

SITE PLAN

SHEETZ - HIGHLAND TOWNSHIP

155 HIGHLAND RD HIGHLAND, MI 48357

PROJECT TEAM

DEVELOPER/OWNER
SHEETZ
351 SHEETZ WAY
CLAYSBURG, PA 16625
TEL: (740) 497-2326
CONTACT: DAVID BRUCKELMEYER

LANDSCAPE ARCHITECT
KIMLEY-HORN OF MICHIGAN, INC.
3000 TOWN CENTER, SUITE 2600
SOUTHFIELD, MI 48075
TEL: (313) 548-7109
CONTACT: AUTUMN MCNINCH
CONTACT: JOHN ACKERMAN, PLA

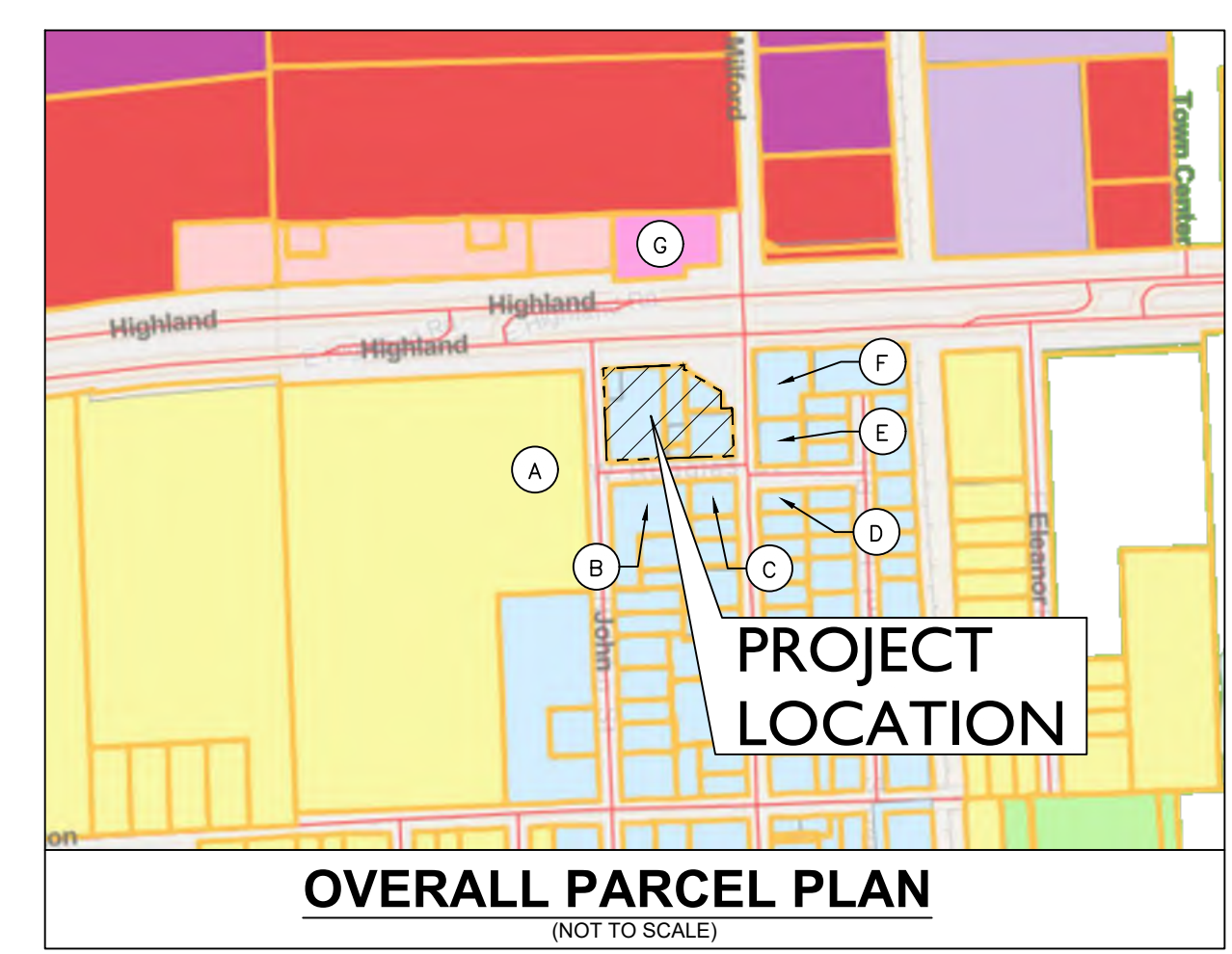
CIVIL ENGINEER
KIMLEY-HORN OF MICHIGAN, INC.
3000 TOWN CENTER, SUITE 2600
SOUTHFIELD, MI 48075
(313) 548-7081
CONTACT: TYLER SMITH, P.E.

LAND SURVEYOR ENGINEER
MONUMNET ENGINEERING GROUP
ASSOCIATES, INC.
298 VETERANS DRIVE
FOWLERVILLE, MI 48836
TEL: (517) 223-3512



OAKLAND COUNTY

CONSTRUCTION OF A SHEETZ CONVENIENCE STORE AND GAS STATION ON ±1.94 AC. PROJECT IS IN SECTION 22 OF T3N, R7E IN HIGHLAND TOWNSHIP, OAKLAND COUNTY, MICHIGAN



LEGAL DESCRIPTION

(PER TITLE AGENCY: CHICAGO TITLE INSURANCE COMPANY, TITLE AGENCY: CHICAGO TITLE INSURANCE COMPANY, TITLE COMMITMENT NO: 631227322NTS, EFFECTIVE DATE: APRIL 3, 2024), EFFECTIVE DATE: APRIL 3, 2024) EFFECTIVE DATE: APRIL 3, 2024) EXHIBIT A DESCRIPTION: LAND SITUATED IN THE STATE OF MICHIGAN, COUNTY OF OAKLAND, TOWNSHIP OF HIGHLAND. PARCEL 1: THAT PART OF THE SOUTHWEST QUARTER OF SECTION 22, T3N, R7E, HIGHLAND TOWNSHIP, OAKLAND COUNTY, MICHIGAN, MORE PARTICULARLY DESCRIBED AS: COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 22; THENCE NORTH 00 DEG. 32' EAST, 627.6 FEET; THENCE NORTH 00 DEG. 26' EAST, 613.38 FEET; THENCE SOUTH 89 DEG. 57' EAST, 1,150.1 FEET TO THE POINT OF BEGINNING, SAID POINT BEING A POINT ON THE SOUTH LINE OF HIGHWAY M-59; THENCE CONTINUING SOUTH 89 DEG. 57' EAST, ALONG SAID SOUTH LINE OF HIGHWAY M-59, A DISTANCE OF 132 FEET TO THE WEST LINE OF MILFORD-HIGHLAND ROAD; THENCE SOUTH 00 DEG. 43' 20" WEST, ALONG SAID WEST LINE OF MILFORD-HIGHLAND ROAD, 132 FEET; THENCE NORTH 89 DEG. 57' WEST, 132 FEET; THENCE NORTH 00 DEG. 43' 20" EAST, 132 FEET TO THE POINT OF BEGINNING. THE ABOVE DESCRIBED LANDS ARE ALSO KNOWN AS LOTS 1 AND 2 OF "SUPERVISOR'S PLAT NO. 4", THAT PART OF SOUTHWEST QUARTER OF SOUTHWEST QUARTER, SECTION 22, T3N, R7E, LYING SOUTH OF STATE HIGHWAY M-59, HIGHLAND TOWNSHIP, OAKLAND COUNTY, MICHIGAN, ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 62 OF PLATS, PAGE 30, OAKLAND COUNTY RECORDS. EXCEPT THAT PART WHICH LIES NORTHEASTERLY OF A LINE DESCRIBED AS: COMMENCING AT THE INTERSECTION OF THE EASTBOUND CENTERLINE OF HIGHWAY M-59 AND THE CENTERLINE OF MILFORD-HIGHLAND ROAD; THENCE WESTERLY ALONG SAID CENTERLINE OF HIGHWAY M-59, 300.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTHEASTERLY TO A POINT ON THE CENTERLINE OF SAID MILFORD-HIGHLAND ROAD, WHICH IS 200.00 FEET SOUTHERLY OF AS MEASURED ALONG THE CENTERLINE OF SAID MILFORD-HIGHLAND ROAD, TO A POINT OF ENDING. ALSO, EXCEPT THE EASTERLY 27 FEET THEREOF.

PARCEL 2: LOT 3 OF SUPERVISOR'S PLAT NO. 4, ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 62, PAGE 30 OF PLATS, OAKLAND COUNTY RECORDS.

PARCEL 3: LOTS 4, 5, 6 AND 7, SUPERVISOR'S PLAT NO. 4, ACCORDING TO THE PLAT THEREOF, AS RECORDED IN LIBER 62, PAGE 30 OF PLATS, OAKLAND COUNTY RECORDS.

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C0.1	NATURAL FEATURES OVERLAY PLAN
C1.0	SITE PLAN
C1.1	TRUCK TURN PLAN
C2.0	GRADING & DRAINAGE PLAN
C2.1	STORMWATER CALCULATIONS
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A105	EQUIPMENT PLAN
A106	SIGNAGE PLAN
DT-1	DRIVE THRU SIGN DETAILS
DT-2	DRIVE THRU SIGN DETAILS

ZONING LEGEND		
TAX ID:	ZONED:	LAND USE:
A. 1122351010	LV, RESIDENTIAL	RESIDENTIAL
B. 1122353025	HS, HIGHLAND STATION	CREDIT UNION
C. 1122353010	HS, HIGHLAND STATION	RESIDENTIAL
D. 1122378001	HS, HIGHLAND STATION	RESIDENTIAL
E. 1122376010	HS, HIGHLAND STATION	RESIDENTIAL, DAYCARE
F. 1122376009	HS, HIGHLAND STATION	VACANT
G. 1122301007	C-1, COMMERCIAL	COMMERCIAL, RETAIL

Drawing name: K:\DEL_DEV\66893002_Sheetz-Highland_Twp_MI\2_Design\CADD\PlanSheets\C0.0-TITLE SHEET.dwg C0.0 TITLE SHEET Dec 18, 2024 1:53pm by tyler.smith
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NO.
REVISIONS
DATE
BY

3000 TOWN CENTER, SUITE 2600
SOUTHFIELD, MI 48075
WWW.KIMLEY-HORN.COM

SCALE: AS NOTED
DESIGNED BY: TES
DRAWN BY: LDF
CHECKED BY: TES

TYLER SMITH
ENGINEER
NO. 6201068975
MICHIGAN PROFESSIONAL ENGINEERING

TITLE SHEET

SHEETZ HIGHLAND TOWNSHIP - HIGHLAND RD AND MILFORD RD

ORIGINAL ISSUE: 12/18/2024
KHA PROJECT NO. 268593002
SHEET NUMBER

C0.0

LEGAL DESCRIPTION (AS PROVIDED)

(PER TITLE AGENCY: CHICAGO TITLE INSURANCE COMPANY,
TITLE COMMITMENT NO: 631227322NTS, EFFECTIVE DATE: APRIL 3, 2024)

EXHIBIT A DESCRIPTION:

LAND SITUATED IN THE STATE OF MICHIGAN, COUNTY OF OAKLAND, TOWNSHIP OF HIGHLAND.

PARCEL 1:
THAT PART OF THE SOUTHWEST QUARTER OF SECTION 22, T3N, R7E, HIGHLAND TOWNSHIP, OAKLAND COUNTY, MICHIGAN, MORE PARTICULARLY DESCRIBED AS: COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 22; THENCE NORTH 00 DEG. 32' EAST, 827.8 FEET; THENCE NORTH 00 DEG. 26' EAST, 613.38 FEET; THENCE SOUTH 89 DEG. 57' EAST, 1,150.1 FEET TO THE POINT OF BEGINNING, SAID POINT BEING A POINT ON THE SOUTH LINE OF HIGHWAY M-59; THENCE CONTINUING SOUTH 89 DEG. 57' EAST, ALONG SAID SOUTH LINE OF HIGHWAY M-59, A DISTANCE OF 132 FEET TO THE WEST LINE OF MILFORD-HIGHLAND ROAD; THENCE SOUTH 00 DEG. 43' 20" WEST, ALONG SAID WEST LINE OF MILFORD-HIGHLAND ROAD, 132 FEET; THENCE NORTH 89 DEG. 57' WEST, 132 FEET; THENCE NORTH 00 DEG. 43' 20" EAST, 132 FEET TO THE POINT OF BEGINNING. THE ABOVE DESCRIBED LANDS ARE ALSO KNOWN AS LOTS 1 AND 2 OF "SUPERVISOR'S PLAT NO. 4", THAT PART OF SOUTHWEST QUARTER OF SOUTHWEST QUARTER, SECTION 22, T3N, R7E, LYING SOUTH OF STATE HIGHWAY M-59, HIGHLAND TOWNSHIP, OAKLAND COUNTY, MICHIGAN, ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 62 OF PLATS, PAGE 30, OAKLAND COUNTY RECORDS, EXCEPT THAT PART WHICH LIES NORTHEASTERLY OF A LINE DESCRIBED AS: COMMENCING AT THE INTERSECTION OF THE EASTBOUND CENTERLINE OF HIGHWAY M-59 AND THE CENTERLINE OF MILFORD-HIGHLAND ROAD; THENCE WESTERLY ALONG SAID CENTERLINE OF HIGHWAY M-59, 300.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTHEASTERLY TO A POINT ON THE CENTERLINE OF SAID MILFORD-HIGHLAND ROAD, WHICH IS 200.00 FEET SOUTHERLY OF AS MEASURED ALONG THE CENTERLINE OF SAID MILFORD-HIGHLAND ROAD, TO A POINT OF ENDING. ALSO, EXCEPT THE EASTERLY 27 FEET THEREOF.

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SCHEDULE B-SECTION II EXCEPTIONS

TITLE AGENCY: CHICAGO TITLE INSURANCE COMPANY
TITLE COMMITMENT NO: 631227322NTS
EFFECTIVE DATE: APRIL 3, 2024

7. RIGHT(S) OF WAY AND/OR EASEMENT(S) AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: IN FAVOR OF: HIGHLAND TOWNSHIP RECORDING NO: LIBER 1121, PAGE 82. (DEDICATION OF N JOHN ST, RUGGLES AND N MILFORD RD)
8. COVENANTS, CONDITIONS, RESTRICTIONS AND EASEMENTS BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH IN THE DOCUMENT RECORDING NO: LIBER 20910, PAGE 194, AS EFFECTED BY RELEASE OF REVERSIONARY INTEREST IN LIBER 22535, PAGE 283. (INGRESS/EGRESS TO STATE ROAD APPEARS RESTRICTED FOR EXCEPTION PARCEL)
9. RIGHT(S) OF WAY AND/OR EASEMENT(S) AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: IN FAVOR OF: THE BOARD OF COUNTY ROAD COMMISSIONERS OF THE COUNTY OF OAKLAND, MICHIGAN RECORDING NO: LIBER 22406, PAGE 807. (PARCEL DESCRIBED IS PARCEL 1 EXCEPTION PARCEL)

SHEET INDEX

ALT-1 = ALTA COVER
ALT-2 = ALTA SURVEY

MISCELLANEOUS NOTES

1. THERE ARE DIRECT ACCESS TO THE SUBJECT PROPERTIES AS FOLLOWS:
TAX ID: 352-010 VIA HIGHLAND ROAD(M-59), N JOHN STREET & W RUGGLES STREET, ALL THREE ROADS ARE PUBLIC RIGHT-OF-WAYS.
TAX ID: 352-011 VIA HIGHLAND ROAD(M-59), IS PUBLIC RIGHT-OF-WAY.
TAX ID: 352-005 VIA HIGHLAND ROAD(M-59) & N MILFORD ROAD, BOTH ARE PUBLIC RIGHT-OF-WAYS.
TAX ID: 352-006 VIA N MILFORD ROAD & W RUGGLES STREET, BOTH ARE PUBLIC RIGHT-OF-WAYS.
2. THE PROPERTIES SURVEYED AND SHOWN HEREIN ARE THE SAME PROPERTIES DESCRIBED IN EXHIBIT A OF TITLE AGENCY: CHICAGO TITLE INSURANCE COMPANY, TITLE COMMITMENT NO: 631227322NTS, EFFECTIVE DATE: APRIL 3, 2024.

TABLE A NOTES

(FOR TABLE "A" ITEMS NOT LISTED BELOW, SEE PLAN VIEW ON ALT-X SHEET FOR MORE INFORMATION)

- ITEM 2: THE POSTED ADDRESSES ARE:
TAX ID: 11-22-352-010, ADDRESS: 155 W HIGHLAND ROAD;
TAX ID: 11-22-352-011, ADDRESS: 135 W HIGHLAND ROAD;
TAX ID: 11-22-352-005, THERE IS NO POSTED ADDRESS ON SITE.
TAX ID: 11-22-352-006, ADDRESS: 315 N MILFORD ROAD; NO BUILDINGS WERE OBSERVED, SUBJECT PROPERTY IS VACANT LAND;
- ITEM 3: FLOOD ZONE FEMA MAP SCALES DO NOT SUPPLY SUFFICIENT LEVEL OF DETAIL TO PLOT ACCURATELY. ZONES IF PLOTTED HEREIN ARE APPROXIMATE.

BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, THE SUBJECT PROPERTY APPEARS TO LIE ENTIRELY IN ZONE (X) AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD PLAIN ACCORDING TO THE FLOOD INSURANCE RATE MAP FOR THE COUNTY OF OAKLAND, COMMUNITY PANEL NO. (261250313F), EFFECTIVE DATE: SEPTEMBER 29, 2006.

ITEM 6(a) and 6(b): ZONING

A ZONING REPORT OR LETTER WAS NOT PROVIDED TO THE SURVEYOR AS REQUIRED BY 2021 ALTA/NSPS STANDARDS TABLE A ITEMS 6(A) & 6(B).

THIS ZONING INFORMATION SHOWN HEREIN WAS TAKEN FROM THE HIGHLAND TOWNSHIP ZONING ORDINANCE, EFFECTIVE DATE: NOVEMBER 18, 2010.

TAX IDS: 11-22-352-05, 06, 010 & 011
ZONING CLASSIFICATION: (HS) (HIGHLAND STATION)
BUILDING SETBACKS:
FRONT = N/A
SIDE = N/A
REAR = N/A
MAX. BUILDING HEIGHT = N/A

FOR FURTHER INTERPRETATION OF THE BUILDING SETBACK REQUIREMENTS OR OTHER APPLICABLE ZONING REGULATIONS, PLEASE REFER TO THE LOCAL ZONING AUTHORITY LISTED ABOVE.

- ITEM 9: EXISTING PARKING NUMBER AND TYPE (E.G., DISABLED, MOTORCYCLE, REGULAR, AND OTHER MARKED SPECIALIZED TYPES) OF CLEARLY IDENTIFIABLE PARKING SPACES ON SURFACE PARKING AREAS, LOTS, AND IN PARKING STRUCTURES. STRIPING OF CLEARLY IDENTIFIABLE PARKING SPACES ON SURFACE PARKING AREAS AND LOTS.

TAX IDS: 11-22-352-010, 011, 006 & 005:
THERE ARE NO STRIPED PARKING SPACES ON THE SUBJECT PROPERTIES.

- ITEM 16: AT THE TIME OF THIS SURVEY "EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION, OR BUILDING ADDITIONS OBSERVED IN THE PROCESS OF CONDUCTING THE FIELDWORK" WAS NOT OBSERVED.

- ITEM 17: AT THE TIME OF THIS SURVEY, INFORMATION REGARDING PROPOSED CHANGES TO RIGHT OF WAY LINES WAS NOT AVAILABLE BY THE CONTROLLING JURISDICTION. EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS WAS NOT OBSERVED IN THE PROCESS OF CONDUCTING THE FIELDWORK.

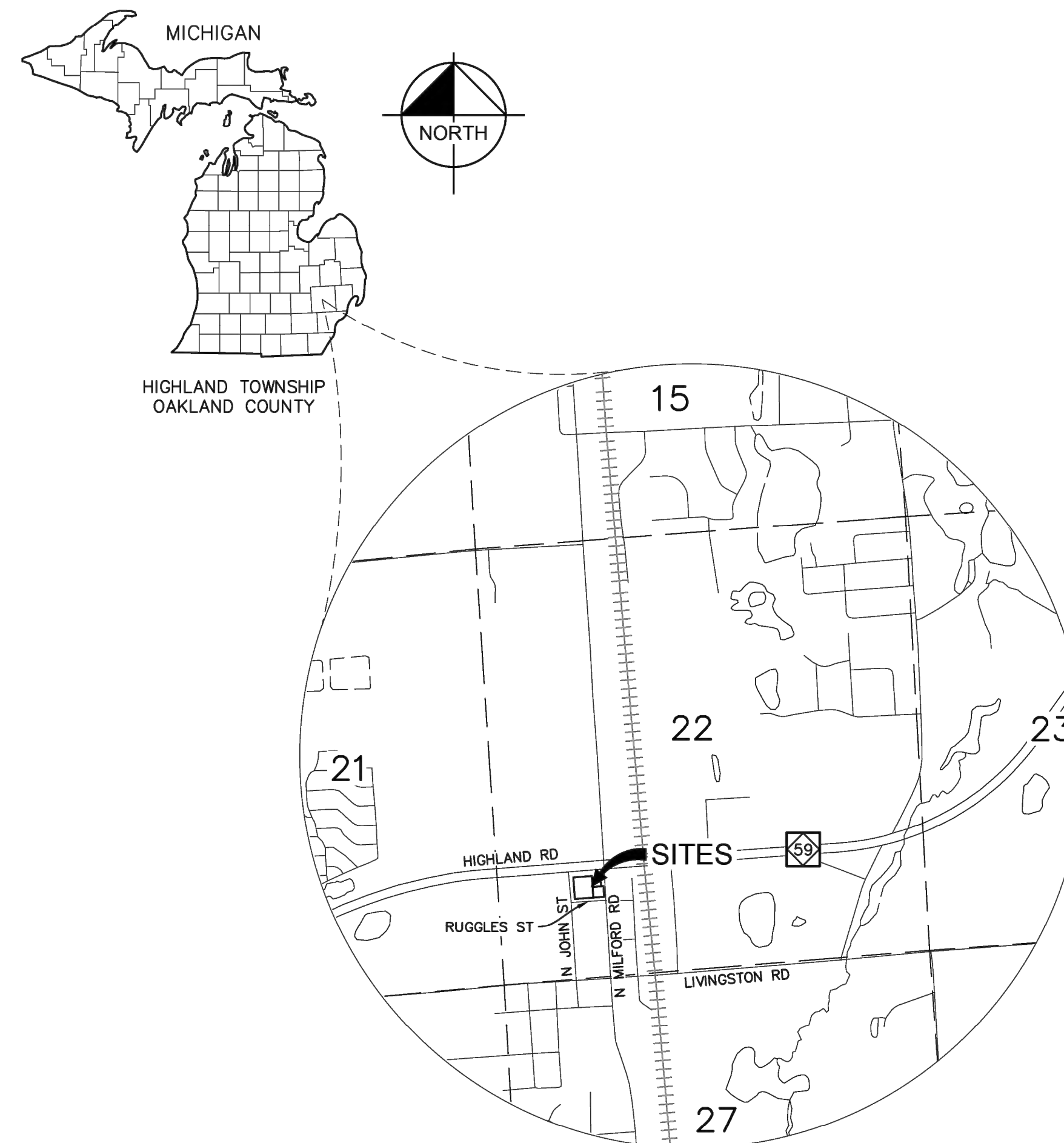
- ITEM 19: CERTIFICATE OF INSURANCE TO BE FURNISHED UPON REQUEST, BUT THIS ITEM SHALL NOT BE ADDRESSED ON THE FACE OF THE PLAT OR MAP.

SURVEYOR'S OBSERVATIONS

AT THE TIME OF THIS SURVEY, EVIDENCE WAS OBSERVED OF POTENTIAL ENROACHMENTS. OTHER ENROACHMENTS MAY OR MAY NOT STILL EXIST ON OR OFF THE SUBJECT PROPERTY.

THE FOLLOWING OBSERVATIONS WERE MADE AT THE TIME OF SURVEY:

1. BUILDING APPEARS TO LIE A MAXIMUM DISTANCE OF 0.5' FEET OVER PROPERTY LINE.
2. SIDEWALK PATH CROSSES PARCEL 1 EXCEPTION PARCEL UNTO PARCEL 1.



LOCATION MAP

BEARING REFERENCE

BEARINGS ARE BASED ON PROJECT COORDINATE SYSTEM:
MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83 (CONUS) (MGL) (GRS80), SOUTH ZONE 2113, INTERNATIONAL FEET, GROUND
(LAT: 42°38'27.74" N, LON: 83°37'05.21" W, ELEV: 1014, SCALE FACTOR: 1.00013249).

UTILITY/REFERENCE INFO

WM:	HIGHLAND TOWNSHIP ~ OAKLAND COUNTY WATER RESOURCE COMMISSIONER
PHONE:	248-887-3791 ~ 248-858-5197
RECEIVED:	4/17/24 ~ 5/7/24
SEPTIC:	OAKLAND COUNTY HEALTH DEPARTMENT
PHONE:	248-858-1280
RECEIVED:	5/10/24
STORM:	OAKLAND COUNTY ROAD COMMISSION
PHONE:	877-858-4804
RECEIVED:	N/A
GAS:	CONSUMERS ENERGY
PHONE:	800-778-9140 ~ 800-477-5050
RECEIVED:	5/1/24
ELEC:	DTE ENERGY
PHONE:	313-407-5364
RECEIVED:	4/22/24
PHONE/CABLE:	COMCAST
PHONE:	855-962-8525
RECEIVED:	4/17/24

UTILITY NOTES

1. ALL UTILITIES SHOWN ARE BASED ON:
A. GPRS MARKINGS AND/OR MISS DIG MARKINGS LOCATED AT TIME OF SURVEY, OR;
B. UTILITY MAPS PROVIDED TO THE SURVEYOR AT THE TIME OF SURVEY.
2. THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS



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MICHIGAN 48856
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MONUMENTENGINEERING.COM
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SMALL BUSINESS (SDVOSB)

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Michigan's Utility Notification Organization
1-800-482-7171
www.missdig.org

FOR FURTHER INTERPRETATION OF THE BUILDING SETBACK REQUIREMENTS OR OTHER APPLICABLE ZONING REGULATIONS, PLEASE REFER TO THE LOCAL ZONING AUTHORITY LISTED ABOVE.

THIS SURVEY PREPARED FOR:
Kimley-Horn
KIMLEY-HORN OF MICHIGAN, INC.

1000 TOWN CENTER, SUITE 1000,
SOUTHFIELD, MI 48034
PHONE: 313-572-1990
WWW.KIMLEY-HORN.COM

ALTA/NSPS LAND TITLE SURVEY
155 HIGHLAND ROAD
TAX IDS: 11-22-352-05, 06, 10, 11
PART OF SW 1/4, SEC. 22, T3N-R7E
HIGHLAND TOWNSHIP, OAKLAND COUNTY, MICHIGAN

DATE	PLAN SUBMITTALS/REVISIONS
5/13/24	UPDATED: SEPTIC LOCATIONS PER COND.

ORIGINAL ISSUE DATE:
5/8/2024

PROJECT NO: 24-059

SCALE: N/A
0 1/2" 1"

FIELD: RZ
DRAWN BY: DC
DESIGN BY:
CHECK BY: MB

V0.0

NOT FOR CONSTRUCTION



CERTIFICATION

TO: CHICAGO TITLE INSURANCE COMPANY
THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 6(c), 7(a), 7(b), 7(c), 8, 9, 11, 13, 14, 16, 17, 18 & 19 OF TABLE A THEREOF.

THE FIELD WORK WAS COMPLETED ON 4/25/2024.

Marc E. Budzinski
MARC E. BUDZINSKI, PS
PROFESSIONAL SURVEYOR
NO. 4001053492
DATE OF PLAT OR MAP: 6/7/2024

THIS SURVEY PLAT WAS PREPARED FOR THE EXCLUSIVE USE OF THE PERSON, PERSONS, OR ENTITY NAMED IN THE CERTIFICATION HEREON. SAID CERTIFICATION DOES NOT EXTEND TO ANY UNNAMED THIRD PERSON WITHOUT AN EXPRESS RECERTIFICATION BY THE SURVEYOR NAMING SAID THIRD PERSON.

EXISTING LEGEND

- BOLLARD
- CONTROL POINT
- ⊙ CONTROL MONUMENT
- ⊙ CONTROL SET
- CONTROL IRON PIPE
- CONTROL REBAR
- ROW MONUMENT
- FLAG POLE
- MAIL BOX
- UTILITY POLE
- WETLAND FLAG
- SOIL BORING
- HANDICAP SYMBOL
- LEFT/RIGHT TURN ARROW
- SIGN
- CABLE MANHOLE
- CABLE PEDESTAL
- SATELLITE DISH
- CALL BOX
- TELEPHONE PEDESTAL
- TELEPHONE HAND HOLE
- TELEPHONE MARKER
- TELEPHONE MANHOLE
- FIBER OPTIC MAKER
- ACCESS COVER
- FUEL TANK LID
- MISC LID
- MONITOR WELL
- GAS MARKER
- GAS VALVE
- AC UNIT
- OIL MARKER
- AREA LIGHT
- CROSSWALK SIGNAL
- DUCT BANK
- ELECTRICAL BOX
- ELECTRICAL HAND HOLE
- ELECTRICAL METER
- ELECTRICAL MANHOLE
- ELECTRICAL MARKER
- ELECTRICAL RISER
- WELL
- ELECTRICAL TRANSFORMER
- ELECTRICAL VAULT
- GUY POLE/WIRE
- POWER POLE
- PEDESTRIAN PUSHBUTTON
- TRAFFIC SIGNAL POLE
- TRAFFIC MANHOLE
- YARD LIGHT
- SANITARY CLEANOUT
- SANITARY MANHOLE
- VENT PIPE
- STEAM MANHOLE
- STORM CLEANOUT
- STORM CURB INLET
- STORM INLET
- STORM ROOF DRAIN
- STORM DRAIN MANHOLE
- STORM YARD DRAIN
- FIRE DEPT CONNECTION
- FIRE HYDRANT
- IRRIGATION VALVE
- POST INDICATOR VALVE
- WATER METER
- WATER MANHOLE
- WATER VALVE
- TREE / STUMP
- TOE OF SLOPE
- TOP OF BANK
- UNDERGROUND FIBER OPTIC
- UNDERGROUND CABLE
- OVERHEAD CABLE
- UNDERGROUND TELEPHONE
- UNDERGROUND FUEL
- UNDERGROUND GAS
- OVERHEAD ELECTRICAL

STRUCTURE SCHEDULE

EX. STORM SEWER TABLE

STRUCTURE:	RIM ELEV.:	PIPES:
(25443) CI	1015.87	IE=1013.17(12" RCP S) IE=1013.17(12" RCP E)
(25541) STMH	1017.74	IE=1014.74(12" CMP S) IE=1014.74(12" CMP N)
(25711) CI	1020.79	IE=1015.39(12" RCP NE)
(25900) CI	1012.24	IE=1006.74(12" RCP N)
(26046) CI	1006.94	FULL OF SILT
(26131) STMH	1006.16	IE=1002.16(12" RCP S) IE=1001.96(12" RCP N) IE=1002.16(12" RCP E)
(26138) CI	1006.21	IE=1002.41(12" RCP S) IE=1002.11(12" RCP N)
(26257) CI	1008.39	IE=1003.00(12" RCP W) IE=1003.00(12" RCP N)
(26258) CI	1008.45	IE=1004.45(12" RCP S) IE=1003.65(12" RCP E)
(26367) CI	1014.19	IE=1012.10(12" RCP S) IE=1011.60(12" RCP N)
(26379) STMH	1014.47	IE=1012.14(12" RCP N)
(26456) BH	1014.53	IE=1012.53(12" RCP S)
(26807) STMH	1002.99	IE=1001.82(12" RCP S) IE=1001.22(12" RCP W) IE=1001.52(12" RCP N)

IRON ROD TABLE

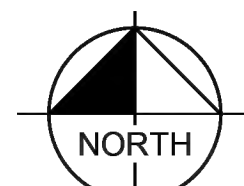
NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	415657.88	13326213.80	973.36	CMF DISC
101	415540.24	13323595.29	1008.44	CMF DISC
102	415531.86	13323595.64	1010.21	CMF CRF IN BOX
103	418187.33	13323477.88	1056.52	CMF DISC
104	418336.94	13326094.16	1004.37	CMF FMON
105	418585.47	13324829.06	1014.73	CRF LTEC 11197
106	418513.10	13324701.72	1015.29	CRF 11806
107	418575.58	13324637.07	1015.18	CRF WARD 22445
108	418613.52	13324635.34	1015.09	CRF LTEC 11197
109	418616.80	13324697.75	1015.31	CRF LTEC 11197
111	418501.34	13324478.71	1017.16	CRF CAP DEFACED IN RAISED LANDSCAPE BED
112	418505.37	13324556.41	1015.46	IPF 3/4"
113	416748.12	13324466.38	1017.01	CRF NO ID
114	416828.41	13324462.11	1018.15	CRF NO ID
117	416839.87	13324688.33	1015.84	CRF WARD 22445
118	418255.88	13324688.64	1016.45	CRF NO ID
119	418781.29	13324796.91	1011.71	CRF NO ID
120	416708.10	13324693.85	1015.67	CRF LTEC 11197
122	416714.29	13324799.03	1012.40	CRF NO ID / BENT LOCATED WHERE STRAIGHT
126	418713.36	13324798.54	1012.92	FD REBAR NO CAP NOT BENT FRESH FLAGGING
127	418527.28	13324829.21	1014.71	FD REBAR NO CAP .5IN OLD IRON
129	416714.99	13324829.53	1011.43	FD REBAR LTEC 11197 OLD CAP

BENCHMARKS

SITE BENCHMARKS:
(LOCATIONS SHOWN ON SURVEY)

BM A: NAIL IN WEST SIDE POWER POLE, 475'± SOUTH FROM BACK OF CURB FOR RUGGLES STREET & 14'± EAST FROM EDGE OF PAVEMENT FOR N JOHN STREET.
ELEVATION= 1015.30

BM B: NAIL IN WEST SIDE POWER POLE, 9'± NORTHEAST FROM BACK OF CURB NEAR THE NORTHEAST INTERSECTION OF N JOHN STREET & RUGGLES STREET.
ELEVATION= 1017.23



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MICHIGAN 48836
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THE LOCATIONS AND DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION, DEPTH AND ELEVATION PRIOR TO THE START OF CONSTRUCTION.

THIS SURVEY PREPARED FOR:

KimleyHorn
KIMLEY-HORN OF MICHIGAN, INC.

1000 TOWN CENTER, SUITE 1000,
SOUTHFIELD, MI 48076
PHONE: 313-572-1990
WWW.KIMLEY-HORN.COM

TOPOGRAPHIC SURVEY

155 HIGHLAND ROAD
TAX IDS: 11-22-352-05, 06, 10, 11
PART OF SW 1/4, SEC. 22, T3N-R7E
HIGHLAND TOWNSHIP, OAKLAND COUNTY, MICHIGAN

DATE: _____

PLAN SUBMITTALS/REVISIONS: _____

ORIGINAL ISSUE DATE: 5/13/2024

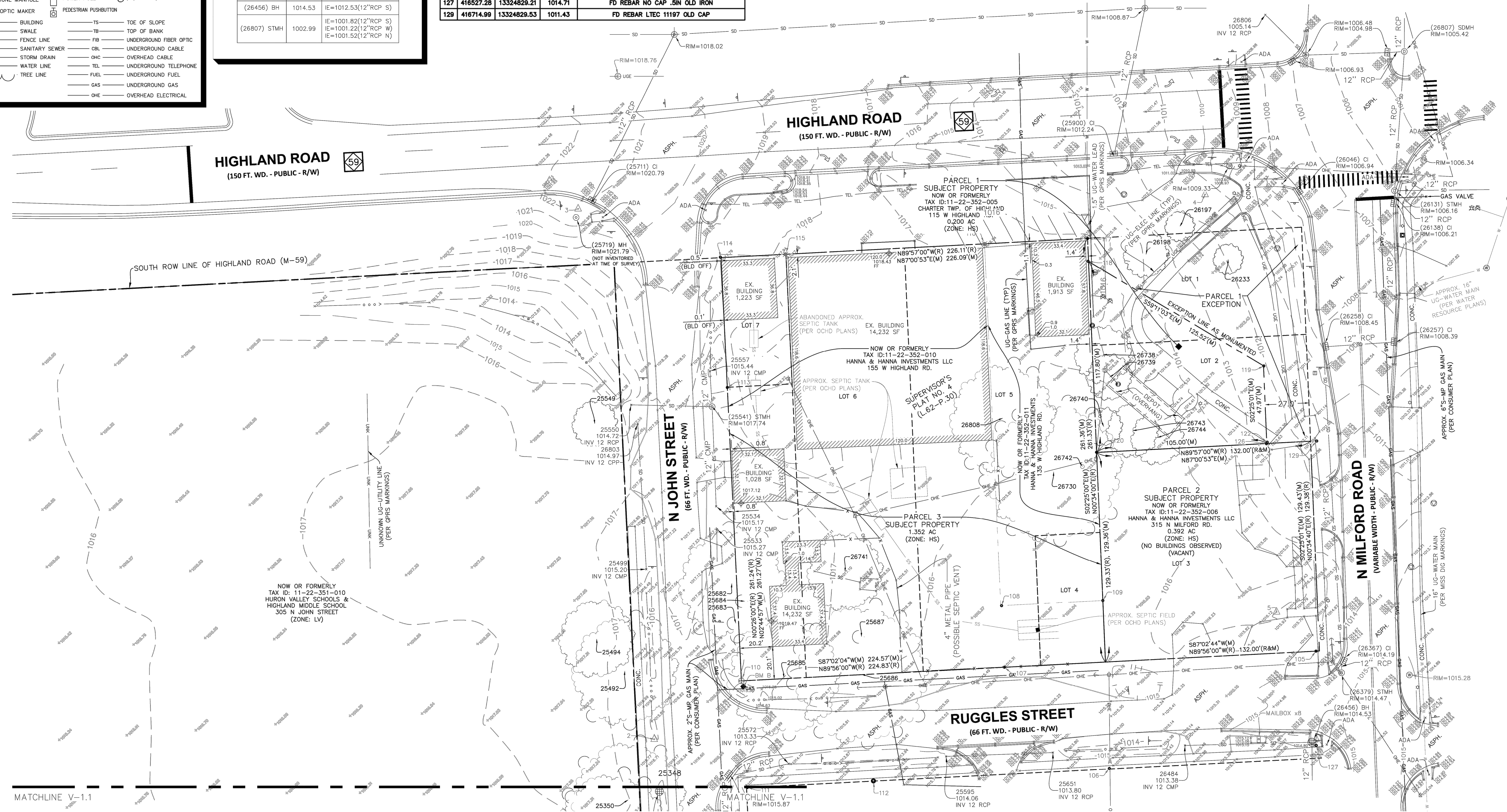
PROJECT NO: 24-059

SCALE: 1" = 30'

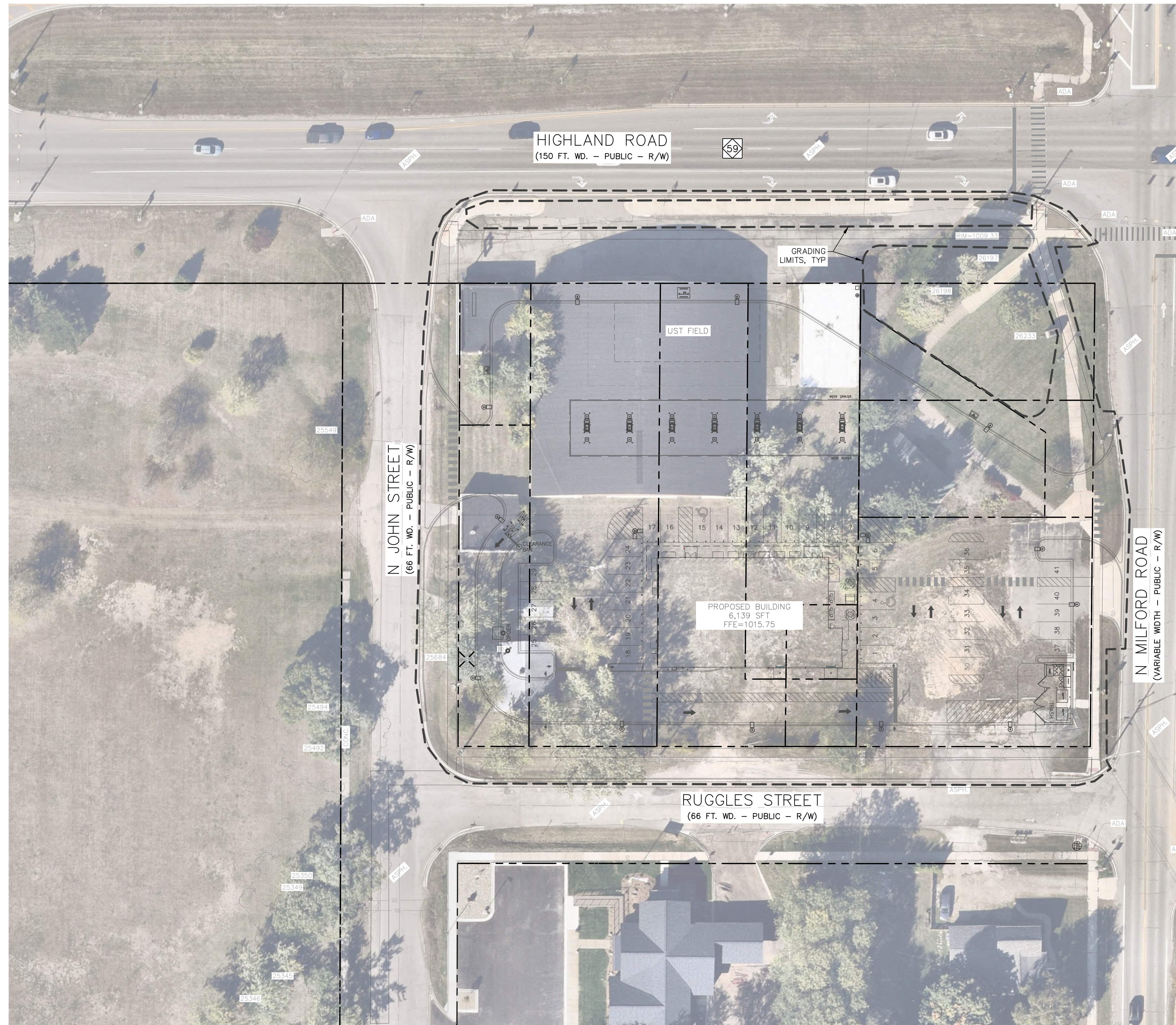
FIELD: RZ
DRAWN BY: DC
DESIGN BY:
CHECK BY: MB

V1.0

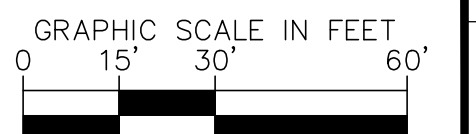
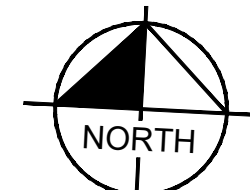
NOT FOR CONSTRUCTION



Drawing name: K:\EIT\DESIGN\268593002_Sheet\001_Sheet\Highland_Twp_MN\2_Design\CADD\Plant\Sheets\CO1_TREE_IMPACT_STUDY.dwg CO1. NATURAL FEATURES OVERLAY PLAN Dec 18, 2024 12:45pm by: Maresmith
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Know what's below.
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TREE LEGEND

- TREE / BUSH
- LANDMARK TREE
- STUMP
- TREE LINE/ CANOPY
- (900) TREE TAG NUMBER
- X TREE TO BE REMOVED

GENERAL NOTES
1. TREE SURVEY CONDUCTED BY MONUMENTAL ENGINEERING GROUP ON 09/27/2024.

TREE IMPACT DATA

TOTAL EXISTING PROTECTED TREES	4
TOTAL PROTECTED TREES TO BE PRESERVED	3
TOTAL PROTECTED TREES TO BE REMOVED	1

*SEE LANDSCAPE PLAN FOR TREE REPLACEMENT REQUIREMENTS



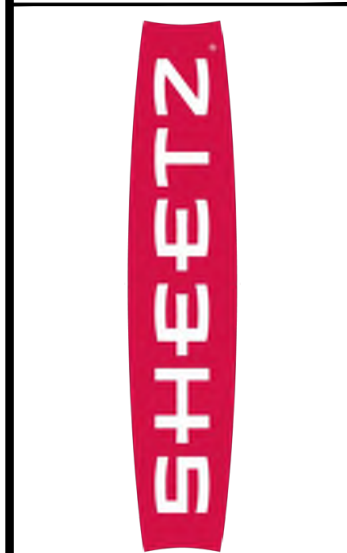
Monument Engineering Group Associates, Inc.
298 Veterans Drive, Fowlerville, MI
(517) 223-3512
www.monumentengineering.com



Tree Survey

Project No./Name: 24-059 KH Sheet Highland Twp. Date: 5/13/2024

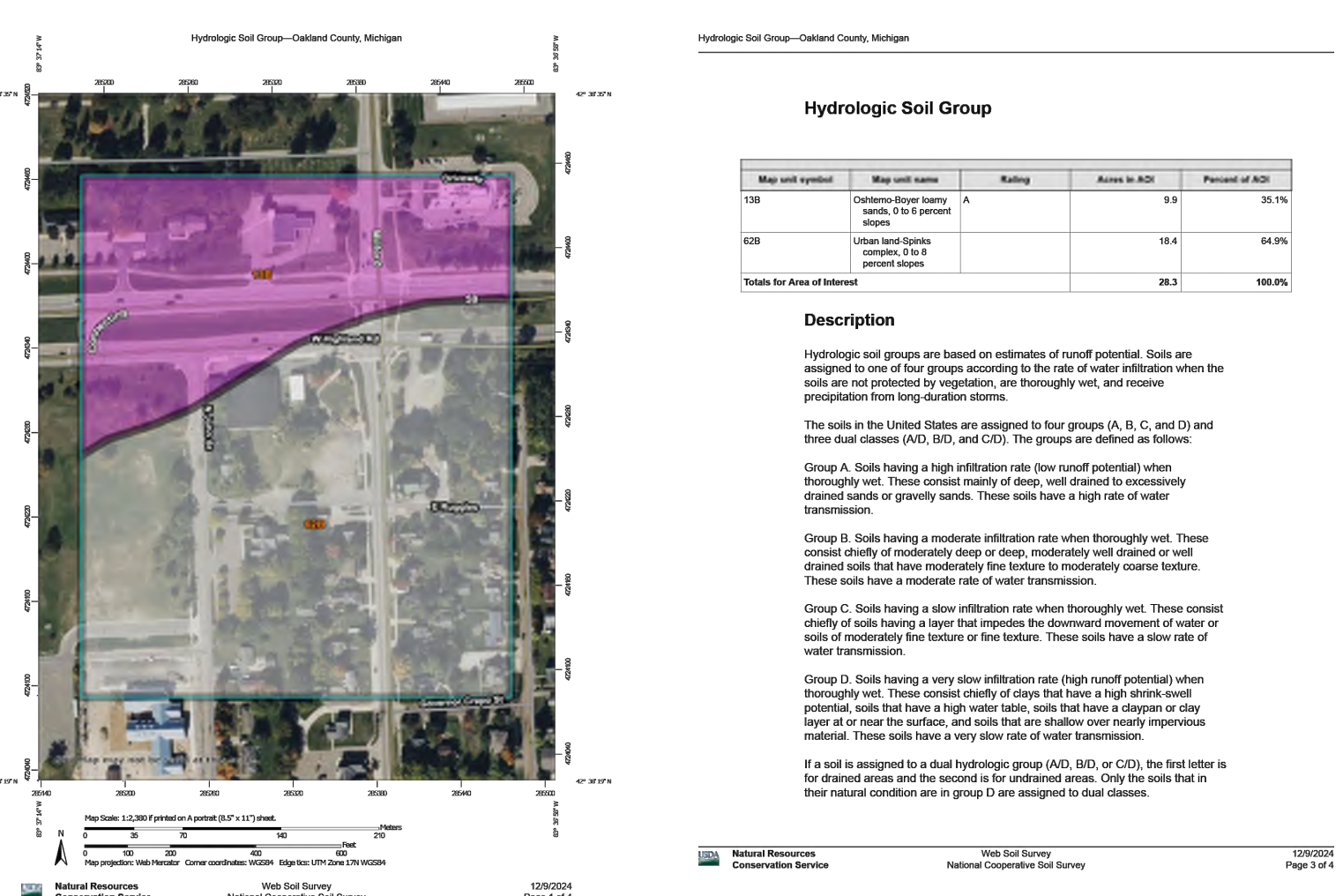
Tag No.	Scientific Name	Common Name	D.B.H.	Condition	Notes
25346		Silver Maple	24"		
25348		Norway Maple	30"		
25349		Norway Maple	30"		
25350		Norway Maple	30"		
25492		Norway Maple	28"		
25494		Norway Maple	20"		
25549		Silver Maple	12"		
25682		Silver Maple	28"		
25683		Silver Maple	24"		
25684		Norway Spruce	30"		
25685		Norway Maple	30"		
25686		Silver Maple	36"		
25687		Silver Maple	28"		
26197		Norway Maple	8"		
26198		Norway Maple	12"		
26233		Norway Maple	8"		
26646		Silver Maple	24"		
26730		Silver Maple	36"		Triple
26738		Norway Spruce	15"		
26739		Norway Spruce	12"		
26740		Norway Spruce	10"		
26741		Birch	20"		
26742		Silver Maple	20"		Triple
26743		Norway Spruce	14"		
26744		Norway Spruce	14"		
26808		Norway Maple	28"		



NATURAL
FEATURES
OVERLAY PLAN

SHEETZ HIGHLAND
TOWNSHIP -
HIGHLAND RD AND
MILFORD RD

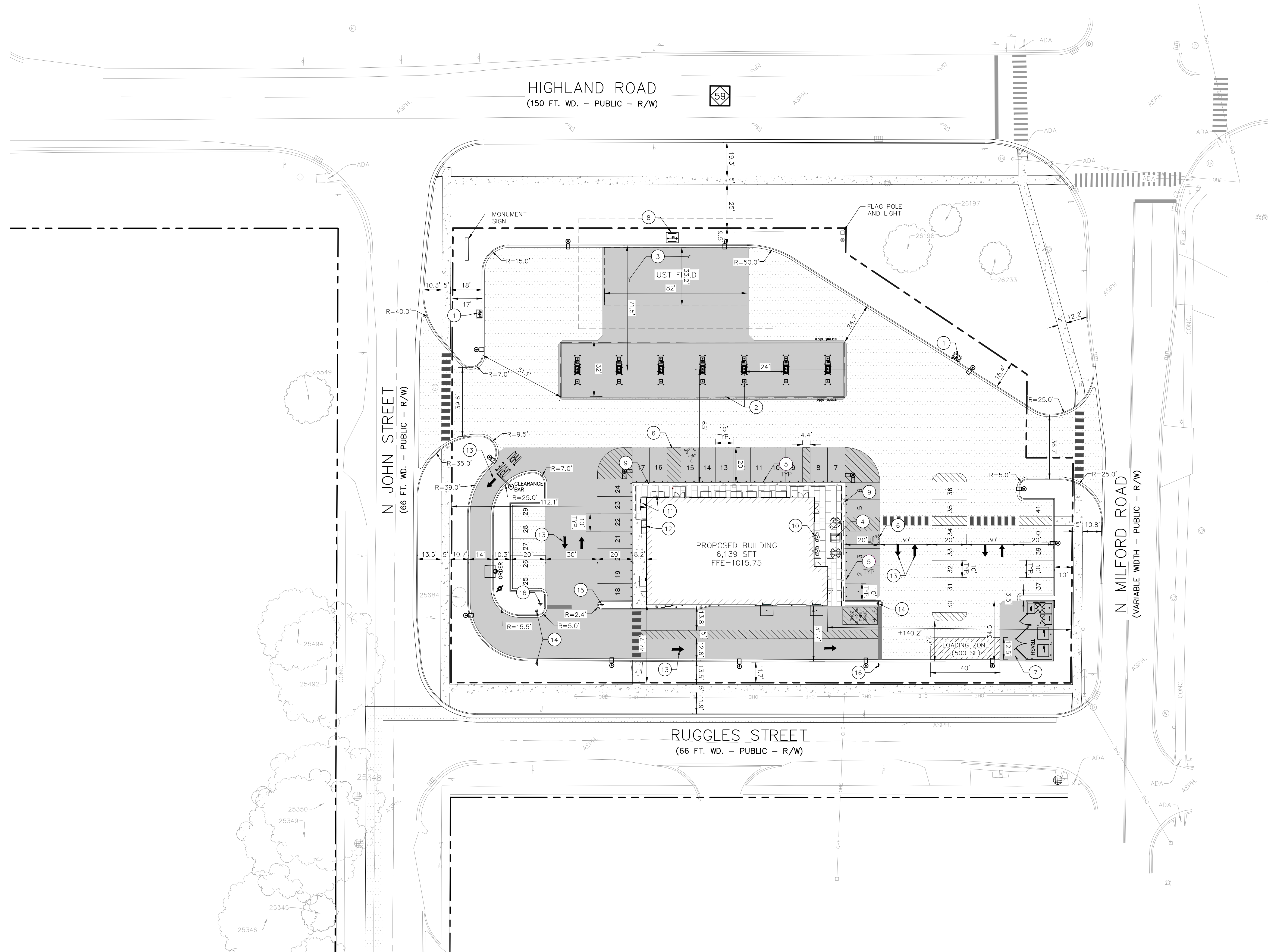
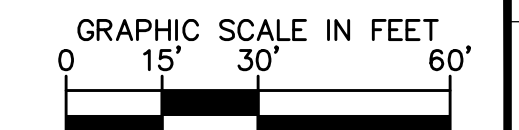
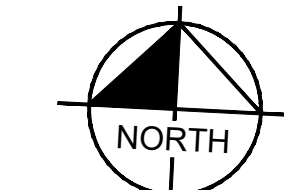
ORIGINAL ISSUE:
12/18/2024
KHA PROJECT NO.
268593002
SHEET NUMBER
C0.1



Drawing name: K:\DET\DESIGN\268593002_Sheet\001_Sheet_Highland_Twp_MA\2_Design\CADD\PlanSheets\C2.0_Site_Plan.dwg C:\0 SITE PLAN Date: 18, 2024 12:12pm by: tyler.smith
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PAVING LEGEND

	HEAVY DUTY ASPHALT PAVEMENT
	HEAVY DUTY CONCRETE PAVEMENT
	CONCRETE SIDEWALK
	BRICK PAVER WALK
	CURB AND GUTTER

- ### SITE NOTES
- ALL DIMENSIONS REFER TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
 - BUILDING DIMENSIONS ARE TO THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
 - REFER TO ARCHITECTURAL AND STRUCTURAL PLANS TO VERIFY ALL BUILDING DIMENSIONS, DOOR LOCATIONS, PRIOR TO ORDERING MATERIALS.
 - RADIi ADJACENT TO PARKING STALL AND NOT DIMENSIONED ON THIS PLAN SHALL BE 3- FEET, TYPICAL.
 - REFER TO ARCHITECTURAL PLANS FOR MONUMENT SIGN DETAILS. SEE MEP PLANS FOR SITE ELECTRICAL DRAWINGS.
 - ALL PROPOSED ON-SITE STRIPING SHALL BE PAINTED UNLESS OTHERWISE NOTED.

- ### KEY NOTES
- AIR STATION, PER SHEETZ, STANDARD DETAIL
 - FUEL STATIONS AND CANOPY
 - UNDERGROUND STORAGE TANK AREA
 - PATIO AREA
 - STOREFRONT BUMPER POST, PER SHEETZ STANDARD DETAIL, TYP.
 - ADA PARKING SPACE
 - CONCRETE DUMPSTER PAD, PER SHEETZ STANDARD DETAIL
 - UNDERGROUND STORAGE TANK VENT PAD, PER SHEETZ STANDARD DETAIL
 - WALK TO BE CONSTRUCTED FLUSH WITH PAVEMENT PER SHEETZ STANDARD DETAIL
 - OUTDOOR SEATING
 - ICE MERCHANDISER
 - PROPANE LOCKER
 - DIRECTIONAL PAVEMENT MARKING, TYP.
 - "DO NOT ENTER, ONE WAY" SIGN
 - "EXIT ONLY" SIGN
 - "STOP" SIGN

SITE DATA TABLE

PARCEL INFORMATION:

PARCEL 1:
 ADDRESS: 115 W HIGHLAND RD
 ID: 11-22-352-005

PARCEL 2:
 ADDRESS: 315 N MILFORD RD
 ID: 11-22-352-006

PARCEL 3:
 ADDRESS: 155 W HIGHLAND RD
 ID: 11-22-352-010

SITE AREA: 1.94 ACRES (84,664 SF) NET AND GROSS

ZONING:
 EXISTING: HS - HIGHLAND STATION
 PROPOSED: HS - HIGHLAND STATION (WITH SPECIAL LAND USE)

PROPOSED USE: GAS STATION/RESTAURANT

BUILDING INFORMATION:
 BUILDING FOOTPRINT AREA = 6,139 SF
 BUILDING LOT COVERAGE = 7.25%

SETBACK REQUIREMENTS:

	PROPOSED BUILDING:
RUGGLES ST:	44.7'
JOHN ST:	82.3'
HIGHLAND RD:	154.6'
MILFORD RD:	170.2'

PROPOSED LANDSCAPE BUFFER:

RUGGLES ST	11.7'
JOHN ST	17.0'
HIGHLAND RD	9.5'
MILFORD RD	10.0'

PARKING CALCULATIONS:
 DRIVE THRU RESTAURANT = 1 SPACE FOR EACH 70 SQ FT OF NET FLOOR AREA, PLUS 10 STACKING SPACES FOR DRIVE-THROUGH SERVICE WHICH DO NOT CONFLICT WITH USE OF REQUIRED SPACES, PLUS 2 LONGER SPACES DESIGNATED FOR RECREATIONAL VEHICLES, BUSES, AND SEMI TRUCKS
 GAS STATION = 1 SPACE FOR EACH 125 SQ FT OF NET FLOOR AREA, PLUS 2 PARKING SPACES PER FUELING STATION
 TOTAL PARKING REQUIRED = 450 NET FLOOR AREA / 70 = 7
 + 2,383 USABLE FLOOR AREA / 125 = 20
 + 7 GAS PUMPS * 2 = 14
 = 41 SPACES

TOTAL PROPOSED PARKING SPACES = 41 SPACES INC. 2 H/C SPACES

NO. _____ DATE _____ BY _____

REVISIONS

Kimley-Horn
 of Michigan, Inc.

SCALE: AS NOTED
 DESIGNED BY: TES
 DRAWN BY: LDF
 CHECKED BY: TES

SHEETZ

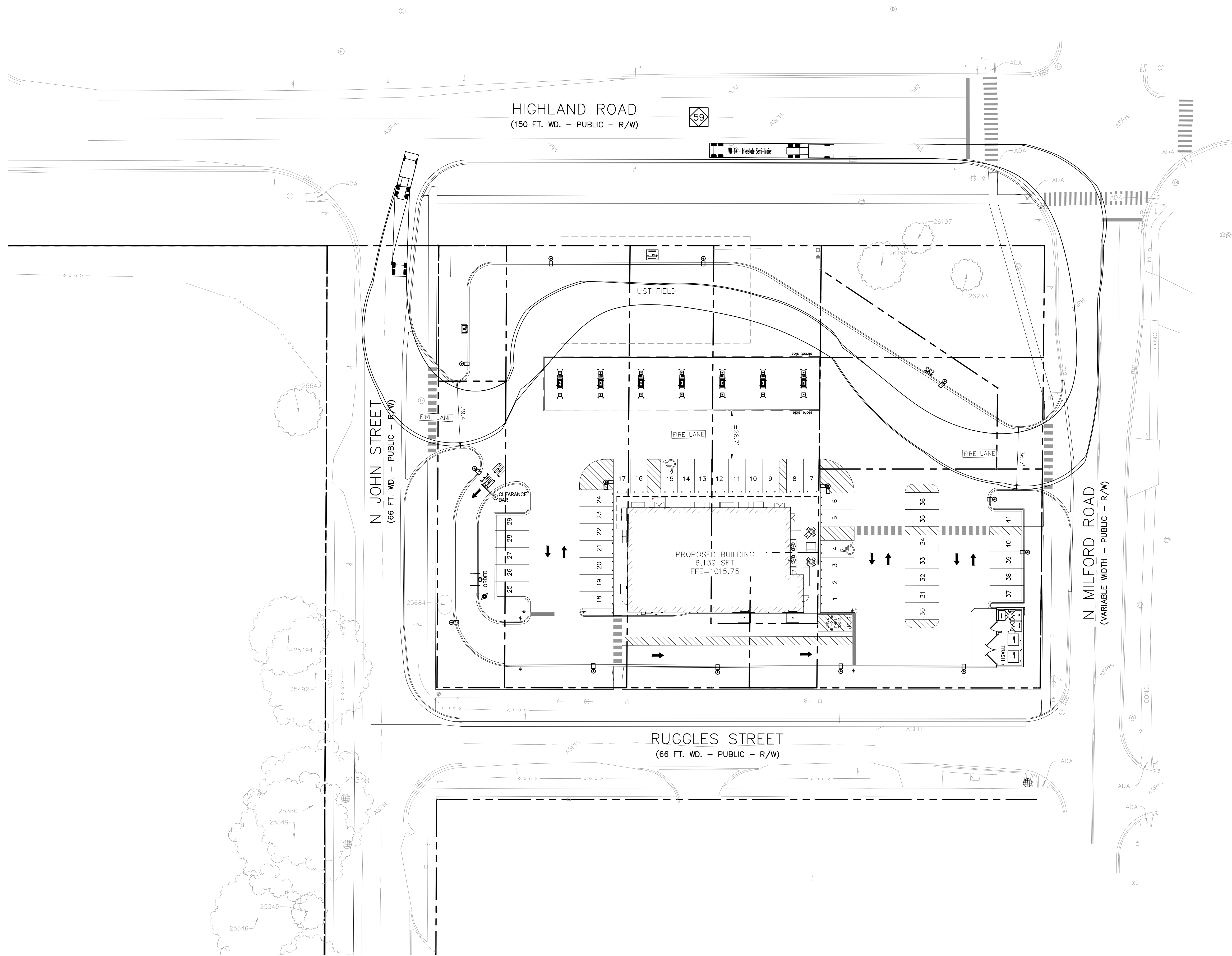
SITE PLAN

SHEETZ HIGHLAND TOWNSHIP - HIGHLAND RD AND MILFORD RD

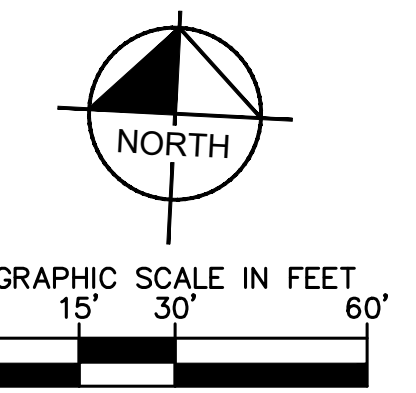
ORIGINAL ISSUE:
 12/18/2024
 KHA PROJECT NO.
 268593002

SHEET NUMBER
C1.0

Drawing name: K:\DEI_DES\268593002-Sheetz-Gold_Sheetz-Highland_Twp_MI_V2_Design\CADD\PHOTOSHETS\C1.1 TRUCK TURN PLAN.dwg C1.1 TRUCK TURN PLAN Dec 18, 2024 10:57am by tyler.smith
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SHEETZ	TRUCK TURN PLAN	SHEETZ HIGHLAND TOWNSHIP - HIGHLAND RD AND MILFORD RD	ORIGINAL ISSUE: 12/18/2024	No.	DATE	BY
			KHA PROJECT NO. 268593002			
SHEET NUMBER C1.1			SHEET NUMBER	REVISIONS		
SCALE: AS NOTED DESIGNED BY: TES DRAWN BY: LDF CHECKED BY: TES			Kimley-Horn of Michigan, Inc. 3000 WALKER AVENUE, SUITE 200 SOUTHFIELD, MI 48075 WWW.KIMLEY-HORN.COM			

STORMWATER DETENTION SYSTEM - INCREMENTAL VOLUME CALCULATIONS



CMP: Underground Detention System
Storage Volume Estimation

Adjustable Input Cells

Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular application and are subject to verification of the Engineer of Record. This tool is only applicable for rectangular shaped systems.

System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	98.0	Backfill Porosity (%):	0%	System Diameter (in):	78
Out-to-out width (ft):	35.0	Depth Above Pipe (in):	0.0	Pipe Spacing (in):	36
Number of Manifolds (ea):	1.0	Depth Below Pipe (in):	0.0	Incremental Analysis (in):	2
Number of Barrels (ea):	4.0	Width At Ends (ft):	1.0	System Invert (Elevation):	0
		Width At Sides (ft):	1.0		

Storage Volume Estimation									
System		Pipe		Stone		Total System		Miscellaneous	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Open Storage (%)	Ave. Surface Area (sf)
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	0.0
0.17	0.16	90.2	90.2	0.0	90.2	90.2	90.2	100.0%	807.5
0.33	0.33	162.9	253.1	0.0	162.9	253.1	253.1	100.0%	1,126.9
0.50	0.50	208.2	461.3	0.0	208.2	461.3	461.3	100.0%	1,361.4
0.67	0.66	243.1	704.4	0.0	243.1	704.4	704.4	100.0%	1,550.0
0.83	0.83	271.9	976.3	0.0	271.9	976.3	976.3	100.0%	1,708.0
1.00	1.00	296.2	1,272.5	0.0	296.2	1,272.5	1,272.5	100.0%	1,843.3
1.17	1.16	317.2	1,589.7	0.0	317.2	1,589.7	1,589.7	100.0%	1,960.6
1.33	1.33	335.5	1,925.2	0.0	335.5	1,925.2	1,925.2	100.0%	2,063.0
1.50	1.50	351.5	2,276.7	0.0	351.5	2,276.7	2,276.7	100.0%	2,152.5
1.67	1.66	365.4	2,642.1	0.0	365.4	2,642.1	2,642.1	100.0%	2,230.8
1.83	1.83	377.6	3,019.7	0.0	377.6	3,019.7	3,019.7	100.0%	2,299.0
2.00	2.00	388.2	3,407.9	0.0	388.2	3,407.9	3,407.9	100.0%	2,358.0
2.17	2.16	397.3	3,805.2	0.0	397.3	3,805.2	3,805.2	100.0%	2,408.4
2.33	2.33	405.0	4,210.3	0.0	405.0	4,210.3	4,210.3	100.0%	2,450.8
2.50	2.50	411.5	4,621.7	0.0	411.5	4,621.7	4,621.7	100.0%	2,485.6
2.67	2.66	416.6	5,038.4	0.0	416.6	5,038.4	5,038.4	100.0%	2,513.0
2.83	2.83	420.6	5,459.0	0.0	420.6	5,459.0	5,459.0	100.0%	2,533.4
3.00	3.00	423.5	5,882.5	0.0	423.5	5,882.5	5,882.5	100.0%	2,546.9
3.17	3.16	425.1	6,307.6	0.0	425.1	6,307.6	6,307.6	100.0%	2,553.7
3.33	3.33	425.7	6,733.3	0.0	425.7	6,733.3	6,733.3	100.0%	2,553.7
3.50	3.50	425.1	7,158.5	0.0	425.1	7,158.5	7,158.5	100.0%	2,546.9
3.67	3.66	423.5	7,581.9	0.0	423.5	7,581.9	7,581.9	100.0%	2,533.4
3.83	3.83	420.6	8,002.6	0.0	420.6	8,002.6	8,002.6	100.0%	2,513.0
4.00	4.00	416.6	8,419.2	0.0	416.6	8,419.2	8,419.2	100.0%	2,485.6
4.17	4.16	411.5	8,830.7	0.0	411.5	8,830.7	8,830.7	100.0%	2,450.8
4.33	4.33	405.0	9,235.7	0.0	405.0	9,235.7	9,235.7	100.0%	2,408.4
4.50	4.50	397.3	9,633.0	0.0	397.3	9,633.0	9,633.0	100.0%	2,358.0
4.67	4.66	388.2	10,021.2	0.0	388.2	10,021.2	10,021.2	100.0%	2,299.0
4.83	4.83	377.6	10,398.9	0.0	377.6	10,398.9	10,398.9	100.0%	2,230.8
5.00	5.00	365.4	10,764.3	0.0	365.4	10,764.3	10,764.3	100.0%	2,152.5
5.17	5.16	351.5	11,115.8	0.0	351.5	11,115.8	11,115.8	100.0%	2,063.0
5.33	5.33	335.5	11,451.2	0.0	335.5	11,451.2	11,451.2	100.0%	1,960.6
5.50	5.50	317.2	11,768.5	0.0	317.2	11,768.5	11,768.5	100.0%	1,843.3
5.67	5.66	296.2	12,064.7	0.0	296.2	12,064.7	12,064.7	100.0%	1,708.0
5.83	5.83	271.9	12,336.6	0.0	271.9	12,336.6	12,336.6	100.0%	1,550.0
6.00	6.00	243.1	12,579.7	0.0	243.1	12,579.7	12,579.7	100.0%	1,361.4
6.17	6.16	208.2	12,787.9	0.0	208.2	12,787.9	12,787.9	100.0%	1,126.9
6.33	6.33	162.9	12,950.8	0.0	162.9	12,950.8	12,950.8	100.0%	807.5
6.50	6.50	90.2	13,040.9	0.0	90.2	13,040.9	13,040.9	100.0%	0.0



3000 Town Center
Suite 2600
Southfield, MI 48075

STORMWATER CONTROL SYSTEMS DESIGN

Project: Sheetz - Highland Township, Oakland County
Location: Milford Rd at M59
Date: 08/13/24
By: TES

RUNOFF COEFFICIENT 'C'

Semi-PerVIOUS Runoff Coefficient

Hydrologic Group %	C Factor
HSG A 0%	0.15
HSG B 0%	0.20
HSG C 0%	0.25
HSG D 100%	0.30
Total 100%	0.30

Surface	Area (sf)	Area (acres)	C Factor	Weighted C
Water Surface	0	0.00	1.00	0.00
Roof	0	0.00	0.95	0.00
Asphalt or Concrete Pavements	72,246	1.66	0.95	0.80
Semi-PerVIOUS Lawn	13,254	0.30	0.30	0.05
Total	85,500	1.96		0.85

Runoff Coefficient: 0.85

TIME OF CONCENTRATION 'Tc'

Sheet Flow

$V = K \cdot S^{0.5}$
K: for sheet flow = 0.48
S: Slope = 1%
V = 0.48 fps

Flow Time=L/(V*60)

L: Flow Length (max 300) = 300 ft
Flow Time = 10.42 min

Shallow Flow

$V = K \cdot S^{0.5}$
K: for valley flow = 1.2
S: Slope = 1%
V = 1.2 fps

Flow Time=L/(V*60)

L: Flow Length = 0 ft
Flow Time = 0.00 min

Sewer Pipe Flow

V: Calculated average velocity = 3 fps

T, Flow Time = L/(V*60)

L: Sewer Length = 400 ft
T, Flow Time = 2.22 min

T_c Total Time of Concentration (min) = 12.64 min
Note: Tc calc above can be used for <5 acres; >5 acres, 15 minutes minimum for commercial

100 YEAR PEAK INTENSITY

$I_{100} = 83.3 / (T_c + 9.17)^{0.81}$
T_c = 12.64 min
I₁₀₀ = 6.86 in/hr

CHANNEL PROTECTION VOLUME CONTROL (CPVC)

V_{CPVC} = 4,719 x C x A = 7,866 ft³
V_{CPVC}: Required CPVC Volume = 7,866 ft³
Note: Extended detention volume intended to control #2 year rate (1.9 inch rainfall) to protect channels from erosive release rates. Is designed to release over a period of 48 hours.

WATER QUALITY CONTROL VOLUME (V_{WQ}): For Forebays, Pre-Treatment Systems, etc

V_{WQ} = 3,630 x C x A = 6,051 ft³
V_{WQ}: Water Quality volume = 6,051 ft³
Q_{WQ} = C x A x 30.2(T_c + 9.17)^{0.81}
T_c: Time of Concentration = 12.64 min
Q_{WQ}: Water Quality rate = 4.15 cfs
(For manufactured pretreatment systems)

CHANNEL PROTECTION RATE CONTROL (CPRC): EXTENDED DETENTION

V_{ED} = V_{CPVC} = A x C x 6897 = 11,497 ft³
V_{ED}: Required CPRC Storage Volume = 11,497 ft³
Note: A portion of the flood control storage volume is the Extended Detention Volume (V_{ED}). The extended detention volume intended to control #2 year rate (1.9 inch rainfall) to protect channels from erosive release rates. Is designed to release over a period of 48 hours.

100-YEAR PEAK INFLOW

Peak Inflow
I₁₀₀ (Calculated Above) = 6.86 in/hr
Q_{100IN} = Q_i x I₁₀₀ x A = 11.44 cfs
Q_{100IN}: 100-yr Developed Site Peak Pond Inflow = 11.44 cfs

DETERMINE THE PEAK ALLOWABLE 100-YEAR DISCHARGE

- Q_{100P} is the lesser of:
- The restricted release rate for the drain (ft³/acre)
 - The prorated share of the drain's capacity (ft³/acre)
 - The Variable Release Rate (Q_{VRR}, ft³/acre, Calculated Below)
- *Assumed downstream drain has sufficient capacity to receive site runoff, therefore variable release rate will be utilized

CALCULATE THE VARIABLE RELEASE RATE

Allowable (Variable) Release Rate
Q_{VRR} = Q_{allow} = 1.1055 * 0.206 x ln(A) ** If less than 100 acres**
Q_{VRR} = Q_{allow}: 100-yr flood allowable peak flow rate = 0.967 cfs/ac
Q_{VRR} = Q_{allow}: 100-yr flood allowable peak flow rate = 1.000 cfs/ac (capped at 1.0)
Note: Variable release rate is capped at 1.0 cfs/acre for developments 2 acres or less. For developments > 2 acres, the variable release rate is 0.15 cfs/acre

Allowable Discharge
Q_{100P} = Q_i = Q_{VRR} x A = 1.96 cfs
Q_{100P}: Peak allowable 100 year discharge (flow) = 1.96 cfs

STORAGE CURVE FACTOR (RATIO)

R = 0.206 - 0.15 x ln(Q_{100P}/Q_{100IN}) = 0.470

100-YEAR RUNOFF

V_{100R} = 18,985 x C x A = 31,646 ft³
V_{100R}: 100-year runoff volume = 31,646 ft³

100-YEAR STORAGE VOLUME

V_{100D} = V_{100R} x R = 14,885 ft³
R, Storage Ratio (Calculated Above) = 0.470
V_{100D}: 100 year storage volume = 14,885 ft³

INFILTRATION STORAGE VOLUME

A₁, average infiltration area = (A₁ + A₂)/2 = 6,300 ft² **** Infiltration Area Assumed ****
V_i, volume of infiltration = (K_{inf} x S₁ x 6 x A₁)/12 in = 2.00 in/hr **** Infiltration Rate Assumed ****
V_{sub}, volume of subsurface storage = h x A x e = 2,835 ft³ **** Gravel Bed Depth Assumed ****
V_{inf}, Total Storage Volume from Infiltration = V_{inf} + V_{sub} + V_i = 7,866 ft³ > V_{CPVC} ?

REQUIRED DESIGN VOLUMES

V_{CPVC}: Required Protection Control Volume = 7,866 ft³
V_{ED} = V_{CPVC}: Required Channel Protection Control Volume = 11,497 ft³
V_{100D}: Required 100-year Storage Volume, less V_{CPVC} = 7,019 ft³
V_{100D}, Required 100-year Storage Volume (V_{ED} Dictat) = 11,497 ft³

Special Notes: * If the volume control requirement is met (CPVC), the CPVC volume can be subtracted from (credited against the 100 year flood control volume)
** The minimum flood storage requirement on any site is the CPRC volume. If the CPRC volume is higher than the resultant flood control volume, the CPRC volume shall dictate the detention storage volume

UNDERGROUND STORAGE SYSTEM - SEE INCREMENTAL STORAGE CALC

Calculated Elevation for V_{CPVC} / V_{ED} = 651.62 / 11,497 ft³

PROJECT SUMMARY

Calculation Details
LOADING = HSD0H925
APPROX. LINEAR FOOTAGE = 393 LF
STORAGE SUMMARY
STORAGE VOLUME REQUIRED = 13,000 CF
PIPE STORAGE VOLUME = 13,041 CF
BACKFILL STORAGE VOLUME = 0 CF
TOTAL STORAGE PROVIDED = 13,041 CF

PIPE DETAILS
DIAMETER = 78"
CORRUIGATION = 5x1
GAGE = 16
COATING = ALT2
WALL TYPE = SOLID
BARREL SPACING = 36"

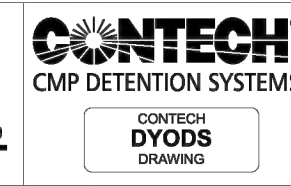
BACKFILL DETAILS
WIDTH AT ENDS = 12"
ABOVE PIPE = 0"
WIDTH AT SIDES = 12"
BELOW PIPE = 0"

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2 1/2" x 1/2" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYEING DESIGN. QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.



DATE	REVISION DESCRIPTION	BY



ASSEMBLY
SCALE: 1" = 4'

DY057401 Sheetz Highland
Main SMW
Highland, MI
DETENTION SYSTEM

PROJECT NO.	REV. NO.	DATE
4587	0001	8/14/2024
DESIGNED BY	DVD	DATE
CHECKED BY	DVD	DATE
APPROVED BY	DVD	DATE
SHEET NO.	1	

Drawing name: K:\DET_DVS\66893002_Sheetz_Highland_Twp_MI_V2_Design\CADD\PlanSheets\C2.1 STORMWATER CALCULATIONS - Dec 18, 2024, 10:56am - by: tyler.smith
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Kimley Horn of Michigan, Inc.
3000 TOWN CENTER SUITE 2600
SOUTHFIELD, MI 48075
WWW.KIMLEY-HORN.COM

AS NOTED
DESIGNED BY: TES
DRAWN BY: LDF
CHECKED BY: TES

TYLER SMITH
ENGINEER
NO. 8201068975
PROFESSIONAL ENGINEER



STORMWATER
CALCULATIONS

SHEETZ HIGHLAND
TOWNSHIP -
HIGHLAND RD AND
MILFORD RD

ORIGINAL ISSUE:
12/18/2024
KHA PROJECT NO.
268593002
SHEET NUMBER
C2.1

EXISTING SITE CONDITIONS:

- SEE SOIL DATA THIS SHEET
- LOTS CONTAIN APPROXIMATELY 1.94 ACRES OF LAND
- EXISTING PROPERTY USES ARE A CELL PHONE STORE, WAREHOUSE, AND HOUSE
- PROPOSED PROPERTY USE IS A SHEETZ FACILITY WITH FOOD SERVICE AND 7 PROPOSED GAS PUMPS ON THE ADJACENT PARCEL

SYSTEM DESIGN SPECIFICATIONS:

- AVERAGE COMPARABLE = 1480 GPD
1480 GPD X 1.25 SAFETY FACTOR = 1850 GPD MINIMUM DESIGN FLOW
- MDEQ MICHIGAN DRAFT CRITERIA
HYDRAULIC LOADING RATE FOR SAND = 0.8 (PER TABLE 4.2) PER MICHIGAN CRITERIA
- DOSE RATE = $\frac{2500 \text{ GPD}}{3325 \text{ SQ FT}} = 0.75 = 0.8$ REQUIRED
- ALL MATERIALS MUST MEET OCHD STANDARDS. NO FOAM CORE PVC ALLOWED.
- WE RECOMMEND PLUMBING FIXTURES BE INSTALLED TO MAINTAIN A MINIMUM OF TOILETS @ 1.6 GAL MAXIMUM FLUSH VOLUME AND SHOWERS @ 2.8 GAL MAXIMUM FLOW
- GARBAGE DISPOSAL IS NOT RECOMMENDED
- NO WATER SOFTENER EFFLUENT MAY BE PUT INTO SEPTIC FIELD

TANK DESIGN:

- GREASE INTERCEPTOR DESIGN:
- ASSUME'S OF FLOW OF BUILDING IS FROM KITCHEN, 1667 GPD
 - A GREASE TRAP FOR 7 HOUR RETENTION IS REQUIRED
 - 1667 GPD X 3 = 5000 GALLONS GREASE TRAP RETENTION REQUIRED
 - 5300 GALLONS GREASE TRAP RETENTION PROVIDED - REQUIRED
- SEPTIC TANK DESIGN:
- WITH PRETREATMENT, 24 HOUR RETENTION IS REQUIRED
 - 3320 GALLONS SEPTIC TANK PROVIDED - REQUIRED

PRETREATMENT DESIGN:

- MYFAST 1.0 UNIT CAN TREAT UP TO 27 LBS OF ORGANIC LOAD
- PROPOSED ORGANIC LOAD
- 2500 GPD X 1300 MG/L 800 (KITCHEN WASTE) X 8.3X10⁻⁶ = 26.98 LBS
- 26.98 LBS PROPOSED < 27 LBS MAXIMUM THEREFORE DESIGN IS OK

CONSTRUCTION NOTES:

- NOTIFY THIS ENGINEER 48 HOURS (2 WORKING DAYS) BEFORE STARTING CONSTRUCTION OF SEPTIC SYSTEM (24874.985)
- SET GREASE TRAPS, SEPTIC TANKS, SURGE TANK, MYFAST UNIT, AND PUMP CHAMBER AS SHOWN ON PLAN
- CUT DOWN TO COARSE SAND THEN SCARIFY BED AREA. AFTER SCARIFICATION ABSOLUTELY NO CONSTRUCTION TRAFFIC ON FIELD AREA AT ANY TIME.
- FILL PROPOSED SEPTIC FIELD AREA WITH 2NS SAND TO ELEVATION AS SHOWN ON CROSS SECTION.
- FILL PROPOSED SEPTIC FIELD AREA WITH 8" 6A WASHED STONE AS SHOWN ON CROSS SECTION AND CONSTRUCT PIPING AS SHOWN. COVER PIPING WITH REMAINING STONE TO MAINTAIN A MINIMUM OF 12" 6A STONE.
- PRIOR TO LAYING FABRIC (STEP 6) THIS ENGINEER AND THE OAKLAND COUNTY HEALTH DEPARTMENT MUST INSPECT AND APPROVE INSTALLATION OF SYSTEM IN ENTIRETY. FILTER FABRIC MUST BE ON SITE DURING FINAL INSPECTION.
- COVER STONE WITH LIGHT (BREATHABLE) FILTER FABRIC TO MINIMIZE STONE CONTAMINATION. FILTER FABRIC MUST BE NON-WOVEN FABRIC WITH A WEIGHT NOT TO EXCEED 2 OUNCES PER SQUARE YARD, MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 10 POUNDS AND MINIMUM PUNCTURE STRENGTH OF 8 POUNDS. COVER FIELD AREA WITH 12" 24" SANDY LOAM & SANDY LOAM TOPSOIL AS SPECIFIED ON CROSS SECTIONS.
- SEED AND MULCH (OR SOD) AFTER FINAL GRADING.
- IF PROPER NOTIFICATION DOES NOT OCCUR AND REQUIRED INSPECTIONS ARE NOT COMPLETED AS SPECIFIED, THIS ENGINEER RESERVES THE RIGHT TO WITHHOLD APPROVALS UNTIL SATISFACTORY INFORMATION IS PROVIDED TO THE ENGINEER REGARDING INSTALLATION. (EXCAVATION OF FIELD AREA MAY BE REQUIRED)
- PRIOR TO FINAL APPROVAL OF THE INSTALLED SEPTIC SYSTEM BY THE OAKLAND COUNTY HEALTH DEPARTMENT, THE DESIGN ENGINEER MUST SUBMIT A LETTER CERTIFYING THAT THE SYSTEM WAS INSTALLED IN SUBSTANTIAL COMPLIANCE WITH THIS PLAN.

SOILS:

- PK #1 6" SANDY LOAM TOPSOIL, FILL
2" FILL
6" SANDY LOAM TOPSOIL
2" SANDY CLAY LOAM, SAND GREATER THAN 50%

PK #2 6" SANDY LOAM TOPSOIL
11" LOAMY SAND, DULL, FILL
1" FILL
HSWT NOT OBSERVED
GWT NOT OBSERVED

PK #3 6" SANDY LOAM TOPSOIL, FILL
3.5" FILL
2" SANDY LOAM
3" SAND, COARSE
HSWT NOT OBSERVED
GWT NOT OBSERVED

PK #4 18" SANDY LOAM TOPSOIL
4.5" SANDY LOAM
3" SAND, COARSE
HSWT NOT OBSERVED
GWT NOT OBSERVED

REQUIREMENTS FOR MYFAST UNIT:

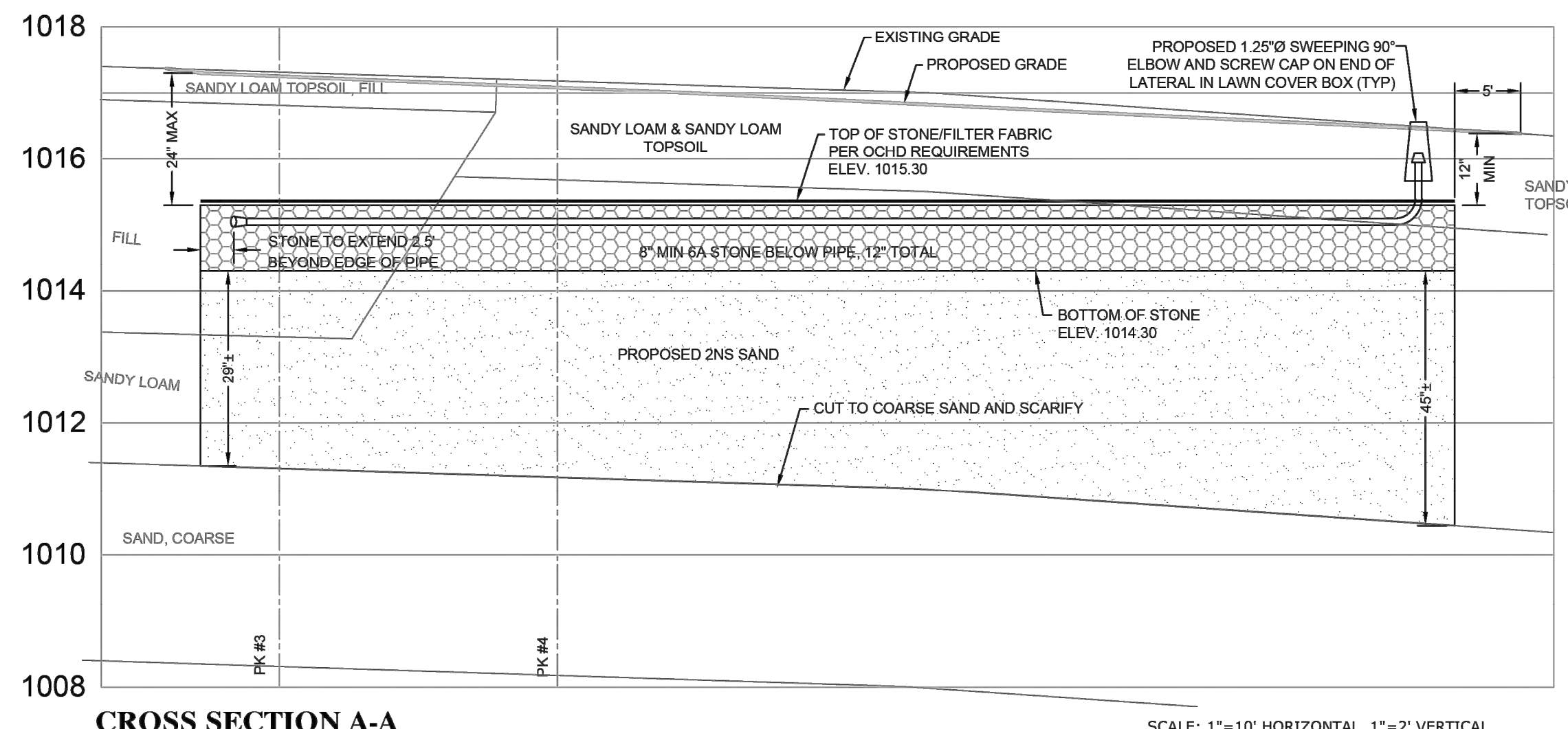
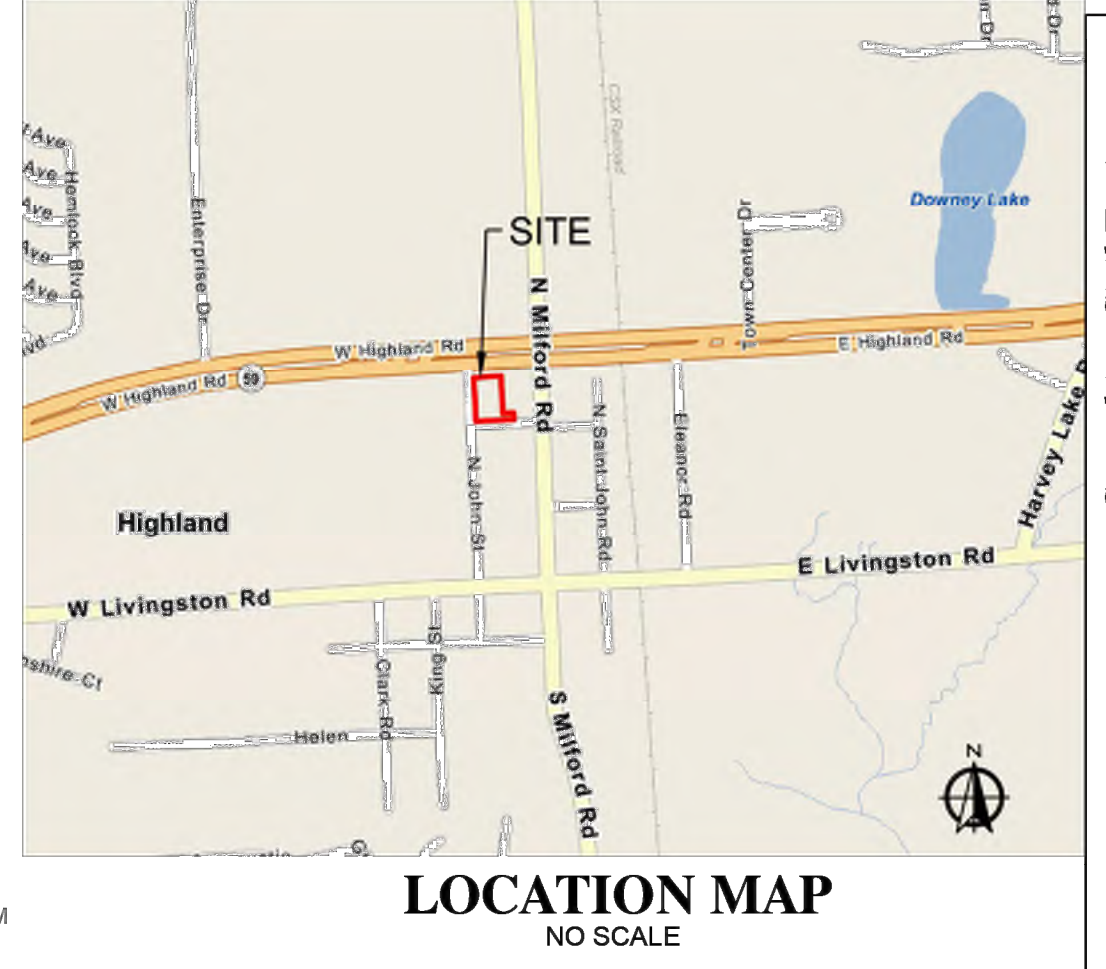
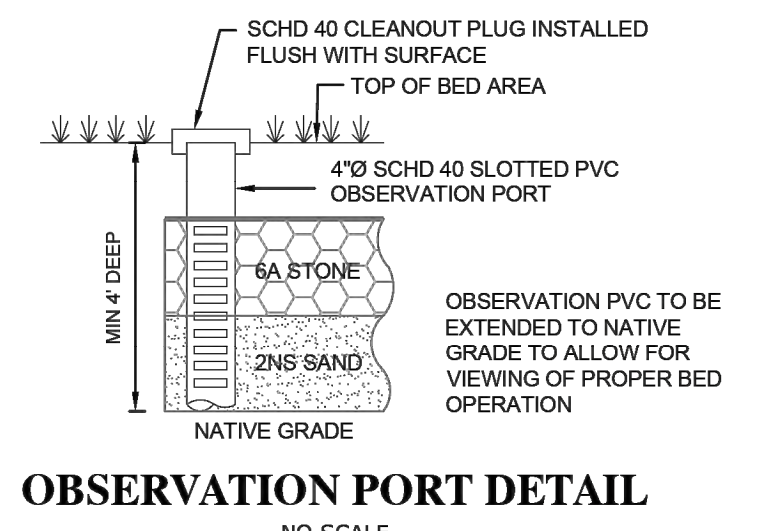
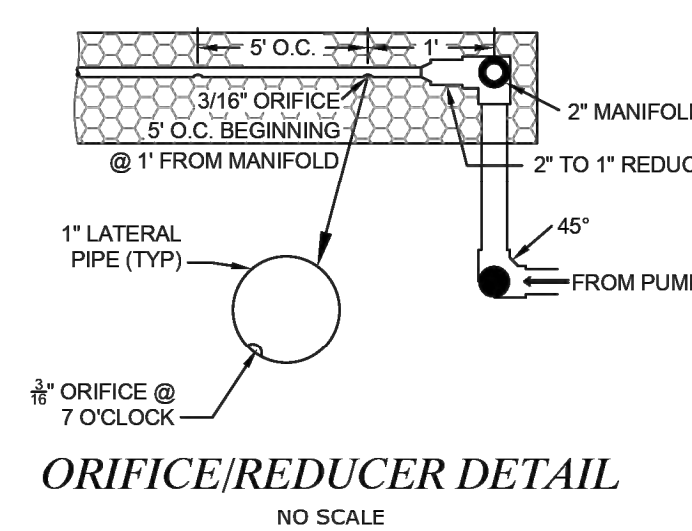
- DEED RESTRICTION FOR OPERATION & MAINTENANCE AGREEMENT WILL BE REQUIRED PRIOR TO FINAL APPROVAL.
- A BIO-MICROBICS MYFAST SYSTEM CERTIFIED INSTALLER IS REQUIRED FOR INSTALLATION OF THE HSFASST TREATMENT UNIT
- THE MYFAST UNIT MUST BE CONNECTED TO A PHONE OR CABLE LINE TO CONTACT REPAIR CONTRACTOR 24 HRS/DAY IN CASE OF SYSTEM FAILURE.
- GREASE LEVELS ENTERING THE FAST UNIT MUST BE LESS THAN 40MG/L. EXCEEDING THIS LEVEL CAN AFFECT TREATMENT AND WILL WARRANT MORE AGGRESSIVE GREASE MANAGEMENT OR DESIGN ALTERATION.
- THE MYFAST MAINTENANCE CONTRACT MUST BE EXTENDED TO COVER THE OPERATION OF THE TREATMENT SYSTEM IN PERPETUITY UNTIL SEWERS ARE AVAILABLE. (THIS CONTRACT IS TO HAVE THE SERVICE PROVIDER COME QUARTERLY TO PERFORM AN 100-POINT INSPECTION). AN OPERATION PERMIT MUST BE OBTAINED FROM THE OCHD ANNUALLY.

DEED RESTRICTION LANGUAGE:

PRIOR TO OCHD GRANTING FINAL APPROVAL FOR THE USE OF AN ALTERNATIVE TECHNOLOGY A DEED RESTRICTION MUST BE RECORDED WITH THE FOLLOWING LANGUAGE: THIS PREMISE IS SERVED BY AN ALTERNATIVE TECHNOLOGY TYPE WASTEWATER DISPOSAL SYSTEM IN ACCORDANCE WITH OAKLAND COUNTY HEALTH DIVISION GUIDELINES. THE HSFASST 4.5 UNIT REQUIRES ROUTINE OPERATION AND MAINTENANCE AT LEAST FOUR TIMES ANNUALLY * OR OTHER VERBIAGE AS REQUIRED BY OAKLAND COUNTY. AN OPERATION AND MAINTENANCE MANUAL FOR THIS ALTERNATIVE TECHNOLOGY SYSTEM HAS BEEN DEVELOPED WITH A COPY ON FILE AND AVAILABLE FOR REVIEW AT THE OAKLAND COUNTY HEALTH DIVISION.

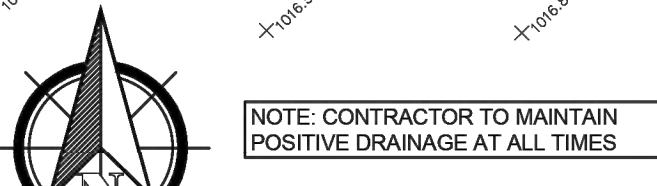
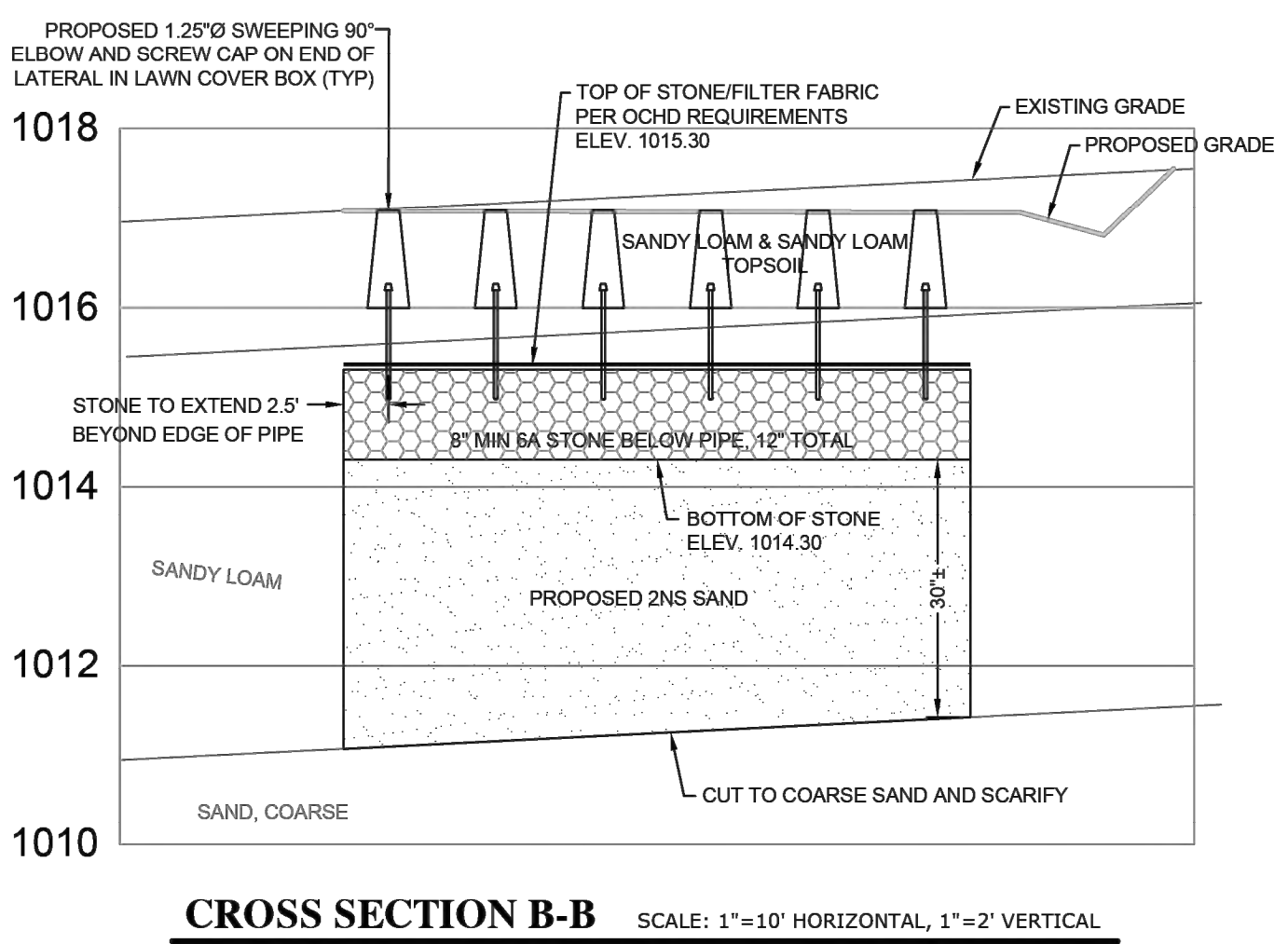
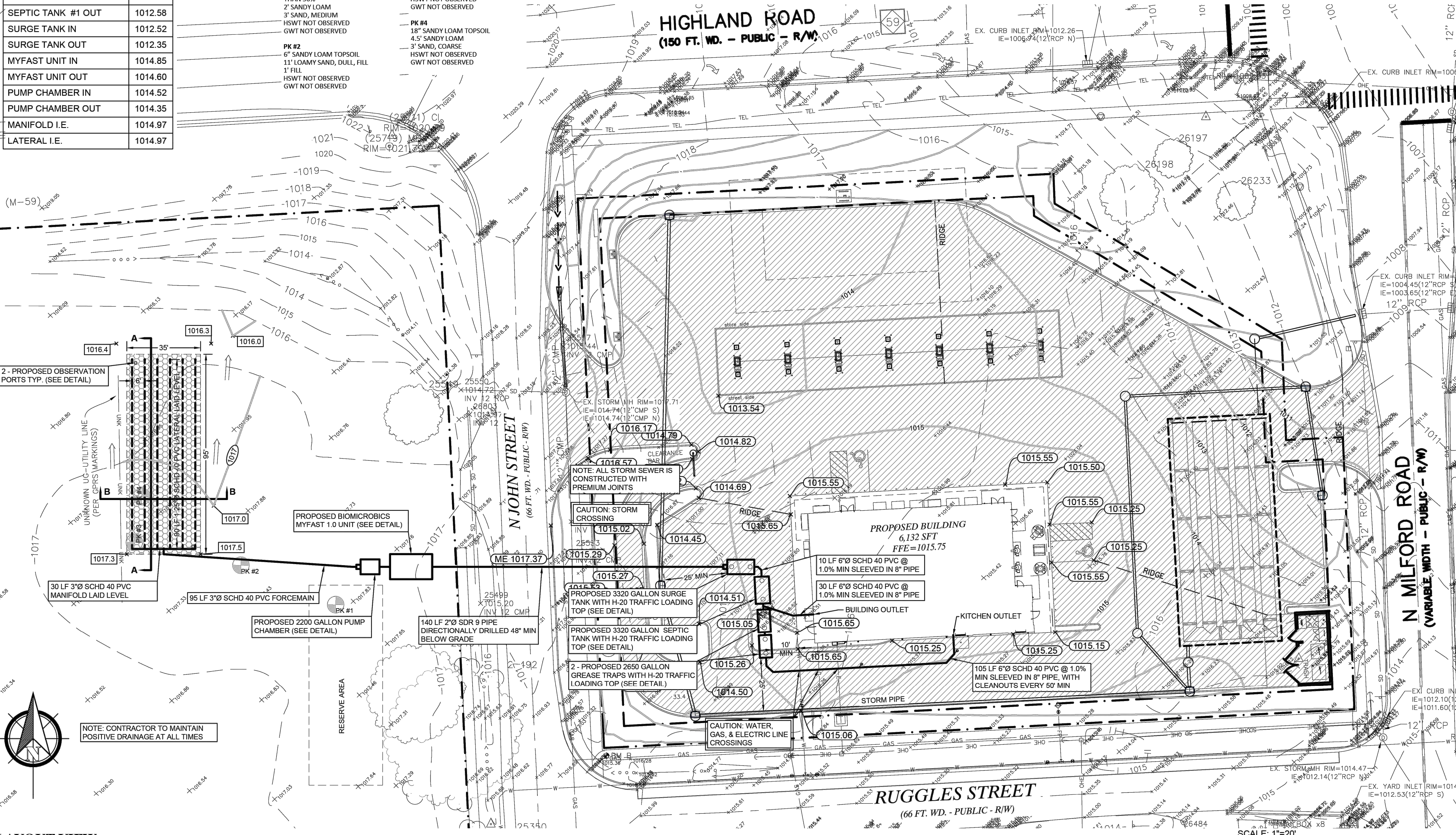
OPERATION & MAINTENANCE SCHEDULE:

- QUARTERLY MYFAST 1.0 UNIT INSPECTIONS AS DESCRIBED ABOVE BY A LICENSED CONTRACTOR
- GREASE TRAP TO BE CLEANED EVERY 3 MONTHS OR AS NEEDED
- SEPTIC TANK ARE TO BE PUMPED ONCE EVERY TWO YEARS (OR AS NEEDED)
- COMMERCIAL BIOFILTER IS TO BE CLEANED TWICE A YEAR FOR THE FIRST YEAR AND THEN EVERY TIME THE SEPTIC TANKS ARE PUMPED (OR AS NEEDED)
- AT SAME TIME OF BIOFILTER CLEANING, OBSERVATION PORTS ARE TO BE CHECKED TO VERIFY PROPER FUNCTIONING OF THE SYSTEM



INVERT ELEVATIONS:

KITCHEN OUT	1013.25
GREASE TRAP #1 IN	1012.20
GREASE TRAP #1 OUT	1012.03
GREASE TRAP #2 IN	1012.97
GREASE TRAP #2 OUT	1012.80
SEPTIC TANK #1 IN	1012.75
SEPTIC TANK #1 OUT	1012.58
SURGE TANK IN	1012.52
SURGE TANK OUT	1012.35
MYFAST UNIT IN	1014.85
MYFAST UNIT OUT	1014.60
PUMP CHAMBER IN	1014.52
PUMP CHAMBER OUT	1014.35
MANIFOLD I.E.	1014.97
LATERAL I.E.	1014.97



LAYOUT VIEW

Consulting Civil Engineers
"Engineering A Better Michigan"

Powell Engineering & Associates, LLC
4700 Cornerstone Drive, White Lake, Michigan 48383
P: 248.714.9895 info@powelleng.com

NOTE: AS AN AID TO THE CONTRACTOR IN LOCATING VARIOUS UTILITIES AND UNDERGROUND STRUCTURES, THE ENGINEER HAS PROVIDED THIS PLAN AND PROFILES TO BE TAKEN FROM FIELD TOP AND/OR OFF-PLAN RECORDS. THE OWNER AND CONTRACTOR DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION. ADDITIONAL UNIDENTIFIED UTILITIES OR STRUCTURES MAY NOT BE ENCOUNTERED BY THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND ENGINEER FOR DIRECTION ON HOW TO PROCEED IF THE CONTRACTOR WILL BE REQUIRED TO EXCAVATE FOR UTILITIES OR STRUCTURES SHOWN ON THESE PLANS IN UNEXPECTED LOCATIONS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND ENGINEER FOR DIRECTION ON HOW TO PROCEED IF THE CONTRACTOR WILL BE REQUIRED TO EXCAVATE FOR UTILITIES OR STRUCTURES SHOWN ON THESE PLANS IN UNEXPECTED LOCATIONS.

BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

SHEETZ HIGHLAND TWP. SANITARIAN: FRANK RHODES
SHEETZ HIGHLAND TOWNSHIP, MI
215 N. JOHN STREET, HIGHLAND TOWNSHIP, MI

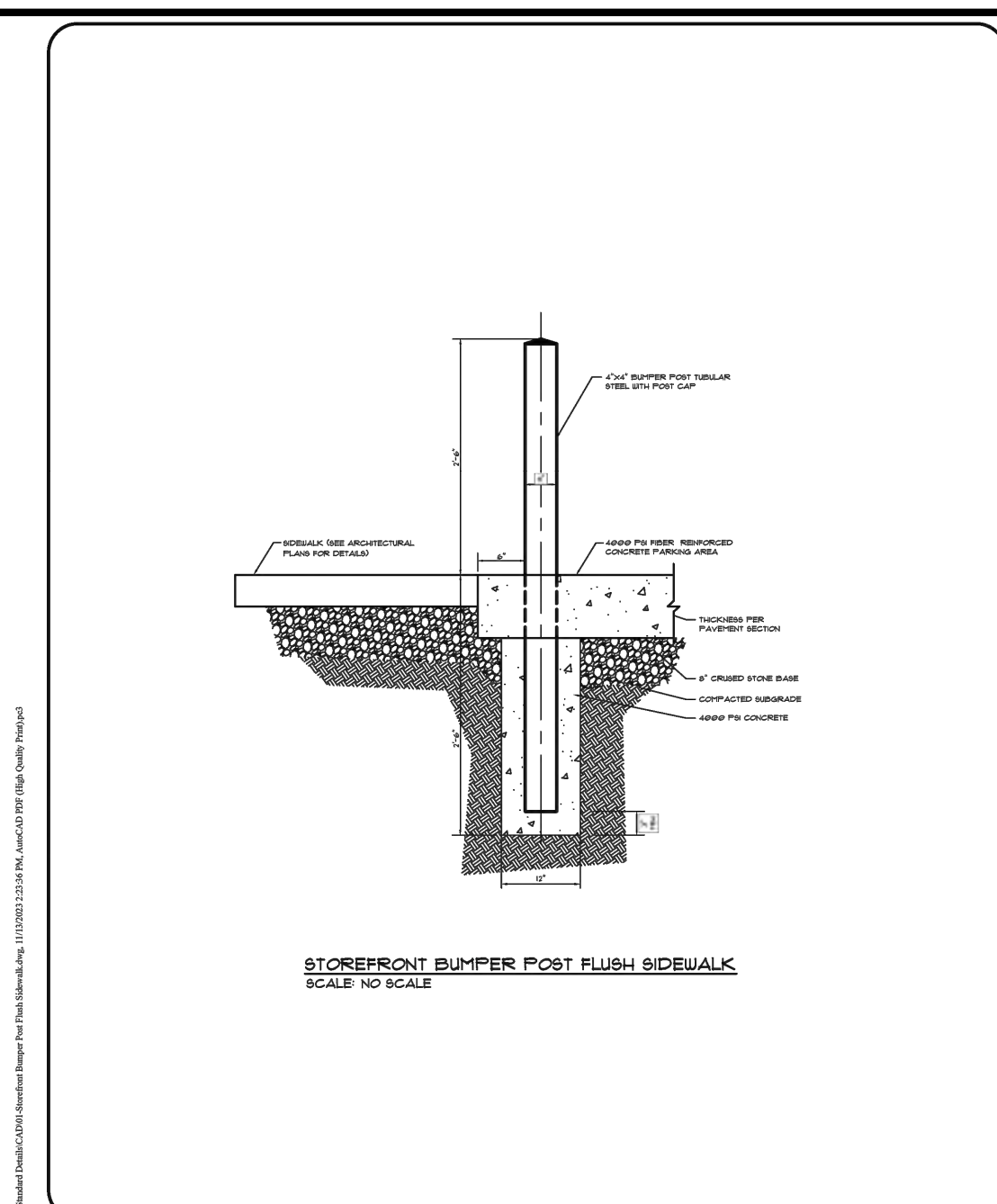
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DESIGNED	JFT
APPROVED	MCP
P.E. JOB No.	24-492
SCALE	AS SHOWN

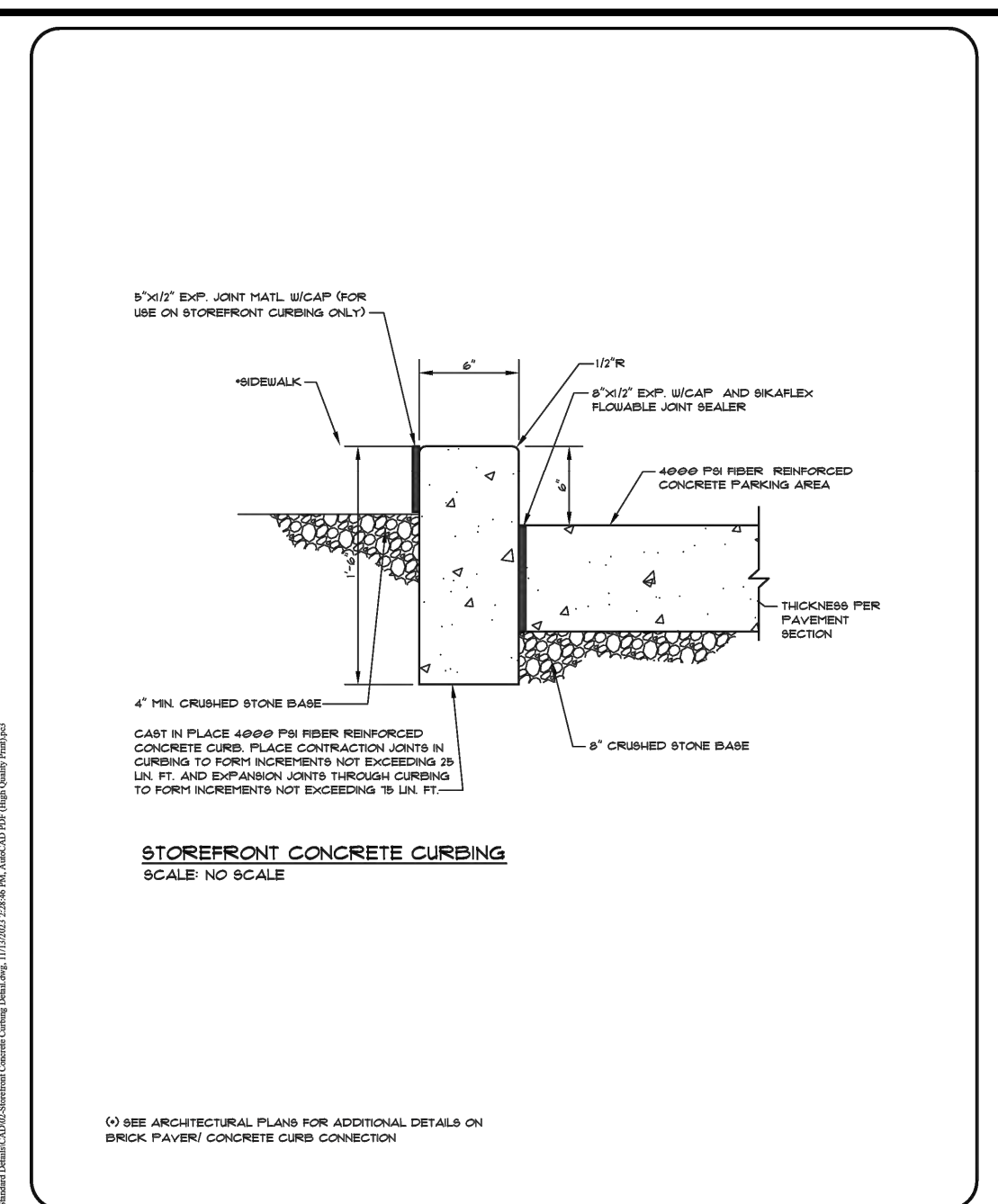
C4.0 SEPTIC

CLIENT:
KIMLEY-HORN OF MICHIGAN, INC.
3000 TOWN CENTER, STE 2800, SOUTHFIELD, MI 48075
313-548-7081

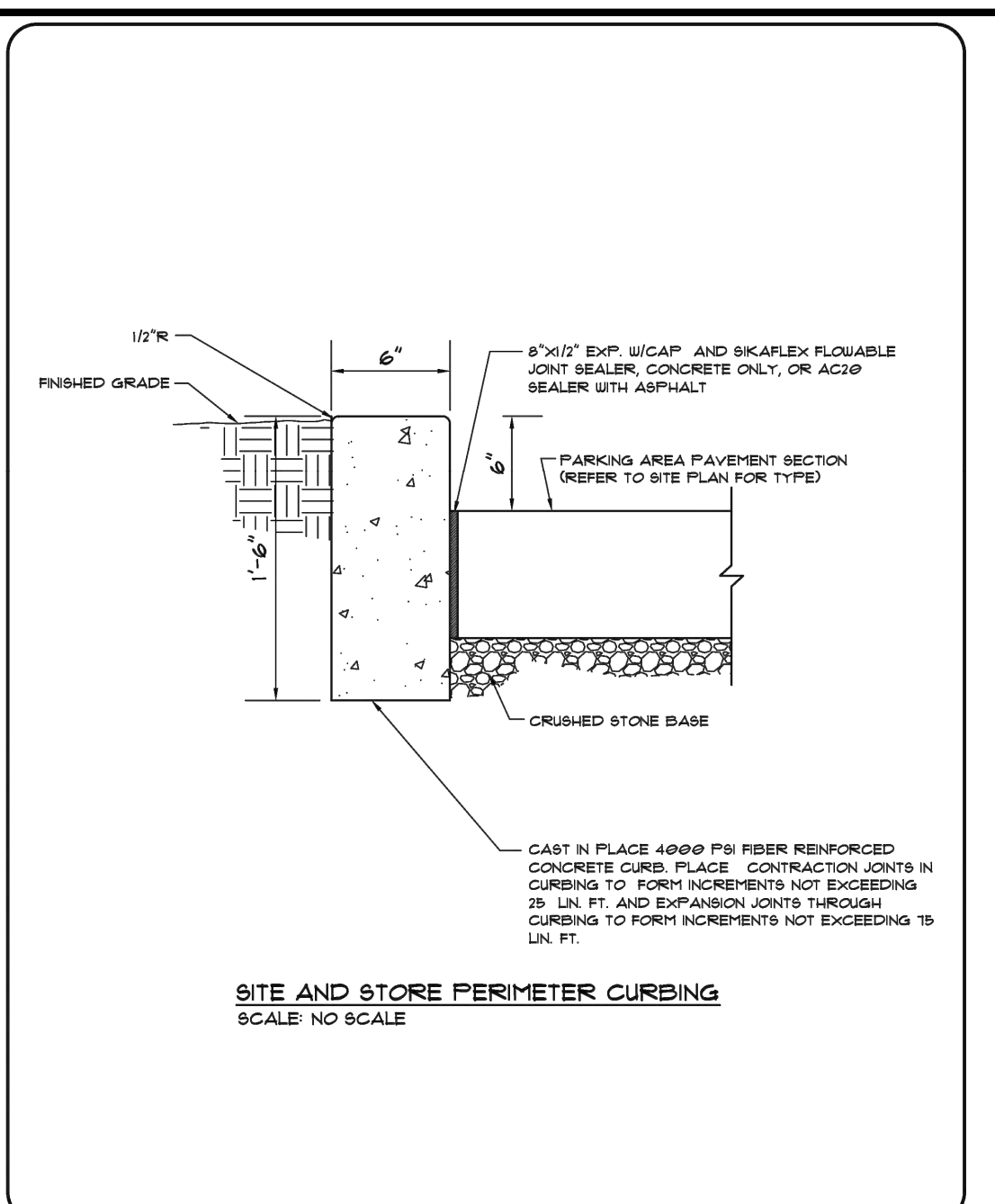
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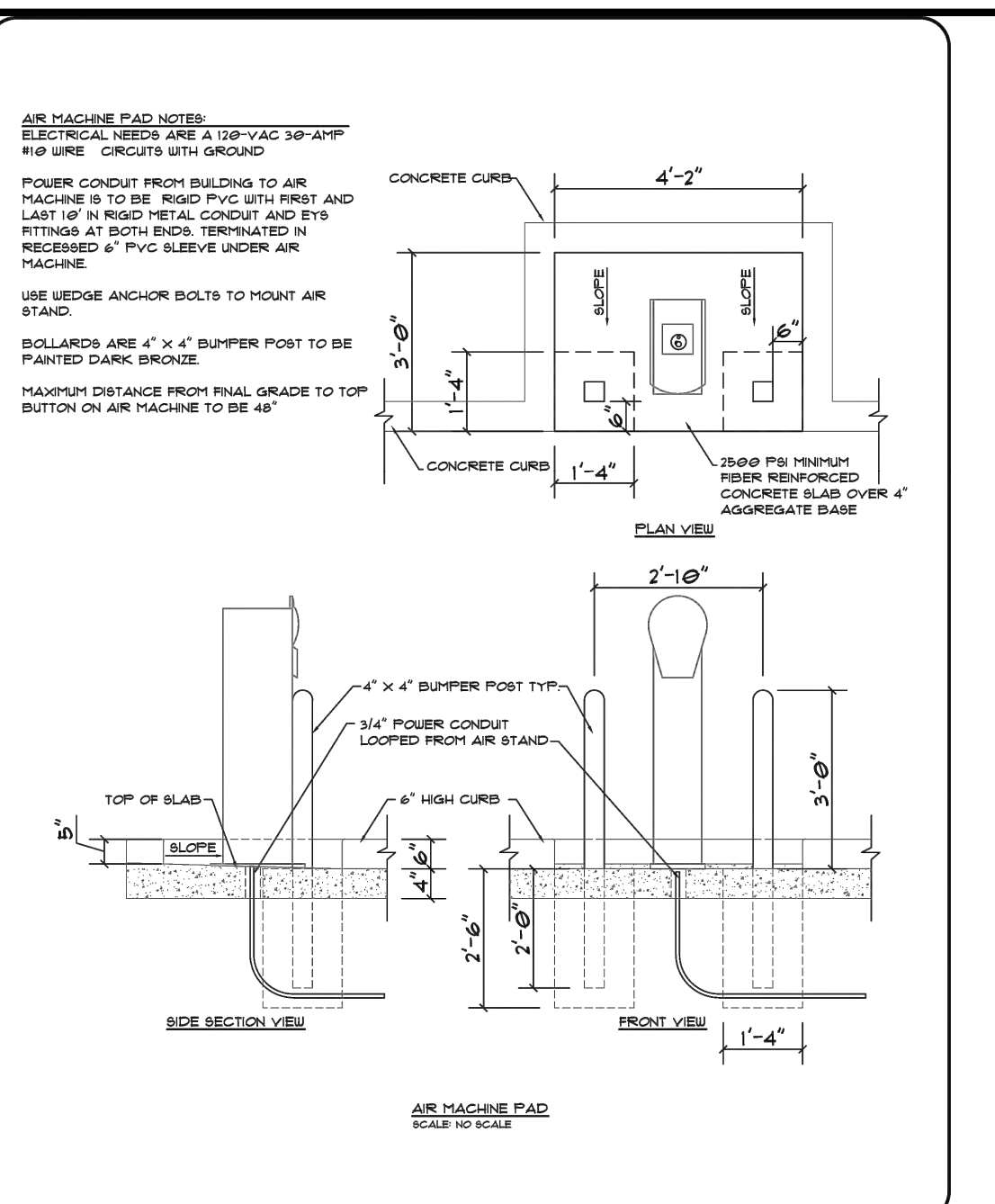
SHEETZ STOREFRONT BUMPER POST DETAIL **01**



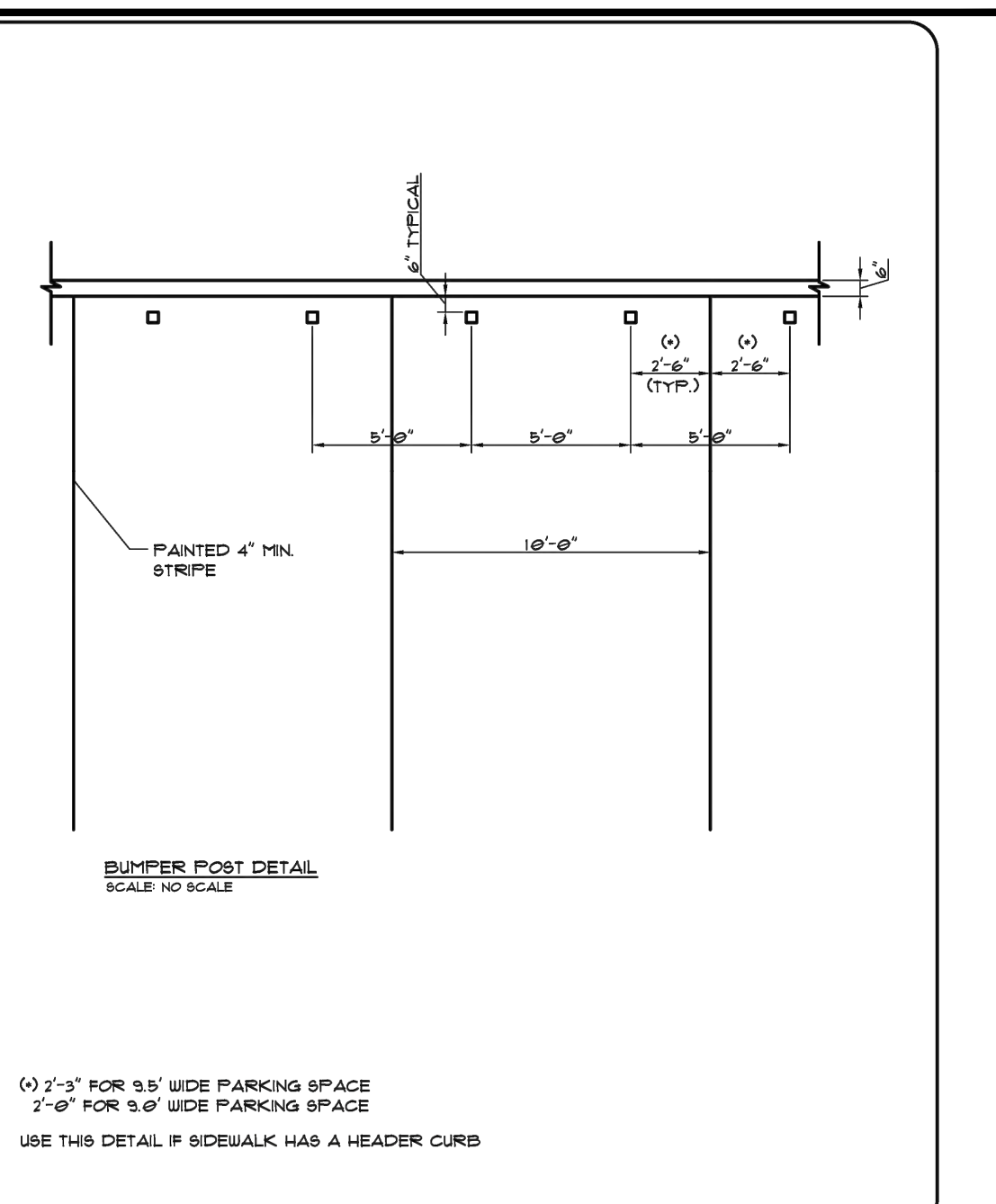
SHEETZ STOREFRONT CONCRETE CURBING DETAIL **02**



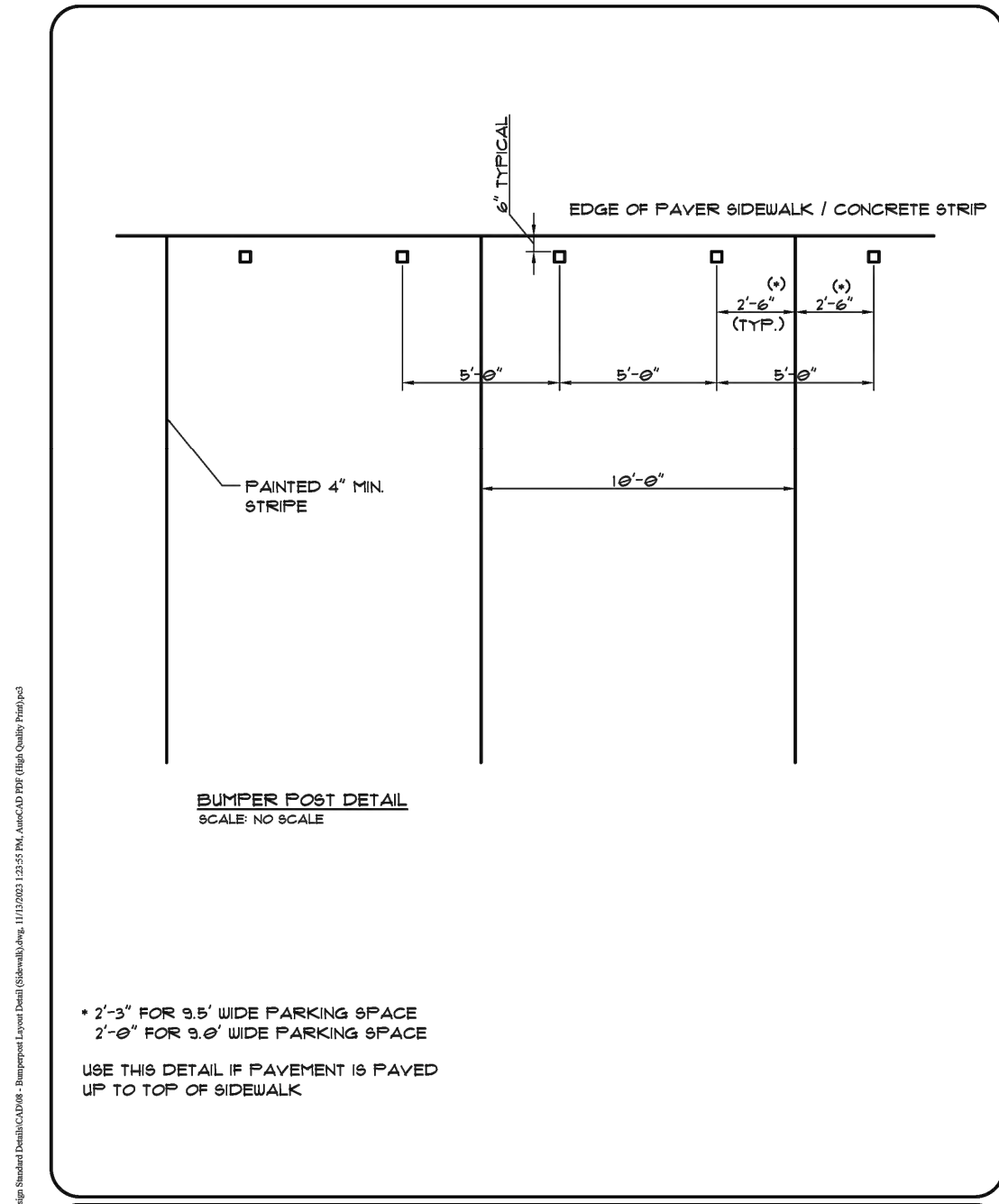
SHEETZ SITE AND STORE PERIMETER CURBING **03**



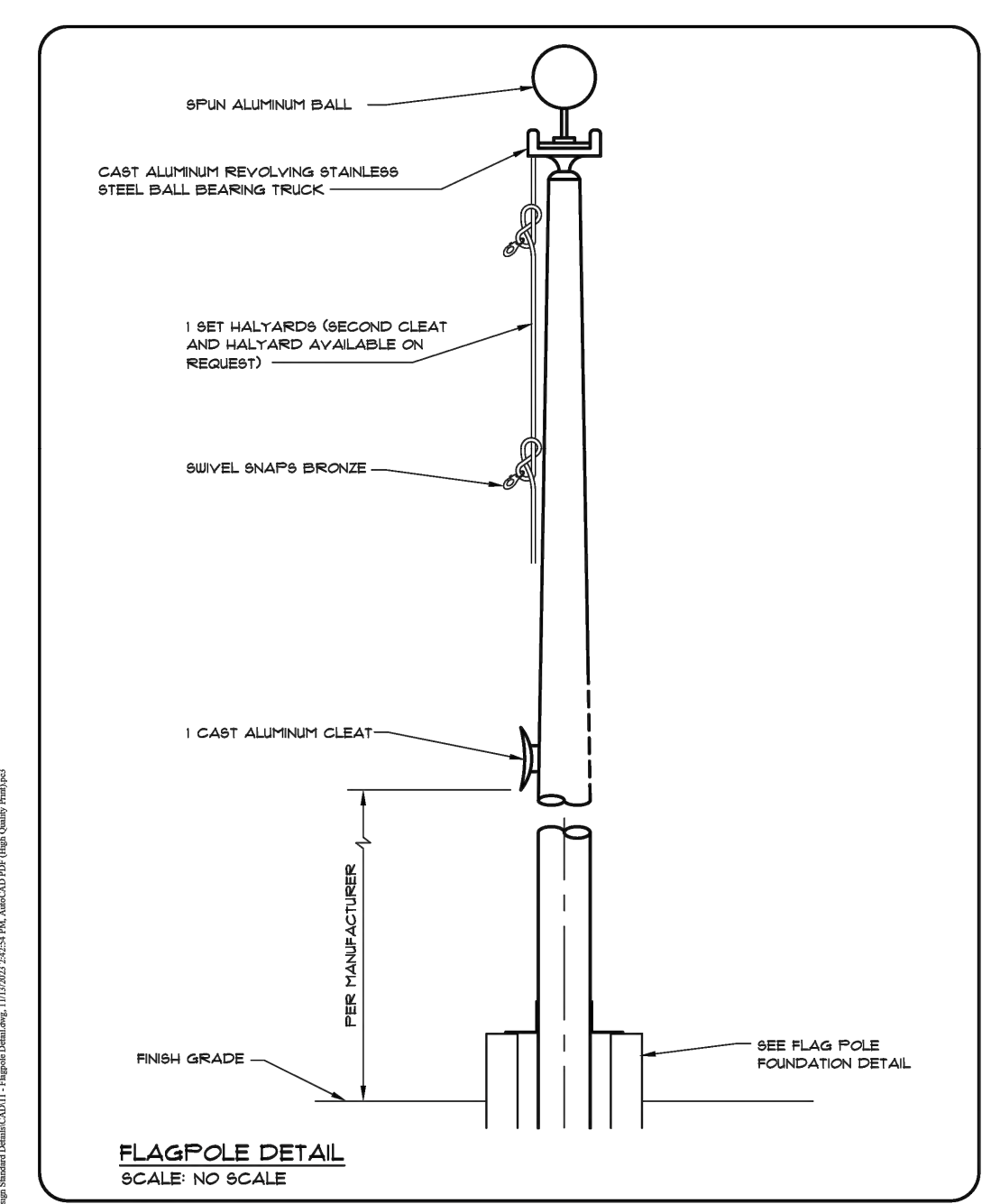
SHEETZ AIR MACHINE PAD DETAILS **05**



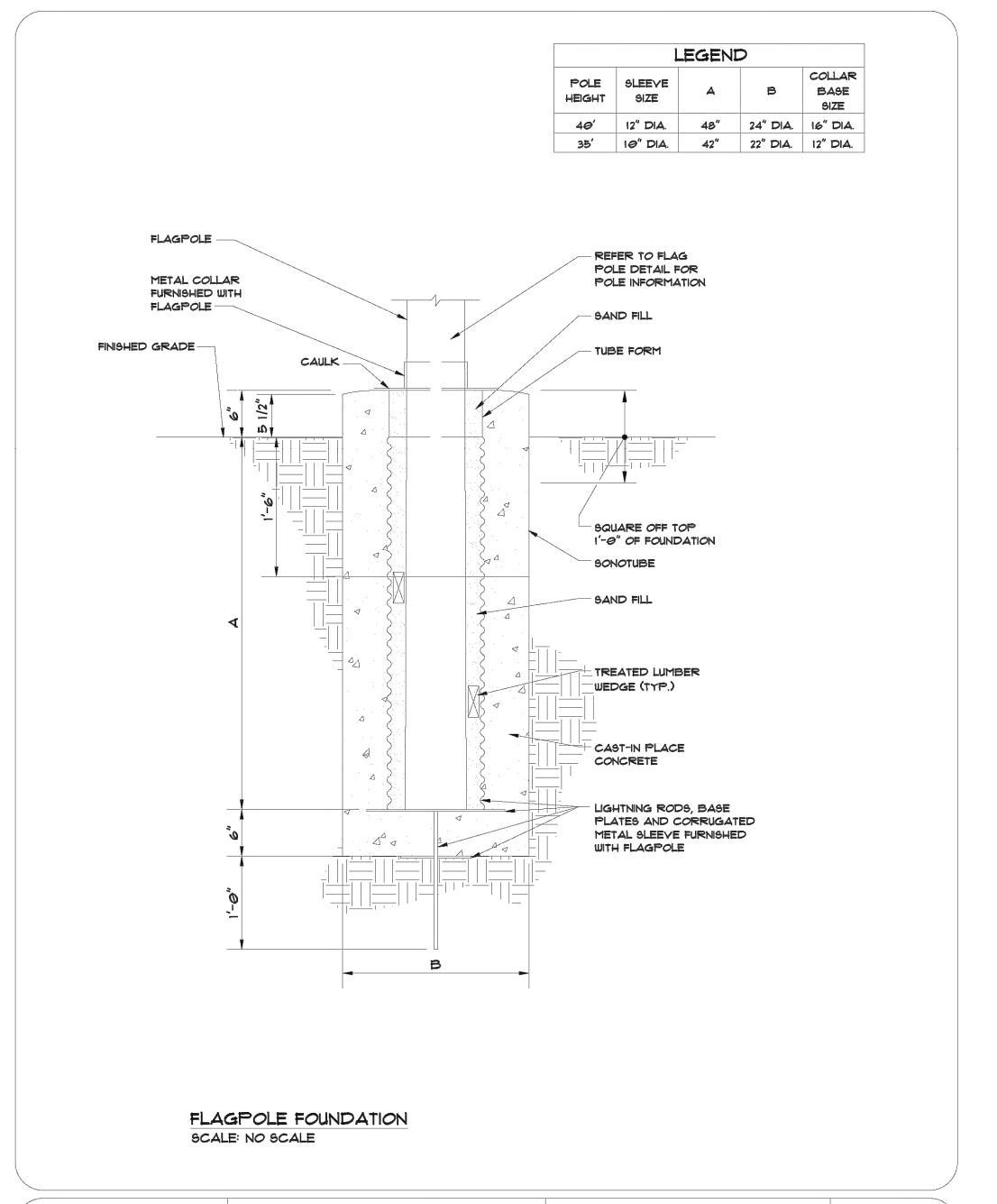
SHEETZ BUMPER POST LAYOUT DETAIL AT 6\"/>



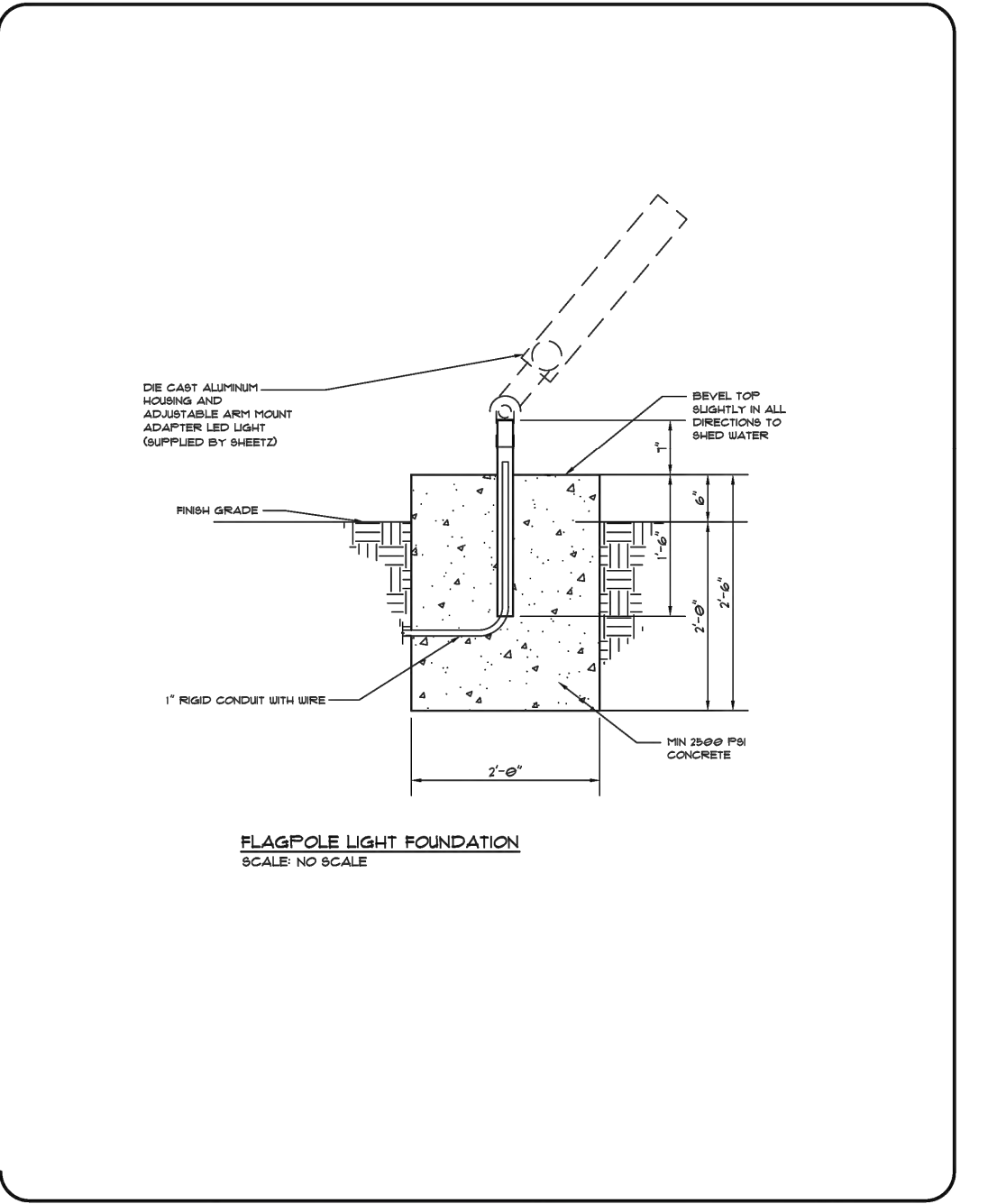
SHEETZ BUMPER POST LAYOUT DETAIL AT PAVEMENT SIDEWALK **08**



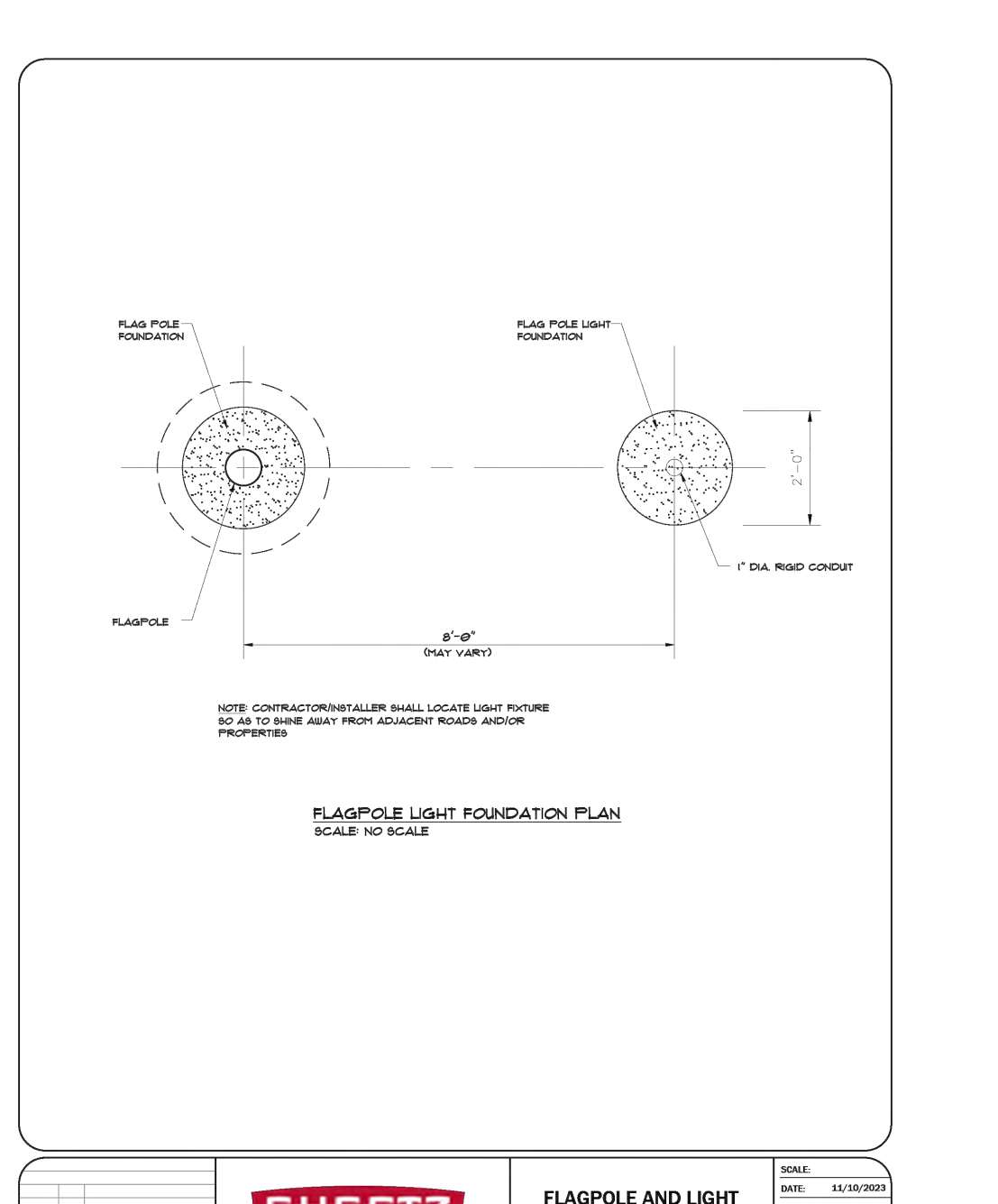
SHEETZ FLAGPOLE DETAIL **11**



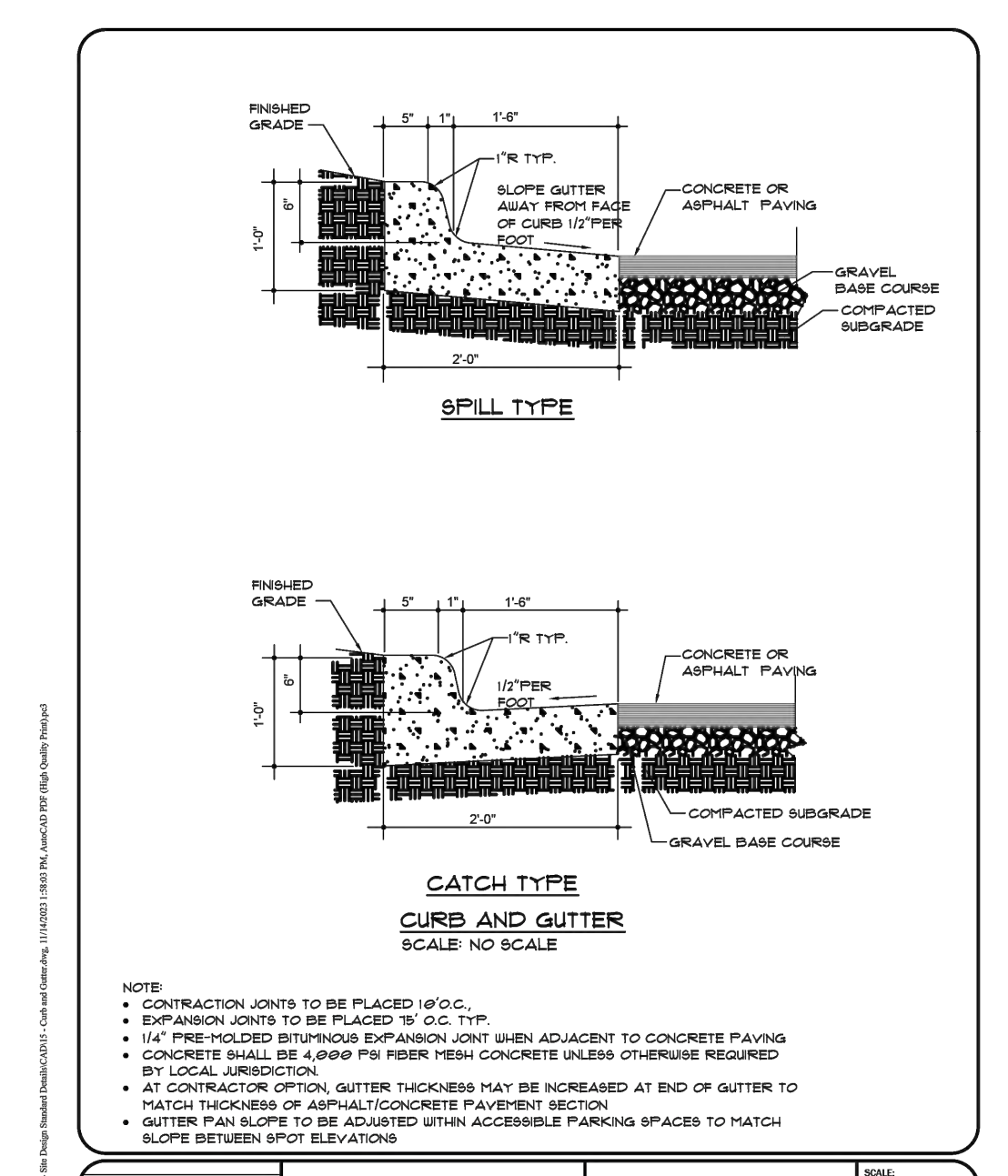
SHEETZ FLAGPOLE FOUNDATION **12**



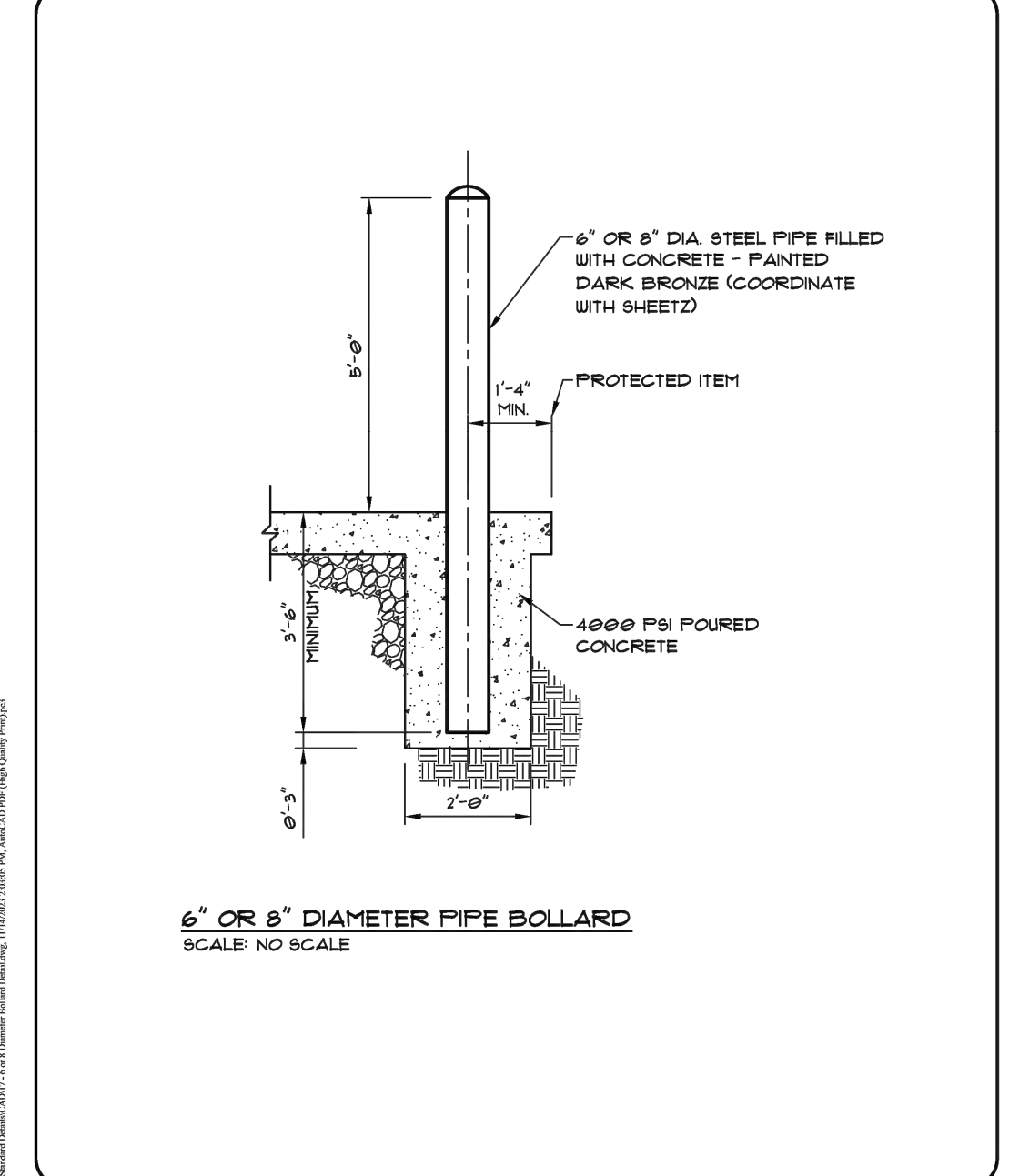
SHEETZ FLAGPOLE LIGHT FOUNDATION **13**



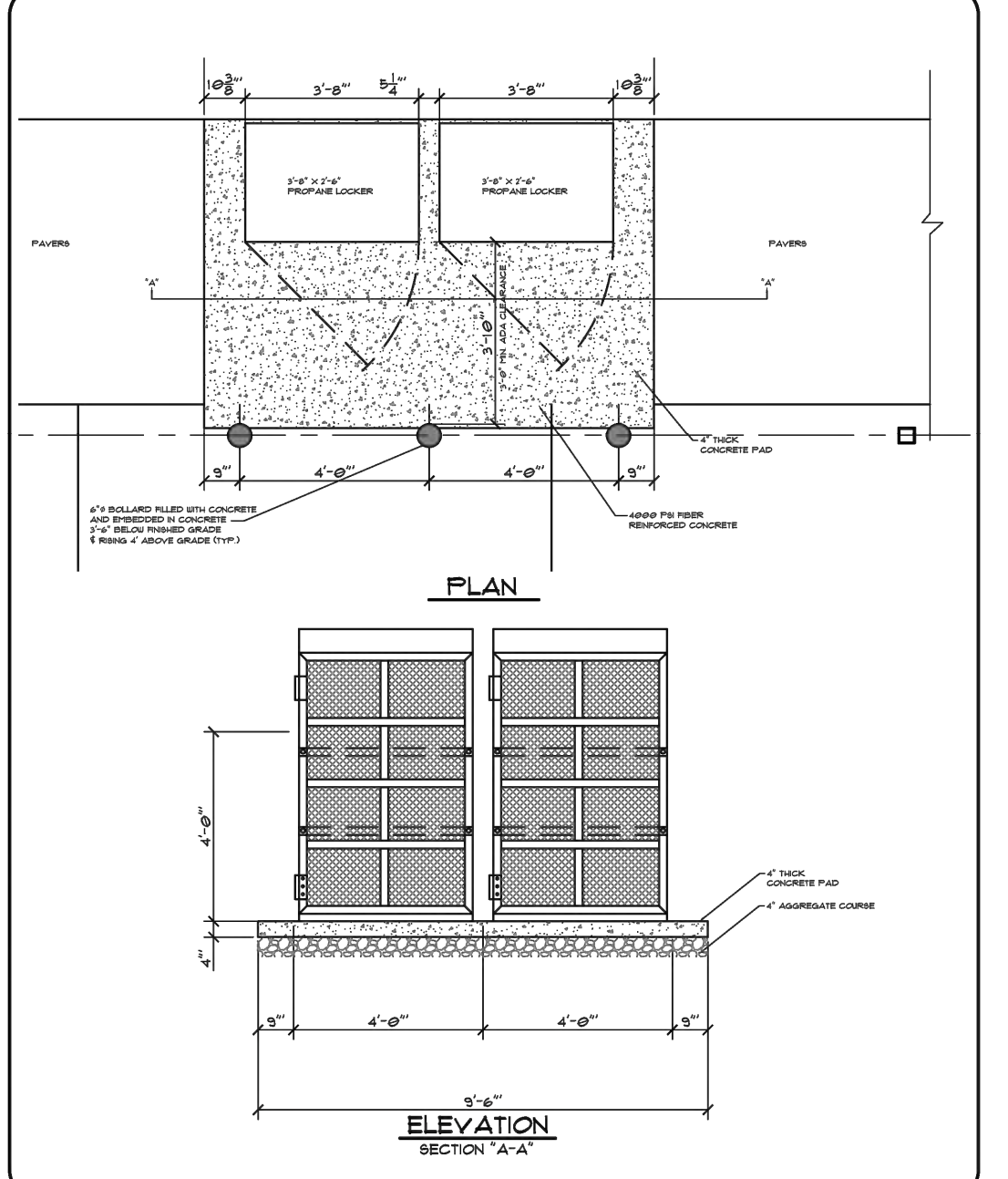
SHEETZ FLAGPOLE AND LIGHT FOUNDATION LAYOUT PLAN **14**



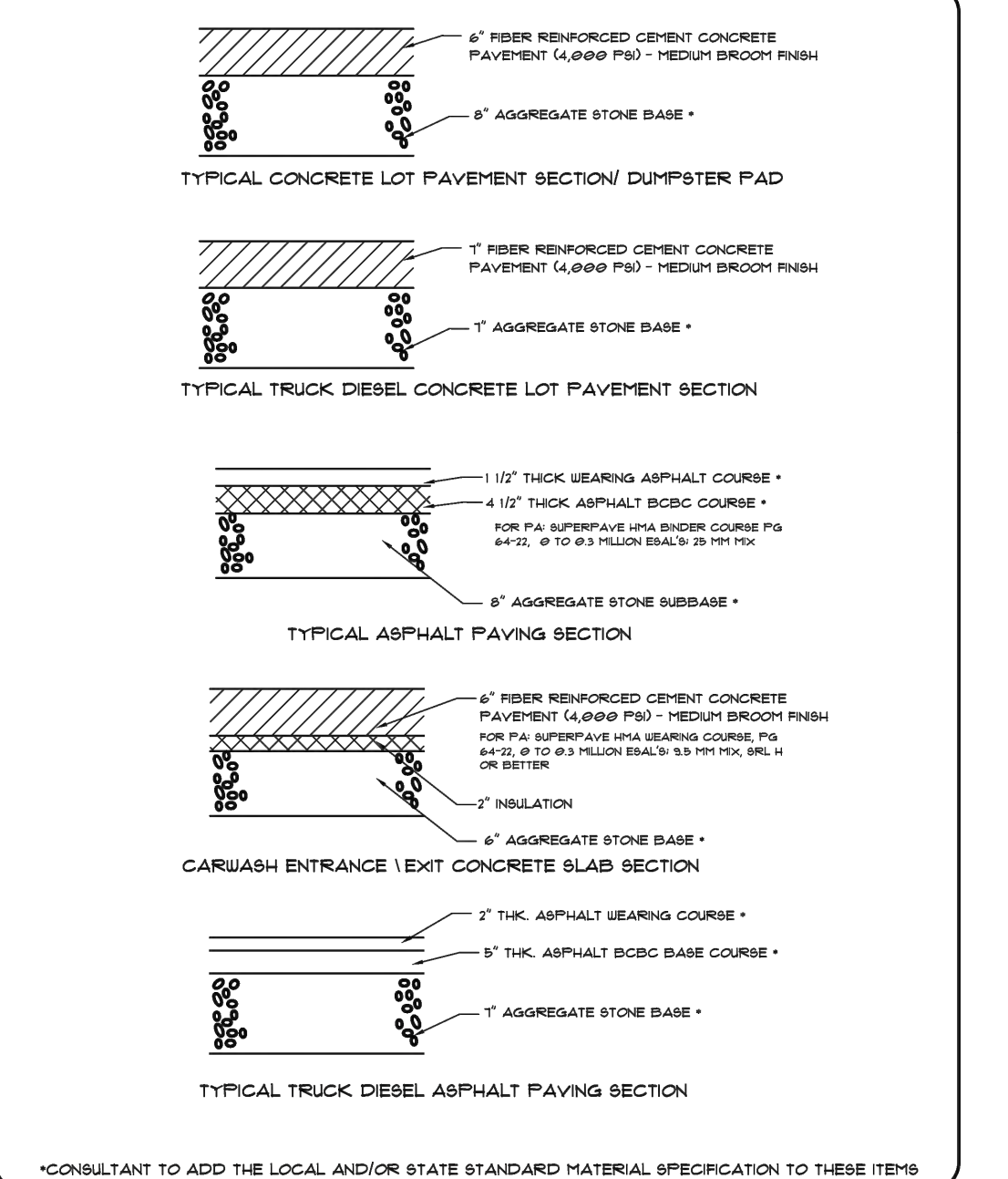
SHEETZ CURB AND GUTTER DETAIL **15**



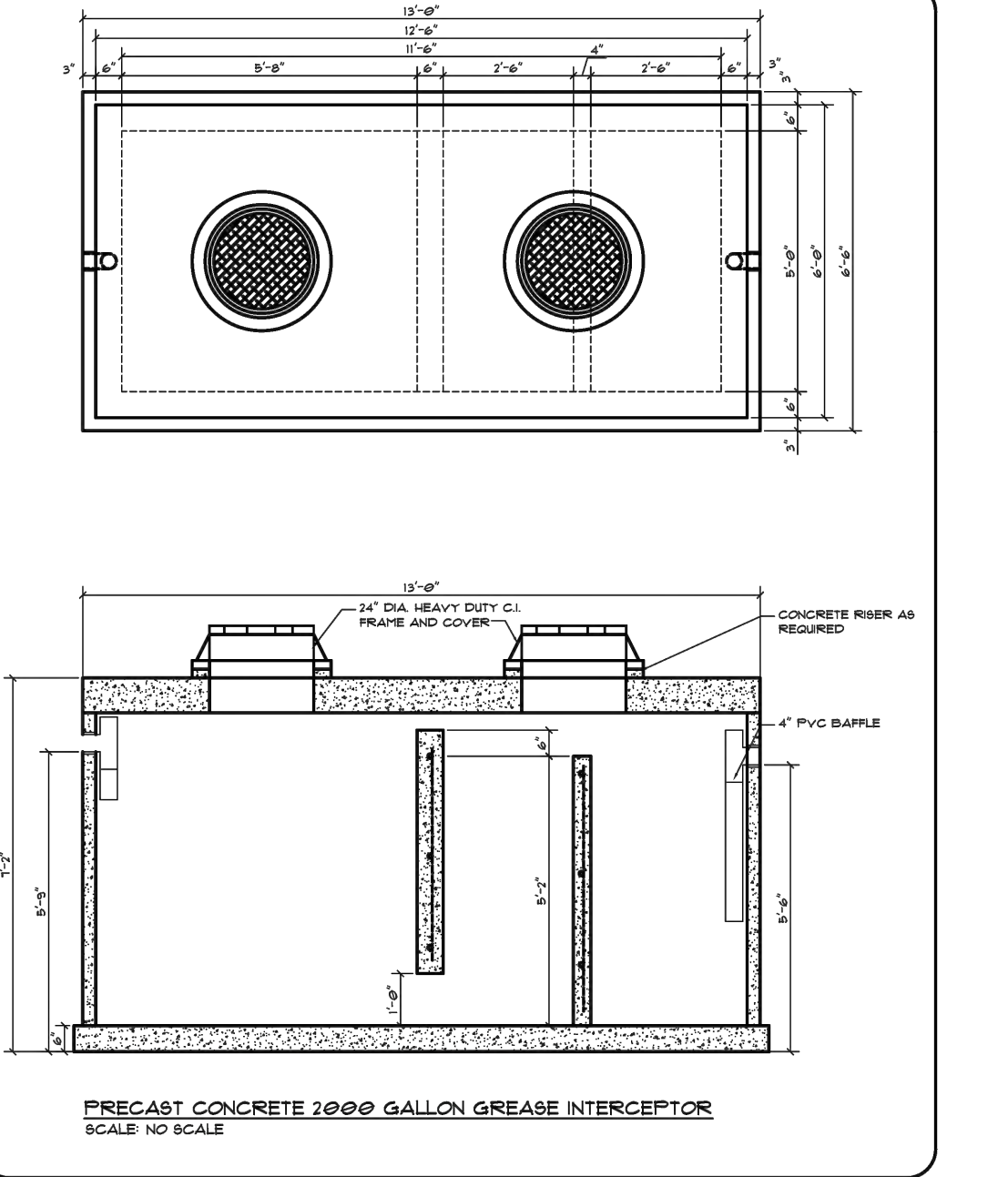
SHEETZ 6\"/>



SHEETZ PROPANE LOCKER (AT BUILDING) (MICHIGAN ONLY) **54**



SHEETZ SITE PAVEMENT DETAILS **20**



SHEETZ 2000 GALLON GREASE INTERCEPTOR **21**

SHEETZ SITE DETAILS

SHEETZ HIGHLAND TOWNSHIP - HIGHLAND RD AND MILFORD RD

ORIGINAL ISSUE: 12/18/2024
 KHA PROJECT NO. 268593002
 SHEET NUMBER C5.0

DESIGNED BY: TES
 DRAWN BY: LDF
 CHECKED BY: TES

AS NOTED
 DESIGNED BY: TES
 DRAWN BY: LDF
 CHECKED BY: TES

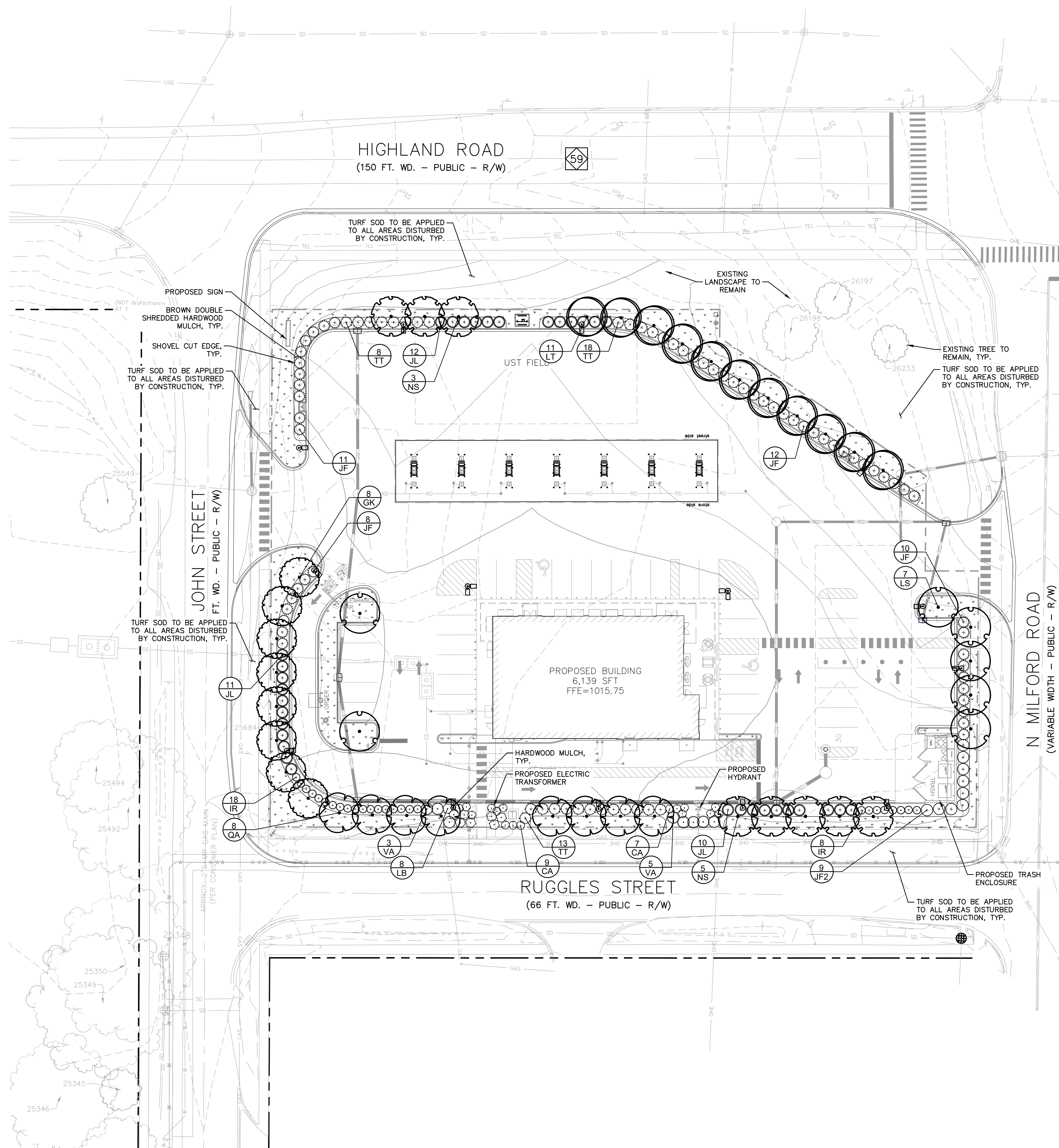
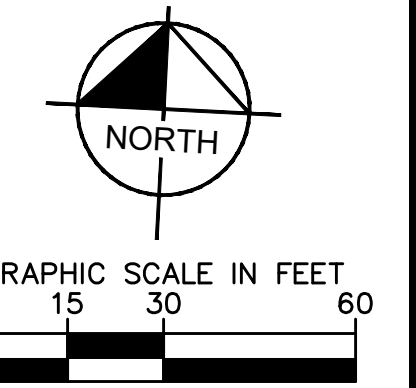
REVISIONS: DATE BY

NO. DATE BY

Kimley-Horn of Michigan, Inc.
 3000 TOWN CENTER, SUITE 200
 SOUTHFIELD, MI 48075
 WWW.KIMLEY-HORN.COM

TYLER SMITH
 ENGINEER
 NO. 8201068975
 REGISTERED PROFESSIONAL ENGINEER

Drawing name: K:\SETI_DS\268593002_Sheets_Gold_Sheetz_Highland_Twp_MI_V_Design\CADD\PlanSheets\L1.0_LANDSCAPE PLAN Dec. 18, 2024 11:19am by: Mrcamrth
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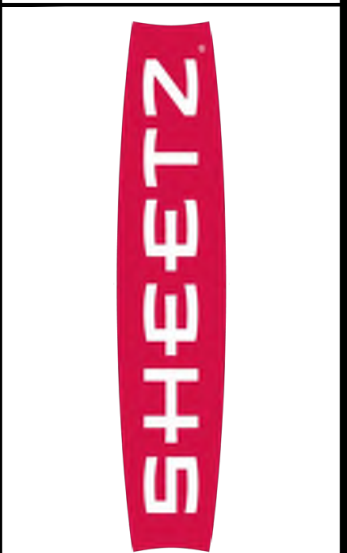
PLANT SCHEDULE

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	CONT	CAL	SIZE
LARGE DECIDUOUS TREES						
	GK	8	GYMNOCLADUS DIOICUS KENTUCKY COFFEETREE	B & B	2.5" CAL. MIN.	
	LS	7	LIQUIDAMBAR STYRACIFLUA SWEET GUM	B & B	2.5" CAL. MIN.	
	LT	11	LIRIODENDRON TULIPIFERA TULIP POPLAR	B & B	2.5" CAL. MIN.	
	NS	8	NYSSA SYLVATICA TUPELO	B & B	2.5" CAL. MIN.	
	QA	8	QUERCUS ALBA WHITE OAK	B & B	2.5" CAL. MIN.	
DECIDUOUS SHRUBS						
	CA	16	CEANOTHUS AMERICANUS NEW JERSEY TEA	5 GAL.	SEE PLAN	24" HT. MIN.
	LB	8	LINDERA BENZOIN SPICEBUSH	5 GAL.	SEE PLAN	36" HT. MIN.
	VA	8	VIBURNUM DENTATUM 'CHRISTOM' BLUE MUFFIN® ARROWWOOD VIBURNUM	5 GAL.	SEE PLAN	24" HT. MIN.
EVERGREEN SHRUBS						
	IR	26	ILEX GLABRA 'STONG BOX' STONG BOX INKBERRY HOLLY	5 GAL.	SEE PLAN	18" HT. MIN.
	JF2	9	JUNIPERUS CHINENSIS 'FAIRVIEW' FAIRVIEW JUNIPER	B & B	SEE PLAN	6' HT. MIN.
	JL	33	JUNIPERUS CHINENSIS 'GOLD LACE' GOLD LACE JUNIPER	5 GAL.	SEE PLAN	18" HT. MIN.
	JF	41	JUNIPERUS CHINENSIS 'SEA GREEN' SEA GREEN JUNIPER	5 GAL.	SEE PLAN	24" HT. MIN.
	TT	39	TAXUS X MEDIA 'TAUNTONI' TAUNTON'S ANGLO-JAPANESE YEW	5 GAL.	SEE PLAN	24" HT. MIN.
GROUND COVERS						
	TS		TURF SOD			

Kimley-Horn
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3500 TOWN CENTER, SUITE 2600
ANN ARBOR, MI 48106
PHONE: 313-572-1660
WWW.KIMLEY-HORN.COM

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LANDSCAPE PLAN

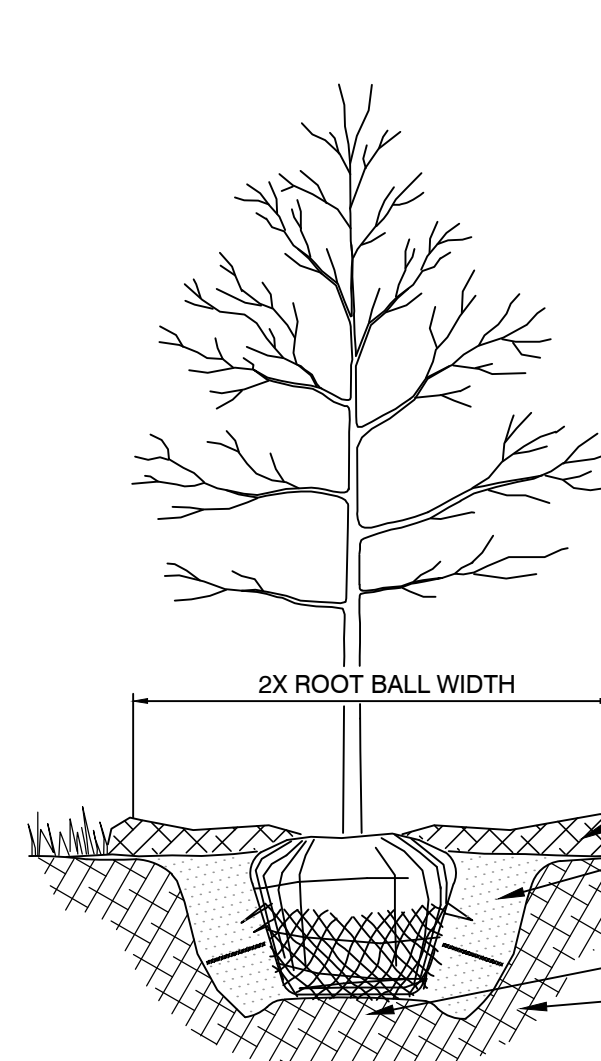
SHEETZ HIGHLAND TOWNSHIP - HIGHLAND RD AND MILFORD RD

ORIGINAL ISSUE:
12/18/2024
KHA PROJECT NO.
268593002

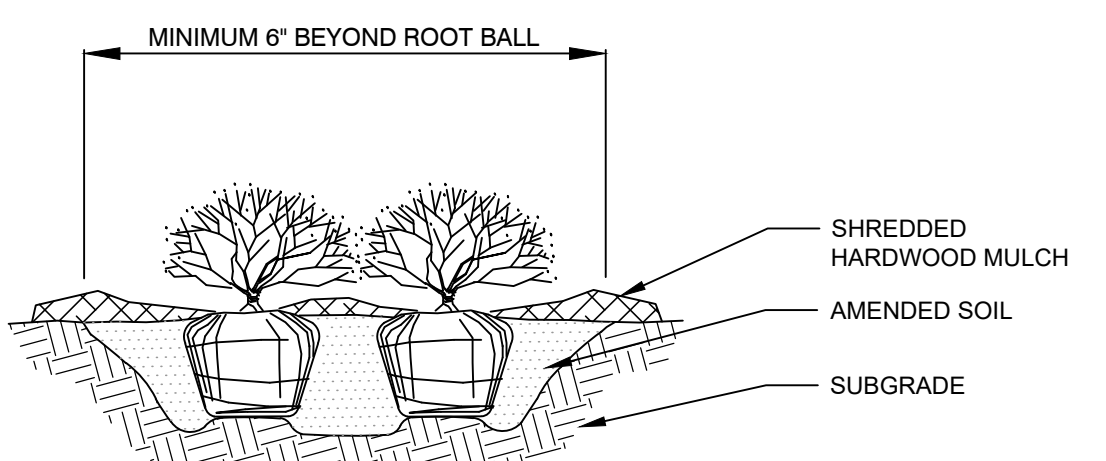
SHEET NUMBER
L1.0

No.	REVISIONS	DATE	BY

Drawing Name: K:\DET_DS\268593002_Sheets_Gold_Sheet_Highland_Twp_Milford\3D\Drawings\Gold_Sheet_Highland_Twp_Milford\L1.LANDSCAPE NOTES & DETAILS Dec 18, 2024 11:19am by: Lynne Smith
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- NOTES:**
1. INSPECT TREE FOR DAMAGED BRANCHES, APPLY CORRECTIVE PRUNING.
 2. SET ROOT BALL ON UNEXCAVATED OR TAMPED SOIL. TOP OF ROOTBALL SHALL BE TWO INCHES ABOVE SURROUNDING GRADE WITH BURLAP AND WIRE BASKET INTACT.
 3. REMOVE WIRE BASKET AND BURLAP DOWN FOUR TO SIX INCHES BELOW TOP OF ROOT BALL. REMOVE ALL TWINE AND (IF USED), SYNTHETIC MATERIAL. REMOVE OR CORRECT GIRDLING ROOTS.
 4. TAMP EXCAVATED SOIL AROUND BASE OF ROOTBALL.
 5. BACKFILL REMAINDER EXCAVATED SOIL, TAMPED LIGHTLY. HIGH CLAY OR POOR SOIL SHALL RECEIVE SOIL AMENDMENT PER LANDSCAPE NOTES.
 6. WATER THOROUGHLY WITHIN TWO HOURS USING 10 TO 15 GALLONS OF WATER.
 7. APPLY MULCH IN EVEN LAYER, KEEPING AWAY FROM ROOT FLARE.
 8. FINAL LOCATION OF TREE TO BE APPROVED BY OWNER.



- NOTES:**
1. APPLY CORRECTIVE PRUNING.
 2. SET ROOT BALL OR CONTAINER ON UNEXCAVATED OR TAMPED SOIL. TOP OF ROOTBALL (CONTAINER) SHALL BE ONE INCH ABOVE SURROUNDING GRADE. FOR LARGER SHRUBS WITHIN PLANTING BED DIG A DEEPER PIT ONLY FOR THOSE SHRUBS.
 3. REMOVE BURLAP FROM TOP HALF THE LENGTH OF ROOTBALL. TWINE AND (IF USED) SYNTHETIC MATERIAL SHALL BE REMOVED FROM PLANTING BED. FOR CONTAINER GROWN SHRUBS, REMOVE CONTAINER AND LOOSEN ROOTS PRIOR TO INSTALLATION.
 4. REMOVE OR CORRECT GIRDLING ROOTS.
 5. PLUMB AND BACKFILL WITH AMENDED SOIL PER LANDSCAPE NOTES. WATER THOROUGHLY WITHIN TWO HOURS.
 6. APPLY MULCH IN EVEN LAYER, KEEPING AWAY FROM ROOT FLARE. MULCH LIMITS FOR SHRUBS EXTEND TO ALL LIMITS OF PLANTING BED, SEE PLANS FOR BED LAYOUTS.

1 TREE PLANTING

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2 SHRUB PLANTING

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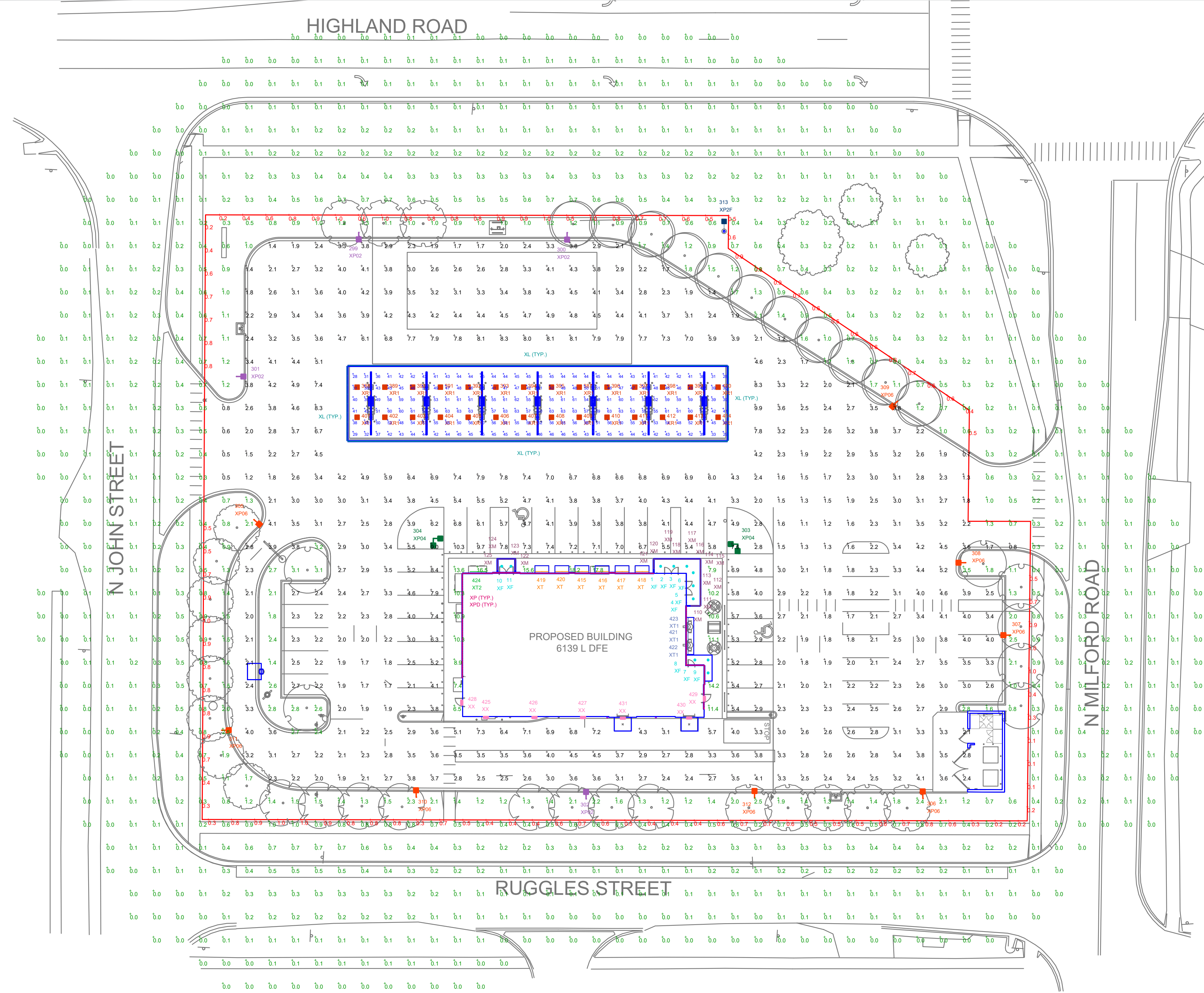
HIGHLAND CHARTER TOWNSHIP, MI - LANDSCAPE CODE REQUIREMENTS		
ZONING ORDINANCE	REQUIRED	PROPOSED
SEC. 12.04. - SCREENING BETWEEN LAND USES		
<p>SCREENING:</p> <p>IN THE HS - HIGHLAND STATION DISTRICT, VISUAL SCREENING BETWEEN LAND USES SHALL BE A SOLID SCREN UTILIZING AN EVERGREEN LANDSCAPE HEDGE, DECORATIVE MASONRY WALL OR WOOD DECORATIVE FENCING.</p>	<p>EVERGREEN LANDSCAPE HEDGE, DECORATIVE MASONRY WALL OR WOOD DECORATIVE FENCING BETWEEN LAND USES REQUIRED</p>	<p>EVERGREEN HEDGE PROVIDED BETWEEN LAND USES</p>
SEC. 12.05. - PARKING LOT LANDSCAPING		
<p>REQUIRED LANDSCAPING WITHIN PARKING LOTS:</p> <p>THERE SHALL BE A MINIMUM OF ONE (1) TREE AND THREE (3) SHRUBS FOR EVERY EIGHT (8) PARKING SPACES</p>	<p>PARKING LOT: 42 PARKING SPACES 41 / 8 = 5.12</p> <p>5 PARKING LOT TREES REQUIRED</p> <p>5 * 3 = 15</p> <p>15 PARKING LOT SHRUBS REQUIRED</p>	<p>5 PARKING LOT TREES PROVIDED</p> <p>15 PARKING LOT SHRUBS PROVIDED</p>
<p>REQUIRED LANDSCAPING ADJACENT TO PUBLIC RIGHTS OF WAY:</p> <p>PARKING LOTS SHALL BE SCREENED FROM VIEW ALONG THE PERIMETER OF THOSE SIDES THAT ARE VISIBLE FROM ALL ROAD RIGHTS OF WAY. THE SCREENING SHALL CONSIST OF A LANDSCAPED BERM, A WALL OR SUFFICIENT PLANTINGS THREE (3) FEET IN HEIGHT, TO PREVENT HEADLIGHTS FROM SHINING INTO THE ROAD RIGHTS OF WAY.</p>	<p>3' TALL LANDSCAPE HEDGE REQUIRED ALONG HIGHLAND ROAD, NORTH MILFORD ROAD, RUGGLES STREET, AND NORTH JOHN STREET</p>	<p>3' TALL LANDSCAPE HEDGE ALONG HIGHLAND ROAD, NORTH MILFORD ROAD, RUGGLES STREET, AND NORTH JOHN STREET PROVIDED</p>
SEC. 12.06. - GREENBELTS		
<p>GREENBELT:</p> <p>THE GREENBELT SHALL BE LANDSCAPED WITH A MINIMUM OF ONE (1) DECIDUOUS TREE FOR EVERY THIRTY (30) LINEAL FEET, OR FRACTION THEREOF, OF FRONTAGE ABUTTING A PUBLIC RIGHT OF WAY. THE WIDTH OF DRIVEWAYS SHALL NOT BE COUNTED AS FRONTAGE ABUTTING A PUBLIC ROAD.</p>	<p>HIGHLAND RD: 358 LF 378 LF / 30 = 13 TREES REQUIRED ALONG HIGHLAND RD</p> <p>N MILFORD RD: 219 LF 161 LF / 30 = 5 TREES REQUIRED ALONG N MILFORD RD</p> <p>RUGGLES ST: 358 LF 358 LF / 30 = 12 TREES REQUIRED ALONG RUGGLES ST</p> <p>N JOHN ST: 209 LF 209 LF / 30 = 7 TREES REQUIRED ALONG N JOHN ST</p>	<p>13 TREES PROVIDED ALONG HIGHLAND RD</p> <p>5 TREES PROVIDED ALONG N MILFORD RD</p> <p>12 TREES PROVIDED ALONG RUGGLES ST</p> <p>7 TREES PROVIDED ALONG N JOHN ST</p>
SEC. 12.07. - SITE LANDSCAPING		
<p>ADDITIONAL LANDSCAPING:</p> <p>IN ADDITION TO ANY LANDSCAPE, GREENBELT, AND/OR PARKING LOT LANDSCAPING REQUIRED BY THIS SECTION, AT LEAST FIFTEEN PERCENT (15%) OF THE SITE AREA SHALL BE LANDSCAPED.</p>	<p>SITE AREA: 84,664 SF 93,386 SF * .15 = 14,008 SF</p> <p>12,700 SF ADDITIONAL LANDSCAPING REQUIRED</p>	<p>9,109 ADDITIONAL LANDSCAPING PROPOSED</p>

1. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING MATERIALS AND PLANTS SHOWN ON THE LANDSCAPE PLAN. THE CONTRACTOR IS RESPONSIBLE FOR THE COST TO REPAIR UTILITIES, ADJACENT LANDSCAPE, PUBLIC AND PRIVATE PROPERTY THAT IS DAMAGED BY THE CONTRACTOR OR THEIR SUBCONTRACTOR'S OPERATIONS DURING INSTALLATION OR DURING THE SPECIFIED MAINTENANCE PERIOD. CALL FOR UTILITY LOCATIONS PRIOR TO ANY EXCAVATION.
2. THE CONTRACTOR SHALL REPORT ANY DISCREPANCY IN PLAN VS. FIELD CONDITIONS IMMEDIATELY TO THE LANDSCAPE ARCHITECT, PRIOR TO CONTINUING WITH THAT PORTION OF WORK.
3. NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY OF THEIR TRENCHES OR EXCAVATIONS THAT SETTLE.
5. ALL PLANTS TO BE SPECIMEN GRADE, WELL BRANCHED, HEALTHY, FULL, PRE-INOCULATED AND FERTILIZED. PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, AND SCARS. PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES. PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES. TRUNKS WILL BE WRAPPED IF NECESSARY TO PREVENT SUN SCALD AND INSECT DAMAGE. THE LANDSCAPE CONTRACTOR SHALL REMOVE THE WRAP AT THE PROPER TIME AS PART OF THIS CONTRACT.
6. THE OWNER'S REPRESENTATIVE MAY REJECT ANY PLANT MATERIALS THAT ARE DISEASED, DEFORMED, OR OTHERWISE NOT EXHIBITING SUPERIOR QUALITY.
7. ALL NURSERY STOCK SHALL BE GUARANTEED, BY THE CONTRACTOR, FOR ONE YEAR FROM DATE OF FINAL INSPECTION. THE GUARANTEE BEGINS ON THE DATE OF THE LANDSCAPE ARCHITECT'S OR OWNERS WRITTEN ACCEPTANCE OF THE INITIAL PLANTING. REPLACEMENT PLANT MATERIAL SHALL HAVE A ONE YEAR GUARANTEE COMMENCING UPON PLANTING.
8. PLANTS TO MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014 OR MOST CURRENT VERSION) REQUIREMENTS FOR SIZE AND TYPE SPECIFIED.
9. PRUNE PLANTS AS NECESSARY- PER STANDARD NURSERY PRACTICE AND TO CORRECT POOR BRANCHING OF EXISTING AND PROPOSED TREES.
10. TOPSOIL SHALL BE PROVIDED AND GRADED BY THE GENERAL CONTRACTOR UP TO 6 INCHES BELOW FINISHED GRADE IN TURF AREAS AND 18 INCHES IN PLANTING AREAS.
11. PLANTING AREA TOPSOIL SHALL BE AMENDED WITH 25% SPHAGNUM PEATMOSS, 5% HUMUS AND 70% PULVERIZED SOIL FOR ALL NON TURF SEED MIX AREAS, SHRUB, ORNAMENTAL GRASS, PERENNIAL AND ANNUAL BEDS.
12. SEED/SOD LIMIT LINES ARE APPROXIMATE. CONTRACTOR SHALL SEED/SOD ALL AREAS WHICH ARE DISTURBED BY GRADING WITH THE SPECIFIED SEED/SOD MIXES.
13. EDGING TO BE A SPADED EDGE UNLESS INDICATED OTHERWISE ON THE PLANS. SPADED EDGE TO PROVIDE V-SHAPED DEPTH AND WIDTH TO CREATE SEPARATION BETWEEN MULCH AND GRASS. A SPADED BED EDGE SHALL SEPARATE MULCH BEDS FROM TURF OR SEEDED AREAS. A SPADED EDGE IS NOT REQUIRED ALONG CURBED EDGES.
14. CONTRACTOR SHALL INSTALL SHREDDED HARDWOOD MULCH AT A 3" DEPTH TO ALL TREES, SHRUB, PERENNIAL, AND GROUNDCOVER AREAS. TREES PLACED IN AREA COVERED BY TURF SHALL RECEIVE A 4 FT WIDE MAXIMUM TREE RING WITH 3" DEPTH SHREDDED HARDWOOD MULCH.
15. INSTALLATION OF TREES WITHIN PARKWAYS SHALL BE COORDINATED IN THE FIELD WITH LOCATIONS OF UNDERGROUND UTILITIES. TREES SHALL NOT BE LOCATED CLOSER THAN 5' FROM UNDERGROUND UTILITY LINES AND NO CLOSER THAN 10' FROM UTILITY STRUCTURES.
16. DO NOT DISTURB THE EXISTING PAVING, LIGHTING, OR LANDSCAPING THAT EXISTS ADJACENT TO THE SITE UNLESS OTHERWISE NOTED ON PLAN.
17. ALL DISTURBED AREAS TO BE SODDED OR SEEDED, UNLESS OTHERWISE NOTED. SOD/SEED SHALL BE LOCAL HARDY TURF GRASS MIX UNLESS, OTHERWISE NOTED.
18. PLANT QUANTITIES SHOWN ARE FOR THE CONVENIENCE OF THE OWNER AND JURISDICTIONAL REVIEW AGENCIES. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL PLANT QUANTITIES AS DRAWN.
19. THE CONTINUED MAINTENANCE OF ALL REQUIRED LANDSCAPING SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY ON WHICH SAID MATERIALS ARE REQUIRED. ALL PLANT MATERIALS REQUIRED BY THIS SECTION SHALL BE MAINTAINED AS LIVING VEGETATION AND SHALL BE PROMPTLY REPLACED IF THE PLANT MATERIAL HAS DIED PRIOR TO FINAL ACCEPTANCE. PLANTING AREAS SHALL BE KEPT FREE OF TRASH, LITTER, AND WEEDS AT ALL TIMES.

3 LANDSCAPE NOTES

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<p>©2024 KIMLEY-HORN OF MICHIGAN 3500 TOWN CENTER, SUITE 2600 ANN ARBOR, MI 48106 PHONE: 313-472-1660 WWW.KIMLEY-HORN.COM</p>								<p>LANDSCAPE NOTES & DETAILS</p>	
<p>SHEETZ HIGHLAND TOWNSHIP - HIGHLAND RD AND MILFORD RD</p>									
<p>ORIGINAL ISSUE: 12/18/2024 KHA PROJECT NO. 268593002 SHEET NUMBER L1.1</p>									



NOTE:
 - AREA LIGHTS ON NEW 3 FT. POLES MOUNTED ON 20 FT. CONCRETE BASES
 - FOOTCANDLE LEVELS CALCULATED AT GRADE USING INITIAL LUMEN VALUES UNLESS NOTED OTHERWISE.
 - LIGHTS XT & XT1: FIXTURE HEAD TO BE LOCKED IN PLACE AIMING AWAY FROM BLDG.

LUMINAIRE LOCATION SUMMARY			
LUM NO.	LABEL	MTG. HT.	Tilt
1-11	XF	11.33	0
12	XL	18.25	5
13	XL	18.599	5
14	XL	18.948	5
15	XL	19.297	5
16	XL	19.646	5
17	XL	19.995	5
18	XL	20.344	5
19	XL	20.693	5
20-48	XL	18.075	0
49-83	XL	20.875	0
84	XL	18.25	5
85	XL	18.599	5
86	XL	18.948	5
87	XL	19.297	5
88	XL	19.646	5
89	XL	19.995	5
90	XL	20.344	5
91	XL	20.693	5
92-97	XL	18.075	0
98-103	XL	20.875	0
104-109	XL	18.075	0
110-125	XM	12	0
126-298	XP	18	0
299-302	XP02	23	0
303-304	XP04	23	0
305-312	XP06	23	0
313	XP2F	1	172.855
314-386	XPD	18	0
387-400	XR1	18.83	0
401-414	XR1	17.67	0
415-420	XT	13.5	0
421-423	XT1	13.5	0
424	XT2	15	0
425-428	XX	15.42	0
429	XX	11.33	0
430-431	XX	9.33	0








THIS SITE IS LOCATED IN A REGION WHERE LIGHTING IS REGULATED BY LOCAL ORDINANCES

CALCULATION SUMMARY					
LABEL	AVG	MAX	MIN	AVG/MIN	MAX/MIN
CANOPY	48.56	63	28	1.73	2.25
PAVED AREA (MEASURED 5' ABOVE GRADE)	3.56	10.3	0.5	7.12	20.60
PROPERTY LINE	0.63	1.0	0.1	6.30	10.00
UNDEFINED	0.52	18.2	0.0	N.A.	N.A.

LUMINAIRE SCHEDULE											
SYMBOL	QTY	LABEL	ARRANGEMENT	LUMENS	LLF	DIMMING FACTOR	BUG RATING	WATTS/LUMINAIRE	TOTAL WATTS	MANUFACTURER	CATALOG LOGIC
	11	XF	Single	1037	1.000	1.000	B1-U0-G0	13	143	LF Illumination LLC (Ledil)	BULLET MINI-5911-1AA-T-13C-9240-M-DMU-BLACK COLOR 90CRI
	98	XL	SINGLE	136	1.000	1.000	N.A.	4.12	403.76	BLAIR COMPANIES	4 FT. LINEAR STRIP LIGHT (BY OTHERS, SHOWN FOR CONTRIBUTION)
	16	XM	SINGLE	136	1.000	0.700	N.A.	4.12	65.92	Blair Companies	LB-110-00-XX-025-RD[1]FR4-15
	173	XP	Single	305	1.000	1.000	N.A.	3.66	633.18	P-LED	STREET WRAP FLEX BACK BEND 4000K
	4	XP02	Single	9647	1.040	1.000	B1-U0-G3	94	376	LITHONIA LIGHTING	DSX0 LED P4 40K 70CRI T3M MVOLT SPA FAO HS DXXXX
	2	XP04	2 @ 90 degrees	11295	1.040	1.000	B2-U0-G3	93.04	372.16	Lithonia Lighting	DSX0 LED P4 40K 70CRI T4M MVOLT SPA FAO DXXXX
	8	XP06	Single	9717	1.040	1.000	B1-U0-G3	94	752	LITHONIA LIGHTING	DSX0 LED P4 40K 70CRI T4M MVOLT SPA FAO HS DXXXX
	1	XP2F	Single	11830	1.040	1.000	N.A.	100	100	LITHONIA LIGHTING	DSXF2 LED P3 40K 70CRI NSP MVOLT IS DXXXX + MOUNTING POST
	73	XPD	Single	25	1.000	1.000	N.A.	0.305	22.265	P-LED	STREET WRAP FLEX BACK BEND 4000K
	28	XR1	Single	18730	1.040	0.731	B4-U0-G2	99	2772	Lithonia Lighting	RCNY LED ALO2_50K 90CRI 1 SYMF MVOLT BZS DWHXD (SW. POS. 5)
	6	XT	Single	1840	1.000	1.000	N.A.	20	120	SPI Lighting Inc.	SEW12146 5FT L20W AN08 120-277V 4000K SMA PSE OAP6
	3	XT1	Single	1472	1.000	1.000	N.A.	16	48	SPI Lighting Inc.	SEW12146 4FT L16W AN08 120-277V 4000K SMA PSE OAP6
	1	XT2	Single	2208	1.000	1.000	N.A.	24	24	SPI Lighting Inc.	SEW12146 6FT L24W AN08 120-277V 4000K SMA PSE OAP12
	7	XX	Single	1921	1.000	1.000	B1-U0-G0	16	112	WILLIAMS OUTDOOR	VVM-HL17/840-TL-DBZ-CGL-DIM-UNV (BRONZE COLOR 80CRI)

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DOWNLIGHT	
	
STREET WRAP	
	
AREA	
	
FLOOD	
	
CANOPY	
	
WALL MOUNTED	
	
WALL MOUNTED	
	