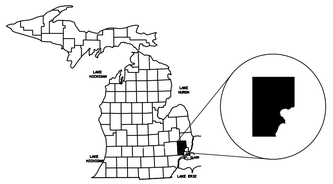
MACOMB COUNTY DEPARTMENT OF ROADS

MOUNT CLEMENS, MICHIGAN

PLAN AND DETAIL OF PROPOSED

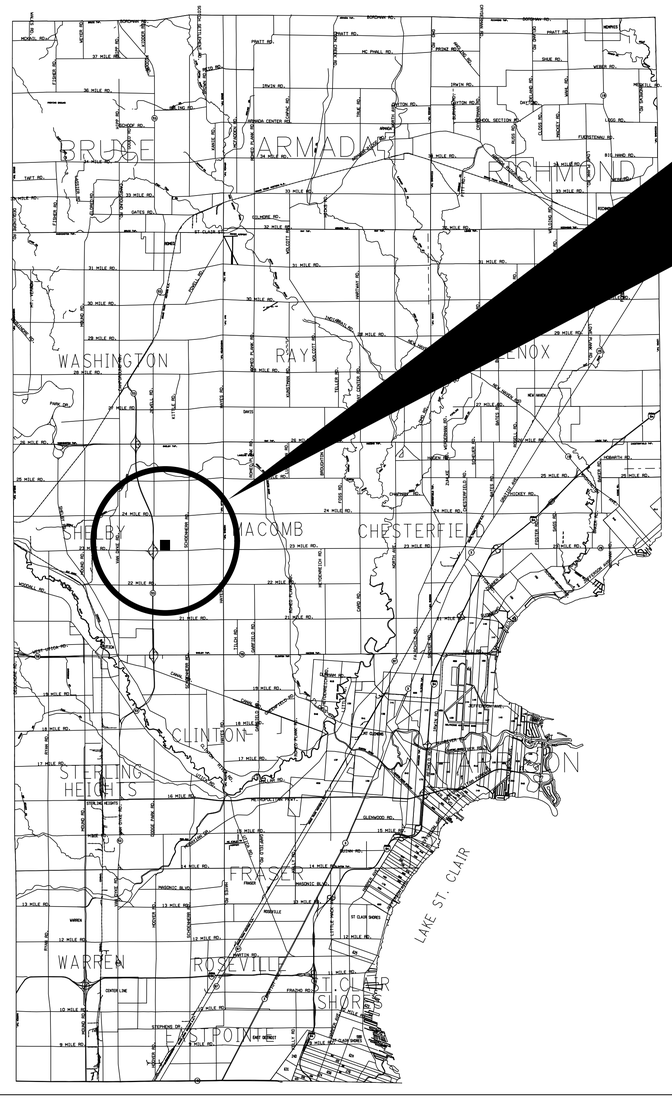
SHELBY TOWNSHIP SERVICE CENTER (SALT BARN PROJECT)

3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG 1-800-482-7171
(TOLL FREE)



PROJECT NUMBERS

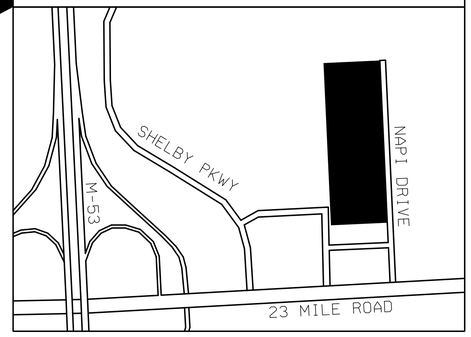
MCDR WO No.: 9048

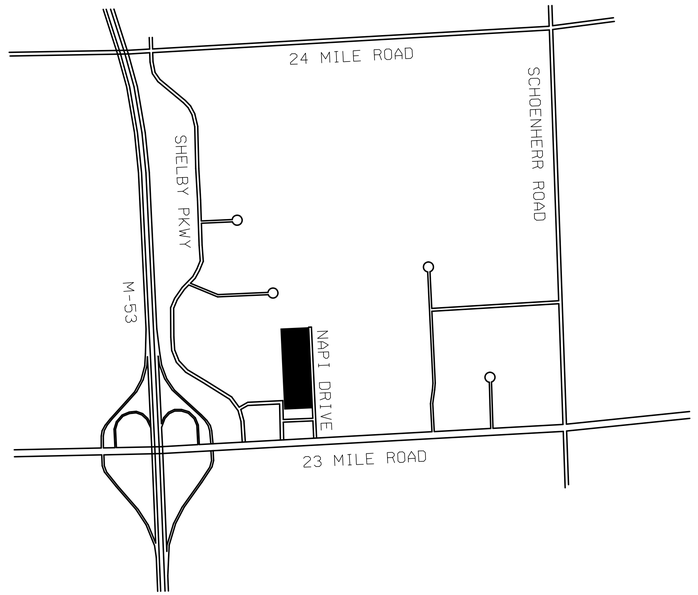


PROJECT LOCATION

MACOMB COUNTY DEPARTMENT OF ROADS
SHELBY TOWNSHIP SERVICE CENTER SALT BARN

SHELBY TOWNSHIP
T.03N., R.12E., SECTION 14





SHEET INDEX

MACOMB COUNTY DEPARTMENT OF ROADS

BRYAN E. SANTO, P.E. - DIRECTOR OF ROADS

SCOTT C. WANAGAT, P.E. - COUNTY HIGHWAY ENGINEER

CONTRACT FOR:
SALT BARN CONSTRUCTION AND ASSOCIATED SITE WORK.

SITE PLAN

STATE OF MICHIGAN
ADAM J. NEWTON
ENGINEER
No. 6201063338
LICENSED PROFESSIONAL ENGINEER

REGISTERED ENGINEER ADAM J. NEWTON, P.E. *DATE*

MACOMB COUNTY, MICHIGAN

MARK A. HACKEL - COUNTY EXECUTIVE

MACOMB COUNTY DEPARTMENT OF ROADS SHELBY SERVICE CENTER

PROPOSED SALT STORAGE BUILDING TITLE SHEET

STRUCTURE NO.	JOB NO.	CONT. SEC.	MCDR WORK ORDER	SCALE	DATE
NA	NA	NA	9048	No Scale	05/07/2025

REVISED BY: $REVBY$ DATE: $REVDATE$

CHECKED BY: $CHKBY$ DATE: $CHDATE$

DESIGNED BY: $DESBY$

MACOMB COUNTY
DEPARTMENT OF ROADS

SHEET NO.
1

OPERATIONAL NOTE: SALT CONTAINMENT METHODS TO PREVENT SALT MATERIAL FROM ENTERING THE STORM SYSTEM

THE PROPOSED SALT STORAGE STRUCTURE IS LARGE ENOUGH TO ACOMODATE INTERIOR LOADING AND UNLOADING.

THE MCDR FOLLOWS EGLE'S POLLUTION INCIDENT PREVENTION PLAN (PIPP) GUIDELINES (PART 5) FOR SALT STORAGE AND STORMWATER MANAGEMENT.

IF ANY SALT IS SPILLED ONTO THE PAVEMENT DURING OPERATIONS, IT WILL BE CLEANED UP IN A TIMELY MANNER WITH THE USE OF MECHANICAL SWEEPERS.

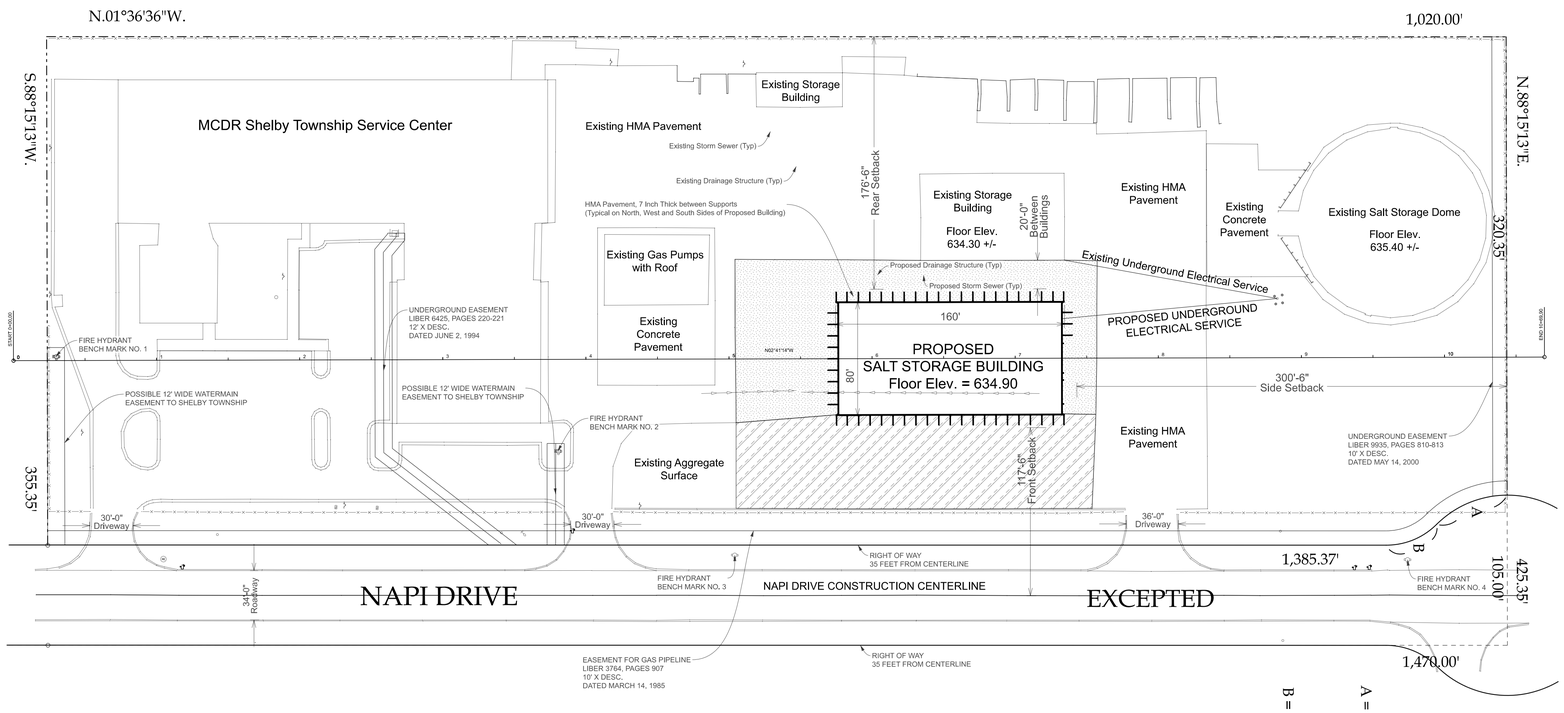
N

0 10 25 50 100

SCALE: 1" = 50'-0"

HMA PAVEMENT SURFACE:
7 INCHES: HMA
8 INCHES: 21AA LIMESTONE

AGGREGATE SURFACE:
24 INCHES: 23A LIMESTONE



A = ARC: 54.70'
RAD: 70.00'
L.CH: S.24°07'31"E.
53.32'

B = ARC: 39.18'
RAD: 50.00'
L.CH: S.24°03'37"E.
38.19'

PROPERTY DESCRIPTION
CURRENT TAX ID 23-07-14-376-009

PART OF THE SOUTHWEST ¼ OF SECTION 14, TOWN 3 NORTH, RANGE 12 EAST, SHELBY TOWNSHIP, MACOMB COUNTY, MICHIGAN, IS DESCRIBED AS:

COMMENCING AT THE SOUTH ¼ POST OF SECTION 14; THENCE SOUTH 88°15'13" WEST 662.86 FEET ALONG THE SOUTH LINE OF SECTION 14 TO THE POINT OF BEGINNING; THENCE CONTINUING SOUTH 88°15'13" WEST 70.00 FEET ALONG THE SOUTH LINE OF SECTION 14; THENCE NORTH 01°36'36" WEST 450.00 FEET; THENCE SOUTH 88°15'13" WEST 355.35 FEET; THENCE NORTH 01°36'36" WEST 1,020.00 FEET; THENCE NORTH 88°15'13" EAST 425.35 FEET; THENCE SOUTH 01°36'36" EAST 1,470.00 FEET TO A POINT ON THE SOUTH LINE OF SECTION 14, SAID POINT BEING THE POINT OF BEGINNING.

EXCEPT THAT PART DEEDED FOR THE ROAD ROW OF NAPI DRIVE (SO-CALLED) DESCRIBED AS:

COMMENCING AT THE SOUTH 1#4 POST OF SECTION 14; THENCE SOUTH 88°15'13" WEST 662.86 FEET ALONG THE SOUTH LINE OF SECTION 14 TO THE POINT OF BEGINNING; THENCE CONTINUING SOUTH 88°15'13" WEST 70.00 FEET ALONG THE SOUTH LINE OF SECTION 14; THENCE NORTH 01°36'36" WEST 1,470.00 FEET; THENCE SOUTH 88°15'13" WEST 105.00 FEET; THENCE SOUTHERLY ALONG A NONTANGENT CURVE CONCAVE TO THE EAST, HAVING A CENTRAL ANGLE OF 44°46'14", A RADIUS 70.00 FEET, AN ARC LENGTH OF 54.70 FEET AND WHOSE CHORD BEARING OF SOUTH 24°07'31" EAST 53.32 FEET; THENCE SOUTHERLY ALONG A TANGENT CURVE CONCAVE TO THE WEST, HAVING A CENTRAL ANGLE OF 44°54'02", AN ARC LENGTH OF 39.18 FEET AND WHOSE CHORD BEARS NORTH 24°03'37" WEST 38.19 FEET; THENCE SOUTH 01°36'36" EAST 1,385.37 FEET TO THE SOUTH LINE OF SECTION 14; THENCE NORTH 88°13'15" EAST 70.00 FEET ALONG THE SOUTH LINE OF SECTION 14 TO THE POINT OF BEGINNING.

DECRIPTION FROM EXISTING RECORDS.
WARRANTY DEED RECORDED IN LIBER 3781, PAGES 953-954, MACOMB COUNTY RECORDS, AND
WARRANTY DEED RECORDED IN LIBER 3910, PAGES 150-151, MACOMB COUNTY RECORDS.

ZONING

Property at 51235 Napi Drive Zoned LM: Light Manufacturing

Proeprty located west of 51235 Napi Drive Zoned C-3: Shopping Center Business
Property located north of 51235 Napi Drive Zoned HM: Heavy Manufacturing
Property located east of 51235 Napi Drive Zoned LM: Light Manufacturing
Property located south of 51235 Napi Drive Zoned LM: Light Manufacturing

DEVELOPMENT PROGRAM

The project consists of storage buildings, and operational areas for the Macomb County Department of Roads.

Proposed Buidling Area: 12,800 Sq. Ft.

Site Area: 8.29 Acres

DEVELOPMENT IMPACT STATEMENT

The proposed development satisfies the following:
a. Proposed use is the same as the existing use
b. The proposed use is in compliance with ordinance standards with the exception of a height variance that is being requested for the building height
c. The proposed use is compatible with the existing environment
d. The proposed use is compatible to public services
e. The proposed use furthers public health, safety, and welfare.

NOTES

COORDINATE SYSTEM:	MICHIGAN STATE PLANE
ZONE:	MICHIGAN SOUTH
ELLIPSOID:	WGS 1984
HORIZONTAL DATUM:	NAD 83 (CORS 2011)
VERTICAL DATUM:	NAVD 88
GEOID:	MISO 2003
UNITS:	INTERNATIONAL FEET
SURVEY FIRM:	MACOMB COUNTY

PLAN ELEVATION

ELEVATIONS SHOWN ON THESE PLANS ARE BASED ON THE NAVD88 DATUM.

BENCHMARKS

BENCHMARK NO. 1
DESCRIPTION: ARROWHEAD IN TOP OF FIRE HYDRANT. HYDRANT LOCATED IN GREEN SPACE ALONG SOUTH PROPERTY LINE NEAR THE SOUTHEAST CORNER OF THE SERVCIE CENTER OFFIC SPACE.
STATION 0+29.58, OFFSET 2.74' Left
COORDINATES:
N=429729.97
E=13488800.57
ELEVATION: 636.22

BENCHMARK NO. 2
DESCRIPTION: ARROWHEAD IN TOP OF FIRE HYDRANT. HYDRANT LOCATED IN ISLAND AT NOTHEAST CORNER OF THE MAIN GARAGE FOR THE SERVICE CENTER
STATION 3+80.17, OFFSET 64.06' Right
COORDINATES:
N=430083.31
E=13488850.86
ELEVATION: 636.25

BENCHMARK NO. 3
DESCRIPTION: ARROWHEAD IN TOP OF FIRE HYDRANT. HYDRANT LOCATED IN GREEN SPACE NORTH OF THE CENTER DRIVEWAY TO THE SERVICE CENTER
STATION 5+03.72, OFFSET 137.16' Right
COORDINATES:
N=430210.15
E=13488918.19
ELEVATION: 636.30

BENCHMARK NO. 4
DESCRIPTION: ARROWHEAD IN TOP OF FIRE HYDRANT. HYDRANT LOCATED IN GREEN SPACE APPROXIMATELY 150 FEET NORTH OF THE NORTH DRIVEWAY TOTHE SERVICE CENTER
STATION 9+73.69, OFFSET 141.36' Right
COORDINATES:
N=430680.00
E=13488900.32
ELEVATION: 634.95

ALIGNMENT

ALIGNMENT POINT NO. 1:
STATION: 0+00.00
OFFSET: 0.00

COORDINATES:
N=429700.55
E=13488804.70

ALIGNMENT POINT NO. 2:
STATION: 10+69.90
OFFSET: 0.00

COORDINATES:
N=430769.28
E=13488754.54

FIRE HYDRANTS

FIRE HYDRANT NO. 1:
STATION: 0+30.0
OFFSET: 2.89' Left

FIRE HYDRANT NO. 2:
STATION: 3+80.74
OFFSET: 64.24' Right

FIRE HYDRANT NO. 3:
STATION: 5+03.72
OFFSET: 137.16' Right

FIRE HYDRANT NO. 4:
STATION: 9+73.69
OFFSET: 141.36' Right

UTILITY INFORMATION

Utility information, as shown, indicates approximate locations and type of facilities only, as disclosed to this firm by the various utility company's records, No guarantee is given or implied as to the completeness or accuracy of thereof.

Prior to construction, all location and depths of existing overhead and underground utilities (in conflict with the constructon of proposed improvements) must be verified.

During construciton, Contractor must use extreme caution when operating near overhead and/or buried utilities

MACOMB COUNTY DEPARTMENT OF ROADS SHELBY SERVICE CENTER

PROPOSED SALT STORAGE BUILDING SITE PLAN

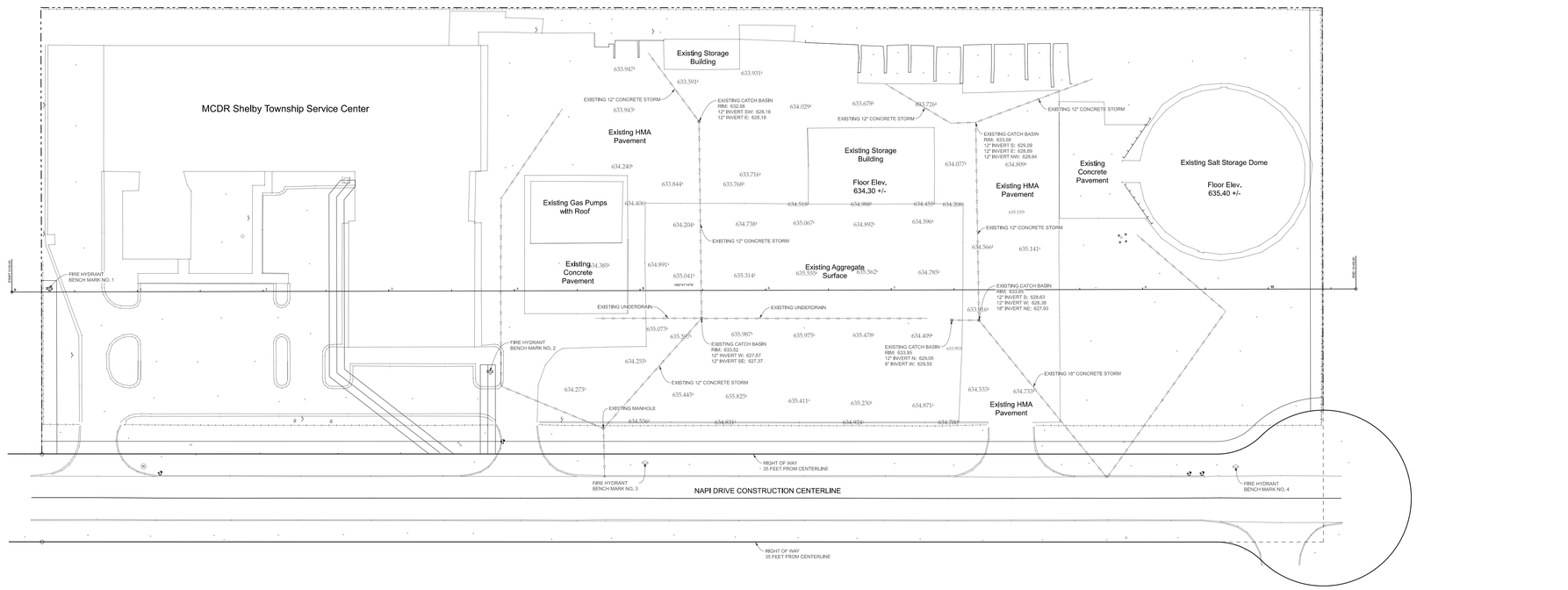
MCDOR WORK ORDER 9048 | JOB NO. NA | STRUCTURE NO. NA
CONT. SEC. NA | SCALE 1" = 50'
DATE 05/15/2025

MACOMB COUNTY DEPARTMENT OF ROADS

SHEET NO. 2

DESIGNED BY: $DESBY$ DATE: $CHDATE$ CHECKED BY: $CHKBY$ DATE: $REVDATE$ REVISED BY: $REVBY$ DATE: $REVDATE$

DATE/TIME PRINTED: $DATE$ $TIME$
PRINT SCALE: 1=1 ES
DWG FILE NAME: $FILE$



N

0 10 25 50 100

SCALE: 1" = 50'-0"

PROPERTY DESCRIPTION
CURRENT TAX ID 23-07-14-376-009

PART OF THE SOUTHWEST ¼ OF SECTION 14, TOWN 3 NORTH, RANGE 12 EAST, SHELBY TOWNSHIP, MACOMB COUNTY, MICHIGAN, IS DESCRIBED AS:

COMMENCING AT THE SOUTH ¼ POST OF SECTION 14; THENCE SOUTH 88°15'13" WEST 662.86 FEET ALONG THE SOUTH LINE OF SECTION 14 TO THE POINT OF BEGINNING; THENCE CONTINUING SOUTH 88°15'13" WEST 70.00 FEET ALONG THE SOUTH LINE OF SECTION 14; THENCE NORTH 01°36'36" WEST 450.00 FEET; THENCE SOUTH 88°15'13" WEST 355.35 FEET; THENCE NORTH 01°56'36" WEST 1,020.00 FEET; THENCE NORTH 88°15'13" EAST 425.35 FEET; THENCE SOUTH 01°36'36" EAST 1,470.00 FEET TO A POINT ON THE SOUTH LINE OF SECTION 14, SAID POINT BEING THE POINT OF BEGINNING.

EXCEPT THAT PART DEEDED FOR THE ROAD ROW OF NAPI DRIVE (SO-CALLED) DESCRIBED AS:

COMMENCING AT THE SOUTH 1#4 POST OF SECTION 14; THENCE SOUTH 88°15'13" WEST 662.86 FEET ALONG THE SOUTH LINE OF SECTION 14 TO THE POINT OF BEGINNING; THENCE CONTINUING SOUTH 88°15'13" WEST 70.00 FEET ALONG THE SOUTH LINE OF SECTION 14; THENCE NORTH 01°36'36" WEST 1,470.00 FEET; THENCE SOUTH 88°15'13" WEST 105.00 FEET; THENCE SOUTHERLY ALONG A NONTANGENT CURVE CONCAVE TO THE EAST, HAVING A CENTRAL ANGLE OF 44°46'14", A RADIUS 70.00 FEET, AN ARC LENGTH OF 54.70 FEET AND WHOSE CHORD BEARING OF SOUTH 24°07'31" EAST 53.32 FEET; THENCE SOUTHERLY ALONG A TANGENT CURVE CONCAVE TO THE WEST, HAVING A CENTRAL ANGLE OF 44°54'02", AN ARC LENGTH OF 39.18 FEET AND WHOSE CHORD BEARS NORTH 24°03'37" WEST 38.19 FEET; THENCE SOUTH 01°36'36" EAST 1,385.37 FEET TO THE SOUTH LINE OF SECTION 14; THENCE NORTH 88°13'15" EAST 70.00 FEET ALONG THE SOUTH LINE OF SECTION 14 TO THE POINT OF BEGINNING.

DECRIPTION FROM EXISTING RECORDS.
WARRANTY DEED RECORDED IN LIBER 3781, PAGES 953-954, MACOMB COUNTY RECORDS, AND
WARRANTY DEED RECORDED IN LIBER 3910, PAGES 150-151, MACOMB COUNTY RECORDS.

NOTES

COORDINATE SYSTEM:	MICHIGAN STATE PLANE
ZONE:	MICHIGAN SOUTH
ELLIPSOID:	WGS 1984
HORIZONTAL DATUM:	NAD 83 (CORS 2011)
VERTICAL DATUM:	NAVD 88
GEOID:	MISO 2003
UNITS:	INTERNATIONAL FEET
SURVEY FIRM:	MACOMB COUNTY

PLAN ELEVATION

ELEVATIONS SHOWN ON THESE PLANS ARE BASED ON THE NAVD88 DATUM.

BENCHMARKS

BENCHMARK NO. 1
DESCRIPTION: ARROWHEAD IN TOP OF FIRE HYDRANT. HYDRANT LOCATED IN GREEN SPACE ALONG SOUTH PROPERTY LINE NEAR THE SOUTHEAST CORNER OF THE SERVCIE CENTER OFFIC SPACE.
STATION 0+29.58, OFFSET 2.74' Left
COORDINATES:
N=429729.97
E=13488800.57
ELEVATION: 636.22

BENCHMARK NO. 2
DESCRIPTION: ARROWHEAD IN TOP OF FIRE HYDRANT. HYDRANT LOCATED IN ISLAND AT NOTHEAST CORNER OF THE MAIN GARAGE FOR THE SERVICE CENTER
STATION 3+80.17, OFFSET 64.06' Right
COORDINATES:
N=430083.31
E=13488850.86
ELEVATION: 636.25

BENCHMARK NO. 3
DESCRIPTION: ARROWHEAD IN TOP OF FIRE HYDRANT. HYDRANT LOCATED IN GREEN SPACE NORTH OF THE CENTER DRIVEWAY TO THE SERVICE CENTER
STATION 5+03.72, OFFSET 137.16' Right
COORDINATES:
N=430210.15
E=13488918.19
ELEVATION: 636.30

BENCHMARK NO. 4
DESCRIPTION: ARROWHEAD IN TOP OF FIRE HYDRANT. HYDRANT LOCATED IN GREEN SPACE APPROXIMATELY 150 FEET NORTH OF THE NORTH DRIVEWAY TOTHE SERVICE CENTER
STATION 9+73.69, OFFSET 141.36' Right
COORDINATES:
N=430680.00
E=13488900.32
ELEVATION: 634.95

ALIGNMENT

ALIGNMENT POINT NO. 1:
STATION: 0+00.00
OFFSET: 0.00

COORDINATES:
N=429700.55
E=13488804.70

ALIGNMENT POINT NO. 2:
STATION: 10+69.90
OFFSET: 0.00

COORDINATES:
N=430769.28
E=13488754.54

FIRE HYDRANTS

FIRE HYDRANT NO. 1:
STATION: 0+30.0
OFFSET: 2.89' Left

FIRE HYDRANT NO. 2:
STATION: 3+80.74
OFFSET: 64.24' Right

FIRE HYDRANT NO. 3:
STATION: 5+03.72
OFFSET: 137.16' Right

FIRE HYDRANT NO. 4:
STATION: 9+73.69
OFFSET: 141.36' Right

UTILITY INFORMATION

Utility information, as shown, indicates approximate locations and type of facilities only, as disclosed to this firm by the various utility company's records, No guarantee is given or implied as to the completeness or accuracy of thereof.

Prior to construction, all location and depths of existing overhead and underground utilities (in conflict with the constructon of proposed improvements) must be verified.

During construciton, Contractor must use extreme caution when operating near overhead and/or buried utilities

MACOMB COUNTY DEPARTMENT OF ROADS SHELBY SERVICE CENTER

PROPOSED SALT STORAGE BUILDING TOPOGRAPHIC SURVEY

MACOMB COUNTY DEPARTMENT OF ROADS

MCDOR WORK ORDER	CONT. SEC.	JOB NO.	STRUCTURE NO.
9048	NA	NA	NA

DATE	SCALE	
05/04/2025	1" = 50'	

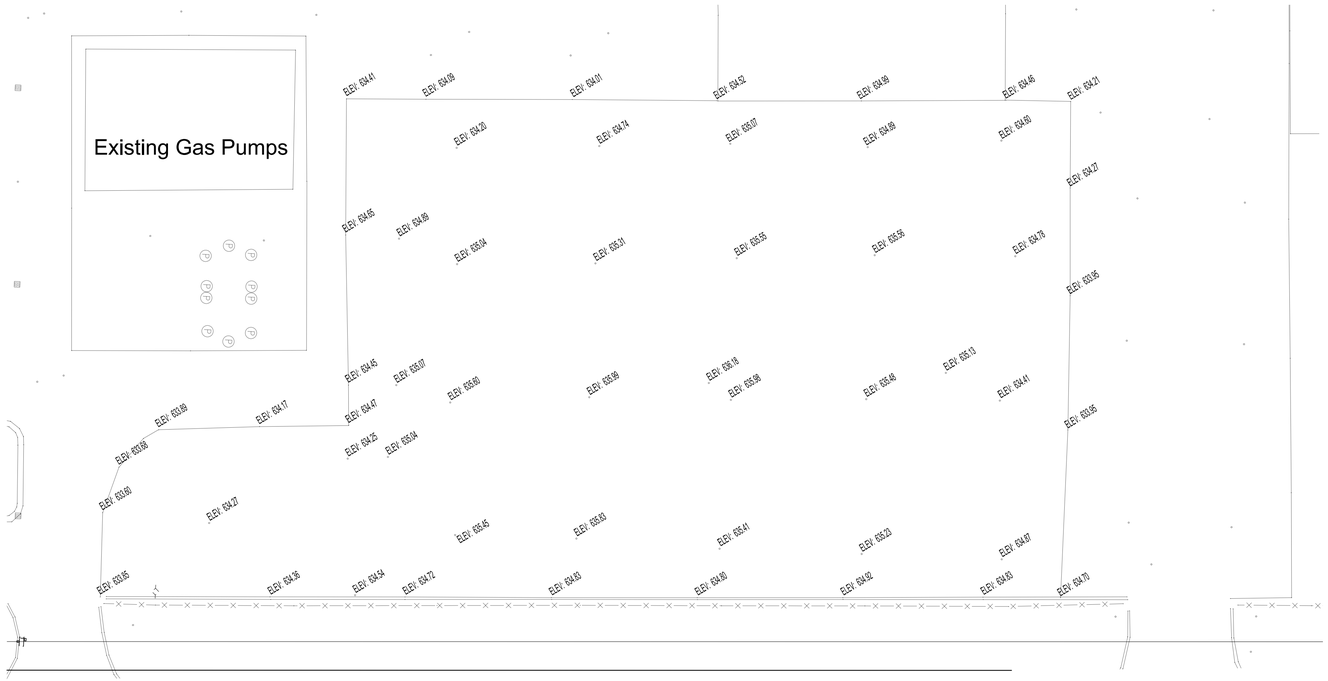
SHEET NO. 3

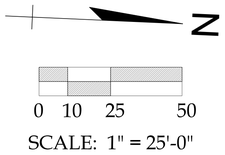
DESIGNED BY: $DESBY$ CHECKED BY: $CHKBY$ DATE: $SCHDATE$

REVISED BY: $REVBY$ DATE: $REVDATE$

DATE/TIME PRINTED: $DATE$ $TIME$
PRINTED AT SCALE: $SCALE$
DRAWING FILE NAME: $FILES$

EXISTING GRADES





FINAL GRADES

EXCAVATION AND EMBANKMENT - COMPLETE: 1 LUMP SUM

Approximate Quantity: 4500 Cyd

Silt Fence will be installed around the building footprint and proposed sitework prior to the start of work. Existing catch basins and proposed catch basins when installed will have silt sacks and sediment traps installed. See SESC Plan on Sheet 9 for locations. The Contractor will strip the existing 23A Limestone Aggregate within the limits of construction and stockpile for use as aggregate base material and aggregate surface course for the finished aggregate surface area. The anticipated quantity of salvaged 23A Limestone Aggregate is 1620 Cyd or 2620 Ton, assuming a compacted unit weight of 120 lbs/cft. The Contractor will excavate to the elevations necessary to install the building footings per plan, concrete pavement/aggregate base, asphalt pavement/aggregate base and aggregate surface course per plan. The excavated material below the stripped 23A Limestone Aggregate is estimated to be approximately2900 Cyd (Measured in Place) and will be removed from the site by the Contractor. Estimated quantities are not guaranteed and no attempt will be made by the MCDR to confirm.

NON-HAZARDOUS CONTAMINATED MATERIAL HANDLING AND DISPOSAL:

Estimated Quantity: 50 Cyd

An estimated quantity has been included in this contract for any excavated material discovered that is determined to require disposal in a Type II landfill.

UTILITY INFORMATION

Utility information, as shown, indicates approximate locations and type of facilities only, as disclosed to this firm by the various utility company's records, No guarantee is given or implied as to the completeness or accuracy of thereof.

Prior to construction, all location and depths of existing overhead and underground utilities (in conflict with the constructon of proposed improvements) must be verified.

During construciton, Contractor must use extreme caution when opeating near overhead and/or buried utilities

MACOMB COUNTY DEPARTMENT OF ROADS SHELBY SERVICE CENTER

PROPOSED SALT STORAGE EARTHWORK PLAN

MCDOR WORK ORDER	CONT. SEC.	JOB NO.	STRUCTURE NO.
9048	NA	NA	NA

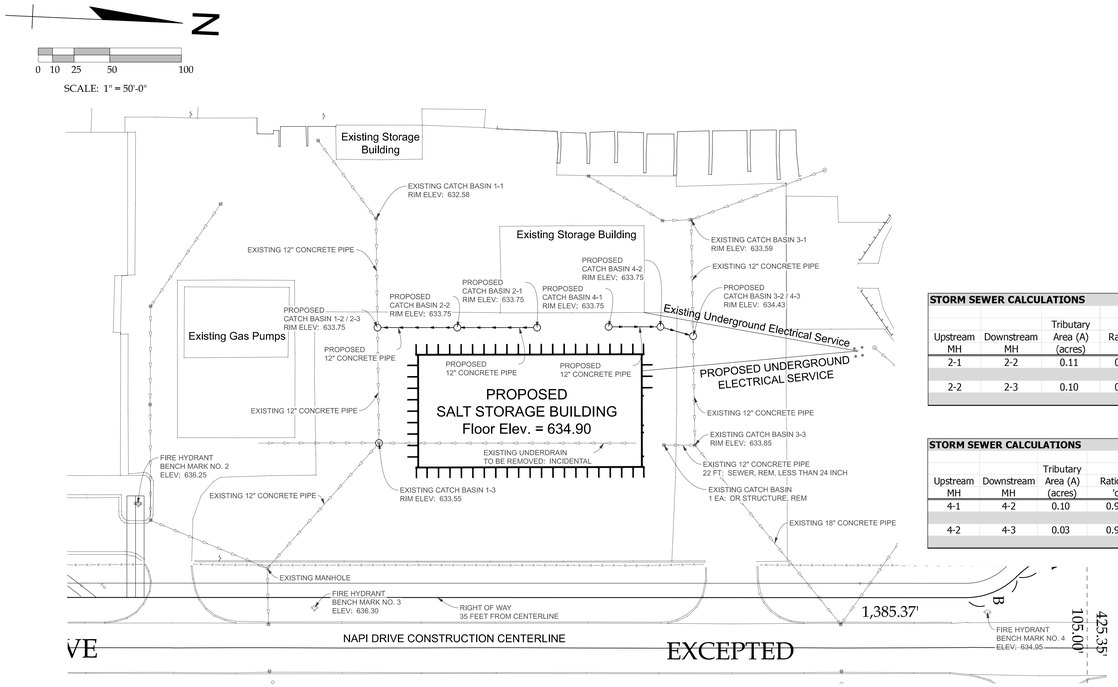
DATE	SCALE
05/15/2025	1" = 25'

MACOMB COUNTY DEPARTMENT OF ROADS

SHEET NO. 4

DESIGNED BY: $DESBY$ DATE: $SCHDATE$ CHECKED BY: $CHKBY$ DATE: $REVDATE$ REVISED BY: $REVBY$ DATE: $REVDATE$

DATE/TIME PRINTED: $DATES $TIMES
PRINTED SCALE: $SCALES
DRIVE:FILE NAME: $FILES



STORM SEWER WORK:

Dr Structure, Rem: 1 Each
Sewer, Rem, Less than 24 inch: 22 Ft
Dr Structure, 48 inch Dia: 6 Each
Dr Structure Cover, Type B: 1 Each
Dr Structure Cover, Type D: 5 Each
Dr Structure Cover, Adj, Case 1: 1 Each
Dr Structure Cover, Adj, Add Depth: 1 Ft
Sewer, Cl IV, 12 inch, Tr Det B: 173 Ft
Sewer Tap, 12 inch: 2 Each

UTILITY INFORMATION

Utility information, as shown, indicates approximate locations and type of facilities only, as disclosed to this firm by the various utility company's records, No guarantee is given or implied as to the completeness or accuracy of thereof.

Prior to construction, all location and depths of existing overhead and underground utilities (in conflict with the constructon of proposed improvements) must be verified.

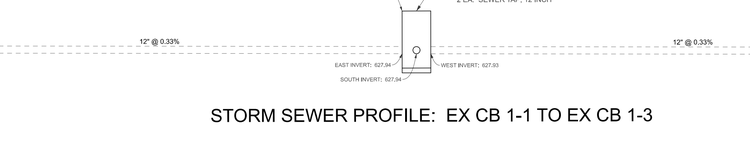
During construciton, Contractor must use extreme caution when opeating near overhead and/or buried utilities

STORM SEWER CALCULATIONS

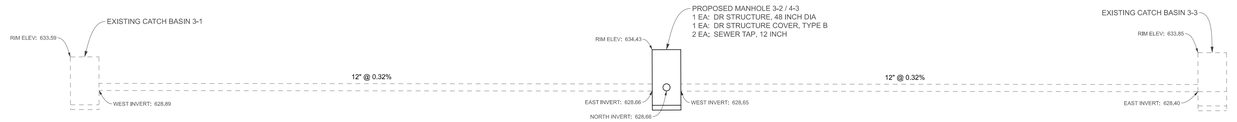
Upstream MH	Downstream MH	Tributary Area (A) (acres)	Rational 'c'	Equivalent Area (A x c)	Cumulative Equivalent Area (A x c)	Time of Concentration (min)	Runoff (cfs/A)	Total Runoff (cfs/A)	Pipe Diameter (in)	Pipe Length (ft)	HGL Slope (%)	Pipe Capacity HGL Slope (cfs)	Intensity "I" (in/hr)	Flow Velocity (ft/s)	Upstream HGL Elevation (ft)	Delta HGL Elevation (ft)	Downstream HGL Elevation (ft)	Flow Time (min)	Manning's "n"	Upstream INV Elevation (ft)	Pipe Slope (%)	Downstream INV Elevation (ft)	Pipe Capacity Pipe Slope (cfs)	Upstream Rim Elevation	Rim to HGL
2-1	2-2	0.11	0.90	0.10	0.09	20.00	0.30	0.30	12	56.00	0.01%	0.31	3.42	0.39	630.86	0.00	630.85	2.40	0.013	628.48	0.48%	628.21	2.47	633.75	2.89
2-2	2-3	0.10	0.90	0.09	0.18	22.40	0.58	0.58	12	56.00	0.03%	0.58	3.25	0.74	630.85	0.01	630.84	1.26	0.013	628.21	0.48%	627.94	2.47	633.75	2.90

STORM SEWER CALCULATIONS

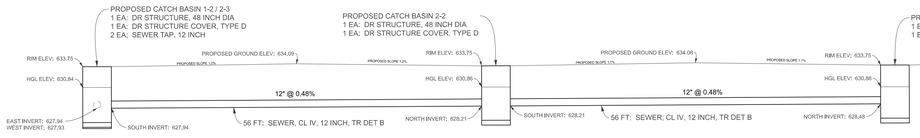
Upstream MH	Downstream MH	Tributary Area (A) (acres)	Rational 'c'	Equivalent Area (A x c)	Cumulative Equivalent Area (A x c)	Time of Concentration (min)	Runoff (cfs/A)	Total Runoff (cfs/A)	Pipe Diameter (in)	Pipe Length (ft)	HGL Slope (%)	Pipe Capacity (HGL Slope) (cfs)	Intensity "I" (in/hr)	Flow Velocity (ft/s)	Upstream HGL Elevation (ft)	Delta HGL Elevation (ft)	Downstream HGL Elevation (ft)	Flow Time (min)	Manning's "n"	Upstream INV Elevation (ft)	Pipe Slope (%)	Downstream INV Elevation (ft)	Pipe Capacity (Pipe Slope) (cfs)	Upstream Rim Elevation	Rim to HGL
4-1	4-2	0.10	0.90	0.09	0.09	20.00	0.31	0.31	12	37.00	0.01%	0.31	3.42	0.39	631.51	0.00	631.50	1.57	0.013	628.95	0.48%	628.78	2.47	633.75	2.24
4-2	4-3	0.03	0.90	0.03	0.12	21.57	0.39	0.39	12	24.00	0.01%	0.39	3.31	0.49	631.50	0.00	631.50	0.81	0.013	628.78	0.48%	628.66	2.47	633.75	2.25



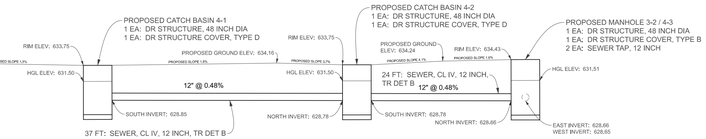
STORM SEWER PROFILE: EX CB 1-1 TO EX CB 1-3



STORM SEWER PROFILE: EX CB 3-1 TO EX CB 3-3



STORM SEWER PROFILE: STR 2-1 TO STR 1-2 / 2-3



STORM SEWER PROFILE: STR 4-1 TO STR 3-2 / 4-3

MACOMB COUNTY DEPARTMENT OF ROADS SHELBY SERVICE CENTER

PROPOSED SALT STORAGE BUILDING SITE DRAINAGE PLAN

OPERATIONAL NOTE: SALT CONTAINMENT METHODS TO PREVENT SALT MATERIAL FROM ENTERING THE STORM SYSTEM

THE PROPOSED SALT STORAGE STRUCTURE IS LARGE ENOUGH TO ACOMODATE INTERIOR LOADING AND UNLOADING.

THE MCDR FOLLOWS EGLE'S POLLUTION INCIDENT PREVENTION PLAN (PIPP) GUIDELINES (PART 5) FOR SALT STORAGE AND STORMWATER MANAGEMENT.

IF ANY SALT IS SPILLED ONTO THE PAVEMENT DURING OPERATIONS, IT WILL BE CLEANED UP IN A TIMELY MANNER WITH THE USE OF MECHANICAL SWEEPERS

DATE/TIME PRINTED: $DATE$ $TIME$
PRINT SCALE: 1" = 50'
DWG FILE NAME: $FILE$

DESIGNED BY: $DESBY$ CHECKED BY: $CHKBY$ DATE: $CHDATE$

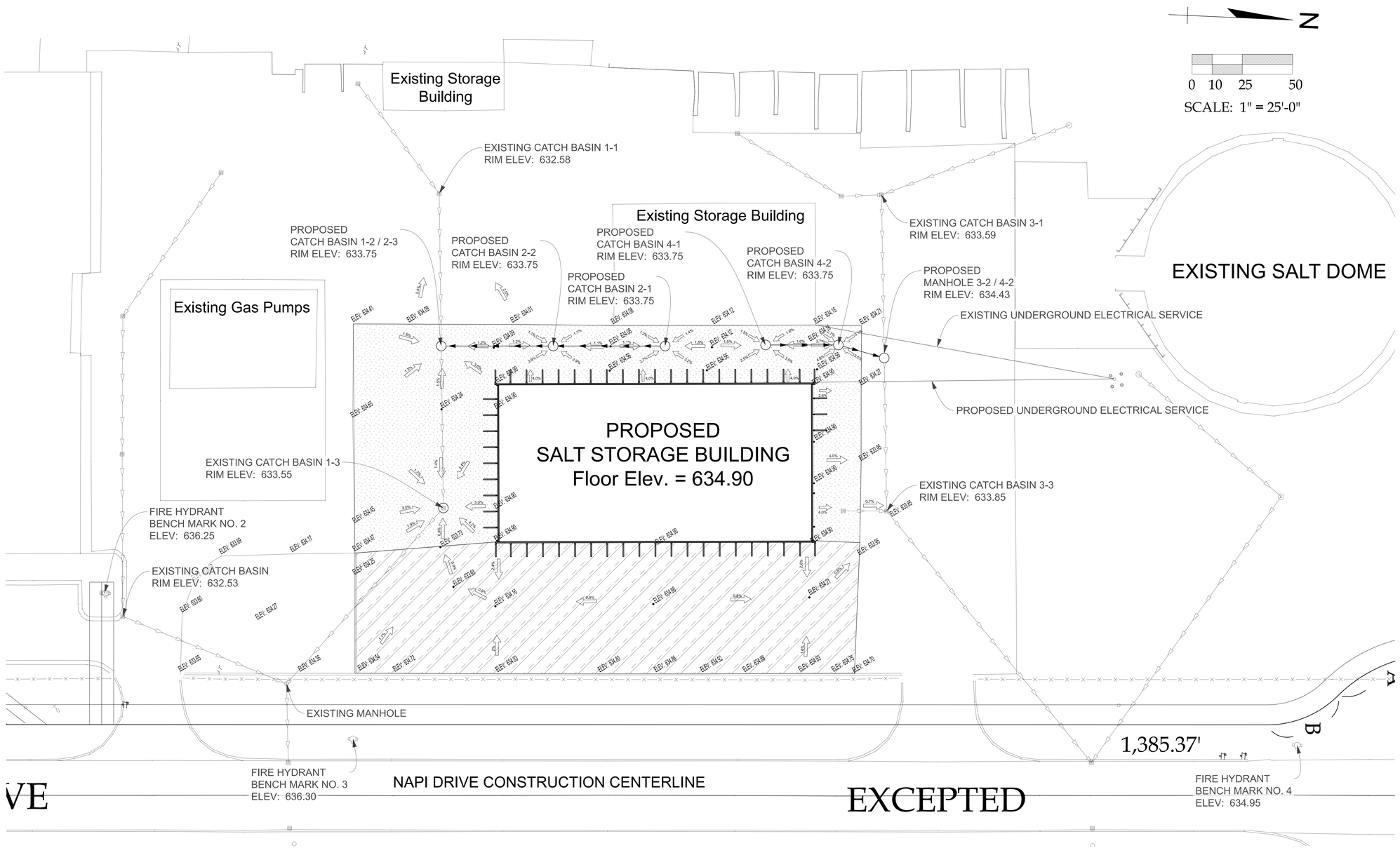
REVISED BY: $REVBY$ DATE: $REVDATE$

STRUCTURE NO.	JOB NO.	CONT. SEC.	MCDOR WORK ORDER
NA	NA	NA	9048

DATE	SCALE
05/14/2025	1" = 50'

MACOMB COUNTY DEPARTMENT OF ROADS

SHEET NO. 5



VE

EXCEPTED

OPERATIONAL NOTE: SALT CONTAINMENT METHODS TO PREVENT SALT MATERIAL FROM ENTERING THE STORM SYSTEM

THE PROPOSED SALT STORAGE STRUCTURE IS LARGE ENOUGH TO ACOMODATE INTERIOR LOADING AND UNLOADING.

THE MCDR FOLLOWS EGLE'S POLLUTION INCIDENT PREVENTION PLAN (PIPP) GUIDELINES (PART 5) FOR SALT STORAGE AND STORMWATER MANAGEMENT.

IF ANY SALT IS SPILLED ONTO THE PAVEMENT DURING OPERATIONS, IT WILL BE CLEANED UP IN A TIMELY MANNER WITH THE USE OF MECHANICAL SWEEPERS.

HMA PAVEMENT SURFACE:
7 INCHES: HMA
8 INCHES: 21AA LIMESTONE

AGGREGATE SURFACE:
24 INCHES: 23A LIMESTONE

MACOMB COUNTY DEPARTMENT OF ROADS SHELBY SERVICE CENTER

PROPOSED SALT STORAGE BUILDING SITE GRADING PLAN

MCDOR WORK ORDER	JOB NO.	STRUCTURE NO.
9048	NA	NA

DATE	SCALE	CONT. SEC.
05/15/2025	1" = 25'	NA

MACOMB COUNTY DEPARTMENT OF ROADS

SHEET NO. 6

DESIGNED BY: $DESBY$ DATE: $CHDATE$ CHECKED BY: $CHKBY$ DATE: $REVDATE$ REVISED BY: $REVBY$ DATE: $REVDATE$

PRINT SCALE: $SCALES
DIR/FILE NAME: $FILES

EPOXY COATED STEEL REINFORCEMENT CONCRETE FLOOR - COMPLETE: 1 LUMP SUM

Approximate Area: 1352 Syd

Construction of an 8-inch thick reinforced concrete floor over 16 inches of aggregate base. The aggregate base will be 21AA limestone material. The steel reinforcement will be Grade 60 epoxy coated No. 4 bars spaced at 1 foot centers in both the longitudinal and transverse directions in the center of the slab thickness. After the floor is cured it will be sawcut 1/8" x 3" deep into 12' by 12' panels. The joints will be cleaned and sealed according to the manufacturer's directions with Dow Corning 888 silicone joint sealant or approved equivalent. The surface will then be cleaned and sealed with Enviroseal 40 manufactured by Hydrozo according to the manufacturer's directions or approved equal.

PAVEMENT REMOVAL AND REPLACEMENT - COMPLETE: 1 LUMP SUM

Approximate Quantity: 2088 Syd

The Contractor will sawcut, remove and dispose of the existing pavement edges where abutting with the proposed asphalt including the pavement necessary to be removed to install Catch Basin 3-2 / 4-3 as shown on the plans. When the salt storage building is complete, the Contractor will excavate the proposed pavement areas to a depth of 15 inches below the final grades as indicated on the plans or as directed by the Engineer and place 8 inches of aggregate base. The aggregate base will be 21AA limestone material. The pavement will be 7 inches of HMA over the aggregate base. See HMA Application Estimate for specific requirements. The pavement area includes asphalt and base material being installed between each of the supports for the salt storage barn up to the outside wall and restoration of the pavement if the electrical service and equipment is installed by direct bury method. This item includes the 8 inch non-reinforced concrete pavement around each drainage structure as identified on Shelby Township's Storm Sewer Detail Sheet.

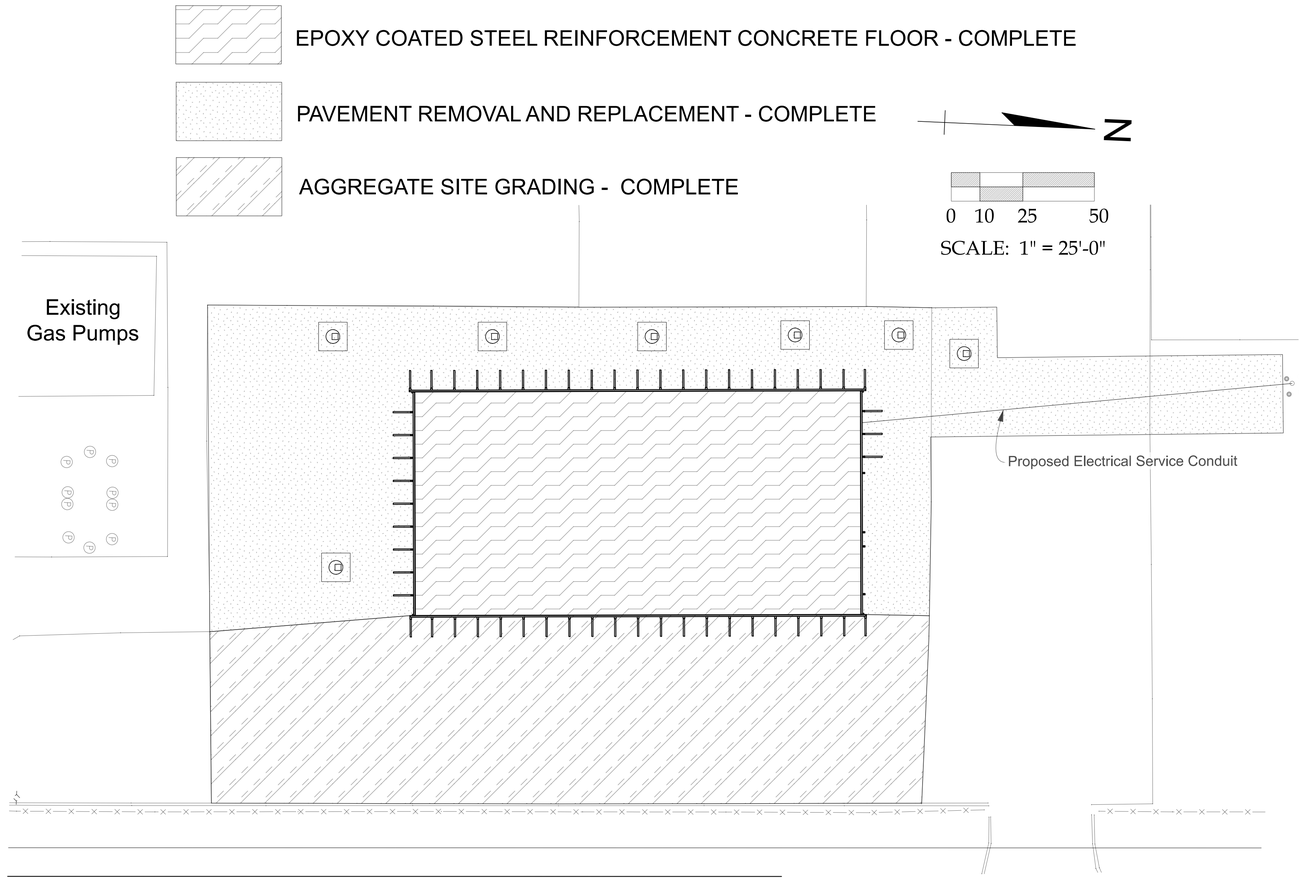
AGGREGATE SITE GRADING - COMPLETE: 1 LUMP SUM

Approximate Quantity: 1590 Syd

When the salt storage building is complete, the Contractor will excavate the proposed aggregate area to a depth of 24 inches below the final grades as indicated on the plans or as directed by the Engineer and place 24 inches of aggregate surface course. The aggregate surface course will be 23A limestone material salvaged and stockpiled from the site.

SITE WORK - COMPLETE: 1 LUMP SUM

This item covers all miscellaneous costs to restore the site for Department of Roads use.



SUBGRADE UNDERCUTTING, TYPE II: MEASURED IN CYD

If determined to be necessary, to be completed below the aggregate base within the limits of the proposed reinforced concrete floor as directed by the Engineer. Reference the Michigan Department of Transportation Standard Specifications for Construction.

SUBGRADE UNDERCUTTING, SPEC, 21AA: MEASURED IN CYD

If determined to be necessary, to be completed below the aggregate base within the limits of the proposed HMA pavement area as directed by the Engineer. See Special Provision.

GEOTEXTILE, STABLIZATION: MEASURED IN SYD

If determined to be necessary, to be completed below the aggregate base within the limits of the proposed HMA pavement and/or the proposed reinforced concrete floor as directed by the Engineer. Reference the Michigan Department of Transportation Standard Specifications for Construction.

MACOMB COUNTY DEPARTMENT OF ROADS SHELBY SERVICE CENTER
PROPOSED SALT STORAGE SITE CONSTRUCITON PLAN

STRUCTURE NO.	JOB NO.	CONT. SEC.	MCDOR WORK ORDER
NA	NA	NA	9048

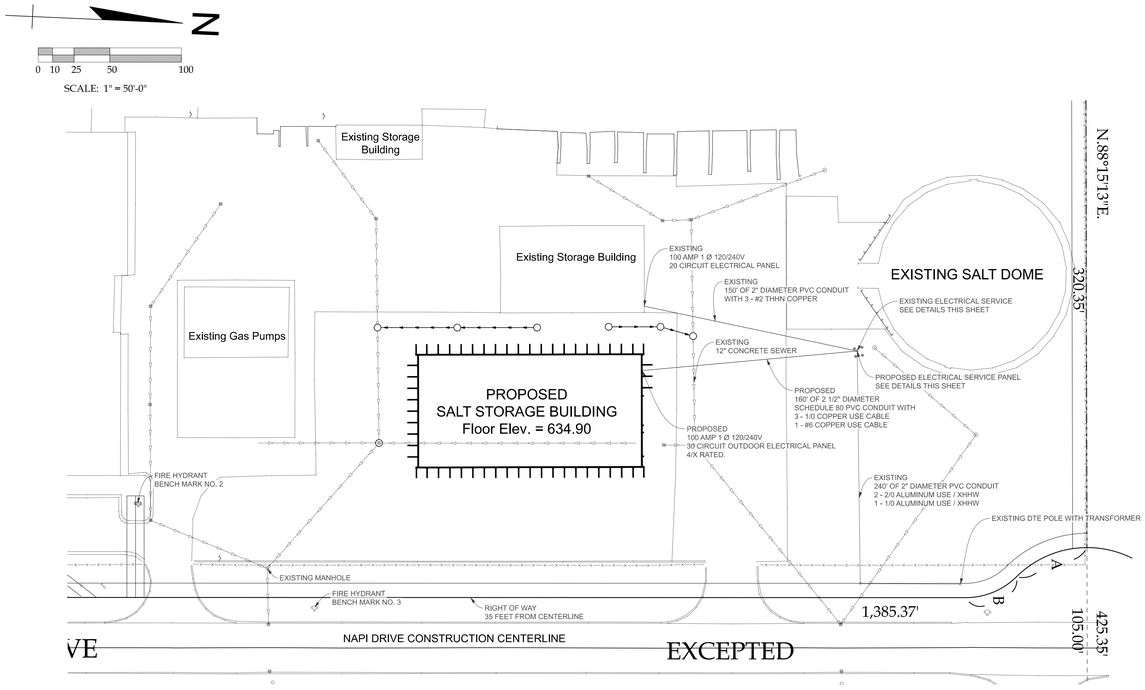
DATE	SCALE
05/16/2025	1" = 25'

MACOMB COUNTY
DEPARTMENT OF ROADS

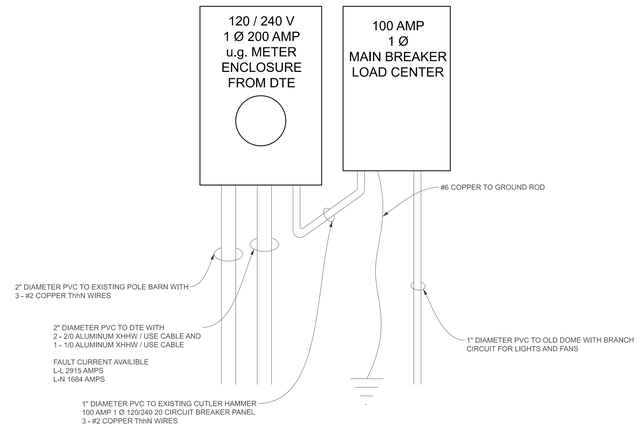
SHEET NO.
7

REVISED BY: $REVBY$ DATE: $REVDATE$
CHECKED BY: $CHKBY$ DATE: $CHDATE$
DESIGNED BY: $DESBY$

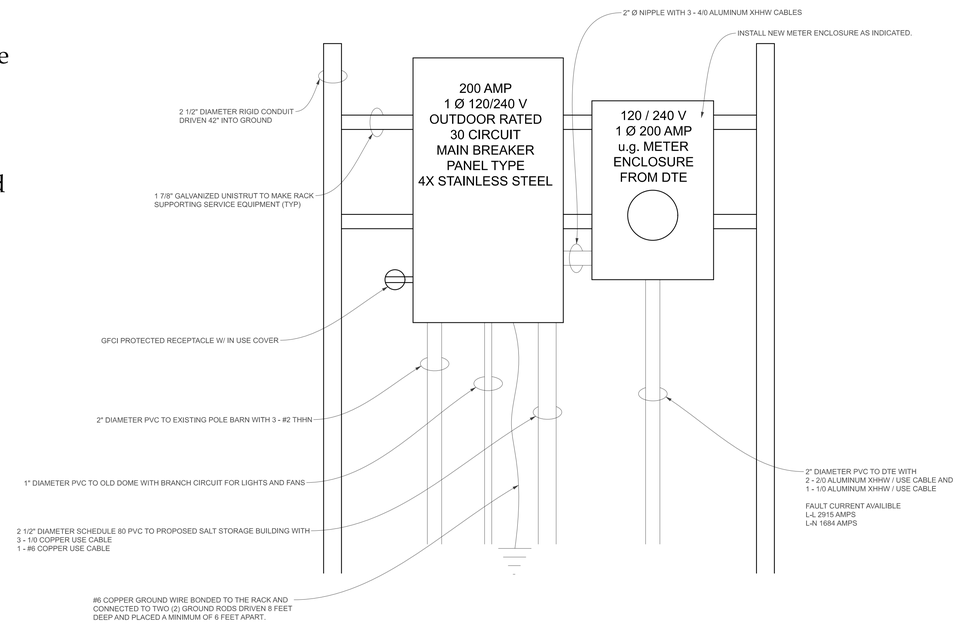
DATE/TIME PRINTED: $DATES $TIMES
PRINTED VALUES: $VALS
DWG FILE NAME: $FILES



EXISTING ELECTRICAL SERVICE



PROPOSED ELECTRICAL SERVICE



ELECTRICAL SERVICES AND EQUIPMENT - COMPLETE: 1 LUMP SUM

Install buried electrical power drop from the existing pole to the proposed panel located near the northwest corner of the proposed salt storage building. Install proposed electrical panel at the existing pole and at the proposed salt storage facility as indicated. Includes all required coordination with Shelby Township and/or DTE for permits and/or inspections. All proposed electrical work shall be completed by a licensed electrician within the State of Michigan and in accordance with the requirements of the National Electrical Code, Michigan Electrical Code, and Local Electrical Code.

UTILITY INFORMATION

Utility information, as shown, indicates approximate locations and type of facilities only, as disclosed to this firm by the various utility company's records, No guarantee is given or implied as to the completeness or accuracy of thereof.

Prior to construction, all location and depths of existing overhead and underground utilities (in conflict with the constructon of proposed improvements) must be verified.

During construciton, Contractor must use extreme caution when opeating near overhead and/or buried utilities

DATE/TIME PRINTED: $DATE$ $TIME$
PRINTED AT SCALE: $SCALE$
DRAWING FILE NAME: $FILE$

MACOMB COUNTY DEPARTMENT OF ROADS SHELBY SERVICE CENTER
PROPOSED SALT STORAGE BUILDING SITE ELECTRICAL PLAN

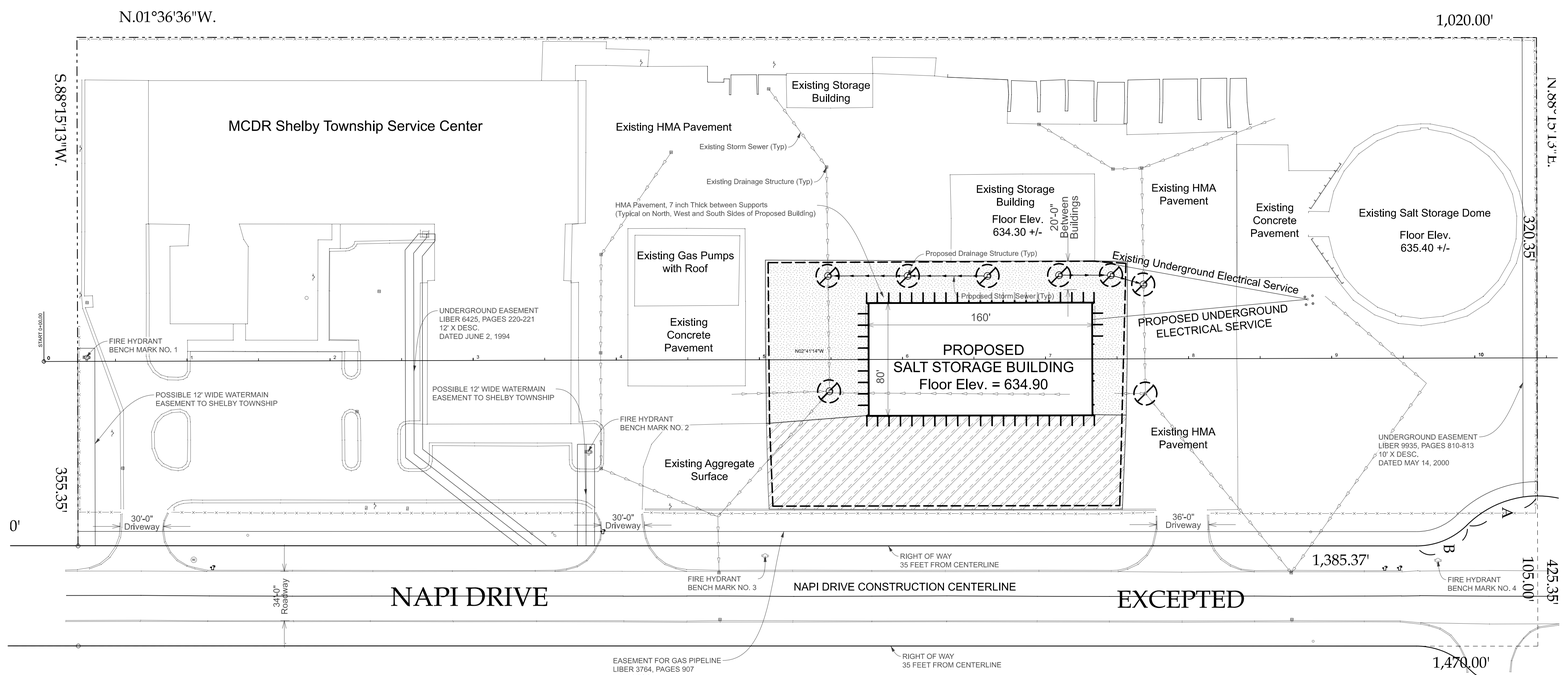
MCDOR WORK ORDER	CONT. SEC.	JOB NO.	STRUCTURE NO.
9048	NA	NA	NA

DATE	SCALE	MACOMB COUNTY DEPARTMENT OF ROADS
05/15/2025	1" = 50'	

DESIGNED BY: $DESBY$ DATE: $CHDATE$ CHECKED BY: $CHKBY$ DATE: $REVDATE$ REVISED BY: $REVBY$ DATE: $REVDATE$

SHEET NO.
8

NOTE: ALL REQUIRED SESC ITEMS INCLUDED IN "EXCAVATION AND EMBANKMENT - COMPLETE " PAY ITEM OF 1 LUMP SUM



HMA PAVEMENT SURFACE:
7 INCHES: HMA
8 INCHES: 21AA LIMESTONE

AGGREGATE SURFACE:
24 INCHES: 23A LIMESTONE

INLET PROTECTION:
EROSION CONTROL, INLET PROTECTION, FABRIC DROP
EROSION CONTROL, INLET PROTECTION, SEDIMENT TRAP

SILT FENCE:
EROSION CONTROL, SILT FENCE

PROPERTY DESCRIPTION
CURRENT TAX ID 23-07-14-376-009

PART OF THE SOUTHWEST ¼ OF SECTION 14, TOWN 3 NORTH, RANGE 12 EAST, SHELBY TOWNSHIP, MACOMB COUNTY, MICHIGAN, IS DESCRIBED AS:

COMMENCING AT THE SOUTH ¼ POST OF SECTION 14; THENCE SOUTH 88°15'13" WEST 662.86 FEET ALONG THE SOUTH LINE OF SECTION 14 TO THE POINT OF BEGINNING; THENCE CONTINUING SOUTH 88°15'13" WEST 70.00 FEET ALONG THE SOUTH LINE OF SECTION 14; THENCE NORTH 01°36'36" WEST 450.00 FEET; THENCE SOUTH 88°15'13" WEST 355.35 FEET; THENCE NORTH 01°36'36" WEST 1,020.00 FEET; THENCE NORTH 88°15'13" EAST 425.35 FEET; THENCE SOUTH 01°36'36" EAST 1,470.00 FEET TO A POINT ON THE SOUTH LINE OF SECTION 14, SAID POINT BEING THE POINT OF BEGINNING.

EXCEPT THAT PART DEEDED FOR THE ROAD ROW OF NAPI DRIVE (SO-CALLED) DESCRIBED AS:

COMMENCING AT THE SOUTH 1#4 POST OF SECTION 14; THENCE SOUTH 88°15'13" WEST 662.86 FEET ALONG THE SOUTH LINE OF SECTION 14 TO THE POINT OF BEGINNING; THENCE CONTINUING SOUTH 88°15'13" WEST 70.00 FEET ALONG THE SOUTH LINE OF SECTION 14; THENCE NORTH 01°36'36" WEST 1,470.00 FEET; THENCE SOUTH 88°15'13" WEST 105.00 FEET; THENCE SOUTHERLY ALONG A NONTANGENT CURVE CONCAVE TO THE EAST, HAVING A CENTRAL ANGLE OF 44°46'14", A RADIUS 70.00 FEET, AN ARC LENGTH OF 54.70 FEET AND WHOSE CHORD BEARING OF SOUTH 24°07'31" EAST 53.32 FEET; THENCE SOUTHERLY ALONG A TANGENT CURVE CONCAVE TO THE WEST, HAVING A CENTRAL ANGLE OF 44°54'02", AN ARC LENGTH OF 39.18 FEET AND WHOSE CHORD BEARS NORTH 24°03'37" WEST 38.19 FEET; THENCE SOUTH 01°36'36" EAST 1,385.37 FEET TO THE SOUTH LINE OF SECTION 14; THENCE NORTH 88°13'15" EAST 70.00 FEET ALONG THE SOUTH LINE OF SECTION 14 TO THE POINT OF BEGINNING.

DECRIPTION FROM EXISTING RECORDS.
WARRANTY DEED RECORDED IN LIBER 3781, PAGES 953-954, MACOMB COUNTY RECORDS, AND
WARRANTY DEED RECORDED IN LIBER 3910, PAGES 150-151, MACOMB COUNTY RECORDS.

UTILITY INFORMATION

Utility information, as shown, indicates approximate locations and type of facilities only, as disclosed to this firm by the various utility company's records, No guarantee is given or implied as to the completeness or accuracy of thereof.

Prior to construction, all location and depths of existing overhead and underground utilities (in conflict with the constructon of proposed improvements) must be verified.

During construciton, Contractor must use extreme caution when operating near overhead and/or buried utilities

SITE NOTES:

Approximate Gross Acreage Disturbed = 0.94 ±Acres
Distance to nearest body of water = 940 Feet south to the Longstaff Drain

SOIL TYPES:
AsB: Au Gres Sand

This project shall be constructed in compliance with Part 91 of Act 451 of 1994, as amended. The Soil Erosion and Sediment Control Act.

SOIL EROSION / SEDIMENTATION CONTROL CONSTRUCITON SEQUENCE

1. INSTALL SILT FENCE AROUND THE PROJECT LIMITS. INSTALL INLET FILTERS WITHIN EXISTING DRAINAGE STRUCTURES.

2. COMPLETE EXCAVATION TO INSTALL PROPOSED BUILDING FOOTINGS.

3. CONSTRUCT PROPOSED BUILDING.

4. COMPLETE ROUGH GRADING OPERATIONS.

5. INSTALL PROPOSED STORM SEWER WORK AND PLACE INLET FILTERS WITHIN THE PROPOSED DRAINAGE STRUCTURES WHERE INDICATED.

6. PERFORM FINE GRADIG AND PAVING OPERATIONS.

7. EROSION CONTROL MEASURES ARE NOT TO BE REMOVED UNTIL THE MACOMB COUNTY PUBLIC WORKS OFFICE GRANTS ITS APPROVAL. INLET FILTERS SHALL BE PERIODICALLY INSPECTED AND CLEANED / REPLACED AS NECESSARY.

ALL EROSION CONTROL MEASURES SHALL BE INSTALLED APPROXIMTELY ACCRDING TO THE FOLLOWING SEQUENCE OF CONSTRUCTION.

PREOJCT COMMENCEMENT ON OR ABOUT JULY 2025

SCHEDULE

A. INSTALL SILT FENCE AND INLET FILTERS AS SHOWN ON PLANS	1 WEEK
B. STRIP AND STOCKPILE EXISTAING SALVAGEABLE 23A LIMESTONE	1 WEEK
C. CONSTRUCT SALT STORAGE BARN FACILITY	12 WEEKS
D. INSTALL UNDERGROUND STORM SEWER	2 WEEKS
E. FINE GRADE SITE, PAVE AND AGGREGATE SITE GRADING	2 WEEKS
F. CLEAN PAVEMENT, WALKS, STORM DRAINS, AND WATERCOURSES OF ALL ACCUMULATED SEDIMENT IN CONJUNCTION WITH REMOVING ALL TEMPORARY DEVICES	1 WEEK

PROECT COMPLETION ON OR ABOUT DECEMBER 2025

SOIL EROSION AND SEDIMENTATION CONTROL NOTES AND MAINTENANCE NOTES

1. THIS PROJECT SHALL BE CONSTRUCTED IN COMPLIANCE WITH PART 91 OF ACT 451 OF 1994, AS AMENDED, THE SOIL EROSION AND SEDIMENTATION CONTROL ACT AND THE MACOMB COUNTY SOIL EROSION AN SEDIMENTATION CONTROL ORDINANCE.
2. ALL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE MACOMB COUNTY PUBLIC WORKS OFFICE.
3. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
4. STAGING THE WORK WILL BE DONE BY THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE AS DIRECTED IN THESE PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED EARTH CHANGE.
5. THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE SHALL BE RESPONSIBLE FOR INSTALLATION AND MAINTENANCE OF SOIL EROSION AND SEDIMENTATION CONTROL DEVICES.
6. THE LANDOWNER AND LANDOWNER'S REPRESENTATIVE SHALL IMPLEMENT AND MAINTAIN THE SOIL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS BEFORE AND AT ALL TIMES DURING CONSTRUCTION ON THIS PROJECT. ANY MODIFICATIONS OR ADDITIONS TO SOIL EROSION CONTROL MEASURES DUE TO CONSTRUCTION OR CHANGED CONDITIONS SHALL BE COMPLIED WITH AS REQUIRED OR DIRECTED BY THE MACOMB COUNTY PUBLIC WORKS OFFICE.
7. IF ANY OF THE SESC MEASURES ON THE SITE ARE DEEMED INADEQUATE OR INEFFECTIVE, THE MACOMB COUNTY PUBLIC WORKS OFFICE SESC DIVISION HAS THE RIGHT TO REQUIRE ADDITIONAL SESC MEASURES AT THE EXPENSE OF THE LANDOWNER
8. INSTALL SILT FENCE AS INDICATED ON THE PLAN AND AT ADDITIONAL AREAS AS NECESSARY.
   A. SILT FENCE SHALL BE INSTALLED PER DETAIL
   B. BUILD UP OF SEDIMENT SHALL BE REMOVED WHEN SEDIMENT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE SILT FENCE
   C. IF THE SILT FENCE FABRIC DECOMPOSES OR BECOMES INEFFECTIVE PRIOR TO THE END OF EXPECTED USABLE LIFE AND THE BARRIER IS STILL REQUIRED, THE SILT FENCE SHALL BE REPLACED PROMPTLY.
   D. SILT FENCE SHALL BE INSPECTED WEEKLY UNDER NORMAL CONDITIONS, WITHIN 24 HOURS OF A RAINFALL AND DAILY DURING A PROLONGED RAIN EVENT.
9. INSTALL INLET FILTERS ON ALL CATCH BASINS PER DETAILS.
   A. INLET FILTERS SHALL BE INSPECTED WEEKLY UNDER NORMAL CONDITIONS, WITHIN 24 HOURS OF A RAINFALL AND DAILY DURING A PROLONGED RAIN EVENT
   B. BUILD UP OF SEDIMENT AND DEBRIS SHALL BE REMOVED PROMPTLY.
   C. IF FABRIC DECOMPOSES OR BECOMES INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER IS STILL REQUIRED, THE FABRIC SHALL BE REPLACED PROMPTLY.
10. ALL STOCKPILED SOILS SHALL BE MAINTAINED IN SUCH A WAY AS TO PREVENT EROSIOIN FROM LEAVING THE SITE. IF THE STOCKPILE WILL BE ON SITE FOR MORE THAN 30 DAYS, THE STOCKPILE MUST BE SEEDED. SILT FENCE MUST BE INSTALLED AROUND THE PERIMETER OF THE STOCKPILE.
11. IF ANY DEWATERING IS NEEDED, IT SHALL BE DISCHARGED THROUGH A FILTER BAG OVER A WELL VEGETATED AREA. THE PUMP MUST DISCHARGE AT A NON-EROSIVE VELOCITY. IF NECESSARY, AN APPROVED ENERGY DISSAPTOR MAY BE USED.
12. ALL DIRT TRACKED ONTO ANY ROADWAY SHALL BE REMOVED IMMEDIATELY.
13. STREETS AND/OR PAKING AREAS WILL BE SCRAPED ON A DAILY BASIS AND SWEPT AT A MINIMUM OF ONCE PER WEEK BY THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE.
14. DURING DRY PERIODS, ALL DISTURBED AREAS SHALL BE WATERED FOR DUST CONTROL.
15. PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 5 CALENDAR DAYS AFTER FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER EARTH CHANGE ACTIVITY CEASES, TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED IMMEDIATELY. ALL TEMPORARY SOIL EROSION CONTROL SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED. ALL PERMANENT SOIL EROSION CONTROL MEASURES WILL BE IMPLEMENTED AND ESTABLISHED BEFORE A CERTIFICATE OF COMPLANCE IS ISSUED.
16. FINAL GRADE, ESTABLISH VEGETATION AND/OR LANDSCAPE ALL DISTURBED AREAS NOT BUILT OR PAVED UPON.
17. REMOVE ALL TEMPORARY SOIL EROSION DEVICES AFTER PERMANENT SURFACES ARE CONSTRUCTED.
18. SOIL TYPE: AsB, AU GRES SAND
19. NAME OF NEAREST WATERCOURSE: LONGSTAFF DRAIN
20. DISTANCE TO NEAREST WATERCOURSE IN FEET: 940 LF
21. NAME(S) AND PHONE NUMBER(S) FOR PERSON(S) RESPONSIBLE FOR THE MAINTENANCE OF ALL TEMPORARY SOIL EROSION CONTROL MEASURES: TBD
22. NAME(S) AND PHONE NUMBER(S) FOR PERSON(S) RESPONSIBLE FOR THE MAINTENANCE OF ALL PERMANENT SOIL EROSION CONTROL MEASURES: TBD
23. APPROXIMATE START DATE: JULY 2025
24. APPROXIMATE COMPLETION DATE: DECEMBER 2025
25. TOTAL ACRES DISTURBED: 0.94 ACRES

MACOMB COUNTY DEPARTMENT OF ROADS SHELBY SERVICE CENTER

SESC PLAN

STRUCTURE NO.	JOB NO.	CONT. SEC.	MCDOR WORK ORDER
NA	NA	NA	9048

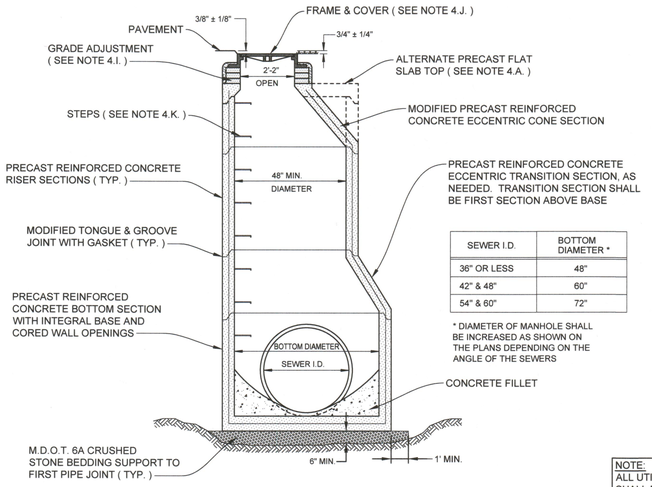
DATE	SCALE
05/16/2025	1" = 50'

REVISED BY: $REVBY$ DATE: $REVDATE$
CHECKED BY: $CHKBY$ DATE: $CHDATE$
DESIGNED BY: $DESBY$

MACOMB COUNTY
DEPARTMENT OF ROADS

SHEET NO.
9

DATE/TIME PRINTED: $DATE$ $TIME$
PRINT SCALE: AS PLOTTED
DWFILE NAME: $FILE$



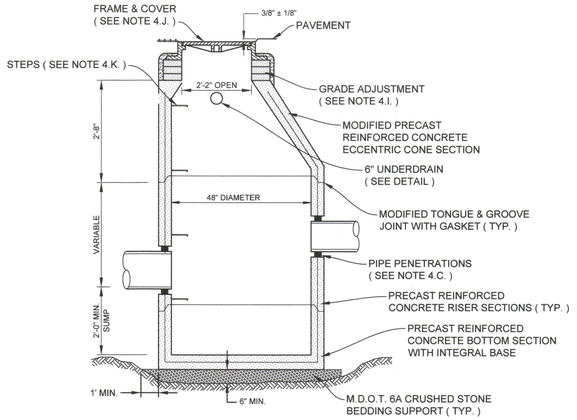
SEWER I.D.	BOTTOM DIAMETER *
36" OR LESS	48"
42" & 48"	60"
54" & 60"	72"

* DIAMETER OF MANHOLE SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE ANGLE OF THE SEWERS

STORM SEWER MANHOLE

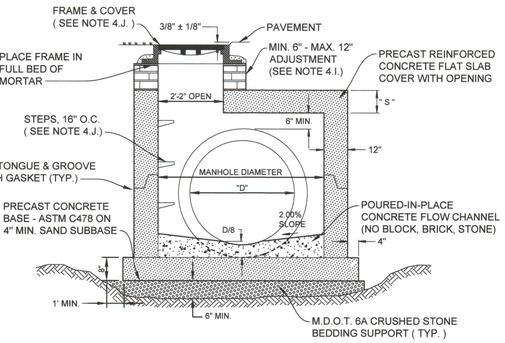
NOT TO SCALE

NOTE:
ALL UTILITY STRUCTURE ENTRY SHALL BE IN ACCORDANCE WITH MIOSHA REQUIREMENTS.



CATCH BASIN

NOT TO SCALE



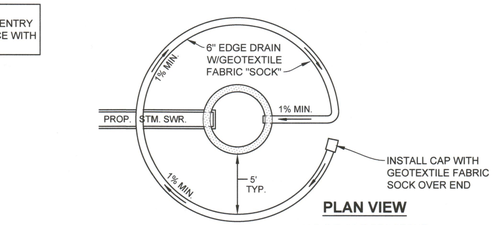
OUTLET "D"	M.H. I.D.*	TOP SLAB "S"	REINFORCING STEEL
36" OR LESS	4'	9"	3/4" @ 9" EA. WAY
42"	5'	10"	3/4" @ 9" EA. WAY
48"- 54"	6'	11"	7/8" @ 9" EA. WAY
60" OR MORE	7'	12"	1" @ 9" EA. WAY
	8'	12"	1" @ 9" EA. WAY

*DIAMETER OF MANHOLE SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE ANGLE OF THE SEWERS

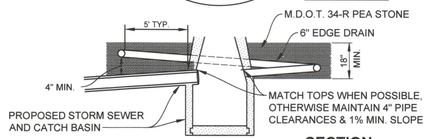
NOTE:
SUPPORT PIPE TO UNDISTURBED GROUND WITH 1/4" - 1 1/2" ANGULAR STONE

LOWHEAD FLAT SLAB

NOT TO SCALE



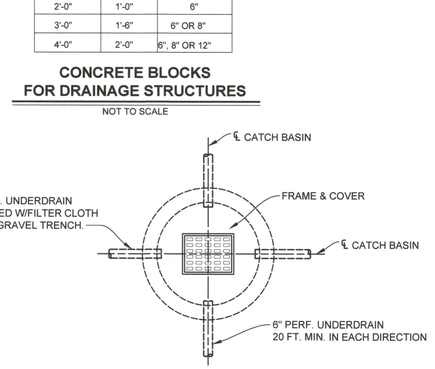
PLAN VIEW



SECTION

UNDERDRAIN DETAIL IN GRASS AREAS & PARKING LOTS

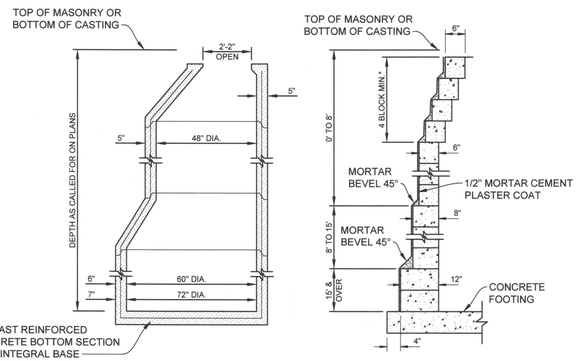
NOT TO SCALE



STRUCTURE DIAMETER	R	X
2'-0"	1'-0"	6"
3'-0"	1'-6"	6" OR 8"
4'-0"	2'-0"	6", 8" OR 12"

CONCRETE BLOCKS FOR DRAINAGE STRUCTURES

NOT TO SCALE



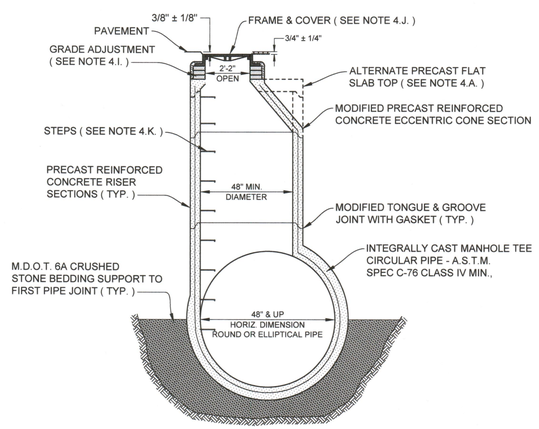
TYPICAL PRECAST CONCRETE SECTION

TYPICAL CONCRETE BLOCK SECTION

* 6 BLOCK MIN. FOR 5'-0" DIA. STRUCTURE ONLY TO BE USED WITH WRITTEN APPROVAL FROM THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS

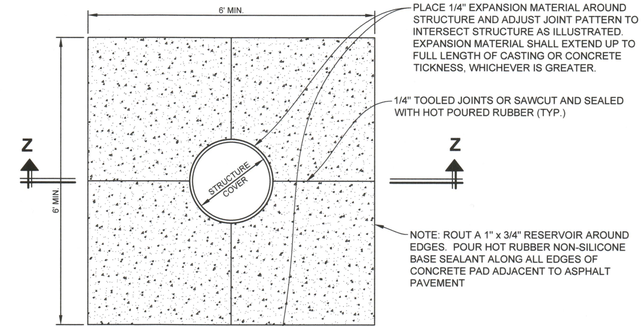
TYPICAL WALL SECTIONS FOR ALL DRAINAGE STRUCTURES

NOT TO SCALE

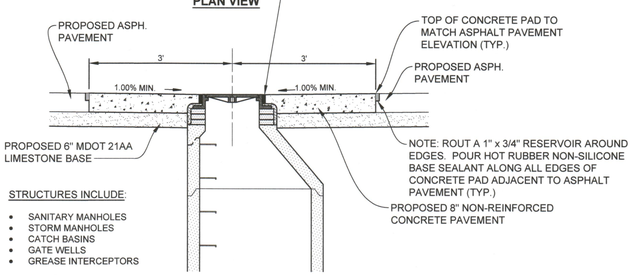


STORM SEWER MANHOLE TEE

NOT TO SCALE



PLAN VIEW



STRUCTURES INCLUDE:

- SANITARY MANHOLES
- STORM MANHOLES
- CATCH BASINS
- GATE WELLS
- GREASE INTERCEPTORS

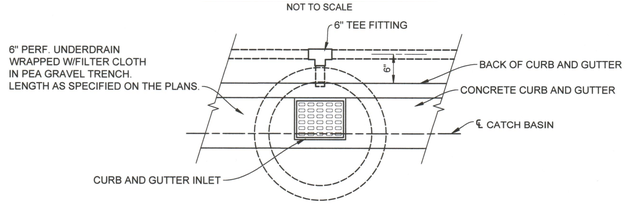
SECTION Z-Z

CONCRETE PAD DETAIL AT STRUCTURE IN ASPHALT PAVEMENT

NOT TO SCALE

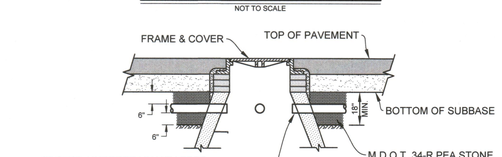
ALTERNATE CATCH BASIN UNDERDRAIN IN PARKING LOT WITH TOWNSHIP APPROVAL

NOT TO SCALE



CATCH BASIN UNDERDRAIN ALONG CURB

NOT TO SCALE



UNDERDRAIN DETAIL

NOT TO SCALE

ANDERSON, ECKSTEIN AND WESTRICK, INC.

CIVIL ENGINEERS SURVEYORS ARCHITECTS

51301 Schoenherr Road
Shelby Township
Michigan 48315

Phone 586 726 1234
Fax 586 726 8780

www.aewinc.com

ENGINEERING STRONG COMMUNITIES

Shelby Township
- Chartered 1978 -

DATE	SUBMITTALS/REVISIONS

DRAWN BY:	CHECKED BY:	DATE:
DM	JA	FEBRUARY 2022

M:\0132\0132-1408\DWG\STDDETAILS\STM_1.DWG
STM 1–10/11/2023 2:45:12 PM

STATE OF MICHIGAN
ASEEL A. PUTROS
LICENSE No. 6201055083
LICENSED PROFESSIONAL ENGINEER

ASEEL A. PUTROS, P.E. NO. 6201055083

DEPARTMENT OF PUBLIC WORKS

APPROVED BY
DAVID G. MILLER II, DIRECTOR

DATE: 12/6/2023

CHARTER TOWNSHIP OF SHELBY

STANDARD STORM SEWER DETAILS
(1 OF 2)

SHEET NO.

STM1

COPYRIGHT, 2022, ANDERSON, ECKSTEIN AND WESTRICK, INC.

GENERAL NOTES

1. STANDARDS AND SPECIFICATIONS

A. ALL STORM SEWER AND STORM DRAINAGE SYSTEM CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS, THE MACOMB COUNTY OFFICE OF PUBLIC WORKS, THE MACOMB COUNTY DEPARTMENT OF ROADS (MCDR) AND THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, AS APPLICABLE. CONSTRUCTION AND MATERIALS SHALL ALSO CONFORM TO THE APPLICABLE CURRENT ASTM STANDARD SPECIFICATION OR PRACTICE, WHEN REFERENCED.

B. ANY MATERIALS OTHER THAN THOSE LISTED ON THE STANDARD DETAIL SHEETS MUST BE APPROVED IN WRITING BY THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS. CONTRACTOR MUST SUBMIT THREE (3) COPIES OF SHOP DRAWINGS AND SPECIFICATIONS FOR PROPOSED ALTERNATE MATERIAL TO THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS FOR REVIEW AS AN APPROVED EQUAL. DETERMINATION OF ACCEPTANCE BY THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS SHALL BE CONSIDERED FINAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REVIEW OF THE PROPOSED ALTERNATE MATERIAL AS AN APPROVED EQUAL.

C. ALL STORM SEWER AND STORM DRAINAGE SYSTEM CONSTRUCTION SHALL HAVE COMPETENT CONSTRUCTION OBSERVATION PROVIDED BY, OR CAUSED TO BE PROVIDED BY, THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH LIKE MATERIAL. ALL COSTS FOR LOCATING, SUPPORTING, REMOVING AND REPLACING, RELOCATING OR REPAIRING THESE UTILITIES SHALL BE BORNE BY THE CONTRACTOR. THE CONTRACTOR SHALL VERIFY THE DEPTH AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES BEFORE ANY WORK IS STARTED. THE EXACT LOCATION OF EXISTING UTILITIES SHALL BE DETERMINED BY HAND DIGGING.

2. PRE-CONSTRUCTION REQUIREMENTS

A. THE DEVELOPER SHALL PROVIDE A BREAKDOWN OF CONSTRUCTION COST TO THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS DEPARTMENT AND PAY ALL REQUIRED FEES PRIOR TO SCHEDULING A PRE-CONSTRUCTION MEETING.

B. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING AT A TIME AND PLACE AS ARRANGED BY THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS. THE DESIGN ENGINEER SHALL NOTIFY AFFECTED UTILITY COMPANIES AND GOVERNMENTAL AGENCIES A MINIMUM OF TEN (10) DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING. THE DESIGN ENGINEER SHALL OBTAIN APPROVALS FROM AFFECTED UTILITY COMPANIES AND GOVERNMENTAL AGENCIES A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO PRE-CONSTRUCTION MEETING. CONSTRUCTION SHALL START WITHIN TWO (2) WEEKS OF THE MEETING UNLESS WAIVED BY THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS.

C. THE CONTRACTOR SHALL NOTIFY MISS DIG AT (800) 482-7171 OR (811), THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS AT (586) 731-5990, AND ANDERSON, ECKSTEIN AND WESTRICK, INC. AT (586) 726-1234 THREE (3) WORKING DAYS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY REPRESENTATIVES OF ANY OTHER FACILITIES, LOCATED IN THE VICINITY OF THE WORK, WHICH ARE NOT PARTICIPANTS OF THE MISS DIG SYSTEM. THE CONTRACTOR SHALL NOTIFY THE MACOMB COUNTY OFFICE OF PUBLIC WORKS AT (586) 469-5325, AND THE MACOMB COUNTY DEPARTMENT OF ROADS (MCDR) AT (586) 463-8671 TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION.

D. A MACOMB COUNTY OFFICE OF PUBLIC WORKS, MACOMB COUNTY DEPARTMENT OF ROADS (MCDR), AND/OR MICHIGAN DEPARTMENT OF TRANSPORTATION PERMIT IS REQUIRED FOR ALL CONSTRUCTION WITHIN THEIR ROAD AND/OR DRAIN RIGHT-OF-WAYS AND/OR EASEMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL PERMITS AND BONDS PRIOR TO CONSTRUCTION, OR ENSURE THAT ALL REQUIRED PERMITS AND BONDS HAVE BEEN OBTAINED PRIOR TO CONSTRUCTION.

3. PIPE MATERIAL

C. ONLY NEW UNDAMAGED STORM SEWER PIPE SHALL BE USED. THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS SHALL HAVE THE RIGHT TO REJECT ANY OR ALL PIPE.

D. TWELVE INCH (12") AND LARGER PIPE SHALL BE REINFORCED CONCRETE CIRCULAR SEWER PIPE WITH MINIMUM WALL THICKNESS C (ASTM C76, CLASS IV). SIZE AND CLASS OF PIPE SHALL BE AS INDICATED ON THE PLANS. ALL REINFORCED CONCRETE SEWER PIPE SHALL BE CAST WITH REINFORCING STEEL EXTENDING INTO THE BELL. ALL JOINTS SHALL BE MODIFIED TONGUE AND GROOVE WITH GASKET (ASTM C361). GASKETS SHALL BE SYNTHETIC RUBBER. NATURAL RUBBER GASKETS ARE NOT ACCEPTABLE. ALL CONCRETE STORM SEWER THIRTY-SIX INCH (36") OR LARGER SHALL HAVE POINTED JOINTS.

E. THE FOLLOWING PLASTIC PIPE MAY ONLY BE USED WITH THE WRITTEN AUTHORIZATION OF THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS AND WHEN THE PIPE WILL NOT BE SUBJECT TO CRUSHING LOADS FROM CONSTRUCTION EQUIPMENT AND PROPERTY MAINTENANCE AND A MINIMUM THREE FEET (3') OF COVER CAN BE MAINTAINED:

COMPOSITE (PVC TRUSS) PIPE:	POLYVINYL CHLORIDE (PVC) COMPOSITE (TRUSS) SEWER PIPE (ASTM D2680) WITH GASKETED JOINTS (ASTM D3212).
PVC SOLID WALL PIPE:	PVC TYPE PS-115 PLASTIC GRAVITY FLOW SEWER PIPE (ASTM F789), PVC SOLID PLASTIC PIPE, SCHEDULE 40 (ASTM D1785), OR PVC SOLID PLASTIC PIPE, SDR 26 (ASTM D3034) WITH GASKETED JOINTS (ASTM D3212).
CORRUGATED PVC:	CORRUGATED PVC SEWER PIPE WITH A SMOOTH INTERIOR SURFACE (ASTM F949) WITH GASKETED PUSH-ON JOINTS (ASTM D3212). GASKET SHALL BE A DOUBLE SEALING GASKET THAT INDEXES TWO (2) CORRUGATIONS. CORRUGATED PVC SEWER PIPE SHALL BE INSTALLED WITH CRUSHED STONE ENCASEMENT BEDDING.
PVC CLOSED PROFILE:	PVC CLOSED PROFILE GRAVITY SEWER PIPE (ASTM F1803) WITH BELL AND SPIGOT TYPE JOINTS WITH ELASTOMERIC SEALS (ASTM D3212). PVC CLOSED PROFILE GRAVITY PIPE SHALL BE INSTALLED WITH CRUSHED STONE ENCASEMENT BEDDING.
CORRUGATED POLYETHYLENE:	CORRUGATED POLYETHYLENE (PE) PIPE WITH A SMOOTH INTERIOR (ASTM F2306). WATERTIGHT PIPE JOINTS SHALL MEET A 10.8 PSI LABORATORY TEST PER ASTM D3212 AND UTILIZE A BELL AND SPIGOT DESIGN WITH A GASKET MEETING ASTM F477. BELL SHALL SPAN OVER THREE (3) SPIGOT CORRUGATIONS. ONLY TWELVE INCH (12") THROUGH TWENTY-FOUR INCH (24") PIPE WILL BE CONSIDERED.

4: DRAINAGE STRUCTURES

A. ALL NEW MANHOLES SHALL BE PRECAST REINFORCED CONCRETE, FLEXIBLE-JOINT TYPE (ASTM C478). THE TOP SECTION SHALL BE A MODIFIED ECCENTRIC CONE SECTION. ALTERNATELY, THE MANHOLE MAY BE CONSTRUCTED WITH A REINFORCED CONCRETE FLAT SLAB COVER (ASTM C478). THE BASE SECTION FOR EIGHT INCH (8") TO SIXTY INCH (60") DIAMETER SEWERS SHALL BE A PRECAST RISER SECTION WITH AN INTEGRAL BASE. JOINTS AND GASKETS SHALL BE MODIFIED TONGUE AND GROOVE (ASTM C443). ALL LIFTING HOLES SHALL BE FILLED WITH A NON-SHRINK TYPE MORTAR COMPOSED OF TYPE IIA CEMENT. NON-SHRINK TYPE MORTAR SHALL BE PRECO OR SEKA SET. NO LIME SHALL BE USED IN THE MORTAR. ALTERNATELY, THE BASE SECTION FOR SEWERS FORTY EIGHT INCHES (48") IN DIAMETER AND LARGER MAY BE A MANHOLE TEE (ASTM C76, CLASS IV MINIMUM).

NOTE: NEW MANHOLES MAY ALSO BE CONSTRUCTED WITH CONCRETE BLOCK, WITH DEPARTMENT OF PUBLIC WORKS DIRECTOR APPROVAL ONLY, AND MDOT TYPE R-2 MORTAR WITH A PRECAST CONCRETE BASE (ASTM C478) OR A POURED CONCRETE BASE (2500 PSI AT 28 DAYS). IF A PRECAST BASE IS USED, PLACE A MINIMUM SIX INCH (6") 6A SUB-BASE. THE EXTERIOR OF THE CONCRETE BLOCK DRAINAGE STRUCTURE SHALL HAVE A ONE-HALF INCH (½") MORTAR CEMENT PLASTER COAT. MANMADE STRUCTURES MAY ONLY BE USED WITH THE WRITTEN PERMISSION FROM THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS.

B. ALL NEW CATCH BASINS SHALL BE FORTY EIGHT INCH (48") DIAMETER (MINIMUM) PRECAST REINFORCED CONCRETE, FLEXIBLE-JOINT TYPE (ASTM C478). THE TOP SECTION SHALL BE A MODIFIED ECCENTRIC CONE SECTION. THE BASE SECTION SHALL BE A PRECAST RISER SECTION WITH AN INTEGRAL BASE. JOINTS AND GASKETS SHALL BE MODIFIED TONGUE AND GROOVE (ASTM C443). ALL LIFTING HOLES SHALL BE FILLED WITH A NON-SHRINK TYPE MORTAR COMPOSED OF TYPE IIA CEMENT. NON-SHRINK TYPE MORTAR SHALL BE PRECO OR SEKA SET. NO LIME SHALL BE USED IN THE MORTAR. ALL CATCH BASINS SHALL BE CONSTRUCTED WITH A TWO FOOT (2') SUMP (MINIMUM).

NOTE: NEW CATCH BASINS MAY ALSO BE CONSTRUCTED WITH CONCRETE BLOCK, WITH DEPARTMENT OF PUBLIC WORKS DIRECTOR APPROVAL ONLY, AND MDOT TYPE R-2 MORTAR WITH A PRECAST CONCRETE BASE (ASTM C478) OR A POURED CONCRETE BASE (2500 PSI AT 28 DAYS). IF A PRECAST BASE IS USED, PLACE A MINIMUM SIX INCH (6") 6A SUB-BASE. THE EXTERIOR OF THE DRAINAGE STRUCTURE SHALL HAVE A ONE-HALF INCH (½") MORTAR CEMENT PLASTER COAT.

C. PIPE PENETRATION JOINTS FOR NEW PRECAST REINFORCED DRAINAGE STRUCTURES SHALL BE A FLEXIBLE WATER-TIGHT JOINT, "KOR-N-SEAL" FOR SEWERS SIX INCH (6") THROUGH THIRTY INCH (30") IN DIAMETER AND "A-LOK" FOR SEWERS THIRTY-SIX INCH (36") IN DIAMETER AND LARGER. HOLES FOR PIPES SHALL BE CAST IN THE RISER SECTION SO AS TO PROVIDE A MINIMUM CLEARANCE OF TWO INCHES (2") BETWEEN THE INSIDE BOTTOM OF THE BASE SECTION AND THE OUTSIDE WALL OF THE PIPE. PIPE SHALL NOT EXTEND INTO A MANHOLE BEYOND THE INTERIOR FACE OF THE MANHOLE WALL.

D. EXISTING PRECAST DRAINAGE STRUCTURES SHALL BE TAPPED WITH THE "KOR-N-SEAL" METHOD, WITH A WATER-TIGHT RUBBER BOOT FOR SEWERS SIX INCH (6") THROUGH FIFTEEN INCH (15") IN DIAMETER. EXISTING BRICK DRAINAGE STRUCTURES, AND TAPS FOR SEWERS EIGHTEEN INCH (18") IN DIAMETER AND LARGER, SHALL HAVE HOLES DRILLED AT FOUR INCHES (4") CENTER TO CENTER AROUND THE PERIPHERY OF THE OPENING TO CREATE A PLANE OF WEAKNESS BEFORE BREAKING OUT THE SECTION. NON-SHRINK GROUT, PRECO OR SEKA SET, SHALL BE USED TO SEAL THE OPENING. A CONCRETE COLLAR SHALL BE POURED TWELVE INCHES (12") AROUND THE PIPE AND EXTEND TWELVE INCHES (12") EXTERIOR TO THE DRAINAGE STRUCTURE.

E. THE CONTRACTOR SHALL BE REQUIRED TO RECONSTRUCT ANY DRAINAGE STRUCTURE THAT IS DAMAGED WHILE BEING TAPPED.

F. FIELD TAPS SHALL NOT BE ALLOWED TO THE PIPE SECTION OF MANHOLE TEES. TAPPING OF RISER SECTIONS IS PERMITTED WITH THE WRITTEN AUTHORIZATION OF THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS.

G. ALL CONNECTIONS TO THE STORM SEWER SHALL BE MADE AT A MANHOLE OR CATCH BASIN. NO BLIND TAPS TO STORM SEWERS WILL BE ALLOWED FOR STORM SEWER OR SUMP LEAD CONNECTIONS.

H. ALL DRAINAGE STRUCTURES SHALL HAVE UNDERDRAIN, CONSTRUCTED IN ACCORDANCE WITH THE DETAILS ON SHEET STM 1.

I. GRADE ADJUSTMENTS SHALL BE MADE USING MDOT GRADE S-II CONCRETE BRICKS (ASTM C55) IN FULL MORTAR BED. MORTAR COAT ALL OPEN SPACES AND IRREGULARITIES ON THE INSIDE OF BRICKWORK TO FORM DRAINAGE STRUCTURE INTERIOR. MORTAR COAT ALL OPEN SPACES AND IRREGULARITIES ON THE OUTSIDE OF BRICKWORK. TAPER OUTSIDE MORTAR COAT A MINIMUM OF ONE PERCENT (1%) FROM THE FRAME FLANGE TO THE DRAINAGE STRUCTURE OUTSIDE DIAMETER. BRICKWORK AND MORTAR SHALL NOT OVERHANG BEYOND THE OUTSIDE DIAMETER OF THE DRAINAGE STRUCTURE. MORTAR SHALL BE MDOT TYPE R-2. MINIMUM ADJUSTMENT SHALL BE SIX INCHES (6") AND MAXIMUM SHALL BE TWELVE INCHES (12").

J. DRAINAGE STRUCTURE FRAMES AND COVERS SHALL BE AS FOLLOWS:

MANHOLE:	EJIW 1040 WITH TYPE B COVER OR APPROVED EQUAL
CATCH BASIN (PAVEMENT TYPE): (NO CURB & GUTTER)	EJIW 5100Z WITH TYPE M1 5105 GRATE OR APPROVED EQUAL
CATCH BASIN (PAVEMENT TYPE): (STR. FACE CURB & GUTTER)	EJIW 7045 WITH TYPE M1 GRATE AND 7050 T1 BACK OR APPROVED EQUAL
CATCH BASIN (PAVEMENT TYPE): (MOUNTABLE CURB & GUTTER)	EJIW 7065 WITH 7045 TYPE M1 GRATE AND 7060 T1 BACK OR APPROVED EQUAL
CATCH BASIN (YARD TYPE):	EJIW 1040 WITH TYPE M1, M2 OR TYPE N GRATE OR APPROVED EQUAL
CATCH BASIN (DITCH TYPE):	EJIW 1040 WITH TYPE N, O2 GRATE OR APPROVED EQUAL

K. STEPS SHALL BE M.A. INDUSTRIES P.S.I. POLYPROPYLENE OR MSU #360 ALU POLY MANHOLE STEPS AND INSTALLED AT SIXTEEN INCHES (16") CENTER TO CENTER SPACING. STEPS SHALL HAVE FOOT RECESS AND BE SUITABLY SCORED TO PROVIDE A NONSLIP SURFACE. BOTTOM STEP SHALL BE TWENTY-FOUR INCHES (24") MAXIMUM ABOVE FLOOR. TOP STEP SHALL BE TWENTY INCHES (24") MAXIMUM BELOW RIM. STEPS SHALL NORMALLY BE PROVIDED ON A BACK WALL OF THE DRAINAGE STRUCTURE FURTHEST FROM TRAFFIC. IF A DRAINAGE STRUCTURE IS INSTALLED AT A LOCATION WITHIN EXISTING TRAFFIC FLOW, STEPS SHALL BE PROVIDED SUCH THAT PERSONNEL WILL FACE ON-COMING TRAFFIC.

L. ALL STRUCTURES RECEIVING STORM RUN-OFF SHALL HAVE AT LEAST A TWO FOOT (2') SUMP.

5. CONSTRUCTION

A. NO GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWNSPOUT DRAINAGE OR WEEP TILE DRAINAGE SHALL BE ALLOWED TO ENTER ANY SANITARY SEWER INSTALLATION.

B. A MINIMUM VERTICAL CLEARANCE OF ONE AND ONE-HALF FEET (1-½') MUST BE MAINTAINED BETWEEN THE STORM SEWER AND ANY UTILITIES.

C. VERTICAL TOLERANCES FOR STRUCTURE RIM GRADES SHALL BE:

MANHOLE IN PAVEMENT	- 0.00 TO + 0.00 FEET
CATCH BASIN IN PAVEMENT	- 0.25 TO + 0.00 FEET
STRUCTURES IN R.O.W. AND/OR FRONT YARD	- 0.30 TO + 0.00 FEET
STRUCTURES IN REAR YARD	- 0.30 TO + 0.00 FEET

D. ALL SEWER PIPE SHALL BE LAID USING A LASER TO MAINTAIN GRADE AND ALIGNMENT.

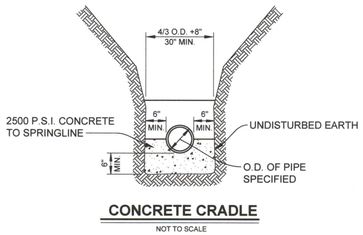
E. ALL SEWER PIPE AND APPURTENANCES SHALL BE STAKED FOR LINE AND GRADE UNDER THE SUPERVISION OF A LICENSED LAND SURVEYOR OR A LICENSED ENGINEER. CUT SHEETS SHALL BE PROVIDED TO THE TOWNSHIP ENGINEER AND THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS. NO SEWER SHALL BE LAID WITHOUT STAKES.

F. ALL SEWER PIPE AND APPURTENANCES SHALL BE STAKED UNDER THE SUPERVISION OF A LICENSED LAND SURVEYOR OR A LICENSED ENGINEER. ALL SIGNIFICANT POINTS OF EACH ELEMENT SHALL BE LOCATED. THIS SHALL INCLUDE BUT NOT BE LIMITED TO ALIGNMENT STAKES, OFFSET STAKES, CENTERLINE STAKES AND BENCHMARK REFERENCES. STAKES SHALL BE MARKED WITH ALIGNMENT AND ELEVATION / GRADE CONTROL. CUT SHEETS SHALL BE PROVIDED TO THE TOWNSHIP ENGINEER AND THE CHARTER TOWNSHIP OF SHELBY DEPARTMENT OF PUBLIC WORKS. NO SEWER SHALL BE LAID WITHOUT STAKES.

G. ANY BUILDING CONNECTION OR SUMP PUMP LEAD SHALL CONNECT TO A CATCH BASIN OR MANHOLE, ALL SUMP PUMP LEAD CONNECTIONS TO PRECAST STRUCTURES SHALL BE CORED. SUMP LEADS SHALL BE A MINIMUM OF THREE INCH (3") PVC SCHEDULE 40 PIPE WITH FUSED JOINTS.

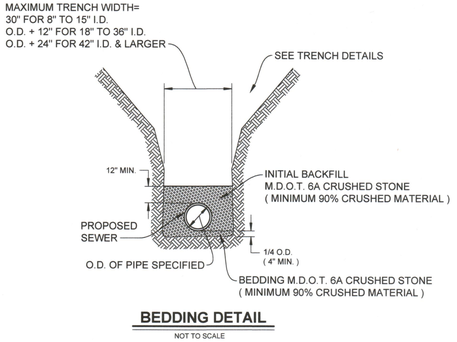
6. TESTING AND ACCEPTANCE

A. ALL CORRUGATED PVC SEWER PIPE (ASTM F949), PVC CLOSED PROFILE GRAVITY SEWER PIPE (ASTM F1803) AND CORRUGATED PE SEWER PIPE (ASTM 2306) FOR PUBLIC STORM SEWER INSTALLATIONS SHALL BE SUBJECT TO DEFLECTION TESTING, NO EARLIER THAN THIRTY (30) DAYS AFTER CONSTRUCTION, WITH A NINE (9) SIDED MANDREL. A PROVING RING, PROVIDED BY THE CONTRACTOR, SHALL BE AVAILABLE FOR ALL DEFLECTION TESTS. THE HORIZONTAL AND VERTICAL DEFLECTION AT THE TIME OF INITIAL TESTING SHALL NOT EXCEED FIVE PERCENT (5%). ANY SEWER FOUND EXCEEDING THESE LIMITS SHALL BE REPLACED BY AND AT THE CONTRACTOR'S EXPENSE.



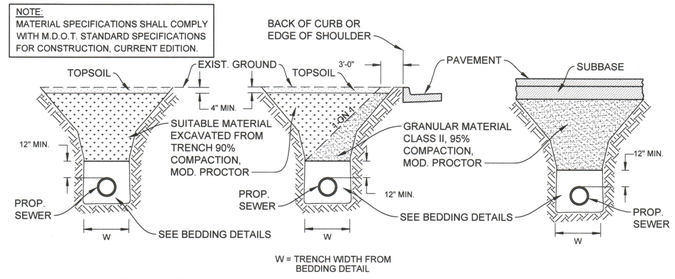
CONCRETE CRADLE

NOT TO SCALE



BEDDING DETAIL

NOT TO SCALE



PROP. STORM SEWER NOT UNDER ROADBED

TRENCH DETAIL "A"

PROP. STORM SEWER UNDER ROADBED OR WITHIN INFLUENCE OF ROADBED

TRENCH DETAIL "B"

TRENCH DETAILS

NOT TO SCALE

ANDERSON, ECKSTEIN AND WESTRICK, INC.

CIVIL ENGINEERS SURVEYORS ARCHITECTS

51301 Schoenherr Road
Shelby Township
Michigan 48315

Phone 586 726 1234
Fax 586 726 8780

www.aewinc.com

ENGINEERING STRONG COMMUNITIES

Shelby Township
Chartered 1978

DATE	SUBMITTALS/REVISIONS	
DRAWN BY:	CHECKED BY:	DATE:
DM	JA	FEBRUARY 2022

M:\0132\01321-1408\DWG\STDDETAILS\STM_2.DWG
STM 2–11/17/2023 10:01:28 AM

STATE OF MICHIGAN
ASEEL A. PUTROS
LICENSE No. 6201055083
LICENSED PROFESSIONAL ENGINEER

ASEEL A. PUTROS, P.E. NO. 6201055083

DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
DAVID G. MILLER II, DIRECTOR

DATE: 12/6/2023

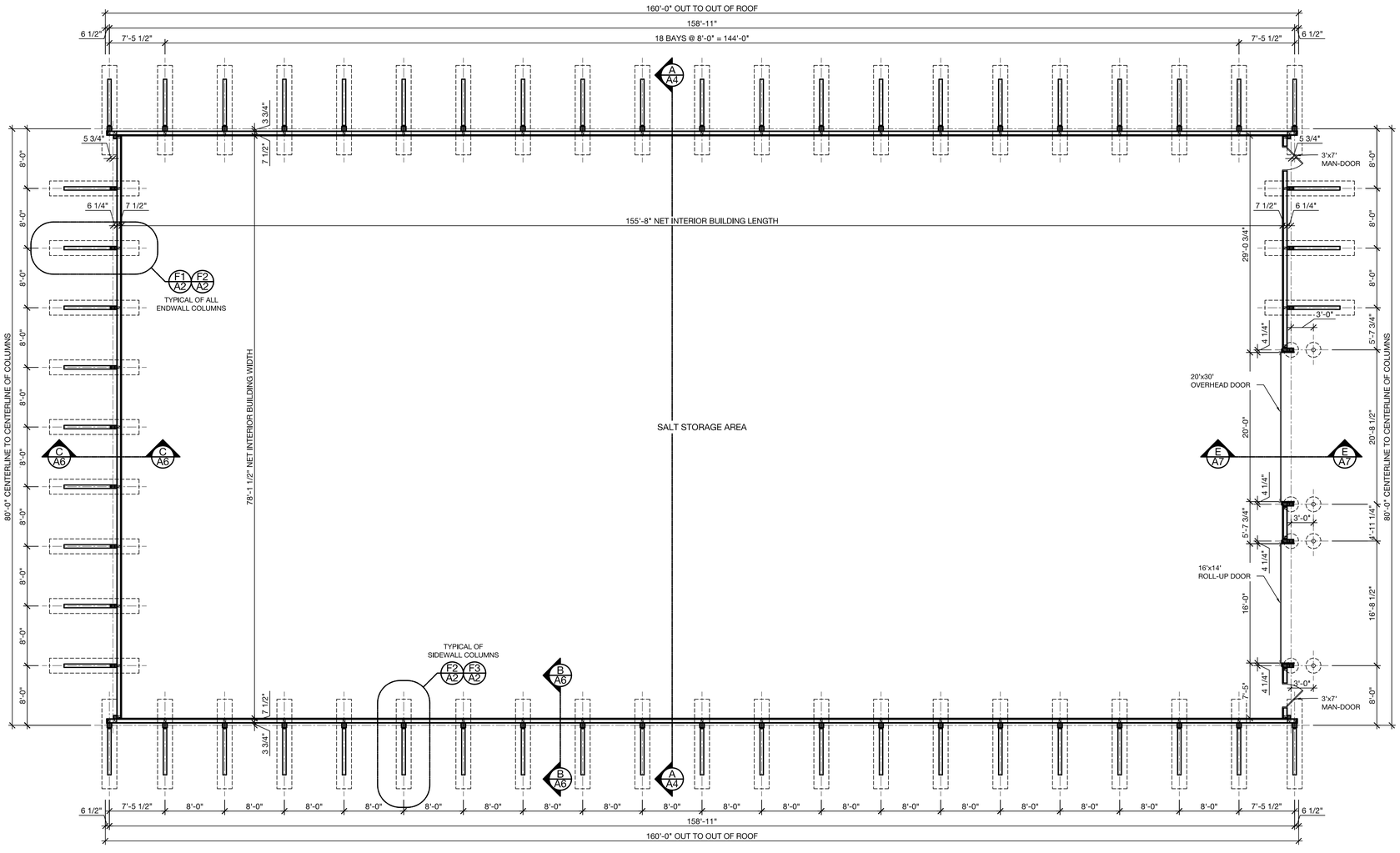
CHARTER TOWNSHIP OF SHELBY

STANDARD STORM SEWER DETAILS (2 OF 2)

SHEET NO.

STM2

COPYRIGHT, 2022, ANDERSON, ECKSTEIN AND WESTRICK, INC.



FOUNDATION/FLOOR PLAN

1/8"=1'-0"

INDEX OF DRAWINGS:

NOTES:

1. ALL FASTENERS USED IN PRESSURE-TREATED WOOD TO MEET MINIMUM REQUIREMENTS OF G185.
2. ALL TRUSS CONNECTOR PLATES SHALL BE G185 AND EPOXY COATED IN FIELD.
3. PLYWOOD SIDING TO BE ATTACHED USING 6D RING SHANK GALVANIZED NAILS @ 6" o.c.
4. ATTACH 2x MEMBERS USING 16D RING SHANK GALVANIZED NAILS.
5. ALL EXTERIOR T-111 PLYWOOD SIDING AND TRIM SHALL RECEIVE 2 COATS OF STAIN.
6. ALL REINFORCING STEEL SHALL BE EPOXY COATED.

DESIGN CRITERIA:

GROUND SNOW LOAD:	25 PSF
WIND LOAD:	101 MPH
WIND EXPOSURE:	B
RISK CATEGORY:	1
ENCLOSURE:	PARTIALLY ENCLOSED
CONSTRUCTION TYPE:	VB
FLOOD PLANE:	ZONE X - MINIMAL RISK AREA
OCCUPANCY:	S-2
CODE:	2015 MICHIGAN BUILDING CODE

SEISMIC PARAMETERS:

SEISMIC USE GROUP:	I
SEISMIC SITE CLASS:	D DEFAULT
0.2 SECOND MAPPED SPECTRAL RESPONSE ACCELERATION (SS):	0.089
1.0 SECOND MAPPED SPECTRAL RESPONSE ACCELERATION (S1):	0.043
DESIGN SPECTRAL ACCELERATION AT SHORT PERIODS (SDS):	0.095
DESIGN SPECTRAL RESPONSE ACCELERATION AT 1SECOND PERIOD (SD1):	0.069
SEISMIC DESIGN CATEGORY:	B

FOUNDATION PARAMETERS:

NET ALLOWABLE BEARING PRESSURE:	2,000 PSF (PROVIDED)
MINIMUM FOUNDATION DEPTH REQUIRED:	4.0 FEET
SOIL UNIT WEIGHT:	115 PSF
SOIL FRICTION ANGLE:	30 DEGREES
AT REST EARTH PRESSURE COEFFICIENT (KO):	0.50
ACTIVE EARTH PRESSURE COEFFICIENT (KA):	0.33
PASSIVE EARTH PRESSURE COEFFICIENT (KP):	3.0
COEFFICIENT OF SLIDING FRICTION FOR C.I.P. CONCRETE:	0.40
COEFFICIENT OF SLIDING FRICTION FOR PRECAST CONCRETE:	0.30

ADVANCED STORAGE TECHNOLOGY, INC.
13140 Route 31
Savannah, NY 13146
716-262-1002
www.saltstorage.com

SECOR ENGINEERING, PLLC
(315) 730-6023

NEW 80' x 160' x 12'
SALT STORAGE BUILDING
51235 NAPI DRIVE
SHELBY TOWNSHIP, MI 48315

FOUNDATION/
FLOOR PLAN

DRAWN	CPD
CHECKED	
DATE	10/09/2024
PROJECT	24033

SUBMISSION	DATE
REVISION #1	04/23/2025
REVISION #2	05/02/2025

STATE OF MICHIGAN
David Secor
ENGINEER
No. 6201313757
REGISTERED PROFESSIONAL ENGINEER

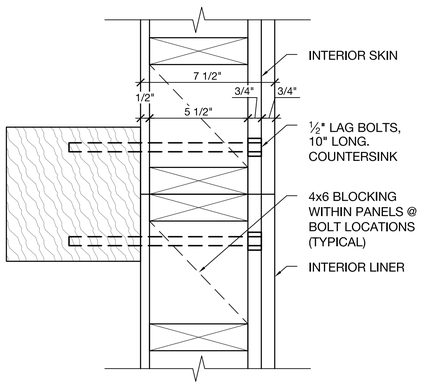
COPYRIGHT 2024

A-1

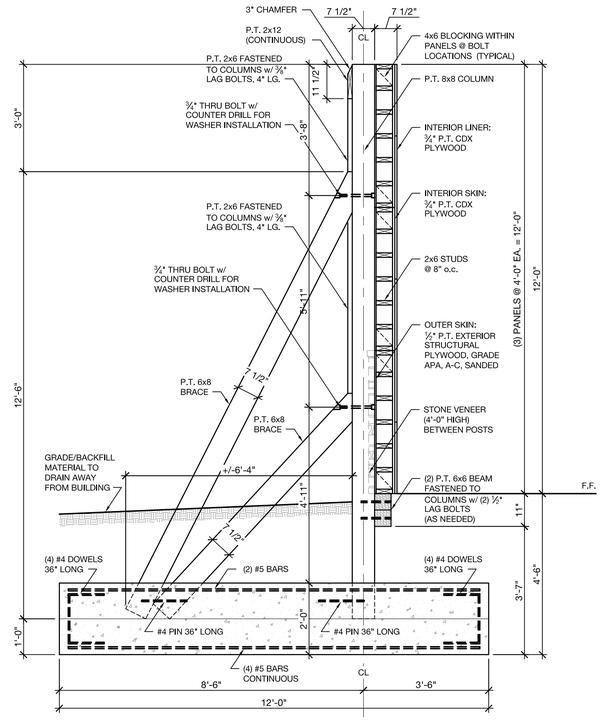
STRESS SKIN PANELS

4'-0" WIDE PANELS CONSISTING OF:
-2x6 PRESSURE TREATED PERIMETER STUDS
-2x6 INTERNAL WOOD STUDS @ 8" o.c.
-OUTER SKIN: ½" PRESSURE TREATED EXTERIOR STRUCTURAL PLYWOOD, GRADE APA, A-C, SANDED
-INTERIOR SKIN: ¾" PRESSURE TREATED CDX PLYWOOD
-INTERIOR LINER: ¾" PRESSURE TREATED CDX PLYWOOD
-1x2 PRESSURE TREATED WOOD BATTENS AT EXTERIOR HORIZONTAL JOINTS
-NAILING: AS SHOWN ON DRAWINGS AND IN SPECIFICATIONS
-ADHESIVE: PL500
-REFER TO SPECIFICATIONS FOR LUMBER GRADE AND TYPES

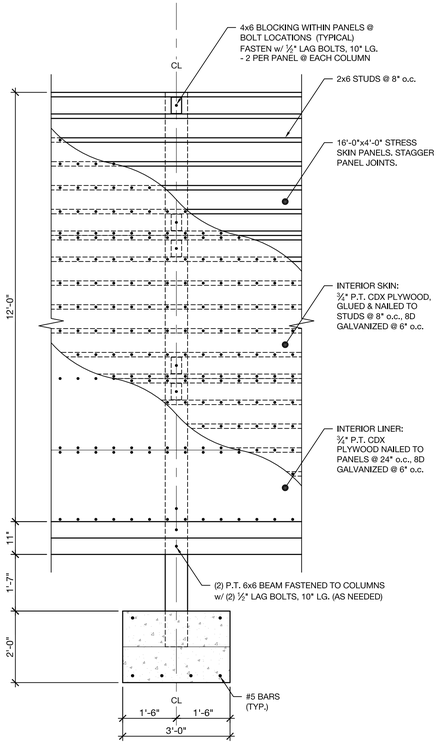
NOTE: BOTH INNER AND OUTER PLYWOOD SKINS ARE TO BE BOTH NAILED AND GLUED TO BOTH INTERIOR AND PERIMETER STUDS. GLUE TO BE APPLIED IN CONTINUOUS BEADS.



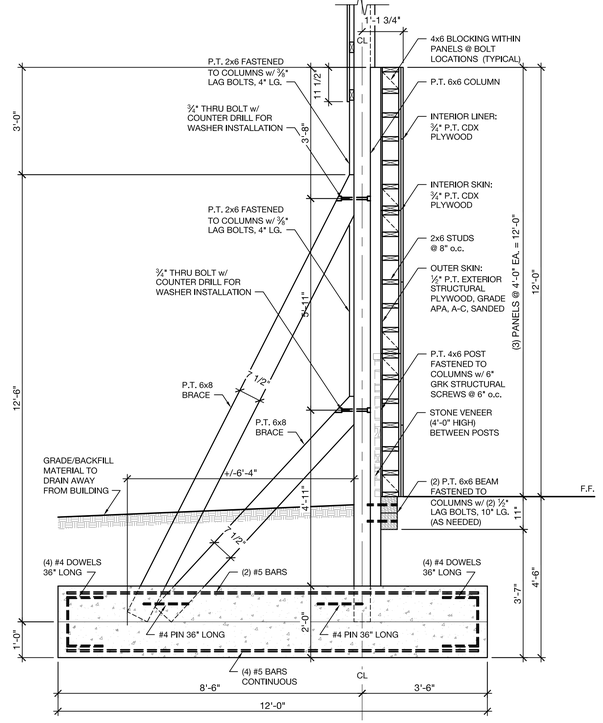
BARRIER WALL FASTENING DETAIL
3"=1'-0"



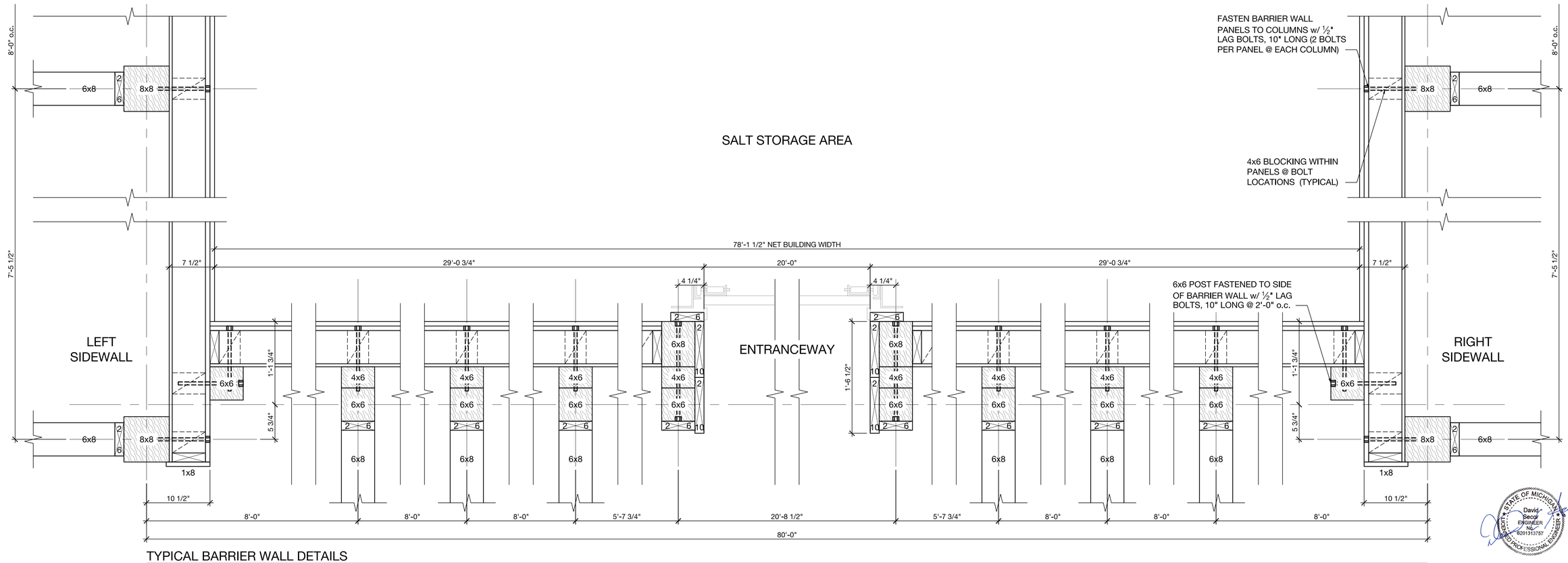
FOUNDATION AT SIDEWALL COLUMNS 'F3'
1/2"=1'-0"



ELEVATION AT BARRIER WALL 'F2'
1/2"=1'-0"



FOUNDATION AT ENDWALL COLUMNS 'F1'
1/2"=1'-0"



TYPICAL BARRIER WALL DETAILS
1 1/2"=1'-0"

ADVANCED STORAGE TECHNOLOGY, INC.
13140 Route 31
Savannah, NY 13146
716-262-1002
www.saltstorage.com

SECOR ENGINEERING, PLLC
(315) 730-6023

NEW 80' x 160' x 12'
SALT STORAGE BUILDING
51235 NAPI DRIVE
SHELBY TOWNSHIP, MI 48315

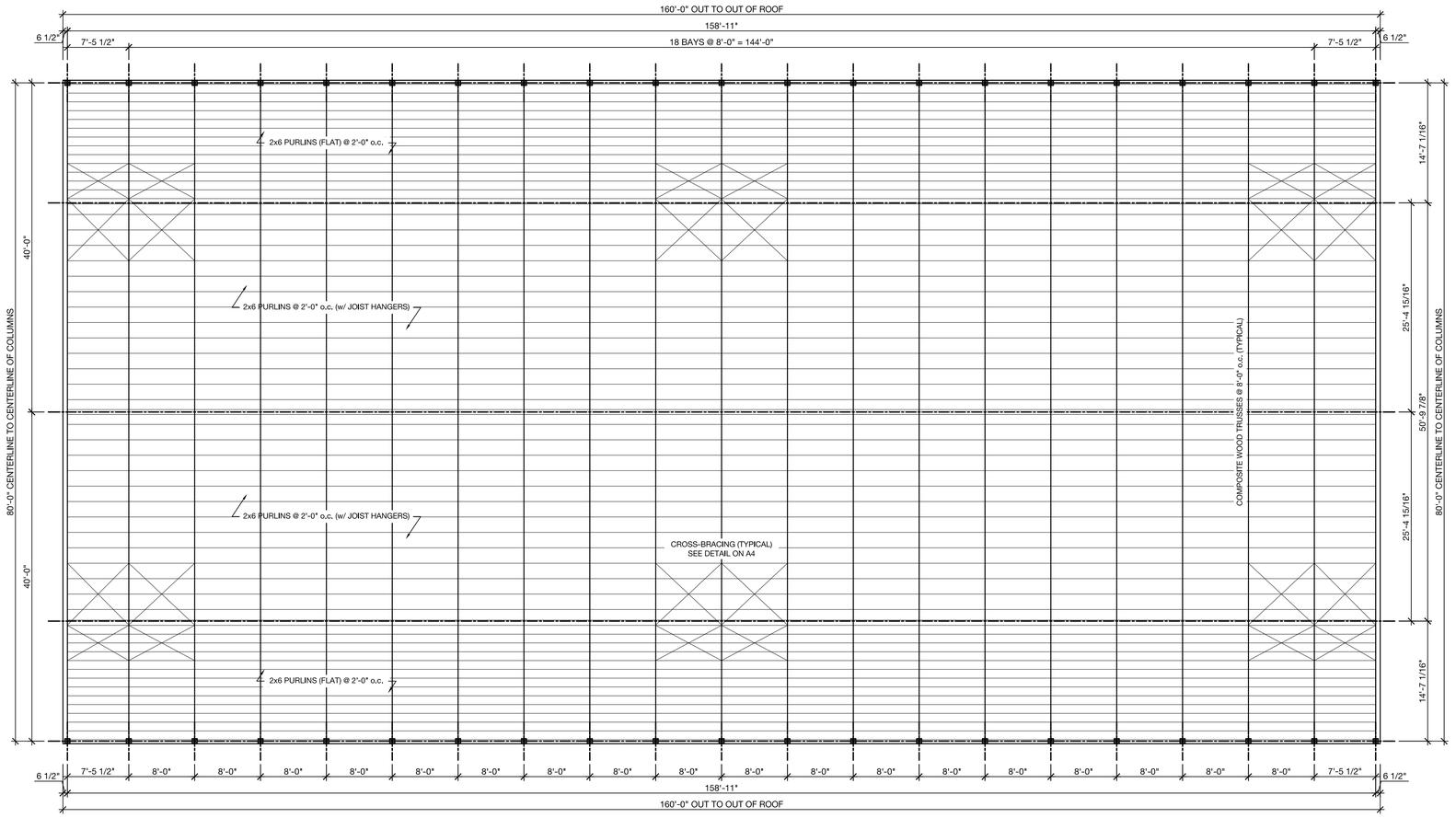
FOUNDATION WALL DETAILS

DRAWN	CPD
CHECKED	
DATE	10/09/2024
PROJECT	24033

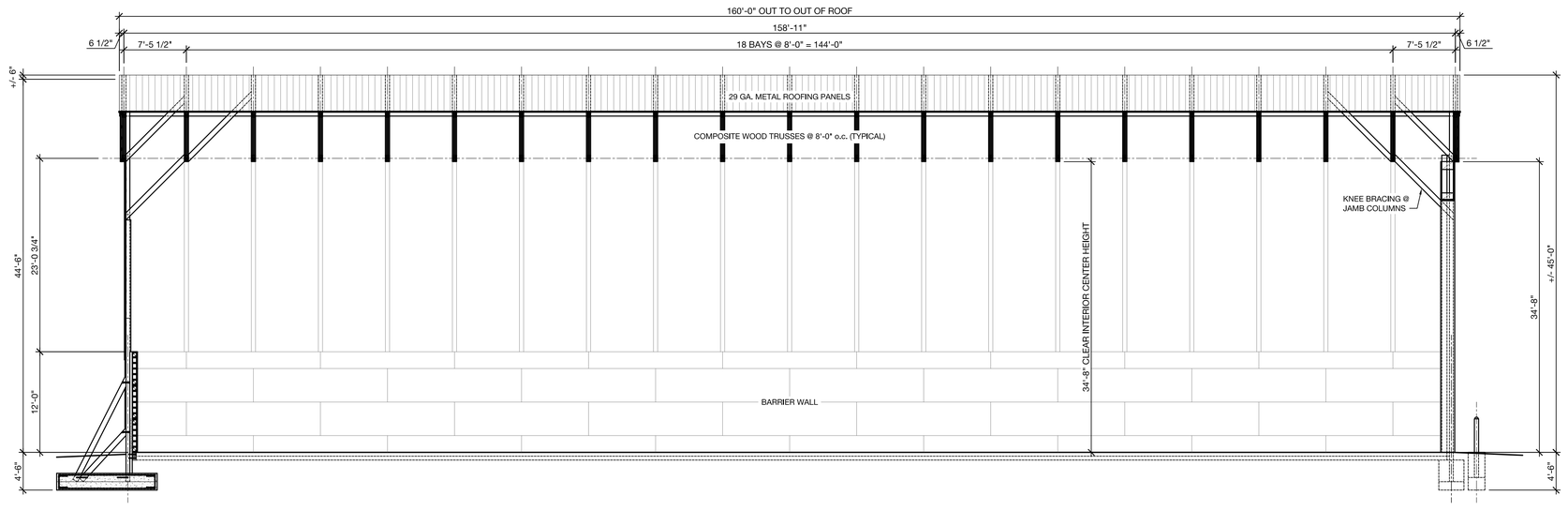
SUBMISSION REVISION #1	DATE 04/23/2025

A-2

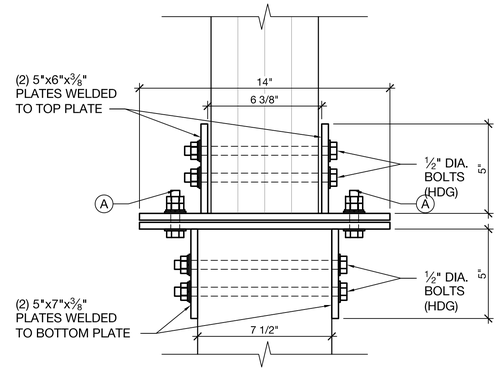
COPYRIGHT 2024



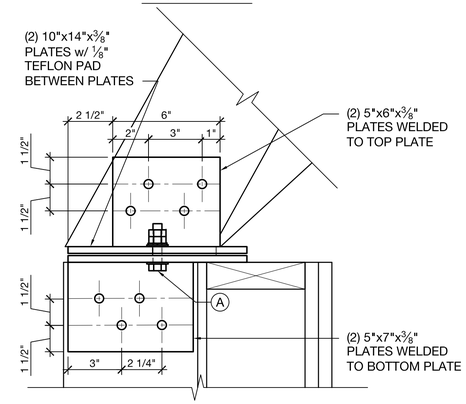
ROOF FRAMING PLAN
1/8"=1'-0"



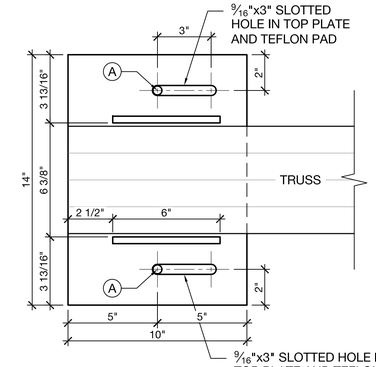
LONGITUDINAL BUILDING SECTION
1/8"=1'-0"



FRONT VIEW



SIDE VIEW

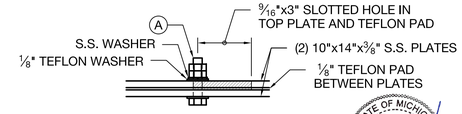


PLAN

NOTE:

(A) 1/2" BOLTS BOTTOM NUT TO BE HAND TIGHTENED FIRMLY LOCK WITH ADDITIONAL NUT. PROVIDE TEFLON WASHER UNDER STAINLESS STEEL WASHER.

ALL PLATES, BOLTS, & WASHERS TO BE STAINLESS STEEL AS SPECIFIED.



BOLT & WASHER DETAIL

TRUSS BEARING PLATE DETAILS
3"=1'-0"

ADVANCED STORAGE TECHNOLOGY, INC.
13140 Route 31
Savannah, NY 13146
716-262-1002
www.saltstorage.com

SECOR ENGINEERING, PLLC
(315) 730-6023

NEW 80' x 160' x 12'
SALT STORAGE BUILDING
51235 NAPI DRIVE
SHELBY TOWNSHIP, MI 48315

ROOF FRAMING PLAN & DETAILS

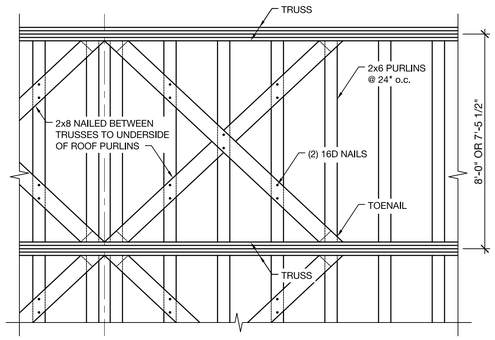
DRAWN	CPD
CHECKED	
DATE	10/09/2024
PROJECT	24033

SUBMISSION	DATE
REVISION #1	04/23/2025

STATE OF MICHIGAN
David Secor
ENGINEER
No. 6201313757
LICENSED PROFESSIONAL ENGINEER

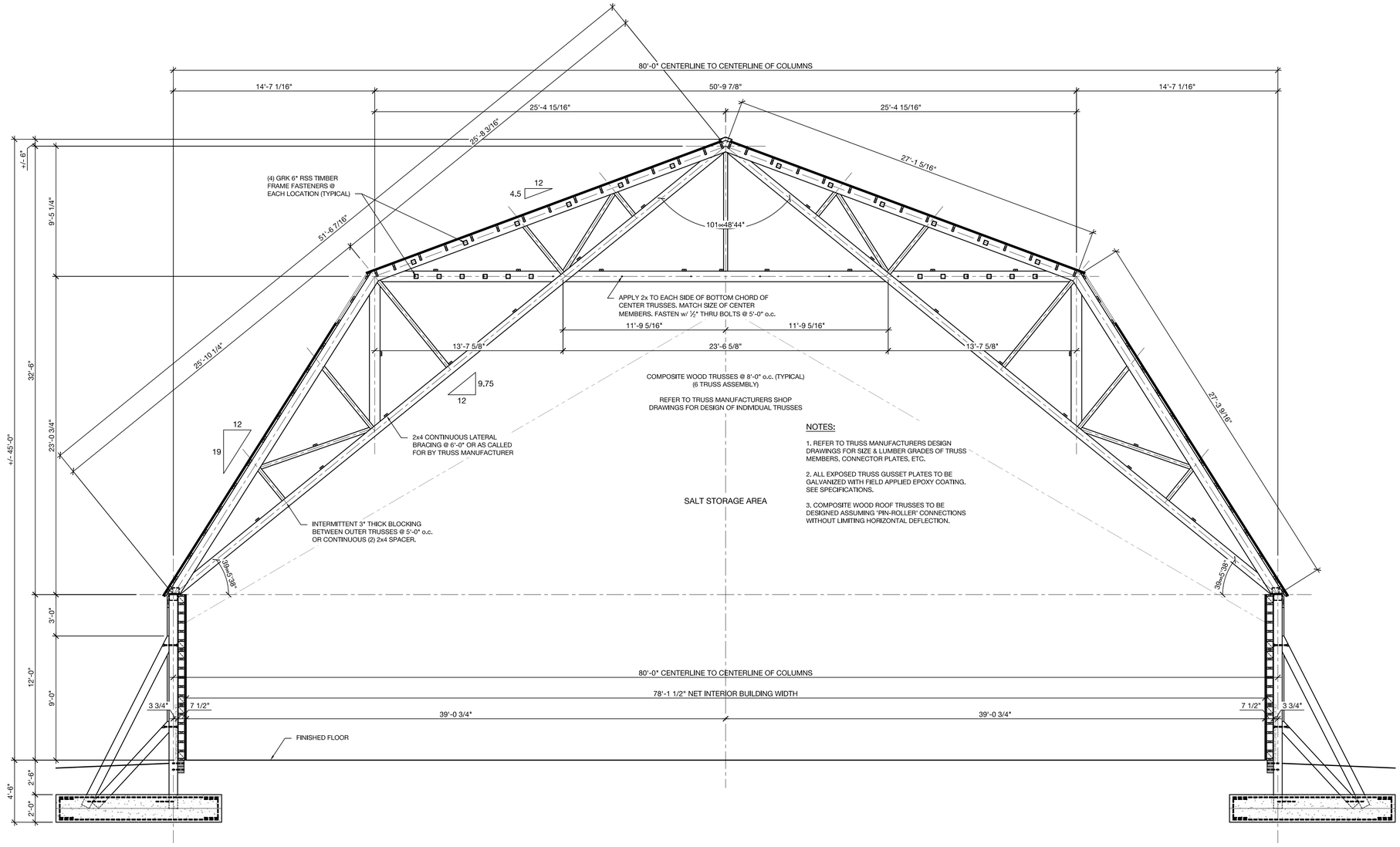
COPYRIGHT 2024

A-3



TYPICAL CROSS BRACING DETAIL

3/8"=1'-0"



TYPICAL BUILDING SECTION 'A'

1/4"=1'-0"

ADVANCED STORAGE TECHNOLOGY, INC.
13140 Route 31
Savannah, NY 13146
716-262-1002
www.saltstorage.com

SECOR ENGINEERING, PLLC
(315) 730-6023

NEW 80' x 160' x 12'
SALT STORAGE BUILDING
51235 NAPI DRIVE
SHELBY TOWNSHIP, MI 48315

BUILDING SECTION

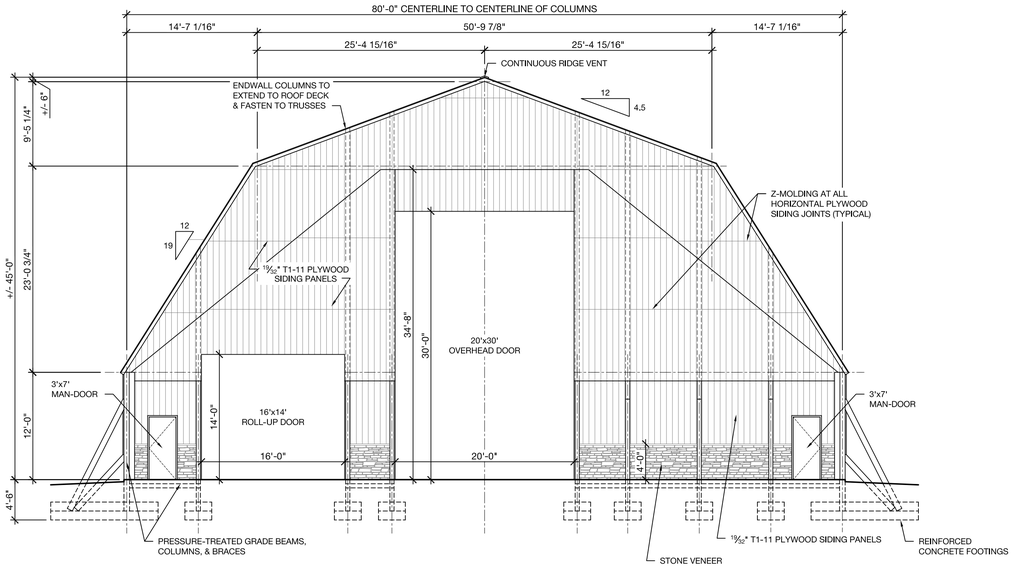
DRAWN	CPD
CHECKED	
DATE	10/09/2024
PROJECT	24033

DATE	04/23/2025
SUBMISSION	
REVISION #1	

STATE OF MICHIGAN
David Secor
ENGINEER
No. 6201313757
REGISTERED PROFESSIONAL ENGINEER

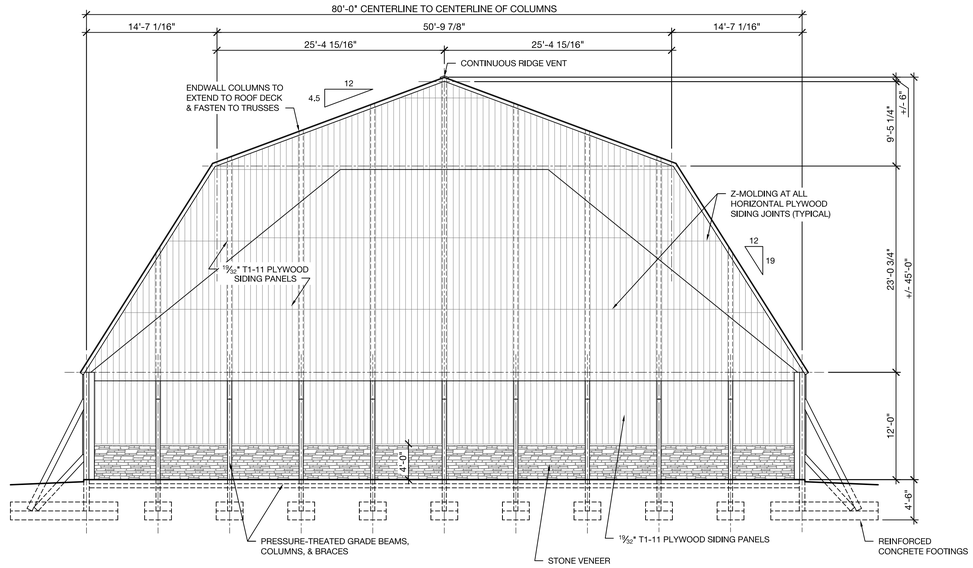
A-4

COPYRIGHT 2024



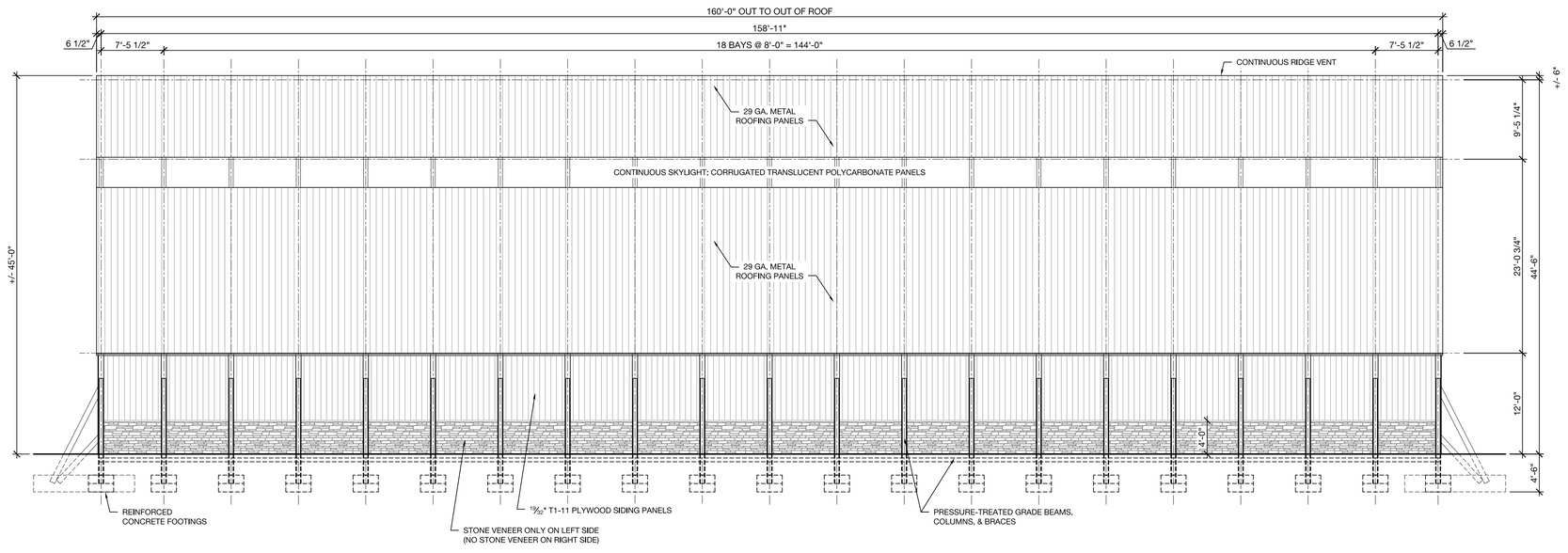
FRONT ELEVATION

1/8"=1'-0"



REAR ELEVATION

1/8"=1'-0"



RIGHT & LEFT SIDE ELEVATIONS

1/8"=1'-0"

ADVANCED STORAGE TECHNOLOGY, INC.
13140 Route 31
Savannah, NY 13146
716-262-1002
www.saltstorage.com

SECOR ENGINEERING, PLLC
(315) 730-6023

NEW 80' x 160' x 12'
SALT STORAGE BUILDING
51235 NAPI DRIVE
SHELBY TOWNSHIP, MI 48315

ELEVATIONS

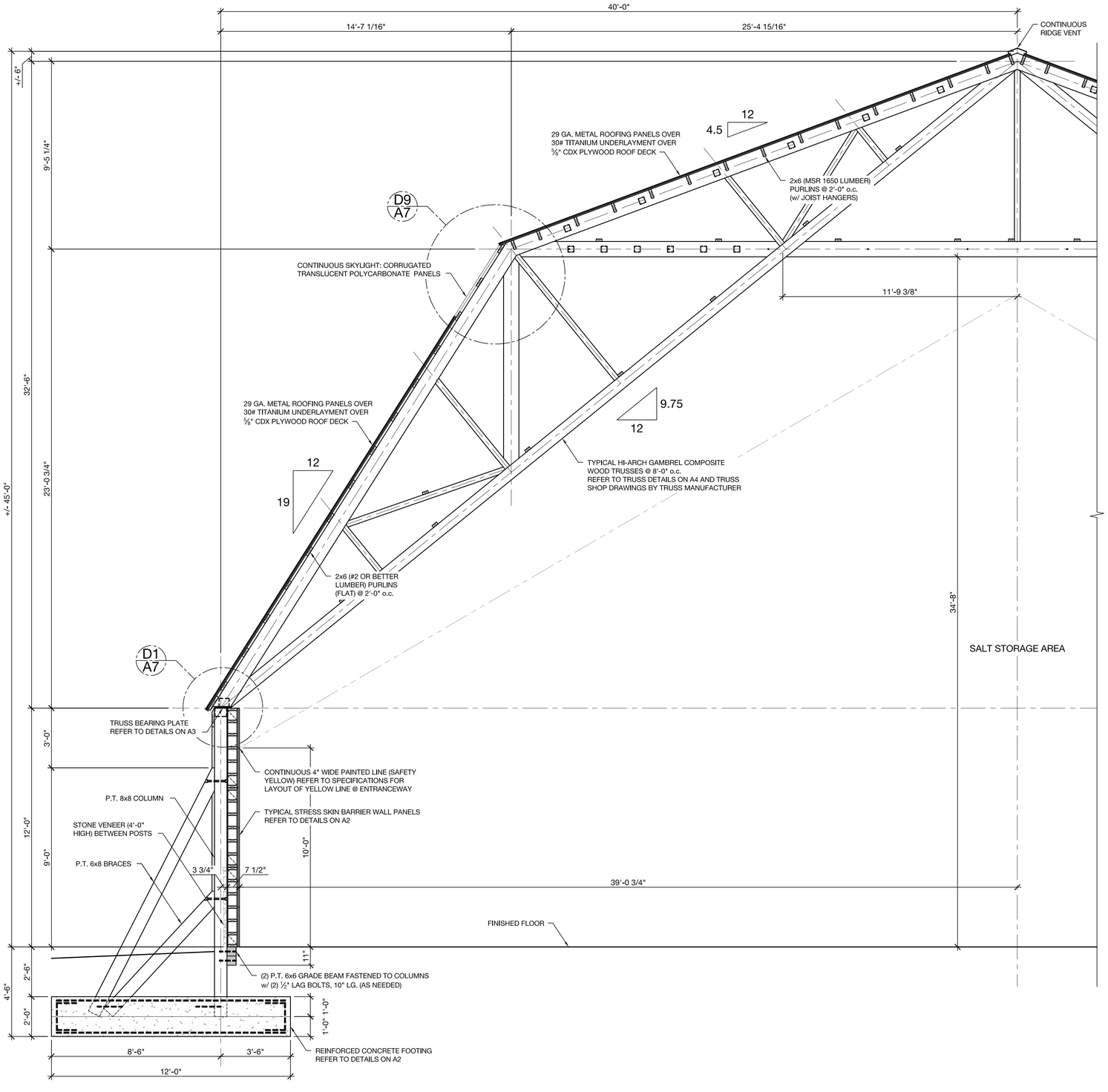
DRAWN	CPD
CHECKED	
DATE	10/09/2024
PROJECT	24033

SUBMISSION	DATE
REVISION #1	04/23/2025
REVISION #2	05/02/2025

STATE OF MICHIGAN
David Secor
ENGINEER
NO. 6201313757
REGISTERED PROFESSIONAL ENGINEER

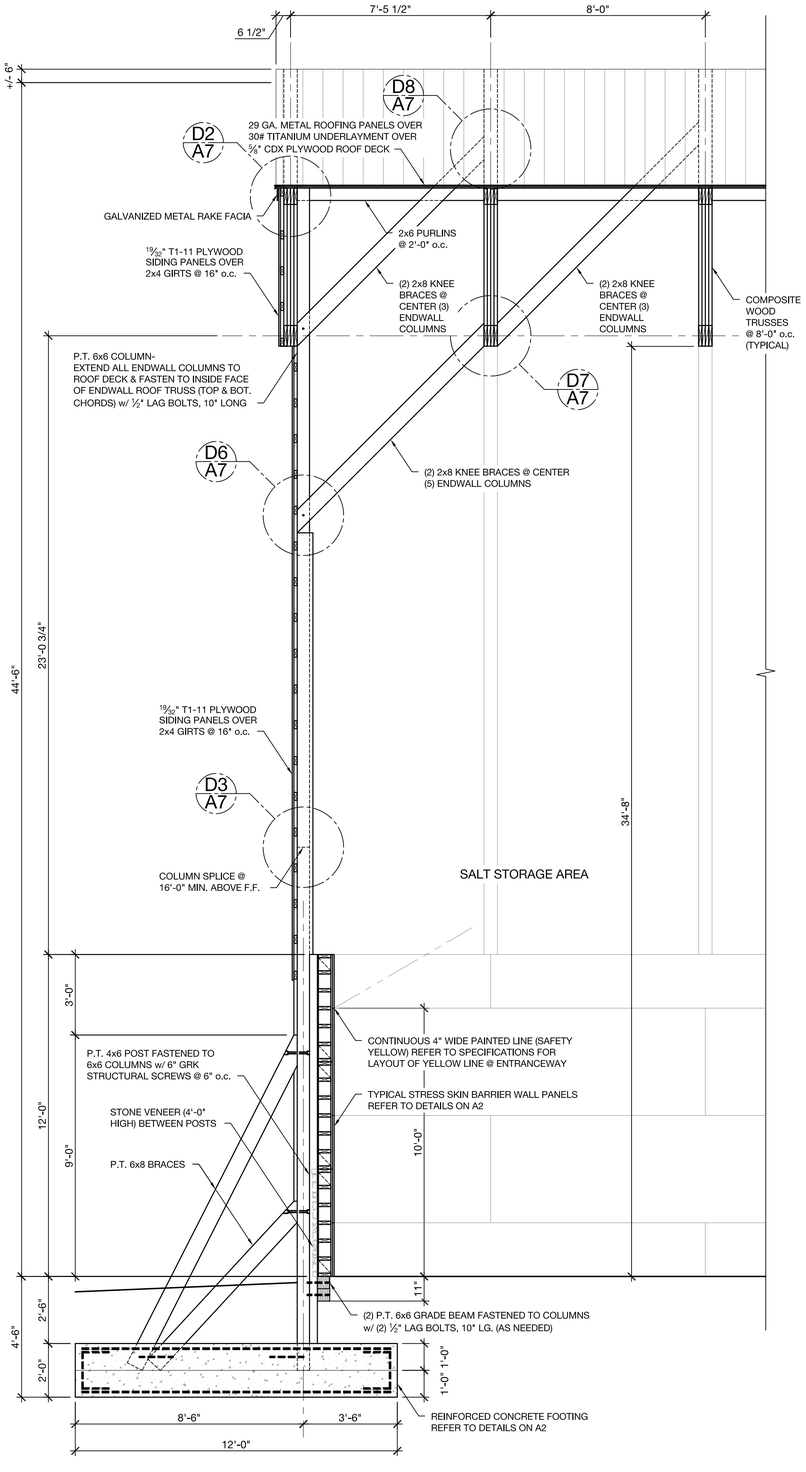
COPYRIGHT 2024

A-5



TYPICAL SIDEWALL SECTION 'B'

3/8"=1'-0"



TYPICAL ENDWALL SECTION 'C'

3/8"=1'-0"

ADVANCED STORAGE TECHNOLOGY, INC.
13140 Route 31
Savannah, NY 13146
716-262-1002
www.saltstorage.com

SECOR ENGINEERING, PLLC
(315) 730-6023

NEW 80' x 160' x 12'
SALT STORAGE BUILDING
51235 NAPI DRIVE
SHELBY TOWNSHIP, MI 48315

WALL SECTIONS

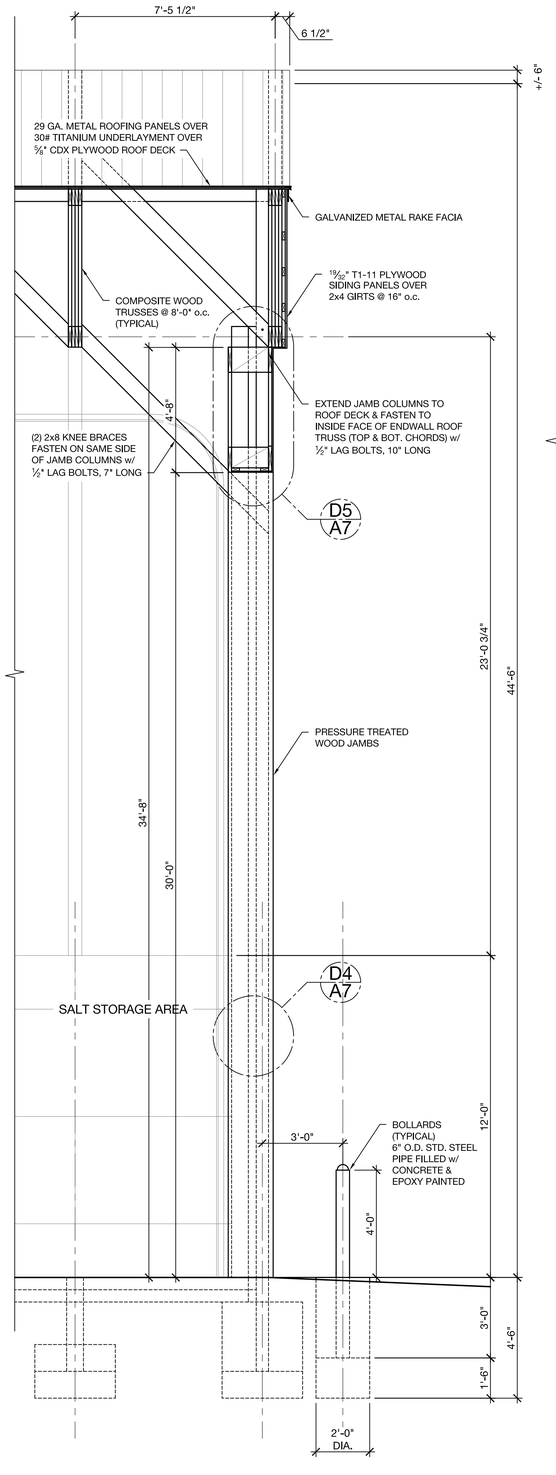
DRAWN	CPD
CHECKED	
DATE	10/09/2024
PROJECT	24033

SUBMISSION / REVISION #1	DATE
	04/23/2025

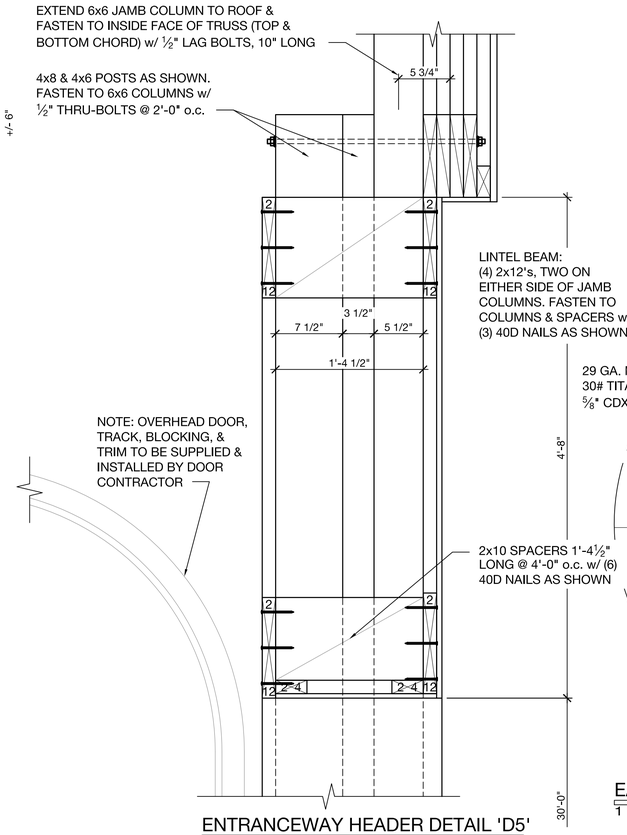
STATE OF MICHIGAN
David Secor
ENGINEER
No. 6201351757
REGISTERED PROFESSIONAL ENGINEER

COPYRIGHT 2024

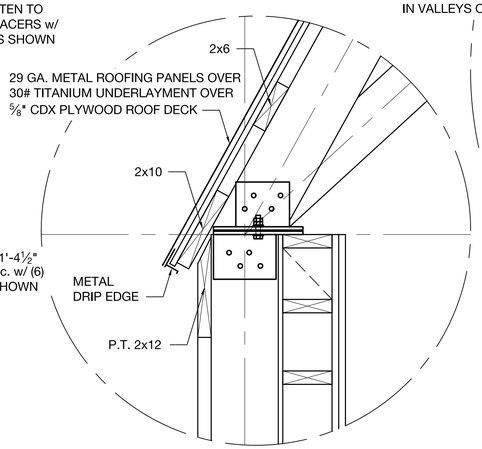
A-6



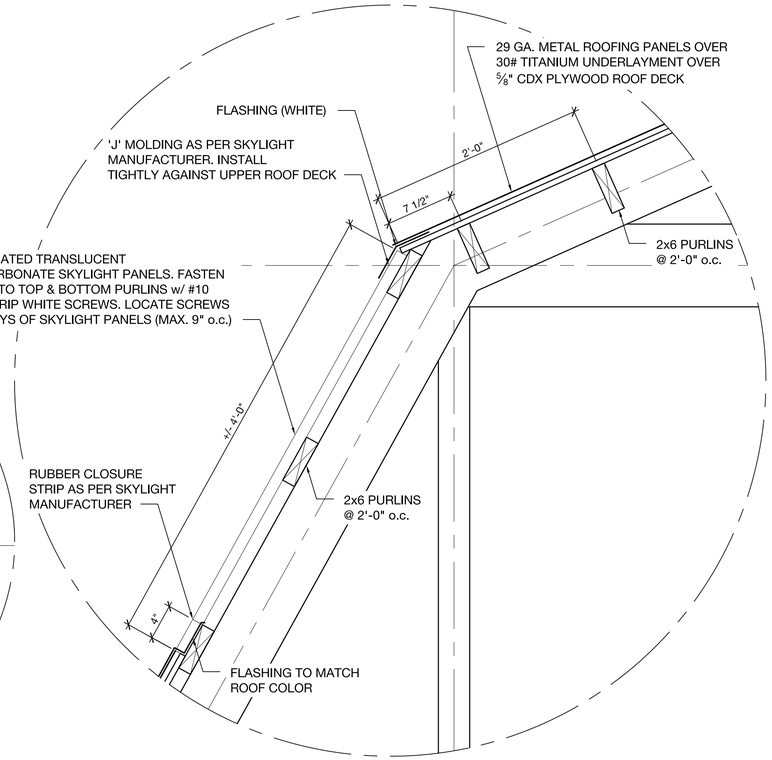
TYPICAL ENDWALL SECTION 'E'
3/8"=1'-0"



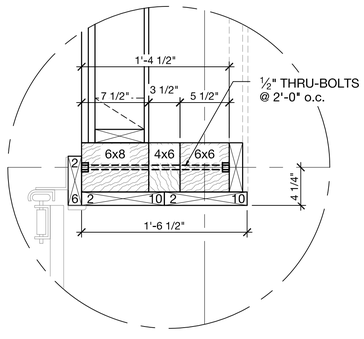
ENTRANCEWAY HEADER DETAIL 'D5'
1 1/2"=1'-0"



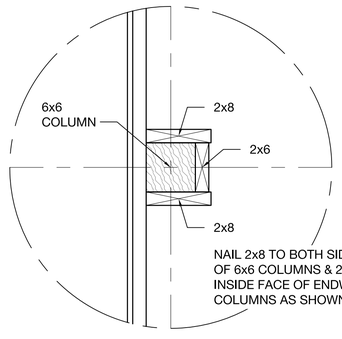
EAVE DETAIL 'D1'
1 1/2"=1'-0"



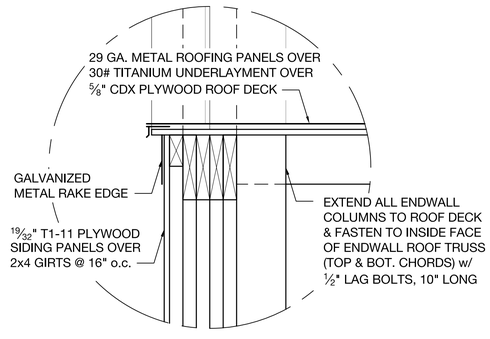
SKYLIGHT DETAIL 'D9'
1 1/2"=1'-0"



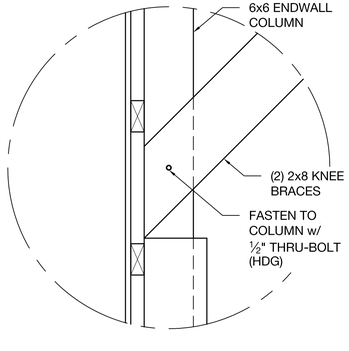
ENTRANCEWAY JAMB DETAIL 'D4'
1 1/2"=1'-0"



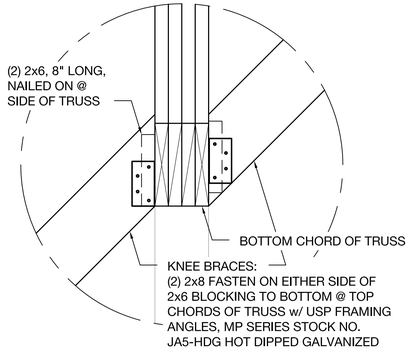
SPLICE DETAIL 'D3'
1 1/2"=1'-0"



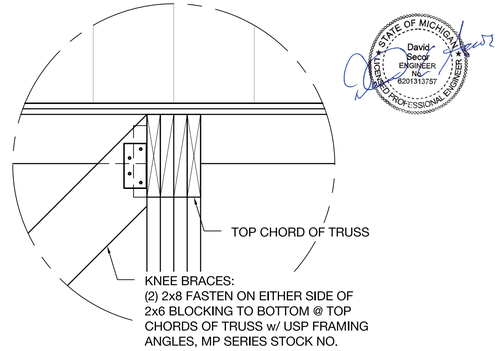
RAKE DETAIL 'D2'
1 1/2"=1'-0"



KNEE BRACING DETAIL 'D6'
1 1/2"=1'-0"



KNEE BRACING DETAIL 'D7'
1 1/2"=1'-0"



KNEE BRACING DETAIL 'D8'
1 1/2"=1'-0"

COPYRIGHT 2024

ADVANCED STORAGE TECHNOLOGY, INC.
13140 Route 31
Savannah, NY 13146
716-262-1002
www.saltstorage.com

SECOR ENGINEERING, PLLC
(315) 730-6023

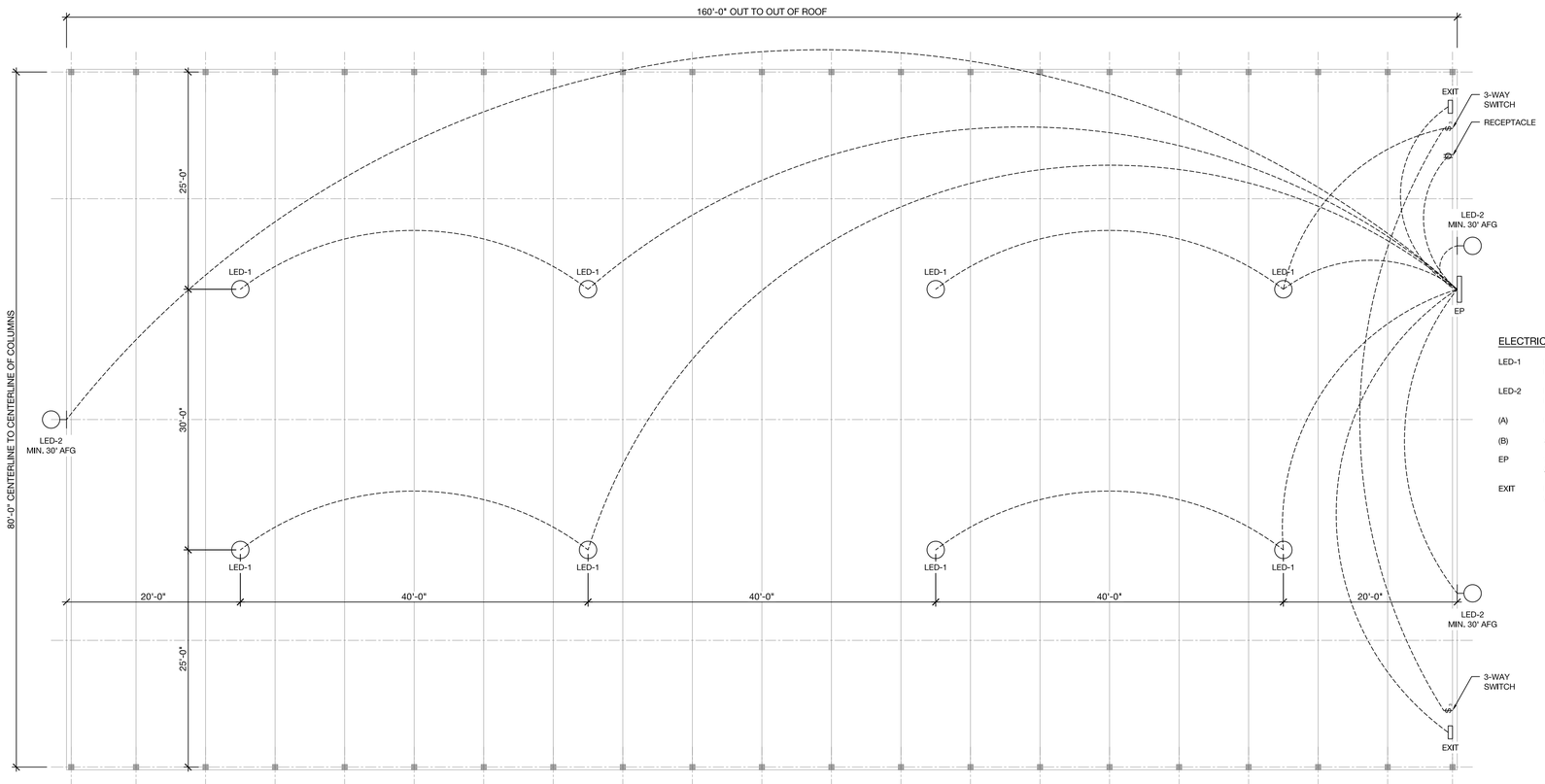
NEW 80' x 160' x 12'
SALT STORAGE BUILDING
51235 NAPI DRIVE
SHELBY TOWNSHIP, MI 48315

CONSTRUCTION DETAILS

DRAWN: CPD
CHECKED:
DATE: 10/09/2024
PROJECT: 24033

SUBMISSION	DATE
REVISION #1	04/23/2025

A-7



ELECTRICAL NOTES:

LED-1	HUBBELL KEMLUX III - SEVERE LOCATION KSL SERIES: KSL-36L-U-86-5K-5M-C-2-GR
LED-2	LITHONIA LIGHTING LED WALL LUMINAIRE CSXW LED SERIES: CSXW LED-30C-700-40K-T4M-MVOLT-PE-DDBXD
(A)	LIGHTS TO BE LOCATED NO LOWER THAN BOTTOM OF TRUSSES
(B)	3 # 12 / ½" PVC CONDUIT
EP	100 AMP ELECTRICAL PANEL, SEE DETAILS IN SPECIFICATIONS AND INFORMATION ON ELECTRICAL SITE PLAN
EXIT	ILLUMINATED EXIT SIGN ABOVE DOOR. ADD ADDITIONAL EXIT SIGNS AS REQUIRED BY THE FIRE MARSHALL

LIGHTING PLAN
1/8"=1'-0"

ADVANCED STORAGE TECHNOLOGY, INC.
13140 Route 31
Savannah, NY 13146
716-262-1002
www.saltstorage.com

SECOR ENGINEERING, PLLC
(315) 730-6023

NEW 80' x 160' x 12'
SALT STORAGE BUILDING
51235 NAPI DRIVE
SHELBY TOWNSHIP, MI 48315

LIGHTING PLAN

DRAWN: CPD
CHECKED:
DATE: 10/09/2024
PROJECT: 24033

SUBMISSION	DATE
REVISION #1	04/23/2025
REVISION #2	05/02/2025

STATE OF MICHIGAN
David Secor
ENGINEER
No. 6201313757
REGISTERED PROFESSIONAL ENGINEER

COPYRIGHT 2024

A-8