flow

The change in site useage shows a net decrease in sanitary flow therfore no Footing Drain disconnects are proposed.

LEGEND

U.P.	EXIST. UTILITY POLE
	GUY WIRE
	ELEC. TRANSFORMER
	EXIST. OVERHEAD UTILITY LINE
	PROP. LIGHT POLE
t	EXIST. TELEPHONE LINE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS 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
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
	END SECTION
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	℄ OF DITCH
	SIGN
	MAILBOX
	TELEPHONE RISER
	POST
	FENCE
	SECTION CORNER
	SOIL BORING LOCATION
O F	FOUND IRON PIPE
● F	FOUND MONUMENT
G	PROP. GAS LINE
E	PROP. ELECTRIC LINE
T	PROP. TELEPHONE LINE
	DOM. = DOMESTIC WATER LINE
	FIRE = FIRE WATER LINE

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RACQUET CLUB OF ANN ARBOR

SITE PLAN

UTILITY PLAN

9

DATE: 5/15/2015
SHEET 9 OF 22
CADD: WAJ
ENG: JAM
PM: SWB
TECH:
14058UP1.dwg

REV. DATE
REVISIONS:

JOB No. 14058

LEGEND

U.P.	EXIST. UTILITY POLE
	GUY WIRE
	ELEC. TRANSFORMER
	EXIST. OVERHEAD UTILITY LINE
	PROP. LIGHT POLE
t	EXIST. TELEPHONE LINE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS 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
r	EXIST. STORM SEWER
R	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
	END SECTION
s	EXIST. SANITARY SEWER
S	PROP. SANITARY SEWER
	℄ OF DITCH
	SIGN
	MAILBOX
	TELEPHONE RISER
	POST
	FENCE
	SECTION CORNER
	SOIL BORING LOCATION
O F	FOUND IRON PIPE
◉ F	FOUND MONUMENT
G	PROP. GAS LINE
E	PROP. ELECTRIC LINE
T	PROP. TELEPHONE LINE

NOTES:

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2. ALL WATER SYSTEM WORK IS ON PRIVATE MAIN, DOWNSTREAM OF THE METER PIT AT THE NORTH OF THE SITE.

3. ALL PRIVATE WATER MAIN AND LEADS ON THIS SITE ARE DOMESTIC LEADS. NO BUILDINGS HAVE EXISTING OR PROPOSED FIRE SERVICES. A SINGLE METER PIT EXISTS SOUTH OF GEDDES AVENUE, AND EACH BUILDING HAS ITS OWN BACKFLOW PREVENTOR AT THE PIPE ENTRY POINT.

4. ALL SANITARY AND STORM SEWERS ON SITE ARE PRIVATE SEWERS.

5. AS REFERENCE IN THE 2008 SITE PLAN AMENDMENT, THE ONLY EXISTING BUILDING WITH FOOTING DRAINS IN THIS PROJECT IS THE TENNIS BUILDING, WHICH WILL BE DEMOLISHED. ALL PROPOSED BUILDINGS ARE SLAB ON GRADE, AND WILL NOT HAVE FOOTING DRAINS.

5. NO FIREWALLS ARE EXISTING OR PROPOSED FOR THIS SITE.

6. GAS AND ELECTRIC SERVICES ENTER THE SITE AND ARE METERED AT AND DISTRIBUTED FROM THE EAST SIDE OF THE POOL BUILDING. COORDINATE ALL NEW CONNECTIONS AT THE MODIFIED METER/DISTRIBUTION AREA. SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING PLANS FOR FURTHER INFORMATION.

7. INSTALL 3 – 3" DIA. CONDUITS CONNECTING FROM THE MANAGER'S RESIDENCE TO THE CLUB BUILDINGS AS INDICATED ON THE PLANS, WITH JUNCTION BOXES WHERE CONDUITS COME TOGETHER. INSTALL PULL WIRE FOR FUTURE CABLE PULLS.

8. INSTALL ELECTRIC SERVICES TO BUILDINGS IN 3" DIA. CONDUIT.

9. ALL GAS PIPE TO BE INSTALLED WITH 3' COVER.

10. ALL POWER AND TELECOM CONDUITS TO BE BURIED 3' DEEP, OR DEEPER AS REQUIRED TO CROSS GAS AND OTHER UTILITIES.

11. EXISTING UTILITY SERVICE LOCATIONS OF SANITARY SEWER, WATER MAIN, GAS, AND ELECTRIC ARE APPROXIMATIONS BASED ON BEST AVAILABLE INFORMATION. EXISTING UTILITY LABELED WITH AN ASTERISK (*) HAVE NO WRITTEN RECORDS, AND ARE INFERRED FROM VISIBLE APPURTENANCES AND STANDARD CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LCOATIONS, AND INFORM THE ENGINEER OF ANY SUBSTANTIAL DISCREPANCIES BEFORE CONTINUING.

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

SCALE: 1" = 10'
0 10 20 30

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MIDWESTERN CONSULTING
Civil, Environmental and Transportation Engineers
Planners, Surveyors
Landscape Architects
3815 Plaza Drive
Ann Arbor, Michigan 48108
Phone 734.995.0200
Fax 734.995.0599

CLIENT
RACQUET CLUB OF ANN ARBOR
3010 HICKORY LANE
ANN ARBOR, MI 48104
BRENT SCHOMAKER
(734) 216-0579

RACQUET CLUB OF ANN ARBOR

SITE PLAN

DETAILED UTILITY PLAN

10

JOB No. 14058

REVISIONS: REV. DATE

DATE: 5/15/2015
SHEET 10 OF 22
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PM: SWB
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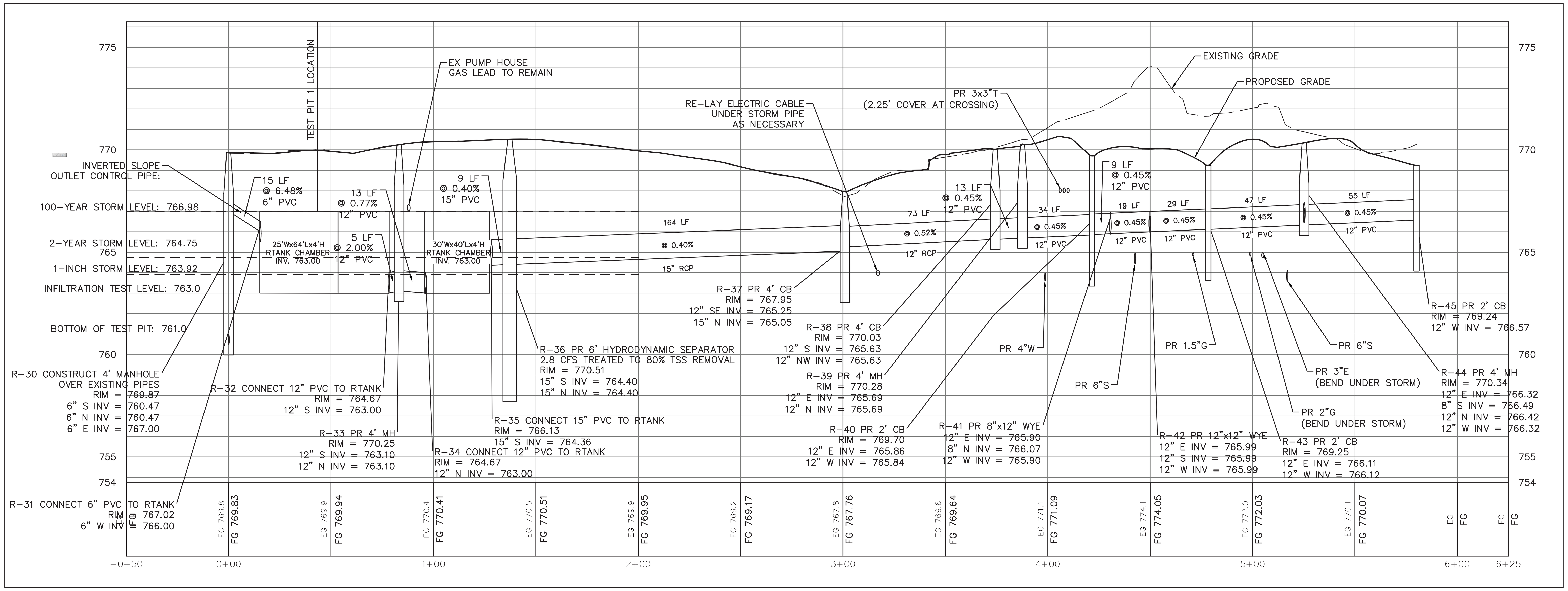

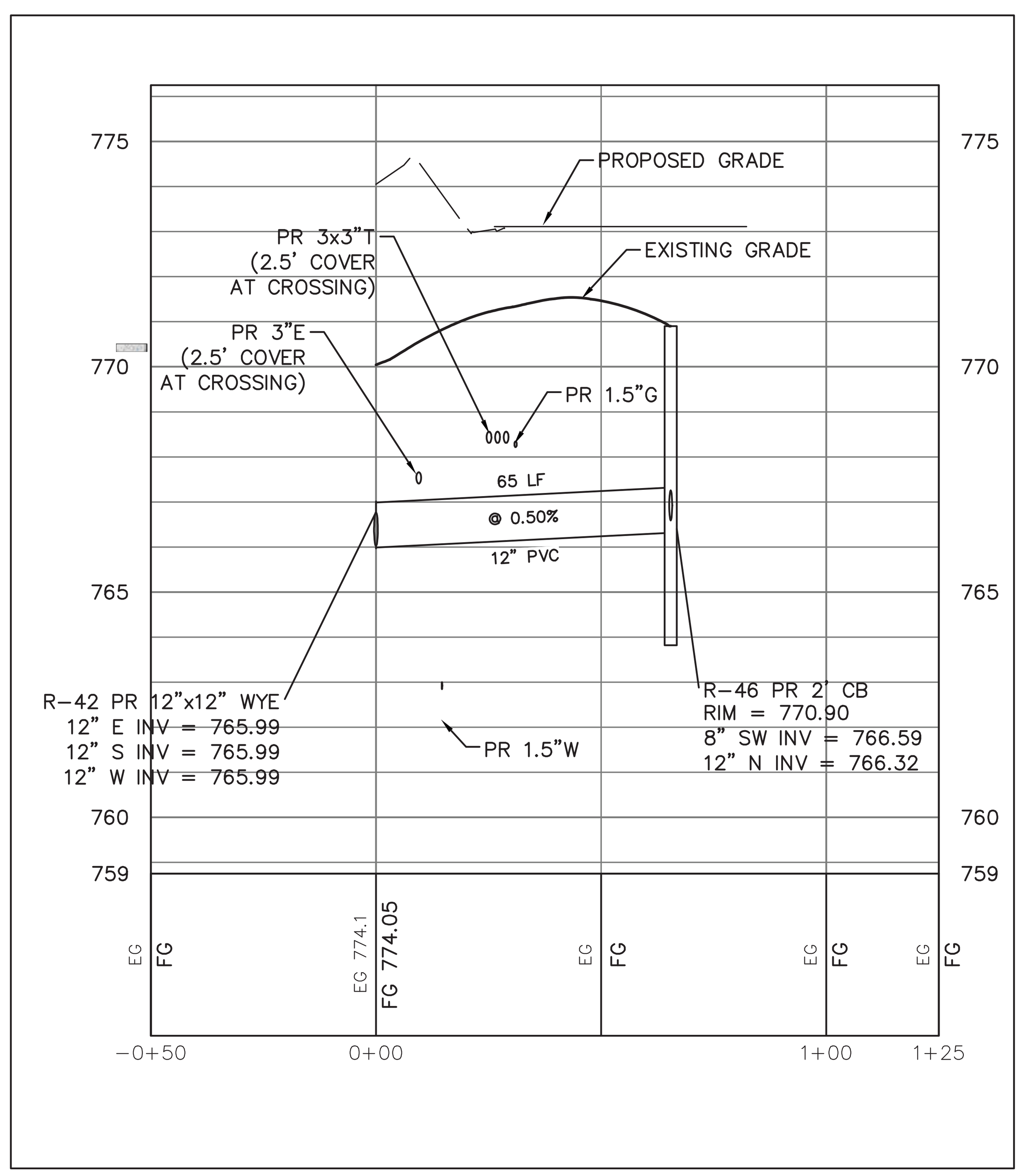

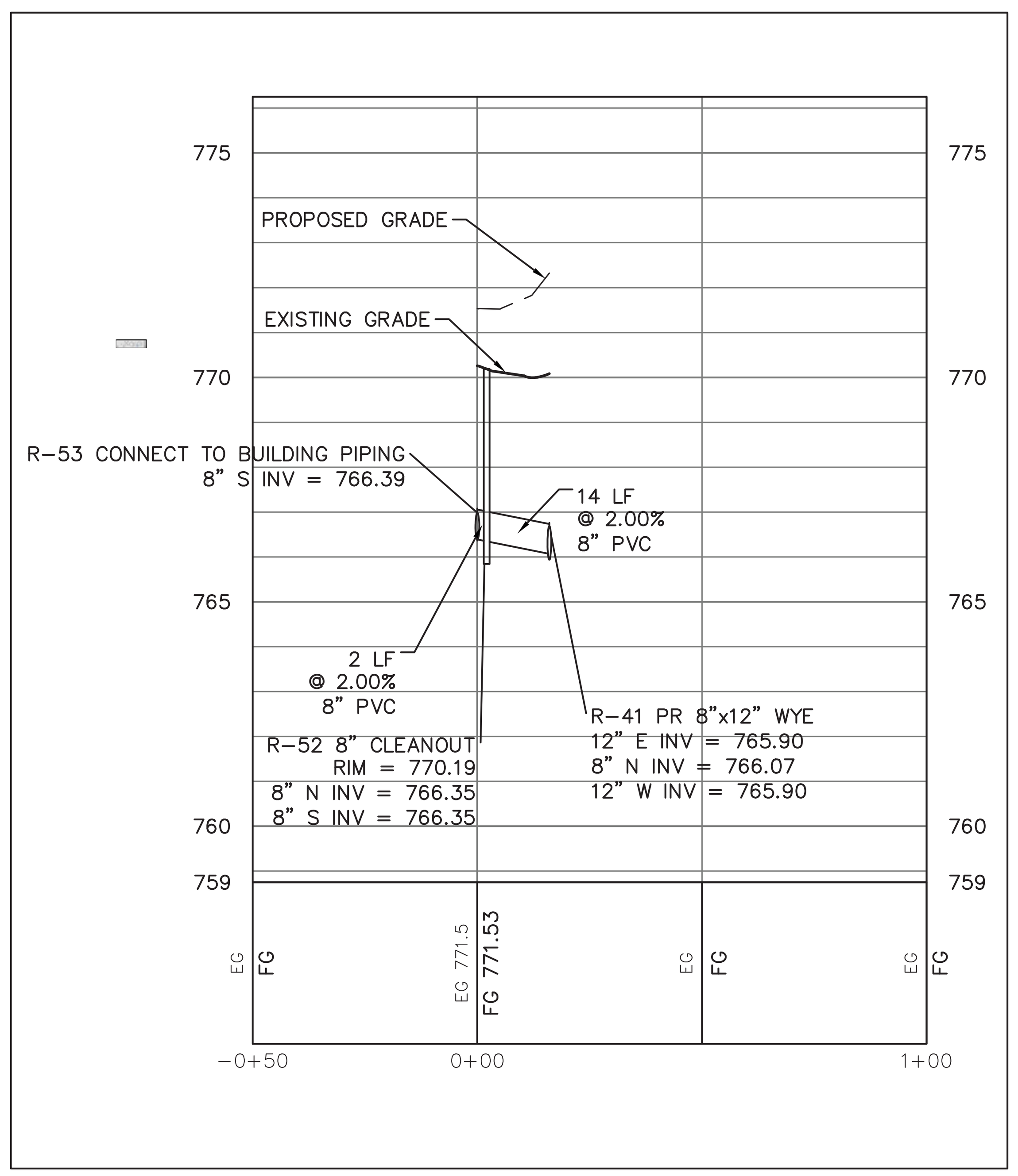

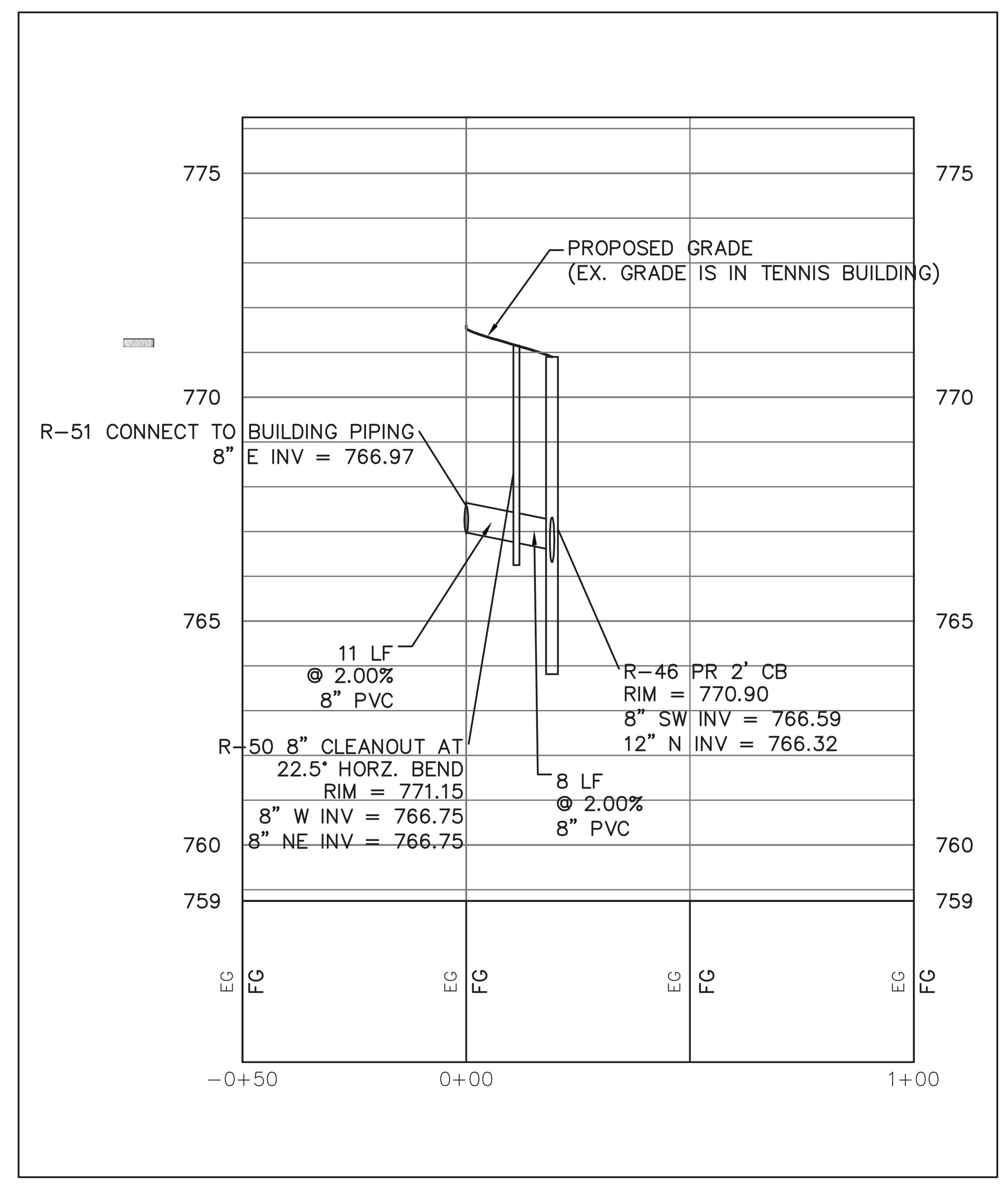

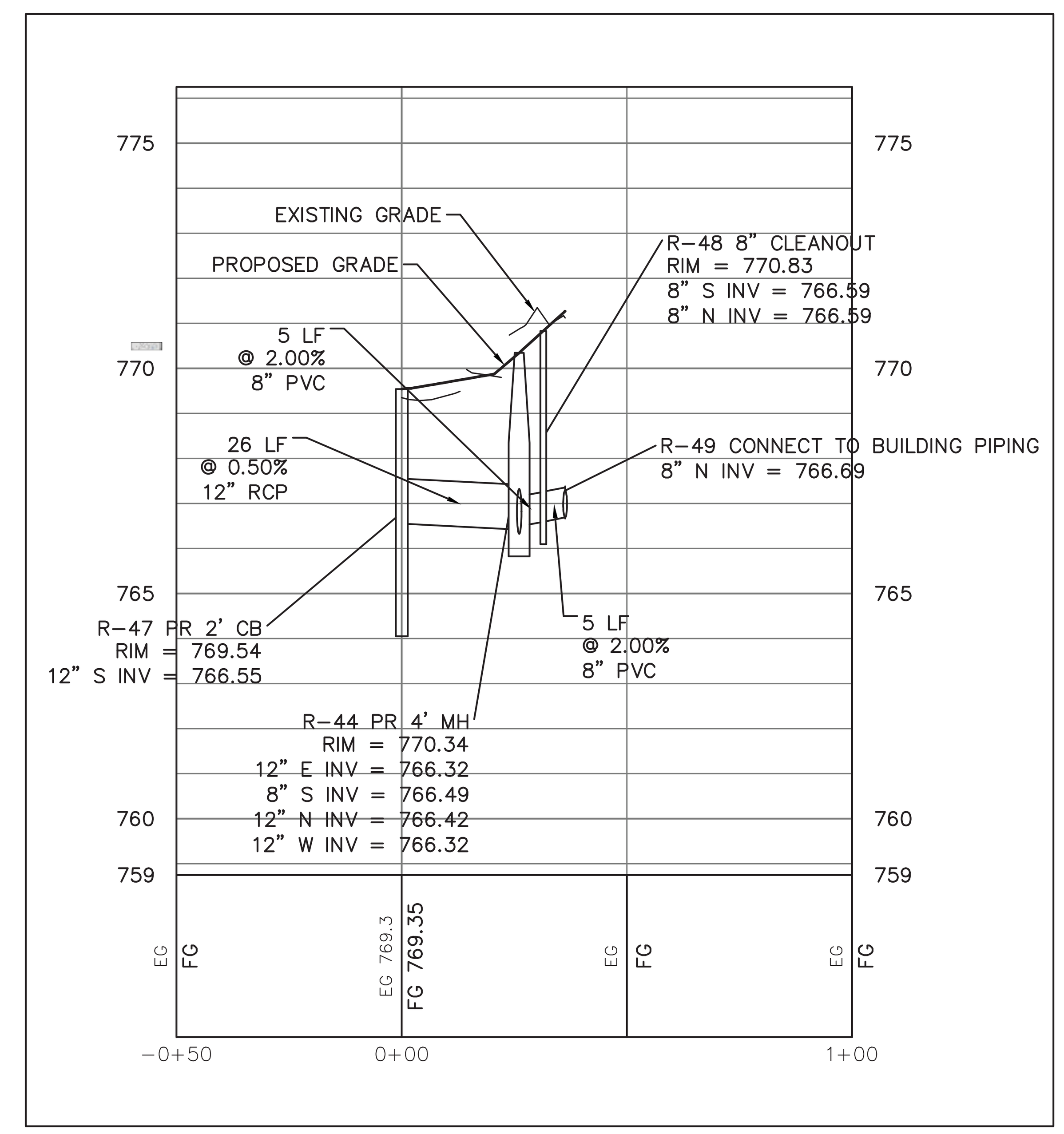

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RACQUET CLUB OF ANN ARBOR

SITE PLAN

PROPOSED STORM SEWER PROFILES

11

DATE: 5/15/2015
SHEET 11 OF 22
CADD: WAJ
ENG: JAM
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REV. DATE

JOB No. 14058

REVISIONS:

Stormwater Narrative
Racquet Club of Ann Arbor
May 12, 2015

Ordinance: This project is bound by the Washtenaw County Water Resources Commissioner Rules and Guidelines, Issued August 6, 2014. The regulations require that the greater of the 1-inch storm volume or the increase in the 2-year storm volume be infiltrated, if feasible, and that the 100-year storm runoff be reduced to less than 0.15 cfs/acre. If infiltration is infeasible, an additional 20% penalty is applied to the storage volume required. Additionally, the 1-inch storm must be treated for water quality to remove 80% of total suspended solids.

Portion of Site Modified: If less than 50% of a site is being modified, the portion modified must be fully brought up to standards, and the remainder of the site must be treated for quality. If more than 50% of a site is modified, the full site must be brought up to current standards. This site will be 12.7% modified (0.98 of 7.72 acres), so the modified portion will be infiltrated, with the remainder treated for quality.

General Approach: The site consists of BnB Boyer Loamy Sands, a Type A well-draining soil. However due to current basement flooding issues near the buildings, the project will take the storm water to the north end of the site, near Test Pit 1. Due to the very well draining soils, the project will infiltrate the entire 100-year storm event in less than 48 hours, with the only outlet pipe from the infiltration chambers being an emergency overflow pipe to the existing storm line.

Infiltration Rate: The infiltration test results from Test Pit 1 indicated a 27.75 in/hour infiltration rate. The WCWRC requires a minimum factor of safety of 2, and we are using a factory of safety of 4, to obtain a design infiltration rate of 6.94 in/hr. With this rate the full 4' high chambers can infiltrate the 100-year storm in 6.6 hours.

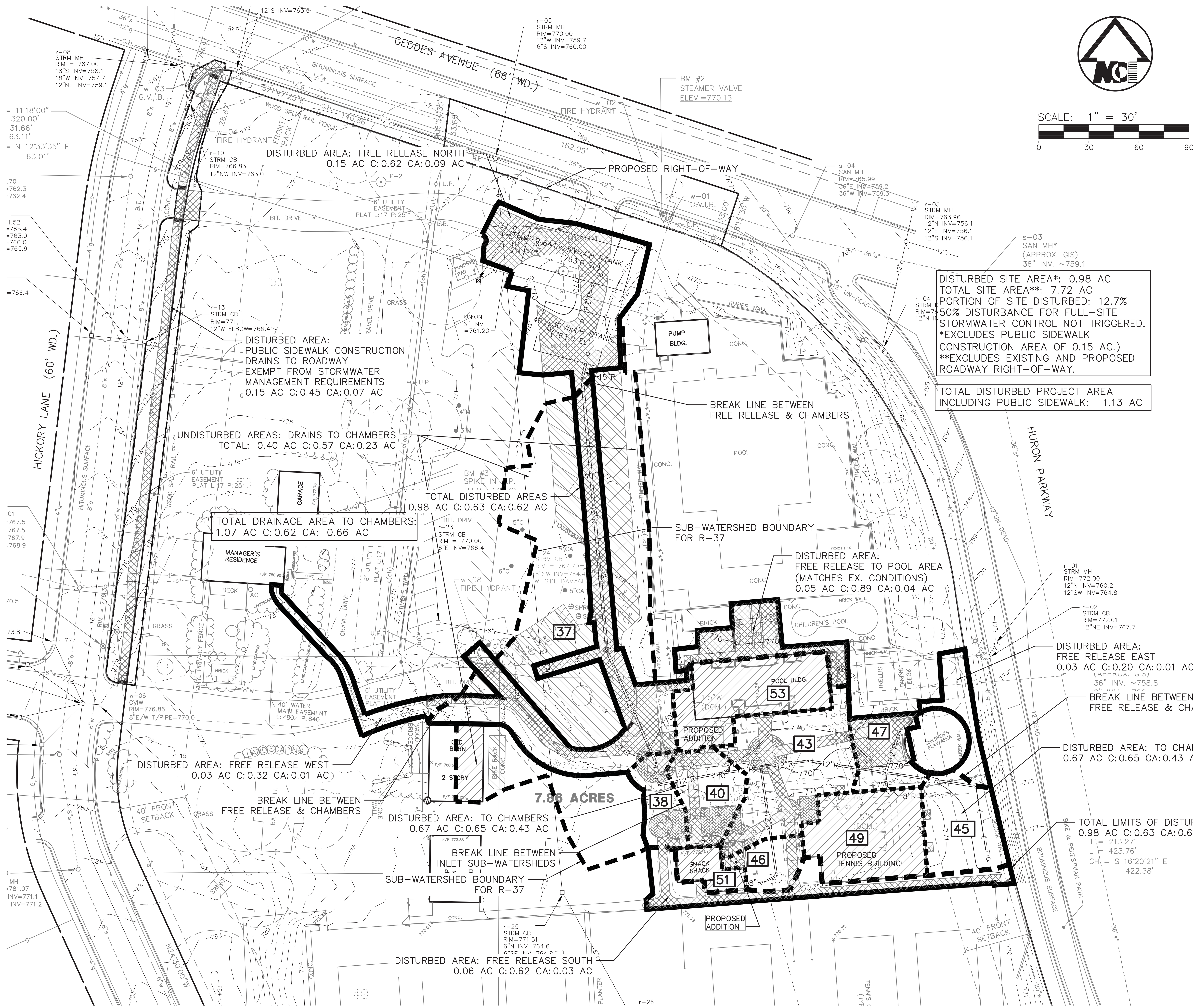
Outlet Path: Presently, most of the paved portions of the site drain through catch basins into a 6-inch storm pipe running from south to north on the site, before tying into the City storm sewer on Huron River Drive. While this pipe is undersized based upon modern design standards, the facility has not faced surface ponding issues due to the generally well-draining soils and the well-established overland flow paths throughout the site. Additionally, portions of the site sheet-flow to the east, south, and north across vegetated surfaces, partially infiltrating into the ground, with the remainder eventually reaching the City's storm sewers in the adjacent roadways.

Infiltration Chamber Design: Due to a desire to preserve landscaping and reduce construction impacts, the infiltration system will be placed underground in chambers, near Test Pit 1. To further reduce site impacts, RTank (or engineer-approved equal) chambers with 93% voids will be used, and the pre-treatment and emergency outlet control with invert at the top of the chamber elevation will also be underground. They are sized to handle the full 100-year storage volume of the disturbed site area, and our calculations indicate that due to infiltration out of the chambers during the storm events, the tank will not overflow when handling the larger stormwater volume routed to them in a 100-year event.

Water Quality Design: Before entering the infiltration chamber, the stormwater will pass through a hydrodynamic separator (Contech CDS or approved equal) sized to handle the pipe capacity leading to it. The hydrodynamic separator will treat the 10-year design storm flow rate (2.8 cfs) to at least the 80% TSS standard, and any remaining solids will be filtered in the soils beneath the infiltration chamber.

Conveyance Systems: New Pipes and swales are designed to convey the 10-year storm without surcharging above the crown of pipe, flowing full, following the calculation methodology in the WCWRC Rules and Guidelines.

Free Release Areas: Certain small areas (0.28 acres) along the edge of the site free-release to the east, west, north, and south, and to the pool, as collecting the water from these areas is difficult. However they are mitigated by taking in 0.40 acres of undisturbed site runoff at Structure R-37. Calculations of the "disturbed area runoff" and of the "infiltrated area runoff" were undertaken to ensure that the stormwater requirements would be exceeded. The project intends to use this trade-off of areas to comply with the regulations.



LEGEND:

- LIMITS OF DISTURBANCE MAIN SITE WORK
- LIMITS OF DISTURBANCE HICKORY LANE SIDEWALK WORK (EXEMPT FROM STORMWATER MANAGEMENT REUQIREMENTS)
- BREAK LINE BETWEEN DETAINED AND FREE RELEASE
- WATERSHED BOUNDARY FOR CHAMBERS
- SUB-WATERSHED BOUNDARY FOR INLET DRAINAGE AREAS
- 42 INLET & SUB-WATERSHED NUMBER
- ROOF AREA
- PAVEMENT AREA
- PERMEABLE PAVEMENT AREA
- OFFSITE PAVEMENT AREA DRAINING TO CHAMBERS

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RACQUET CLUB OF ANN ARBOR

SITE PLAN

STORMWATER MANAGEMENT PLAN

12

DATE: 5/15/2015

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Racquet Club of Ann Arbor - Sub-Watershed Analysis
Midwestern Consulting
5/12/2015

Rational C Values:

Soil Type	Roof/Pvmt.	Vegetated	Perm. Paver*	Steep Vegetated (>8%)	Water
A	0.95	0.20	0.25	0.25	1.00
B	0.95	0.30	0.35	0.35	1.00
C	0.95	0.35	0.40	0.40	1.00
D	0.95	0.50	0.55	0.55	1.00

* Steep Vegetated C Value used for permeable pavers.
NRCS Soils Type - Entire Site: BNB - Boyer Loamy Sand - Type A Hydrologic Soil Group - 0.60 - 6.00 in/hour infiltration

Inlet #	sft total area	sft roof	sft pvmt.	total imp.	sft perm. Paver	sft veg.	Soil Type	Imp. C	Perm. Paver C	Veg. C	CxA (sft)	CxA (ac)	Area (ac)	C Value
R-37 (disturbed area)	6,900	0	4976	4,976	72	1,852	A	0.95	0.25	0.20	5,116	0.117	0.158	0.74
R-38	1,310	0	278	278	459	573	A	0.95	0.25	0.20	493	0.011	0.030	0.38
R-40	1,952	0	642	642	384	926	A	0.95	0.25	0.20	891	0.020	0.045	0.46
R-43	5,018	0	1341	1,341	454	3,223	A	0.95	0.25	0.20	2,032	0.047	0.115	0.40
R-45	2,537	0	51	51	0	2,486	A	0.95	0.25	0.20	546	0.013	0.058	0.22
R-46	1,099	0	302	302	0	797	A	0.95	0.25	0.20	446	0.010	0.025	0.41
R-47	1,651	0	915	915	0	736	A	0.95	0.25	0.20	1,016	0.023	0.038	0.62
R-49 (Tennis Bldg.)	3,562	3562	0	3,562	0	0	A	0.95	0.25	0.20	3,384	0.078	0.082	0.95
R-51 (Snack Shack)	812	812	0	812	0	0	A	0.95	0.25	0.20	771	0.018	0.019	0.95
R-53 (Pool Bldg.)	4,433	4433	0	4,433	0	0	A	0.95	0.25	0.20	4,211	0.097	0.102	0.95
East Free	1,163	0	0	0	0	1,163	A	0.95	0.25	0.20	233	0.005	0.027	0.20
South Free	2,421	0	1344	1,344	0	1,077	A	0.95	0.25	0.20	1,492	0.034	0.056	0.62
West Free	1,165	0	182	182	0	983	A	0.95	0.25	0.20	370	0.008	0.027	0.32
North Free	6,637	0	3679	3,679	0	2,958	A	0.95	0.25	0.20	4,087	0.094	0.152	0.62
To Pool Free	1,976	0	1827	1,827	0	149	A	0.95	0.25	0.20	1,765	0.041	0.045	0.89
R-37 - (From Undisturbed)	17,210	740	7723	8,463	0	8,747	A	0.95	0.25	0.20	9,789	0.225	0.395	0.57
Hickory Sidewalk (Exempt)	6,596	0	2190	2,190	0	4,406	A	0.95	0.25	0.20	2,962	0.068	0.151	0.45

Subtotals: A = disturbed areas, routed through detention chamber. B = disturbed areas, free released. C = undisturbed areas, routed through infiltration chamber. D = Total flows into Inlet 37

A (Dist/Inf)	29,274	8,807	8,505	17,312	1,369	10,593	A	0.95	0.25	0.20	18,907	0.434	0.672	0.65
B (Dist/Rel)	13,362	0	7,032	7,032	0	6,330	A	0.95	0.25	0.20	7,946	0.182	0.307	0.59
C (Undist/Inf)	17,210	740	7,723	8,463	0	8,747	A	0.95	0.25	0.20	9,789	0.225	0.395	0.57
D (Total R-37)	24,110	740	12,699	13,439	72	10,599	A	0.95	0.25	0.20	14,905	0.342	0.553	0.62

Totals to determine stormwater treatment required: A + B (All disturbed areas)

A+B (disturbed)	42,636	8,807	15,537	24,344	1,369	16,923	A	0.95	0.25	0.20	26,854	0.616	0.979	0.63

Totals to determine proposed system: A + C (Treating C instead of B to allow for practical water distribution)

A+C (proposed)	46,484	9,547	16,228	25,775	1,369	19,340	A	0.95	0.25	0.20	28,697	0.659	1.067	0.62

Proposed stormwater treatment plan:
Because C > B, and infiltration is feasible near C but not by B, the project intends to treat C instead of B as follows:
1) Provide underground storage chambers for the 100-year storm in Area A, near Area A, to release at 0.15 cfs/acre of A
2) Provide underground infiltration chambers for the 2-year storm in Area C, instead of Area A
3) Provide additional storage for Area C, sized for the volume of the 100-year storm in Area B. Release rate will be 0.15 cfs/acre of C.
4) By City Code, public sidewalks are exempt from stormwater management requirements, and they are also off the property on City right-of-way, so the Hickory Sidewalk Area is not included in the project stormwater system.

STORM DRAINAGE CALCULATION SHEET
Racquet Club of Ann Arbor - 14058.00 - 5/15/2015

MIDWESTERN CONSULTING, INC.
3815 Plaza Drive
Ann Arbor, MI 48108
(313) 995-0200, Fax (313) 995-0599

Runoff Formula: Q = CIA

I = x/(T+y) x = 175 y= 25 (10 Year Storm Event)
Type of Pipe = rcp
n = 0.013 Min time of concentration 15.00 min

Structure No. From	Structure No. To	Drainage Area A (Acres)	Runoff Coeff. C	CxA	ADD. CxA	Σ CxA	Time T (min.)	Rainfall I (in./hr.)	Q (cfs)	Q Inlet Here	Pipe Dia. (in.)	Pipe Length (ft.)	Pipe Slope %	H.G. Slope %	Velocity Flowing Full (ft./sec.)	Travel Time (min.)	Sewer Capacity (cfs)	Spare Capac. (cfs)
R-31	R-30										6	15	6.48	0.00	7.29	0.03	1.43	1.43
R-34	R-32										12	18	0.77	0.00	3.99	0.08	3.13	3.13
R-36	R-35	0.000	0.00	0.00		0.66	17.31	4.14	2.73	0.00	15	9	0.40	0.18	3.34	0.04	4.10	1.37
R-37	R-36	0.553	0.62	0.34		0.66	16.50	4.22	2.78	1.50	15	164	0.40	0.19	3.34	0.82	4.10	1.31
R-38	R-37	0.030	0.38	0.01		0.32	16.13	4.26	1.35	0.05	12	73	0.52	0.14	3.28	0.37	2.58	1.22
R-39	R-38	0.000	0.00	0.00		0.31	16.05	4.26	1.30	0.00	12	13	0.45	0.13	3.05	0.07	2.40	1.09
R-40	R-39	0.045	0.46	0.02		0.31	15.87	4.28	1.31	0.09	12	34	0.45	0.14	3.05	0.19	2.40	1.09
R-41	R-40	0.000	0.00	0.00	0.10	0.29	15.82	4.29	1.22	0.00	12	9	0.45	0.12	3.05	0.05	2.40	1.17
R-42	R-41	0.000	0.00	0.00	0.03	0.19	15.72	4.30	0.81	0.00	12	19	0.45	0.05	3.05	0.10	2.40	1.59
R-43	R-42	0.115	0.40	0.05		0.16	15.56	4.31	0.69	0.20	12	29	0.45	0.04	3.05	0.16	2.40	1.71
R-44	R-43	0.000	0.00	0.00	0.10	0.11	15.30	4.34	0.50	0.00	12	47	0.45	0.02	3.05	0.26	2.40	1.90
R-45	R-44	0.058	0.22	0.01		0.01	15.00	4.38	0.06	0.06	12	55	0.45	0.00	3.05	0.30	2.40	2.34
R-46	R-42	0.025	0.41	0.01		0.03	15.06	4.37	0.12	0.04	12	65	0.50	0.00	3.22	0.34	2.53	2.40
R-50	R-46	0.000	0.00	0.00		0.02	15.04	4.37	0.08	0.00	8	8	2.00	0.00	4.91	0.03	1.71	1.63
R-51	R-50	0.019	0.95	0.02		0.02	15.00	4.38	0.08	0.08	8	11	2.00	0.00	4.91	0.04	1.71	1.63
R-47	R-44	0.038	0.62	0.02		0.02	15.00	4.38	0.10	0.10	12	26	0.50	0.00	3.22	0.13	2.53	2.42
R-48	R-44	0.000	0.00	0.00		0.08	15.02	4.37	0.34	0.00	8	5	2.00	0.08	4.91	0.02	1.71	1.37
R-49	R-48	0.082	0.95	0.08		0.08	15.00	4.38	0.34	0.34	8	5	2.00	0.08	4.91	0.02	1.71	1.37
R-52	R-41	0.000	0.00	0.00		0.10	15.01	4.37	0.42	0.00	8	14	2.00	0.12	4.91	0.05	1.71	1.29
R-53	R-53	0.102	0.95	0.10		0.10	15.00	4.38	0.42	0.42	8	2	2.00	0.12	4.91	0.01	1.71	1.29

Please note that based on Manning's equation with an "n" of 0.06 for poor condition natural channel,
A 20' wide, 10% side-sloped swale (1' deep), at 1.0% minimum slope, can handle 8.574 cfs at 0.8' full,
and 15.55 cfs at full depth.

No inlet > 2.5 cfs (max is 1.50 cfs at R-37)

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Racquet Club of Ann Arbor
Preliminary Detention/Infiltration Calculations - Summary Table
Midwestern Consulting, LLC
5/12/2015

Portions of the disturbed site free drain, but portions of undisturbed site flow through the stormwater treatment systems.
This table compares the 2-year and 100-year runoff volumes to ensure that the flows actually reaching the stormwater treatment systems are at least as great as the volumes required.

Infiltration Volume Required (Disturbed Area):	4,304	cft	0.099	ac-ft
Actual 2-year Volume (Detained Area):	4,557	cft	0.105	ac-ft
Total 100-year Runoff Required (Disturbed Area):	10,353	cft	0.24	ac-ft
Actual 100-year Volume (Detained Area):	10,978	cft	0.252	ac-ft

Volume Provided:

RTank Chambers are used to conserve space and reduce surface demolition and construction costs.

Sizing Calculations
Storage Required: 10,353 cft
Void Ratio of Chambers: 93%
RTank Volume Required: 11,132 cft

Bottom of Chambers: 763.0 Infiltration Test Elevation
Top of Chambers: 767.0 (2.5' under low point of 769.5, 3' under pavement of 770.0)
Height of Chambers 4.0 ft
Rtank Area Required: 2,783 sft minimum area required to store stormwater in 4' height.

Check for Infiltration:
Infiltration Rate by TP-1 27.75 in/hr
Factor of Safety 4 (WCWRC 2 minimum - also accounting for soils variation)
Design Infiltration Rate 6.94 in/hr 0.578 ft/hr

Time to Infiltrate 48 hr
Minimum Volume to Infiltrate per hour 216 cft/hr
Minimum Infiltration Area 373 sft minimum infiltration area required.

RTank Area Provided 2,700 sft

W13 - Storage-Elevation Data

Basin Storage Information

	Elevation (ft)	Area (sft)	Volume (cft)	Cum. Volume (cft)	Cum. Volume (ac-ft)
Bottom of Basin	763	2,800	2,604	2,604	0.06
	764	2,800	2,604	5,208	0.12
	765	2,800	2,604	7,812	0.18
	766	2,800	2,604	10,416	0.24
Top of Basin and Overflow Weir	767	0	0	10,416	0.24
Low Point Ground Elevation	769.5	0	0	10,416	0.24

Storage Volumes
1" Event 2,391 cft 0.05 ac-ft
2-year Event volume 4,557 cft 0.10 ac-ft
Full Tank volume 10,353 cft 0.24 ac-ft

Infiltration Rate 1,561 cft/hr 0.036 ac-ft/hr 0.43 cfs
Time to infiltrate 1" event 1.5 hr (<24 hours)
Time to infiltrate 2-year event 2.9 hr (<48 hours)
Tiime to infiltrate 100-year event 6.6 hr

Storage Elevations
Elevation for 1" event 763.92 Elevation 0.92 ft. depth
Elevation for 2-year event 764.75 Elevation 1.75 ft. depth
Elevation for 100-year event 766.98 Elevation 3.98 ft. depth

Racquet Club of Ann Arbor
Outlet Certification
5/12/2015

Outlet from Chambers:

The infiltration chambers are designed to infiltrate the full 100-year storm into the ground in less than 24 hours. The measured infiltration rate at Test Pit 1 was 27.75 in/hr, and we have applied a factor of safety of 4 (twice the required level) to use a design rate of 6.94 in/hr. This matches the NRCS soils type of BnB Boyer Loamy Sand, a Type A soil.

In case of a failure of the infiltration bed or a storm exceeding the design capacity, and overflow outlet with an invert at the height of the infiltration chamber top has been provided to the existing 6" drainage pipe through the site. Although the 6" pipe is undersized to handle a 10-year storm, the existing site's sandy soils and overland overflow paths have ensured that water ponding on the existing site has not been a problem. The renovations to the site will be reducing the flow through the existing system, and reducing the overland flow off of the site, improving the existing drainage conditions.

Outlet Certification:
Based upon the data and criteria outlined above, I hereby certify that the existing drain is the only reasonably achievable stormwater outlet for the proposed stormwater management system, and that the exiting drain has sufficient capacity to serve as an adequate outlet for the proposed system, without detriment to or diminution of the drainage serve that the existing outlet presently provides.

Signed: Jeremy Matthei

Jeremy Matthei, PE #62010 53590

STATE OF MICHIGAN
JEREMY A. MATTHEI
ENGINEER NO.
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RACQUET CLUB OF ANN ARBOR
SITE PLAN
STORMWATER MANAGEMENT CALCULATIONS

13

DATE: 5/15/2015
SHEET 13 OF 22
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JOB No. 14058

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Racquet Club of Ann Arbor
Preliminary Detention/Infiltration Calculations - Total Disturbed Area
Midwestern Consulting, LLC
5/12/2015

Total Disturbed Area Calculations (to Determine Infiltration and Detention Required)
W1 - Determining Post-Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients

Total Site Area (Disturbed Area)	**0.98**	**ac**
Total Site Area Excluding "Self-Crediting" BMPs* (Main Infiltration Chamber)	**0.98**	**ac**

*** Used for remainder of calculations below**

Rational Method Variables
(for first flush)
0.95 for impervious surfaces
0.25 for permeable pavers (use "steep vegetated" value)
0.20 for pervious surfaces

Cover Type	Soil Type	Area (sft)	Area (ac)	Runoff Coeff. (C)	(C) (Area)
Roofs	A	8,807	0.20	0.95	0.19
Pavements	A	15,537	0.36	0.95	0.34
Perm. Pavers	A	1,369	0.03	0.25	0.01
Landscaping	A	16,923	0.39	0.20	0.08
Total		42,636	0.98	0.63	0.62

Total - Sum(C)(Area)	0.62	ac
Area Total	0.98	ac
Weighted C - (Sum(C)(Area))/(Area Total)	0.63	

Pervious

NRCS Variables
(for bankfull and 100-year calculations)

68 for Permeable Pavers, Soil Type A
(use "Landscaping, Poor Condition, Soil Type A" value)
39 for Landscaping, Good Condition, Soil Type A

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) (Area)
Perm. Pavers	A	1,369	0.03	68	0.02
Landscaping	A	16,923	0.39	39	0.15
Total		18,292	0.42	41	0.17

Total - Sum(C)(Area)	0.17
Area Total	0.42
Weighted C - (Sum(C)(Area))/(Area Total)	41.2

Impervious

NRCS Variables
(for bankfull and 100-year calculations)

98 for Roofs
98 for Pavements

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) (Area)
Roofs	A	8,807	0.20	98	0.20
Pavements	A	15,537	0.36	98	0.35
Total		24,344	0.56	98	0.55

Total - Sum(C)(Area)	0.55
Area Total	0.56
Weighted C - (Sum(C)(Area))/(Area Total)	98.0

W2 - First Flush Runoff Calculations (Vff)

A. Vff = 1" x 1'/12" x 43560 sft/ac x A x C	2,238	cft
	0.05	*ac-ft*

W3 - Pre-Development Bankfull Runoff Calculations (Vbf-pre)

A. 2 year / 24 hour storm event: P=	2.35	in
B. Pre-Development CN (Good Cover Woods, Type A Soils)	30	
C. S = (1000 / CN) - 10	23.333	in
D. Q = [(P-0.2S)^2] / [P+0.8S]	0.000	in
E. Total Site Area excluding "Self-Crediting" BMPs	42,636	sft
F. Vbf-pre = Q x (1/12) x Area	-	cft
	-	*ac-ft*

W4 - Pervious Cover Post-Development Bankfull Runoff Calculations (Vbf-per-post)

A. 2 year / 24 hour storm event: P=	2.35	in
B. Pervious Cover CN From Worksheet 1	41	
C. S = (1000 / CN) - 10	14.289	in
D. Q = [(P-0.2S)^2] / [P+0.8S]	0.000	in
E. Pervious Cover Area from Worksheet 1	18,292	sft
F. Vbf-per-post = Q x (1/12) x Area	-	cft
	-	*ac-ft*

W5 - Impervious Cover Post-Development Bankfull Runoff Calculations (Vbf-imp-post)

A. 2 year / 24 hour storm event: P=	2.35	in
B. Impervious Cover CN From Worksheet 1	98	
C. S = (1000 / CN) - 10	0.204	in
D. Q = [(P-0.2S)^2] / [P+0.8S]	2.122	in
E. Impervious Cover Area from Worksheet 1	24,344	sft
F. Vbf-imp-post = Q x (1/12) x Area	4,304	cft
	0.10	*ac-ft*

W6 - Pervious Cover Post-Development 100-Year Runoff Calculations (V100-per-post)

A. 100 year / 24 hour storm event: P=	5.11	in
B. Pervious Cover CN From Worksheet 1	41	
C. S = (1000 / CN) - 10	14.289	in
D. Q = [(P-0.2S)^2] / [P+0.8S]	0.307	in
E. Pervious Cover Area from Worksheet 1	18,292	sft
F. V100-per-post = Q x (1/12) x Area	467	cft
	0.01	*ac-ft*

W7 - Impervious Cover Post-Development 100-Year Runoff Calculations (V100-imp-post)

A. 2 year / 24 hour storm event: P=	5.11	in
B. Impervious Cover CN From Worksheet 1	98	
C. S = (1000 / CN) - 10	0.204	in
D. Q = [(P-0.2S)^2] / [P+0.8S]	4.873	in
E. Impervious Cover Area from Worksheet 1	24,344	sft
F. Vbf-imp-post = Q x (1/12) x Area	9,886	cft
	0.23	*ac-ft*

W8 - Time of Concentration (Tc-hrs)

A. Assume 15-minute minimum time of concentration	0.25	hr

W9 - Runoff Summary & On-Site Infiltration Requirement

A. Summary from Previous Worksheets

First Flush Volume (Vff)	2,238	cft	0.05	ac-ft
Pre-Development Bankfull Runoff Volume (Vbf-pre)	-	cft	-	ac-ft
Pervious Cover Post-Development Bankfull Volume (Vbf-per-post)	*-*	*cft*	*-*	*ac-ft*
Impervious Cover Post-Development Bankfull Volume (Vbf-imp-post)	*4,304*	*cft*	*0.10*	*ac-ft*
Total BF Volume (Vbf-post)	4,304	cft	0.10	ac-ft
Pervious Cover Post-Development 100-Year Volume (V100-per-post)	*467*	*cft*	*0.01*	*ac-ft*
Impervious Cover Post-Development 100-Year Volume (V100-imp-post)	*9,886*	*cft*	*0.23*	*ac-ft*
Total 100-Year Volume (V100)	10,353	cft	0.24	ac-ft

B. Determine Onsite Infiltration Requirement
Subtract the Pre-Development Bankfull from the Post-Development Bankfull Volume

Total Post-Development Bankfull Volume (Vbf-post)	4,304	cft	0.10	ac-ft
Pre-Development Bankfull Runoff Volume (Vbf-pre)	-	cft	-	ac-ft
Bankfull Volume Difference	**4,304**	**cft**	**0.10**	**ac-ft**
Compare to First Flush Volume (Vff)	2,238	cft	0.05	ac-ft
Greater of Bankfull Volume or First Flush Volume To be Infiltrated	**4,304**	**cft**	0.10	ac-ft

W10 - Detention/Retention Requirement

Detention

A. Qp = 238.6 Tc^-0.82	743.63 cfs/(in x sq. mi)	
B. Total Site Area excluding "Self-Crediting" BMPs	0.98 ac	
C. Q100 = Q100-per + Q100-imp (from W6 and W7, respectively)	5.180 in	
D. Peak Flow (PF) = Qp x Q100 x Area / 640	5.89 cfs	
E. Delta = PF - 0.15 x Area (ac)	5.74 cfs	
[0.15 x Area (ac)]	*0.15 cfs*	
F. Vdet = Delta / PF x V100 - Vinf	(5,319) cft	(0.12) ac-ft
Required Detention	(All Runoff is infiltrated)	

Retention

A. Vret = 2 x V100	20,706 cft	0.48 ac-ft

W11 - Determine Applicable BMPs and Associated Volume Credits

Proposed BMP	Area (sft)	Stor. Vol. (cft)	Ave Inf. Rate (in/hr)	6-hour Inf. Storm (cft)	Total Red. (cft)
Infiltration Chambers	2,700	10,353	6.9	9,366	19,719

(Area conservatively taken at bottom of pond)
Average infiltration rate at Test Pit 10 (pond location) is 14 in/hr, FS of 2 is 7 in/hr. 3.0in/hr is used here to be conservative.

Total Volume Reduction Credit by Proposed Structural BMPs	19,719	cft
Runoff Volume Infiltration Requirement (Vinf) from Worksheet 9	4,304	cft
Runoff Volume Credit	15,415	cft

Minimum Surface Area Check

Contributing Impervious Surface	24,344	sft
Contributing Total Surface	42,636	sft
Impervious Surface Ratio	9.0	Type A soils at 6.9"/hour drain quickly.
Total Surface Ratio	15.8	

W12 - Natural Features Inventory

Existing Natural Resources	**Mapped**	Total Area (ac)	Protected Area (ac)
Wetlands	Yes	0.00	0.00
Woodlands	Yes	0.00	0.00
Total Existing		0.00	0.00

Racquet Club of Ann Arbor
Preliminary Detention/Infiltration Calculations - Detained Area
Midwestern Consulting, LLC
5/12/2015

Total Disturbed Area Calculations (to Determine Actual Flow Rates and Volumes to Chambers)
W1 - Determining Post-Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients

Total Site Area (Proposed Detained Area)	**1.07**	**ac**
Total Site Area Excluding "Self-Crediting" BMPs* (Main Detention Basin)	**1.07**	**ac**

*** Used for remainder of calculations below**

Rational Method Variables
(for first flush)
0.95 for impervious surfaces
0.25 for permeable pavers (use "steep vegetated" value)
0.20 for pervious surfaces

Cover Type	Soil Type	Area (sft)	Area (ac)	Runoff Coeff. (C)	(C) (Area)
Roofs	A	9,547	0.22	0.95	0.21
Pavements	A	16,228	0.37	0.95	0.35
Perm. Pavers	A	1,369	0.03	0.25	0.01
Landscaping	A	19,340	0.44	0.20	0.09
Total		46,484	1.07	0.62	0.66

Total - Sum(C)(Area)	0.66	
Area Total	1.07	ac
Weighted C - (Sum(C)(Area))/(Area Total)	0.62	ac

Pervious

NRCS Variables
(for bankfull and 100-year calculations)

68 for Permeable Pavers, Soil Type A
(use "Landscaping, Poor Condition, Soil Type A" value)
39 for Landscaping, Good Condition, Soil Type A

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) (Area)
Perm. Pavers	A	1,369	0.03	68	0.02
Landscaping	A	19,340	0.44	39	0.17
Total		20,709	0.48	41	0.19

Total - Sum(C)(Area)	0.19
Area Total	0.48
Weighted C - (Sum(C)(Area))/(Area Total)	40.9

Impervious

NRCS Variables
(for bankfull and 100-year calculations)

98 for Roofs
98 for Pavements

Cover Type	Soil Type	Area (sft)	Area (ac)	Curve Number	(CN) (Area)
Roofs	A	9,547	0.22	98	0.21
Pavements	A	16,228	0.37	98	0.37
Total		25,775	0.59	98	0.58

Total - Sum(C)(Area)	0.58
Area Total	0.59
Weighted C - (Sum(C)(Area))/(Area Total)	98.0

W2 - First Flush Runoff Calculations (Vff)

A. Vff = 1" x 1'/12" x 43560 sft/ac x A x C	2,391	cft
	0.05	*ac-ft*

W3 - Pre-Development Bankfull Runoff Calculations (Vbf-pre)

A. 2 year / 24 hour storm event: P=	2.35	in
B. Pre-Development CN (Good Cover Woods, Type A Soils)	30	
C. S = (1000 / CN) - 10	23.333	in
D. Q = [(P-0.2S)^2] / [P+0.8S]	0.000	in
E. Total Site Area excluding "Self-Crediting" BMPs	46,484	sft
F. Vbf-pre = Q x (1/12) x Area	-	cft
	-	*ac-ft*

W4 - Pervious Cover Post-Development Bankfull Runoff Calculations (Vbf-per-post)

A. 2 year / 24 hour storm event: P=	2.35	in
B. Pervious Cover CN From Worksheet 1	41	
C. S = (1000 / CN) - 10	14.440	in
D. Q = [(P-0.2S)^2] / [P+0.8S]	0.000	in
E. Pervious Cover Area from Worksheet 1	20,709	sft
F. Vbf-per-post = Q x (1/12) x Area	-	cft
	-	*ac-ft*

W5 - Impervious Cover Post-Development Bankfull Runoff Calculations (Vbf-imp-post)

A. 2 year / 24 hour storm event: P=	2.35	in
B. Impervious Cover CN From Worksheet 1	98	
C. S = (1000 / CN) - 10	0.204	in
D. Q = [(P-0.2S)^2] / [P+0.8S]	2.122	in
E. Impervious Cover Area from Worksheet 1	25,775	sft
F. Vbf-imp-post = Q x (1/12) x Area	4,557	cft
	0.10	*ac-ft*

W6 - Pervious Cover Post-Development 100-Year Runoff Calculations (V100-per-post)

A. 100 year / 24 hour storm event: P=	5.11	in
B. Pervious Cover CN From Worksheet 1	41	
C. S = (1000 / CN) - 10	14.440	in
D. Q = [(P-0.2S)^2] / [P+0.8S]	0.296	in
E. Pervious Cover Area from Worksheet 1	20,709	sft
F. V100-per-post = Q x (1/12) x Area	511	cft
	0.01	*ac-ft*

W7 - Impervious Cover Post-Development 100-Year Runoff Calculations (V100-imp-post)

A. 2 year / 24 hour storm event: P=	5.11	in
B. Impervious Cover CN From Worksheet 1	98	
C. S = (1000 / CN) - 10	0.204	in
D. Q = [(P-0.2S)^2] / [P+0.8S]	4.873	in
E. Impervious Cover Area from Worksheet 1	25,775	sft
F. Vbf-imp-post = Q x (1/12) x Area	10,467	cft
	0.24	*ac-ft*

W8 - Time of Concentration (Tc-hrs)

A. Assume 15-minute minimum time of concentration	0.25	hr

W9 - Runoff Summary & On-Site Infiltration Requirement

A. Summary from Previous Worksheets

First Flush Volume (Vff)	2,391	cft	0.05	ac-ft
Pre-Development Bankfull Runoff Volume (Vbf-pre)	-	cft	-	ac-ft
Pervious Cover Post-Development Bankfull Volume (Vbf-per-post)	*-*	*cft*	*-*	*ac-ft*
Impervious Cover Post-Development Bankfull Volume (Vbf-imp-post)	*4,557*	*cft*	*0.10*	*ac-ft*
Total BF Volume (Vbf-post)	4,557	cft	0.10	ac-ft
Pervious Cover Post-Development 100-Year Volume (V100-per-post)	*511*	*cft*	*0.01*	*ac-ft*
Impervious Cover Post-Development 100-Year Volume (V100-imp-post)	*10,467*	*cft*	*0.24*	*ac-ft*
Total 100-Year Volume (V100)	10,978	cft	0.25	ac-ft

B. Determine Onsite Infiltration Requirement
Subtract the Pre-Development Bankfull from the Post-Development Bankfull Volume

Total Post-Development Bankfull Volume (Vbf-post)	4,557	cft	0.10	ac-ft
Pre-Development Bankfull Runoff Volume (Vbf-pre)	-	cft	-	ac-ft
Bankfull Volume Difference	**4,557**	**cft**	**0.10**	**ac-ft**
Compare to First Flush Volume (Vff)	2,391	cft	0.05	ac-ft
Greater of Bankfull Volume or First Flush Volume To be Infiltrated	**4,557**	**cft**	0.10	ac-ft

W10 - Detention/Retention Requirement

Detention

A. Qp = 238.6 Tc^-0.82	743.63 cfs/(in x sq. mi)	
B. Total Site Area excluding "Self-Crediting" BMPs	1.07 ac	
C. Q100 = Q100-per + Q100-imp (from W6 and W7, respectively)	5.169 in	
D. Peak Flow (PF) = Qp x Q100 x Area / 640	6.41 cfs	
E. Delta = PF - 0.15 x Area (ac)	6.25 cfs	
[0.15 x Area (ac)]	*0.16 cfs*	
F. Vdet = Delta / PF x V100 - Vinf	(4,457.50) cft	(0.10) ac-ft
Required Detention		

Retention

A. Vret = 2 x V100	21,956 cft	0.50 ac-ft

W11 - Determine Applicable BMPs and Associated Volume Credits

Proposed BMP	Area (sft)	Stor. Vol. (cft)	Ave Inf. Rate (in/hr)	6-hour Inf. Storm (cft)	Total Red. (cft)
Infiltration Chambers	2,700	10,353	6.9	9,366	19,719

(Area conservatively taken at bottom of pond)
Average infiltration rate at Test Pit 10 (pond location) is 14 in/hr, FS of 2 is 7 in/hr. 3.0in/hr is used here to be conservative.

Total Volume Reduction Credit by Proposed Structural BMPs	19,719	cft
Runoff Volume Infiltration Requirement (Vinf) from Worksheet 9	4,557	cft
Runoff Volume Credit	15,162	cft

Minimum Surface Area Check

Contributing Impervious Surface	25,775	sft
Contributing Total Surface	46,484	sft
Impervious Surface Ratio	9.5	Type A soils at 6.9"/hour drain quickly.
Total Surface Ratio	17.2	

W12 - Natural Features Inventory

Existing Natural Resources	**Mapped**	Total Area (ac)	Protected Area (ac)
Wetlands	Yes	0.00	0.00
Woodlands	Yes	0.00	0.00
Total Existing		0.00	0.00

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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RACQUET CLUB OF ANN ARBOR
SITE PLAN
STORMWATER MANAGEMENT WCWRC WORKSHEETS

14

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ENG: JAM
PM: SWB
TECH:
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REVISIONS: | REV. | DATE

JOB No. **14058**

LANDSCAPE NOTES

1. Water outlets will be provided within 150 feet of all required plantings.
2. Plant materials shall be selected and installed in accordance with standards established by the City Parks and Recreation Department.
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.
4. Restore remaining disturbed areas (except detention basin overflow) with a minimum of four (4) inches of topsoil and then seed/ fertilize/mulch. Fertilizer for the initial establishment 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.
   Seed mix shall consist 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 a rate of five pounds (5 lbs) per 1000 sq ft. Mulch within 24 hours with two (2) tons of straw per acre, or 71 bales of excelsior mulch per acre. Anchor straw mulch with spray coating of adhesive material applied at the rate of 150 gals/acre.
5. 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.
6. All plants except ground cover are to receive four (4) inches of shredded bark mulch. Ground cover to receive two (2) inches of Canadian peat mulch.
7. All trees to be located a minimum of 10 feet from public utilities.
8. 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.
9. 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.
10. Fertilizer applied after the first growing season shall NOT contain phosphorus.
11. 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.
12. 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 materials harmful to plant growth. Mix surface soil with the following soil amendments to produce planting soil:
    a. Ratio of Loose Compost to Topsoil by Volume: 1:4.
    b. Weight of Lime per 1000 sq. ft.: Amend with lime only on recommendation of soil test to adjust soil pH.
    c. Weight of sulfur or aluminum sulfate per 1,000 sq. ft.: amend with sulfur or aluminum sulfate only on recommendation of soil test to adjust soil pH.
    d. Volume of Sand: amend with sand only on recommendation of 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.
13. Bio-retention islands can be used for snow storage, if the parking lots are plowed.
14. Snow storage areas are not shown on the plan since the facility is not open in the winter, and the snow is not plowed.
15. Proposed trees will be planted a minimum of 15 feet apart.

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

For Use in Bioswale/Rain Gardens

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
Verbena hastata	Blue Vervain
Vernonia sp.	Ironweed
Cassia fasciculata	Partridge Pea
Coreopsis lanceolata	Sand Coreopsis
Lupinus perennis	Flowerwild Lupine
Monarda fistulosa	Wild Bergamot
Ratibida pinnata	Yellow Coneflower
Rudbeckia hirta	Black-eyed Susan
Cosmos bipinnatus	Annual Cosmo
Gaillardia pulchella	Blanket Flower
Papaver rhoeas	Annual Corn Poppy

SCALE: 1" = 30'

0 30 60 90

LEGEND

- 838 EXIST. CONTOUR
- 838 PROP. CONTOUR
- ×836.2 EXIST. SPOT ELEVATION
- 36.60 PROP. SPOT ELEVATION
- U.P. EXIST. UTILITY POLE
- GP EXIST. GUY POLE
- 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
- 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
- r EXIST. STORM SEWER
- R PROP. STORM SEWER
- EXIST. CATCH BASIN OR INLET
- PROP. CATCH BASIN OR INLET
- s EXIST. SANITARY SEWER
- S PROP. SANITARY SEWER
- EXIST. CLEANOUT
- PROP. CLEANOUT
- SIGN
- MAILBOX
- TELEPHONE RISER
- catv CABLE TELEVISION RISER
- ELECTRIC METER
- WATER METER
- GAS METER
- POST
- WELL
- SINGLE TREE
- FENCE
- TREE OR BRUSH LIMIT
- EXIST. BOULDER
- EXIST. SPRINKLER HEAD
- SECTION CORNER
- FOUND IRON PIPE
- FOUND MONUMENT
- FIR FOUND IRON ROD
- CONTROL PT.
- VEHICLE USE AREA
- 4" TOPSOIL, LAWN SEED, AND MULCH
- BIO-RETENTION SOILS, SEED, AND MULCH
- PLACE TRANSPLANTED TREE

LANDSCAPE REQUIREMENTS:

I. VEHICULAR USE AREA LANDSCAPING:

Vehicular Use Area = 18,165 SF
Interior Landscape Area required 1:20 = 908 SF
Interior Landscape Area provided = 8,336 SF
Trees required 1/250 SF = 4 trees req.
Trees existing (5CA + 1O + 1528, 1537, 1538) = 19 total
Bio-retention required = 454 SF / Proposed = 776 SF

II. RIGHT OF WAY SCREENING:

Hickory Lane frontage = 127 lf of parking lot (fully screened by 8 spindle trees, 26 privet, mature trees, and depressed grade)
Geddes Drive frontage = 100 lf of parking lot (fully screened with 5 burning bush and 6' high opaque privacy fence)

III. REFUSE/RECYCLING SCREENING:

Provided/existing.

IV. CONFLICTING LAND USE BUFFER:

Note applicable.

V. PARKING LOT LIGHTING:

Not required since the facility is not open past dusk, and does not open until it's daylight in the morning.

VI. STREET TREE ESCROW:

Hickory Lane frontage = 813 lf x $1.30/lf of street frontage = $1,056.90
Geddes Drive frontage = 322 lf x $1.30/lf = $418.60
Total of $1,475.50 to be paid to the City of Ann Arbor

VII. TREE MITIGATION:

Not applicable.

VIII. NATURAL FEATURES:

Statement of Natural Features Impacts is shown on Sheet 2.

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

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.

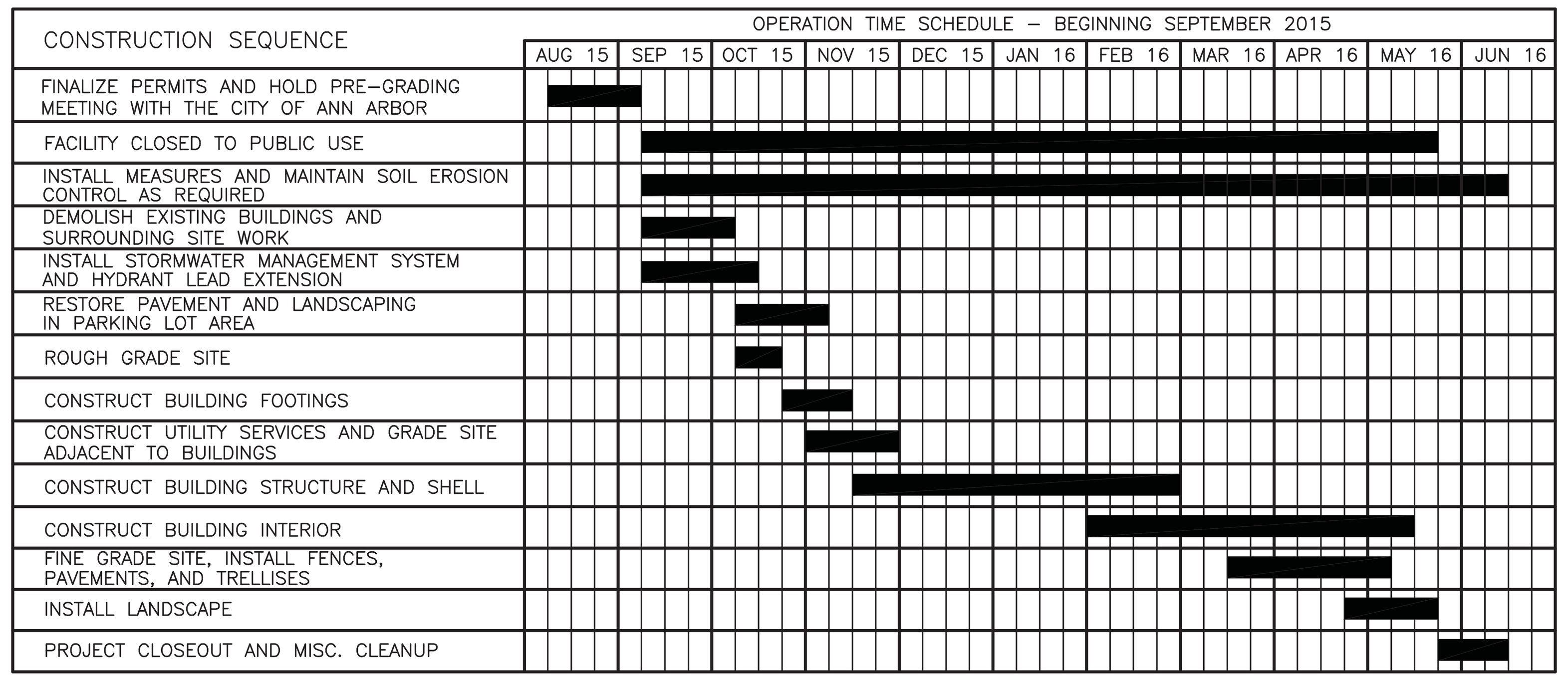
MIDWESTERN CONSULTING
Civil, Environmental and Transportation Engineers
Planners, Surveyors
Landscape Architects
3815 Plaza Drive
Ann Arbor, Michigan 48108
Phone: 734.995.0200
Fax 734.995.0599

CLIENT
RACQUET CLUB OF ANN ARBOR
3010 HICKORY LANE
ANN ARBOR, MI 48104
BRENT SCHOMAKER
(734) 216-0579

RACQUET CLUB OF ANN ARBOR
SITE PLAN
LANDSCAPE PLAN

15

JOB No. 14058	DATE: 5/15/2015
REVISIONS: REV. DATE	SHEET 15 OF 22
	CADD: WAJ
	ENG: JAM
	PM: SWB
	TECH:
	14058LP1.dwg



PROGRAM PROPOSAL

THE RACQUET CLUB MANAGEMENT STAFF SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND REPLACEMENT, IF NECESSARY, OF ANY AND ALL OF THE PERMANENT SOIL EROSION CONTROL FEATURES ASSOCIATED WITH SEDIMENT AND SOIL EROSION CONTROL WITHIN THE DEVELOPMENT. THE FINANCIAL IMPLICATIONS OF SAID MAINTENANCE WILL BE ADDRESSED BY THE RACQUET CLUB MANAGEMENT STAFF.

CONSTRUCTION SEQUENCE:

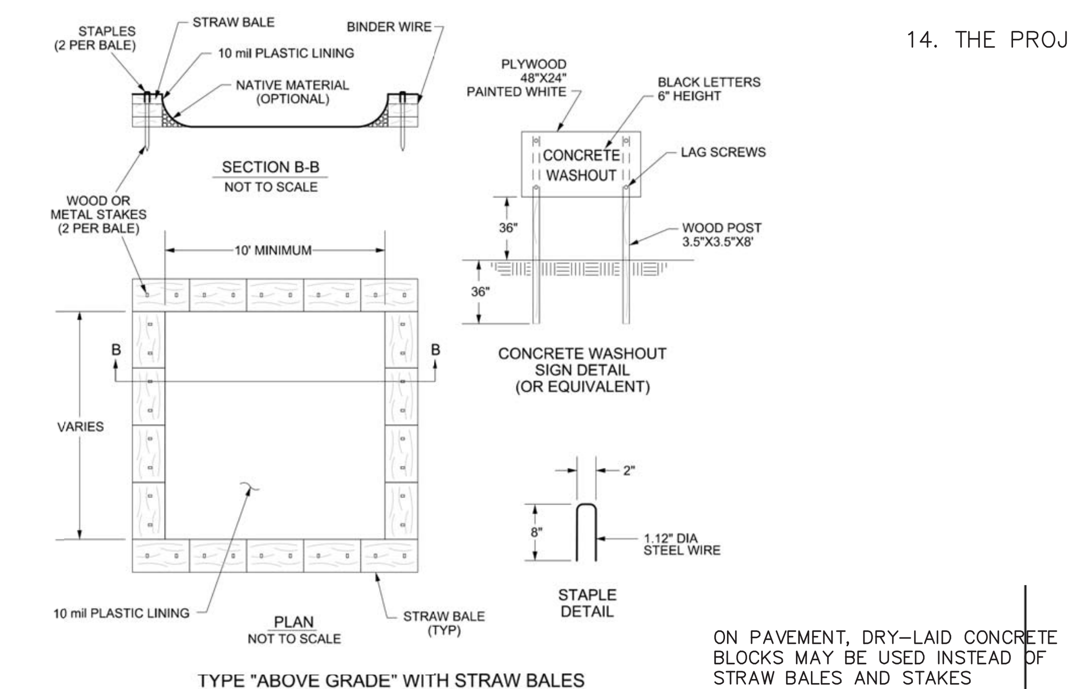
1. OBTAIN SOIL EROSION AND SEDIMENTATION CONTROL, AND GRADING PERMIT FROM THE CITY OF ANN ARBOR. CERTIFIED MDEQ STORM WATER OPERATOR TO INSPECT SITE ONCE A WEEK AND IMMEDIATELY FOLLOWING EACH PRECIPITATION EVENT. MAINTAIN WRITTEN REPORTS ON SITE.
2. SCHEDULE AND ATTEND A SOIL EROSION AND SEDIMENTATION CONTROL PRE–GRADING MEETING WITH THE CITY OF ANN ARBOR.
3. MARK TREES AND BRUSHFOR REMOVAL AND PROTECTION.
4. CLOSE FACILITY TO THE PUBLIC ON LABOR DAY, 2015.
5. CLEAR BRUSH AND TREES WHERE INDICATED, ABOVE STUMPS ONLY.
6. INSTALL TREE PROTECTION FENCE, SITE SECURITY FENCE, SILT FENCE, INLET FILTER SILT SACKS, AND OTHER SESC DEVICES. SEE DEMOLITION PLAN AND EROSION CONTROL PLAN FOR FURTHER DETAILS ON NATURAL FEATURES PROTECTION.
7. REMOVE PAVEMENT, STUMPS, AND SITE STRUCTURES, WHERE INDICATED.
8. STRIP TOPSOIL AND STOCKPILE ON–SITE FOR REUSE.
9. CONSTRUCT STORMWATER MANAGEMENT SYSTEM IN PARKING LOT AREA. INSTALL INLET FILTER SILT SACKS IN ALL NEW INLETS AS SOON AS THEY ARE CONSTRUCTED.
10. EXTEND HYDRANT LEAD.
11. INSTALL COMMUNICATIONS CONDUIT IN PARKING LOT AREA.
12. WHILE PARKING LOT UTILITY WORK IS IN PROGRESS, DISCONNECT AND REMOVE UTILITIES WHERE INDICATED ON REMOVALS PLAN.
13. WHILE PARKING LOT UTILITY WORK IS IN PROGRESS, DEMOLISH STRUCTURES WHERE INDICATED ON REMOVALS PLAN AND ARCHITECTURAL PLANS.
14. WHILE PARKING LOT UTILITY WORK IS IN PROGRESS, ROUGH GRADE SITE NEAR BUILDINGS.
15. RESTORE PAVEMENT IN PARKING LOT AREA, AS SOON AS POSSIBLE, IN THE FALL OF 2015.
16. RESTORE LANDSCAPE IN PARKING LOT AREA, WITHIN 5 DAYS OF THE FINAL EARTH CHANGE, AS SOON AS POSSIBLE, IN THE FALL OF 2015.
17. INSTALL SANITARY SEWER AND STORM SEWER NEAR BUILDINGS. INSTALL INLET FILTER SILT SACKS IN ALL NEW INLETS AS SOON AS THEY ARE CONSTRUCTED.
18. AFTER STORMWATER SYSTEM IS OPERATIONAL, OBTAIN BUILDING PERMITS AND INSTALL BUILDING FOOTINGS.
19. INSTALL REMAINDER OF SITE UTILITIES NEAR BUILDINGS, AND GRADE SITE.
20. CONSTRUCT BUILDING STRUCTURE AND SHELL.
21. CONSTRUCT BUILDING INTERIOR.
22. IN EARLY SPRING 2016, CONSTRUCT SITE PAVEMENTS, FENCES, AND TRELLISES.
23. PLACE TOPSOIL AND LANDSCAPE SITE. ALL SOILS MUST BE LANDSCAPED (WITH ALL PERMANENT SESC CONTROLS) WITHIN FIVE DAYS OF THE FINAL EARTH CHANGE.
24. CLEAN UP SITE.
25. OPEN FACILITY TO THE PUBLIC ON MEMORIAL DAY, 2016.
26. MAINTAIN ALL SESC DEVICES UNTIL VEGETATION IS FULLY ESTABLISHED, THEN REMOVE TEMPORARY SESC DEVICES.
27. CLOSE OUT SITE PERMITS.

MAINTENANCE REQUIREMENTS

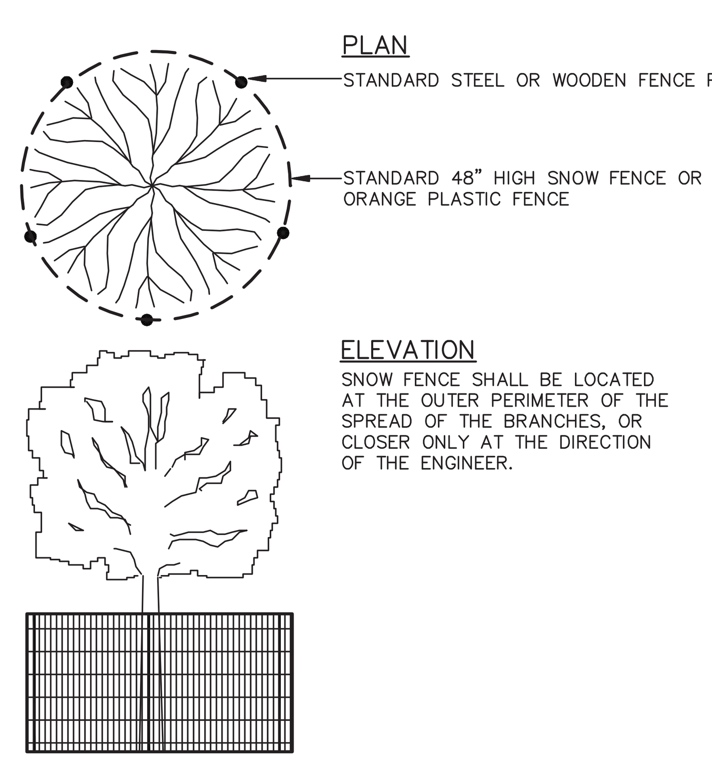
1. ALL SILT FENCE SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. IF AT ANY TIME THE DEPTH OF SILT AND SEDIMENT COMES TO WITHIN 12" OF THE TOP OF ANY SILT FENCE, ALL SILT AND SEDIMENT SHALL BE REMOVED TO ORIGINAL GRADE.

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 EROSION CONTROL DEVICES BE REMOVED. ALSO, ALL STORM SEWERS MUST BE CLEANED OF ALL SEDIMENT.



CONCRETE WASHOUT
NOT TO SCALE



TREE PROTECTION FENCE
NOT TO SCALE

SOIL EROSION AND SEDIMENTATION CONSTRUCTION NOTES:

1. ALL SOIL EROSION CONTROL MEASURES SHALL COMPLY WITH THE CURRENT CITY OF ANN ARBOR ORDINANCES, WASHTENAW COUNTY STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND STATE OF MICHIGAN "SOIL EROSION AND SEDIMENTATION CONTROL ACT" (ACT #347).

2. CONTRACTOR SHALL HAVE A PRE–GRADING MEETING WITH THE CITY OF ANN ARBOR SOIL EROSION CONTROL STAFF PRIOR TO ANY GRADING ACTVITIES.

3. THE SITE REQUIRES AN SESC PERMIT FROM THE CITY OF ANN ARBOR. INSPECTIONS WILL BE PERFORMED BY A CERTIFIED MDEQ STORM WATER OPERATOR AT LEAST ONCE A WEEK AND IMMEDIATELY FOLLOWING EACH PRECIPITATION EVENT.

4. PRIOR TO COMMENCING EARTHMOVING OPERATIONS, THE GRADING CONTRACTOR SHALL INSTALL THE MUD TRACKING MAT, THE SILT FENCE AND TEMPORARY GRAVEL FILTER(S) SHOWN ON THE PLANS.

5. ANY LAWN AREA WHICH WILL HAVE A SLOPE STEEPER OR EQUAL TO 3:1 (3 FT. MEASURED HORIZONTALLY AND 1 FT. MEASURED VERTICALLY) SHALL BE SODDED AND PEGGED OR SEEDED AND MULCHED USING A SOIL EROSION CONTROL FABRIC OR BLANKET. HYDROSEEDING MAY BE USED IN LIEU OF SEED AND MULCH OR SOD WHERE SLOPES ARE FLATTER THAN 3:1.

6. THE ACTUAL LOCATION OF THE MUD TRACKING MATS AND THE GRAVEL FILTERS MAY BE ADJUSTED BY THE CONTRACTOR TO MATCH CONTRACTOR'S OPERATIONS AND FIELD CONDITIONS BUT ONLY IF APPROVED BY THE ENGINEER.

7. ALL DISTURBED AREAS, EVEN WHERE FUTURE PAVEMENT AND BUILDINGS ARE PROPOSED, ARE TO BE REVEGETATED PER COUNTY STANDARDS FOR TEMPORARY SEEDING.

8. BOTH INTERNAL AND EXTERNAL STREETS WILL BE CLEANED OF ANY MUD IMMEDIATELY FOLLOWING EACH MUD TRACKING OCCURRENCE.

9. PERMANENT SOIL EROSION CONTROLS ARE REQUIRED TO BE INSTALLED WITHIN 5 DAYS AFTER FINAL GRADING OR FINAL EARTH CHANGE.

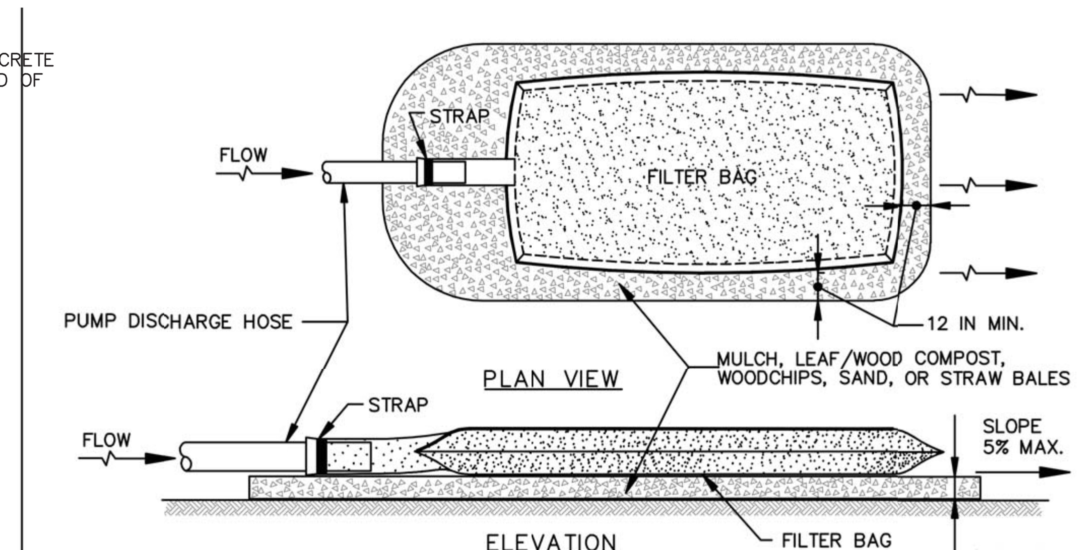
10. DRAINAGE FROM ALL IMPERVIOUS AREAS IS TO BE DIRECTED TO THE ON–SITE STORM WATER MANAGEMENT SYSTEM.

11. THE OBTAINING OF BUILDING PERMITS, AND BUILDING FOOTING CONSTRUCTION MAY NOT BEGIN UNTIL THE SITE STORMWATER MANAGEMENT SYSTEM IS INSTALLED AND OPERATIONAL.

12. THE ESTIMATE COST TO ESTABLISH A GRASS SEED MIX IN DISTURBED AREAS, IF CONSTRUCTION WERE TO BE DISCONTINUED, IS $8,000, FOR TOPSOIL SPREADING, SEEDING, AND WATERING.

13. THE PROJECT WILL INVOLVE APPROXIMATELY 600 CYD OF CUT, 800 OF FILL, AND 1,900 CYD OF UTILITY TRENCH CUT AND BACKFILL. THIS NUMBER WILL VARY BASED UPON CONTRACTOR TECHNIQUES, AND ALL BIDDERS ARE REQUIRED TO PERFORM THEIR OWN EARTHWORK CALCULATIONS BEFORE BIDDING.

14. THE PROJECT'S DISTURBED AREA IS APPROXIMATELY 1.13 ACRES.



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.

2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.

3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.

4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.

5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D–4632
PUNCTURE	150 LB	ASTM D–4833
FLOW RATE	70 $GAL/MIN/FT^2$	ASTM D–4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D–4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D–4355
APPARENT OPENING SIZE (AOS)	0.15–0.18 MM	ASTM D–4751
SEAM STRENGTH	90%	ASTM D–4632

6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

DEWATERING FILTER BAG
NOT TO SCALE

STORMWATER /SESC MAINTENANCE SCHEDULE
RACQUET CLUB OF ANN ARBOR

DURING CONSTRUCTION:

TASK	Paved Areas	Pervious Areas	Riprap & Silt Fence	Storm Pipes	Catch Basins and Manholes	Inlet Grates	Flow Restriction Devices	Chambers & QC Devices	SCHEDULE
Inspect for sediment accumulation	X		X	X	X		X	X	Weekly
Removal of sediment accumulation	X		X	X	X		X	X	As needed* & prior to turnover
Inspect for floatables and debris				X	X	X	X	X	Quarterly
Cleaning for floatables and debris				X	X	X	X	X	Quarterly and at turnover
Inspect for erosion		X	X						Weekly
Reestablish permanent vegetation on eroded slopes		X							As needed* & prior to turnover
Clean drives and parking lots	X								Weekly or as determined by permitting agency
Water disturbed areas to provide dust control	X	X							As needed* & prior to turnover
Inspect structural elements during wet weather and compare to as-built plans (by a professional engineer reporting to the owner)			X	X			X	X	Annually and at turnover
Make adjustments or replacements as determined by wet weather inspection			X	X			X	X	As needed* & prior to turnover
* "as needed" means when sediment has accumulated to a minimum of one foot depth.									**Total Project Phase Cost**

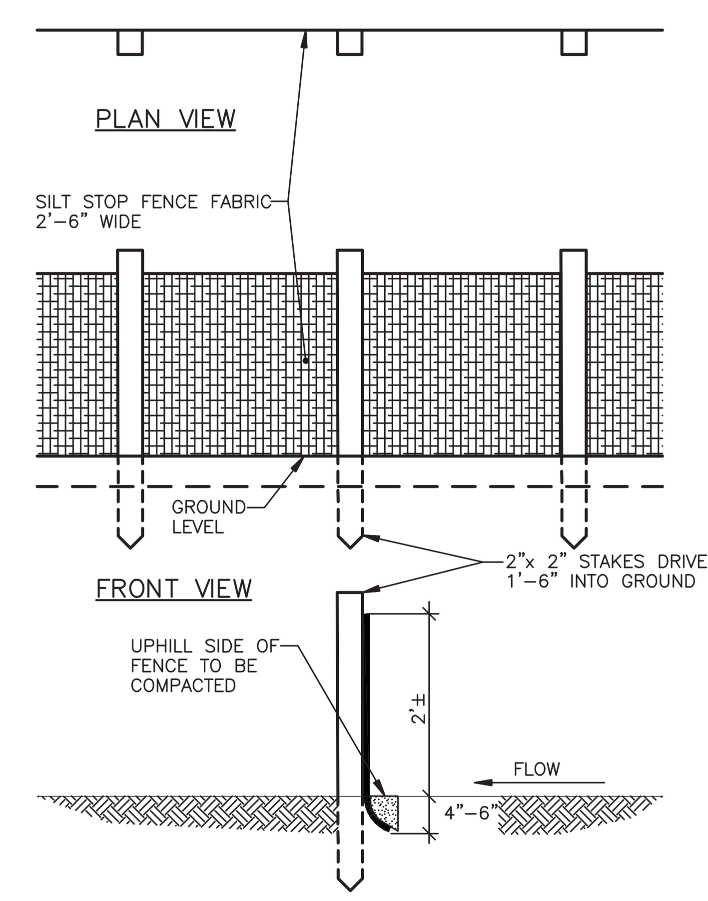
Maintenance of soil erosion and sedimentation during construction to be the repsonsibility of the to-be-selected contractor, and ultimately to the developer.

PERMANENT MAINTENANCE:

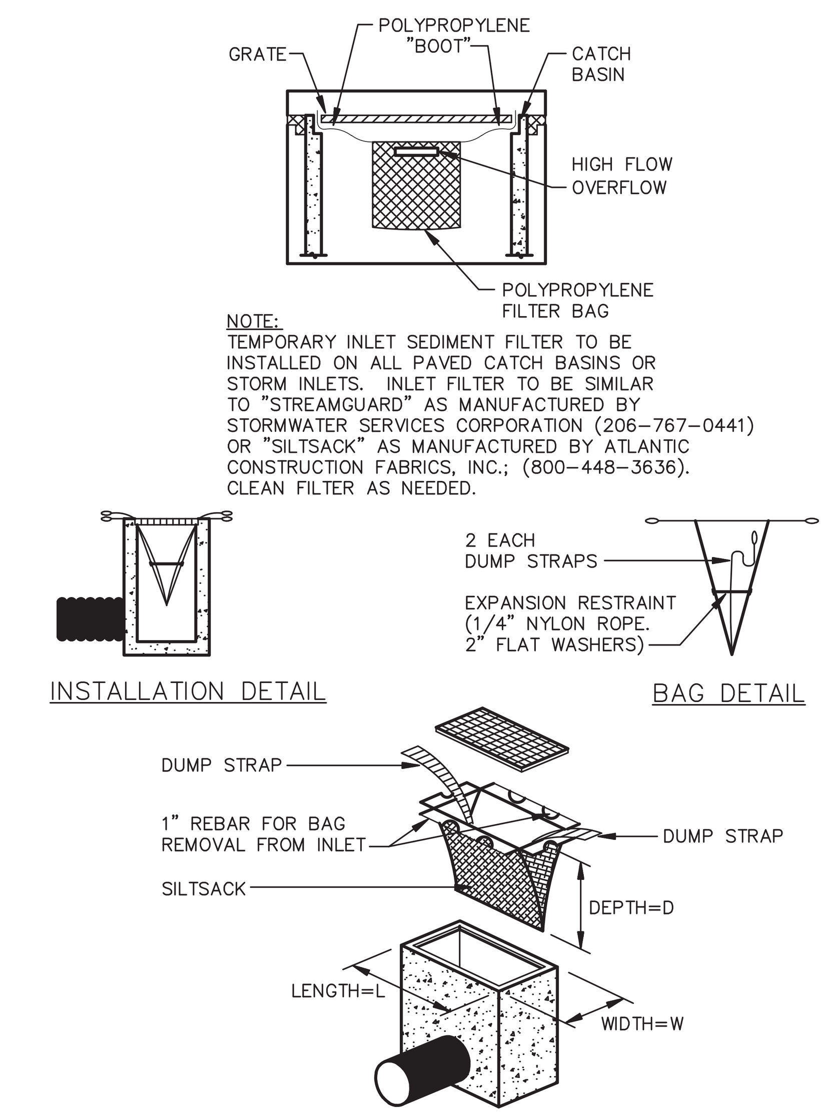
TASK	Paved Areas	Pervious Areas	Riprap	Storm Pipes	Catch Basins and Manholes	Inlet Grates	Flow Restriction Devices	Chambers & QC Devices	SCHEDULE
Inspect for sediment accumulation	X		X	X	X		X	X	Annually
Removal of sediment accumulation	X		X	X	X		X	X	Annually, and as needed*
Inspect for floatables and debris				X	X	X	X	X	Annually
Cleaning for floatables and debris				X	X	X	X	X	Annually, and as needed*
Inspect for erosion		X	X						Every six months
Reestablish permanent vegetation on eroded slopes		X							As needed*
Clean drives and parking lots	X								Annually
Mowing		X							Weekly during growing season
Inspect structural elements during wet weather and compare to as-built plans (by a professional engineer reporting to the owner)			X	X			X	X	Annually
Make adjustments or replacements as determined by wet weather inspection			X	X			X	X	As needed*
Keep records of all inspections and maintenance									Annually
Keep records of all costs for inspections,									Annually
Property owner to review cost-effectiveness of the preventative maintenance program and make necessary adjustments.									Annually
Onwer to hire a professional engineer to carry out emergency inspections upon identification of severe problems.									As needed*
									Total Annual Cost

* "as needed" means when sediment has accumulated to a minimum of one foot depth.

Permanent maintenance of soil erosion and sedimentation control to be the resPonsibility of the Racquet Club of Ann Arbor, and enforced by the City of Ann Arbor.



SILT FENCE 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.

SILT SACK (INLET FILTER)
NO SCALE

MIDWESTERN CONSULTING
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BRENT SCHOMAKER
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RACQUET CLUB OF ANN ARBOR

SITE PLAN

SESC NOTES AND DETAILS

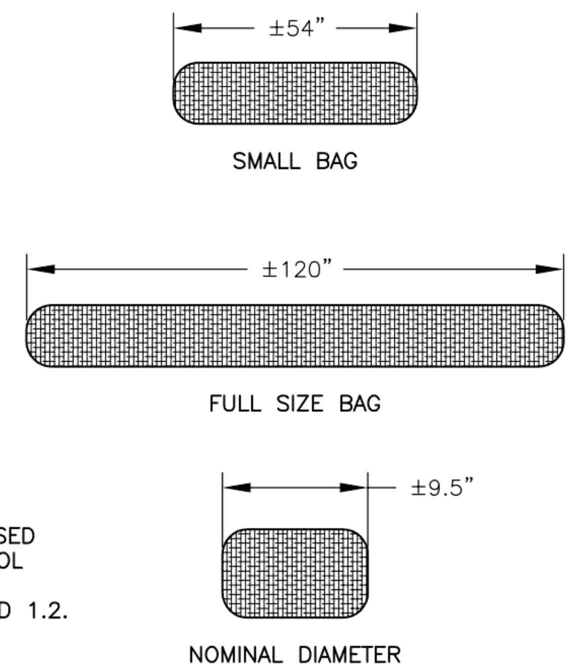
16

DATE: 5/15/2015

CADD: WAJ
ENG: JAM
PM: SWB
TECH:
14058DT1.dwg

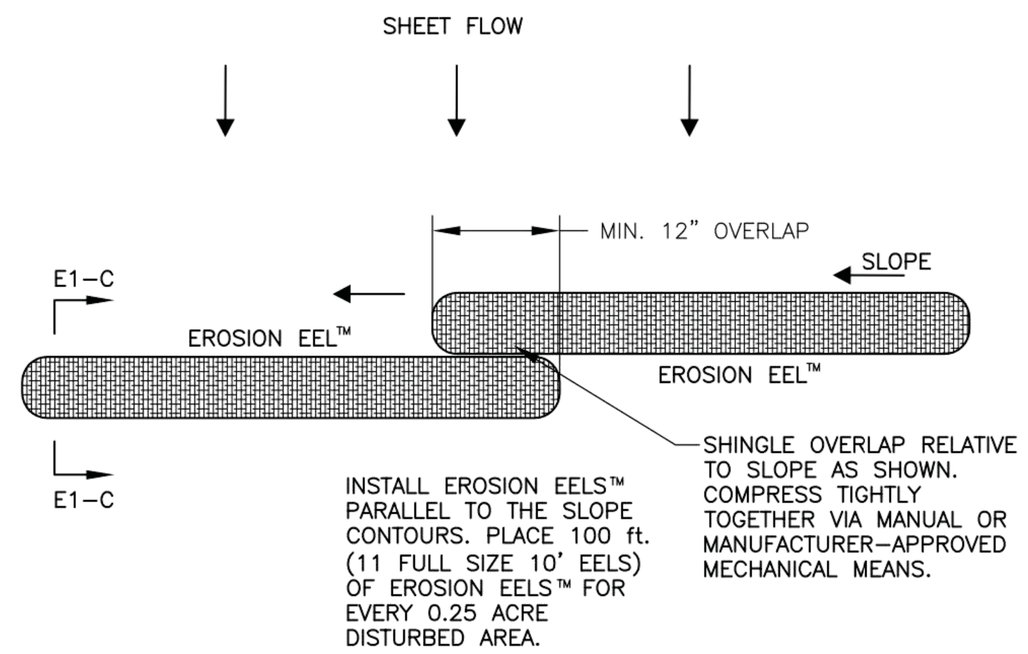
REV. DATE

JOB No. 14058
REVISIONS:

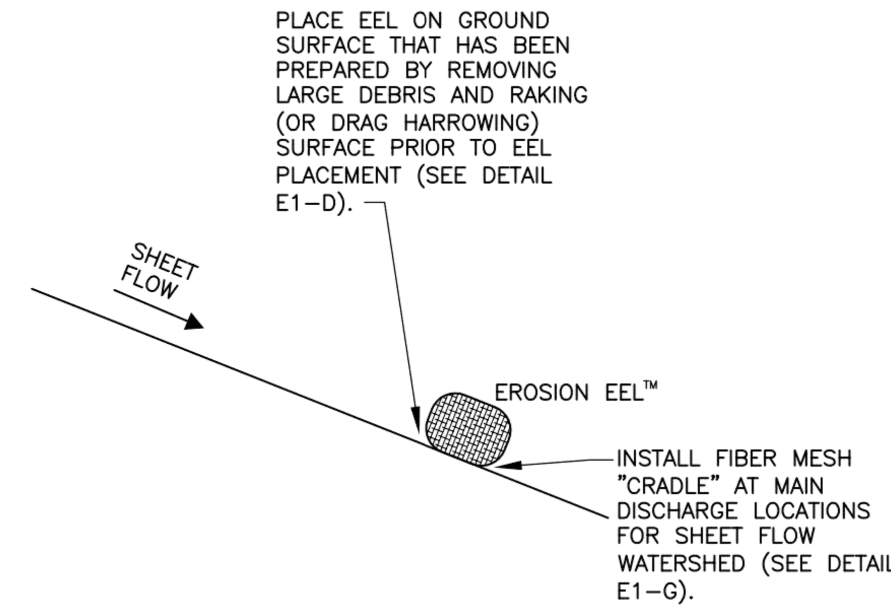


NOTE:
ALL EROSION EELS™ USED FOR PERIMETER CONTROL SHALL USE MIXTURE SPECIFICATIONS 1.1 AND 1.2.

DETAIL E1-A: EROSION EELs™
N.T.S.

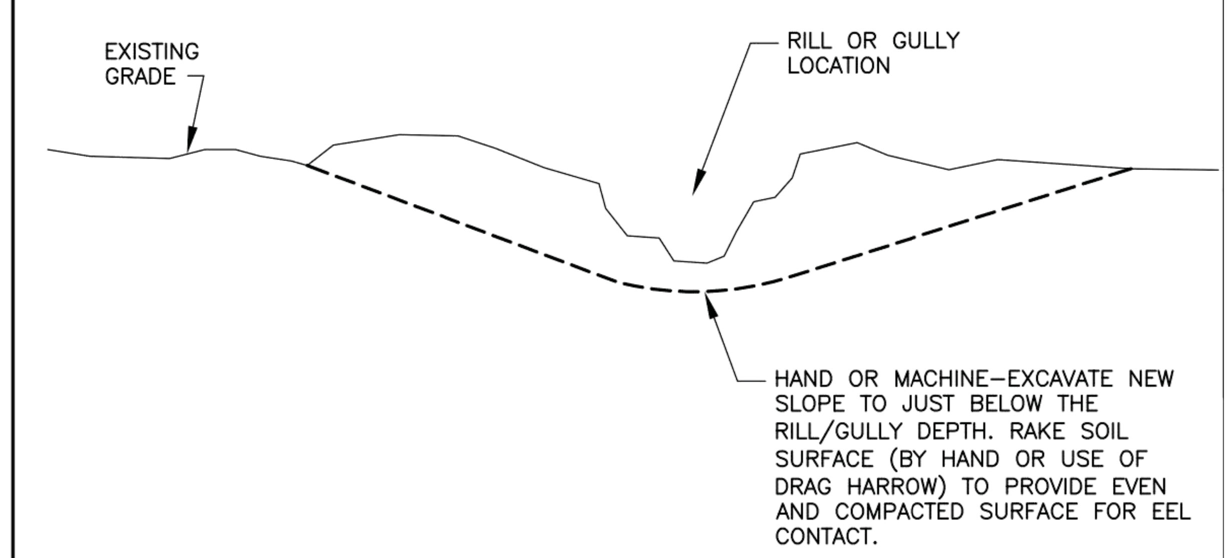


DETAIL E1-B: INTERCEPTING SHEET FLOW
PERPENDICULAR TO FLOW PATH - PLAN VIEW

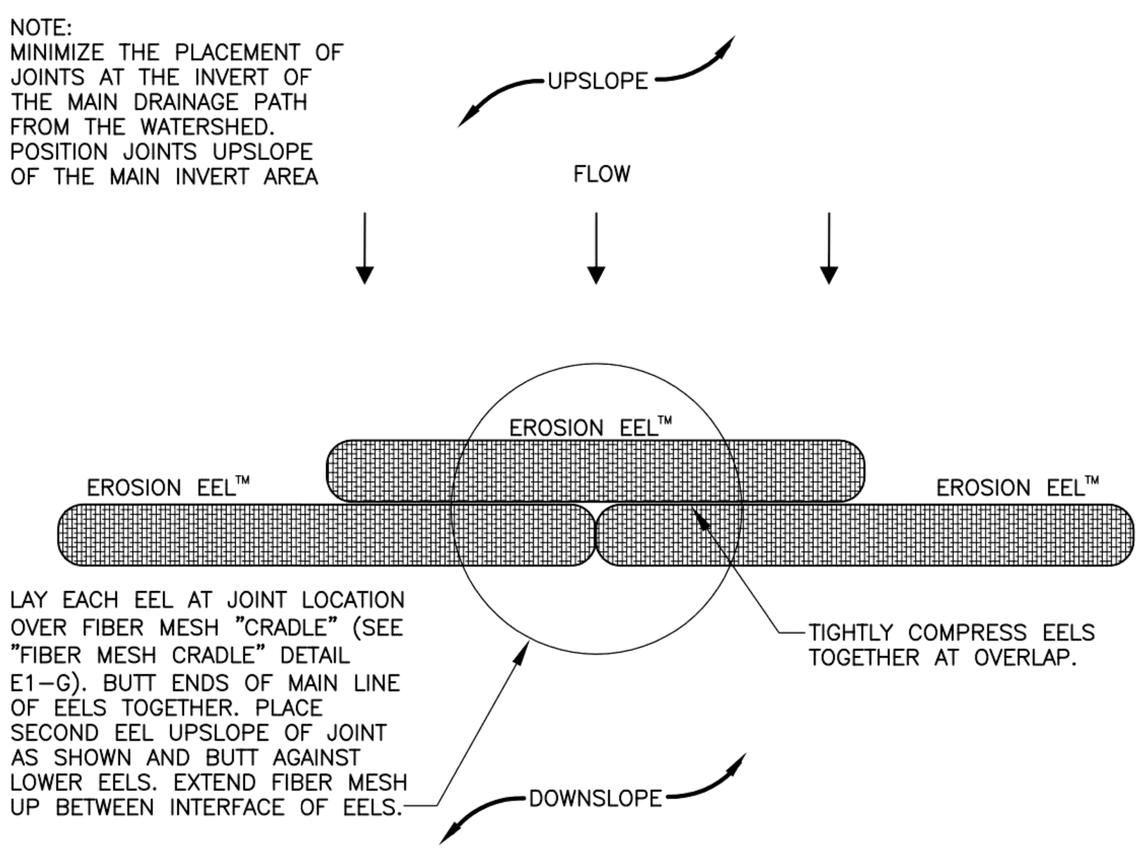


DETAIL E1-C: INTERCEPTING SHEET FLOW
PERPENDICULAR TO FLOW PATH - PLAN VIEW

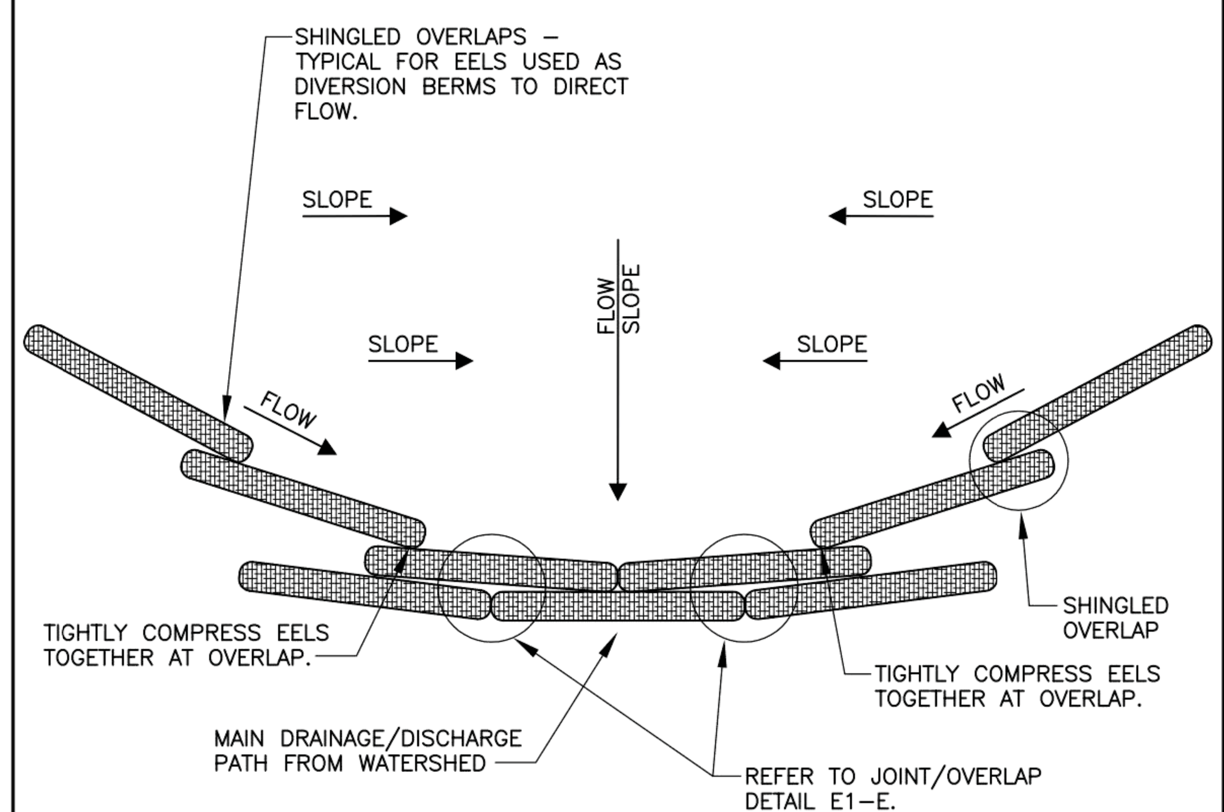
INSTALLATION OVER RILL/GULLEY AREAS



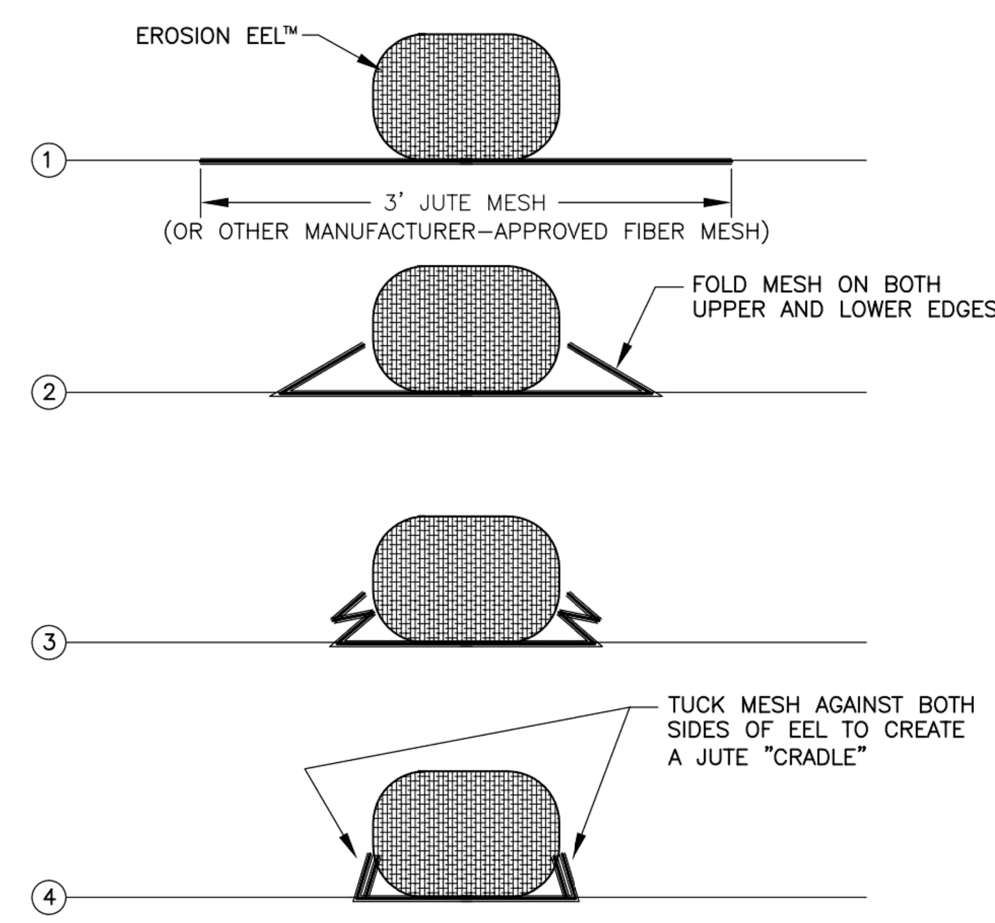
DETAIL E1-D: CROSS-SECTION VIEW
N.T.S.



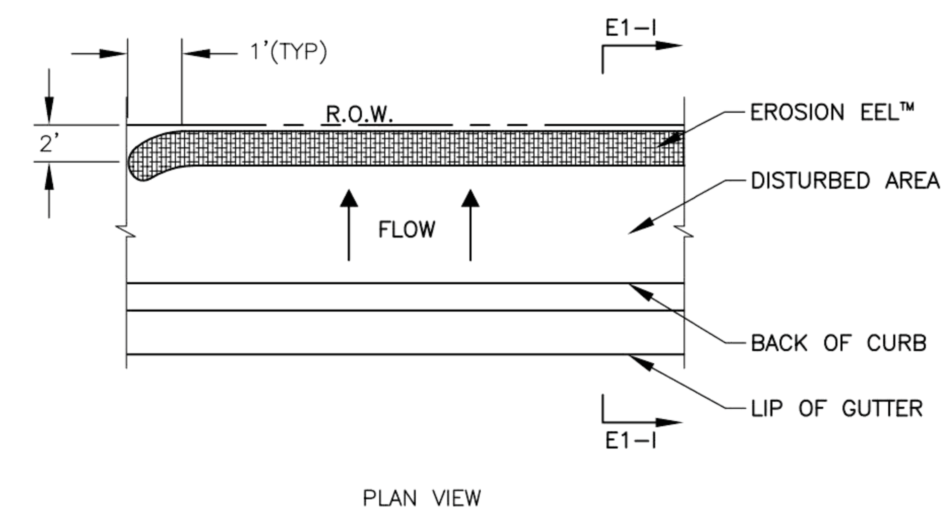
DETAIL E1-E: PLAN VIEW -
OVERLAP/JOINT DETAIL NEAR DISCHARGE POINTS FROM WATERSHED
N.T.S.



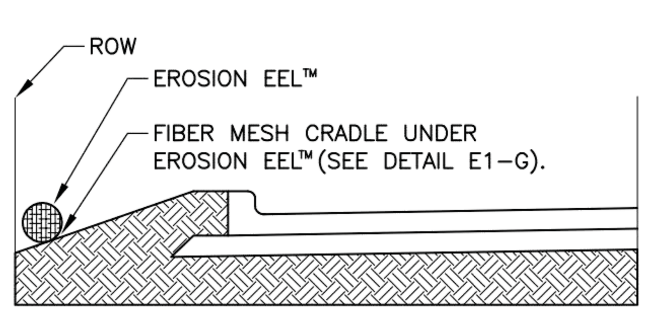
DETAIL E1-F: PLAN VIEW - TYPICAL
ARRANGEMENT OF EELS USED FOR PERIMETER CONTROL
N.T.S.



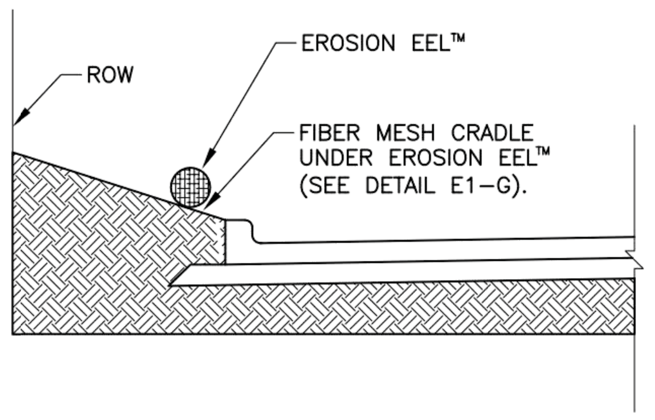
DETAIL E1-G: SECTION - FIBER MESH "CRADLE"
N.T.S.



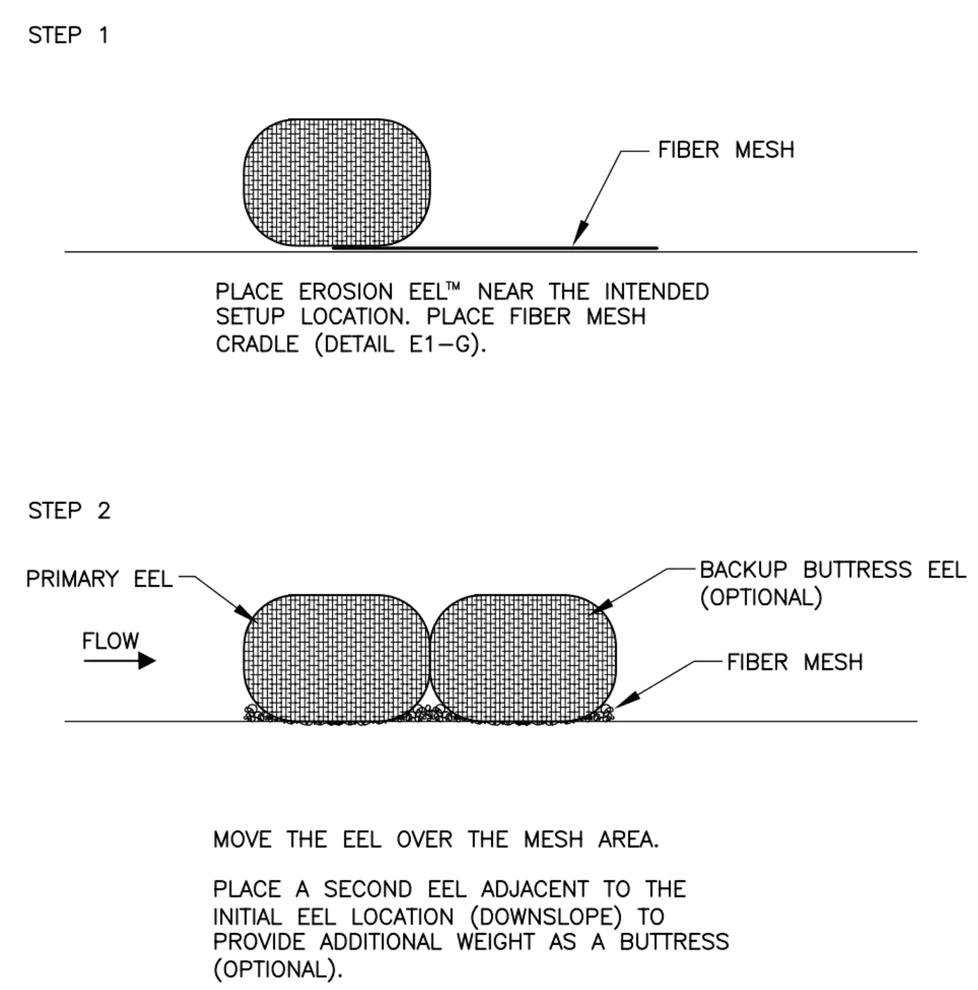
DETAIL E1-H: EROSION EEL™
PLACED AT EDGE OF ROADWAY RIGHT-OF-WAY
N.T.S.



DETAIL E1-I: SECTION
N.T.S.



DETAIL E1-J: SECTION
N.T.S.



DETAIL E1-K: STABILIZING PROCEDURE FOR
EROSION EEL PLACED OVER HARD SURFACE (PAVED, ROCK, ETC.)
N.T.S.

Spacing Recommendations for the Erosion Eel™ for Perimeter Controls and Intercepting Sheet Flow on Slopes

slope(%)	single eel spacing (ft)	*Stacked Dual eel spacing (ft)
0.5	300	N/A
1	200	N/A
2	160	N/A
3	80	N/A
4	50	N/A
5	40	N/A
6	35	N/A
8	30	N/A
10	25	N/A
15	17	N/A
20	12	25
25	7	15
33	N/A	10
50	N/A	6

* DUAL STACK REFERS TO TWO EELS STACKED ATOP ONE ANOTHER AND STABILIZED WITH T-POSTS. SEE DETAIL E2-E ON SHEET E-2.

GENERAL NOTES:

1. EROSION EELS™ USED IN PERIMETER CONTROL APPLICATIONS SHALL HAVE A SPECIFICATION MIXTURE 1.1 OR 1.2.
   a. MIXTURE SPECIFICATION 1.1. A FILTER MIXTURE COMPRISED OF 50% SHREDDED RUBBER AND 50% WOOD CHIP PARTICLES BY VOLUME. THE SHREDDED RUBBER SHALL BE WASHED AND PROCESSED TO REMOVE MOST, IF NOT ALL, METAL COMPONENTS. THE RUBBER SHALL BE DERIVED FROM RECYCLED TIRES AND SHALL BE SHREDDED TO PRODUCE A MAXIMUM PARTICLE SIZE OF +/- 3/4 INCH. THE WOOD CHIPS SHALL BE PRODUCED FROM HARDWOOD TREES AND SHALL CONFIRM TO AASHTO CERTIFICATION SPECIFICATION MP 9-03.
   b. MIXTURE SPECIFICATION 1.2. A FILTER MIXTURE COMPRISED OF 1/3 SHREDDED RUBBER, 1/3 WOOD CHIPS, AND 1/3 RECYCLED SYNTHETIC FIBERS. THE SHREDDED RUBBER SHALL BE WASHED AND PROCESSED TO REMOVE MOST, IF NOT ALL, METAL COMPONENTS. THE RUBBER SHALL BE DERIVED FROM RECYCLED TIRES AND SHALL BE SHREDDED TO PRODUCE A MAXIMUM PARTICLE SIZE OF +/- 3/4 INCH. THE WOOD CHIPS SHALL BE PRODUCED FROM HARDWOOD TREES AND SHALL CONFIRM TO AASHTO CERTIFICATION SPECIFICATION MP 9-03. THE SYNTHETIC FIBERS SHALL BE PRODUCED FROM RECYCLED, MANUFACTURED MATERIALS, SUCH AS, BUT NOT LIMITED TO, PRE-CONSUMER SCRAP CARPET, TIRE CHORD, AND TIRE FIBER MATERIALS.
2. EROSION EELS™ SHALL BE MANUFACTURED FROM A WOVEN GEOTEXTILE COVERING WITH INTERIOR FILTER MATERIALS SUCH AS 100% SHREDDED RUBBER (MIXTURE SPECIFICATION 1.0, 50% SHREDDED RUBBER/50% AASHTO-CERTIFIED WOOD CHIPS (MIXTURE SPECIFICATION 1.1), OR 1/3 SHREDDED RUBBER:1/3 AASHTO-CERTIFIED WOOD CHIPS:1/3 RECYCLED SYNTHETIC FIBERS (MIXTURE SPECIFICATION 1.2).
3. LENGTHS OF EROSION EELS™ SHALL BE EITHER A NOMINAL +/-10 FT. OR +/- 4.5 FT. NOMINAL DIAMETER SHALL BE +/-9.5 INCHES.
4. EROSION EELS™ CAN BE PLACED AT THE TOP, ON THE FACE, OR AT THE TOE OF SLOPES TO INTERCEPT RUNOFF, REDUCE FLOW VELOCITY, RELEASE THE RUNOFF AS SHEET FLOW AND PROVIDE REMOVAL OF SEDIMENT FROM THE RUNOFF.
5. EROSION EELS™ SHALL BE INSTALLED ALONG THE GROUND CONTOUR, AT THE TOE OF SLOPES, AT AN ANGLE TO THE CONTOUR TO DIRECT FLOW AS A DIVERSION BERM, AROUND INLET STRUCTURES, IN A DITCH AS A CHECK DAM TO HELP REDUCE SUSPENDED SOLIDS LOADING AND RETAIN SEDIMENT, OR AS A GENERAL FILTER FOR ANY DISTURBED SOIL AREA.
6. NO TRENCHING IS REQUIRED FOR INSTALLATION OF EROSION EELS™
7. PREPARE BED FOR EEL INSTALLATION BY REMOVING ANY LARGE DEBRIS INCLUDING ROCKS, SOIL CLODS, AND WOODY VEGETATION. EROSION EELS™ CAN ALSO BE PLACED OVER PAVED SURFACES INCLUDING CONCRETE AND ASPHALT WITH NO SURFACE PREPARATION REQUIRED.
8. RAKE BED AREA WITH A HAND RAKE OR BY DRAG HARROW.
9. DO NOT PLACE EEL DIRECTLY OVER RILL AND GULLIES UNTIL AREA HAS BEEN HAND-EXCAVATED AND RAKED TO PROVIDE A LEVEL BEDDING SURFACE. ALL SURFACES SHALL BE UNIFORMLY COMPACTED FOR MAXIMUM SEATING OF EELS IN PLACE.
10. FOR LOCATIONS WHERE EELS WILL BE PLACED IN CONCENTRATED FLOWS (SUCH AS CHECK DAMS, INLET PROTECTION) AND FOR PERIMETER CONTROLS AT PRIMARY DISCHARGE LOCATIONS, BED THE EELS IN A JUTE MESH CRADLE PER THE DETAILED DRAWINGS.
11. FOR DITCH APPLICATIONS, THE MAXIMUM DRAINAGE AREA SHALL BE 10 ACRES.
12. IF MORE THAN ONE EROSION EEL™ IS PLACED IN A ROW, THE EELS SHALL BE OVERLAPPED A MINIMUM OF 12 INCHES TO PREVENT FLOW AND SEDIMENT FROM PASSING THROUGH THE FIELD JOINT. COMPRESS THE TWO EELS OF THE OVERLAP TIGHTLY TOGETHER EITHER BY HAND OR MANUFACTURER-APPROVED MECHANIZED MEANS.
13. WHEN USED IN DITCHES AS A CHECK DAM, EROSION EELS™ SHALL BE INSTALLED PER MANUFACTURER'S DETAILS.
14. FOR CHECK DAM APPLICATIONS, EROSION EELS™ SHALL BE PLACED PERPENDICULAR TO THE FLOW OF THE WATER. EROSION EELS™ SHALL CONTINUE UP THE SIDES SLOPES A MINIMUM OF 3 FEET ABOVE THE DESIGN FLOW DEPTH.
15. EROSION EELS™ SHALL REMAIN IN PLACE UNTIL FULLY ESTABLISHED VEGETATION HAS COMPLETELY DEVELOPED OR UNTIL THE STORAGE CAPACITY/FUNCTIONAL LIFE OF THE EEL HAS BEEN EXHAUSTED (REQUIRING REPLACEMENT WITH NEW EELS).
16. ANCHORING POSTS FOR CHECK DAM APPLICATIONS SHALL HAVE A MINIMUM WEIGHT OF 1.25 LBS/FT STEEL T-POSTS (5 TO 7 FT. LENGTHS) ROLLED FROM HIGH CARBON STEEL. POSTS SHOULD BE HOT-DIP GALVANIZED OR COATED WITH A WEATHER-RESISTANT PAINT FOR STEEL APPLICATION. POSTS SHOULD BE EQUIPPED WITH A METAL ANCHOR PLATE. INSTALL PER DETAILS ON THIS SHEET.
17. PLACE T-POSTS THROUGH HANDLE OF BAGS. DO NOT DRIVE POSTS THROUGH EROSION EELS™. T-POSTS ARE TO BE EMBEDDED A MINIMUM OF 2 FT INTO GROUND.

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ANN ARBOR, MI 48104
BRENT SCHOMAKER
(734) 216-0579

RACQUET CLUB OF ANN ARBOR
SITE PLAN
SESC EROSION EEL DETAIL

17

DATE: 5/15/2015
SHEET 17 OF 22
CADD: WAJ
ENG: JAM
PM: SWB
TECH:
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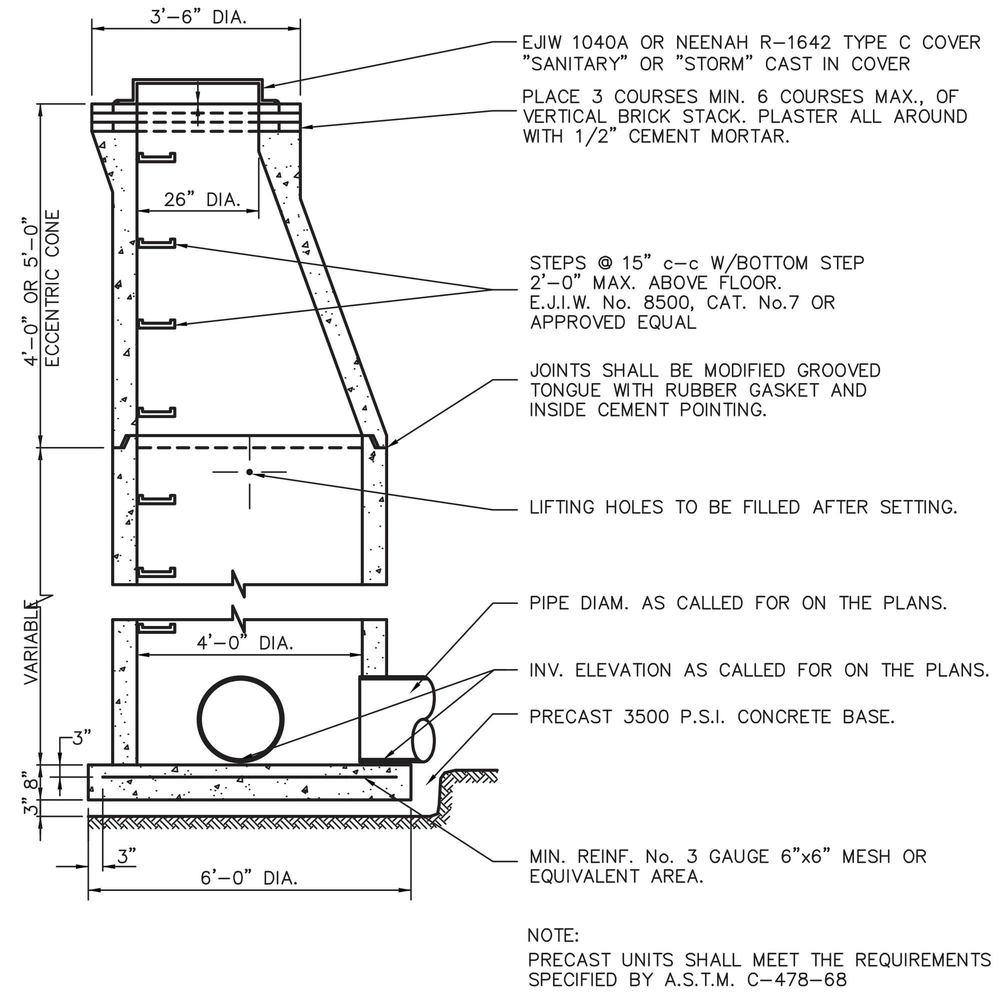
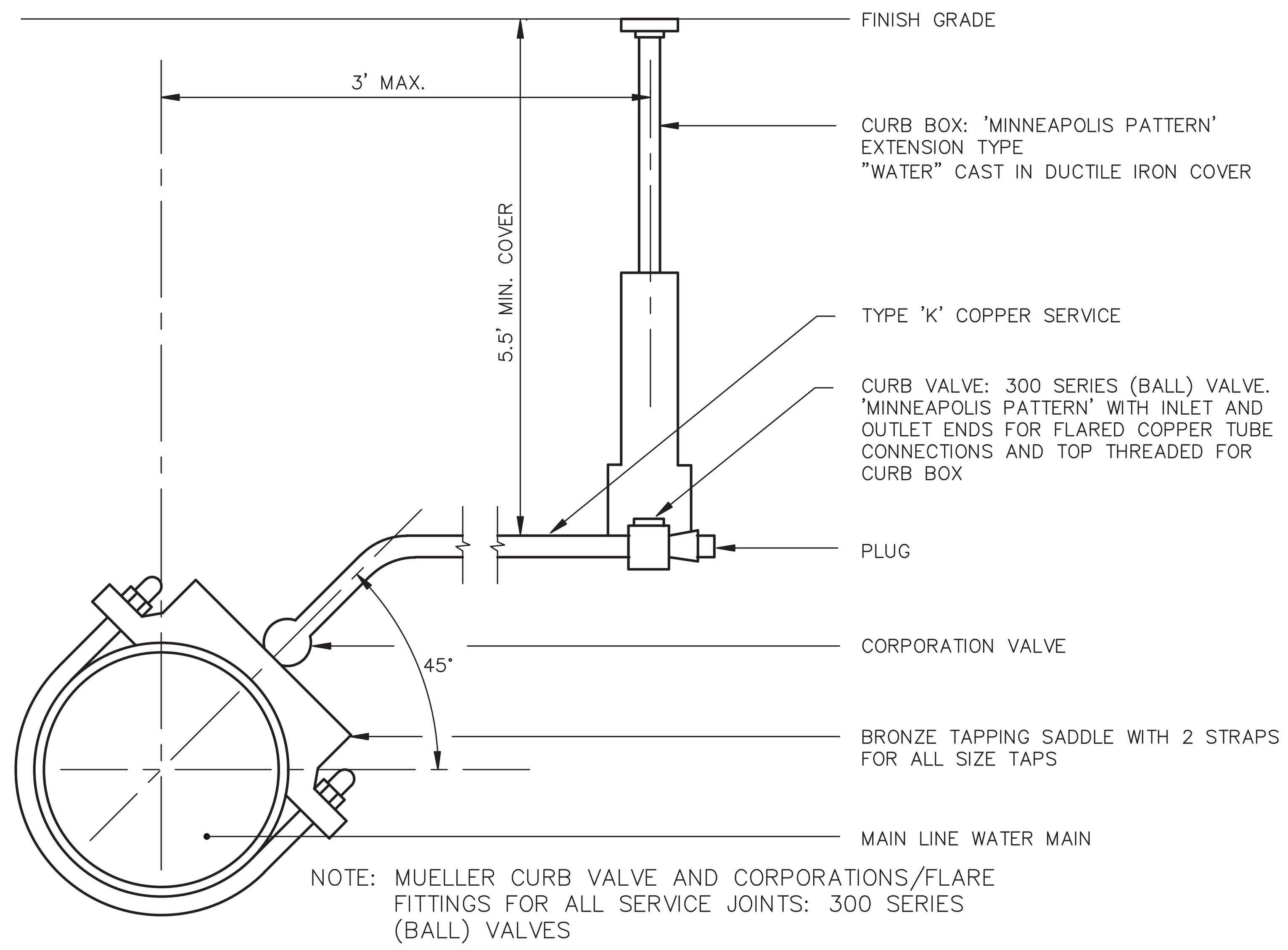
REV. DATE
JOB No. 14058
REVISIONS:

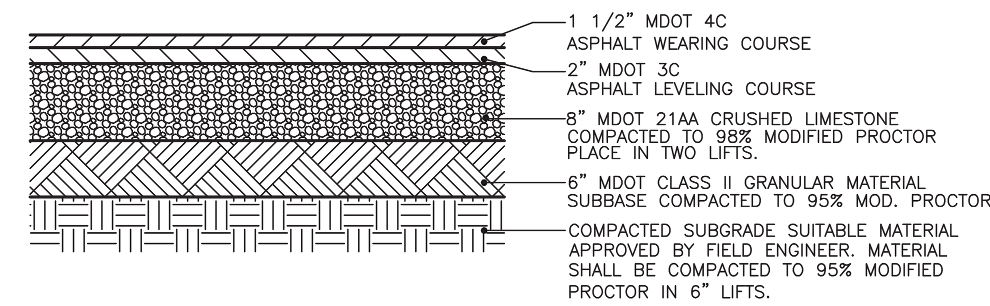


SANITARY AND STORM MANHOLE
NOT TO SCALE

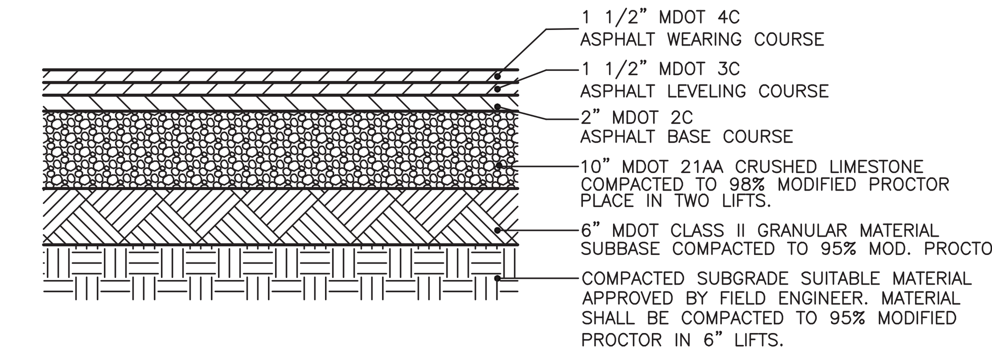


NOTE: MUELLER CURB VALVE AND CORPORATIONS/FLARE FITTINGS FOR ALL SERVICE JOINTS: 300 SERIES (BALL) VALVES

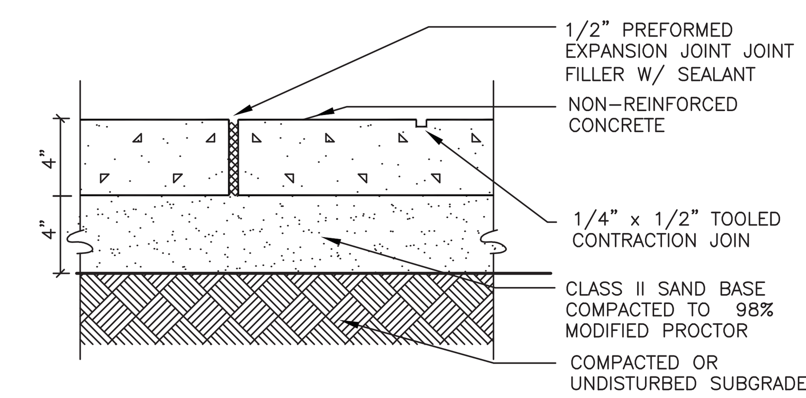
WATER SERVICE CONNECTION
NOT TO SCALE



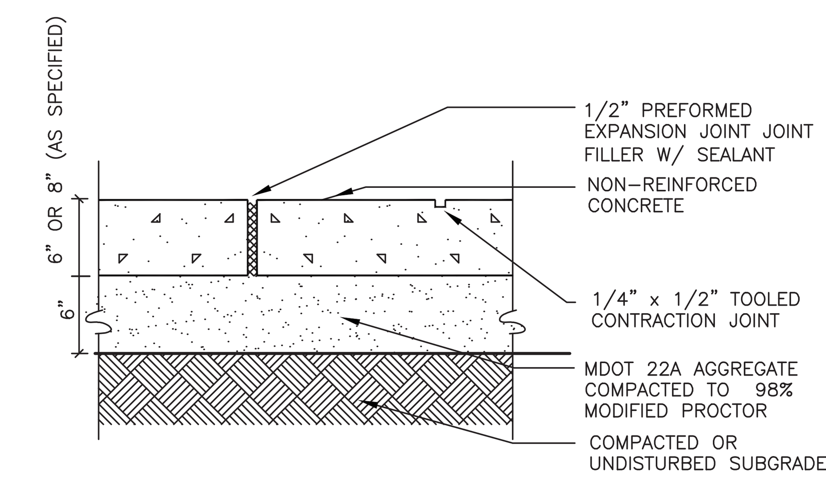
3.5" ASPHALT PAVEMENT SECTION (SITE)
NO SCALE



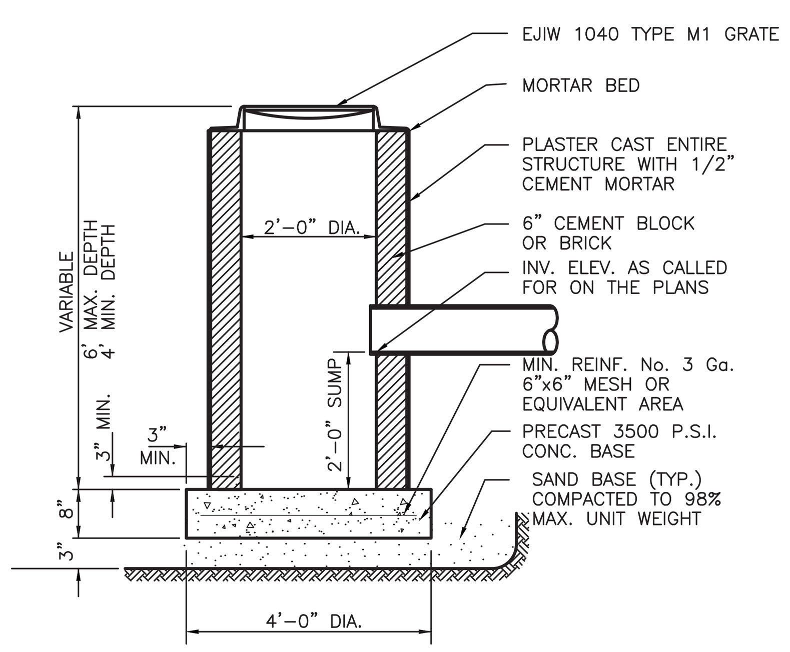
3.5" ASPHALT PAVEMENT SECTION (ROAD)
NO SCALE



4" CONCRETE WALK DETAIL
NOT TO SCALE

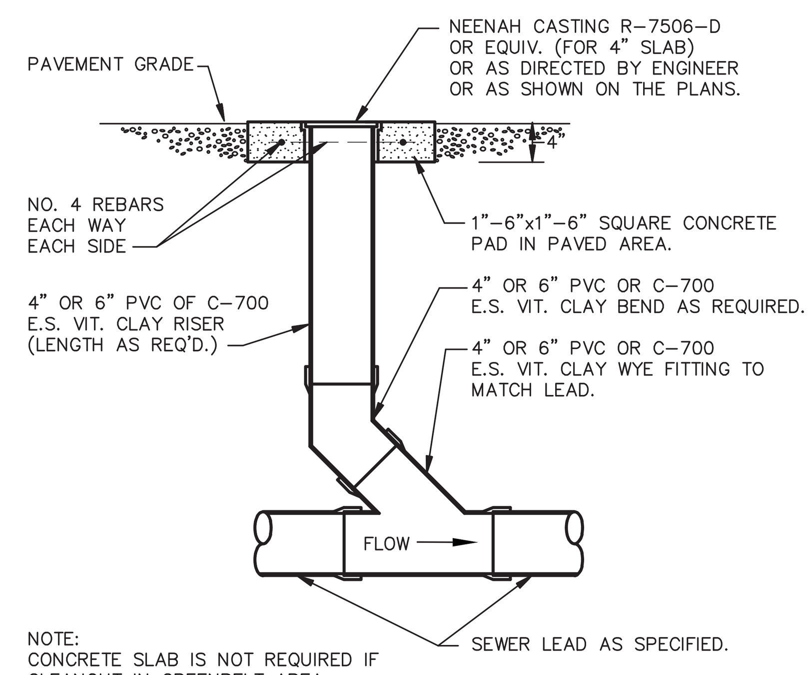


6" OR 8" CONCRETE WALK DETAIL
NOT TO SCALE



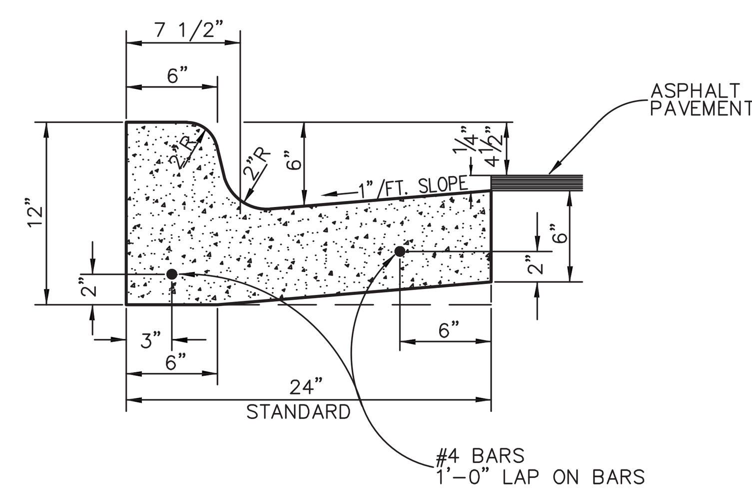
CROSS SECTION

2' DIA. INLET W/ SUMP
NOT TO SCALE



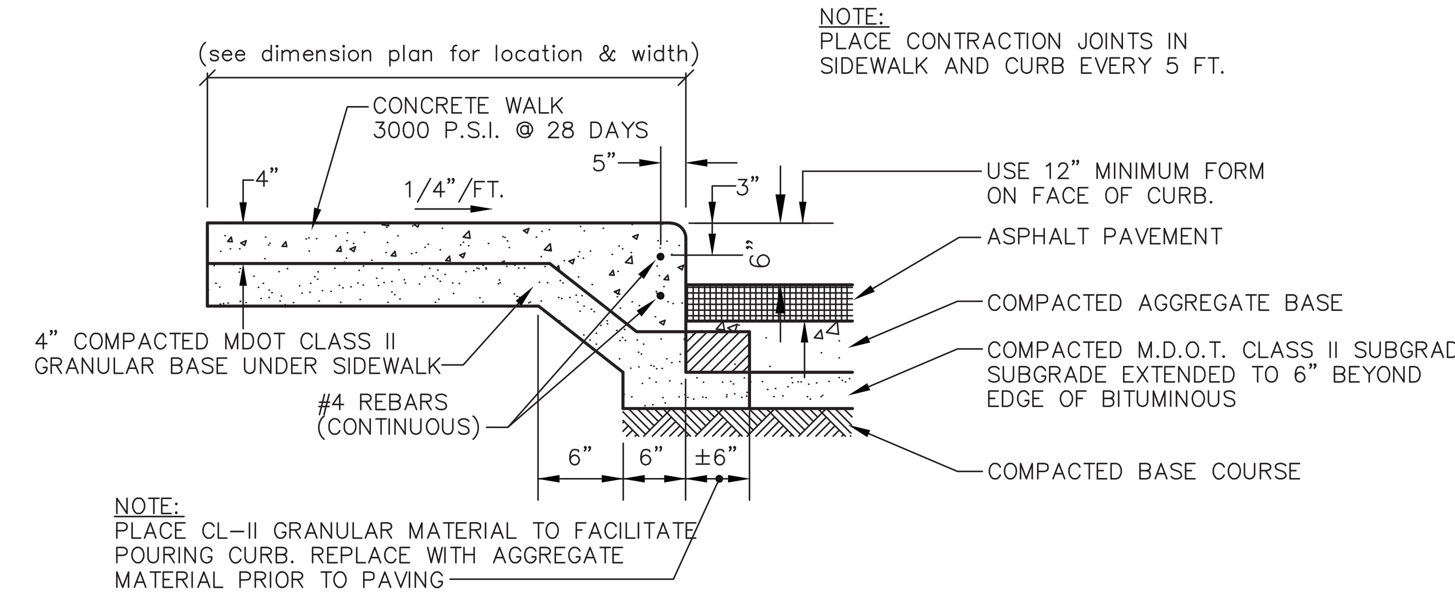
NOTE:
CONCRETE SLAB IS NOT REQUIRED IF CLEANOUT IN GREENBELT AREA.

SANITARY SEWER LEAD CLEANOUT
NOT TO SCALE



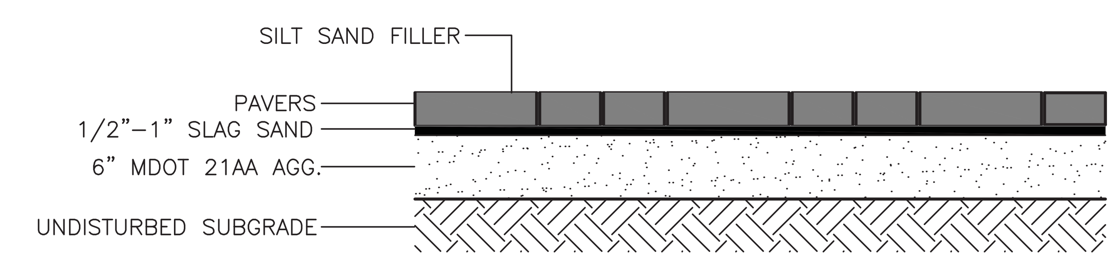
24" ROADWAY CURB AND GUTTER
(ANN ARBOR STANDARD BARRIER CURB & GUTTER)
NOT TO SCALE

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

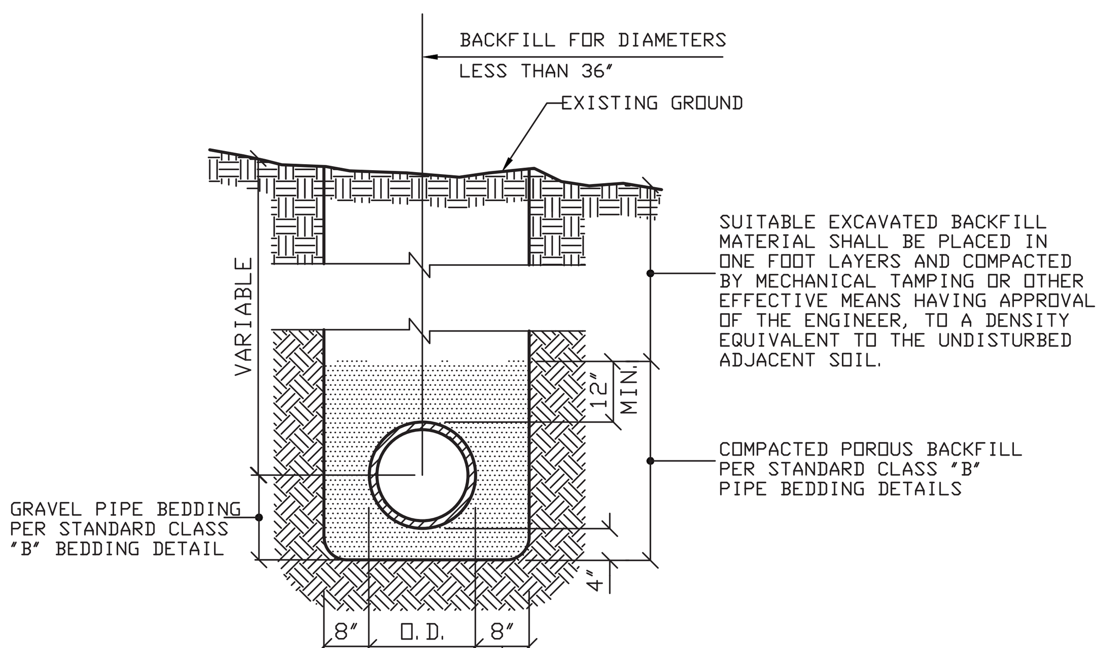


NOTE:
PLACE CL-II GRANULAR MATERIAL TO FACILITATE POURING CURB. REPLACE WITH AGGREGATE MATERIAL PRIOR TO PAVING

TYPICAL INTEGRAL WALK & CURB
NOT TO SCALE

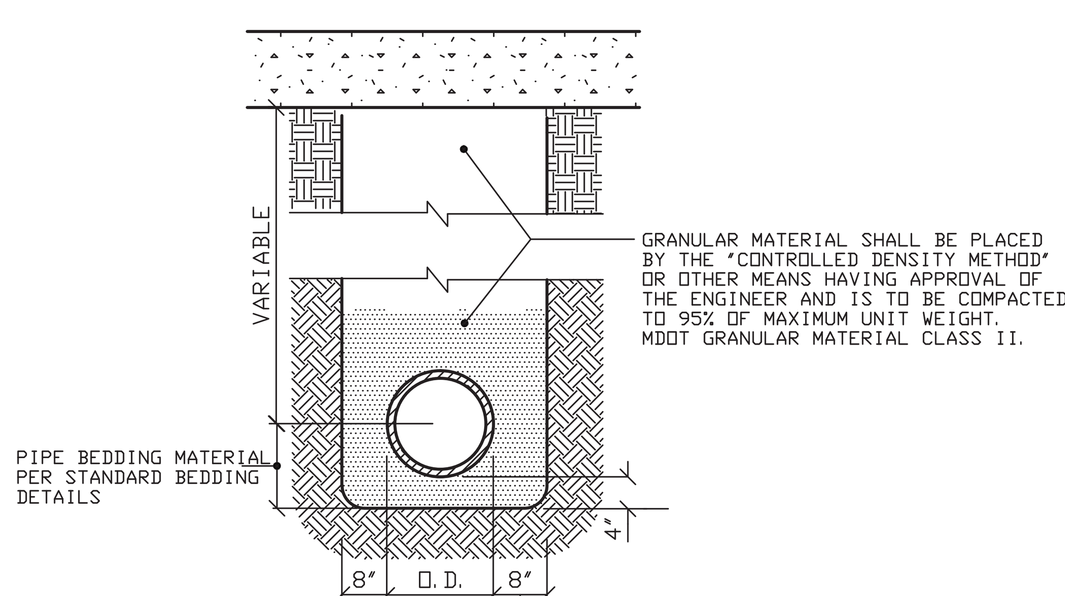


UNIT PAVER DETAIL
NOT TO SCALE



NOTE:
TRENCH "A" SHALL BE USED UNDER CONDITIONS OTHER THAN SPECIFIED FOR TRENCH "B"

TRENCH "A"



NOTE:
TRENCH "B" SHALL BE USED UNDER ROAD SURFACES, PAVEMENT, SIDEWALK, CURB, AGGREGATE & PAVED DRIVES AND WHERE THE EDGE OF TRENCH IS WITHIN 3 FEET OF THE PAVEMENT

TRENCH "B"

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RACQUET CLUB OF ANN ARBOR
SITE PLAN
UTILITY AND PAVING DETAILS

18

DATE: 5/15/2015
SHEET 18 OF 22
CADD: WAJ
ENG: JAM
P.M.: SWB
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REV. DATE

JOB No. 14058
REVISIONS:

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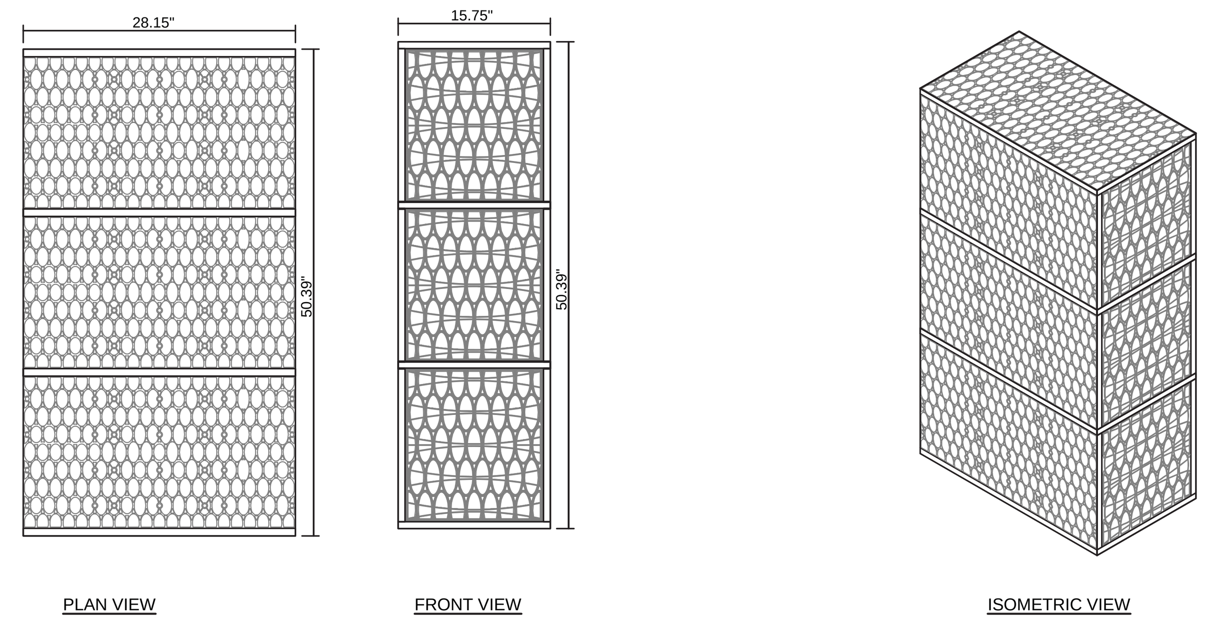
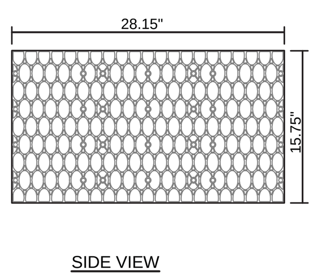




MODULE DATA

GEOMETRY: LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 50.39 IN. (1280 MM)
STORAGE VOLUME = 12.28 CF (348 L)
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

LOAD RATING: 40 PSI, (MODULE ONLY)
HS25, (WITH ACF COVER SYSTEM)

MATERIAL: 85% RECYCLED POLYPROPYLENE

R-TANK^{HD} - TRIPLE MODULE

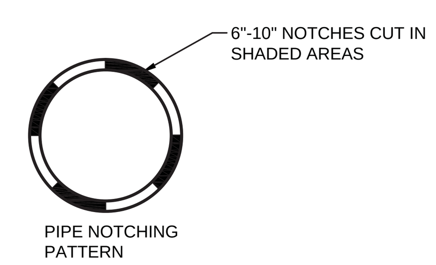
MAINTENANCE PORT

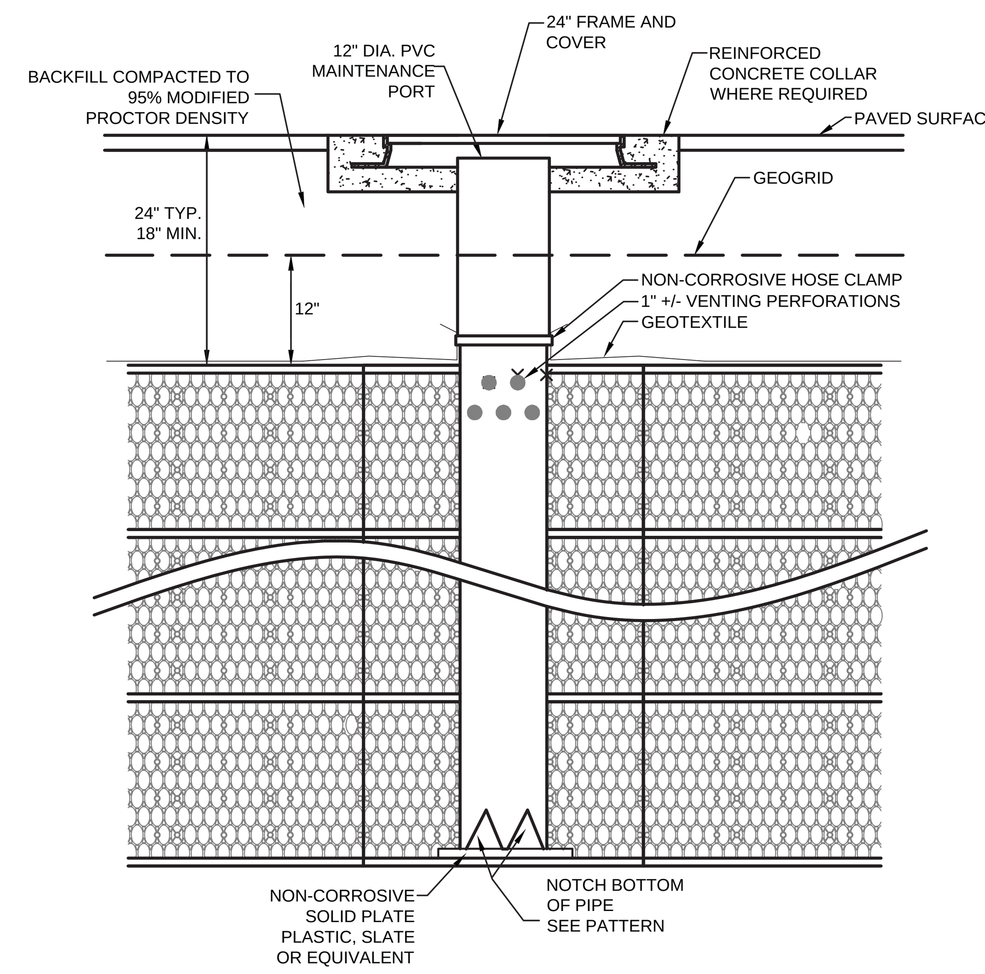
THIS PORT IS USED TO PUMP WATER INTO THE SYSTEM AND RE-SUSPEND ACCUMULATED SEDIMENT SO THAT IT MAY BE PUMPED OUT. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.

PLACE MAINTENANCE PORT AS INDICATED ON THE PLANS, AND TO MEET THE FOLLOWING CONDITIONS:

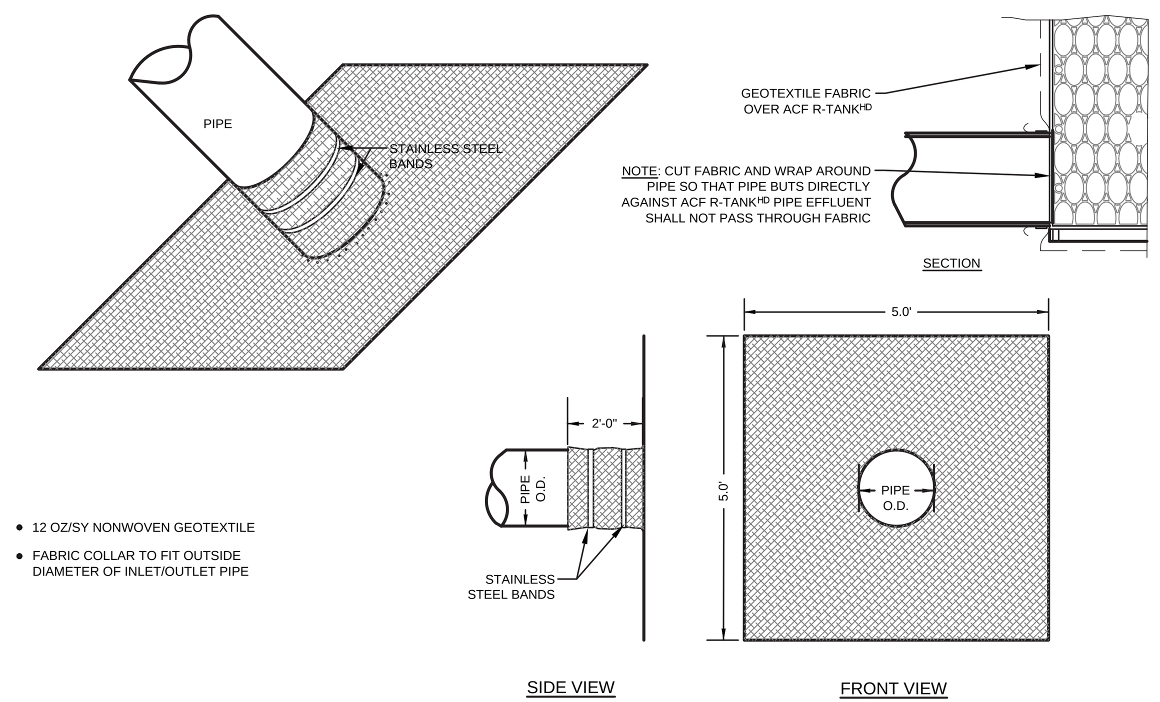
1. ONE MAINTENANCE PORT WITHIN 10 FEET OF EVERY INLET AND OUTLET PIPE.

2. ENSURE THE FULL RTANK SYSTEM IS COVERED WITHIN A 25-FOOT RADIUS DRAWN AROUND EACH MAINTENANCE PORT.





R-TANK^{HD} TYPICAL MAINTENANCE PORT



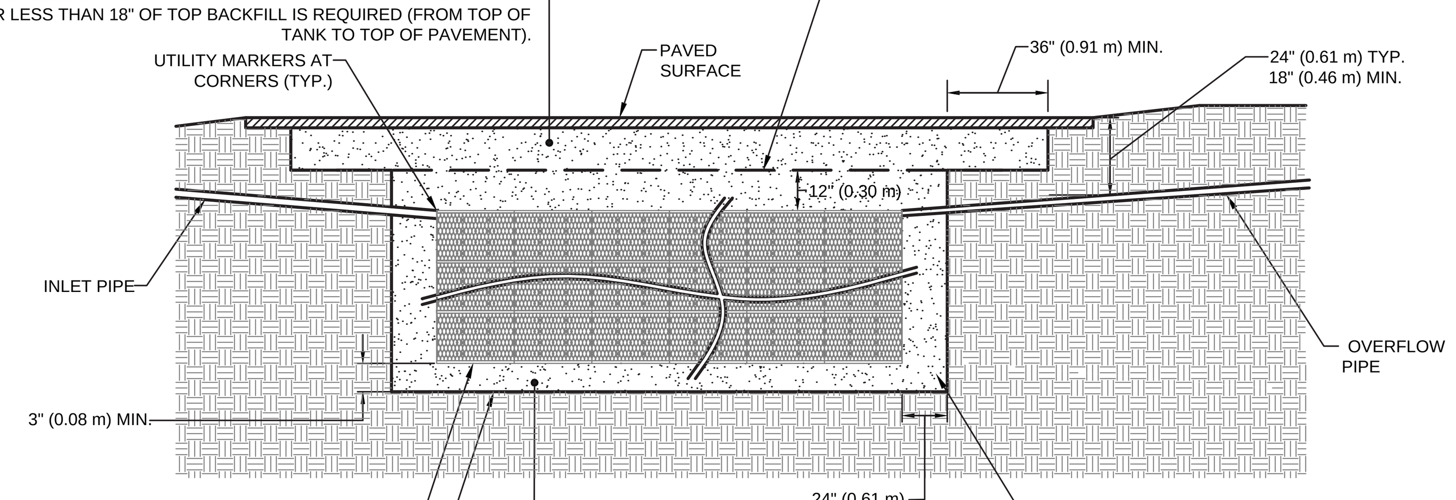
- 12 OZ/SY NONWOVEN GEOTEXTILE
- FABRIC COLLAR TO FIT OUTSIDE DIAMETER OF INLET/OUTLET PIPE

FABRIC PIPE BOOT FOR R-TANK^{HD}

NOTES:
- CONTRACTOR MAY ALSO SUBMIT ALTERNATES FOR APPROVAL BY ENGINEER.
- ALL STORAGE VAULTS MUST BE CONSTRUCTED IN FULL ACCORDANCE WITH MANUFACTURER INSTRUCTIONS AND BEST PRACTICES.
- SHOP DRAWINGS MUST BE SUBMITTED FOR ENGINEER APPROVAL PRIOR TO SITE DELIVERY OF PRODUCT.
- SEE PROFILE ON SHEET 11 FOR SITE-SPECIFIC INSTALLATION REQUIREMENTS AND DIMENSIONS

TOP BACKFILL: 18" MINIMUM AND 24" RECOMMENDED. FIRST 12" MUST FREE DRAINING BACKFILL (SPEC SECTION 2.03B): STONE <1.5" OR SOIL (USCS CLASS GW, GP, SW OR SP). ADDITIONAL FILL MAY BE STRUCTURAL FILL (SPEC SECTION 2.03C): STONE OR SOIL (USCS CLASS SM, SP, SW, GM, GP OR GW) WITH MAX CLAY CONTENT<10%, MAX 25% PASSING NO. 200 SIEVE, AND MAX PLASTICITY INDEX OF 4. A MIN. 12" COVER MUST BE MAINTAINED BETWEEN BACKFILL EQUIPMENT AND THE TOP OF THE R-TANK™ SYSTEM AT ALL TIMES. FOR BEST RESULTS, PUSH OUT 14" TO MAINTAIN A MIN. 12" COVER. REFER TO THE R-TANK^{HD} INSTALLATION GUIDE FOR LISTING OF ACCEPTABLE EQUIPMENT. TOTAL HEIGHT OF TOP BACKFILL SHOULD NOT EXCEED 10'.CONTACT ACF ENVIRONMENTAL IF MORE THAN 10' OR LESS THAN 18" OF TOP BACKFILL IS REQUIRED (FROM TOP OF TANK TO TOP OF PAVEMENT).

GEOGRID (TENSAR BX-1200 OR EQUAL) PLACED 12" ABOVE THE R-TANK^{HD} SYSTEM. OVERLAP ADJACENT PANELS BY 18" MIN. GEOGRID SHOULD EXTEND 3' BEYOND THE EXCAVATION FOOTPRINT.



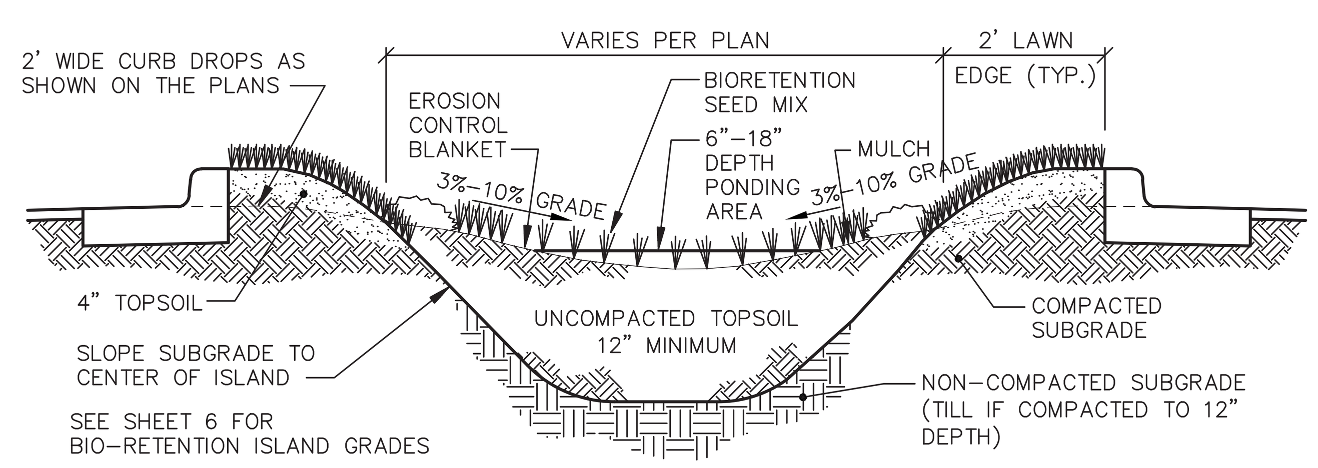
R-TANK^{HD} UNITS WRAPPED IN 8 OZ. NONWOVEN GEOTEXTILE (OR EQUAL) LOAD RATING: 40 PSI (MODULE ONLY)

EXCAVATION LINE (AND IMPERMEABLE LINER IF REQUIRED)

BASE: 3" MIN. FREE DRAINING BACKFILL (SPEC SECTION 2.03B) COMPACTED TO 95% STANDARD PROCTOR DENSITY IS REQUIRED TO PROVIDE A LEVEL BASE SURFACE. MUST BE SMOOTH, FREE OF LUMPS OR DEBRIS, AND EXTEND 2' BEYOND R-TANK^{HD} FOOTPRINT. A BEARING CAPACITY OF 2,000 PSF MUST BE ACHIEVED PRIOR TO INSTALLING R-TANK^{HD}. NATIVE SOILS MAY BE ACCEPTABLE IF DETERMINED TO BE STABLE BY OWNER'S ENGINEER.

SIDE BACKFILL: 24" MIN. OF FREE DRAINING BACKFILL (SPEC SECTION 2.03B): STONE <1.5" OR SOIL (USCS CLASS GW, GP, SW OR SP). MUST BE FREE FROM LUMPS, DEBRIS AND OTHER SHARP OBJECTS. SPREAD EVENLY TO PREVENT R-TANK^{HD} MOVEMENT. COMPACT SIDE BACKFILL WITH POWERED MECHANICAL COMPACTOR IN 12" LIFTS.

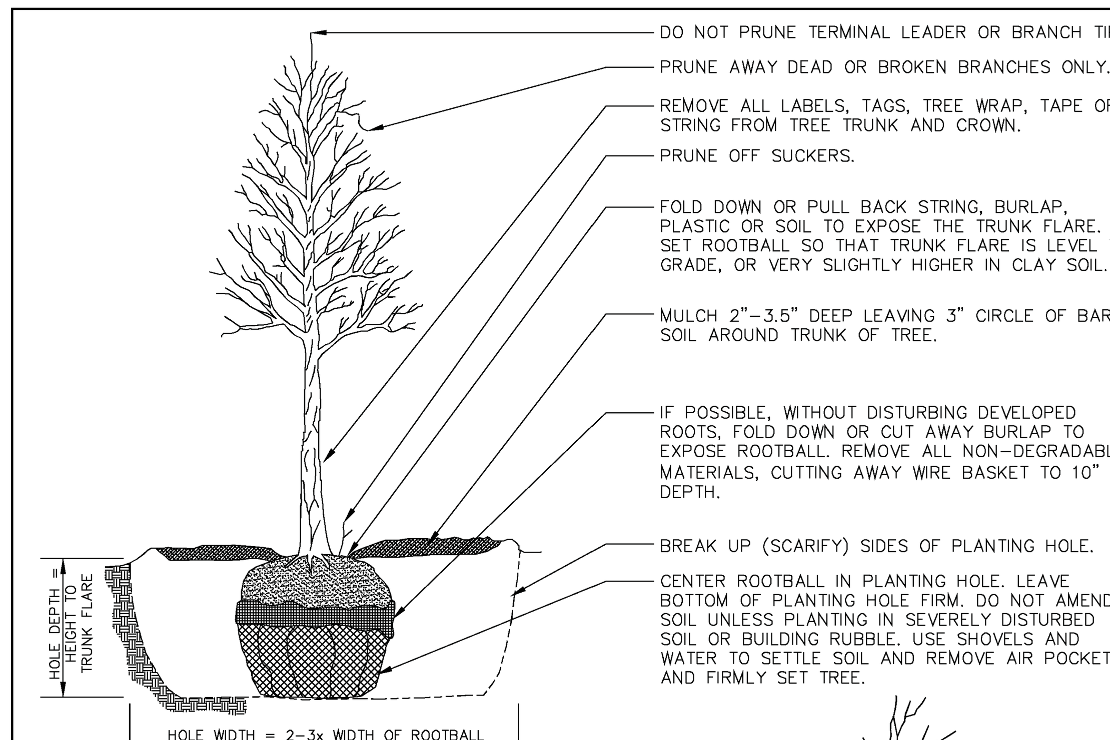
R-TANK^{HD} - H20 LOADS



SEE SHEET 6 FOR BIO-RETENTION ISLAND GRADES

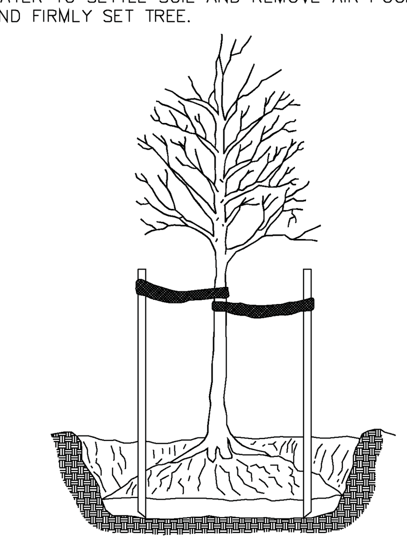
BIO-RETENTION ISLAND DETAIL

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.
SCALE	NONE	DATE	7-23-10	SD-L-3
INCH				SHEET NO. ______ OF ______

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SITE PLAN

INFILTRATION CHAMBER AND LANDSCAPE DETAILS

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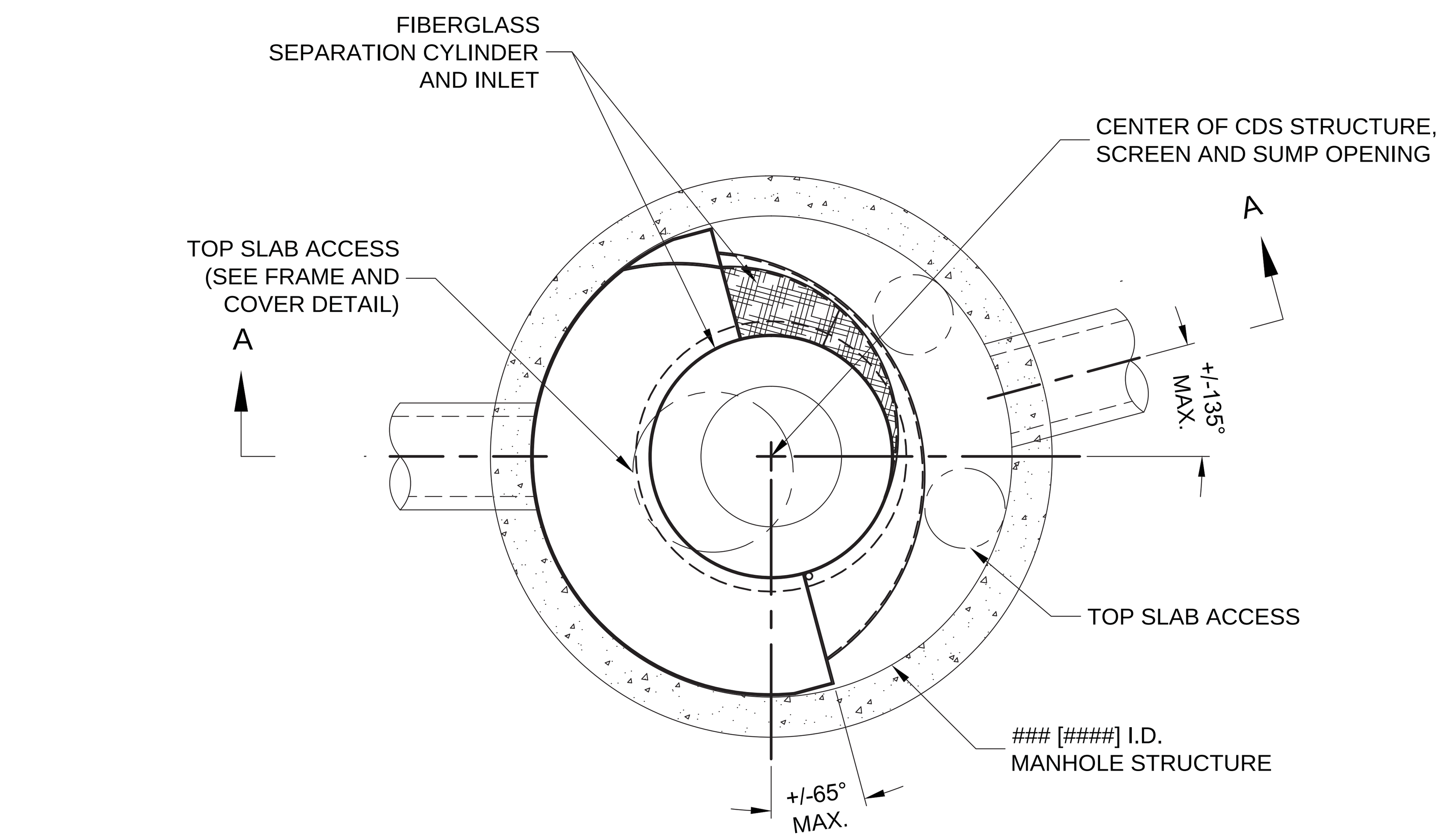
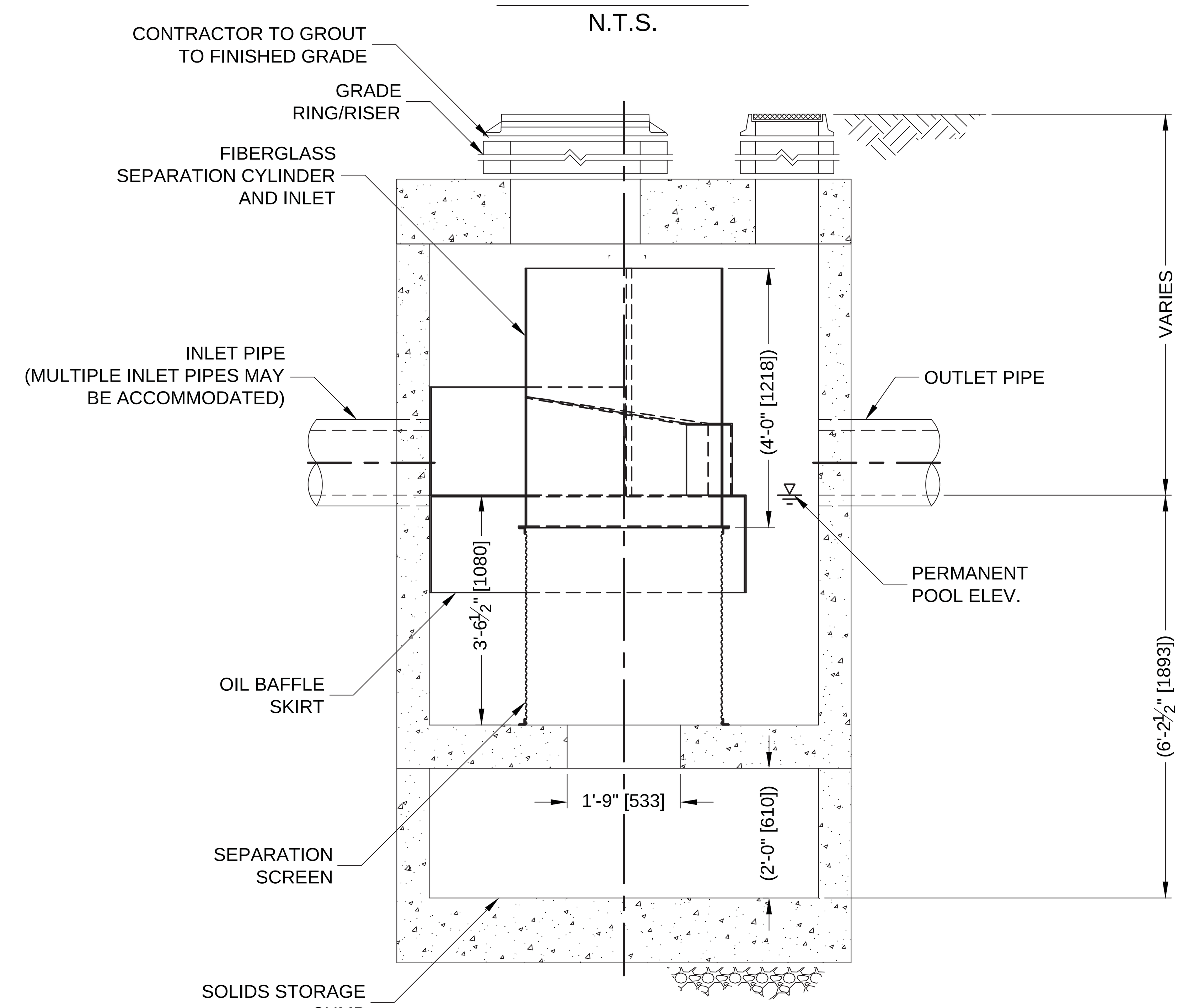
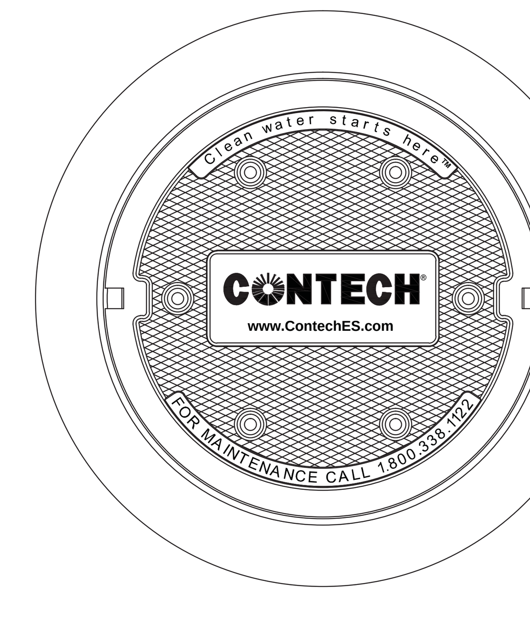


PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE R-36: CDS3030-6-C
(OR ENGINEER APPROVED EQUAL)
2.8 MIN. CFS RATED CAPACITY - 10.0 CFS BYPASS CAPACITY

HYDRODYNAMIC SEPARATOR GENERAL NOTES
(CONSTRUCT CDS OR ENGINEER-APPROVED EQUAL
IN ACCORDANCE WITH ALL MANUFACTURER INSTRUCTIONS.)

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SITE PLAN
STORMWATER QUALITY DEVICE DETAILS

20

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SHEET 20 OF 22
CADD: WAJ
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TECH:
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REV. DATE

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REVISIONS:

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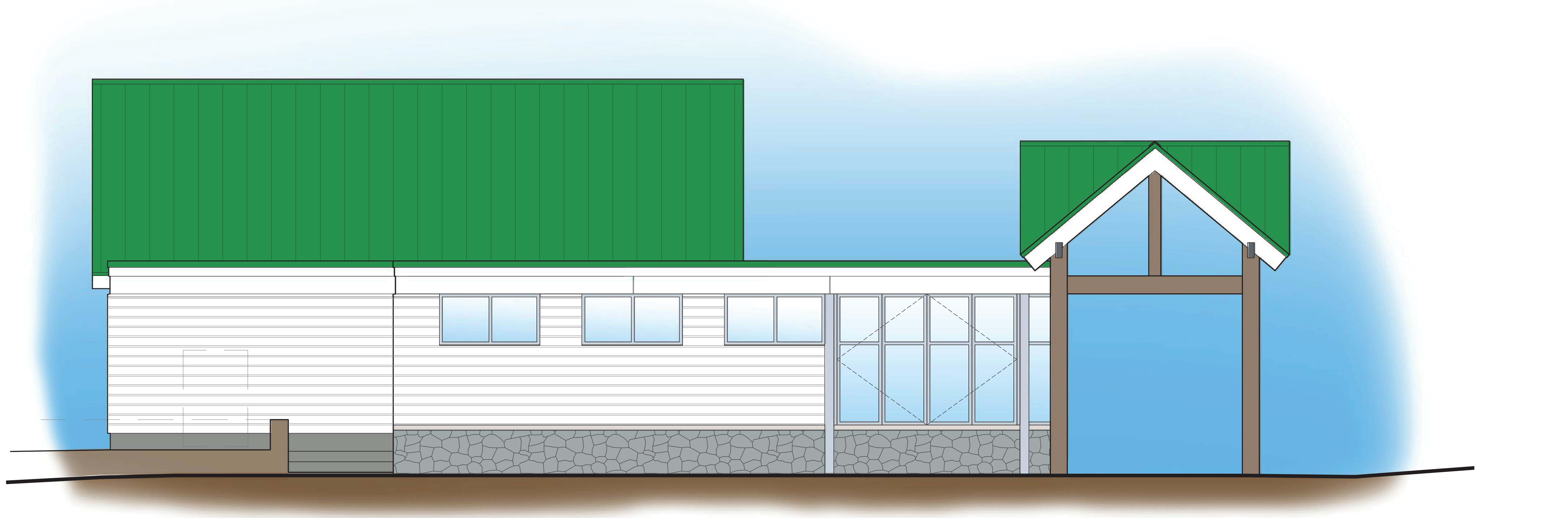
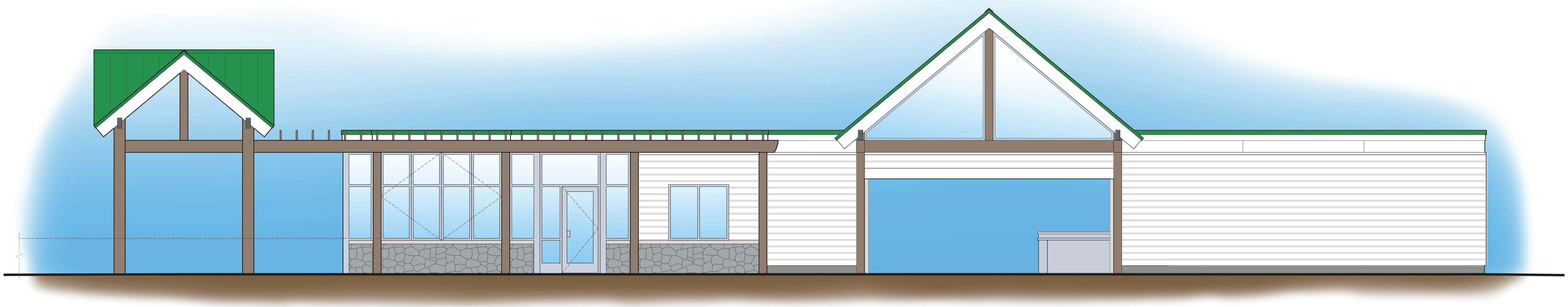


2 A2.4 EXTERIOR ELEVATION - POOL BUILDING - WEST
SCALE: 1/4"=1'-0"



1 A2.4 EXTERIOR ELEVATION - POOL BUILDING - SOUTH
SCALE: 1/4"=1'-0"

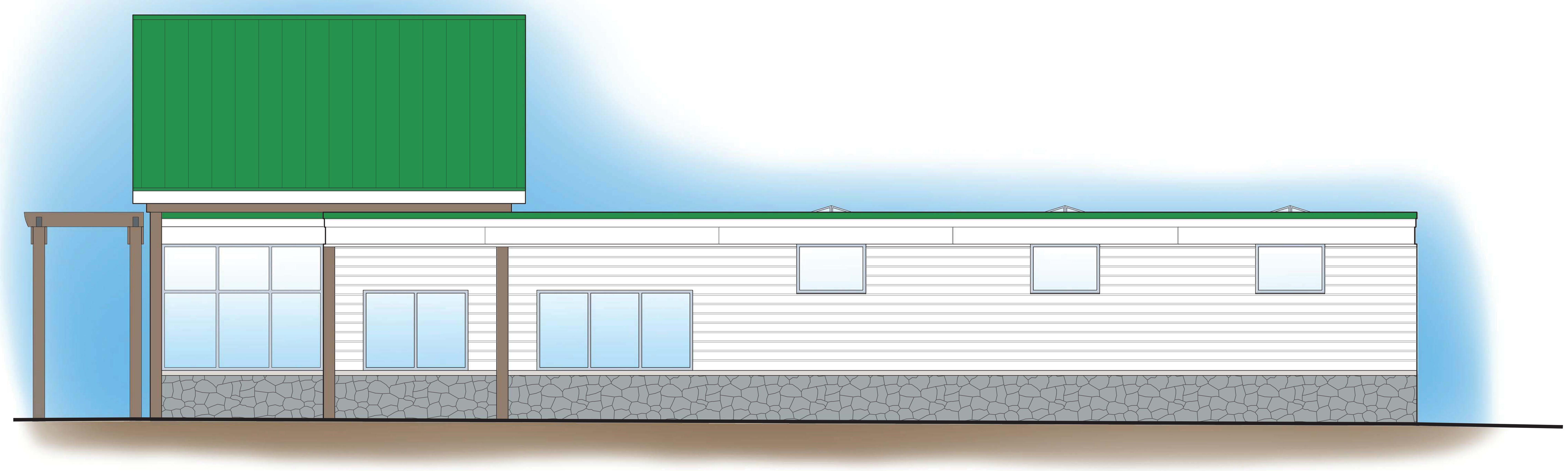
Mitchell and Mouat architects
113 South Fourth Avenue Ann Arbor, Michigan 48104
734-662-6070 FAX 734-662-3802 MaMA@MitchellandMouat.com

Date:	Issued For:
10.14.14	Schematic Design Estimate
12.02.14	Client Review
12.09.14	Presentation

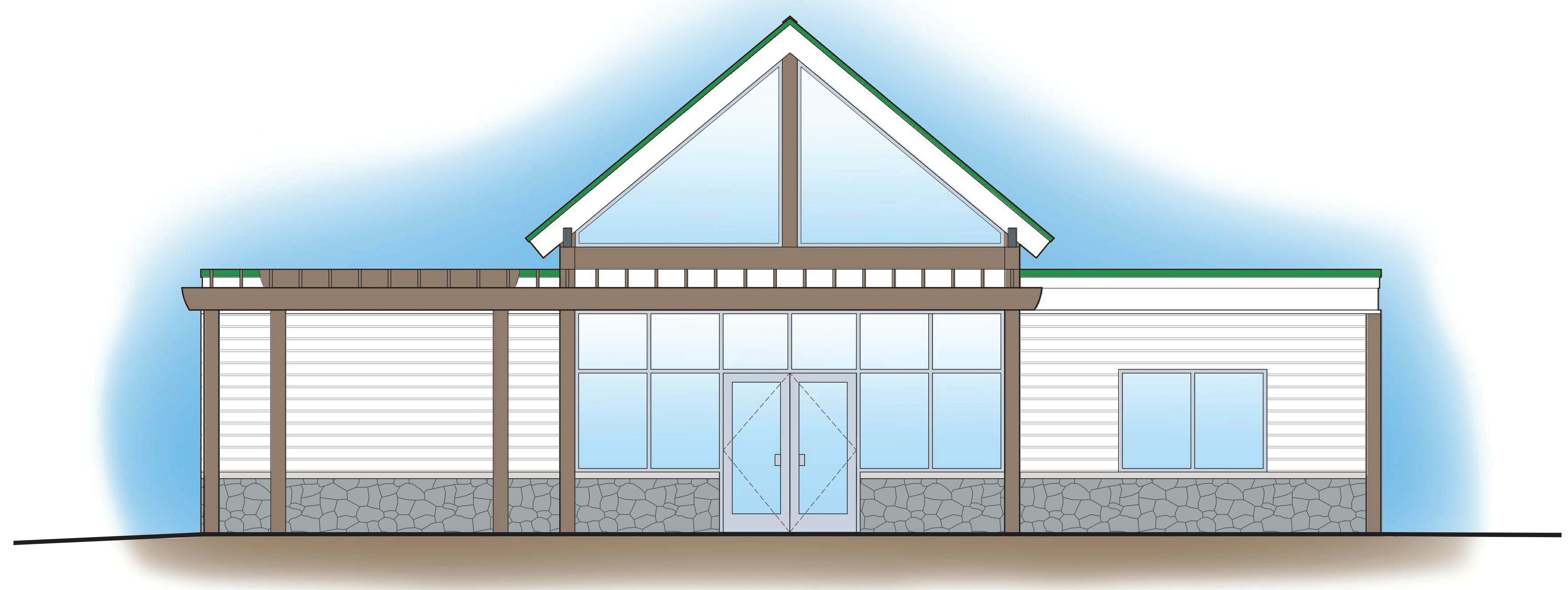
Ann Arbor Racquet Club
3010 Hickory Lane
Ann Arbor, Michigan 48104
Project Number: 1223

Exterior Elevation
Colors: Pool Building

A2.4



2 A2.6 EXTERIOR ELEVATION - TENNIS BUILDING - SOUTH
SCALE: 1/4"=1'-0"



1 A2.6 EXTERIOR ELEVATION - TENNIS BUILDING - WEST
SCALE: 1/4"=1'-0"

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10.14.14	Schematic Design Estimate
12.02.14	Client Review
12.09.14	Presentation

Ann Arbor Racquet Club
3010 Hickory Lane
Ann Arbor, Michigan 48104
Project Number: 1223

Exterior Elevation
Colors: Tennis Building

A2.6