

INDEPENDENCE TOWNSHIP FUELING FARM DEVELOPMENT

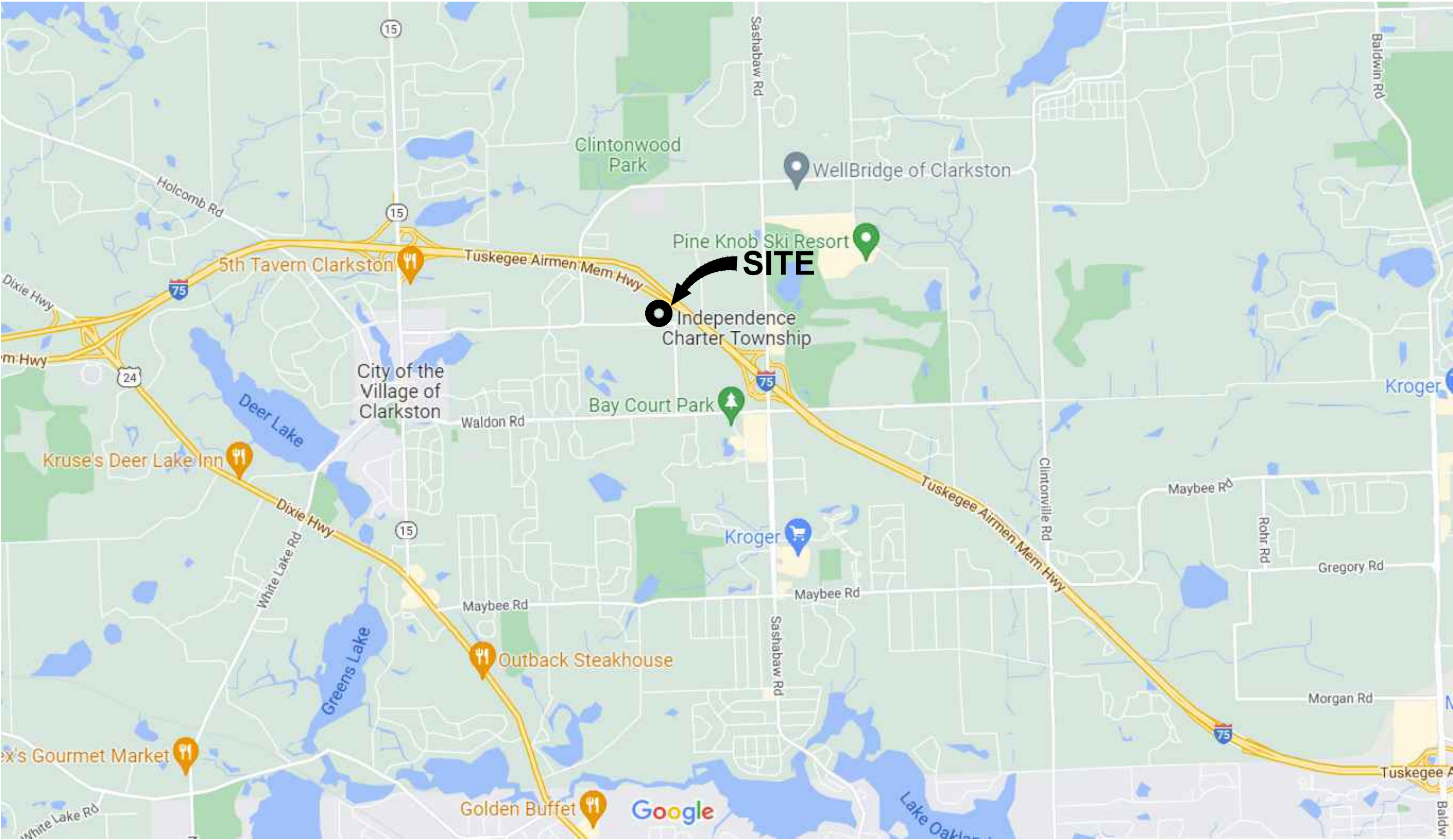
6050 FLEMINGS LAKE ROAD, CLARKSTON, MICHIGAN 48346

SECTION 21, TOWN 4 NORTH, RANGE 9 EAST
INDEPENDENCE CHARTER TOWNSHIP, OAKLAND COUNTY, MICHIGAN



KEY TO COUNTIES

SHEET INDEX	
SHEET	DESCRIPTION
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V-101	TOPOGRAPHICAL SURVEY
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L-201	TYPICAL PLANTING DETAILS
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LOCATION MAP

SCALE: NOT TO SCALE



INDEPENDENCE TOWNSHIP BOARD OF TRUSTEES

6483 WALDON CENTER DRIVE, CLARKSTON, MICHIGAN 48346

JOSE ALIAGA
CARI J. NEUBECK
PAUL A. BROWN
SAM MORACO
THERESA A. NALLAMOTHU
RONALD A. RITCHIE
MATT STOIAN

SUPERVISOR
CLERK
TREASURER
TRUSTEE
TRUSTEE
TRUSTEE

GENERAL NOTES

THE CONTRACTOR SHALL CALL "MISS DIG" (1-800-482-7171) THREE WORKING DAYS, EXCEPT SATURDAY, SUNDAY, AND HOLIDAYS PRIOR TO COMMENCEMENT OF ANY WORK.

CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 48-HOURS IN ADVANCE OF BEGINNING CONSTRUCTION IN ORDER TO ADEQUATELY SCHEDULE INSPECTION FOR PROJECT.

THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH INDEPENDENCE TOWNSHIP CODE OF ORDINANCES.



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

INDEPENDENCE TOWNSHIP DPW
6050 FLEMINGS LAKE ROAD
CLARKSTON, MICHIGAN 48346
PHONE: (248) 625-8222
WWW.INDTWP.COM

PREPARED UNDER THE SUPERVISION OF

YADONG DONG, P.E. 6201068280
REGISTERED PROFESSIONAL ENGINEER REGISTRATION NO.

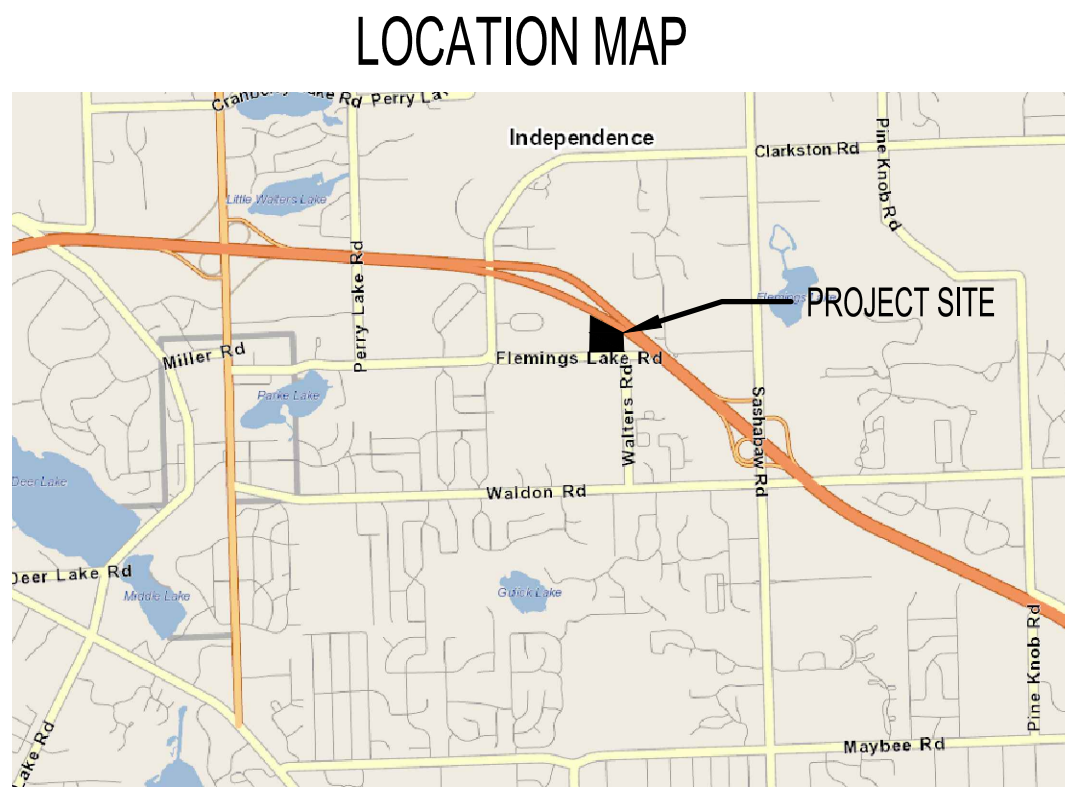
DLZ
ORGANIZATION

ENGINEER
DLZ MICHIGAN, INC.
4494 ELIZABETH ROAD
WATERFORD, MICHIGAN 48328
PHONE: (248) 681-7800
WEB SITE: www.dlz.com

GENERAL CONTRACTOR

ISSUED FOR BID 6/2/2023
BUILDING PERMIT REVIEW 4/17/2023
SLU REVISION 4/10/2023
SLU REVIEW 3/3/2023

DLZ PROJECT NO. 2245-7545-00



VERTICAL DATUM: NAVD 1988 (BASED ON GPS OBSERVATION REFERENCED TO MSRN NETWORK)
HORIZONTAL DATUM: MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE 2113, INTERNATIONAL FEET, NAD 83, 2011 ADJUSTMENT YEAR
BM1: ELEV = 1088.49
PUNCH ON NORTHERN HYDRANT FLANGE BOLT AT THE ENTRANCE TO 6050 FLEMINGS LAKE ROAD
BM2: ELEV = 1099.80
BOX CUT ON NW QUADRANT OF CONC TRANSFORMER PAD
SITE IS IN ZONE X, AREA OF MINIMAL FLOOD HAZARD
PER FIRM PANEL 26125C0332F
EFFECTIVE 09/29/2006
UTILITIES SHOWN ARE BASED ON PLAN INFORMATION RECEIVED FROM UTILITY OWNERS IN RESPONSE TO A MISS DIG TICKET
THESE PLANS WERE USED TO SUPPLEMENT FIELD EVIDENCE. UTILITY INFORMATION SHOULD BE CONSIDERED APPROXIMATE
AND WILL NEED TO BE VERIFIED PRIOR TO ANY CONSTRUCTION.
MISS DIG TICKET #: 202210300479
SOURCE DOCUMENTS:
ATT: MISSDIGTICKET202210300479_145554_A1.PDF
CONSUMERS ENERGY: 0492211.PDF
CROWN CASTLE: 020272-TICKET 202210300479.000 ORIGINAL DESIGN(CFIBR).DOCX
DPW WATER: SANITARY PLAN AND PROFILE, FEBRUARY 1, 2015
OTHER SOURCE DOCUMENTS: DPW BUILDING ADDITION BY HRC IN JULY 2017
SURVEY COMPLETED 11-1-2022

CONTROL POINTS				
Pt. No.	Northing	Easting	Elev.	Description
1	453867.35	13385324.50	1085.34	CP RBR
2	453993.85	13385336.30	1097.28	CP RBR
100	453774.38	13385296.57	1087.51	CP RBR

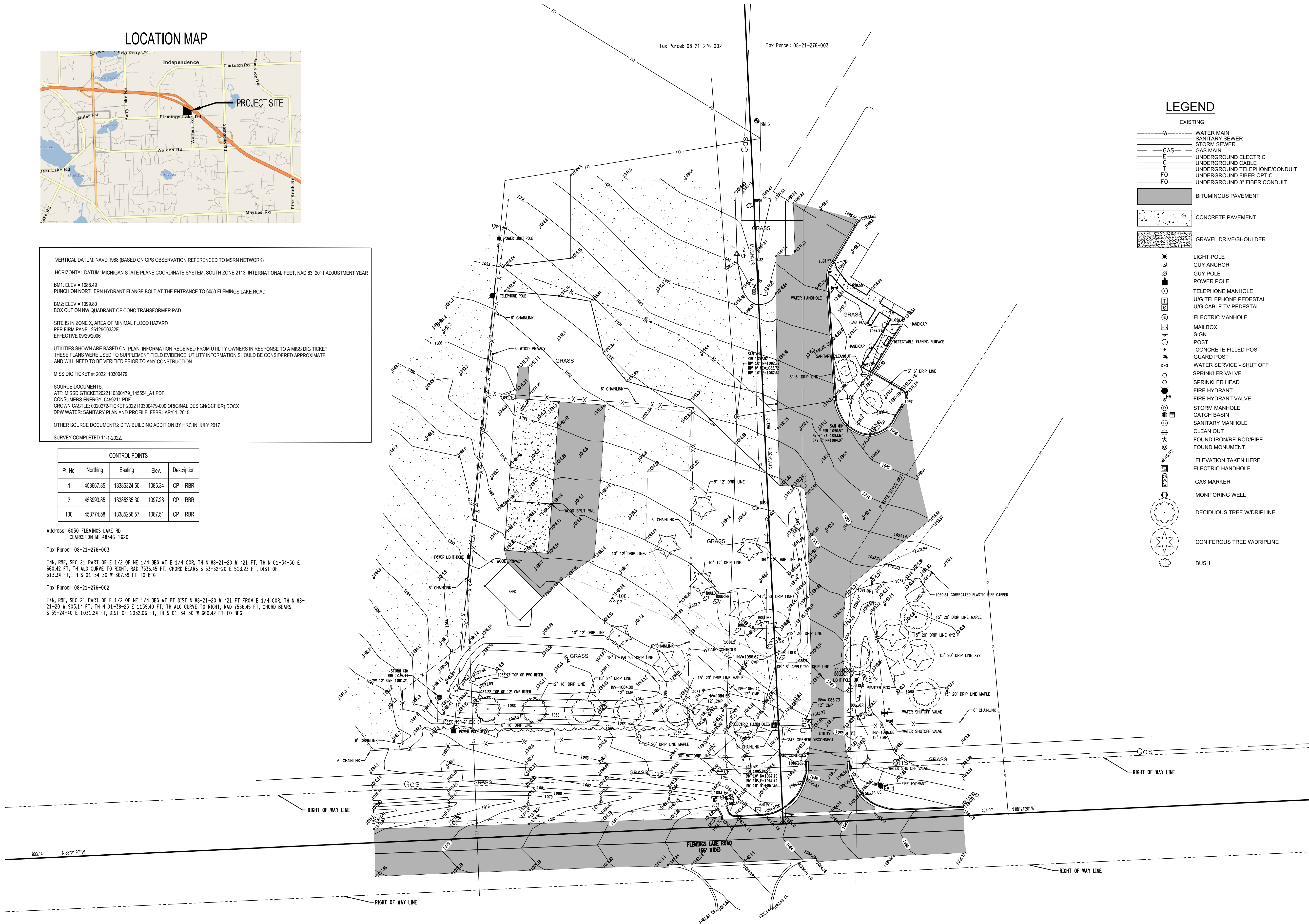
Address: 6050 FLEMINGS LAKE RD
CLARKSTON MI 48346-1620

Tax Parcel: 08-21-276-003

T4N, R9E, SEC 21 PART OF E 1/2 OF NE 1/4 BEG AT E 1/4 COR, TH N 88-21-20 W 421 FT, TH N 01-34-30 E 660.42 FT, TH ALG CURVE TO RIGHT, RAD 7536.45 FT, CHORD BEARS S 53-32-20 E 513.23 FT, DIST OF 513.34 FT, TH S 01-34-30 W 367.39 FT TO BEG

Tax Parcel: 08-21-276-002

T4N, R9E, SEC 21 PART OF E 1/2 OF NE 1/4 BEG AT PT DIST N 88-21-20 W 421 FT FROM E 1/4 COR, TH N 88-21-20 W 903.14 FT, TH N 01-38-25 E 1159.40 FT, TH ALG CURVE TO RIGHT, RAD 7536.45 FT, CHORD BEARS S 59-24-40 E 1031.24 FT, DIST OF 1032.06 FT, TH S 01-34-30 W 660.42 FT TO BEG



LEGEND

- EXISTING
- W WATER MAIN
 - SS SANITARY SEWER
 - SS STORM SEWER
 - G GAS MAIN
 - U UNDERGROUND ELECTRIC
 - U UNDERGROUND CABLE
 - U UNDERGROUND TELEPHONE/CONDUIT
 - U UNDERGROUND FIBER OPTIC
 - FO UNDERGROUND 3" FIBER CONDUIT
 - BIT BITUMINOUS PAVEMENT
 - CONC CONCRETE PAVEMENT
 - GRAV GRAVEL DRIVE/SHOULDER
 - LIGHT POLE
 - GUY ANCHOR
 - GUY POLE
 - POWER POLE
 - TELEPHONE MANHOLE
 - U/G TELEPHONE PEDESTAL
 - U/G CABLE TV PEDESTAL
 - ELECTRIC MANHOLE
 - MAIL BOX
 - SIGN
 - POST
 - CONCRETE FILLED POST
 - GUARD POST
 - WATER SERVICE - SHUT OFF
 - SPRINKLER VALVE
 - SPRINKLER HEAD
 - FIRE HYDRANT
 - FIRE HYDRANT VALVE
 - STORM MANHOLE
 - CATCH BASIN
 - SANITARY MANHOLE
 - CLEAN OUT
 - FOUND IRON/RE-ROD/PIPE
 - FOUND MONUMENT
 - ELEVATION TAKEN HERE
 - ELECTRIC HANDHOLE
 - GAS MARKER
 - MONITORING WELL
 - DECIDUOUS TREE WIDRILINE
 - CONIFEROUS TREE WIDRILINE
 - BUSH

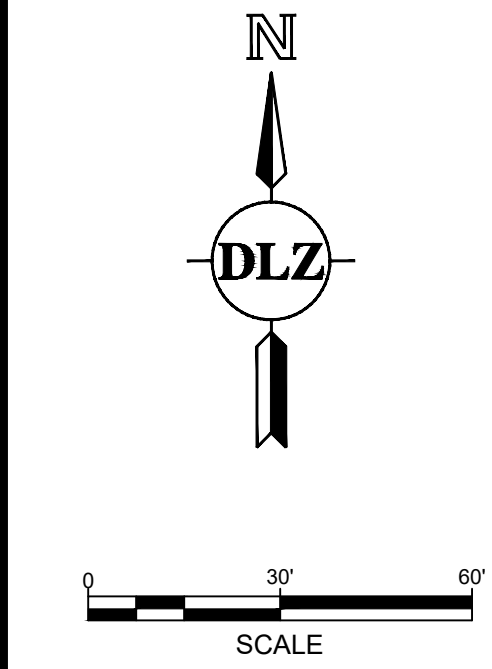
Independence Township
6050 Flemings Lake Rd
Clarkston, Michigan 48346

Topographic Survey
Fueling Farm Development

6050 Flemings Lake Rd
Clarkston, Michigan 48346

WARNING

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NOTIFY UTILITY OWNERS TO
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AND LOCATIONS OF UTILITIES
HAVE BEEN RELOCATED AS NOTED
IN THE SPECIFICATIONS. ALL
UTILITIES THAT MIGHT
INTERFERE WITH
CONSTRUCTION



SLU REVIEW	03/03/23
SLU REVISION	04/10/23
BUILDING PERMIT REVIEW	04/17/23
ISSUED FOR BID	06/02/23
-	-
-	-
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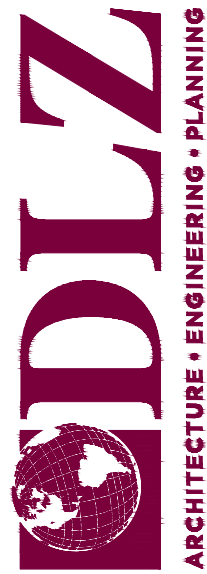
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DESIGN BY: -
CHECKED BY: TWW

DLZ JOB NUMBER: 2245-7545-00
TOPOGRAPHIC SURVEY
SHEET NO.

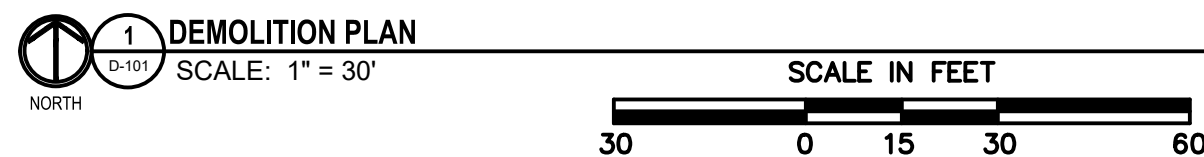
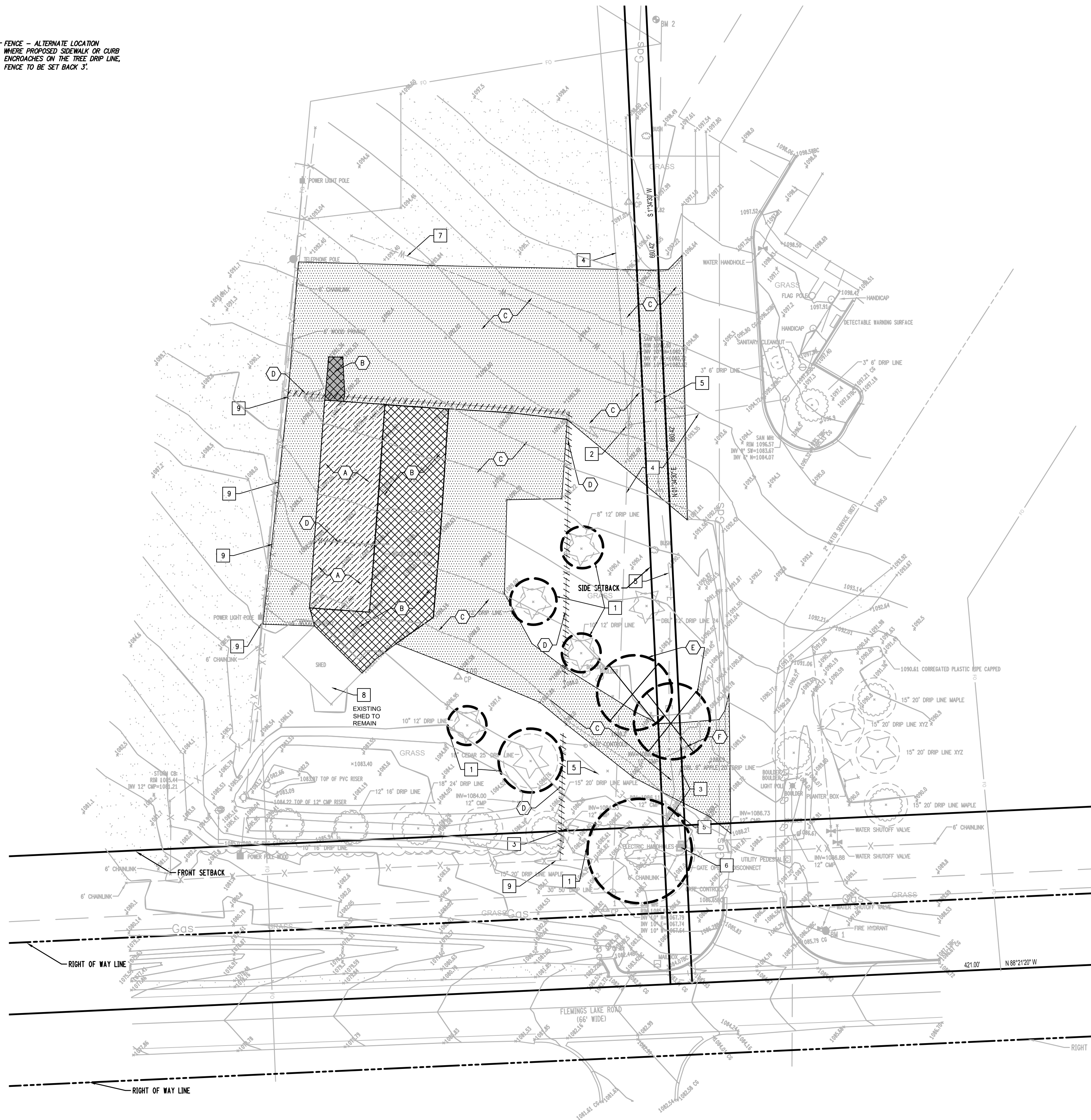
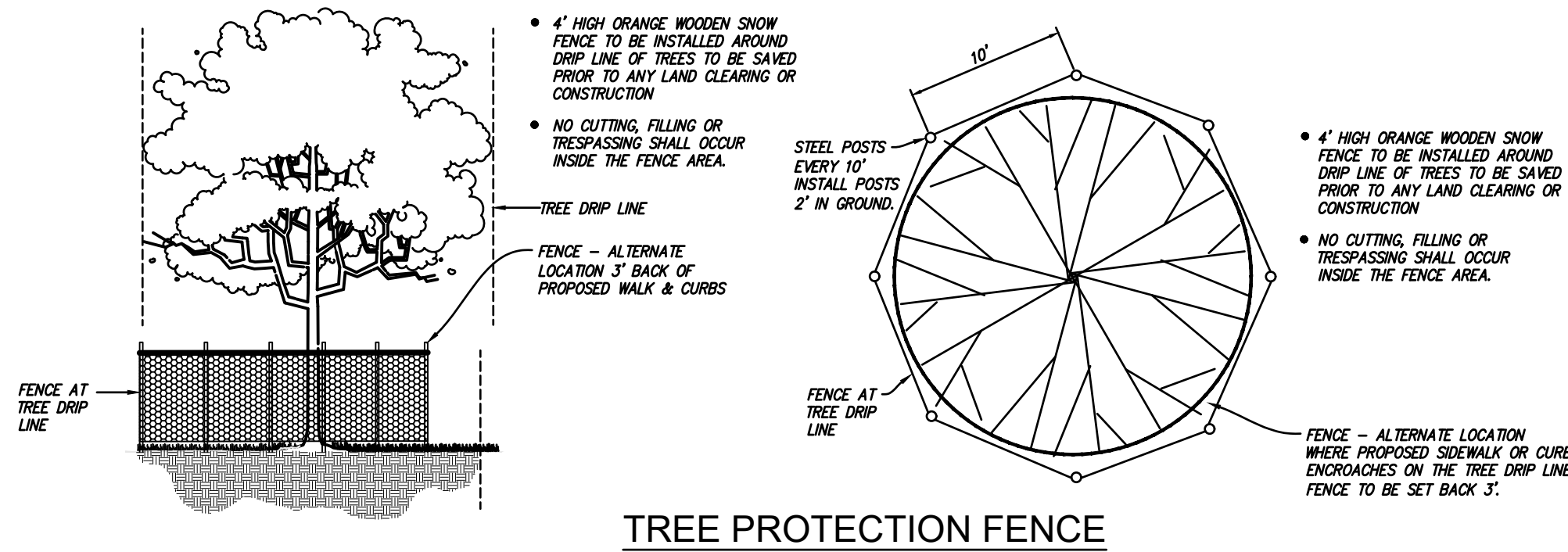
V-101

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811
3 FULL WORKING DAYS
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INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
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REMOVAL LEGEND

- REMOVE EXISTING ASPHALT PAVEMENT
- REMOVE EXISTING CONCRETE PAVEMENT
- CLEAR AND GRUB
- REMOVE EXISTING FENCE
- REMOVE EXISTING TREE

SITE DEMOLITION KEY

- A** REMOVE CONCRETE PAVEMENT TO FULL DEPTH. SAWCUT FULL DEPTH TO NEAREST JOINT WHERE NEW PAVEMENT WILL BE PLACED ADJACENT TO EXISTING PAVEMENT. INCLUDE REMOVAL OF CONCRETE CURB AND GUTTER. SAWCUT FULL DEPTH TO NEAREST JOINT, WHERE SHOWN. REMOVAL LIMITS TO BE FIELD VERIFIED BY ENGINEER.
- B** REMOVE ASPHALT PAVEMENT TO FULL DEPTH. SAWCUT FULL DEPTH WHERE NEW PAVEMENT WILL BE PLACED ADJACENT TO EXISTING PAVEMENT. INCLUDE REMOVAL OF CONCRETE CURB AND GUTTER. SAWCUT FULL DEPTH TO NEAREST JOINT, WHERE SHOWN. REMOVAL LIMITS TO BE FIELD VERIFIED BY ENGINEER.
- C** CLEAR AND GRUB TO THE LIMITS SHOWN. INCLUDE REMOVAL OF GRAVEL AND BOULDERS. STRIP TOPSOIL AND STOCKPILE ON SITE IN DESIGNATED LOCATION.
- D** REMOVE EXISTING FENCE.
- E** REMOVE EXISTING TREE (INCLUDING STUMPS AND ROOTS)
- F** SALVAGE EX. METAL END SECTION AND STORAGE ON SITE FOR RE-CONNECTION.

SITE PROTECTION KEY

- EXISTING TREE, PROTECT.
- EXISTING MANHOLE STRUCTURE, PROTECT.
- EXISTING CULVERT, PROTECT.
- EXISTING SANITARY MAIN, PROTECT.
- EXISTING ELECTRIC LINE, PROTECT.
- EXISTING ELECTRIC HANDHOLE, PROTECT.
- EXISTING WATERMAIN, PROTECT.
- EXISTING SHED TO REMAIN, PROTECT.
- EXISTING FENCE, PROTECT.

NOTE:

CONTRACTOR SHALL UTILIZE A PRIVATE UTILITY LOCATOR TO IDENTIFY AND STAKE PUBLIC AND PRIVATE UTILITY LOCATIONS PRIOR TO START OF CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REPAIR OR REPLACE ANY DAMAGE TO EXISTING UTILITY LINES.

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DLZ
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Independence Township
6050 Flemings Lake Rd
Clarkston, Michigan 48346

Demolition Plan
Fueling Farm Development

6050 Flemings Lake Rd
Clarkston, Michigan 48346

N

DLZ

0 30' 60'

SCALE

SLU REVIEW	03/03/23
SLU REVISION	04/10/23
BUILDING PERMIT REVIEW	04/17/23
ISSUED FOR BID	06/02/23
-	-
-	-
-	-
-	-
-	-
-	-

DRAWN BY: DLZ
DESIGN BY: -
CHECKED BY: -

DLZ JOB NUMBER: 2245-7545-00

DEMOLITION PLAN

SHEET NO.
D-101

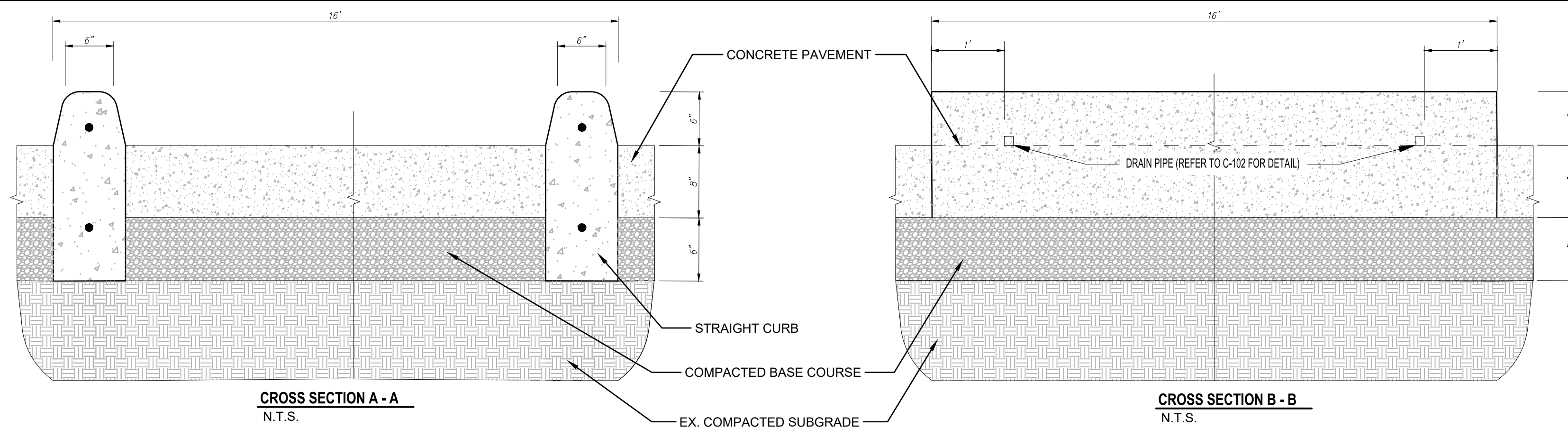
EXISTING ZONING:	R-1A SINGLE FAMILY RESIDENTIAL
LOT USE:	EXISTING: DPW VEHICLE STORAGE PROPOSED: MUNICIPAL FUELING STATION
<u>BUILDING SETBACK LINES:</u>	PER THE CHARTER TOWNSHIP OF INDEPENDENCE ZONING ORDINANCE UPDATED 07/11/2022

CONSTRUCTION ACTIVITY AREA:	0.52 AC (±)
IMPERVIOUS SURFACE NET INCREASE:	0.37 AC (±)
PARCEL NUMBER:	08-21-276-002
PARCEL SIZE:	18.86 AC
PROPERTY OWNER INFORMATION:	DAVE MCKEE, DIRECTOR OF PUBLIC WORKS

	<u>REQUIRED</u>	<u>PROVIDED</u>
<u>FRONT YARD:</u>	40 FT	178 FT
<u>REAR YARD:</u>	50 FT	459 FT
<u>LEAST SIDE:</u>	10 FT	75 FT

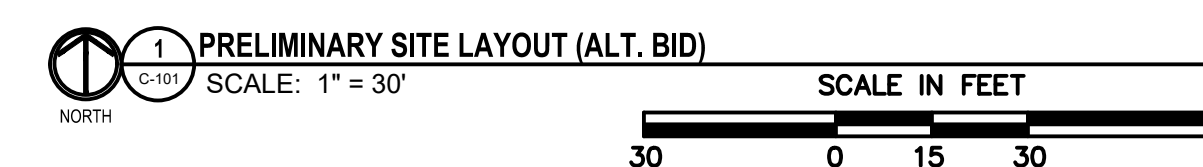
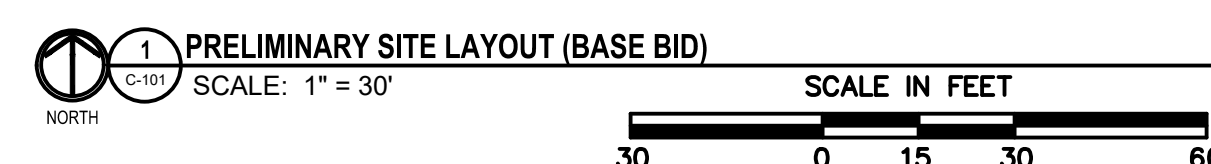
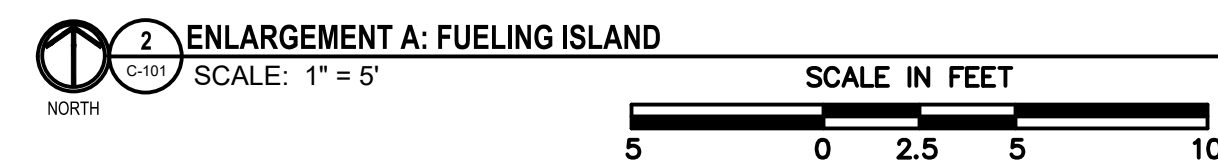
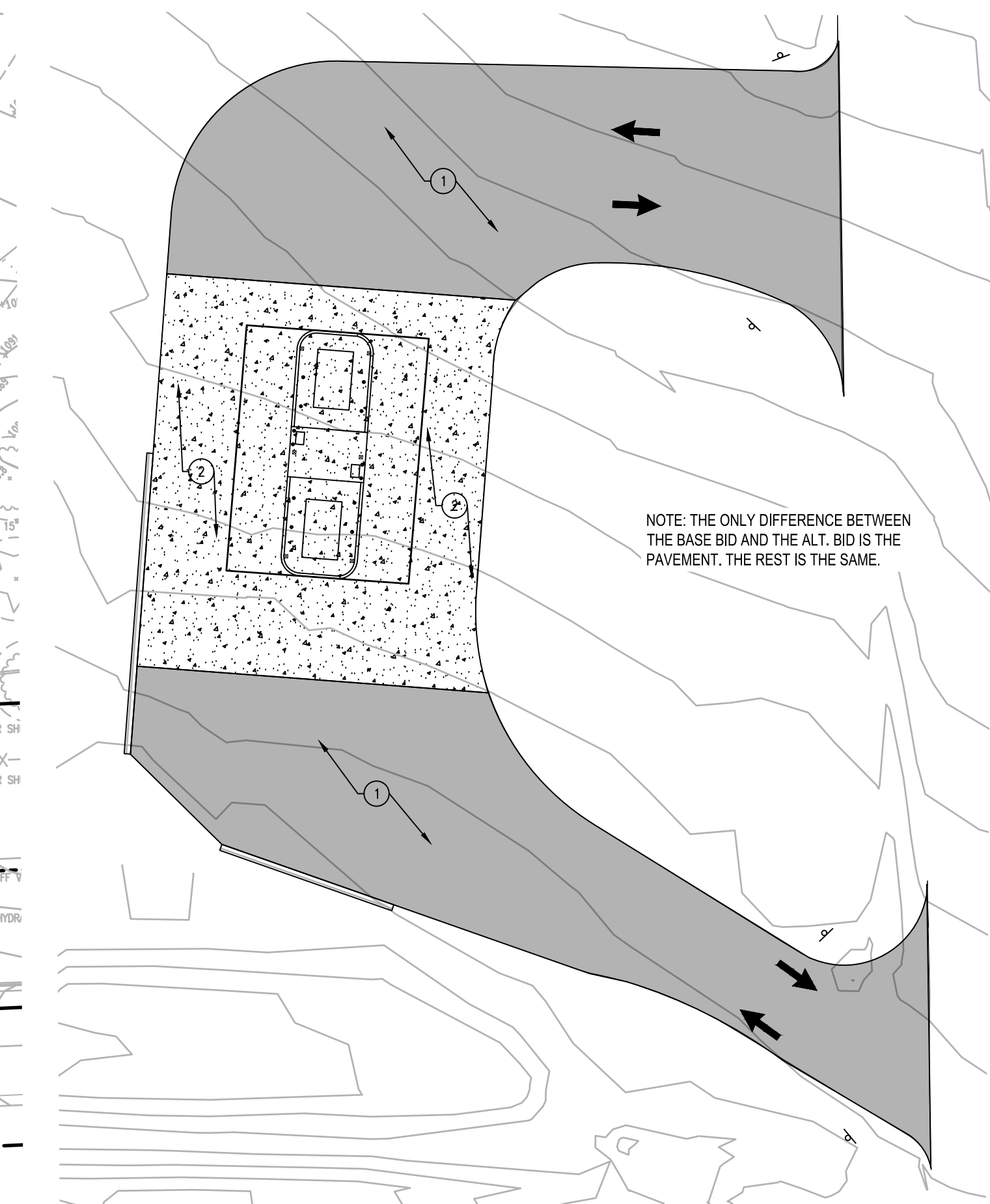
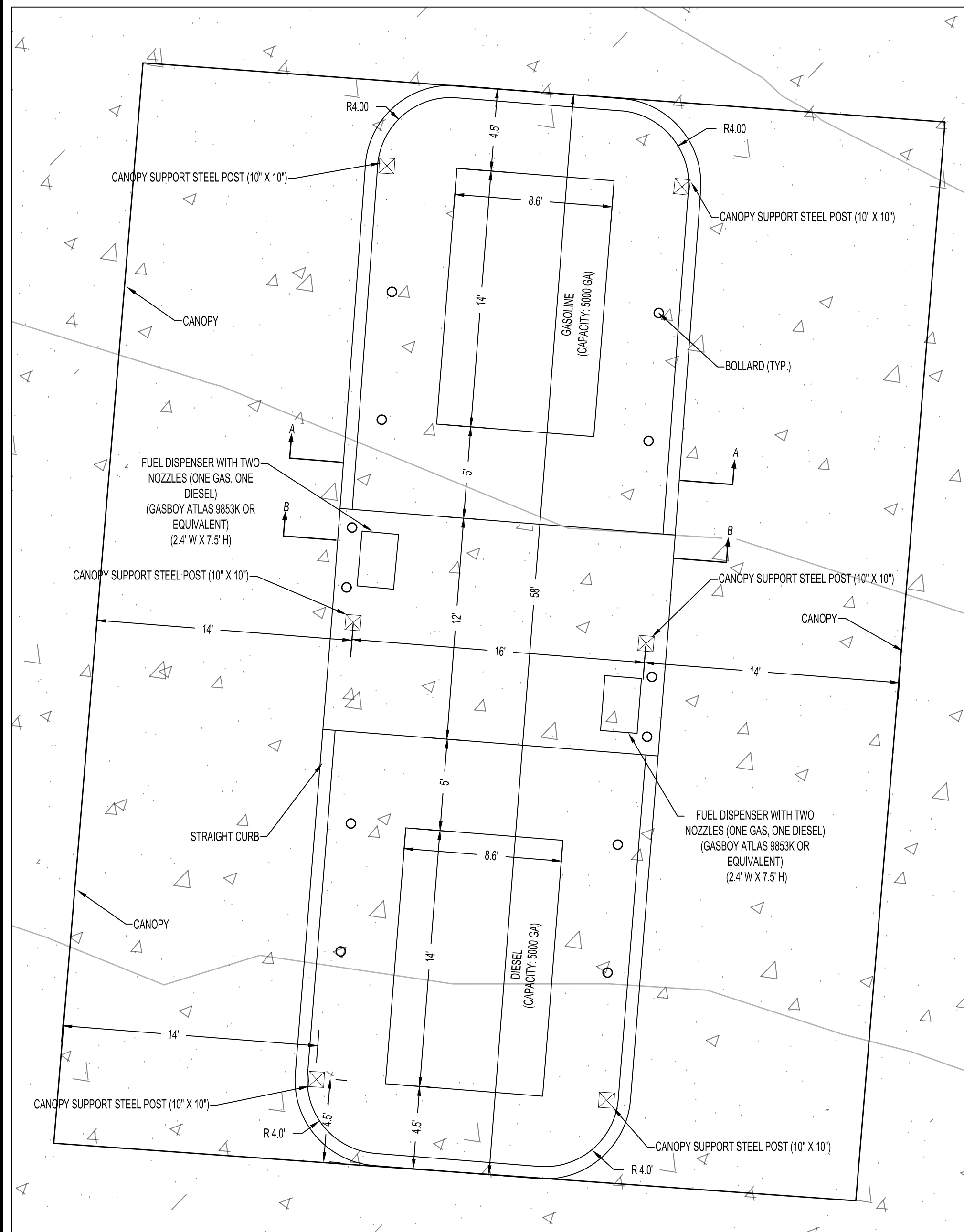
	<u>MAXIMUM</u>	<u>PROPOSED CANOPY</u>
BUILDING HEIGHT:	35 FT	16 FT

TYPE:	FIREGUARD FIRE-RATED ABOVEGROUND HORIZONTAL TANK
DIAMETER:	8.6 FT (103 IN)
LENGTH:	14 FT (169IN)
CAPACITY:	5000 GALLONS (EACH)
NOTE:	AN OVERFILL ALARM SET AT 90% AND AN OVERFILL SHUTOFF VALVE SET AT 95% SHALL BE PLACED ON ALL DOUBLE WALL TANKS



PROPOSED

SYMBOL	REFERENCE NOTES	DETAIL
① ASPHALT PAVEMENT (ALT. BID)		01 C-105
② CONCRETE PAVEMENT		02 C-105
③ STRAIGHT CURB		03 C-105
④ CANOPY		1 C-105A
⑤ FUEL TANK		-
⑥ FUEL DISPENSER		-
⑦ PIPE BOLLARD		04 C-105
⑧ CANOPY POST		-
⑨ CONCRETE CONTROL JOINT		05 C-105
⑩ AUTHORIZED VEHICLES ONLY POST SIGN		06 C-105
⑪		-
⑫ EMERGENCY SPILL CONTROL KIT		-
⑬ FIRE EXTINGUISHER		-
⑭ SLEEVE UNDER PAVEMENT DETAIL		08 C-105
⑮ 6" CURB AND GUTTER		09 C-105



NOTE: THE ONLY DIFFERENCE BETWEEN THE BASE BID AND THE ALT. BID IS THE PAVEMENT. THE REST IS THE SAME.

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Independence Township
6050 Flemings Lake Road
Clarkston, MI 48346

Site Layout Plan Fueling Farm Development

811 **3 FULL WORKING DAYS**
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A horizontal graphic scale bar with tick marks at 0, 30', and 60'. The bar is divided into alternating black and white segments. Below the bar, the word "SCALE" is centered.

[illegible]

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DESIGN BY: AMB
CHECKED BY: -

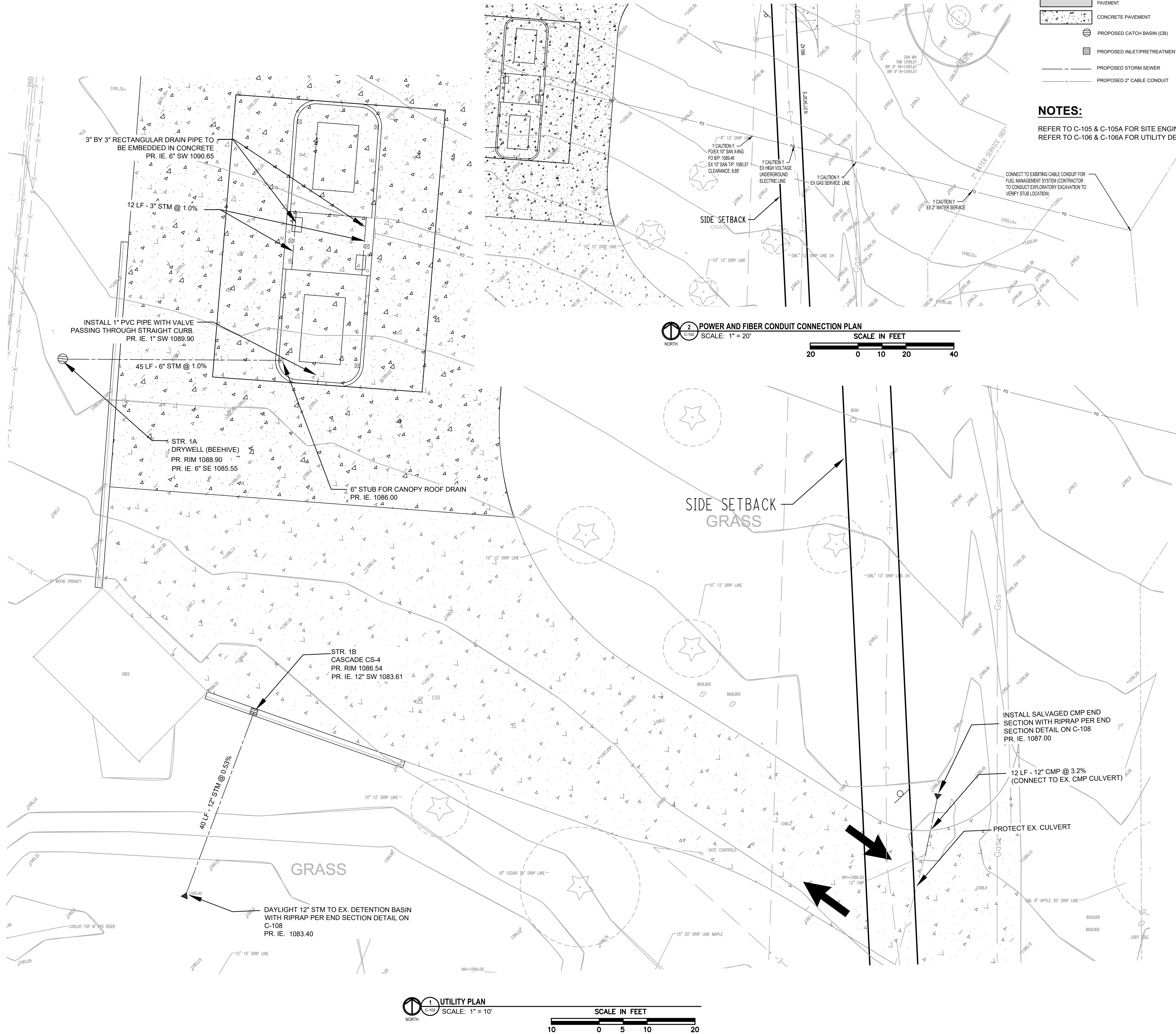
DLZ JOB NUMBER: 2245-7545-00

SITE LAYOUT PLAN

SHEET NO.

C-101

PROJECT: 2022-2450 Fueling Farm Development (C-102) DATE: 6/7/2023 3:44:26 PM
DRAWN BY: DLZ
DESIGNED BY: AMB
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SCALE: 1" = 20'
SHEET NO. C-102



LEGEND

- STANDARD BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- PROPOSED CATCH BASIN (CB)
- PROPOSED INLET/PRE-TREATMENT
- PROPOSED STORM SEWER
- PROPOSED 2" CABLE CONDUIT

NOTES:

REFER TO C-105 & C-105A FOR SITE ENGINEERING DETAILS
REFER TO C-106 & C-106A FOR UTILITY DETAILS AND NOTES

UTILITY NOTES

- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT MISS DIG UTILITY PROTECTION SERVICE "811" THREE (3) WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION TO VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES.
- STORM SEWER 12" SHALL BE C76 CL III; UNLESS NOTED OTHERWISE.
- STORM SEWER 6" SHALL BE PVC SDR 23.5.
- UTILITIES AND UNDERGROUND OBSTACLES SHOWN ARE APPROXIMATE. FIELD VERIFY UTILITY LOCATION PRIOR TO COMMENCEMENT OF EARTHWORK AND UTILITY ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO OBSTRUCTIONS AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION.
- WHEN EXCAVATING NEAR UTILITIES, CONTRACTOR WILL BE RESPONSIBLE FOR SUPPORTING, BRACING, AND SHORING AS REQUIRED TO PREVENT DAMAGE TO THE UTILITIES.
- CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY UTILITY PERMITS TO CONNECT TO EX. UTILITIES AND FIELD COORDINATION WITH THE TOWNSHIP AND/OR THE COUNTY.
- CONTRACTOR SHALL CONSTRUCT ALL UNDERGROUND IMPROVEMENTS IN ACCORDANCE WITH INDEPENDENT TOWNSHIP STANDARD CONSTRUCTION SPECIFICATIONS.
- ALL UTILITY TRENCHES THAT FALL WITHIN A 1-ON-1 INFLUENCE OF PAVEMENT AREAS SHALL BE BACKFILLED WITH CLASS 2 SAND AND COMPACTED TO 95% OF MAXIMUM DENSITY.
- ALL UTILITIES SHALL BE INSTALLED ON CLASS "B" BEDDING OR BETTER.
- ALL UTILITIES SHALL BE PLACED AT LEAST 10' FROM OTHER UTILITIES, SIGNIFICANT TREES, AND FIXED STRUCTURES.
- LOCATIONS OF LIGHT POLES, IF SHOWN ON THESE DRAWINGS, MAY BE APPROXIMATE. CONFIRM EXACT LOCATION (I.E. CURB OFFSETS, SIDEWALK OFFSETS, ETC.) PRIOR TO STAKING AND CONSTRUCTION. REFER TO SITE ELECTRICAL PLAN FOR DETAILS, AND COORDINATE WITH ELECTRICAL ENGINEER, ARCHITECT, AND CIVIL ENGINEER TO DETERMINE PROPER PLACEMENT.
- WHERE THESE PLANS DIFFER FROM THE STANDARD DETAILS OR STANDARD SPECIFICATIONS OF THE COMMUNITY, THE COMMUNITY REQUIREMENTS SHALL GOVERN.
- CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING HORIZONTAL AND VERTICAL CONTROL POINTS, BENCHMARKS, ETC. CONTRACTOR IS RESPONSIBLE FOR PROVIDING CONSTRUCTION STAKING AND FIELD LAYOUT. IT IS RECOMMENDED THAT TWO (2) BENCHMARKS BE USED FOR VERIFICATION OF ALL CONSTRUCTION ELEVATIONS. SET ADDITIONAL BENCHMARKS, AS NEEDED, TO COMPLY WITH THIS REQUIREMENT.

ELECTRICAL CONNECTION NOTES

- POWER FEED FOR THE PROPOSED FUELING FARM WILL CONNECT TO THE EXISTING DPW BUILDING.
- CONTRACTOR TO COORDINATE WITH THE TOWNSHIP ON DISCONNECTING EXISTING SERVICE AND RE-ROUTING TO THE PROPOSED FUELING FARM.
- CONTRACTOR TO PERFORM DIRECTIONAL DRILL FOR THE ELECTRICAL SERVICE.
- CONTRACTOR TO EXERCISE THEIR OWN DUE DILIGENCE TO DECONFLICT ANY POTENTIAL UTILITY CROSSINGS. IT IS THE CONTRACTORS RESPONSIBILITY TO REPAIR ANY DAMAGES CAUSED BY THIS OPERATION.

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Utility Plan
Fueling Farm Development

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INNOVATIVE IDEAS
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0 10' 20'
SCALE

SLU REVIEW	03/03/23
SLU REVISION	04/10/23
BUILDING PERMIT REVIEW	04/17/23
ISSUED FOR BID	06/02/23
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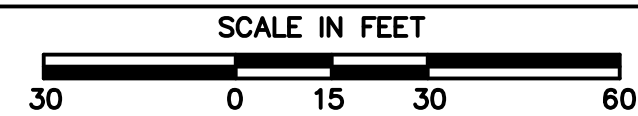
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DESIGN BY: AMB
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DLZ JOB NUMBER: 2245-7545-00

UTILITY PLAN

SHEET NO.

C-102



6050 Flemings Lake Road
Clarkston Michigan 48346



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INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
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DLZ JOB NUMBER: 2245-7545-00
DRAINAGE AREA MAP
SHEET NO.

C-102A

1. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF OAKLAND COUNTY.
2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR TO DETERMINE EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL DEVICES, AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
3. EROSION AND ANY SEDIMENT FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS.
4. EROSION AND SEDIMENT CONTROL DEVICES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CONSTRUCTION. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
5. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL DEVICES AS REQUIRED AND AS DIRECTED ON THESE PLANS. HE SHALL REMOVE TEMPORARY DEVICES AS SOON AS PERMANENT STABILIZATION OF SLOPES AND OTHER EARTH CHANGES HAVE BEEN ACCOMPLISHED AND APPROVED BY OAKLAND COUNTY.
6. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY THE CONTRACTOR.
7. DUST CONTROL WILL BE EXERCISED AT ALL TIMES WITHIN THE PROJECT BY THE CONTRACTORS. SPRINKLING TANK TRUCKS WILL BE AVAILABLE AT ALL TIMES TO BE USED ON HAUL ROUTES OR OTHER PLACES WHERE DUST BECOMES A PROBLEM.
8. IMMEDIATELY AFTER SEEDING, MULCH ALL SEEDING AREAS WITH UNWEATHERED SMALL GRAIN STRAW OR HAY. SPREAD UNIFORMLY AT A RATE OF 1 1/2 TO 2 TONS PER ACRE OR 0.10 POUNDS PER SQUARE FEET. ANCHOR MULCH WITH DISC TYPE MULCH ANCHORING TOOL.
9. ALL MUD, DIRT, AND DEBRIS TRACKED ONTO EXISTING ROADS FROM THIS SITE SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR OR BUILDER. ALL MUD, DIRT, AND DEBRIS TRACKED OR SPILLED ONTO PAVED SURFACES WITHIN THIS SITE SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
10. PERMANENT SOIL EROSION CONTROL DEVICES FOR ALL SLOPES, CHANNELS, DITCHES OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 15 CALENDAR DAYS AFTER FINAL GRADING OR FINAL EARTH CHANGES HAVE BEEN COMPLETED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER AN EARTH CHANGE HAS BEEN COMPLETED OR WHERE SIGNIFICANT EARTH CHANGE ACTIVITY CEASES TEMPORARY SOIL EROSION CONTROL DEVICES SHALL BE IMPLEMENTED WITHIN 30 CALENDAR DAYS. ALL TEMPORARY SOIL EROSION CONTROL DEVICES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION DEVICES ARE IMPLEMENTED AND/OR ESTABLISHED. ALL PERMANENT SOIL EROSION CONTROL DEVICES WILL BE IMPLEMENTED AND ESTABLISHED BEFORE A CERTIFICATE OF OCCUPANCY IS ISSUED.

1. INSTALL SILT FENCE AROUND DEFINED PERIMETER AS SHOWN.
2. REMOVE PAVEMENT WHERE INDICATED.
3. CLEAR, GRUB, AND STRIP TOPSOIL IN AREAS OF EARTH DISRUPTION.
4. COMPLETE LAND BALANCING OPERATIONS.
5. PERFORM FINE GRADING, LANDSCAPING, PAVING OPERATIONS AND POURING CONCRETE.
6. EROSION CONTROL MEASURES ARE NOT TO BE REMOVED UNTIL THE TOWNSHIP AND/OR COUNTY GRANTS ITS APPROVAL.

PROJECT COMMENCEMENT ON OR ABOUT MAY 2023.

A. INSTALL SILT FENCE AS SHOWN ON PLANS.	1 DAY
B. REMOVE PAVEMENT.	2 DAYS
C. STRIP AND STOCKPILE TOPSOIL AND ROUGH GRADE SITE.	1 WEEK
D. FINE GRADE SITE, PAVE, INSTALL LANDSCAPING AND ESTABLISH VEGETATION.	4 WEEKS
E. CLEAN PAVEMENTS AND ALL ACCUMULATED SEDIMENT IN CONJUNCTION WITH REMOVING ALL TEMPORARY DEVICES.	1 WEEK

The image is a detailed site plan for a property located along Flemings Lake Rd. The plan shows a large rectangular building footprint with a smaller structure to its left. A thick dashed line outlines the 'SIDE SETBACK' area, and a thinner dashed line indicates the 'FRONT SETBACK'. The plan includes numerous utility lines (water, sewer, gas, electric), drop lines, and various markers like 'SILT FENCE' and 'SIDE SETBACK'. The property is bounded by 'RIGHT OF WAY LINE' on the left and 'FLEMINGS LAKE RD' at the bottom. The plan also shows existing gravel drives and construction access points.

SOIL EROSION CONTROL DEVICES


— — — SILT FENCE

APPROX. GROSS ACREAGE DISTURBED = 0.52± ACRES

SOIL TYPES:
10B MARLETTE SANDY LOAM, 1 TO 6 PERCENT SLOPES
40C UDORTHENTS, LOAMY, ROLLING

THIS PROJECT SHALL BE CONSTRUCTED IN COMPLIANCE WITH PART 91 OF ACT 451 OF 1994, AS AMENDED. THE SOIL EROSION AND SEDIMENT CONTROL ACT.

REFER TO C-107 FOR SOIL EROSION AND SEDIMENTATION
CONTROL DETAILS.

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IN THE SPECIFICATIONS. ALL
UTILITIES THAT MIGHT
INTERFERE WITH
CONSTRUCTION

Independence Township
6050 Flemings Lake Road
Clarkston, MI 48346

SOIL EROSION CONTROL PLAN

Fueling Farm Development

6050 Flemings Lake Road
Clarkston, Michigan 48346



A horizontal scale bar with alternating black and white segments. It is marked with '0' at the left end, '30'' at the midpoint, and '60'' at the right end. Below the bar is the word 'SCALE'.

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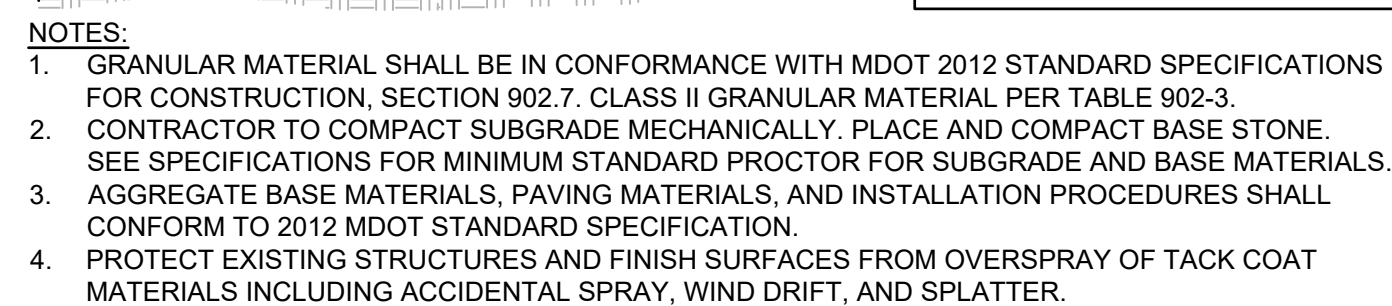
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DESIGN BY: AMB
CHECKED BY: -

DLZ JOB NUMBER: 2245-7545-00

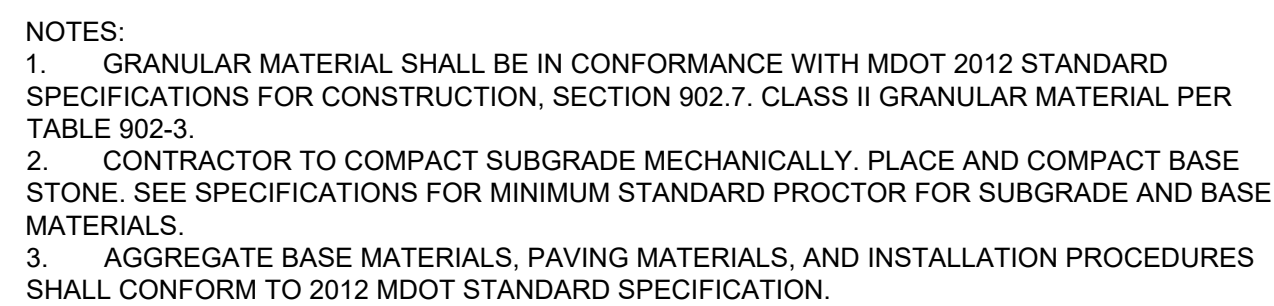
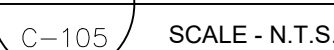
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SHEET NO

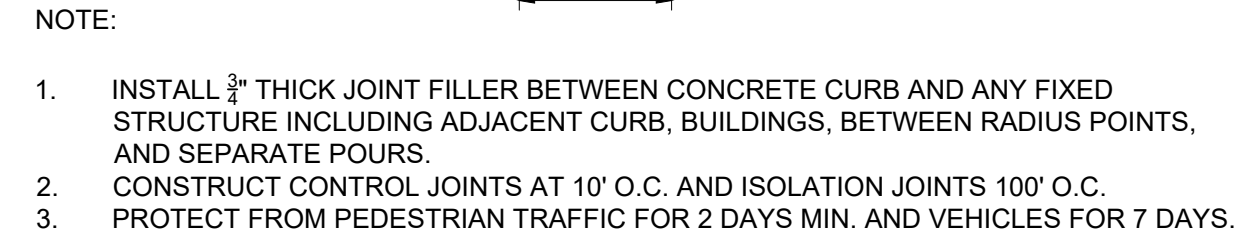
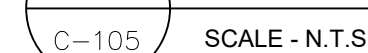
C-104



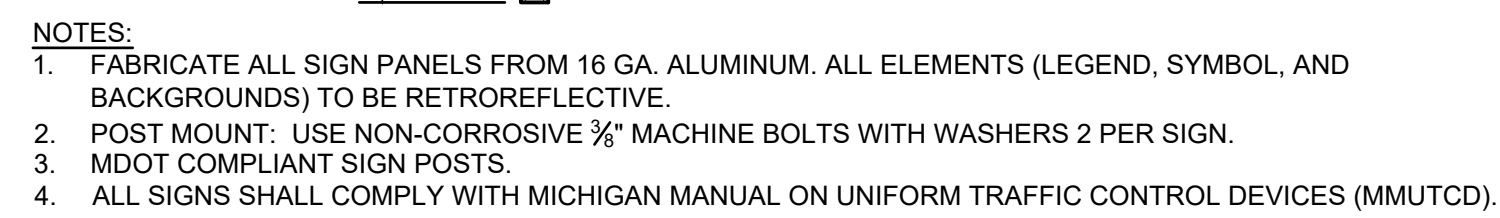
C-105 SCALE - N.T.S.



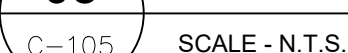
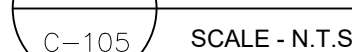
C-105 SCALE - N.T.S



C-105 SCALE - N.T.S.



C-105 SCALE - N.T.S.



1. REMOVE ANY EXISTING TOPSOIL, VEGETATION, TREES AND OTHER DELETERIOUS MATERIALS TO EXPOSE THE SUBGRADE SOIL. TREE ROOTS SHALL BE COMPLETELY REMOVED.
2. EXCAVATE TO THE DEPTH OF THE FINAL SUBGRADE ELEVATION TO ALLOW FOR GRADE CHANGES AND THE PLACEMENT OF THE RECOMMENDED PAVEMENT SYSTEM.
3. THE TOP 12 INCHES OF THE EXPOSED SUBGRADE SHALL BE COMPACTED TO A DENSITY NO LESS THAN 95 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR (ASTM D 1557-91).
4. THE FINAL SUBGRADE SHALL BE THOROUGHLY PROOFROLLED UNDER THE OBSERVATION OF A GEOTECHNICAL/PAVEMENT ENGINEER. LOOSE OR YIELDING AREAS WHICH CANNOT BE MECHANICALLY STABILIZED SHALL BE REMOVED AND REPLACED WITH ENGINEERED FILL OR AS DICTATED BY FIELD CONDITIONS.
5. ALL BITUMINOUS MATERIAL SHALL BE COMPACTED TO A DENSITY NO LESS THAN 97 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY THE MARSHALL METHOD.
6. PERFORMANCE GRADE PG64-22 ASPHALT CEMENT SHALL BE USED IN THE PRODUCTION OF ALL BITUMINOUS MIXTURES. RECLAIMED ASPHALT PAVEMENT (RAP) SHALL BE ALLOWED ONLY AS SPECIFIED BY THE CURRENT MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION, UNLESS NOTED ON THE PROJECT DETAILS.
7. CONTRACTOR SHALL PROTECT EXISTING CURB, GUTTER, SIDEWALK, WALLS, FENCES AND ALL OTHER EXISTING SITE FEATURES NOT INDICATED FOR REMOVAL OR REHABILITATION.
8. PLACE EXPANSION JOINTS WHERE NEW CONCRETE PAVEMENT OR WALKS ABUT BUILDING WALLS (PROPOSED OR EXISTING), CURB, OR EXISTING CONCRETE PAVEMENT. PLACE JOINT SEALANT ON ALL EXPANSION JOINTS.
9. CONTRACTOR TO CONSTRUCT CONTRACTION AND EXPANSION JOINTS IN ALL NEW CONCRETE PAVEMENT. CONTRACTION JOINTS SHALL BE TOOLED WHERE SIDEWALK WIDTH IS 8' OR LESS, AND SHALL BE SPACED EQUAL TO THE WIDTH OF THE PAVEMENT (I.E. 8' SPACING FOR 8' WIDE WALK), BUT NOT MORE THAN 10' APART. PLACE EXPANSION JOINTS WITH JOINT SEALANT AT MAXIMUM 50' SPACING. CONTRACTOR SHALL GENERALLY MATCH THE JOINT PATTERNS FOR CONCRETE PAVEMENT WHEN SHOWN ON THE PLANS.
10. WHERE THESE PLANS DIFFER FROM THE STANDARD DETAILS OR STANDARD SPECIFICATIONS OF THE COMMUNITY, THE COMMUNITY REQUIREMENTS SHALL GOVERN.
11. CONCRETE PAVEMENT SHALL MEET THE REQUIREMENTS FOR MDOT GRADE P1 CONCRETE PER THE CURRENT MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

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Site Engineering Details

6050 Flemings Lake Road
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A horizontal graphic scale bar with tick marks at 0, 30', and 60'. The bar is divided into alternating black and white segments. Below the bar, the word "SCALE" is written in bold capital letters.

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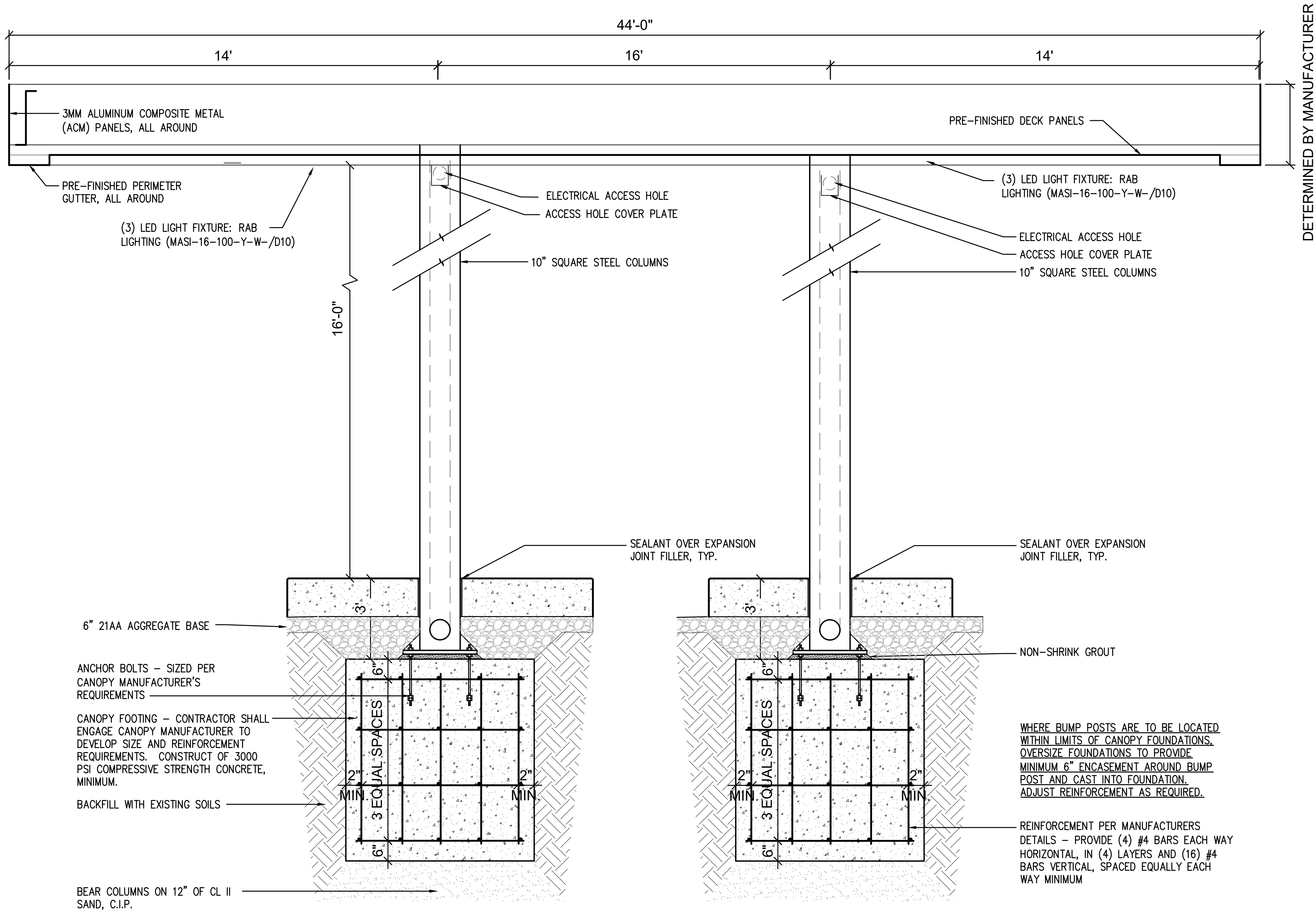
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DLZ JOB NUMBER: 2245-7545-00

SITE ENGINEERING DETAILS

SHEET NO

C-105



01 TYPICAL CANOPY CROSS SECTION
C-105A SCALE - N.T.S.

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Site Engineering Details
Fueling Farm Development
6050 Flemings Lake Road
Clarkston, Michigan 48346

N

DLZ

0 30' 60'

SCALE

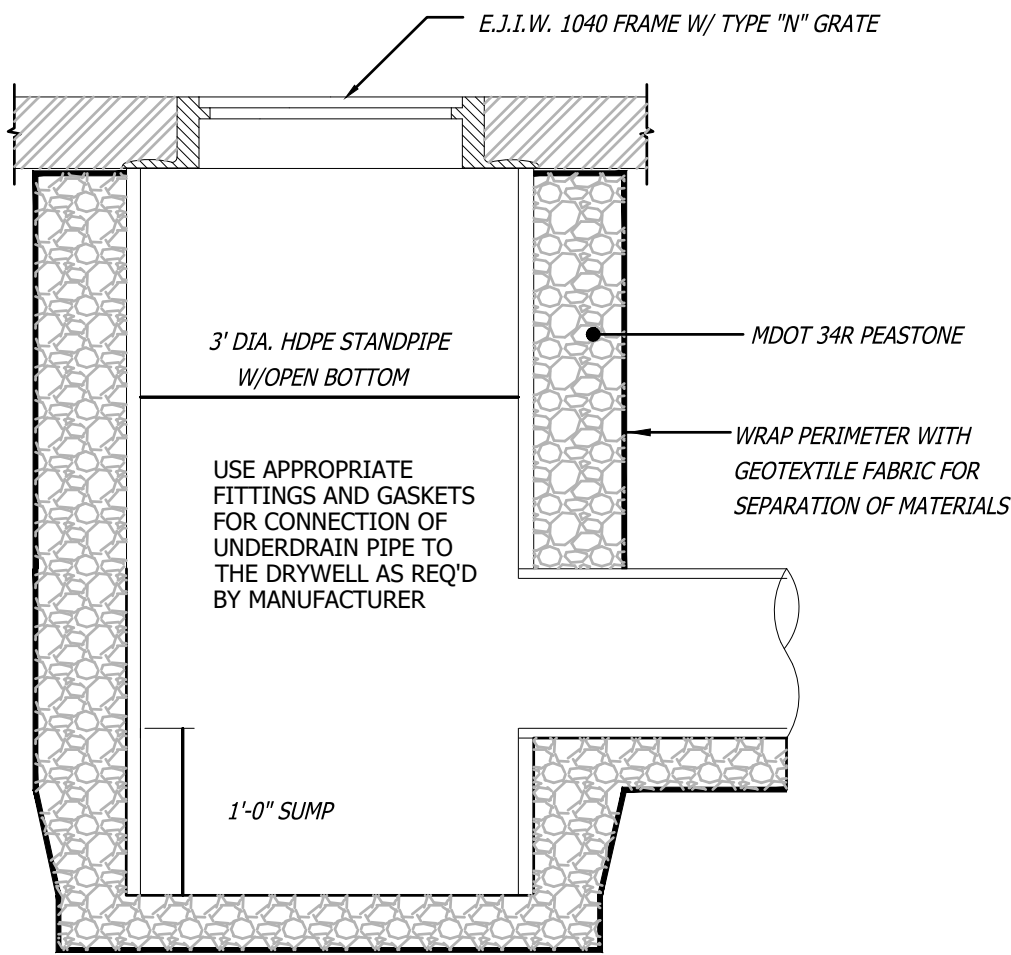
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SLU REVISION	04/10/23
BUILDING PERMIT REVIEW	04/17/23
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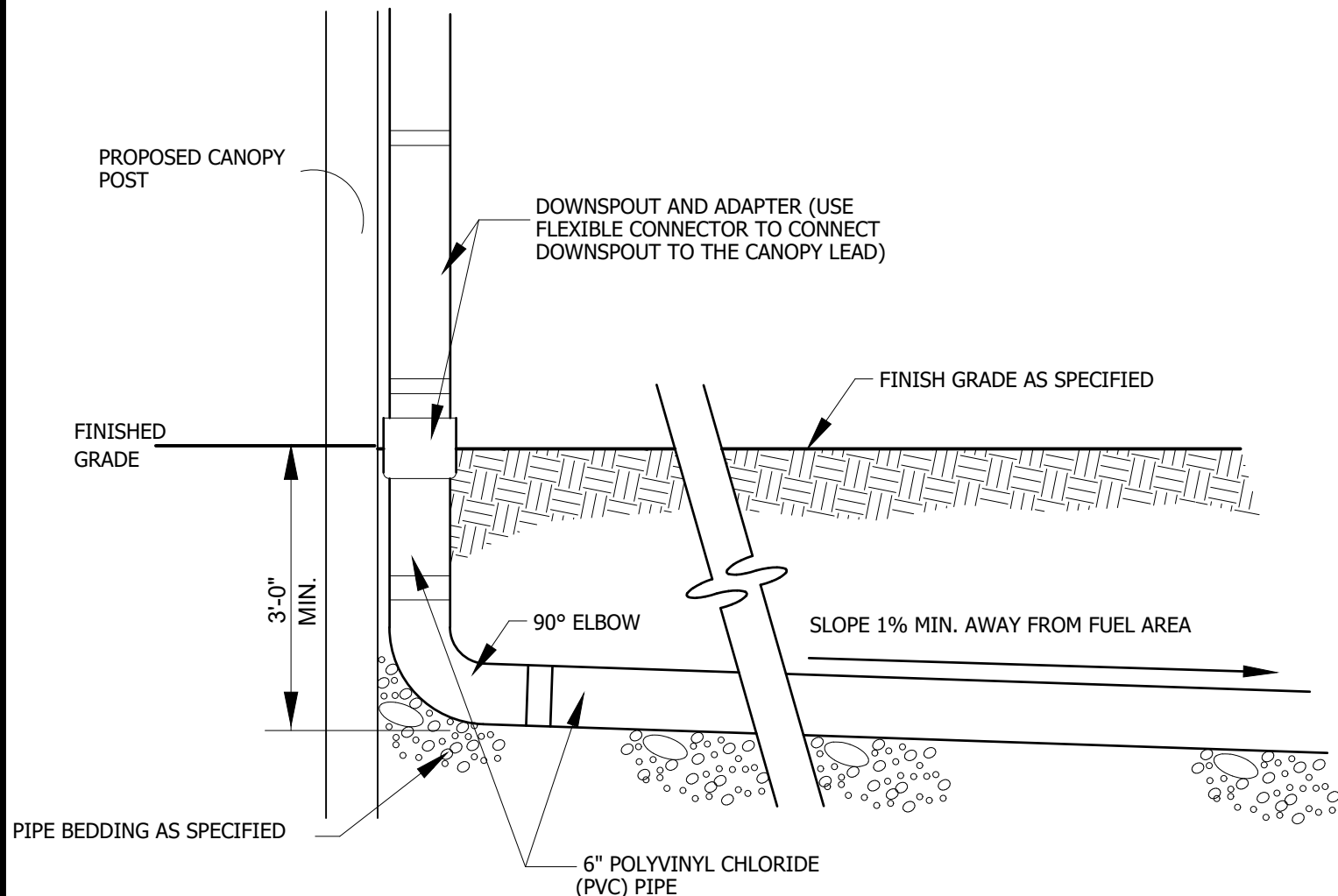
DLZ JOB NUMBER: 2245-7545-00

SITE ENGINEERING DETAILS

SHEET NO.
C-105A



02 DRYWELL DETAIL
C-106 SCALE - N.T.S.



NOTES
1. CONTRACTOR TO PROVIDE REDUCERS AS NECESSARY FOR INSTALLATION.

03 CANOPY DOWNSPOUT DETAIL
C-106 SCALE - N.T.S.

Design the Conveyance System for 10-Yr (STR. 1A)

Calculate Site "C" Factor

Pervious	0 Ac.	0.30	0
Impervious	0.06 Ac.	0.90	0.05
	0.06 Ac.		0.05
C = 0.90			

Determine 10-Yr Storm Intensity

Time of Concentration (T_c) = 5 Min.
From Oakland County stormwater standards, 5 min. = 5.85 in/hr

Determine Site Runoff Flow

$Q = C * I * A$
 $Q = 0.90 * 5.85 * 0.06 = 0.32$ cfs
∴ Okay to use an 6" PVC pipe at 1.00%
Capacity = 0.56 cfs based on Manning equation with a N of .013

Design the Conveyance System for 10-Yr (STR. 1B)

Calculate Site "C" Factor

	Area	C-factor	C x A
Pervious	0.14 Ac.	0.30	0.04
Impervious	0.29 Ac.	0.90	0.26
	0.43 Ac.		0.30
C = 0.70			

Determine 10-Yr Storm Intensity

Time of Concentration (T_c) = 5 Min.
From Oakland County stormwater standards, 5 min. = 5.85 in/hr

Determine Site Runoff Flow

$Q = C * I * A$
 $Q = 0.70 * 5.85 * 0.43 = 1.76$ cfs
∴ Okay to use an 12" C-76-CL III pipe at 0.50%
Capacity = 2.52 cfs based on Manning equation with a N of .013

Project: Fueling Farm Development
Location: Independence Township, MI



Oakland County Water Resources Commissioner's Office
Manufactured Treatment Device Sizing Calculation

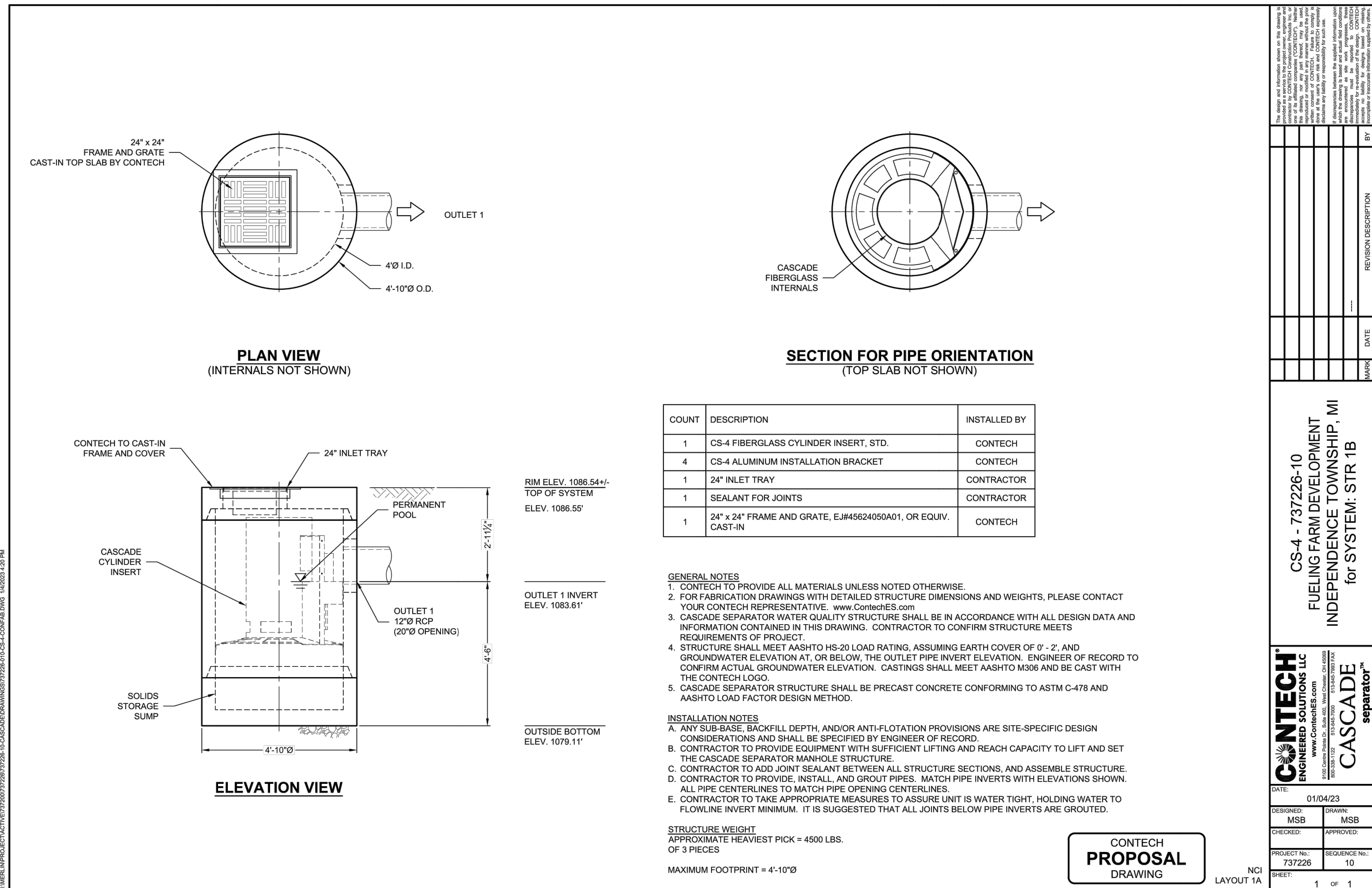
Area (acres) = 0.43
Runoff Coefficient, C = 0.7
 T_c (min) = 5

1-year I_1 (in/hr) = $30.20 / (T_c + 9.17) 0.81 = 3.53$
1-year Peak Flow (cfs) = $Q_{WQ} = C \times I_1 \times A = 1.06$



Recommended Model: CS-4

CASCADE SEPARATOR™ MODEL SPECIFICATIONS PER NJDEP CERTIFICATION LETTER

Model	MTFR (cfs)
CS-4	1.80
CS-5	2.81
CS-6	4.05
CS-8	7.20
CS-10	11.3
CS-12	16.2



01 CASCADE SEPARATOR DETAIL
C-106 SCALE - N.T.S.

Estimated Net Annual Solids Load Reduction Based on the Rational Rainfall Method						
		Fueling Farm Development Independence Township, MI Water Quality Unit				
AREA (acres):	0.430	CASCADE MODEL:		CS-4		
WEIGHTED C:	0.70	PARTICLE SIZE (µm):		110		
Tc (minutes):	5.00	RAINFALL STATION:		78		
Rainfall Intensity ¹ (in/hr)	Percent Rainfall Volume ¹	Cumulative Rainfall Volume	% Rainfall Volume Treated	Total Flowrate (cfs)	Removal Efficiency (%)	Incremental Removal (%)
0.02	13.13%	13.1%	13.1%	0.01	100.0	13.1
0.04	11.36%	24.5%	11.4%	0.01	100.0	11.4
0.06	10.08%	34.6%	10.1%	0.02	100.0	10.1
0.08	7.49%	42.1%	7.5%	0.02	100.0	7.5
0.10	7.01%	49.1%	7.0%	0.03	100.0	7.0
0.12	5.37%	54.4%	5.4%	0.04	100.0	5.4
0.14	4.73%	59.2%	4.7%	0.04	100.0	4.7
0.16	4.13%	63.3%	4.1%	0.05	100.0	4.1
0.18	3.53%	66.8%	3.5%	0.05	100.0	3.5
0.20	2.99%	69.8%	3.0%	0.06	100.0	3.0
0.25	5.50%	75.3%	5.5%	0.08	100.0	5.5
0.30	4.47%	79.8%	4.5%	0.09	100.0	4.5
0.35	3.85%	83.6%	3.9%	0.11	100.0	3.9
0.40	2.16%	85.8%	2.2%	0.12	100.0	2.2
0.45	2.09%	87.9%	2.1%	0.14	100.0	2.1
0.50	1.31%	89.2%	1.3%	0.15	100.0	1.3
0.75	5.07%	94.3%	5.1%	0.23	100.0	5.1
1.00	2.58%	96.9%	2.6%	0.30	100.0	2.6
1.50	2.50%	99.4%	2.5%	0.45	96.7	2.4
2.00	0.51%	99.9%	0.5%	0.60	91.7	0.5
2.54	0.15%	100.0%	0.2%	0.76	86.2	0.1
Removal Efficiency Adjustment ² =						6.5%
Predicted % Annual Rainfall Treated =						93.5%
Predicted Net Annual Load Removal Efficiency =						93.4%
1 - Based on 5.5 years of 15 minute precipitation data from NCDC station 2102 at Detroit City Airport in Detroit, MI						
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.						

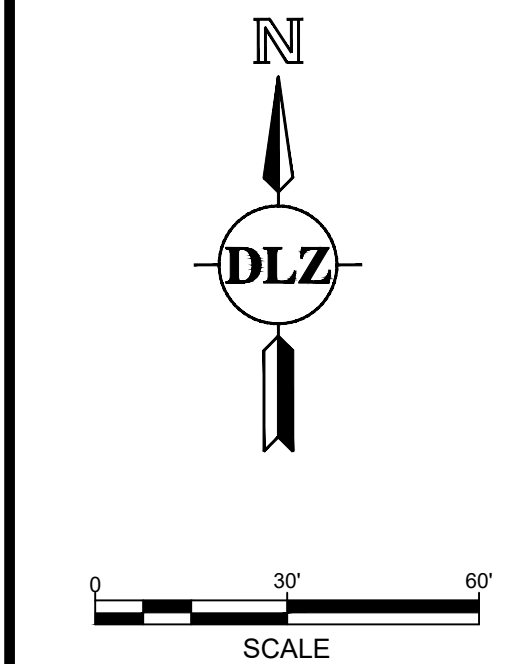
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Fueling Farm Development

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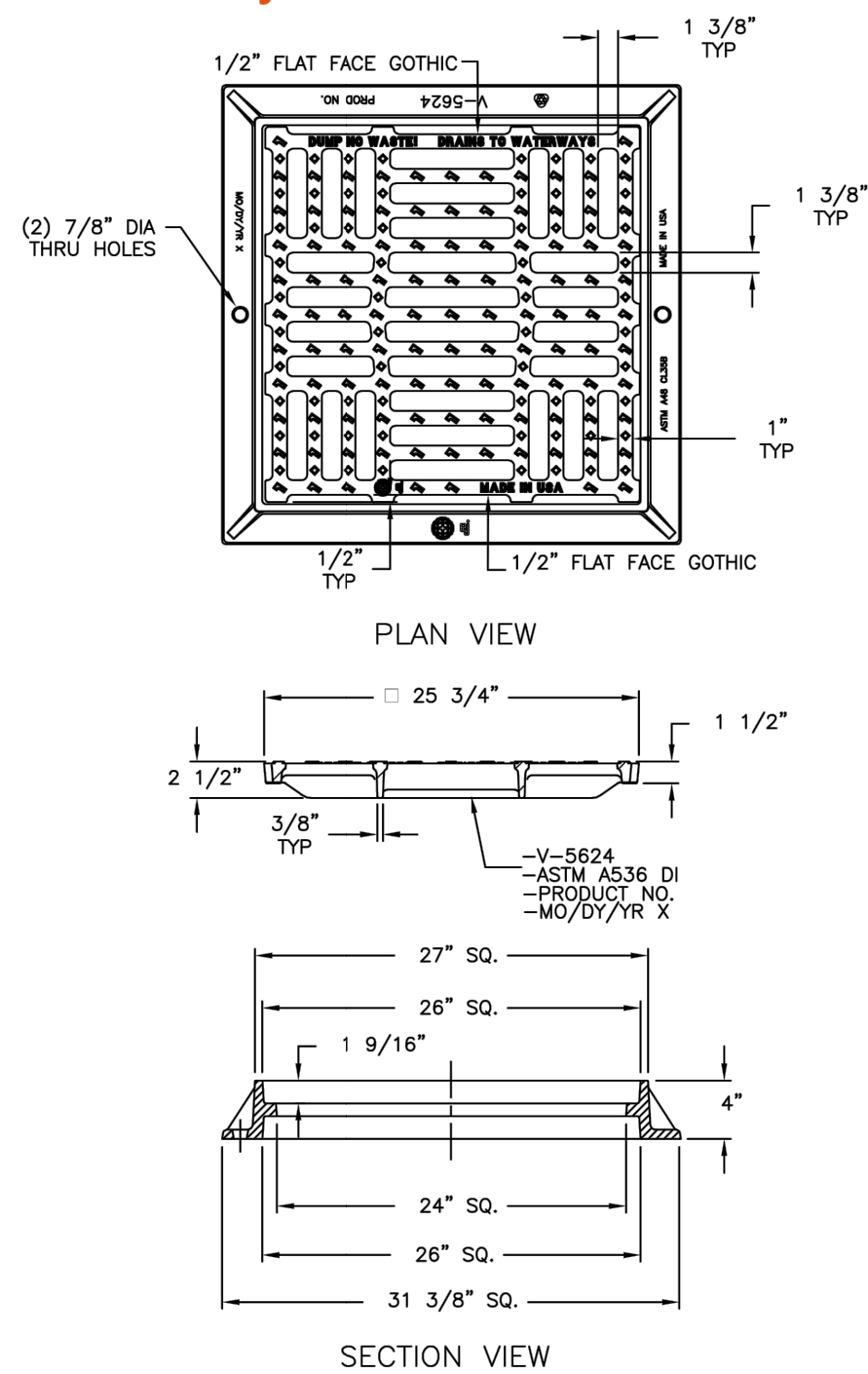
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DESIGN BY: -
CHECKED BY: -

DLZ JOB NUMBER: 2245-7545-00
UTILITY DETAILS AND NOTES
SHEET NO.

C-106

V5624 Assembly



Product Number
45624050A01

Design Features

- Materials
 - Frame
 - Gray Iron (CL35B)
 - Grate
 - Ductile Iron (70-50-05)

88 lbs

- Design Load
Heavy Duty
- Open Area
318 SQ.IN.
- Coating
Undipped
- ✓ Designates Machined Surface

Certification

- ASTM A536
- ASTM A48
- Country of Origin:USA

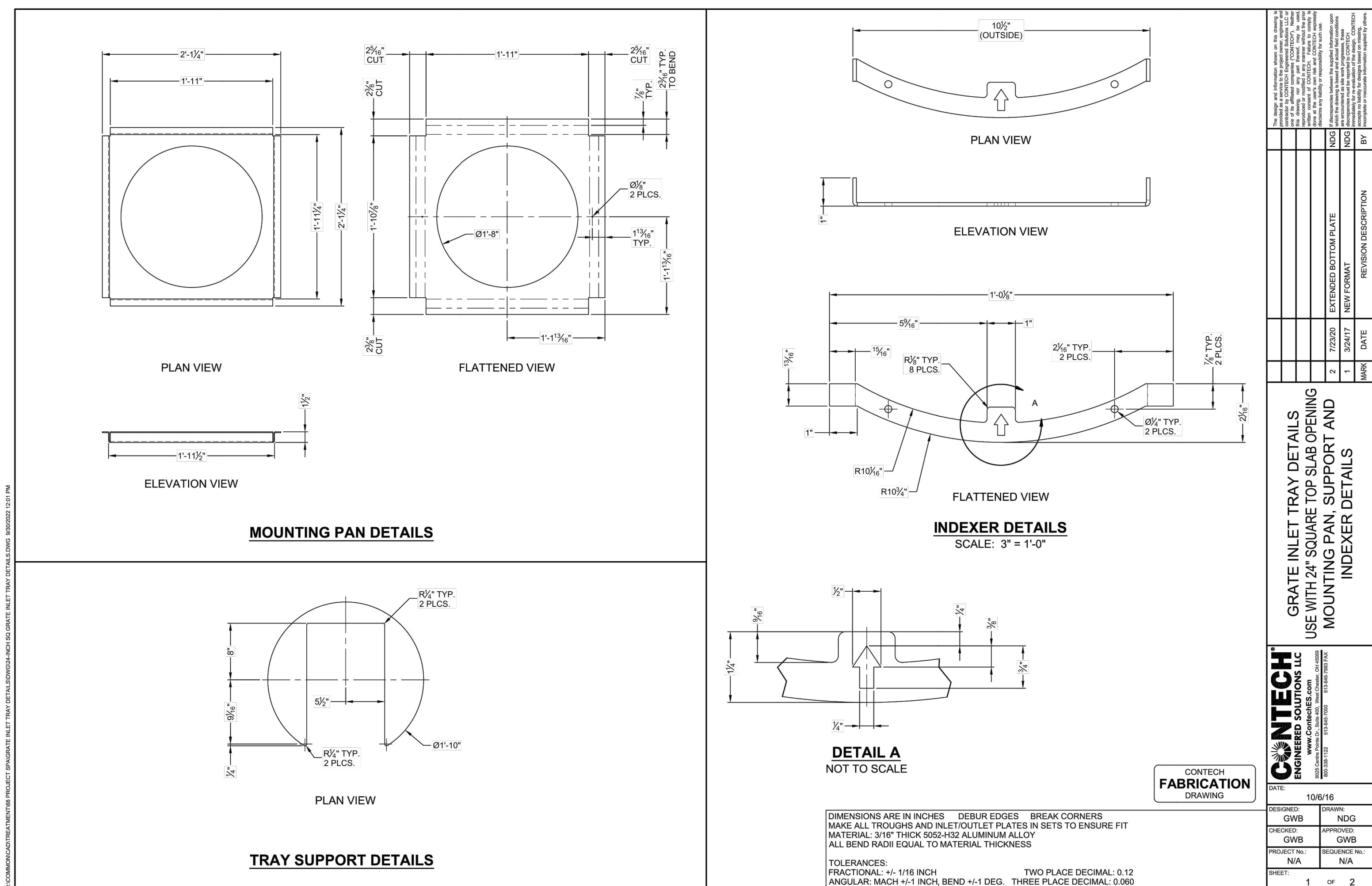
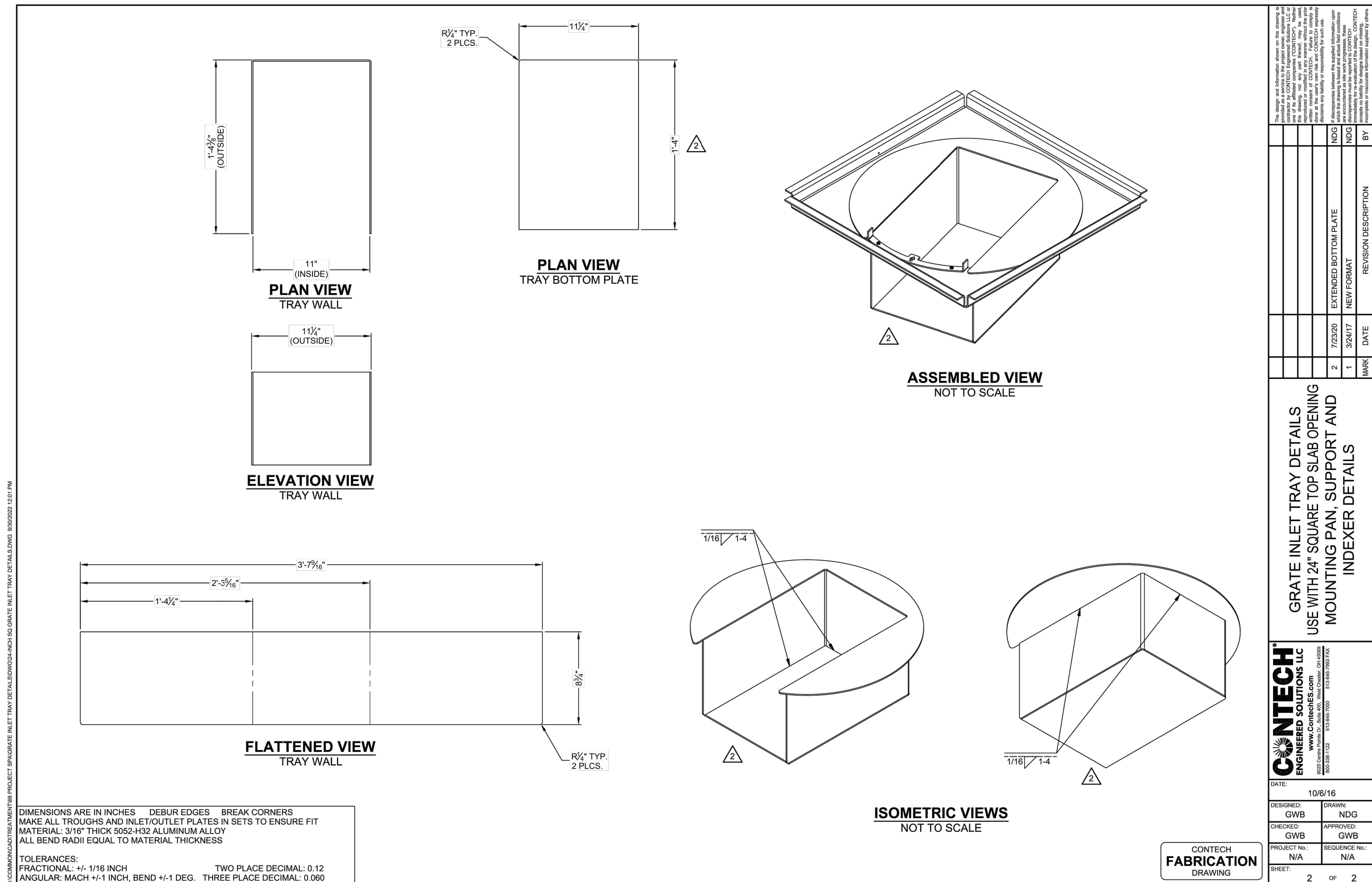
Major Components
45624010
45624050

Drawing Revision
09/01/2017 Designer: MAH
9/5/2017 Revised By: MAH

Disclaimer
Weights (lbs./kg) dimensions (inches/mm)
and drawings provided for your guidance. We
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Utility Details and Notes
Fueling Farm Development
6050 FI
Clarkston



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[illegible]

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DLZ JOB NUMBER: 2245-7545-00

UTILITY DETAILS AND NOTES

SHEET NO.

C-106A



PLANT SCHEDULE

QTY.	SYM.	COMMON NAME	BOTANICAL NAME	SIZE & COND.	COMME NTS
EVERGREEN TREES					
4	PIC	BLACK HILLS SPRUCE	PICEA GLAUCA 'DENSATA'	6' HT., B&B	17'-6" O.C.
48	THG	GREEN GIANT ARBORVITAE	THUJA 'GREEN GIANT'	6' HT., B&B	5' O.C.
DECIDUOUS TREES					
3	AML	JUNE BERRY SERVICE BERRY	AMELANCHIER LAMARCKII	7' HEIGHT	16' O.C.
1	KCT	KENTUCKY COFFEETREE	GYMNOCLADUS DIOICUS	2-1/2" CAL.	
ORNAMENTAL TREES					
1	CRV	'WINTER KING' HAWTHORN	CRATAEGUS VIRIDIS 'WINTER KING'	8' HEIGHT	TREE FORM
1	AMG	AUTUMN BRILLIANCE SERVICE BERRY	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE'	8' HEIGHT	
DECIDUOUS SHRUBS					
16	COC	CARDINAL RED TWIG DOGWOOD	CORNUS SERICEA 'CARDINAL'	#5 CONT, 24'-36" HT	6' O.C.
13	CEO	BUTTONBUSH	CEPHALANTHUS OCCIDENTALIS	24" - 36" HT	7' O.C.
7	ARV	ARROWWOOD VIBURNUM	VIBURNUM DENTATUM		

GENERAL LANDSCAPE NOTES

- ALL DISTURBED AREAS NOT COVERED BY OTHER SURFACE TREATMENT SHALL BE RESTORED WITH A MINIMUM OF 4 INCHES OF TOPSOIL, SEED (OR SOD), AND MULCH. AREAS WHERE THE SLOPE IS 3H:1V (HORIZONTAL TO VERTICAL) OR STEEPER SHALL HAVE A MULCH BLANKET INSTALLED OVER THE SEED. MULCH BLANKET SHALL BE INSTALLED PER THE MANUFACTURER'S SPECIFICATIONS. PLACE MDOT TUF - TURF URBAN FREEWAY SEED MIX AT A UNIFORM RATE OF 6 POUNDS / 1,000 SQUARE FEET.
- ALL PERENNIAL AREAS SHALL RECEIVE A MINIMUM 6" DEPTH OF PLANT MIX. PLANT MIX SHALL BE A BLEND OF $\frac{1}{3}$ TOPSOIL, $\frac{1}{3}$ SAND, $\frac{1}{3}$ PEAT.
- TREES SHALL NOT BE LOCATED IN DRAINAGE SWALES, DRAINAGE AREAS, OR UTILITY EASEMENTS. CONTACT OWNER'S REPRESENTATIVE FOR RELOCATION OF PLANTS IN QUESTIONABLE AREAS PRIOR TO INSTALLATION.
- ALL NEW TREES SHALL BE STAKED AND GUYED PER DETAILS FOR A PERIOD OF 1 YEAR (FROM ACCEPTANCE). THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING STAKES AT THE END OF 1 YEAR FROM ACCEPTANCE OF LANDSCAPE INSTALLATION BY THE OWNER'S REPRESENTATIVE. OBTAIN APPROVAL BY OWNER'S REPRESENTATIVE PRIOR TO REMOVAL.
- ALL NEW TREES IN SEED OR TURF LAWN AREAS SHALL RECEIVE 6" DIAMETER TREE RINGS CONSTRUCTED WITH 4" MINIMUM DEPTH OF SHREDDED HARDWOOD BARK MULCH.
- ALL SHRUB BEDS SHALL BE MULCHED WITH MIN. 4" DEPTH, SHREDDED BARK LANDSCAPE MULCH OVER GEOTEXTILE WEED CONTROL FABRIC.
- PRIOR TO THE PLACEMENT OF MULCH AND WEED FABRIC, A GRANULAR, PRE-EMERGENT WEED CONTROL AGENT SHALL BE ADDED TO ALL PLANTING BEDS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS, EXCEPT AROUND ORNAMENTAL GRASSES.
- THE OWNER AGREES TO SEASONAL MAINTENANCE PROGRAM AND WILL REPLACE ALL DISEASED, DEAD, OR DAMAGED PLANTS, REPLENISH MULCH, CONTROL WEEDS, FERTILIZE, AND PRUNE BEGINNING UPON COMPLETION OF CONSTRUCTION OF LANDSCAPING.
- REFER TO SHEET NO. V-101 TOPOGRAPHICAL SURVEY FOR PROPERTY DESCRIPTION AND EXISTING CONDITIONS.
- REFER TO SHEET NO. C-101 SITE LAYOUT PLAN FOR SITE IMPROVEMENTS AND GEOMETRICS.
- REFER TO SHEET NO. L-201 FOR TYPICAL PLANTING DETAILS.

MAINTENANCE NOTES

- MAINTAIN TREES, SHRUBS, PERENNIALS, AND ANNUALS BY PRUNING, CULTIVATING, WATERING, WEEDING, FERTILIZING, RESTORING PLANT SAUCERS AND TIGHTENING, REPAIRING, RESETTling STAKES AND GUY WIRE SUPPORTS AS REQUIRED TO ESTABLISH HEALTHY, VIABLE PLANTINGS. SPRAY AS REQUIRED TO KEEP TREES AND SHRUBS FREE OF INSECTS AND DISEASE. MAINTENANCE SHALL BE CONTINUED UNTIL FINAL ACCEPTANCE OF INSTALLATION BY OWNER.
- MAINTAIN LARGE BASINS AROUND PLANTS SO ENOUGH WATER MAY BE APPLIED OVER ENTIRE ROOT ZONE. USE MULCH TO MINIMIZE EVAPORATION AND WATERING FREQUENCY.
- PRUNE AS NEEDED AT THE TIME OF PLANTING AND AS NEEDED TO CORRECT DAMAGE.
- INSPECT STAKES AND GUY WIRES REGULARLY TO PREVENT GIRDLING AND RUBBING. REMOVE AND REPLACE DAMAGED STAKES AND GUY'S AS DIRECTED BY OWNER.
- MAINTAIN TREE AND SHRUB BASINS FREE OF WEEDS AND GRASSES ON A WEEKLY BASIS. SOIL CULTIVATION THAT MAY DESTROY SHALLOW ROOTS IS NOT RECOMMENDED.
- CONTROL INSECTS AND DISEASE AS NECESSARY TO PREVENT DAMAGE TO PLANTS. USE ONLY APPROVED METHODS AND MATERIALS.
- WOOD MULCH, DECORATIVE STONE, ETC. SHALL BE REPLENISHED AS NEEDED TO MAINTAIN THE ORIGINAL DESIGNATED MINIMUM DEPTH.
- WEED CONTROL MEASURES APPROPRIATE TO THE AMOUNT OF GROWTH AND SPECIES SHALL BE PROVIDED.
- HERBICIDE SHALL BE APPLIED BY A LICENSED APPLICATOR OR UNDER THE DIRECT SUPERVISION OF A LICENSED APPLICATOR.
- WINTERIZE PERENNIAL AND ANNUAL BED AREAS IN THE LATE FALL PRIOR TO SNOW COVERAGE.
- APPLY A PRE-EMERGENT WHEN PLANTING ANNUALS TO INHIBIT WEED GROWTH. APPLY PER MANUFACTURER RECOMMENDATIONS.
- CONTROL GROUND COVER AND PERENNIALS THROUGH MAINTENANCE POLICIES SO PLANTS REMAIN IN ORIGINAL DESIGNATED LOCATIONS.
- IT IS RECOMMENDED TO WORK WITH A PROFESSIONAL LANDSCAPE COMPANY TO ESTABLISH AND EXECUTE A MAINTENANCE PROGRAM.

LANDSCAPE IMPROVEMENT KEY

- L LAWN RESTORATION, REFER TO GENERAL LANDSCAPE NOTES 1.
- EVERGREEN TREE PLANTING DETAIL 1 L-201
- TREE INSTALLATION DETAIL 2 L-201
- TREE STAKING AND GUYING DETAIL 3 L-201
- SHRUB INSTALLATION DETAIL 6 L-201

LEGEND:

- 1089 EXISTING CONTOUR
- 1089 PROPOSED CONTOUR
- LAWN
- PROJECT LIMITS

WARNING
 UTILITY LOCATIONS ARE NOT CONFIRMED. THOSE SHOWN WERE OBTAINED FROM UTILITY OWNERS OR PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR PRIOR TO BEGINNING WORK. THE CONTRACTOR SHALL NOTIFY UTILITY OWNERS TO HAVE WORK AREA STAKED PRIOR TO BEGINNING WORK. CONTRACTOR SHALL HAVE RELOCATED AS NOTED IN THE SPECIFICATIONS. ALL UTILITIES THAT MIGHT INTERFERE WITH CONSTRUCTION.

Independence Township
 6050 Flemings Lake Road
 Clarkston, MI 48346

Landscape Plan
 Fueling Farm Development

6050 Flemings Lake Road
 Clarkston, Michigan 48346



0 30' 60'
 SCALE

SLU REVIEW	03/03/23
SLU REVISION	04/10/23
BUILDING PERMIT REVIEW	04/17/23
ISSUED FOR BID	06/02/23
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DRAWN BY: RMS
 DESIGN BY: AMB
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DLZ JOB NUMBER: 2245-7545-00

LANDSCAPE PLAN

SHEET NO.

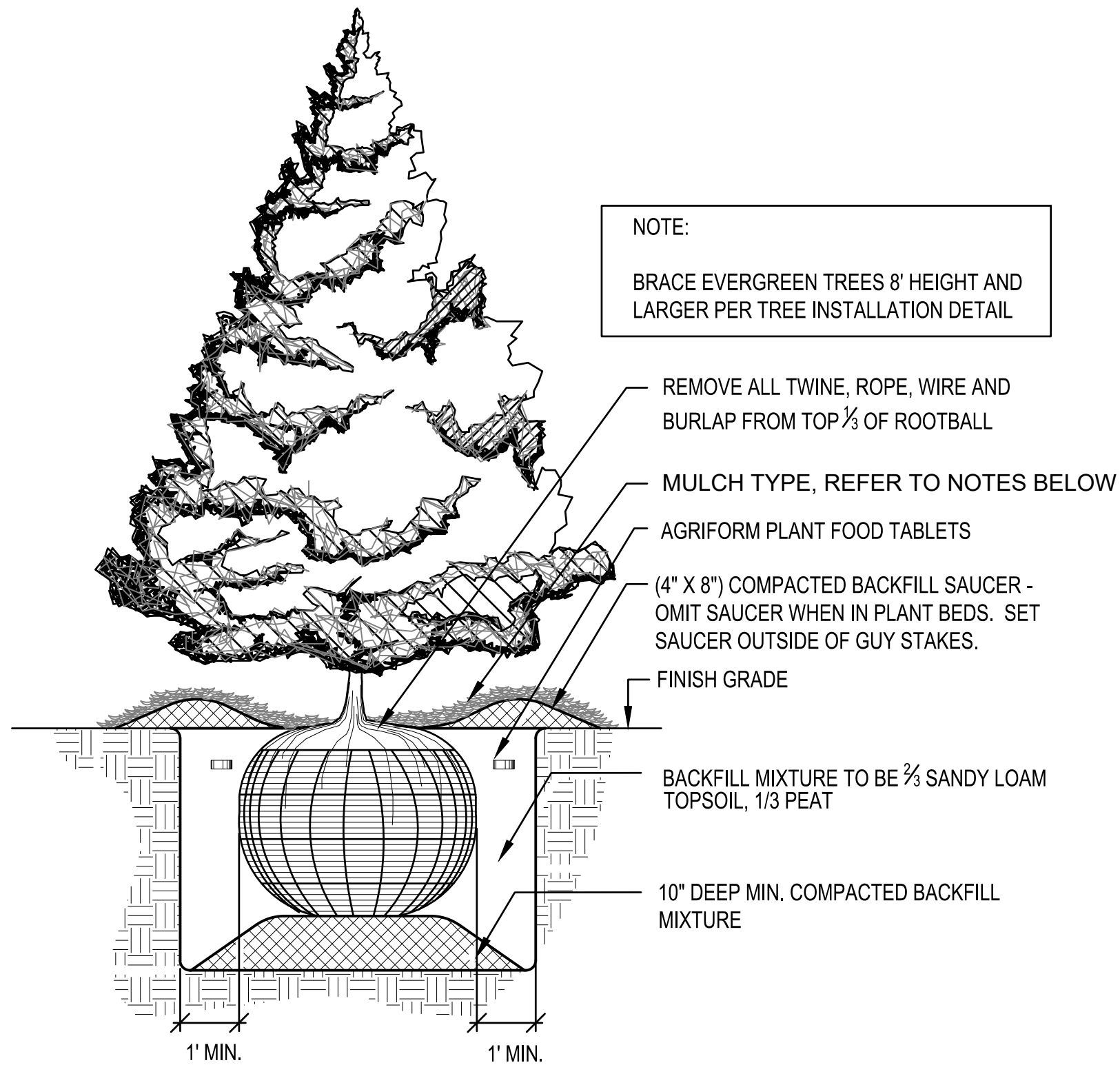
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YADONG DONG
SAVE DATE: 6/7/2023 3:38:47 PM
PLOT DATE: 6/7/2023 3:47:11 PM



- NOTES
1. SET PLANTS SO THAT TOP OF ROOT BALL IS APPROXIMATELY 2" ABOVE FINISH GRADE.
 2. PLANTS SHALL BE SOAKED IMMEDIATELY FOLLOWING PLANTING.
 3. ALL TREE SAUCERS SHALL BE MULCHED WITH 4" SHREDDED HARDWOOD BARK MULCH OVER LANDSCAPE FABRIC (MIRAFI 140N OR EQUAL).

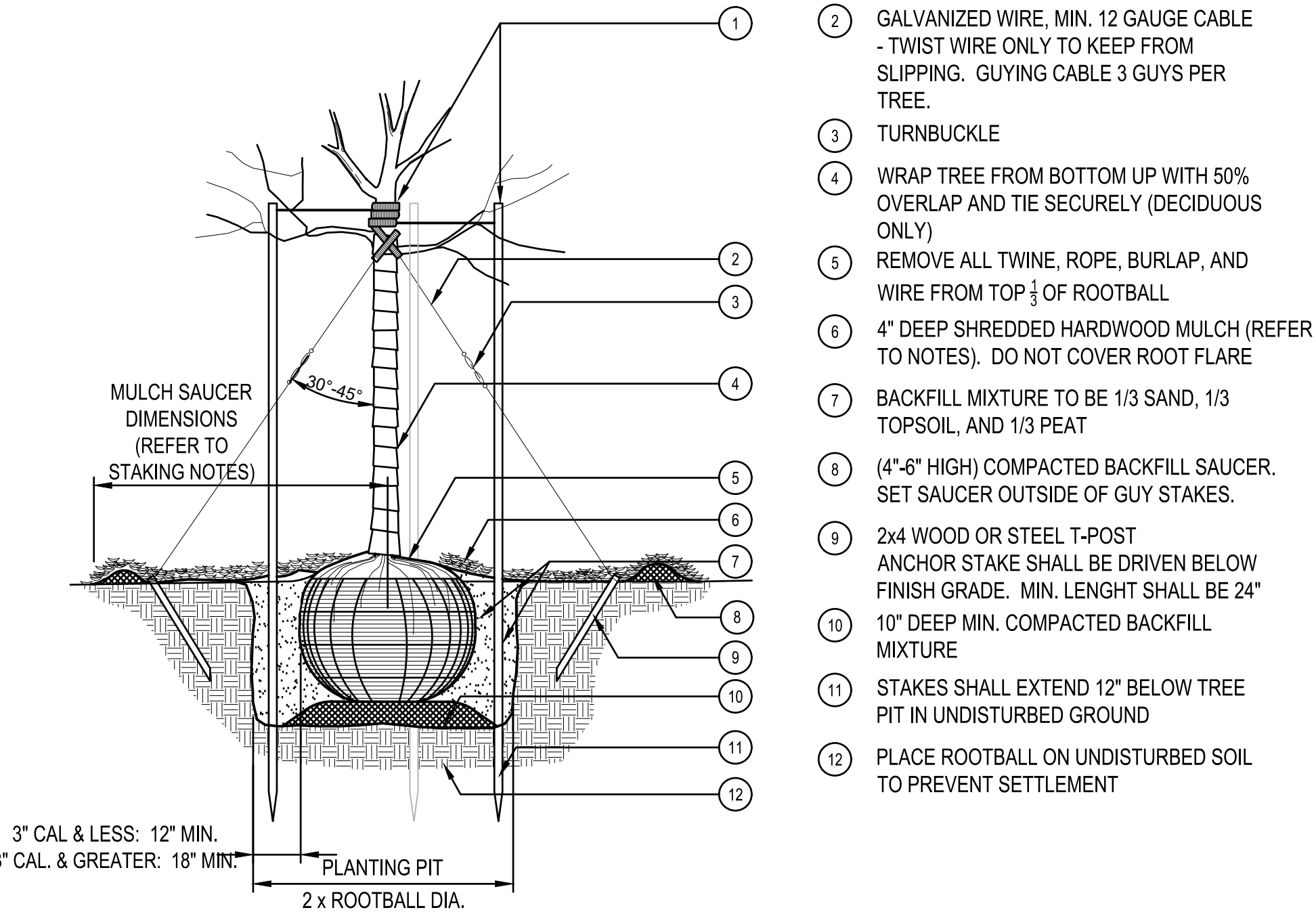
EVERGREEN TREE PLANTING DETAIL

SCALE: NTS

1
L-201

STAKING NOTES		
SIZE	STAKING/GUYING	MULCH SAUCER DIMENSION (NON-BED AREAS)
• 2" CAL. & SMALLER	• DOUBLE STAKE	• 4' DIA.
• 2-1/2" - 3-1/2" CAL.	• TRIPLE STAKE	• 5' DIA.
• 4" CAL. - 6" CAL.	• TRIPLE GUY	• MIN. 8' DIA. - EXTEND OUTSIDE DIAMETER TO INCLUDE GUYING STAKES

- GENERAL NOTES:
1. STAKE TREES PER STAKING NOTES THEN REMOVE AT END OF FIRST GROWING SEASON.
 2. ALL TREE SAUCERS SHALL BE MULCHED WITH 4" SHREDDED HARDWOOD BARK MULCH OVER LANDSCAPE FABRIC (MIRAFI 140N OR EQUAL).

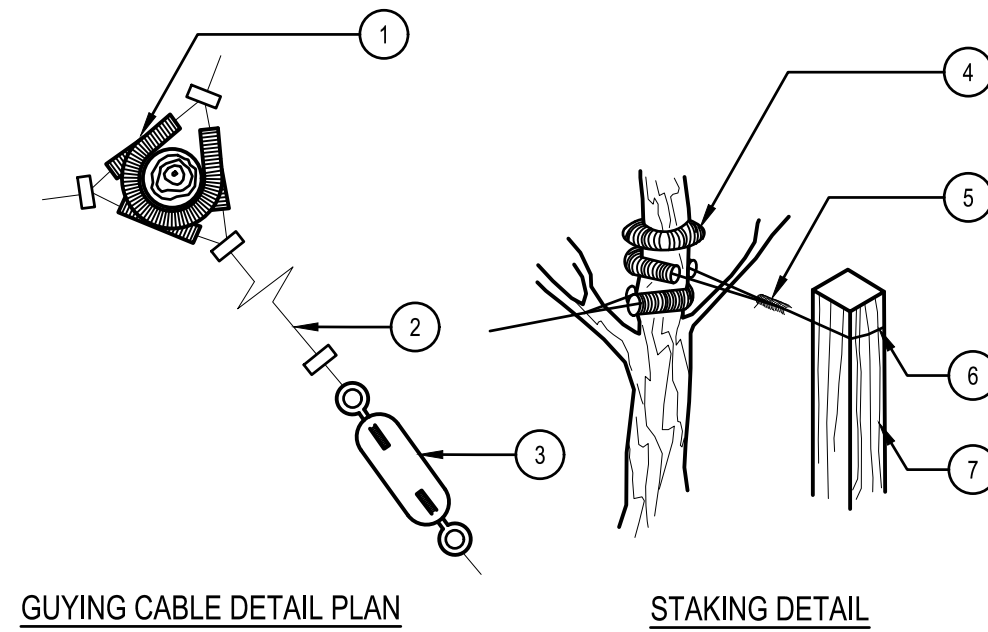
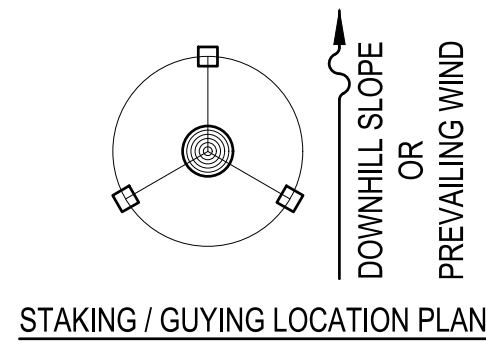


- 1 TOP OF STAKES AND GUYS SHALL BE SET ABOVE FIRST BRANCHES. SET STAKES VERTICAL AND AT SAME HEIGHT
- 2 GALVANIZED WIRE, MIN. 12 GAUGE CABLE - TWIST WIRE ONLY TO KEEP FROM SLIPPING. GUYING CABLE 3 GUYS PER TREE.
- 3 TURNBUCKLE
- 4 WRAP TREE FROM BOTTOM UP WITH 50% OVERLAP AND TIE SECURELY (DECIDUOUS ONLY)
- 5 REMOVE ALL TWINE, ROPE, BURLAP, AND WIRE FROM TOP 2/3 OF ROOTBALL
- 6 4" DEEP SHREDDED HARDWOOD MULCH (REFER TO NOTES). DO NOT COVER ROOT FLARE
- 7 BACKFILL MIXTURE TO BE 1/3 SAND, 1/3 TOPSOIL, AND 1/3 PEAT
- 8 (4"-6" HIGH) COMPACTED BACKFILL SAUCER. SET SAUCER OUTSIDE OF GUY STAKES.
- 9 2x4 WOOD OR STEEL T-POST ANCHOR STAKE SHALL BE DRIVEN BELOW FINISH GRADE. MIN. LENGTH SHALL BE 24"
- 10 10" DEEP MIN. COMPACTED BACKFILL MIXTURE
- 11 STAKES SHALL EXTEND 12" BELOW TREE PIT IN UNDISTURBED GROUND
- 12 PLACE ROOTBALL ON UNDISTURBED SOIL TO PREVENT SETTLEMENT

TREE INSTALLATION DETAIL

SCALE: N.T.S.

2
L-201



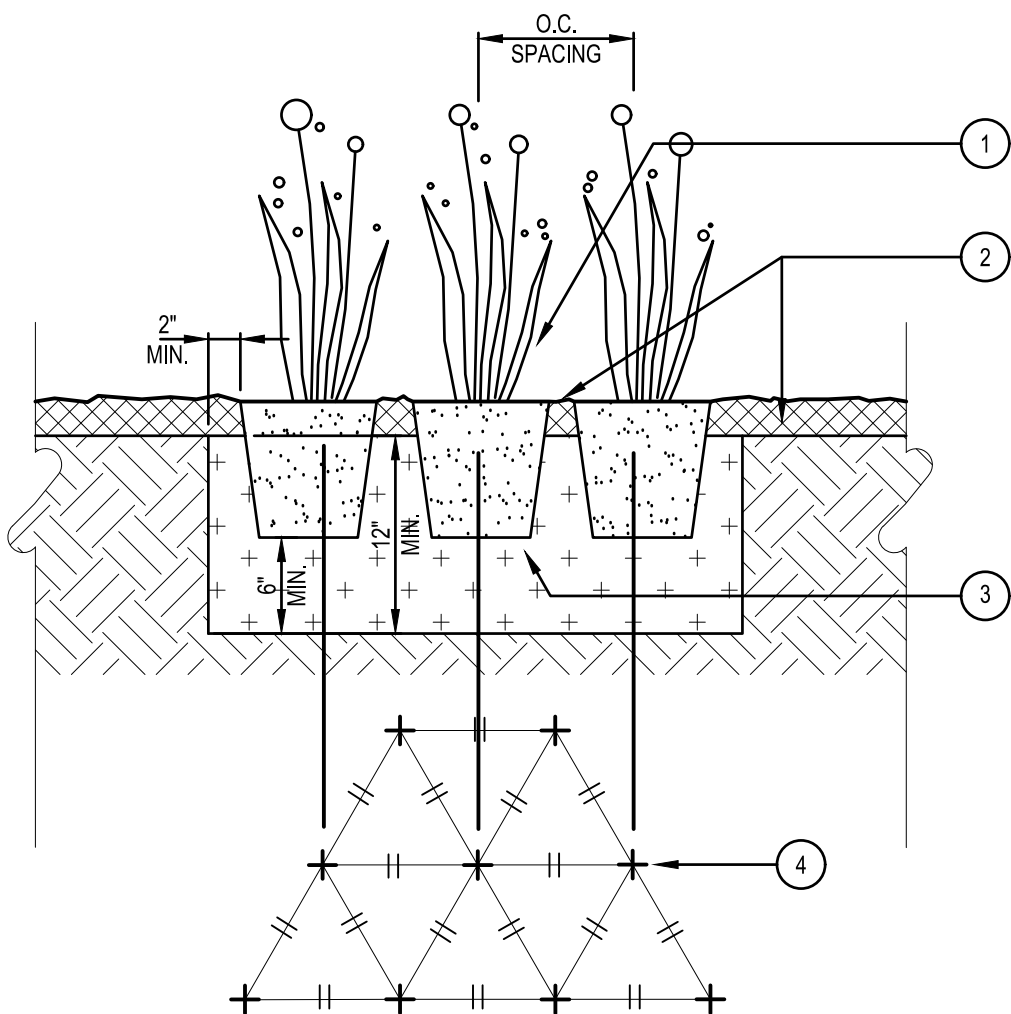
- NOTE:
1. ORIENT STAKING/GUYING TO PREVAILING WINDS AND SLOPES, EXCEPT ON SLOPES GREATER THAN 3:1 ORIENT TO SLOPE
 2. USE SAME STAKING/GUYING ORIENTATION FOR ALL PLANTS WITHIN EACH GROUPING OR AREA.

- 1 1/2" DIA. RUBBER HOSE CHAFING GUARD 2-PLY, COLOR: BLACK PREFERRED
- 2 GUYING CABLE SECURED WITH CLAMPS
- 3 TURNBUCKLE WITH 6" OPENING
- 4 3/4" DIA. RUBBER HOSE CHAFING GUARD 2-PLY, COLOR: BLACK PREFERRED
- 4 3/4" DIA. RUBBER HOSE CHAFING GUARD 2-PLY, COLOR: BLACK PREFERRED
- 5 DOUBLE STRAND #12 GAUGE GALV. WIRE, NEATLY TWISTED
- 6 NOTCH POSTS TO SET STAKE WIRE
- 6 STAKES AS SPECIFIED, 3 PER TREE

TREE STAKING AND GUYING DETAIL

SCALE: N.T.S.

3
L-201



- 1 PERENNIAL PLANT, ORNAMENTAL GRASS, OR GROUNDCOVER
- 2 PLACE 3" DEPTH OF SHREDDED HARWOOD MULCH OVER LANDSCAPE FABRIC, MIRAFI 140N OR EQUAL. REFER TO PLANT SCHEDULE FOR STONE SIZE & TYPE
- 3 EXCAVATE EXISTING SOIL 12" DEEP IN PLANTING BED. BACKFILL PLANTING MIXTURE SHALL BE 1/3 SAND, 1/3 TOPSOIL, AND 1/3 PEAT
- 4 CENTER OF PLANT

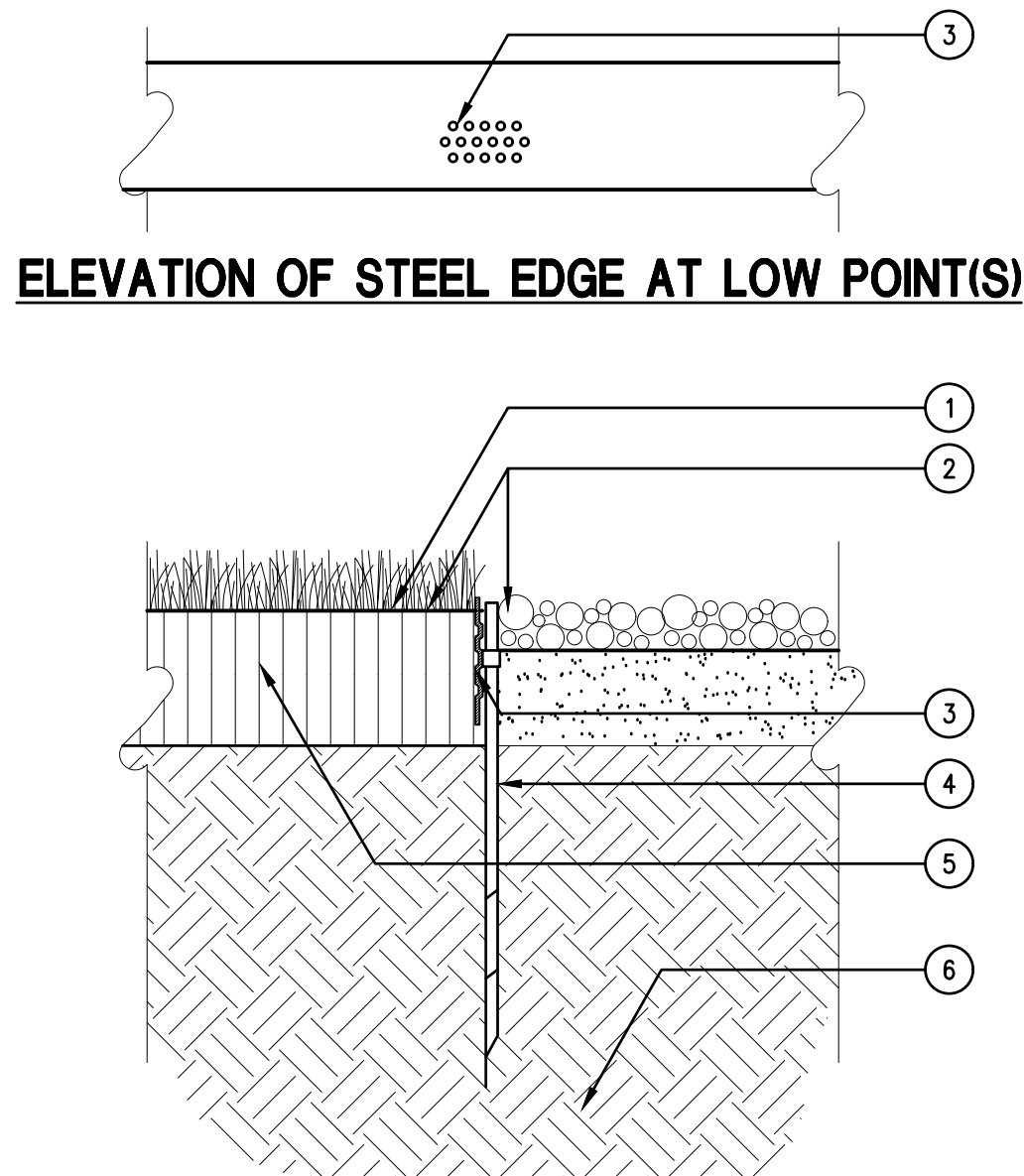
- GENERAL NOTE:
1. WHEN PLANTED ON A CURVE ORIENT ROWS TO FOLLOW THE LONG AXIS OF AREAS WHERE PLANTS ARE MASSED.
 2. CONTRACTOR SHALL FIELD VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION.

PERENNIAL PLANT INSTALLATION

SCALE: 1"=1'-0"

[NOT PART OF THIS CONTRACT]

4
L-201



- 1 TURF THATCH LAYER OR PLANT MATERIAL, REFER TO PLANS
- 2 FINISH GRADE - TOP OF TURF THATCH LAYER AND TOP OF MULCH SHALL BE FLUSH WITH TOP OF EDGER
- 3 STEEL EDGING, 3/8" THICK. DRILL 16 EACH - 3/8" DIA. HOLES AT 1" ON CENTER MIN. AT ALL LOW POINTS OR POORLY DRAINING AREAS TO ENSURE ADEQUATE DRAINAGE
- 4 INSTALL AND STAKE STEEL EDGING AS REQUIRED BY THE MANUFACTURER.
- 5 AMENDED SOIL PER SPECIFICATIONS
- 6 EX. COMPACTED SUBGRADE

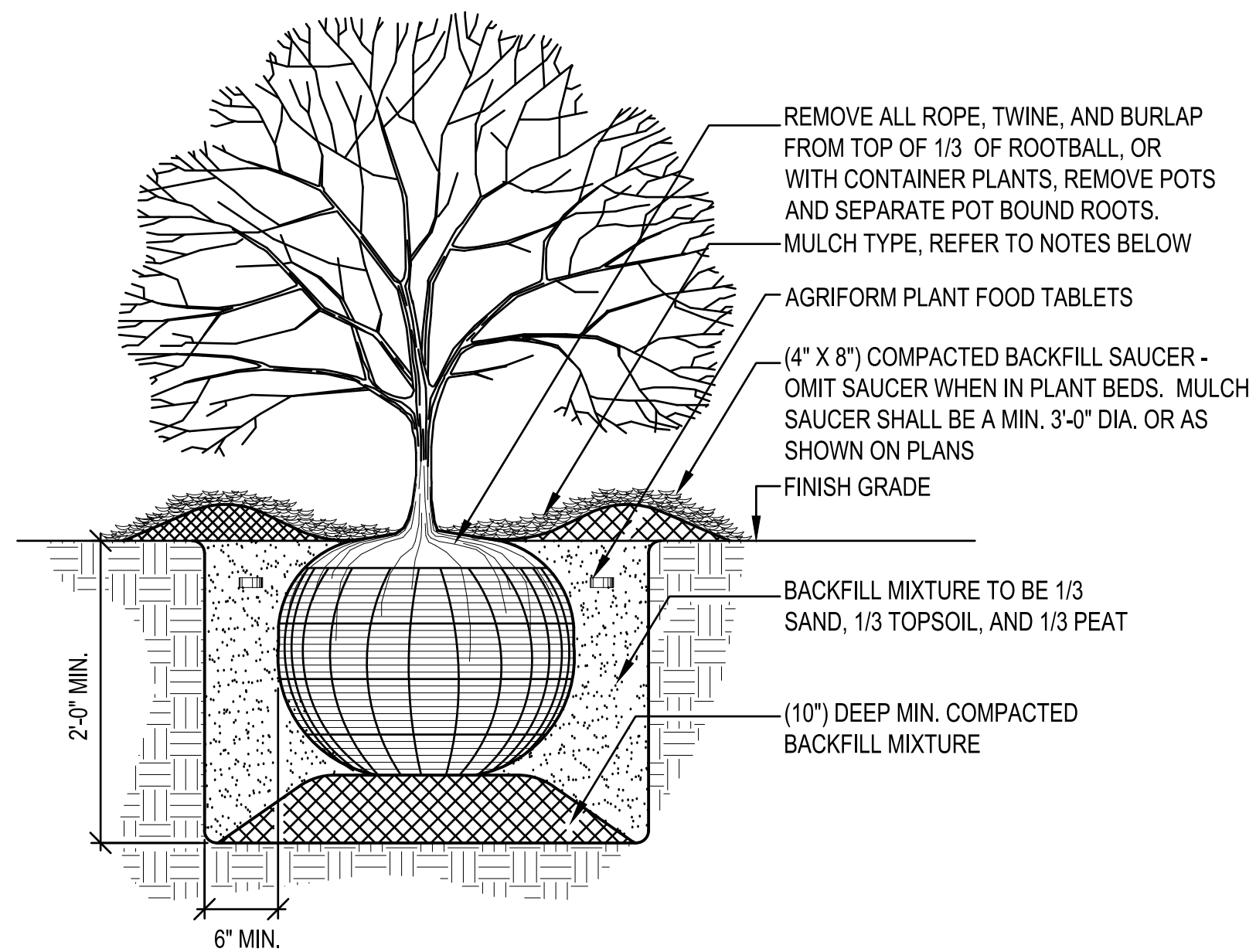
- GENERAL NOTE:
1. THERE SHALL BE NO EXPOSED SHARP/JAGGED EDGES.
 2. STEEL EDGING MANUFACTURED BY: JD RUSSELL CO. (800) 888-9708
PRODUCT: DURAEDGE, 3/8" x 4"
FINISH - BLACK POWDERCOAT;
FINAL COLOR SELECTION DETERMINED BY OWNER'S PROJECT REPRESENTATIVE

STEEL EDGE

SCALE: 1"=1'-0"

[NOT PART OF THIS CONTRACT]

5
L-201



- NOTES
1. PLANTS SHALL BE SOAKED IMMEDIATELY FOLLOWING PLANTING.
 2. ALL SHRUB SAUCERS SHALL BE MULCHED WITH 4" OF SHREDDED HARDWOOD MULCH OVER LANDSCAPE FABRIC (MIRAFI 140N OR EQUAL).

SHRUB INSTALLATION DETAIL

SCALE: N.T.S.

6
L-201

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Typical Planting Details
Fueling Farm Development
6050 Flemings Lake Road
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SLU REVIEW	03/03/23
SLU REVISION	04/10/23
BUILDING PERMIT REVIEW	04/17/23
ISSUED FOR BID	06/02/23
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DRAWN BY: RMS
DESIGN BY: RMS
CHECKED BY: -

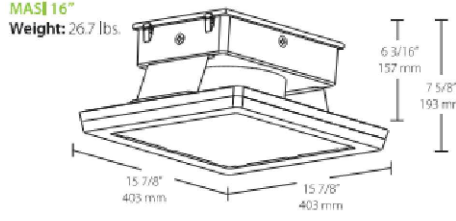
DLZ JOB NUMBER: 2245-7545-00

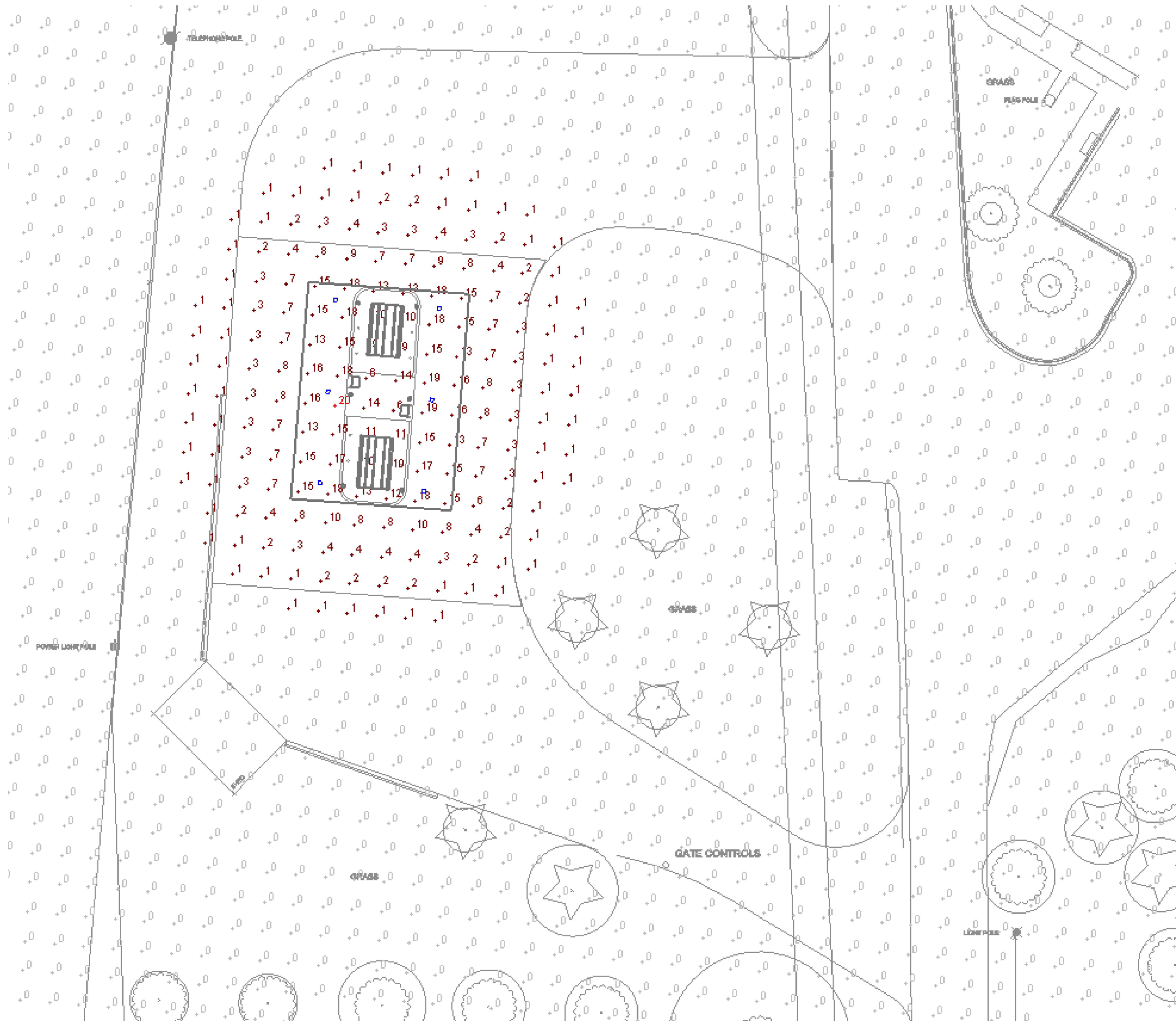
TYPICAL PLANTING DETAILS
SHEET NO.
L-201

SITE LIGHTING DATA

ILLUMINATION LEVELS:	ORDINANCE REQUIREMENT	DESIGNED / CALCULATED
MEASURED AT GRADE ON PROPERTY (MAXIMUM)	20 FT-CANDLES	20 FT-CANDLE
MEASURED AT GRADE ALONG PROPERTY LINES (MAXIMUM)	1 FT-CANDLE	0 FT-CANDLE
LIGHT COLOR STANDARD (MAXIMUM CCT)	3500 KELVIN	3000 KELVIN
MOUNTING HEIGHT (MAXIMUM)	25 FEET	16 FEET

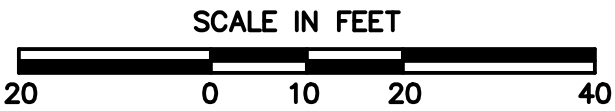
LIGHTING FIXTURE SCHEDULE

TYPE A:	DESCRIPTION:	
	HAZARDOUS AREA RATED, RECESSED CANOPY MOUNT, 16"X16" LED LIGHTING FIXTURE, 1.5" PROFILE, CAST ALUMINUM HOUSING, TEMPERED GLASS FLAT LENS, 127 LPW, 71 CRI	
	QUANTITY:	6
	MOUNTING HEIGHT:	16 FT (BELOW CANOPY)
	LIGHT COLOR STANDARD:	3000 KELVIN
	INITIAL DELIVERED LUMENS (EA):	14,447 LM
	WATTS (EACH / TOTAL):	114 W / 684 W
	MANUFACTURER:	RAB LIGHTING
	MODEL:	MASH-16-100-Y-W/D10



(POINT BY POINT CALCULATIONS IN FOOT-CANDLES AT GRADE, 8FT X 8FT POINT SPACING)

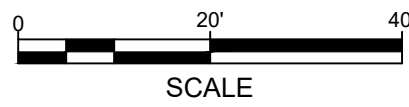
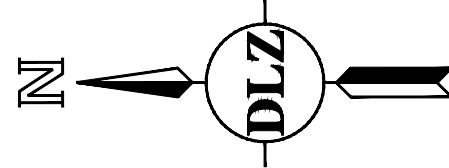
1 LIGHTING PHOTOMETRIC PLAN
E-101 SCALE: 1" = 20'



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Independence Township
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Photometric Plan
Fueling Farm Development
6050 Flemings Lake Road
Clarkston, Michigan 48346



SLU REVIEW	01/18/23
REVISION 1	01/24/23
LARA REVIEW	03/02/23
SLU REVISION	04/10/23
BUILDING PERMIT REVIEW	04/17/23
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PHOTOMETRIC PLAN

SHEET NO.

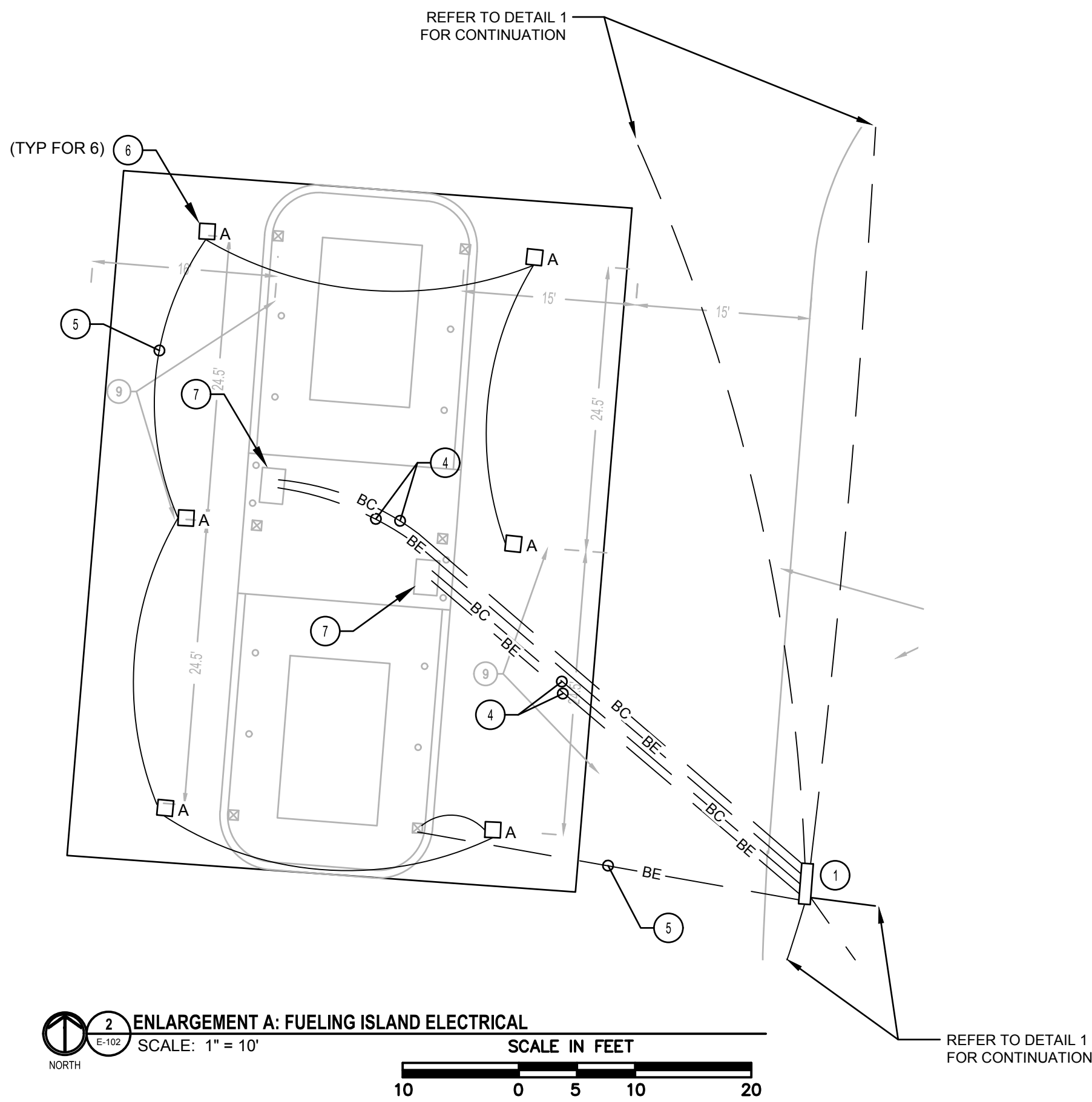
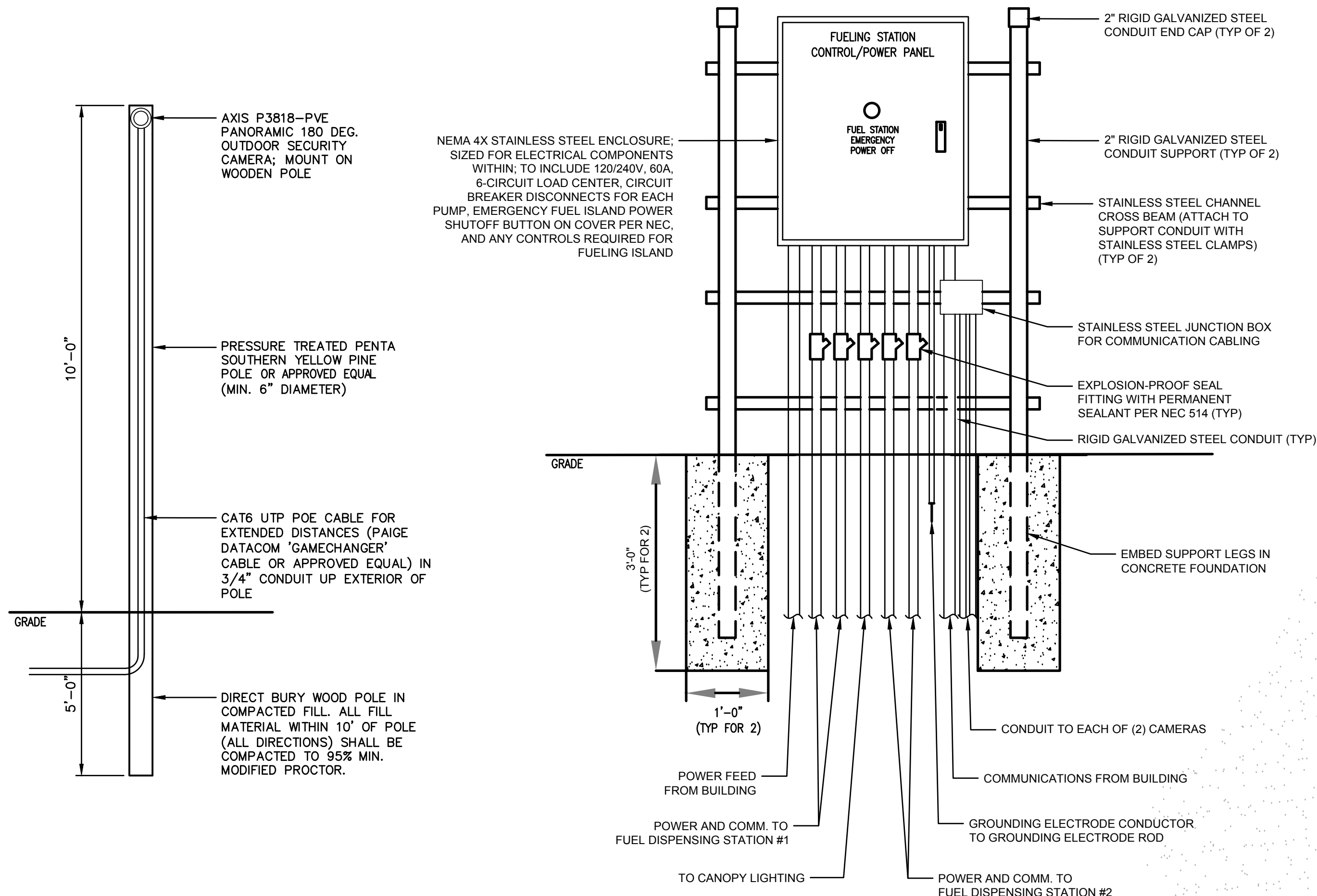
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PLOT DATE: 6/7/2023 4:14:05 PM



1 SITE ELECTRICAL PLAN
SCALE: 1" = 30'

ELECTRICAL LEGEND:

- BC BURIED COMMUNICATIONS CONDUIT/CABLING
- BE BURIED ELECTRICAL CONDUIT/CABLING
- ELECTRICAL ENCLOSURE AS NOTED

GENERAL NOTES:

- ALL WORK SHALL BE IN CONFORMANCE WITH THE NATIONAL ELECTRIC CODE, LATEST EDITION ADOPTED BY THE STATE OF MICHIGAN, WITH MICHIGAN AMENDMENTS, LOCAL CODES, AND THE AUTHORITY HAVING JURISDICTION (AHJ).
- WORK SHALL COMPLY WITH NEC ARTICLE 514 FOR FUEL DISPENSING STATIONS, INCLUDING PERMANENT SEAL-OFF FITTINGS FOR ALL CONDUITS LEAVING CLASSIFIED AREAS, EMERGENCY DISCONNECT SWITCH, WIRING METHODS, ETC.
- UNDERGROUND ELECTRIC SHALL BE PVC SCHEDULE 40 BURIED AT A MINIMUM OF 40" BELOW GRADE. FOR LOCATIONS UNDER PAVED TRAFFICWAYS, USE PVC SCHEDULE 80. STUB-UPS THROUGH CONCRETE AND ABOVE-GRADE CONDUIT EXPOSED TO PHYSICAL DAMAGE SHALL BE RIGID GALVANIZED STEEL CONDUIT.
- DRAWINGS ARE DIAGRAMMATIC. LOCATIONS SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
- CONDUIT ROUTES SHOWN ARE FOR GENERAL GUIDANCE. COORDINATE AND FIELD VERIFY EXACT CONDUIT ROUTING WITH OTHER TRADES AND EXISTING UNDERGROUND UTILITIES.
- EACH SINGLE PHASE BRANCH CIRCUIT SHALL HAVE A DEDICATED NEUTRAL BACK TO THE PANELBOARD. EACH CONDUIT SHALL HAVE AN EQUIPMENT GROUNDING CONDUCTOR.
- ALL AREAS DISTURBED AND NOT BUILT ON, PAVED OR OTHERWISE COVERED BY NEW CONSTRUCTION, SHALL BE REPAIRED AND SEEDED TO MATCH ADJACENT AREAS.
- THE WORK 'PROVIDE' IS TO BE DEFINED AS 'FURNISH AND INSTALL'.
- REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

KEYED NOTES:

- FUELING STATION CONTROL/POWER PANEL (REFER TO DETAIL 3 THIS DRAWING). ENCLOSURE SHALL INCLUDE LOAD CENTER PANELBOARD, PUMP DISCONNECTS, CONVENIENCE RECEPTACLE ON DEDICATED CIRCUIT, PHOTOCELL FOR LIGHTING CIRCUIT, CONTROL AND FUELING STATION EQUIPMENT. MOUNT FUELING STATION EMERGENCY POWER DISCONNECT BUTTON ON FRONT COVER, BUTTION SHALL DISCONNECT ALL POWER AND COMMUNICATIONS CONDUCTORS AND CABLES TO FUELING STATION. SIZE AS REQUIRED FOR COMPONENTS AS INDICATED AND REQUIRED BY THE NEC.
- PROVIDE 1" CONDUIT WITH 60A FEEDER CONDUCTORS TO LOAD CENTER PANELBOARD FOR NEW FUEL STATION. EXTEND CIRCUIT FROM CUSTOMER POWER SOURCE WITHIN EXISTING BUILDING. FIELD DETERMINE POWER SOURCE WITH OWNER.
- PROVIDE 2" CONDUIT WITH FUELING STATION COMMUNICATIONS CABLES TO NEW FUEL STATION CONTROL/POWER PANEL. TIE CONDUIT INTO EXISTING OWNER'S FIBER OPTIC CONDUIT. INSTALL CABLEING BACK TO OWNER NETWORK IN EXISTING BUILDING. FIELD DETERMINE EXACT CABLE TERMINATION LOCATION WITH OWNER.
- PROVIDE MINIMUM 3/4" CONDUIT FOR POWER AND COMMUNICATIONS CABLEING TO EACH FUELING PUMP. PROVIDE CABLEING AS REQUIRED FOR EACH COMPONENT.
- PROVIDE 3/4" CONDUIT WITH LIGHTING CIRCUIT CONDUCTORS TO LIGHT FIXTURES IN FUELING STATION CANOPY. ROUTE CONDUIT UP INSIDE CANOPY SUPPORT COLUMN.
- PROVIDE LIGHTING FIXTURE MOUNTED IN CANOPY; REFER TO DRAWING E-101 FOR FIXTURE TYPE AND MOUNTING DETAILS. CONNECT TO CONTROLLED LIGHTING CIRCUIT FROM CONTROL PANEL 'CP1' WITH MINIMUM (2)#12 AND #12 GROUND.
- FUELING STATION PUMP PROVIDED WITH FUELING STATION. CONNECT TO DEDICATED PUMP POWER CIRCUIT AND COMMUNICATIONS FROM CONTROL PANEL 'CP1'.
- PROVIDE (2) CAT6 CABLES RATED FOR EXTENDED POE DISTANCES (LIKE PAIGE DATACOM 'GAMECHANGER' CABLE OR APPROVED EQUAL). INSTALL CABLES IN NEW 2" CONDUIT AS INDICATED. EXTEND CABLES TO EACH OF (2) CAMERAS AS INDICATED.
- PROVIDE 3/4" CONDUIT WITH CAT6 EXTENDED DISTANCE POE CABLE TO NEW CAMERA POLE.
- PROVIDE NEW CAMERA ON WOODEN POLE; REFER TO DETAIL 4 FOR ADDITIONAL INFORMATION AND REQUIREMENTS. VERIFY EXACT LOCATION WITH OWNER PRIOR TO CONSTRUCTION.

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Site Electrical Plan
Fueling Farm Development
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0 30' 60'
SCALE

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DESIGN BY: MSK
CHECKED BY: -

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SITE ELECTRICAL PLAN

SHEET NO.

E-102