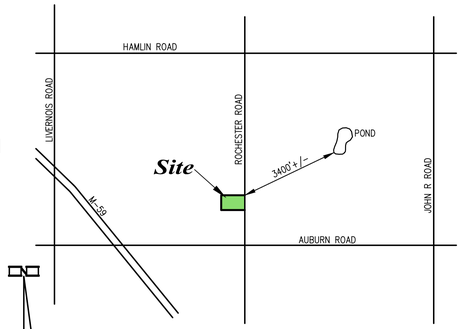
BEBB OAK MEADOWS
MIXED USE DEVELOPMENT
2800 S. ROCHESTER RD.
ROCHESTER HILLS, MI 48307



LOCATION MAP
SCALE: 1" = 2000'

SHEET INDEX

DRAWING INDEX KEY:
- ☐ NOT ISSUED
- ○ NOT REVISED
- ● NEWLY ISSUED OR REVISED
- ☒ REFERENCE

		ISSUED FOR						
		03.19.21 SPA SUBMITTAL	06.01.21 SPA RE-SUBMITTAL	09.14.21 SPA RE-SUBMITTAL	12.01.21 SPA RE-SUBMITTAL	01.21.22 SPA RE-SUBMITTAL	02.25.22 SPA RE-SUBMITTAL	03.17.22 SP REVISION
GENERAL								
TS1.1	TITLE SHEET, SHEET INDEX, AND CODE ANALYSIS	●	●	●	●	●	●	●
SITE								
1 of 11	CIVIL COVER SHEET	●	○	●	○	●	●	○
2 of 11	EXISTING CONDITIONS PLAN & BENCHMARKS	●	●	●	○	●	●	○
3 of 11	DEMOLITION PLAN	●	●	●	●	●	●	○
4 of 11	OVERALL SITE PLAN	●	●	●	●	●	●	●
5 of 11	DETAILED SITE PLAN - EAST	●	●	●	●	●	●	●
6 of 11	DETAILED SITE PLAN - WEST	●	●	●	●	●	●	●
7 of 11	ROCHESTER ROAD ENTRANCE PLAN		●	●	●	●	●	○
8 of 11	FIRE PROTECTION PLAN			●	●	●	●	○
9 of 11	STORM SEWER, DETENTION CALCULATIONS AND DETAILS	●	●	●	●	○	○	○
10 of 11	SANITARY CALCULATIONS AND DETAILS		●	●	○	○	○	○
11 of 11	MDOT NOTES & DETAILS		●	●	○	●	●	●
SL.1	SITE LIGHTING PLAN, PHOTOMETRIC, AND SPECIFICATIONS	●	○	○	●	○	○	○
L1	LANDSCAPE PLAN	●	●	●	●	●	●	●
L2	LANDSCAPE PLAN SPECIFICATIONS AND DETAILS		●	●	●	○	●	○
L3	LANDSCAPE PLAN COURTYARD					●	●	○
L4	IRRIGATION PLAN					●	●	○
L5	IRRIGATION DETAILS					●	●	○
ARCHITECTURAL								
A1.1	FIRST FLOOR PLAN	●	○	●	●	●	●	○
A1.2	SECOND FLOOR PLAN	●	○	○	●	○	○	○
A1.3	THIRD FLOOR PLAN	●	○	○	●	○	○	○
A1.4	FOURTH FLOOR PLAN	●	○	○	●	○	○	○
A3.1	EXTERIOR ELEVATIONS	○	○	○	○	●	○	○
A3.2	SITE VISIBILITY IMAGES					●	○	○

OWNER:
OYK AFFILIATED, LLC
30700 TELEGRAPH RD. SUITE 2665
BINGHAM FARMS, MICHIGAN 48025
(248) 656-7695

ARCHITECT:
STUCKY VITALE ARCHITECTS
27172 WOODWARD AVENUE
ROYAL OAK, MICHIGAN 48067
(248) 546-6700

CIVIL ENGINEER:
KIEFT ENGINEERING, INC
5852 S. MAIN ST. SUITE 1
CLARKSTON, MI 48346
(248) 625-5251

APPLICABLE CODES:

BUILDING CODE:
COMMERCIAL
MBC 2015 (2015 MICHIGAN BUILDING CODE 2015)
EFFECTIVE APRIL 20, 2017

MECHANICAL CODE:
MMC 2015 (MICHIGAN MECHANICAL CODE 2015)
EFFECTIVE APRIL 20, 2017

PLUMBING CODE:
MPC 2015 (MICHIGAN PLUMBING CODE 2015)
EFFECTIVE APRIL 20, 2017

ELECTRICAL CODE:
NEC 2017 (STATE OF MICHIGAN ELECTRICAL CODE)
2017 NATIONAL ELECTRIC CODE WITH PART 8 AMENDMENTS.
EFFECTIVE JANUARY 4, 2019

ENERGY CODE:
MBC 2015 (MICHIGAN BUILDING CODE 2015) -CHAPTER 13 &
MEC 2015 (MICHIGAN ENERGY CODE 2015) - CHAPTERS 1 THROUGH 6 &
MICHIGAN ENERGY CODE, PART 10A. RULES (ANSI/ASHRAE/IES
STANDARD 90.1-2013) ENERGY STANDARDS FOR BUILDINGS
EFFECTIVE SEPTEMBER 20, 2017

FIRE CODE:
IFC 2015 (INTERNATIONAL FIRE CODE 2015) AS REFERENCED IN 2015
MICHIGAN BUILDING CODE

BARRIER FREE REQUIREMENTS:
ICC / ANSI 117.1 - 2009

LIFE SAFETY CODES:
FIRE SUPPRESSION:
COMMERCIAL: NFPA 13 (2013)

FIRE ALARM:
NFPA 72 (2013)
KITCHEN HOODS: NFPA 17A (2013)

PROJECT DATA:

BUILDING CODE AUTHORITY:
CITY OF ROCHESTER HILLS

TYPE OF CONSTRUCTION:
TYPE IIB

USE GROUPS:
SEPARATED OCCUPANCIES IN ACCORDANCE WITH SECTION 508.4,
CONSISTING OF THE FOLLOWING:
GROUP R-2 (APARTMENTS)
GROUP M (MERCANTILE)
GROUP A-2 (RESTAURANT)

FIRE PROTECTION:
ENTIRE BUILDING SHALL BE EQUIPPED WITH AUTOMATIC
SPRINKLER SYSTEM AND FIRE ALARM IN ACCORDANCE WITH
CHAPTER 9 MBC 903.3.1.1

BUILDING HEIGHT AND NUMBER OF STORIES:
MAXIMUM BUILDING HEIGHT (TABLE 504.3)
GROUP A SPRINKERED - 75' MAX ABOVE GRADE
GROUP M SPRINKLERED-75' MAX ABOVE GRADE
GROUP R SPRINKLERED-75' MAX ABOVE GRADE

NUMBER OF STORIES (TABLE 504.4)
GROUP A-2 (FIRST FLOOR ONLY) 2 STORIES MAX ABOVE GRADE
GROUP M (FIRST FLOOR ONLY) 3 STORIES MAX ABOVE GRADE
GROUP R-2- 5 STORIES MAX ABOVE GRADE

BUILDING AREA
FRONTAGE INCREASE:

L_f = [F/P-.25] W/30
L_f = [1411/1411-.25] 30/30
L_f = .75

BUILDING AREA CONT.
ALLOWABLE AREA PER FLOOR INCLUDING FRONTAGE INCREASE

FIRST FLOOR:
GROUP A -2 35,625 SF / GROUP M 46,875 SF / GROUP R-2 60,000 SF

SECOND FLOOR:
GROUP R-2 60,000 SF

THIRD FLOOR:
GROUP R-2 60,000 SF

FOURTH FLOOR
GROUP R-2 60,000 SF

ACTUAL AREA PER FLOOR

FIRST FLOOR:
GROUP A -2 3,559 SF / GROUP M 9,702 SF / GROUP R-2 18,714 SF

SECOND FLOOR:
GROUP R-2 32,504 SF

THIRD FLOOR:
GROUP R-2 32,504 SF

FOURTH FLOOR
GROUP R-2 24,326 SF TOTAL SF = 121,253

AREA RATIO CALCULATION PER FLOOR

FIRST FLOOR: 0.10 + 0.22 + 0.31 = 0.63

SECOND FLOOR: 0.54

THIRD FLOOR: 0.54

FOURTH FLOOR: 0.41

TOTAL = 2.12 OK <3

FACADE TRANSPARENCY

GROUND FLOOR NON-RESIDENTIAL USE MIN. 70%
MEASURED FROM 2'-8' ABOVE SIDEWALK:
1180 SF TRANSPARENCY/ 1595 GSF= 73.9% ACTUAL: COMPLIES

UPPER FLOOR RESIDENTIAL RESIDENTIAL USE MIN 20%
9546 SF TRANSPARENCY/ 43,428 GSF = 21.9%: COMPLIES

BUILDING MATERIALS

PRIMARY MATERIALS MIN. 60%
40,967 SF OF PRIMARY MATERIAL/ 52,215 (TOTAL GSF LESS WINDOWS AND DOORS) =78.5%

ACCENT MATERIALS MAX 40%
11,248 SF OF ACCENT MATERIAL/ 52,215 (TOTAL GSF LESS WINDOWS AND DOORS) =21.5%

PROPERTY DESCRIPTION

Tax Id Number: 15-27-477-058

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF OAKLAND, STA TE OF MICHIGAN, AND IS DESCRIBED AS FOLLOWS:

LAND SITUATED IN THE STATE OF MICHIGAN, COUNTY OF OAKLAND, CITY OF ROCHESTER HILLS.

LAND IN THE SOUTHEAST 1/4 OF SECTION 27, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY MICHIGAN, DESCRIBED AS: COMMENCING AT THE SOUTHEAST SECTION CORNER; THENCE ALONG THE SECTION LINE, NORTH 00 DEGREES 42 MINUTES 00 SECONDS EAST, 985.00 FEET TO THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 22 MINUTES 00 SECONDS WEST, 603.90 FEET; THENCE NORTH 88 DEGREES 52 MINUTES 00 SECONDS WEST, 57.88 FEET TO THE EASTERLY LINE OF EYSTER'S AVON GARDENS SUBDIVISION, RECORDED IN LIBER 31, PAGE 46 OF PLATS, OAKLAND COUNTY RECORDS; THENCE ALONG THIS LINE, NORTH 00 DEGREES 44 MINUTES 48 SECONDS EAST, 328.00 FEET; THENCE SOUTH 89 DEGREES 00 MINUTES 20 SECONDS EAST, 661.59 FEET TO THE SECTION LINE; THENCE SOUTH 00 DEGREES 42 MINUTES 00 SECONDS WEST, 324.33 FEET TO THE POINT OF BEGINNING, EXCEPT THE EASTERLY 33 FEET FOR ROAD.

ALSO DESCRIBED AS PER ASSESSING DEPARTMENT:
T3N, R11E, SEC 27 PART OF SE 1/4 BEG AT PT DIST N 00-42- 00 E 979.73 FT FROM SE SEC COR, TH N 00-42-00 E 227.60 FT, TH N 89- 02- 06 W 660.91 FT, TH S 00-42-00 E 226 FT, TH S 88-54-37 E 660.92 FT TO BEG, ALSO N 102 FT OF S 1309.33 FT OF E 660 FT OF SE 1/4.

SVA
STUCKY VITALE ARCHITECTS
27172 WOODWARD AVENUE
ROYAL OAK, MI 48067-0925
P. 248.546.6700
F. 248.546.8454
WWW.STUCKYVITALE.COM

Consultants:

Project :
BEBB OAK MEADOWS
MIXED USE DEVELOPMENT
2800 S ROCHESTER ROAD
ROCHESTER HILLS, MI 48307

Issued for :

SPA REVIEW REV.	06.01.21
SPA REVIEW REV.	09.14.21
SPA REVIEW REV.	12.01.21
SPA REVIEW REV.	01.21.22
SPA REVIEW REV.	02.25.22
SP REVISION	03.17.22

Drawn by :
SVA

Checked by :
SVA

Sheet Title :
TITLE SHEET

Project No. :
2020.137

TS1.1

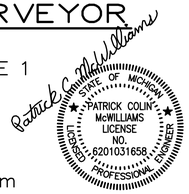
NOTE:
PRIOR TO THE INSTALLATION OF THE ASPHALT LEVELING COURSE OR 2ND LIFT OF ASPHALT BASE, THE CURB BACKFILL MUST BE INSTALLED AND COMPACTED FLUSH TO THE TOP OF CURB.

SITE PLAN
"Bebb Oak Meadows"
"Mixed Use Development"

PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

ENGINEER & SURVEYOR

KIEFT ENGINEERING, INC.
5852 SOUTH MAIN STREET, STE 1
CLARKSTON, MICHIGAN 48346
Phone (248) 625-5251
Fax # (248) 625-7110
Attn: Patrick C. McWilliams
Email: pmcwilliams@kiefteng.com



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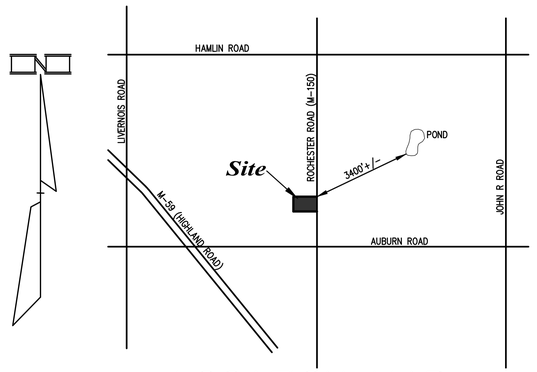
LAND IN THE SOUTHEAST 1/4 OF SECTION 27, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY MICHIGAN, DESCRIBED AS: COMMENCING AT THE SOUTHEAST SECTION CORNER; THENCE ALONG THE SECTION LINE, NORTH 00 DEGREES 42 MINUTES 00 SECONDS EAST, 985.00 FEET TO THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 22 MINUTES 00 SECONDS WEST, 603.90 FEET; THENCE NORTH 88 DEGREES 52 MINUTES 00 SECONDS WEST, 57.88 FEET TO THE EASTERLY LINE OF EYSTER'S AVON GARDENS SUBDIVISION, RECORDED IN LIBER 31, PAGE 46 OF PLATS, OAKLAND COUNTY RECORDS; THENCE ALONG THIS LINE, NORTH 00 DEGREES 44 MINUTES 48 SECONDS EAST, 328.00 FEET; THENCE SOUTH 89 DEGREES 00 MINUTES 20 SECONDS EAST, 661.59 FEET TO THE SECTION LINE; THENCE SOUTH 00 DEGREES 42 MINUTES 00 SECONDS WEST, 324.33 FEET TO THE POINT OF BEGINNING. CONTAINING 4.96 ACRES. EXCEPT THE EASTERLY 33 FEET FOR ROAD.

ALSO DESCRIBED AS PER ASSESSING DEPARTMENT:
T3N, R11E, SEC 27 PART OF SE 1/4 BEG AT PT DIST N 00-42- 00 E 979.73 FT FROM SE SEC COR, TH N 00-42-00 E 227.60 FT, TH N 89- 02- 06 W 660.91 FT, TH S 00-42-00 E 226 FT, TH S 88-54-37 E 660.92 FT TO BEG, ALSO N 102 FT OF S 1309.33 FT OF E 660 FT OF SE 1/4.



LOCATION MAP
SCALE: 1" = 2000'

DEVELOPER/CONTRACTOR

OYK Engineering & Construction
30700 Telegraph Road, Suite 2665
Bingham Farms, Michigan 48025
Ph: (248) 656-7695
Contact: Fred Hadid
Email: fhadid@oykconstruction.com

ARCHITECT

Stucky Vitale Architects
27172 Woodward Avenue
Royal Oak, Michigan 48067-0925
Ph (248) 546-6700, Ext 102
Contact: John Stucky
Email: jvitale@stuckyvitale.com

SHEET INDEX

APPROVALS

AGENCY	DESCRIPTION		DATE	EXPIRATION DATE
	PLANNING COMMISSION			
CITY OF ROCHESTER HILLS	TOWNSHIP BOARD			
CITY OF ROCHESTER HILLS	ENGINEERING APPROVAL	- SANITARY - WATERMAIN - REMAINDER		
OAKLAND COUNTY WATER RESOURCE COMMISSION	SOIL EROSION PERMIT NO.			
OAKLAND COUNTY WATER RESOURCE COMMISSION	WATER MAIN APPROVAL			
OAKLAND COUNTY WATER RESOURCE COMMISSION	SANITARY SEWER APPROVAL			
MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY, GREAT LAKES & ENERGY	WATER MAIN PERMIT NO.			
MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY, GREAT LAKES & ENERGY	SANITARY SEWER PERMIT			
MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY, GREAT LAKES & ENERGY	N.P.D.E.S. NOTICE TO COVER	NOT REQUIRED (<5 ACRES DISRUPTION)		
MICHIGAN DEPARTMENT OF TRANSPORTATION	ROCHESTER ROAD (M-150)			

NOTES:

"THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT".

-GENERAL CONTRACTOR WILL BE RESPONSIBLE FOR THE MAINTENANCE OF THE SOIL EROSION CONTROLS.

REVISION INDEX

REV. #	DESCRIPTION	DATE	SHEET NUMBERS 1	2	3	4	5	6	7	8	9	10	11
1	REVISED PER ARCHITECT	3-19-2021	X	X	X	X	X	X	X				
2	REVISED PER CITY (4-15-21)	5-12-2021	X	X	X	X	X	X	X	X	X	X	X
3	REVISED PER CITY (6-29-21)	6-30-2021	X	X	X	X	X	X	X				
4	ADDED HYDRANTS PER FIRE DEPT (6-26-2021)	8-13-2021	X			X	X	X	X				
5	REVISED ENTRANCE APPROACHES PER CLIENT (9-8-2021)	9-24-2021	X		X	X	X		X			X	
6	ADDED PATH DETAIL & SIGHT LINES PER CITY/HRC (10-22-2021)	11-15-2021	X	X	X	X	X	X	X	X	X	X	X
7	REVISE S. ENTRANCE/ LOADING ZONE/DUMPSTER PER CLIENT (11-22-2021)	11-30-2021	X		X	X	X	X	X	X	X		
8	REVISED PER CITY (6-29-21) PER MDOT (1-17-2022)	1-19-2022	X	X	X	X	X	X	X	X			X
9	REVISED PER CITY (2-15-2022)	2-24-2022	X			X	X	X		X			
10	REVISED PER CITY (3-15-2022)	3-17-2022	X			X	X	X	X	X			

City File #21-008,
Section 27

DATE: 3-17-2021
SHEET 1 OF 11
KE 2021.053

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ALLAA YOUSIF ARABBO
15-27-477-005
R-3

SCOTT & ERIKA HOUSER
15-27-477-006
R-3

SHERRY WONG
15-27-477-008
R-3

"EYSTER'S AVON GARDENS" L. 31, P. 46, O.C.R.

ALBERTO MURGUIA TESCH &
SELENE E. VALQUEZ CARDENAS
15-27-477-008
R-3

CHRISTOPHER JOHNSON
& JOSEPH PETERS
15-27-477-009
R-3

"ROCHESTER AUTOMOTIVE CONDOMINIUM" O.C.C.P. NO. 2206
15-27-477-068
B-5 + FB-3

EXISTING BELLE TIRE
#2740

S 89°00'20" E 661.59'

N 00°44'48" E 328.00'

125' REAR YARD (SEE NOTE)

25' MIN.

75' MIN. FRONT 3 STORIES

15-27-477-058
B-3 + FB-3
4.71 Acres (Excludes R.O.W.)
4.96 Acres (Gross)

ShbuaB

EXISTING BUILDING
#2800

20' WIDE WATER EASEMENT
AS REC. IN L. 7389, P. 861,
O.C.R.

EXISTING DETENTION POND

8" END BURIED

OVERFLOW MH
R 762.24
EX 8" N 757.29
EX 12" SE 757.20

N 88°52'00" W
57.88'

Benchmark-2
N 89°22'00" W 603.90'

SERRA FORD ROCHESTER HILLS
15-27-477-066
B-3 + FB-3

EXISTING BUILDING
#2890
G.F.F. 763.75

P.O.B.

S 00°42'00" W 985.00'

33'

SE Corner
Section 27
T3N, R11E

Benchmark-1

S. Rochester Road (M-150)
VARIABLE WIDTH - 5 LANES ASPHALT W/CC & G-50 MPH (MDOT JURISDICTION)
S 00°42'00" W 324.33'

MDOT R.O.W.

33' WIDE EASEMENT GRANTED TO OAKLAND COUNTY FOR SANITARY SEWER AND ROAD PURPOSES AS REC. IN L. 7184, P. 523 & 531, O.C.R.

"HAMPTON VILLAGE CENTRE CONDO" O.C.C.P. NO. 713

15-26-351-016
B-3 + FB-3

15-26-351-016
B-3 + FB-3

LEGEND

EXISTING

- STORM SEWER
- SANITARY SEWER
- WATERMAIN
- GAS MAIN
- ELEC. TELE. CABLE
- STORM MANHOLE
- CATCH BASIN
- INLET
- REARYARD CATCH BASIN
- END SECTION
- SANITARY MANHOLE
- GATE VALVE AND WELL
- HYDRANT
- CONTOURS
- POWER POLE
- LIGHT POLE
- GRADE

Notes:

ALL EXISTING UTILITIES SHOWN ON THIS TOPOGRAPHIC SURVEY HAVE BEEN TAKEN FROM VISUAL OBSERVATION, AND RECORD MAPPING, WHERE AVAILABLE. NO GUARANTEE IS MADE, OR SHOULD BE ASSUMED, AS TO THE COMPLETENESS OR ACCURACY OF THE UTILITIES SHOWN ON THIS DRAWING. PARTIES UTILIZING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS OF OVERHEAD AND UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION ACTIVITIES.

BUILDER/DEVELOPER IS RESPONSIBLE FOR CONFIRMING BUILDING SETBACKS.

Basis of Bearing:

NORTH 00°42'00" EAST, BEING THE EAST LINE OF SECTION 27, AS DESCRIBED IN PROPERTY DESCRIPTION

Soils Legend

SYMBOL	*NAME*
ShbuaB	*Shebeon-Urban land complex, 0 to 4 percent slopes*

Benchmarks:

BM #1
ARROW OF EXISTING HYDRANT LOCATED ON WEST SIDE OF ROCHESTER ROAD, 39'+/- NORTH OF SOUTH PROPERTY LINE.
ELEVATION = 764.90 NAVD '88

BM #2
ARROW OF EXISTING HYDRANT LOCATED 5' SOUTH OF THE SOUTH PROPERTY LINE & 308'+/- WEST OF ROCHESTER ROAD B.O.C..
ELEVATION = 766.86 NAVD '88

STATE OF MICHIGAN
PATRICK COLIN McWILLIAMS
LICENSE NO. 6201031658
REGISTERED PROFESSIONAL ENGINEER

City File #21-008,
Section 27

DATE	ISSUE
3-19-2021	REVISED PER ARCHITECT
5-12-2021	REVISED PER CITY (4-15-2021)
6-30-2021	REVISED PER CITY (6-29-2021)
11-15-2021	ADDED PATH DETAIL & SIGHT LINES PER CITY/HRC (10-22-2021)
1-18-2021	REVISED PER CITY (12-21-2021), PER MDOT (1-17-2022)

Developer/Contractor
OYK ENGINEERING & CONSTRUCTION
30700 TELEGRAPH ROAD, SUITE 2665
BINGHAM FARMS, MICHIGAN 48025
(248) 656-7695 FRED HADID

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625-5251 www.kieftenq.com FAX (248) 625-7110

DATE	3-17-2021	CKD. BY	DATE
DRAWN	GF		
DESIGN	PCM		
SECTION	27	T- 3 -N. R- 11 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Existing Conditions Plan
"BEBB OAK MEADOWS" MIXED USE DEVELOPMENT
PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SCALE	1" = 30'
SHEET	2 OF 11
	KE 2021.053

G:\2021\053\dwg\Bebb Oak Site Plan.dwg, Ex2, 1/20/2022 9:52:25 AM

ALLAA YOUSIF ARABBO
15-27-477-005
R-3

SCOTT & ERIKA HOUSER
15-27-477-006
R-3

SHERRY WONG
15-27-477-008
R-3

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15-27-477-008
R-3

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R-3

"ROCHESTER AUTOMOTIVE CONDOMINIUM" O.C.C.P. NO. 2206
15-27-477-068
B-5 + FB-3

EXISTING BELLE TIRE
#2740

"HAMPTON VILLAGE CENTRE CONDO" O.C.C.P. NO. 713

15-26-351-016
B-3 + FB-3

15-27-477-058
B-3 + FB-3
4.71 Acres (Excludes R.O.W.)
4.96 Acres (Gross)

S 89°00'20" E 661.59'

N 00°44'48" E 328.00'

125' REAR YARD (SEE NOTE)

25' MIN.

75' MIN. FRONT 3 STORIES

DEMOLITION OF EXISTING BUILDING, INCLUDING ALL FOUNDATIONS AND BELOW GRADE COMPONENTS AS NECESSARY

EXISTING BUILDING
#2800

S. Rochester Road (M-150)
VARIABLE WIDTH - 5 LANES ASPHALT W/CC & G-50 MPH (MDOT JURISDICTION)
S 00°42'00" W 324.33'

33' WIDE EASEMENT GRANTED TO OAKLAND COUNTY FOR SANITARY SEWER AND ROAD PURPOSES AS REC. IN L. 7184, P. 523 & 531, O.C.R.

MDOT R.O.W.

(ADJUST SANITARY MANHOLE RIM)

(REMOVE TYPICAL)
(REMOVE STORM TYPICAL)
(REMOVE WM TYPICAL)
(REMOVE)
(MAINTAIN)
(CUT, PLUG & REMOVE)

(TO BE ABANDONED)
20' WIDE WATER EASEMENT AS REC. IN L. 7392, P. 861, O.C.R.

EXISTING DETENTION POND
(TO BE REMOVED)

N 88°52'00" W
57.88'

N 89°22'00" W 603.90'

SERRA FORD ROCHESTER HILLS
15-27-477-066
B-3 + FB-3

EXISTING BUILDING
#2890
G.F.F. 763.75

P.O.B.

S 00°42'00" W 985.00'

SE Corner
Section 27
T3N, R11E

33'

LEGEND

EXISTING

	STORM SEWER
	SANITARY SEWER
	WATERMAIN
GAS GAS	GAS MAIN
	ELEC. TELE. CABLE
	STORM MANHOLE
	CATCH BASIN
	INLET
	REARYARD CATCH BASIN
	END SECTION
	SANITARY MANHOLE
	GATE VALVE AND WELL
	HYDRANT
770	CONTOURS
	POWER POLE
	LIGHT POLE
+767.5	GRADE
	DEMOLITION LIMITS

PATRICK COLIN McWILLIAMS LICENSE NO. 6201031658 LICENSED PROFESSIONAL ENGINEER STATE OF MICHIGAN

City File #21-008,
Section 27

DATE	ISSUE
3-19-2021	REVISED PER ARCHITECT
5-12-2021	REVISED PER CITY (4-15-2021)
8-24-2021	REVISED ENTRANCE APPROACHES PER CLIENT (9-8-2021)
11-15-2021	ADDED PATH DETAIL & SIGHT LINES PER CITY/HRC (10-22-2021)
11-30-2021	MOVED S. ENTRANCE/LOWERED DUMPSTER PER CLIENT (11-22-2021)
1-18-2021	REVISED PER CITY (12-21-2021), PER MDOT (1-17-2022)

Developer/Contractor
OYK ENGINEERING & CONSTRUCTION
30700 TELEGRAPH ROAD, SUITE 2665
BINGHAM FARMS, MICHIGAN 48025
(248) 656-7695 FRED HADID

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625-5251 www.kiefteng.com FAX (248) 625-7110

DATE	3-17-2021	CKD. BY	DATE
DRAWN	GF		
DESIGN	PCM		
SECTION	27	T- 3 -N. R- 11 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Demolition Plan

"BEBB OAK MEADOWS" MIXED USE DEVELOPMENT
PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SCALE	1" = 30'
SHEET	3 OF 11
	KE 2021.053

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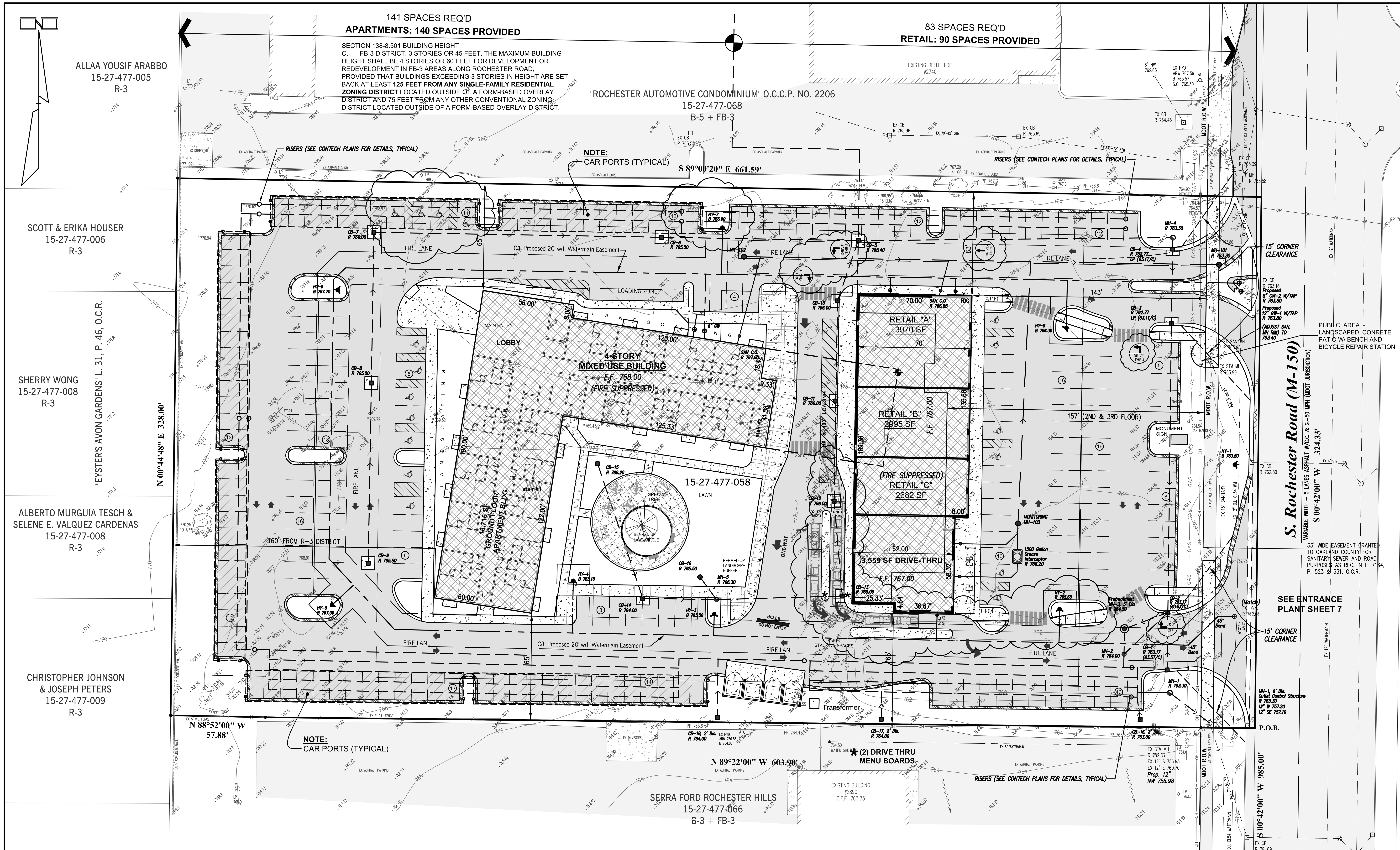

PARKING CALCULATION:
PER CITY OF ROCHESTER HILLS, MI ZONING ORDINANCE
Section 138-8.600 - Flex Business Overlay Districts
A. Minimum Parking Required.
1. 1.5 parking spaces per residential dwelling unit.
2. 1 parking space per 400 square feet of nonresidential building space.

Section 138-11.204 Parking Requirements
Table 14. Minimum Parking Requirements
(RESTAURANT: 1 SPACE PER 2 PERSONS AT MAXIMUM OCCUPANCY)

APARTMENTS / RESIDENTIAL:
(94) APTMT. UNITS: X (1.5 per dwelling unit) = 141 SPACES

GENERAL RETAIL:
9,437 SF X (1 / 400 GROSS) = 24 SPACES

DRIVE-THRU:
(RESTAURANT: 1 SPACE PER 2 PERSONS AT MAXIMUM OCCUPANCY)
3,559 SF DRIVE THRU
x 55% KITCHEN = 1,957 SF
x 45% DINING = 1,602 SF

1,957 SF (1/200 GROSS) = 9.8 = 10 OCCUPANTS
1,602 SF (1/15 NET) = 106.8 = 107 OCCUPANTS

TOTAL OCCUPANCY = 117 OCCUPANTS

(1 PER 2 PERSONS AT MAX OCCUPANCY) = 117 x (1 / 2) = 59 SPACES

PARKING TOTALS:

APARTMENT UNITS:	140 SPACES
(GENERAL RETAIL)	24 SPACES
(DRIVE THRU)	59 SPACES
TOTAL REQUIRED:	224 SPACES
TOTAL PROVIDED:	**230 SPACES**

BARRIER FREE PARKING:
TOTAL #OF SPACES: 201-300 SPACES
MINIMUM # REQUIRED: 5 + 2.33% of total parking provided in lot

TOTAL REQUIRED: 5 + (230 x 2.33%) = 10.36 = 11 SPACES
TOTAL PROVIDED: 17 SPACES

OUTDOOR AMENITY SPACE (2% REQUIRED)
TOTAL AREA = 4.71 ACRES = 205,168 SF
(205,168 SF)(2% REQUIRED) = 4,104 SF REQUIRED
COURTYARD/GAZEBO AREA = 8,000 SF+/- PROVIDED

General Notes:

1. DEVELOP/CONTRACTOR:
OYK ENGINEERING & CONSRUCTION
30700 TELEGRAPH ROAD, SUITE 2665
BINGHAM FARMS, MICHIGAN 48025
PHONE: (248) 656-7695
EMAIL: fhadid@oykconstruction.com
2. PROPERTY DESCRIPTION:
TAX ID NUMBER: 15-27-477-058
THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF OAKLAND, STATE OF MICHIGAN, AND IS DESCRIBED AS FOLLOWS:
LAND SITUATED IN THE STATE OF MICHIGAN, COUNTY OF OAKLAND, CITY OF ROCHESTER HILLS. LAND IN THE SOUTHEAST 1/4 OF SECTION 27, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY MICHIGAN, DESCRIBED AS: COMMENCING AT THE SOUTHEAST SECTION CORNER; THENCE ALONG THE SECTION LINE, NORTH 00 DEGREES 42 MINUTES 00 SECONDS EAST, 985.00 FEET TO THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 22 MINUTES 00 SECONDS WEST, 603.90 FEET; THENCE NORTH 88 DEGREES 52 MINUTES 00 SECONDS WEST, 57.88 FEET TO THE EASTERLY LINE OF EYSTER'S AVON GARDENS SUBDIVISION, RECORDED IN LIBER 31, PAGE 46 OF PLATS, OAKLAND COUNTY RECORDS; THENCE ALONG THIS LINE, NORTH 00 DEGREES 44 MINUTES 48 SECONDS EAST, 328.00 FEET; THENCE SOUTH 89 DEGREES 00 MINUTES 20 SECONDS EAST, 661.59 FEET TO THE SECTION LINE; THENCE SOUTH 00 DEGREES 42 MINUTES 00 SECONDS WEST, 324.33 FEET TO THE POINT OF BEGINNING, EXCEPT THE EASTERLY 33 FEET FOR ROAD.
3. EXISTING ZONING: B-3 (SHOPPING CENTER BUSINESS DISTRICT) & FB-3 (FLEXIBLE BUSINESS OVERLAY)
4. SETBACKS:

SETBACKS:	REQUIRED	PROPOSED APARTMENT	PROPOSED RETAIL/RESTAURANT
FRONT (M-150)	75 FT	157 FT	143 FT (MDOT R.O.W.)
SIDES	25 FT	65' (SOUTH), 65' (NORTH)	62' (SOUTH), 63' (NORTH)
REAR	125 FT	160 FT	414 FT (WEST)

5. PROPOSED USE:
APARTMENT BUILDING – 94 UNITS, 108.048 SF
GENERAL RETAIL BUILDING – 10,245 SF
DRIVE-THRU RESTAURANT – 3,503 SF
6. PARKING CALCULATION: SEE THIS SHEET.
7. PROPOSED INTERNAL PARKING LOT DRIVES: DRIVE WIDTH = 24' MINIMUM & 30' AROUND BUILDING (FIRE LANE).
8. WATER SUPPLY: PROPOSED 8" WATER SERVICE CONNECTING TO MUNICIPAL SYSTEM W/12' WIDE EASEMENT.
9. SEWAGE DISPOSAL: CONNECTION TO EXISTING 15" MUNICIPAL SANITARY SEWERS W/20' WIDE EASEMENT.
10. STORM DRAINAGE: PROPOSED STORM SEWER CONNECTING TO PROPOSED UNDERGROUND DETENTION BASIN BEFORE OUTLETTING INTO THE MDOT (M-150) STORM SYSTEM.
11. PROPOSED UTILITIES: UNDERGROUND GAS, ELECTRIC, PHONE & CABLE.
12. PERMITS REQUIRED:
a) CITY OF ROCHESTER HILLS PLANNING COMMISSION/TOWNSHIP BOARD – SITE PLAN APPROVAL.
b) MDOT: M-150 (ROCHESTER ROAD) PERMIT.
c) OAKLAND COUNTY WATER RESOURCE COMMISSION – SOIL EROSION PERMIT
d) MICHIGAN E.G.L.E. – NPDES 'NOTICE OF COVERAGE' PERMIT (IF REQUIRED).
e) MICHIGAN E.G.L.E. – ACT 451 SANITARY SEWER PERMIT
f) MICHIGAN E.G.L.E. – WATER MAIN PERMIT
13. SIGNAGE: PROPOSED GROUND SIGN ALONG ROCHESTER ROAD PER CITY REQUIREMENTS.
14. ALL WALKS SHALL BE CONCRETE WALKS.
15. DUMPSTERS: LOCATED AS SHOWN, SCREENED IN ACCORDANCE W/MUNICIPAL STANDARDS.
16. LIGHTING: SEPARATE PHOTOMETRIC PLAN TO BE SUBMITTED BY OTHERS.
17. LANDSCAPING: SEE SEPARATE LANDSCAPE PLAN.
18. NO HAZARDOUS MATERIALS WILL BE STORED ON-SITE.
19. REQUIRED SIGHT DISTANCES:
(PARAMETERS: SPEED LIMIT = 50 MPH, 4 OR 5 LANE ROAD)
ROADWAY (VEHICLE SIGHT DISTANCE REQUIRED = 590 LF
PATHWAY (BIKE, ETC.) SIGHT DISTANCE REQUIRED = 140 LF

Notes:

1. UPDATED "NO STOPPING STANDING OR PARKING FIRE LANE" SIGNS MUST BE PROVIDED THROUGHTOUT THE SITE.

2. ALL ACCESSIBLE PARKING SPACES SHALL BE IDENTIFIED BY SIGNS PER ICCA117.1-2009, SECTION 502.7.

3. M.D.O.T. R.O.W. USE PERMIT IS REQUIRED.

4. CITY OF ROCHESTER HILLS R.O.W. PERMIT IS REQUIRED.

5. O.C.W.R.C. SOIL EROSION PERMIT IS REQUIRED.

6. ALL PROPOSED SIGNS MEET SECTION 138-8.603 AND CHAPTER 134 OF THE CITY CODE OF ORDINANCES AND WILL BE APPROVED UNDER A SEPARATE PERMIT ISSUED BY THE BUILDING DEPARTMENT.

LEGEND

EXISTING		PROPOSED
	STORM SEWER	
	SANITARY SEWER	
	WATERMAIN	
GAS — GAS — GAS	GAS MAIN	GAS — GAS — GAS
	ELEC. TELE. CABLE	
	STORM MANHOLE	
	CATCH BASIN	
	INLET	
	REARYARD CATCH BASIN	
	END SECTION	
	SANITARY MANHOLE	
	GATE VALVE AND WELL	
	HYDRANT	
770	CONTOURS	(70)
	MATCH ELEVATION	(M)
	TOP OF CURB	T/C
	TOP OF SIDEWALK	T/S
	TOP OF PAVEMENT	T/P
	TOP OF CONCRETE	TC
	STANDARD CURB	
	REVERSE CURB	
	DOWNSPOUT	D.S.
	ROOF DRAIN	R.D.

STATE OF MICHIGAN
PATRICK COLIN McWILLIAMS
LICENSE NO. 6201031658
LICENSED PROFESSIONAL ENGINEER

City File #21-008, Section 27

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DATE	ISSUE
8-13-2021	ADDED HYDRANTS FOR FIRE DEPT. (8-13-2021)
9-24-2021	REVISED ENTRANCE APPROACHES PER CLIENT (9-8-2021)
11-15-2021	ADDED PATH DETAIL & SIGHT LINES PER CITY/HRC (10-22-2021)
11-30-2021	REVISE S. ENTRANCE/LOADING ZONE/DUMPSTER PER CLIENT (11-22-2021)
1-19-2021	REVISED PER CITY (12-21-2021), PER MDOT (1-17-2022)
2-24-2022	REVISED PER CITY (2-15-2022)
3-17-2022	REVISED PER CITY (3-15-2022)

Developer/Contractor
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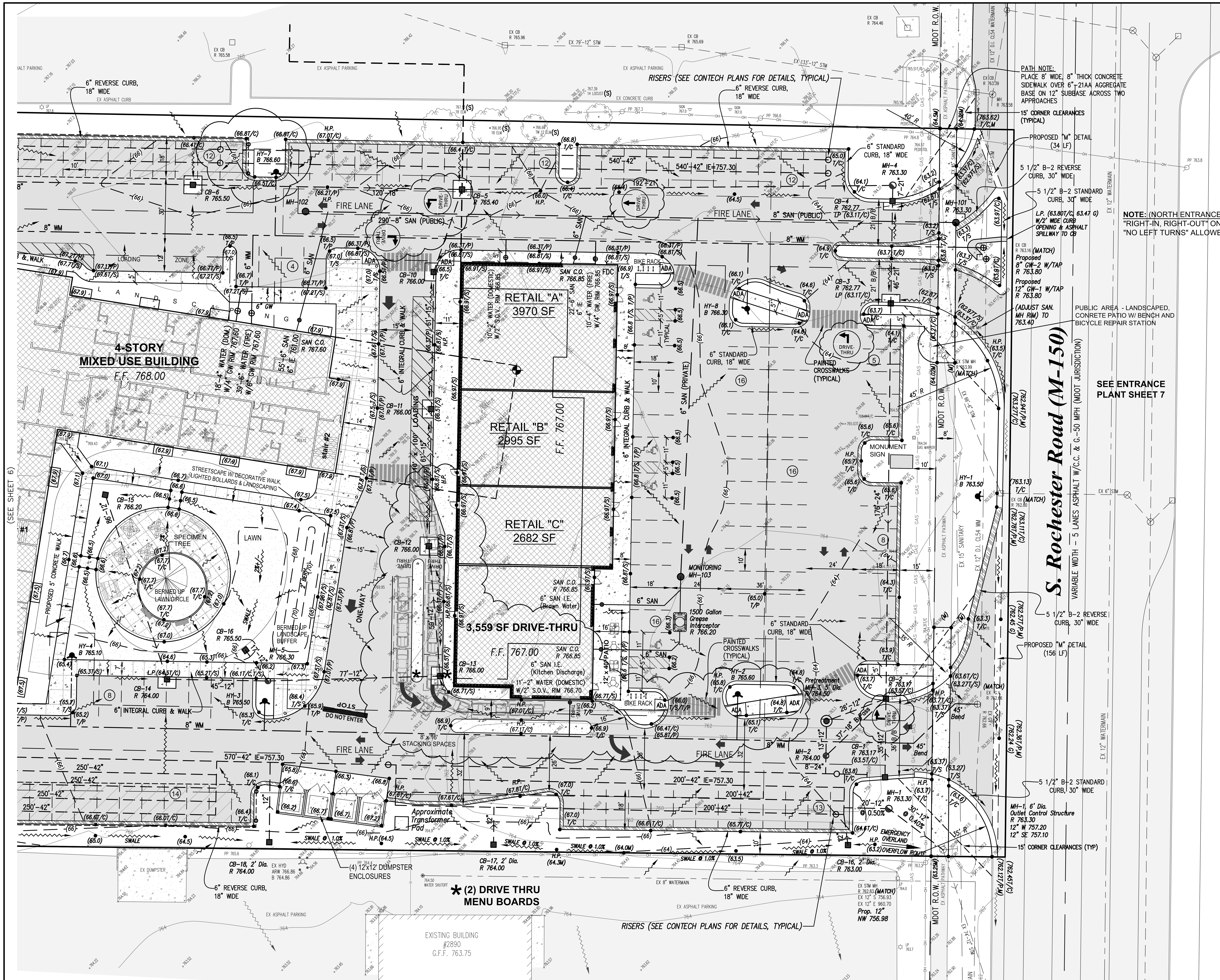
DATE 3-17-2021	CKD. BY	DATE
DRAWN GF		
DESIGN PCM		
SECTION 27	T- 3 -N. R- 11 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Overall Site Plan
"BEBB OAK MEADOWS" MIXED USE DEVELOPMENT
PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 30'
SHEET 4 OF 11
KE 2021.053


4-STORY
MIXED USE BUILDING
F.F. 768.00
RETAIL "A"
3970 SF
RETAIL "B"
2995 SF
F.F. 767.00
RETAIL "C"
2682 SF
3,559 SF DRIVE-THRU
F.F. 767.00
S. Rochester Road (M-150)
VARIABLE WIDTH - 5 LANES ASPHALT W/C.C. & G.-50 MPH (MDOT JURISDICTION)
SEE ENTRANCE
PLANT SHEET 7
PATH NOTE:
PLACE 8' WIDE, 8" THICK CONCRETE SIDEWALK OVER 6" 21AA AGGREGATE BASE ON 12" SUBBASE ACROSS TWO APPROACHES
15' CORNER CLEARANCES (TYPICAL)
PROPOSED "M" DETAIL (34 LF)
5 1/2" B-2 REVERSE CURB, 30" WIDE
5 1/2" B-2 STANDARD CURB, 30" WIDE
L.P. (63.80T/C, 63.47 G) W/2' WIDE CURB OPENING & ASPHALT SPILLWAY TO CB
NOTE: (NORTH ENTRANCE)
"RIGHT-IN, RIGHT-OUT" ONLY
"NO LEFT TURNS" ALLOWED
EX CB R 763.16 (MATCH)
Proposed 8" GW-2 W/TAP R 763.80
Proposed 12" GW-1 W/TAP R 763.80
(ADJUST SAN. MH RIM) TO 763.40
PUBLIC AREA - LANDSCAPED, CONRETE PATIO W/ BENCH AND BICYCLE REPAIR STATION
RISERS (SEE CONTECH PLANS FOR DETAILS, TYPICAL)
6" REVERSE CURB, 18" WIDE
6" STANDARD CURB, 18" WIDE
FIRE LANE
290'-8" SAN (PUBLIC)
8" SAN (PUBLIC)
540'-42" IE=757.30
570'-42" IE=757.30
200'-42" IE=757.30
PAINTED CROSSWALKS (TYPICAL)
MONUMENT SIGN
MONITORING MH-103
1500 Gallon Grease Interceptor R 766.20
Pretreatment MH-3, 5' Dia. R 764.50
STREETSCAPE W/ DECORATIVE WALK, LIGHTED BOLLARDS & LANDSCAPING
SPECIMEN TREE
BERMED UP LAWN CIRCLE
LAWN
BERMED UP LANDSCAPE BUFFER
PROPOSED 5' CONCRETE WALK
6" INTEGRAL CURB & WALK
ONE-WAY
STOP
DO NOT ENTER
8' x 16' STACKING SPACES
BIKE RACK
12' x 40' PATIO
(4) 12'x12' DUMPSTER ENCLOSURES
Approximate Transformer Pad
* (2) DRIVE THRU MENU BOARDS
EMERGENCY OVERLAND OVERFLOW ROUTE
MH-1, 6' Dia. Outlet Control Structure R 763.30 12" W 757.20 12" SE 757.10
15' CORNER CLEARANCES (TYP)
PROPOSED "M" DETAIL (156 LF)
EXISTING BUILDING #2890 G.F.F. 763.75
EX ASPHALT PARKING
EX DUMPSTER
MDOT R.O.W.
(SEE SHEET 6)

Note:

THE PATHWAY CROSS SLOPE THROUGH THE APPROACH IS TO MEET ADA STANDARDS OR 2% MAXIMUM CROSS SLOPE

LEGEND

EXISTING	LEGEND	PROPOSED
	STORM SEWER	
	SANITARY SEWER	
	WATERMAIN	
GAS GAS GAS	GAS MAIN	GAS GAS GAS
	ELEC. TELE. CABLE	
⊘	STORM MANHOLE	◐
□	CATCH BASIN	■
◪	INLET	◩
⊠	REARYARD CATCH BASIN	▣
▷	END SECTION	▶
○	SANITARY MANHOLE	●
⊕	GATE VALVE AND WELL	⊕
α	HYDRANT	●
770	CONTOURS	(70)
	MATCH ELEVATION	(M)
	TOP OF CURB	T/C
	TOP OF SIDEWALK	T/S
	TOP OF PAVEMENT	T/P
	TOP OF CONCRETE	TC
	STANDARD CURB	
	REVERSE CURB	
	DOWNSPOUT	D.S.
	ROOF DRAIN	R.D.

Note:

The on-site underground detention system will continue to be outletted to the existing manhole and 12" pipe at the southeast corner of the site (see sheets 5 & 9). The present detention basin also outlets to the same manhole. The City of Rochester Hills has requested we also show the emergency overland overflow route. thus, if the existing 12" outlet pipe became obstructed, then the 'backed up' water would rise out of CB-16 (rim 763.00) and flow overland in a easterly direction to S. Rochester Road.

STATE OF MICHIGAN
PATRICK COLIN McWILLIAMS
LICENSE NO. 6201031658
LICENSED PROFESSIONAL ENGINEER

City File #21-008, Section 27

DATE	ISSUE
8-13-2021	ADDED HYDRANTS FOR FIRE DEPT. (8-13-2021)
9-24-2021	REVISED ENTRANCE APPROACHES PER CLIENT (9-8-2021)
11-15-2021	ADDED PATH DETAIL & SIGHT LINES PER CITY/HRC (10-22-2021)
11-30-2021	REVISE S. ENTRANCE/LOADING ZONE/DUMPSTER PER CLIENT (11-22-2021)
1-19-2021	REVISED PER CITY (12-21-2021), PER MDOT (1-17-2022)
2-24-2022	REVISED PER CITY (2-15-2022)
3-17-2022	REVISED PER CITY (3-15-2022)

Developer/Contractor
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DATE 3-17-2021	CKD. BY	DATE
DRAWN GF		
DESIGN PCM		
SECTION 27	T- 3 -N. R- 11 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Detailed Site Plan - East

"BEBB OAK MEADOWS" MIXED USE DEVELOPMENT
PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 20'
SHEET 5 OF 11
KE 2021.053

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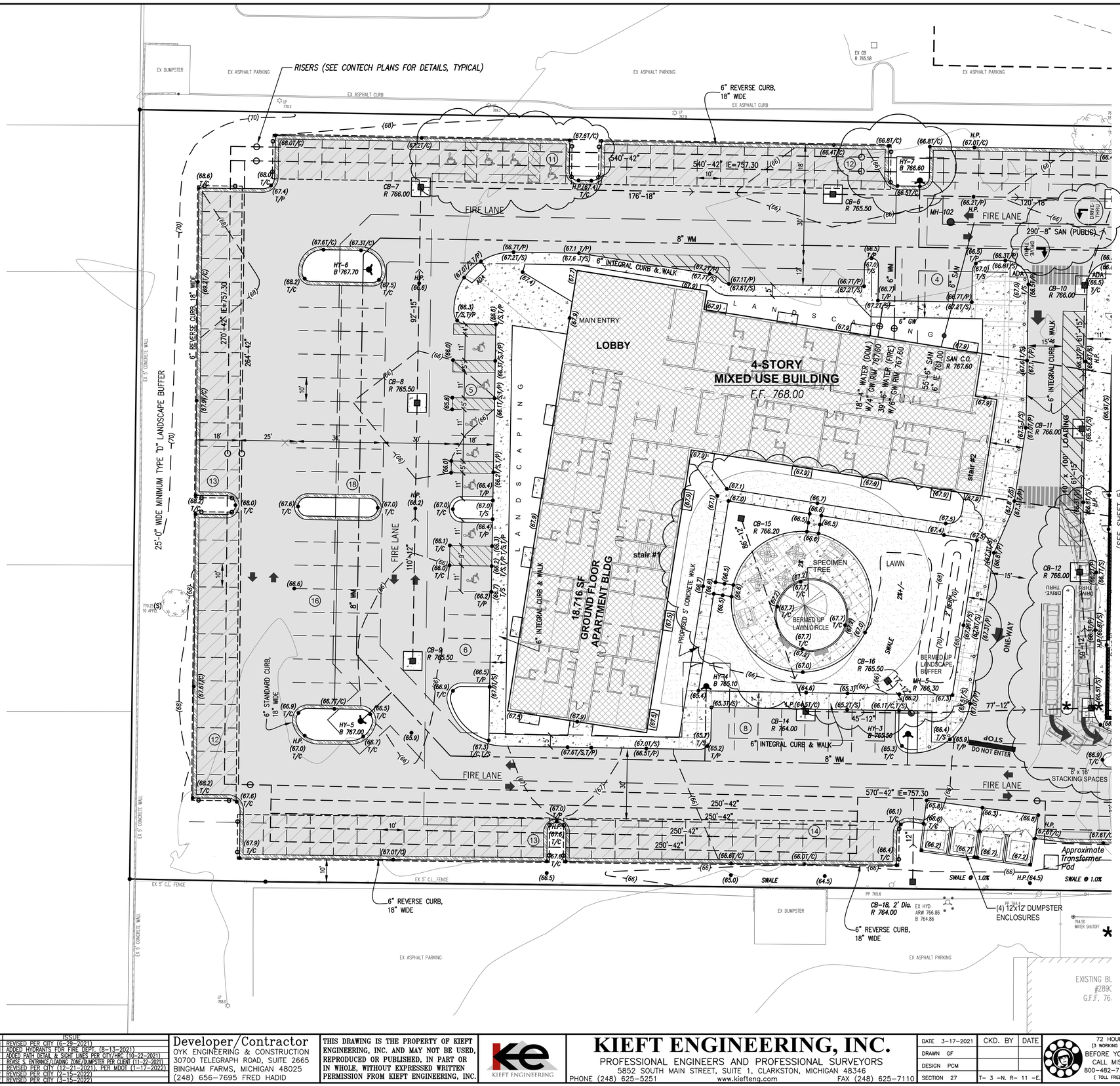

LEGEND

EXISTING		PROPOSED
	STORM SEWER	
	SANITARY SEWER	
	WATERMAIN	
GAS — GAS — GAS	GAS MAIN	GAS — GAS — GAS
	ELEC. TELE. CABLE	
	STORM MANHOLE	
	CATCH BASIN	
	INLET	
	REARYARD CATCH BASIN	
	END SECTION	
	SANITARY MANHOLE	
	GATE VALVE AND WELL	
	HYDRANT	
770	CONTOURS	(70)
	MATCH ELEVATION	(M)
	TOP OF CURB	T/C
	TOP OF SIDEWALK	T/S
	TOP OF PAVEMENT	T/P
	TOP OF CONCRETE	TC
	STANDARD CURB	
	REVERSE CURB	
	DOWNSPOUT	D.S.
	ROOF DRAIN	R.D.

DATE	ISSUE
6-30-2021	REVISED PER CITY (6-29-2021)
8-13-2021	ADDED HYDRANTS FOR FIRE DEPT. (8-13-2021)
11-15-2021	ADDED PATH DETAIL & SIGHT LINES PER CITY/RRC (10-22-2021)
11-30-2021	REVISE S. ENTRANCE/LOADING ZONE/DUMPSTER PER CLIENT (11-22-2021)
1-19-2022	REVISED PER CITY (12-21-2021), PER MDOT (1-17-2022)
2-24-2022	REVISED PER CITY (2-15-2022)
3-17-2022	REVISED PER CITY (3-15-2022)

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DATE	3-17-2021	CKD. BY	DATE
DRAWN	GF		
DESIGN	PCM		
SECTION	27	T- 3 -N, R- 11 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Detailed Site Plan - West

"BEBB OAK MEADOWS" MIXED USE DEVELOPMENT
PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 20'
SHEET 6 OF 11
KE 2021.053

STATE OF MICHIGAN
PATRICK COLIN McWILLIAMS
LICENSE NO. 6201031658
LICENSED PROFESSIONAL ENGINEER

City File #21-008, Section 27

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NOTE: (NORTH ENTRANCE)
"RIGHT-IN, RIGHT-OUT" ONLY
"NO LEFT TURNS" ALLOWED

"HAMPTON VILLAGE CENTRE CONDO" O.C.C.P. NO. 713
15-26-351-016
B-3 + FB-3

RIGHT TURN LANE

NORTHBOUND LANES

ROADWAY OBSERVATION POINT (FROM SOUTH DRIVE)

ROADWAY OBSERVATION POINT (FROM NORTH DRIVE)

TURN LANE

S. Rochester Road (M-150)

VARIABLE WIDTH – 5 LANES ASPHALT W/C.C. & G.–50 MPH (MDOT JURISDICTION)

NOTE:
ENTIRE TURN LANE SHALL BE REPLACED 'IN-KIND' WITH CROSS-SECTION TO MATCH EXISTING

Proposed Sanitary Sewer Connection:
'OPEN CUT' TO INSTALL 8" SANITARY SEWER SDR 26 PVC W/TRENCH BOX WITHIN MDOT R.O.W. INCLUDING MANHOLE OVER 15' SEWER WITHIN R.O.W.
LENGTH OF TRENCH - 12 LF
WIDTH OF TRENCH – 8 LF
DEPTH OF TRENCH – 15 FT
Proposed MH–101 W/CONCRETE COLLAR RIM 763.30 3' FROM B.O.C. (EXTENSION) TO EXCAVATION PIT

PROPOSED 6' HMA ON 10'-21A/AA (TYPICAL)

Proposed Watermain Connection:
'OPEN CUT' TO INSTALL 8" WATERMAIN D.I. CL54 W/TRENCH BOX WITHIN MDOT R.O.W. INCLUDING ONE 8" GATEWELL, ONE 12 GATEWELL & ONE TAP & SLEEVE WITHIN R.O.W.
LENGTH OF TRENCH - 30 LF
WIDTH OF TRENCH - 6 LF
DEPTH OF TRENCH - 6.5 FT
Proposed 8" GW–2 W/TAP & SLEEVE B 763.80
Proposed 12" GW–1 OVER EXISTING 12" WM B 763.80 3' FROM B.O.C. TO EXCAVATION PIT

Lower Sanitary Rim:
'OPEN CUT' TO LOWER RIM OF EXISTING SANITARY MANHOLE WITHIN MDOT R.O.W. TO 763.40
LENGTH OF DISRUPTION - 6 LF
WIDTH OF DISRUPTION - 6 LF
DEPTH OF DISRUPTION - 2 FT

33' WIDE EASEMENT GRANTED TO OAKLAND COUNTY FOR SANITARY SEWER AND ROAD PURPOSES AS REC. IN L. 7164, P. 523 & 531, O.C.R.

(DRIVER) ROADWAY OBSERVATION POINT

15' CORNER CLEARANCES (TYP)

(SEE CONTINUATION BOTTOM LEFT)

ROADWAY SIGHT DISTANCE LINE PROVIDED DISTANCE = >590'+ (FROM NORTH DRIVE)

ROADWAY SIGHT DISTANCE LINE PROVIDED DISTANCE = >590'+ (FROM SOUTH DRIVE)

MDOT R.O.W.

"ROCHESTER AUTOMOTIVE CONDOMINIUM" O.C.C.P. NO. 2206

PATHWAY SIGHT DISTANCE LINE PROVIDED DISTANCE = >140'+ (FROM NORTH DRIVE)

15-27-477-067
B-5 + FB-3

15-27-477-068
B-5 + FB-3

(DRIVER) PATHWAY OBSERVATION POINT

PATHWAY SIGHT DISTANCE LINE PROVIDED DISTANCE = >140'+ (FROM NORTH DRIVE)

PATHWAY SIGHT DISTANCE LINE PROVIDED DISTANCE = >140'+ (FROM SOUTH DRIVE)

(DRIVER) PATHWAY OBSERVATION POINT

REQUIRED SIGHT DISTANCES:
(PARAMETERS: SPEED LIMIT = 50 MPH, 4 OR 5 LANE ROAD)
ROADWAY (VEHICLE SIGHT DISTANCE REQUIRED = 590 LF
PATHWAY (BIKE, ETC.) SIGHT DISTANCE REQUIRED = 140 LF

"HAMPTON VILLAGE CENTRE CONDO" O.C.C.P. NO. 713
15-26-351-016
B-3 + FB-3

(SEE CONTINUATION TOP RIGHT)

RIGHT TURN LANE

S. Rochester Road (M-150)

VARIABLE WIDTH – 5 LANES ASPHALT W/C.C. & G.–50 MPH (MDOT JURISDICTION)

Proposed 6" Watermain Connection:
'OPEN CUT' TO INSTALL 6" WATERMAIN D.I. CL54 W/TRENCH BOX WITHIN MDOT R.O.W. INCLUDING 6' GATEWELL & HYDRANT WITHIN R.O.W.
LENGTH OF TRENCH - 12 LF
WIDTH OF TRENCH - 6 LF
DEPTH OF TRENCH - 6.5 FT

33' WIDE EASEMENT GRANTED TO OAKLAND COUNTY FOR SANITARY SEWER AND ROAD PURPOSES AS REC. IN L. 7164, P. 523 & 531, O.C.R.

Proposed 8" Watermain Connection:
'OPEN CUT' TO INSTALL 8" WATERMAIN D.I. CL54 W/TRENCH BOX WITHIN MDOT R.O.W. INCLUDING CONNECTION TO EXISTING 8" GATEWELL WITHIN R.O.W.
LENGTH OF TRENCH - 22 LF
WIDTH OF TRENCH - 6 LF
DEPTH OF TRENCH - 6.5 FT

ROADWAY OBSERVATION POINT (FROM SOUTH DRIVE)

ROADWAY OBSERVATION POINT (FROM NORTH DRIVE)

ROADWAY SIGHT DISTANCE LINE PROVIDED DISTANCE = >590'+ (FROM NORTH DRIVE)

TURN LANE

SOUTHBOUND LANES

(DRIVER) ROADWAY OBSERVATION POINT

5' FROM B.O.C. (EXTENSION) TO EXCAVATION PIT

(DRIVER) ROADWAY OBSERVATION POINT

15' CORNER CLEARANCES (TYP)

Proposed HY–1 B 763.50 W/TAP & SLEEVE B 763.50

4' FROM B.O.C. TO EXCAVATION PIT

18' FROM B.O.C. TO EXCAVATION PIT

ROADWAY SIGHT DISTANCE LINE PROVIDED DISTANCE = >590' (FROM SOUTH DRIVE)

MDOT R.O.W.

PATHWAY OBSERVATION POINT (FROM SOUTH DRIVE)

PATHWAY SIGHT DISTANCE LINE PROVIDED DISTANCE = >140'+ (FROM SOUTH DRIVE)

Proposed 12" Storm Sewer Connection:
'OPEN CUT' TO INSTALL 12" STORM SEWER C76 CL4 W/TRENCH BOX WITHIN MDOT R.O.W. INCLUDING CONNECTION TO EXISTING MANHOLE WITHIN R.O.W.
LENGTH OF TRENCH - 10 LF
WIDTH OF TRENCH - 6 LF
DEPTH OF TRENCH - 6 FT

SERRA FORD ROCHESTER HILLS
15-27-477-066
B-3 + FB-3

(DRIVER) PATHWAY OBSERVATION POINT

PATHWAY SIGHT DISTANCE LINE PROVIDED DISTANCE = >140'+ (FROM NORTH DRIVE)

PATHWAY SIGHT DISTANCE LINE PROVIDED DISTANCE = >140'+ (FROM SOUTH DRIVE)

Note:
The on-site underground detention system will continue to be outletted to the existing manhole and 12" pipe at the southeast corner of the site (see sheets 5 & 9). The present detention basin also outlets to the same manhole. The City of Rochester Hills has requested we also show the emergency overland overflow route. thus, if the existing 12" outlet pipe became obstructed, then the 'backed up' water would rise out of CB-16 (rim 763.00) and flow overland in a easterly direction to S. Rochester Road.

PATRICK COLIN McWILLIAMS LICENSE NO. 6201031658 PROFESSIONAL ENGINEER STATE OF MICHIGAN

City File #21-008, Section 27

DATE	ISSUE
11-15-2021	ADDED PATH DETAL & SIGHT LINES PER CITY/RRC (10-22-2021)
11-30-2021	REVISE S. ENTRANCE/LINDING ZONE/DUMPSTER PER CLIENT (11-22-2021)
1-18-2021	REVISED PER CITY (12-21-2021), PER MDOT (1-17-2022)
3-17-2022	REVISED PER CITY (3-15-2022)

Developer/Contractor
OYK ENGINEERING & CONSTRUCTION
30700 TELEGRAPH ROAD, SUITE 2665
BINGHAM FARMS, MICHIGAN 48025
(248) 656–7695 FRED HADID

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625–5251 www.kiefteng.com FAX (248) 625–7110

DATE	3–17–2021	CKD. BY	DATE
DRAWN	GF		
DESIGN	PCM		
SECTION	27	T– 3 –N. R– 11 –E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800–482–7171 (TOLL FREE)

Rochester Road Entrance Plan
"BEBB OAK MEADOWS" MIXED USE DEVELOPMENT
PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SCALE	1" = 20'
SHEET	7 OF 11
KE	2021.053

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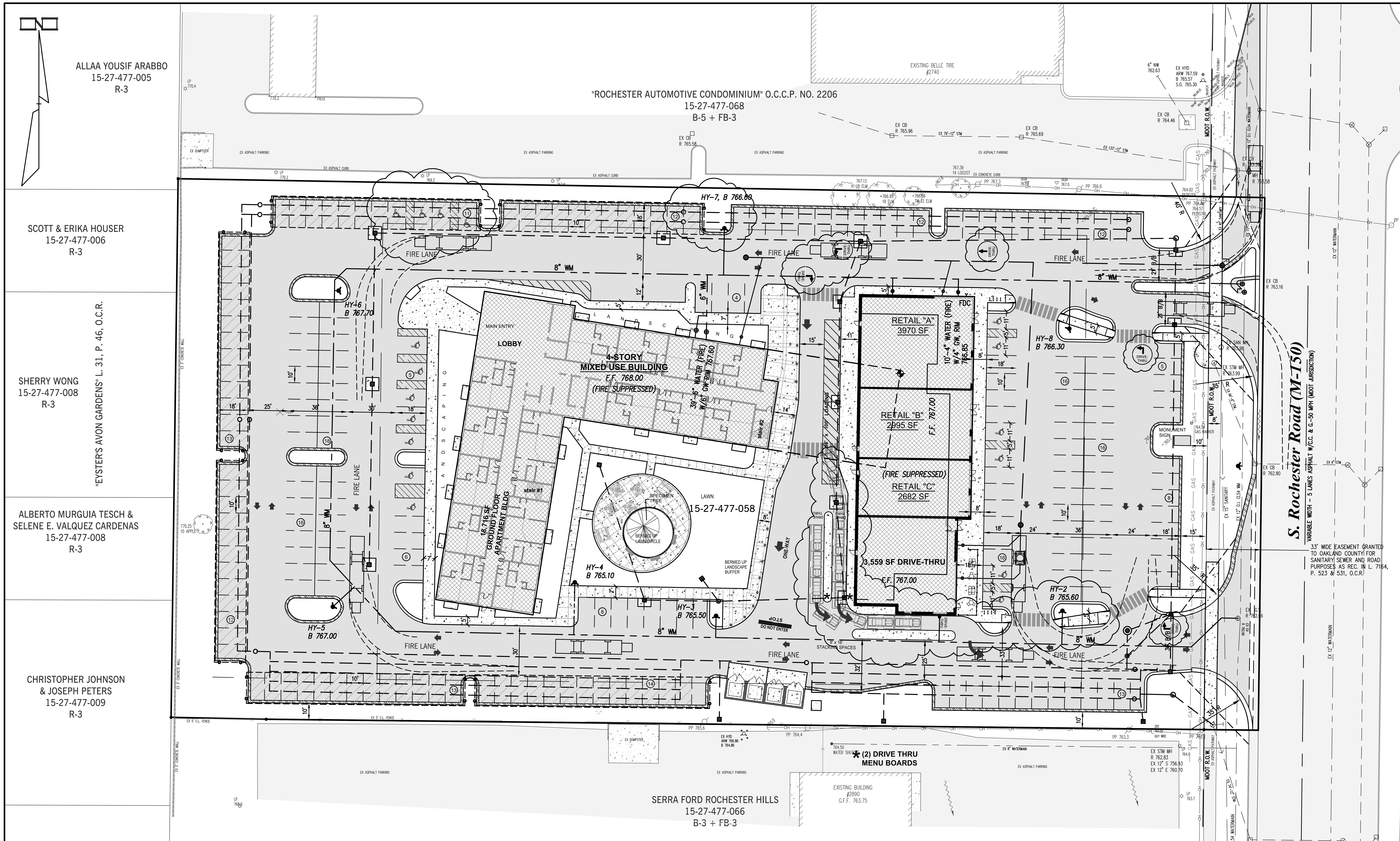

LEGEND

EXISTING	LEGEND	PROPOSED
	STORM SEWER	
	SANITARY SEWER	
	WATERMAIN	
GAS	GAS MAIN	GAS
	ELEC. TELE. CABLE	
	STORM MANHOLE	
	CATCH BASIN	
	INLET	
	REARYARD CATCH BASIN	
	END SECTION	
	SANITARY MANHOLE	
	GATE VALVE AND WELL	
	HYDRANT	
770	CONTOURS	(70)
	MATCH ELEVATION	(M)
	TOP OF CURB	T/C
	TOP OF SIDEWALK	T/S
	TOP OF PAVEMENT	T/P
	TOP OF CONCRETE	TC
	STANDARD CURB	
	REVERSE CURB	
	DOWNSPOUT	D.S.
	ROOF DRAIN	R.D.

Notes:

1. UPDATED "NO STOPPING STANDING OR PARKING FIRE LANE" SIGNS MUST BE PROVIDED THROUGHTOUT THE SITE.

2. ALL ACCESSIBLE PARKING SPACES SHALL BE IDENTIFIED BY SIGNS PER ICCA117.1-2009, SECTION 502.7.

3. M.D.O.T. R.O.W. USE PERMIT IS REQUIRED.

4. CITY OF ROCHESTER HILLS R.O.W. PERMIT IS REQUIRED.

5. O.C.W.R.C. SOIL EROSION PERMIT IS REQUIRED.

6. ALL PROPOSED SIGNS MEET SECTION 138-8.603 AND CHAPTER 134 OF THE CITY CODE OF ORDINANCES AND WILL BE APPROVED UNDER A SEPARATE PERMIT ISSUED BY THE BUILDING DEPARTMENT.

7. THIS IS CONSTRUCTION TYPE 11B WITH 121,796 SF.

FIRE PROTECTION PLAN NOTES:

- A Knox Key system shall be installed in a location approved by the Fire Code Official. Ordering information is available from the Knox Company at www.knoxbox.com - IFC 2006 sec. 1028.2.
- Fire Lanes shall be designated by the Fire Code Official, and shall be conspicuously posted on both sides of the fire lane, with fire lane signs, spaced .not more than 100 feet apart. Fire Lane signs shall read "No Stopping, Standing, Parking, Fire Lane" and shall conform to the Michigan manual of Uniform Traffic Control Devices - Fire Prevention Ordinance Chapter 58, sec. 503.
- Construction sites shall be safeguarded in accordance with IFC 2006 Chapter 14.
- Open Burning is not permitted, including the burning of trash, debris, or land clearing materials . Open burning for warming of s·and and/ or water for the preparation of mortar shall be within the City of Rochester Hills Burn Permit Guidelines - Fire Prevention Ordinance Chapter 58, sec. 307.6.2 & 307.6.2.3.
- Provide a "No Parking Fire Department Connection" sign over the Fire Department Connection.
- Provide a sign above the FDC indicating that they FDC supplies water to the entire structure with a map of the outline of the structure.
- Exit doors shall remain free of obstruction sat all times. Provide guard posts or other acceptable means of protecting exit doors opening onto drives and parking areas.
- FDC's shall not be obstructed by landscaping, parking, or by any other permanent or temporary materials or devices.
- If the Fire Department Connection is not located on the street of the building, a white/clear strobe light shall be tied into the fire alarm system and installed over the FDC.

STATE OF MICHIGAN
PATRICK COLIN McWILLIAMS
LICENSE NO. 6201031658
LICENSED PROFESSIONAL ENGINEER

City File #21-008, Section 27

DATE	ISSUE
8-13-2021	ADDED HYDRANTS FOR FIRE DEPT. (8-13-2021)
9-24-2021	REVISED ENTRANCE APPROACHES PER CLIENT (9-8-2021)
11-15-2021	ADDED PATH DETAIL & SIGHT LINES PER CITY/HRC (10-22-2021)
11-30-2021	REVISE S. ENTRANCE/LOADING ZONE/DUMPSTER PER CLIENT (11-22-2021)
1-19-2021	REVISED PER CITY (12-21-2021), PER MDOT (1-17-2022)
2-24-2022	REVISED PER CITY (2-15-2022)
3-17-2022	REVISED PER CITY (3-15-2022)

Developer/Contractor
OYK ENGINEERING & CONSTRUCTION
30700 TELEGRAPH ROAD, SUITE 2665
BINGHAM FARMS, MICHIGAN 48025
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DATE 3-17-2021	CKD. BY	DATE
DRAWN GF		
DESIGN PCM		
SECTION 27	T- 3 -N. R- 11 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Fire Protection Plan

"BEBB OAK MEADOWS" MIXED USE DEVELOPMENT
PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 30'
SHEET 8 OF 11
KE 2021.053

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"C" Calculations:

TOTAL SITE AREA = 4.71 ACRES
GREENBELTS = 1.09 ACRES @ C=0.25
PAVEMENT = 2.92 ACRES @ C=0.95
ROOFS = 0.70 ACRES @ C=0.95

$$\text{"C"} = \left(\frac{0.70 \text{ Ac} \times 0.95}{4.71 \text{ Acres}}\right) + \left(\frac{2.92 \text{ Ac} \times 0.95}{4.71 \text{ Acres}}\right) + \left(\frac{1.09 \text{ Ac} \times 0.25}{4.71 \text{ Acres}}\right) = 0.788 = \underline{0.79}$$

25 YEAR DETENTION BASIN CALCULATIONS (i.e. WITH OUTLET)

ONSITE CONTRIBUTING AREA = 4.71 ACRES
OFFSITE CONTRIBUTING AREA = 0.00
TOTAL CONTRIBUTING AREA = 4.71 ACRES
RUNOFF COEFFICIENT (C) = 0.79

Q_A = (0.20)(4.71 ACRES) = 0.942 C.F.S.

$Q_O = \frac{Q_A}{(A)(C)} = \frac{0.942}{(4.71)(0.79)} = 0.253$

$T = -25 + \sqrt{\frac{8,062.50}{Q_O}} = 153.46$ MINUTES

$V_S = \frac{12,900\ T}{T + 25} - 40\ Q_O\ T = 9,539$ C.F./ACRE

V_T REQ'D = V_S (C)(A) = (9,539)(0.79)(4.71) = 35,494 C.F. REQ'D.

VOLUME PROVIDED: USING 42" DIAMETER PIPE

(3,784 LF) x (9.621 CF/LF) = 36,405 CF PROVIDED

ORIFICE FORMULA

$Q_A = 0.62\ (A_O)(2gH)^{1/2}$

A_O = AREA OF ORIFICE PIPE
g = 32.2 FT./SEC.^{2}
H = DEPTH OF BASIN ABOVE CENTERLINE OUTLET PIPE = [760.80 – (759.92 + $\frac{5\ 1/2"}{2}$ = 760.15) = 0.65']

$A_O = \frac{Q_A}{0.62\ (2GH)^{1/2}} = \frac{0.942-0.292\ =\ 0.65}{0.62\ [(2)(32.2)(\ 0.65\ )]^{1/2}} = 0.1620$ SF

DIAMETER ORIFICE (D_O): $D_O = \sqrt{\frac{4(A_O)}{TT}} \sqrt{\frac{(4)(0.1620)}{TT}} = 0.454$ FT.= 5.45 INCH

HOWEVER, USE 5 1/2" RESTRICTION

THUS, $Q_A = (0.62)(0.1620)(\sqrt{(2)(32.2)(0.65)}) = 0.65$

UNDERGROUND DETENTION BASIN (42" DIAMETER PIPES):
EXISTING WATER ELEVATION = NONE
DESIGN HIGH WATER ELEVATION = 760.80
1.00' FREEBOARD ELEVATION = 761.80
STORAGE REQUIRED = 35,494 CF
STORAGE PROVIDED = 36,405 CF (BETWEEN 757.30 UPTO 760.80)
TIME TO DRAIN = 35,494 CF/0.942 CFS = 37,679 SECONDS/3600 SEC/HR = 10.47 HOURS

BANK FULL VOLUME CALCULATION:
VOLUME REQUIRED = 6,788(A)(C)
= (6,788)(4.71 Ac)(0.79) = 25,258 CF

REQUIRED AREA PER LF = 25,258 CF/3,784 LF(OF 42" PIPE) = 6.68 SF
(3.5') 42" DETENTION PIPE INVERT = 757.30
REQUIRED WATER DEPTH = 75% (3.5') = 2.62' + 757.30 = 759.92

BANK FULL ORIFICE FORMULA

$Q_A = 0.62\ (A_O)(2gH)^{1/2}$

A_O = AREA OF ORIFICE PIPE
g = 32.2 FT./SEC.^{2}
H = DEPTH OF BASIN ABOVE CENTERLINE OUTLET PIPE = [759.92 – (757.30 + $\frac{2.75"}{2}$ = 757.53) = 2.39']

$A_O = \frac{Q_A}{0.62\ (2GH)^{1/2}} = \frac{0.292}{0.62\ [(2)(32.2)(2.39)]^{1/2}} = 0.0379$ S.F.

DIAMETER ORIFICE (D_O): $D_O = \sqrt{\frac{4(A_O)}{TT}} \sqrt{\frac{(4)(0.0379)}{TT}} = 0.2198$ FT. = 2.64 INCH

USE 2.75" MINIMUM RESTRICTION

THUS, $Q_A = (0.62)(0.0379)(\sqrt{(2)(32.2)(2.39)}) = 0.292$

10 YEAR SPILLWAY DESIGN (WITHIN MH-1)

$I_{10\ YR} = \frac{175}{T+25}$; T = 17.00; I = $\frac{175}{17.00} = 4.17$

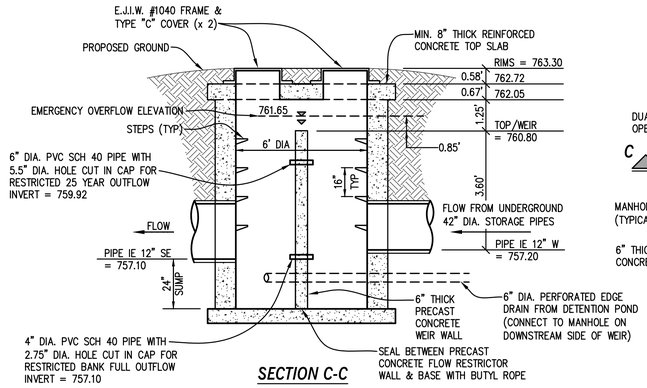
Q REQUIRED = ACI = (4.71 Ac.)(0.79)(4.17) = 15.52 C.F.S. REQUIRED

Q PROVIDED = 3.367 LH 3/2; TRY H = 0.50'

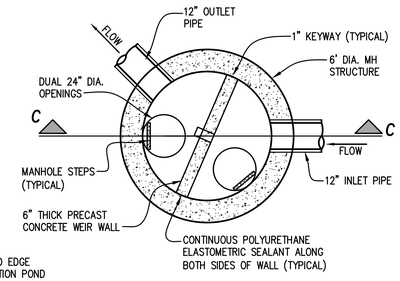
Q = (3.367)(6')(0.85)$^{3/2}$ = 15.83 CFS PROVIDED, OK!

RESTRICTION CALCULATION:

OC Restrictor Sizing:
Storage Elevation = 760.80
Outlet Elevation = 757.30
Hmax = 3.50 ft.
Bank Full Outlet Restriction:
Bank Full Volume = 6,788 A*C = 25,258 cf
Required Area per LF = 6.68 sf
Detention Pipe Invert = 757.30
Water Depth in Pipe = 2.62 ft
Zbf = 759.92
Release Between 24 and 48 Hours:
Qavg (24 hours) = 0.292 cfs
Havg (0.667*Zbf-Zout) = 1.75 ft
A = (Qavg/((0.62*(32.2*2*Havg)^0.5) = 0.0379 sf
BF Hole Dia. Provided = 2.75 in
BF Hole Area Provided = 0.0379 sf
Qact bf = 0.292 cfs
Actual Holding Time = (Vbf/Qact*3600) = 24.03 hrs
25 Year Outlet Restriction:
Qallow = 0.942 cfs
Qbf = 0.292 cfs
Qadjusted = (Qallow-Qbf) = 0.65
A = (Qadjusted/((0.62*(32.2*2*Hmax)^0.5) = 0.1620 sf
25 Year Hole Dia. Provided = 5.50 in
25 Year Hole Area Provided = 0.1620 sf
Qactual (total) = 0.942 cfs </= 0.942

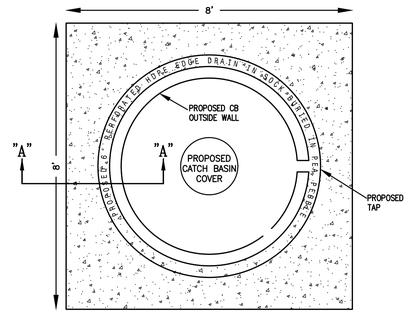


SECTION C-C

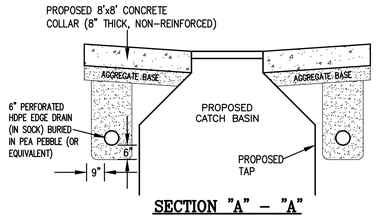


PLAN VIEW

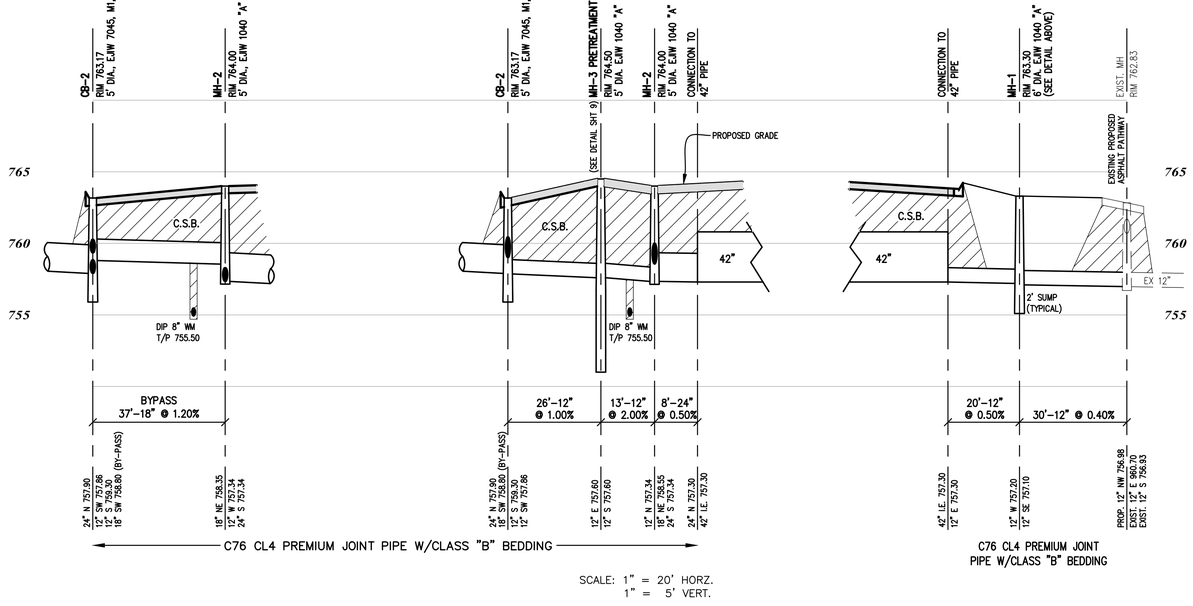
6' DIA. OUTLET CONTROL STRUCTURE MH-1 DETAIL



8" CONCRETE COLLAR & 6" EDGE DRAIN PLAN DETAIL & SECTION
SCALE: 1" = 2'



SECTION "A" – "A"



SCALE: 1" = 20' HORZ.
1" = 5' VERT.

Not to be Used as Construction Drawings

STATE OF MICHIGAN
PATRICK COLIN McWILLIAMS
LICENSE NO. 6201031658
REGISTERED PROFESSIONAL ENGINEER

City File #21-008, Section 27

DATE	ISSUE
3-19-2021	REVISED PER ARCHITECT
5-12-2021	REVISED PER CITY (4-15-2021)
6-30-2021	NO CHANGES
11-15-2021	ADDED PATH DETAIL & SIGHT LINES PER CITY/HRC (10-22-2021)
11-30-2021	REVISE S. ENTRANCE/LOADING ZONE/DUMPSTER PER CLIENT (11-22-2021)

Developer/Contractor
OYK ENGINEERING & CONSTRUCTION
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DATE	3-17-2021	CKD. BY	DATE
DRAWN	GF		
DESIGN	PCM		
SECTION	27	T- 3 -N. R- 11 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Storm Sewer, Detention Calculations & Details

"BEBB OAK MEADOWS" MIXED USE DEVELOPMENT
PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SCALE	N/A
SHEET	9 OF 11
	KE 2021.053

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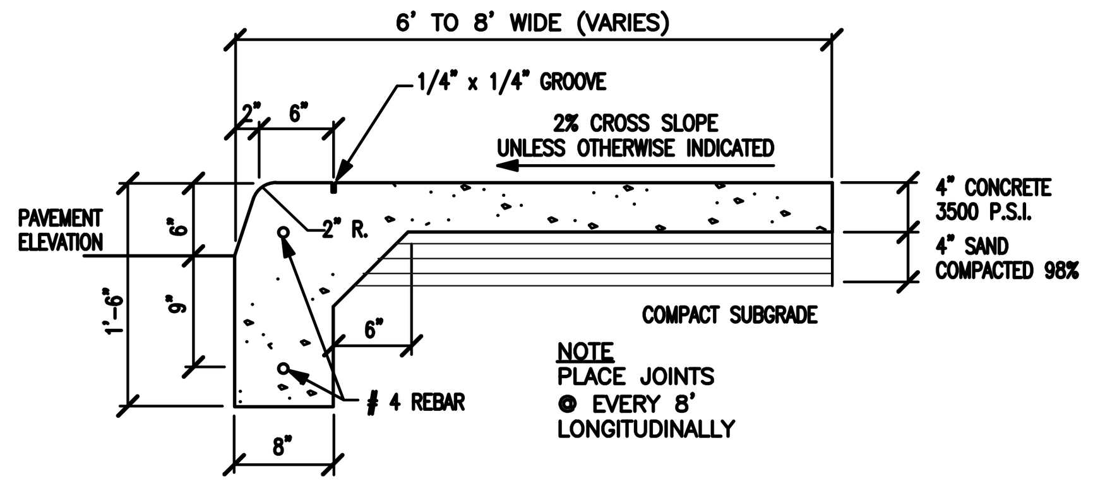
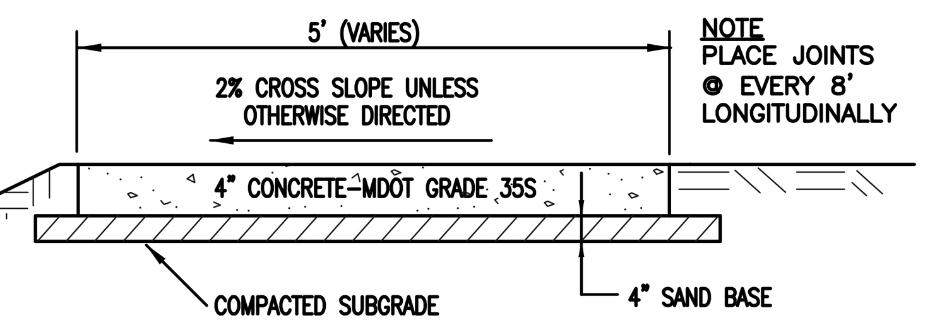
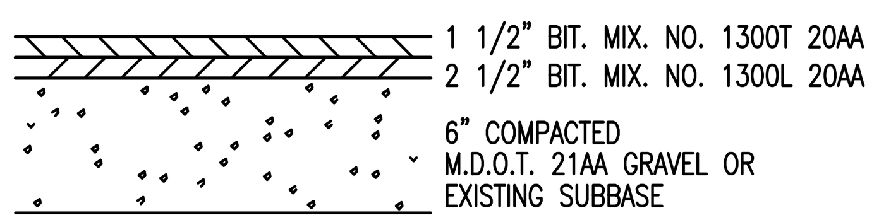


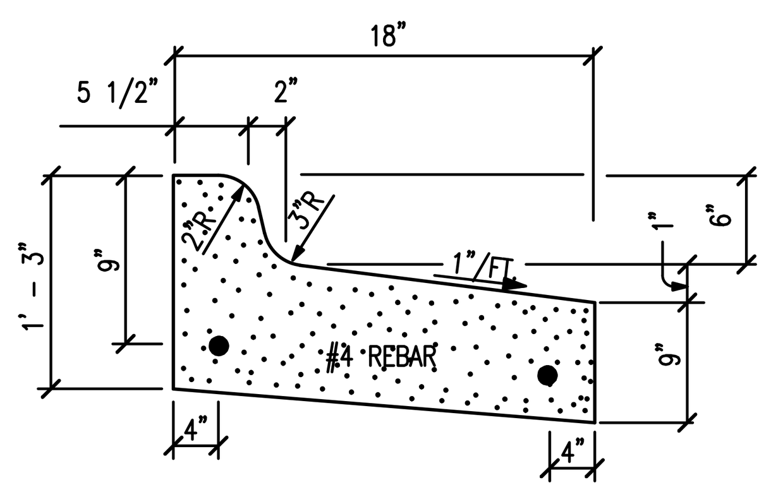
INTEGRAL CURB & WALK
NO SCALE



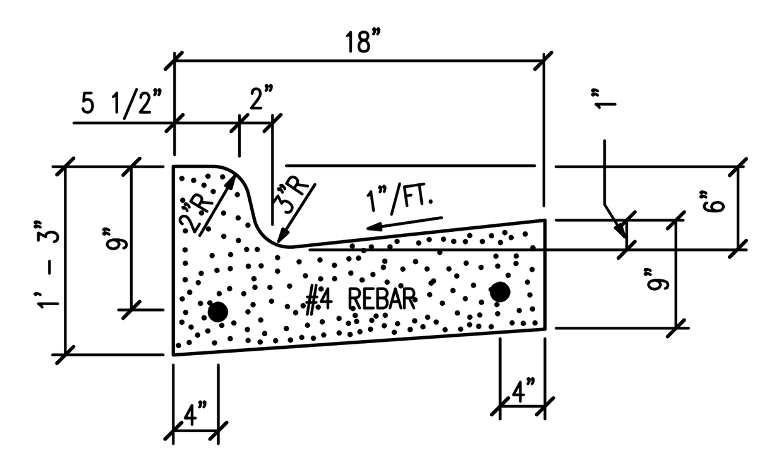
CONCRETE SIDEWALK (ON-SITE)
NO SCALE



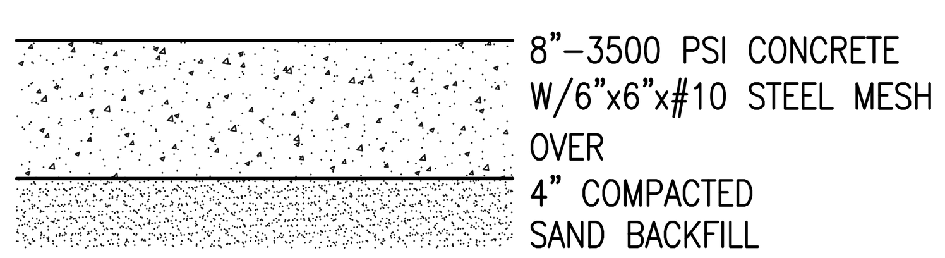
PAVEMENT SECTION-ONSITE
NO SCALE



STRAIGHT FACED CURB AND GUTTER (REVERSE)
NO SCALE



STRAIGHT FACED CURB AND GUTTER
NO SCALE



8" Concrete Pad Detail

ON-SITE SANITARY SEWER DESIGN

APARTMENT BUILDING: 93 UNITS
UNIT FACTOR = (0.60/UNIT) x (93 UNITS) = 55.8

GENERAL RETAIL BUILDING: 9,660 SF
UNIT FACTOR = (0.04/1000 SF) x (9,660 SF) = 0.39

DRIVE-THRU RESTAURANT: 3,782 SF
UNIT FACTOR = 1.00

TOTAL UNIT FACTOR = 55.8+0.39+1.00 = 57.19 = 58

THUS, (58 UNIT FACTOR)(2.44 PERSONS/UNIT FACTOR) = 142 PERSONS

SANITARY DESIGN

"AVERAGE FLOW"

142 PERSONS x 100 GPCD = 14,200 GPD = 0.0142 MGPD
x 1.55 (conversion)
Q = 0.0220 CFS

"PEAK FLOW"

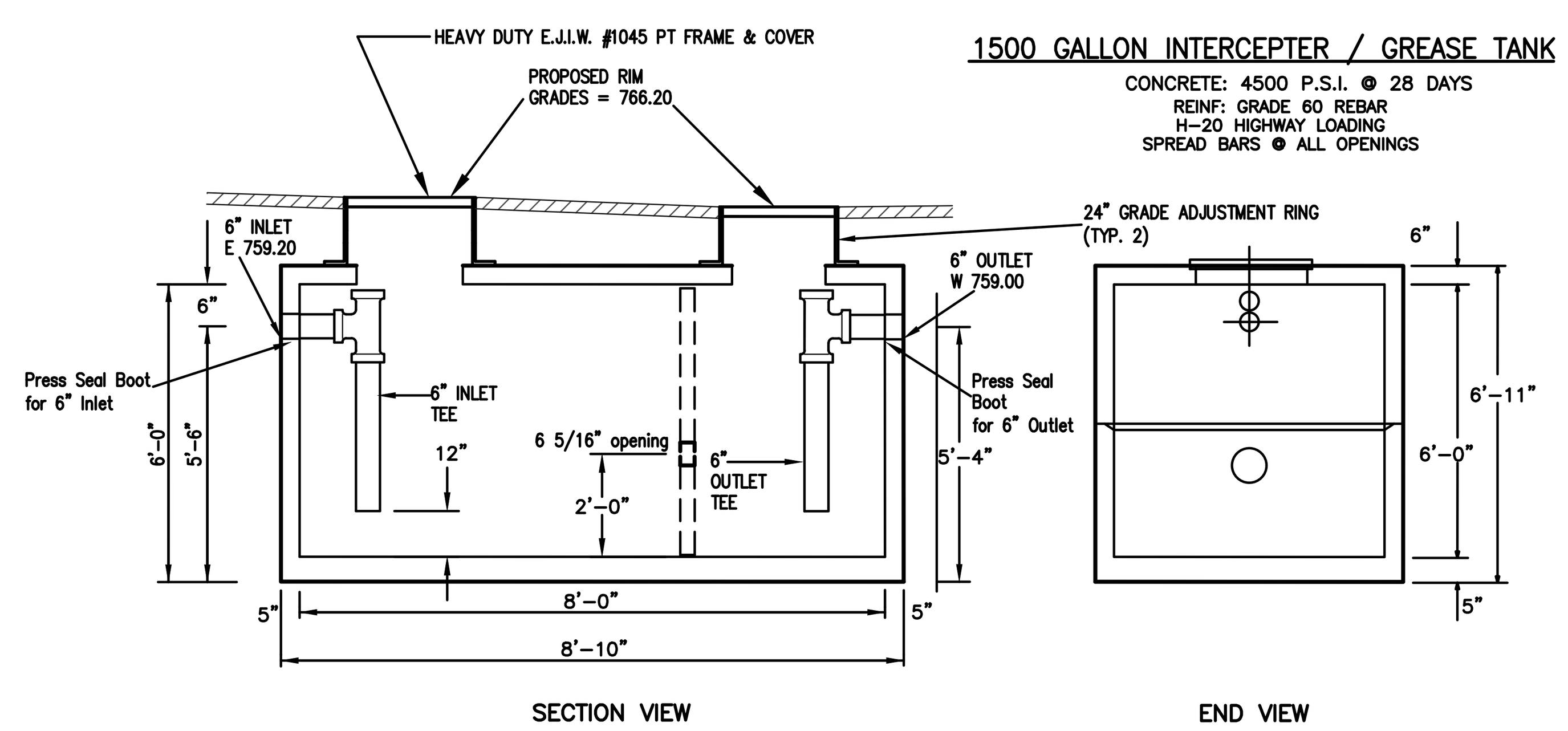
142 PERSONS/1000 = 0.142
$Q = 100 \times (18 + \sqrt{P})/(4 + \sqrt{P}) = 419.87$ GPCD

142 PERSONS x 419.87 GPCD = 59,621.54 GPD = 0.059621 MGPD
x 1.55 (conversion)
Q = REQUIRED = 0.0924 CFS

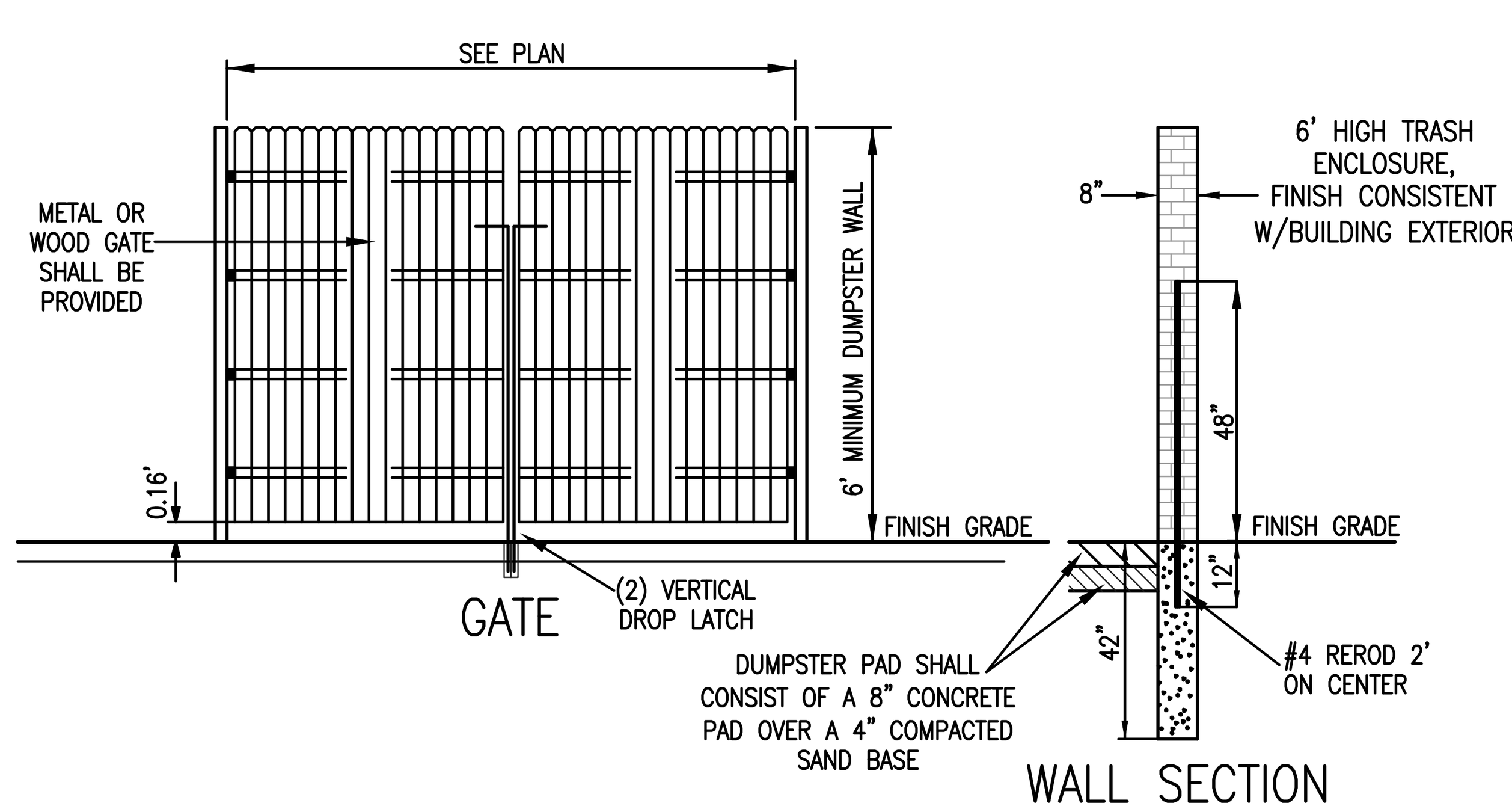
NOTE: AN 8" TRUSS PIPE @ 0.40% (MINIMUM) CAN CARRY 0.765 CFS @ 2.19 FPS
A 10" TRUSS PIPE @ 0.30% (MINIMUM) CAN CARRY 1.19 CFS @ 2.19 FPS

1500 GALLON INTERCEPTER / GREASE TANK

CONCRETE: 4500 P.S.I. @ 28 DAYS
REINF: GRADE 60 REBAR
H-20 HIGHWAY LOADING
SPREAD BARS @ ALL OPENINGS



1500 GALLON HEAVY DUTY GREASE TRAP INTERCEPTOR



Dumpster Detail
NOT TO SCALE

STATE OF MICHIGAN
PATRICK COLIN McWILLIAMS
LICENSE NO. 6201031658
LICENSED PROFESSIONAL ENGINEER

Project: Mixed Use Development
Location: *Rochester Hills, MI*
Prepared For: Kieft Engineering, Inc.

CONTECH ENGINEERED SOLUTIONS

Purpose: To calculate the first flush runoff flow rate (WQF) over a given site area. In this situation the WQV to be analyzed is the runoff produced by the first 0.5" of rainfall.

Reference: United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Given:

Structure Name	A (acres)	A (miles²)*	Runoff Coefficient	Percent Imp. (%)*	t_c (min)	t_c (hr)
WQU	4.71	0.00736	0.79	81.67	15.0	0.250

* Assumes runoff coefficient of 0.3 for pervious areas and 0.9 for impervious areas.

Procedure:
The Water Quality Flow (WQF) is calculated using the Water Quality Volume (WQV). This WQV, converted to watershed inches, is substituted for the runoff depth (Q) in the Natural Resources Conservation Service (formerly Soil Conservation Service), TR-55 Gr

1. Compute WQV in watershed inches using the following equation:

$$WQV = P * R$$

where: WQV = water quality volume (watershed inches)
P = design precipitation (inches)
R = volumetric runoff coefficient = 0.05 + 0.009(I)
I = percent impervious cover

Structure Name	Percent Imp. (%)	R	P (in)	WQV (in)	WQV (CF)
WQU	81.67	0.785	0.5	0.393	6,710.69
					-
					-

2. Compute the NRCS Runoff Curve Number (CN) using the following equation, or graphically using Figure 2-1 from TR-55 (USDA, 1986):

$$CN = 1000 / [10+5P+10Q-10(Q^2+1.25QP)^{1/2}]$$

where: CN = Runoff Curve Number
P = design precipitation (inches)
Q = runoff depth (watershed inches)

Structure Name	Q (in)	CN
WQU	0.393	98.96

3. Using computed CN, read initial abstraction (I_a) from Table 4-1 in Chapter 4 of TR-55; compute I_a/P, interpolating when appropriate.

Structure Name	I_a (in)	I_a/P
WQU	0.041	0.082

4. Compute the time of concentration (t_c) in hours and the drainage area in square miles. A minimum t_c of 0.167 hours (10 minutes) should be used.

Structure Name	t_c (hr)	A (miles²)
WQU	0.250	0.00736

5. Read the unit peak discharge (q_u) from Exhibit 4-II in Chapter 4 of TR-55 for appropriate t_c for type II rainfall distribution.

Structure Name	t_c (hr)	I_a/P	q_u (csm/in)
WQU	0.250	0.082	731

6. Substituting WQV (watershed inches) for runoff depth (Q), compute the water quality flow (WQF) from the following equation:

$$WQF = (q_u)*(A)*(Q)$$

where: WQF = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi²/inch)
A = drainage area (mi²)
Q = runoff depth (watershed inches)

Structure Name	q_u (csm/in)	A (miles²)	Q (in)	WQF (cfs)
WQU	731	0.00736	0.393	2.11

Estimated Net Annual Solids Load Reduction
Based on the Rational Rainfall Method

Mixed Use Development
Rochester Hills, MI
Water Quality Unit

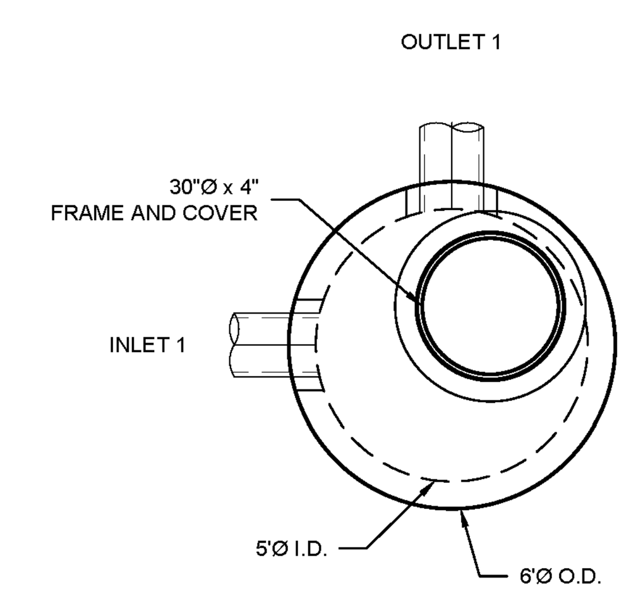
CONTECH ENGINEERED SOLUTIONS — CDS

AREA (acres): 4.71
WEIGHTED C: 0.79
Tc (minutes): 15

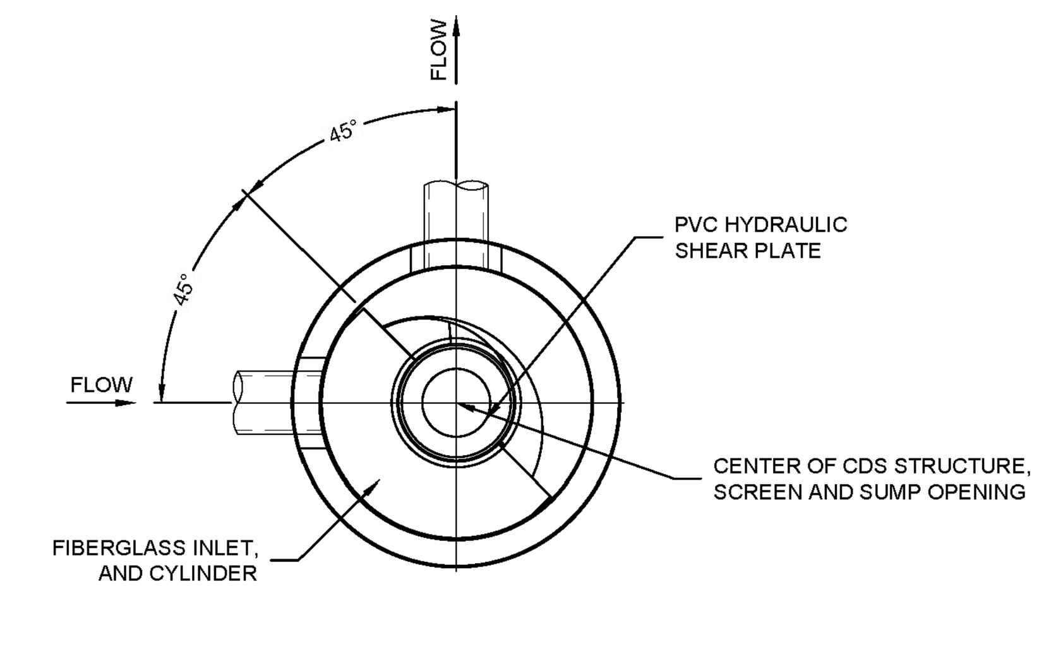
CDS MODEL: 2025
PARTICLE SIZE (μm): 110

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Removal Efficiency (%)	Incremental Removal (%)
0.02	13.13%	13.1%	0.07	100.00	13.13
0.04	11.36%	24.5%	0.15	99.17	11.27
0.06	10.08%	34.6%	0.22	98.07	9.88
0.08	7.49%	42.1%	0.30	96.96	7.26
0.10	7.01%	49.1%	0.37	95.86	6.72
0.12	5.37%	54.4%	0.45	94.75	5.09
0.14	4.73%	59.2%	0.52	93.65	4.43
0.16	4.13%	63.3%	0.60	92.54	3.82
0.18	3.53%	66.8%	0.67	91.44	3.23
0.20	2.99%	69.8%	0.74	90.33	2.70
0.25	5.50%	75.3%	0.93	87.57	4.82
0.30	4.47%	79.8%	1.12	84.81	3.79
0.35	3.85%	83.6%	1.30	82.04	3.16
0.40	2.16%	85.8%	1.49	79.3	1.7
0.45	2.09%	87.9%	1.67	74.2	1.6
0.50	1.31%	89.2%	1.86	66.8	0.9
0.75	5.07%	94.3%	2.79	44.5	2.3
1.00	2.58%	96.9%	3.72	33.4	0.9
1.50	2.50%	99.4%	5.58	22.3	0.6
2.00	0.51%	99.9%	7.44	16.7	0.1
2.54	0.15%	100.0%	9.45	13.1	0.0
					87.21
				Predicted % Annual Rainfall Treated =	93.8%
				Predicted Net Annual Load Removal Efficiency =	**87.2%**

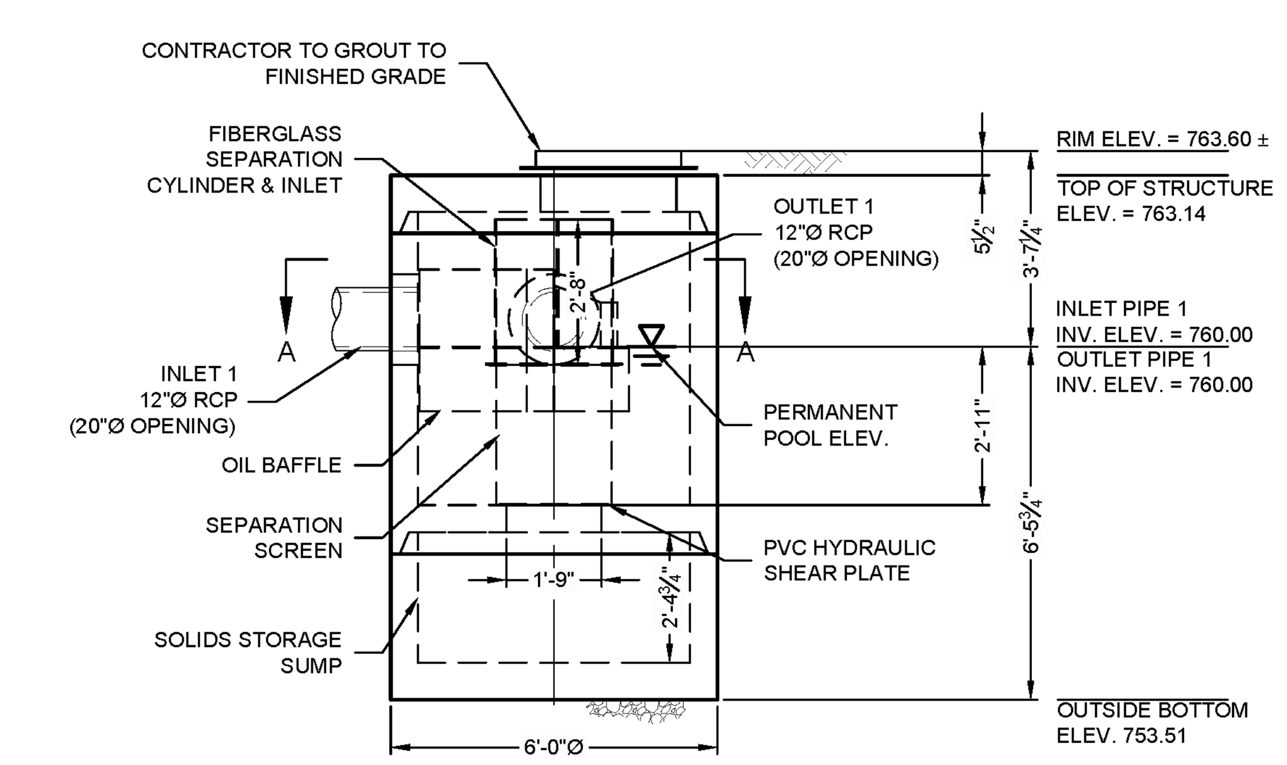
1 - Based on Rainfall Data from DETROIT METRO AP Station
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.



PLAN VIEW



SECTION A-A



ELEVATION VIEW

MATERIAL LIST (PROVIDED BY CONTECH)

COUNT	DESCRIPTION	INSTALLED BY
1	FIBERGLASS INLET AND CYLINDER	CONTECH
1	2400 micron, 2' O.D. x 2.58' SEP. SCREEN	CONTECH
1	3/16 INCH PVC HYDRAULIC SHEAR PLATE *	CONTECH
1	SEALANT FOR JOINTS	CONTRACTOR
1	30"Ø x 4" FRAME & COVER, EJ#41600484, OR EQUIV.	CONTRACTOR

* SEE HYDRAULIC SHEAR PLATE DETAIL

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

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.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
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 WEIGHT
APPROXIMATE HEAVIEST PICK = 9500 LBS.
STRUCTURE IS DELIVERED IN 3 PIECES

MAX FOOTPRINT = Ø6'

CONTECH **PROPOSAL** DRAWING

NCI
LAYOUT 1A
2025-5-FGIS
5824 / 453502

MARK	DATE	REVISION DESCRIPTION	BY

CDS2025-5-C - 673885-20
OYK MIXED USE
ROCHESTER, MI
for SYSTEM: MH-4

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

DATE: 03/26/21	SCALE: 1/4" = 1'-0"
DESIGNED: MSB	DRAWN: MSB
CHECKED: ###	APPROVED: ###
PROJECT No.: 673885	SEQUENCE No.: 20
SHEET: 1 OF 1	

\\QUIKRETE.NET\CONTECH\MERLIN\PROJECT\ACTIVE\673800\673885\673885-20-CDS\DRAWINGS\673885-20-CDS2025-5 CONFAB.DWG 3/26/2021 10:16 AM

Not to be Used as Construction Drawings

City File #21-008,
Section 27

DATE	ISSUE
3-19-2021	REVISED PER ARCHITECT
5-12-2021	REVISED PER CITY (4-15-2021)
6-30-2021	NO CHANGES
11-15-2021	ADDED PATH DETAIL & SIGHT LINES PER CITY/HRC (10-22-2021)

Developer/Contractor
OYK ENGINEERING & CONSTRUCTION
30700 TELEGRAPH ROAD, SUITE 2665
BINGHAM FARMS, MICHIGAN 48025
(248) 656-7695 FRED HADID

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625-5251 www.kiefteng.com FAX (248) 625-7110

DATE 3-17-2021	CKD. BY	DATE
DRAWN GF		
DESIGN PCM		
SECTION 27	T- 3 -N. R- 11 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Sanitary Calculations & Details
"BEBB OAK MEADOWS" MIXED USE DEVELOPMENT
PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SCALE N/A
SHEET 10 OF 11
KE 2021.053

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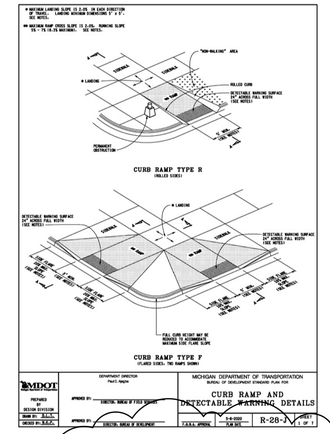
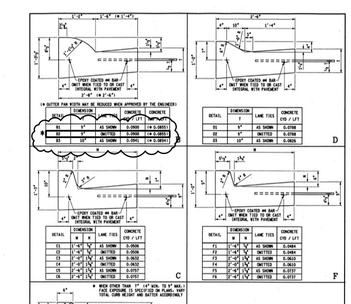
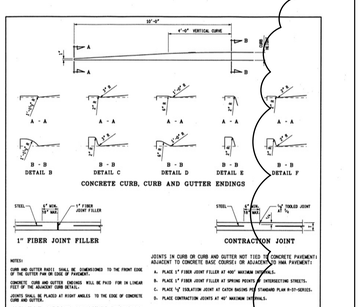


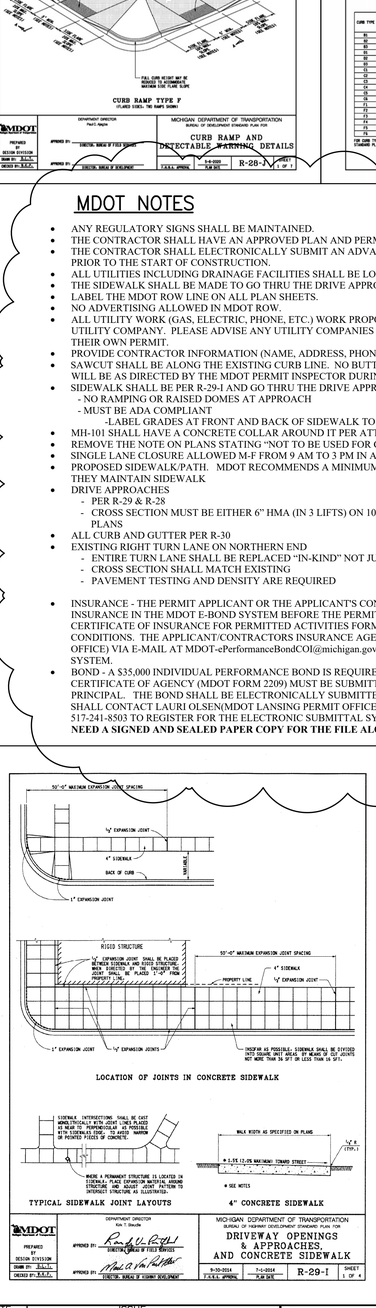
MDOT NOTES

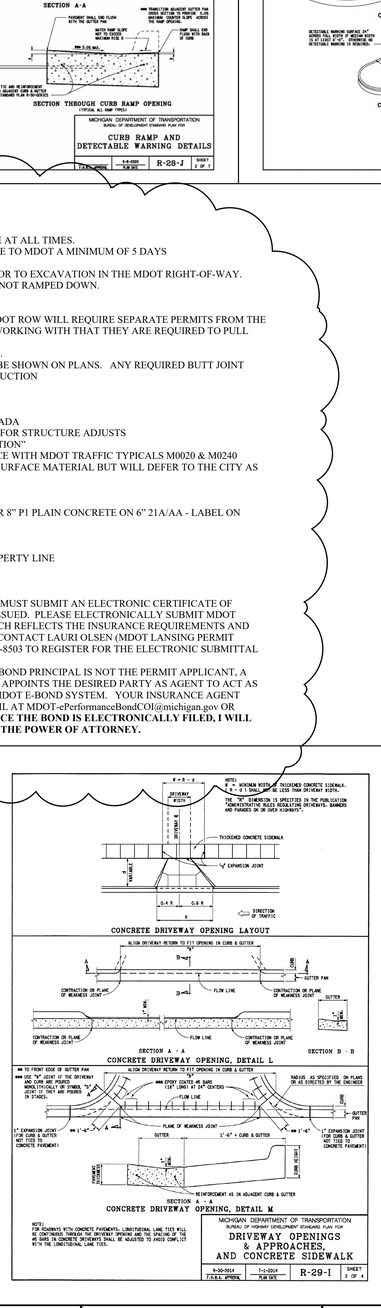
- ANY REGULATORY SIGNS SHALL BE MAINTAINED.
- THE CONTRACTOR SHALL HAVE AN APPROVED PLAN AND PERMIT ON SITE AT ALL TIMES.
- THE CONTRACTOR SHALL ELECTRONICALLY SUBMIT AN ADVANCE NOTICE TO MDOT A MINIMUM OF 5 DAYS PRIOR TO THE START OF CONSTRUCTION.
- ALL UTILITIES INCLUDING DRAINAGE FACILITIES SHALL BE LOCATED PRIOR TO EXCAVATION IN THE MDOT RIGHT-OF-WAY.
- THE SIDEWALK SHALL BE MADE TO GO THRU THE DRIVE APPROACH AND NOT RAMPED DOWN.
- LABEL THE MDOT ROW LINE ON ALL PLAN SHEETS.
- NO ADVERTISING ALLOWED IN MDOT ROW.
- ALL UTILITY WORK (GAS, ELECTRIC, PHONE, ETC.) WORK PROPOSED IN MDOT ROW WILL REQUIRE SEPARATE PERMITS FROM THE UTILITY COMPANY. PLEASE ADVISE ANY UTILITY COMPANIES YOU ARE WORKING WITH THAT THEY ARE REQUIRED TO PULL THEIR OWN PERMIT.
- PROVIDE CONTRACTOR INFORMATION (NAME, ADDRESS, PHONE #, EMAIL).
- SAWCUT SHALL BE ALONG THE EXISTING CURB LINE. NO BUTT JOINT TO BE SHOWN ON PLANS. ANY REQUIRED BUTT JOINT WILL BE AS DIRECTED BY THE MDOT PERMIT INSPECTOR DURING CONSTRUCTION
- SIDEWALK SHALL BE PER R-29-I AND GO THRU THE DRIVE APPROACH
  - NO RAMPING OR RAISED DOMES AT APPROACH
  - MUST BE ADA COMPLIANT
    - -LABEL GRADES AT FRONT AND BACK OF SIDEWALK TO INDICATE ADA
- MH-101 SHALL HAVE A CONCRETE COLLAR AROUND IT PER ATTACHED SP FOR STRUCTURE ADJUSTS
- REMOVE THE NOTE ON PLANS STATING "NOT TO BE USED FOR CONSTRUCTION"
- SINGLE LANE CLOSURE ALLOWED M-F FROM 9 AM TO 3 PM IN ACCORDANCE WITH MDOT TRAFFIC TYPICALS M0020 & M0240
- PROPOSED SIDEWALK/PATH. MDOT RECOMMENDS A MINIMUM 4" HARD SURFACE MATERIAL BUT WILL DEFER TO THE CITY AS THEY MAINTAIN SIDEWALK
- DRIVE APPROACHES
  - PER R-29 & R-28
  - CROSS SECTION MUST BE EITHER 6" HMA (IN 3 LIFTS) ON 10" 21A/AA OR 8" P1 PLAIN CONCRETE ON 6" 21A/AA - LABEL ON PLANS
- ALL CURB AND GUTTER PER R-30
- EXISTING RIGHT TURN LANE ON NORTHERN END
  - ENTIRE TURN LANE SHALL BE REPLACED "IN-KIND" NOT JUST TO PROPERTY LINE
  - CROSS SECTION SHALL MATCH EXISTING
  - PAVEMENT TESTING AND DENSITY ARE REQUIRED

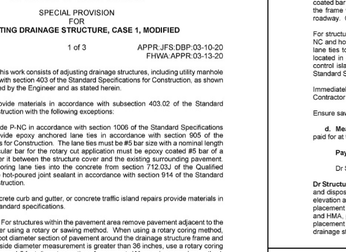
- INSURANCE - THE PERMIT APPLICANT OR THE APPLICANT'S CONTRACTOR MUST SUBMIT AN ELECTRONIC CERTIFICATE OF INSURANCE IN THE MDOT E-BOND SYSTEM BEFORE THE PERMIT CAN BE ISSUED. PLEASE ELECTRONICALLY SUBMIT MDOT CERTIFICATE OF INSURANCE FOR PERMITTED ACTIVITIES FORM 2020, WHICH REFLECTS THE INSURANCE REQUIREMENTS AND CONDITIONS. THE APPLICANT/CONTRACTORS INSURANCE AGENT SHALL CONTACT LAURI OLSEN (MDOT LANSING PERMIT OFFICE) VIA E-MAIL AT MDOT-ePerformanceBondCOI@michigan.gov OR 517-241-8503 TO REGISTER FOR THE ELECTRONIC SUBMITTAL SYSTEM.
- BOND – A $35,000 INDIVIDUAL PERFORMANCE BOND IS REQUIRED. IF THE BOND PRINCIPAL IS NOT THE PERMIT APPLICANT, A CERTIFICATE OF AGENCY (MDOT FORM 2209) MUST BE SUBMITTED WHICH APPOINTS THE DESIRED PARTY AS AGENT TO ACT AS PRINCIPAL. THE BOND SHALL BE ELECTRONICALLY SUBMITTED IN THE MDOT E-BOND SYSTEM. YOUR INSURANCE AGENT SHALL CONTACT LAURI OLSEN(MDOT LANSING PERMIT OFFICE) VIA E-MAIL AT MDOT-ePerformanceBondCOI@michigan.gov OR 517-241-8503 TO REGISTER FOR THE ELECTRONIC SUBMITTAL SYSTEM. **ONCE THE BOND IS ELECTRONICALLY FILED, I WILL NEED A SIGNED AND SEALED PAPER COPY FOR THE FILE ALONG WITH THE POWER OF ATTORNEY.**











PATRICK COLIN McWILLIAMS LICENSE NO. 6201031655 LICENSED PROFESSIONAL ENGINEER
STATE OF MICHIGAN

City File #21-008, Section 27

20SP-403A-01

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
ADJUSTING DRAINAGE STRUCTURE, CASE 1, MODIFIED

CFS:DMG | 1 of 3 | APPR:JFS:DBP:03-10-20 | FHWA:APPR:03-13-20

a. Description. This work consists of adjusting drainage structures, including utility manhole covers, in accordance with section 403 of the Standard Specifications for Construction, as shown on the plans, as directed by the Engineer and as stated herein.

b. Materials. Provide materials in accordance with subsection 403.02 of the Standard Specifications for Construction with the following exceptions:

Provide Concrete, Grade P-NC in accordance with section 1006 of the Standard Specifications for Construction. Provide epoxy anchored lane ties in accordance with section 905 of the Standard Specifications for Construction. The lane ties must be #5 bar size with a nominal length of 18 inches. The circular bar for the rotary cut application must be epoxy coated #5 bar of a diameter that will center it between the structure cover and the existing surrounding pavement. Select epoxy for anchoring lane ties into the concrete from section 712.03J of the Qualified Products List. Provide hot-poured joint sealant in accordance with section 914 of the Standard Specifications for Construction.

For concrete curb, concrete curb and gutter, or concrete traffic island repairs provide materials in accordance with the standard specifications.

c. Construction. For structures within the pavement area remove pavement adjacent to the drainage structure cover using a rotary or sawing method. When using a rotary coring method, remove a minimum 4 foot diameter section of pavement around the drainage structure frame and cover. If the frame outside diameter measurement is greater than 36 inches, use a rotary coring head to remove a minimum 4.5 foot diameter section of pavement. When using a sawing method, saw cut clean and remove a 6 foot by 6 foot pavement square.

For structures within the curb line, saw cut and remove a 4 foot by 6 foot section of pavement around the frame with the 6 foot dimension measured along the curb line. Remove curb and/or curb and gutter associated with the adjustment of structures, as directed by the Engineer.

For structures located adjacent to concrete traffic control islands, remove concrete island full-width or up to 6 feet wide to facilitate adjustment of the drainage structure cover frame, as directed by the Engineer.

Prior to setting the frame, compact exposed soil using a method approved by the Engineer.

Support the cover frame over the structure matching the adjacent roadway cross slope. Secure the frame in-place to allow for placement of concrete using brick or block as required on a full bed of mortar without altering frame position.

20SP-403A-01
CFS:DMG | 2 of 3 | 03-10-20

Install epoxy anchored lane ties in accordance with section 603 of the Standard Specifications for Construction to anchor the concrete to adjacent composite pavement. Install circular epoxy coated bar as detailed below. For structures within the pavement area, replace pavement around the frame with Concrete, Grade P-NC matching the finished elevation and cross-slope of the roadway. Construct plane of weakness joint as directed by the Engineer.

For structures within the curb line, replace pavement around the frame with Concrete, Grade P-NC and hot mix asphalt (HMA) top course as shown on the detail herein. Install epoxy anchored lane ties to anchor the concrete to adjacent composite pavement for curb drainage structures located in curbed areas. Replace concrete curb, concrete curb and gutter, or concrete traffic control islands in-kind in accordance with Standard Plan R-30 Series and section 802 of the Standard Specifications for Construction.

Immediately remove any debris that falls into drainage structures or other utility manholes due to Contractor operations.

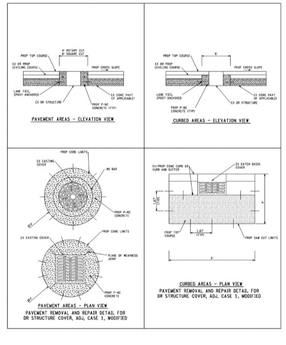
Ensure saw overcuts are cleaned and sealed with hot-poured joint sealant.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Dr Structure Cover, Adj, Case 1, Modified	Each

Dr Structure Cover, Adj, Case 1, Modified includes furnishing all materials, saw cutting, removal and disposal of existing pavement and curb or curb and gutter, adjustment of cover to required elevation and cross-slope, installation of epoxy anchored lane ties and epoxy coated circular bars, placement and finishing of new curb or curb and gutter, placement and finishing of new concrete and HMA, placement and removal of temporary HMA wedging for maintaining traffic, if required, placement of cover on open structures to prevent accumulation of debris and cleaning existing drainage structures due to Contractor operations.

20SP-403A-01
CFS:DMG | 3 of 3 | 03-10-20



PAVEMENT REMOVAL AND REPAIR DETAIL FOR DR STRUCTURE COVER, ADJ, CASE 1, MODIFIED

PAVEMENT REMOVAL AND REPAIR DETAIL FOR DR STRUCTURE COVER, ADJ, CASE 1, MODIFIED

DATE	ISSUE
5-12-2021	REVISED PER CITY (4-15-2021)
5-12-2021	REVISED PER CITY (4-15-2021)
6-30-2021	NO CHANGES
9-24-2021	REVISED ENTRANCE APPROACHES PER CLIENT (9-8-2021)
11-15-2021	ADDED PATH DETAIL & SIGHT LINES PER CITY/HRC (10-22-2021)
1-18-2021	REVISED PER CITY (12-21-2021). PER MDOT (1-17-2022)

Developer/Contractor
OYK ENGINEERING & CONSTRUCTION
50700 TELEGRAPH ROAD, SUITE 2665
BINGHAM FARMS, MICHIGAN 48025
(248) 656-7695 FRED HADID

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625-5251 www.kiefteng.com FAX (248) 625-7110

DATE 3-17-2021	CKD. BY	DATE
DRAWN GF		
DESIGN PCM		
SECTION 27	T- 3 -N. R- 11 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

MDOT Notes & Details
"BEBB OAK MEADOWS" MIXED USE DEVELOPMENT
PART OF THE SE 1/4 OF SECTION 27, T3N, R11E,
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

SCALE	N/A
SHEET	11 OF 11
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