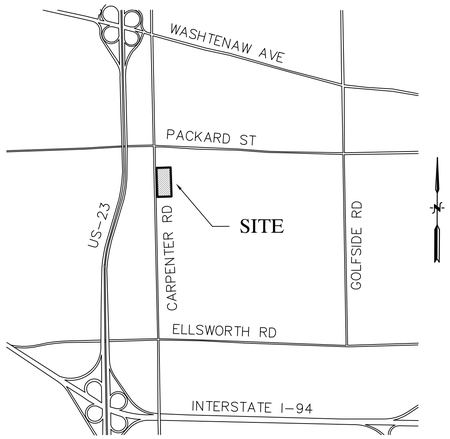
FINAL SITE PLAN

FOR

ALDI FOOD MARKET #48

PART OF PARCEL #L-12-12-200-014
3113 CARPENTER ROAD
PITTSFIELD TOWNSHIP, MICHIGAN
A PART OF SECTION 12, TSN, R6E
PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN



LOCATION MAP
SCALE: 1in. = 2000ft.

LEGAL DESCRIPTION OF RECORD
Reference: Commitment for Title Insurance Issued by
Fidelity National Title Insurance Company,
an Agent of American Land Title Association,
Commitment No. A0713286, Effective Date: February 27, 2017 at 12:00am

Situated in the Township of Pittsfield, County of Washtenaw, State of Michigan

Commencing at the West 1/4 corner of Section 12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; thence North 0 degrees 20'30" West 1262.04 feet along the West line of said Section 12 to the PLACE OF BEGINNING; thence continuing North 0 degrees 20'30" West 939.06 fee along the West line of said Section 12; thence North 89 degrees 39'30" East 828.88 feet; thence South 85degrees 49'30" East 495.00 feet; thence South 0 degrees 20'30" East 900.0 feet; thence South 89degrees 39'30" West 1322.34 feet to the place of beginning, being a part of the Northwest 1/4 of Section12, Town 3 South, Range 6 East.

Parcel ID No.: L-12-12-200-014
Commonly known as: Part of 3113 Carpenter Road, Pittsfield Township, MI 48197

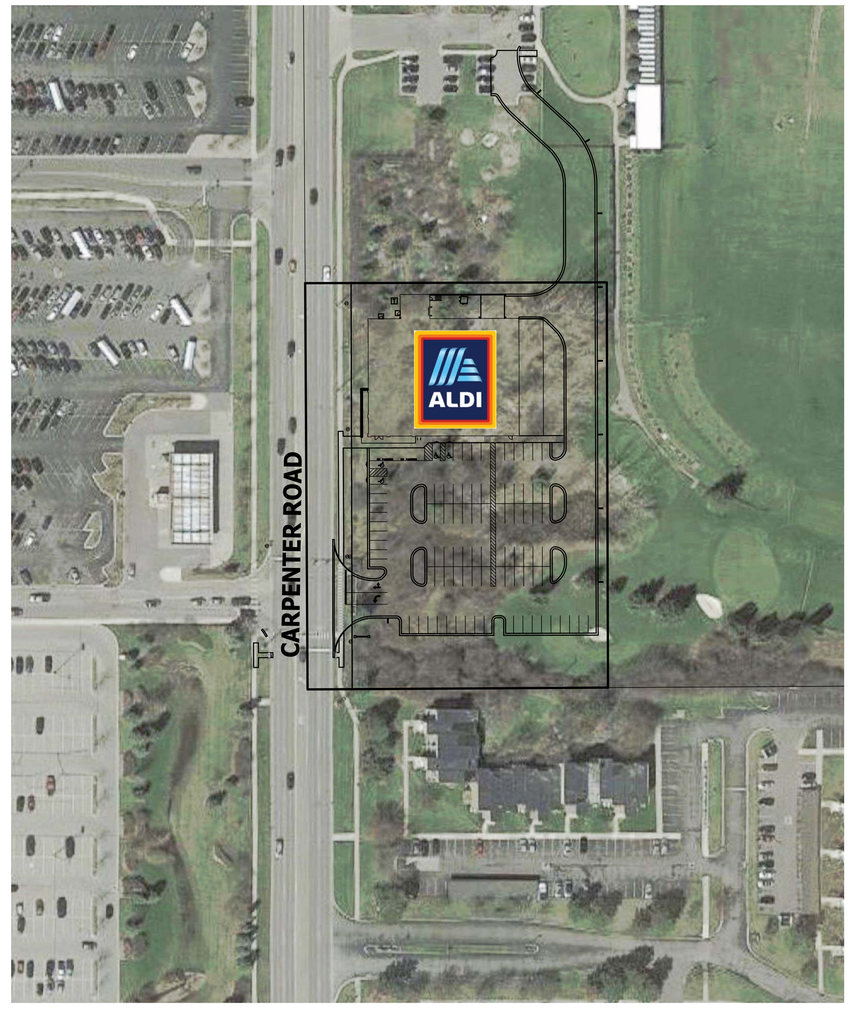
PARCEL DESCRIPTION SUBSEQUENT TO SURVEY
Situated in the Township of Pittsfield, County of Washtenaw, State of Michigan

Commencing at the West 1/4 corner of Section 12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; thence N0°20'30"W 1262.04 feet along the West line of said Section 12 to the PLACE OF BEGINNING; thence continuing N0°20'30"W 939.35 feet (939.06 feet record) along the West line of said Section 12 to a point distant 505.00 feet S0°20'30"E from the Northwest corner of said section; thence N89°39'30"E 828.78 feet (828.88 feet record) along a line perpendicular to aforementioned West line of Section 12; thence S85°49'49"E 493.80 feet (S85°49'30"E 495.00 feet record) along a line parallel with the North line of said Section 12, same being, in part, the South line of "Arbor Heights Condominium" (according to Master Deed thereof recorded in Liber 1761, Page 899, Washtenaw County Records); thence the following two courses along the boundary of "Madison Place Condominium" (according to Master Deed thereof recorded in Liber 4026, Page 663, Washtenaw County Records): (1) S00°16'29"E (S01°19'10"E condominium deed record) 460.43 feet, and (2) S85°49'49"E 1.60 feet along a line parallel with said North line of Section 12; thence S0°20'30"E 439.95 feet along a line referred to as the West line of the East 1/2 of the Northwest 1/4 of said Section 12 in Warranty Deed recorded in Liber 3864, Page 517; thence S89°39'30"W 1322.11 feet (1322.34 feet record.) to the Place of Beginning. Containing 28.28 acres, more or less. Being a part of the Northwest 1/4 of Section12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan. Subject to the rights of the public over that portion thereof taken for Carpenter Road, also subject to and together with all easements and restrictions affecting title to the described above premises.

PROPOSED OUTLOT 1 (ALDI PARCEL)
Situated in the Township of Pittsfield, County of Washtenaw, State of Michigan, described as:

Commencing at the West 1/4 corner of Section 12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; thence N0°20'30"W 1262.04 feet along the West line of said Section 12 to the PLACE OF BEGINNING; thence continuing N0°20'30"W 413.14 feet along the West line of said Section 12; thence N89°50'18"E 46.70 feet to a point on the East line (as established by previous Surveys) of Carpenter Road Right-of-way (100-foot wide); thence continuing N89°50'18"E 260.00 feet; thence S00°09'42"E 412.18 feet along the line lying 260 feet Easterly and parallel with said East line of Carpenter Road; thence S89°39'30"W 305.40 feet to the Place of Beginning. Containing 2.90 acres, more or less. Being a part of the Northwest 1/4 of Section12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan. Subject to the rights of the public over that portion thereof taken for Carpenter Road, also subject to and together with all easements and restrictions affecting title to the described above premises.

PERMITTING AGENCY	APPROVAL DATE
WASHTENAW COUNTY ROAD COMMISSION	06-05-18
WASHTENAW COUNTY WATER RESOURCES COMMISSIONER	06-22-18



AERIAL PHOTOGRAPHY BY:
Google maps

Aerial photographic underlay is an unrectified image and is orientated to the engineering line work within reasonable accuracy and precision, and may not accurately depict current site conditions.

AERIAL PHOTOGRAPH
NOT TO SCALE

CSPA 17-29
Aldi Food Market - Pittsfield

Rec'd 2019-01-02

SHEET INDEX

1-COV	COVER SHEET
2-LD	LAND DIVISION PLAN
3-EX	EXISTING CONDITIONS & DEMOLITION PLAN
4-SP	SITE PLAN
5-UT1	UTILITY PLAN
6-UT2	SANITARY SEWER PLAN AND PROFILE
7-UT3	WATER MAIN PLAN AND PROFILE
8-UT4	STORM SEWER PLAN, NOTES AND DETAILS
9-UT5	STORM SEWER PROFILES
10-UT6	STORM SEWER PROFILES
11-UT7	UNDERGROUND STORM WATER STORAGE SYSTEM PLAN, NOTES AND DETAILS
12-UT8	ROOF DRAIN AND UNDERDRAIN NOTES AND DETAILS
13-UT9	STORM SEWER NOTES AND DETAILS
14-GR1	GRADING PLAN
15-GR2	GRADING DETAILS
16-GR3	WETLAND GRADING PLAN
17-SE1	SOIL EROSION & SEDIMENTATION CONTROL PLAN
18-SE2	SOIL EROSION & SEDIMENTATION CONTROL NOTES & DETAILS
19-SE3	PITTSFIELD TWP. SOIL EROSION & SEDIMENTATION CONTROL NOTES & DETAILS
20-WS1	WATERSHED PLAN
21-WS2	WCWRC RUNOFF VOLUME WORK SHEETS
22-WS3	STORM WATER MANAGEMENT SYSTEM CALCULATIONS
23-WS4	STORM WATER MANAGEMENT SYSTEM MAINTENANCE PLAN
24-LA1	OVERALL LANDSCAPE PLAN
25-LA2	ALDI LANDSCAPE PLAN
26-LA3	TREE MITIGATION PLAN
27-LA4	TREE MITIGATION PLAN
28-LA5	TREE MITIGATION PLAN & DETAILS
29-LT1	SITE LIGHTING PLAN
30-LT2	SITE LIGHTING DETAILS
31-LT3	EMERGENCY LIGHTING DETAILS
32-TR	TRUCK CIRCULATION PLAN
33-FP	FIRE PROTECTION PLAN
34-DT1	SITE PAVEMENT NOTES & DETAILS
35-DT2	SIGNAGE & PAVEMENT MARKING NOTES & DETAILS
36-E	PITTSFIELD TWP. EARTHWORK SPECIFICATIONS
37-S1	PITTSFIELD TWP. SANITARY SEWER DETAILS
38-S2	PITTSFIELD TWP. SANITARY SEWER SPECIFICATIONS
39-W1	PITTSFIELD TWP. WATER MAIN DETAILS
40-W2	PITTSFIELD TWP. WATER MAIN SPECIFICATIONS
41-ST	PITTSFIELD TWP. STORM SEWER DETAILS
42-PM1	CARPENTER ROAD PAVEMENT MARKING PLAN
43-PM2	MDOT PAVEMENT MARKING TYPICALS
44-A1	A-131 BUILDING FLOOR PLAN / OPERATIONS PLAN
45-A2	A-201 EXTERIOR ELEVATIONS
46-A2C	A-201 COLOR EXTERIOR ELEVATIONS
47-A3	A-201C-T TRANSPARENCY STUDY EXTERIOR ELEVATIONS
48-A4	A-505 EXTERIOR DETAILS
49-A5	A-506 EXTERIOR DETAILS

SITE DATA:
PARCEL: PROPOSED OUTLOT 1 (PART OF L-12-12-200-014)
ADDRESS: TO BE ASSIGNED (PART OF 3113 CARPENTER ROAD)
SITE AREA: ±2.90 ACRES / 126,295 SF (GROSS)
±2.46 ACRES / 107,274 SF (NET)
ZONING: FORM-BASED MIXED USE
PROPOSED USE: LIMITED ASSORTMENT GROCERY
LOT COVERAGE: 17.8%
IMPERVIOUS COVERAGE: 74,336 SF / 69.4%
SETBACKS:
FRONT BUILDING LINE: 10 FT
NORTH SIDE: 5 FT
SOUTH SIDE: 40 FT
REAR: 10 FT
NUMBER OF FLOORS: 1
FLOOR AREA RATIO: 17.8%

PARKING CALCULATIONS:
REQUIRED PARKING = 1 SPACE PER 250 SF GFA
(19,030 SF + 2,968 SF)/250 SF PER SPACE = 88 SPACES
PROPOSED PARKING = 95 SPACES

LOADING CALCULATIONS:
REQUIRED LOADING = 1 SPACE PER 20,000 SF.
19,030 SF/20,000 SF PER SPACE = 1 SPACE
PROPOSED LOADING = 1 SPACE

ALDI FOOD MARKET PITTSFIELD
CSPA 17-29

PROPERTY OWNER
MID PINE GOLF LLC
12134 PALMER DRIVE
MOOR PARK, CA 93021

ENGINEER/SURVEYOR
DESINE INC.
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114
PHONE: (810) 227-9533

DEVELOPER / APPLICANT
ALDI Inc.
2625 N. STOCKBRIDGE ROAD
WEBBERVILLE, MICHIGAN 48892
PHONE: (517) 521-3907

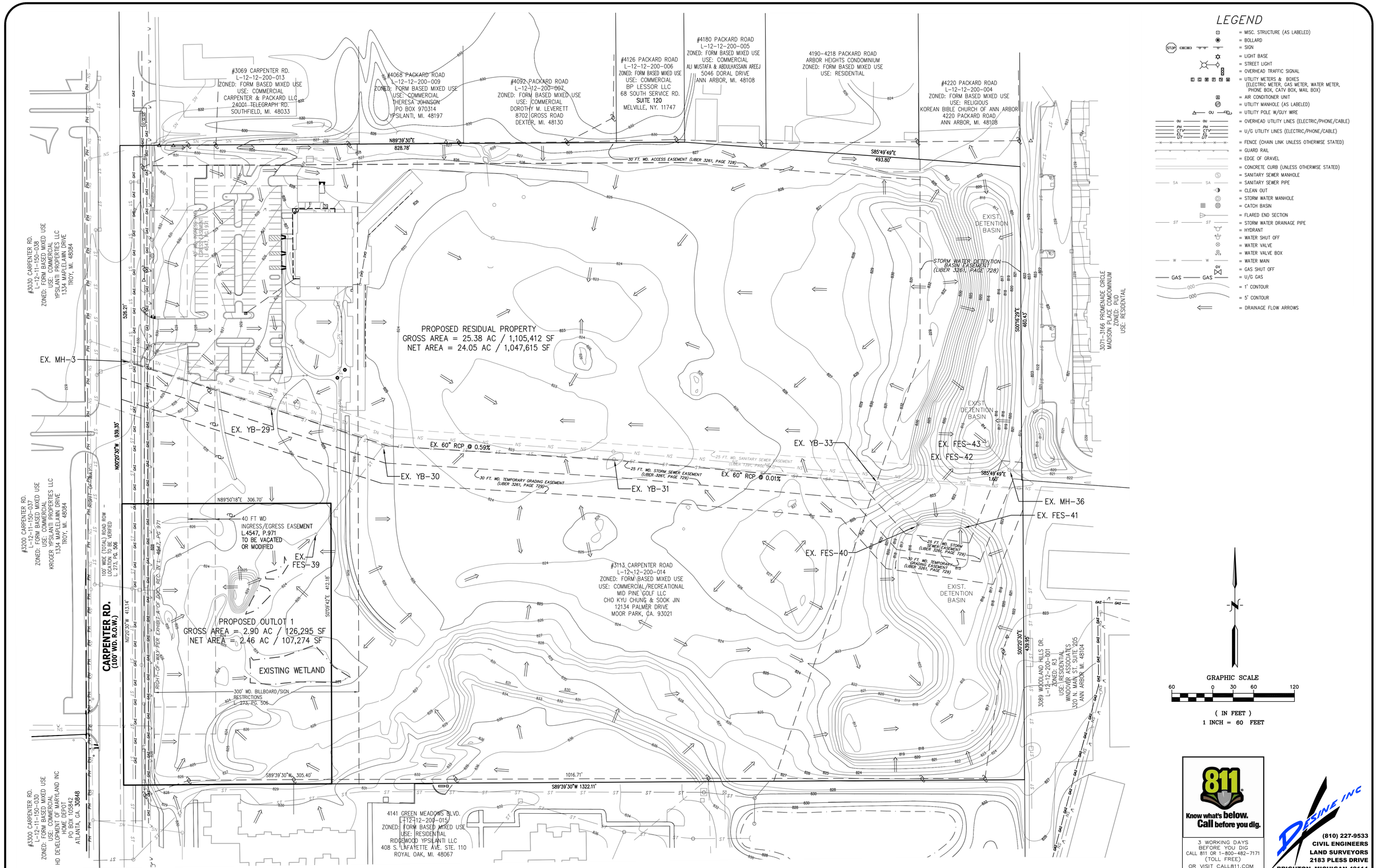
ARCHITECT
APD ENGINEERING AND ARCHITECTURE, PLLC
615 FISHERS RUN
VICTOR, NEW YORK 14564
PHONE: (585) 742-2222

811 Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

REVISED
07-02-18
08-28-18
09-24-18
10-31-18
12-19-18

SCALE: N/A
PROJECT No.: 9162803
DWG NAME: 2803-COV
PRINT: DEC. 19, 2018



DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	01-26-18	REVISED PER TOWNSHIP REVIEW COMMENTS
2	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
3	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS

REVISION #	DATE	REVISION-DESCRIPTION

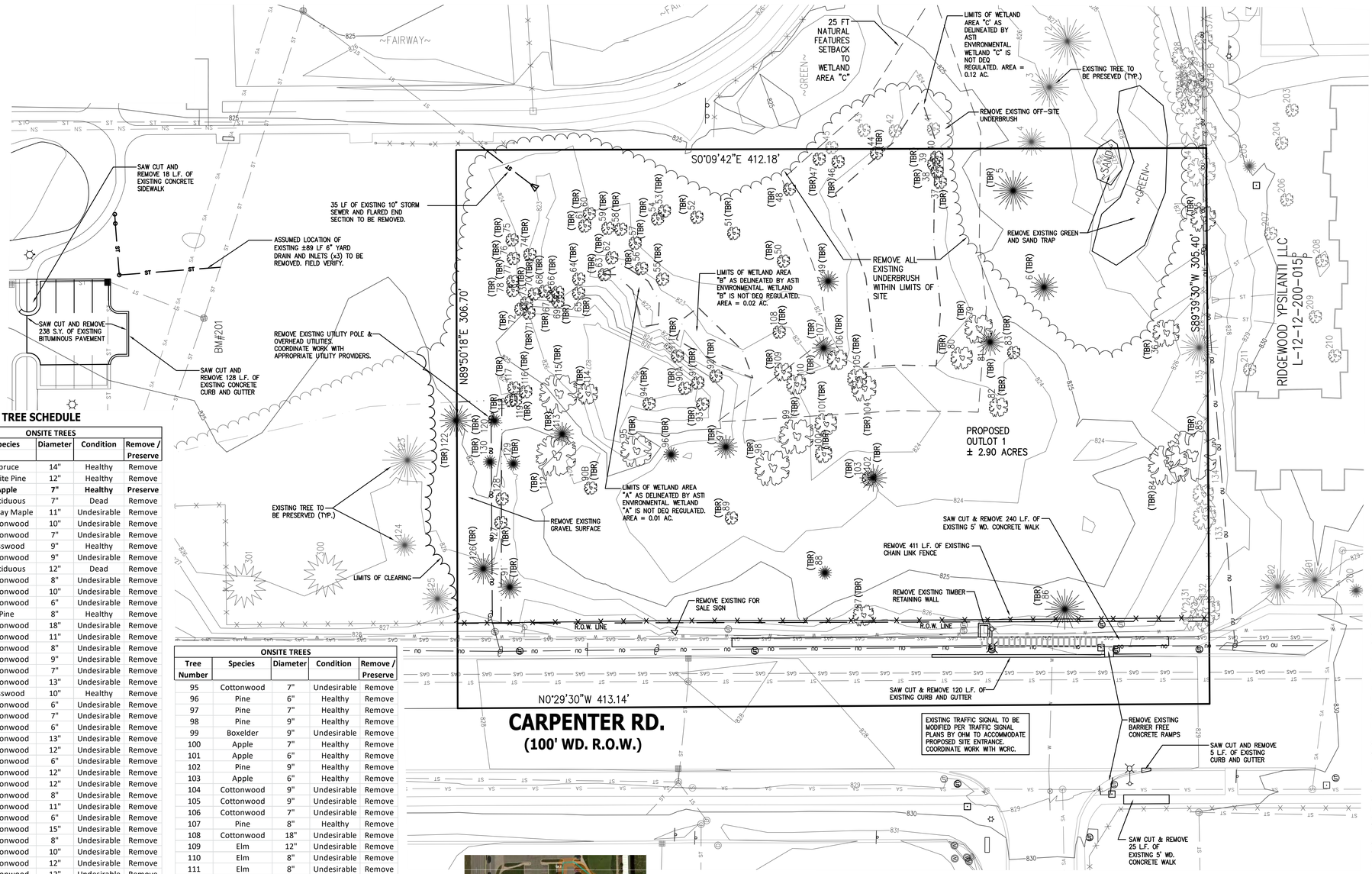
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

LAND DIVISION PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=60'
PROJECT No.: 9162803
DWG NAME: 2803-LAND
ISSUED: JULY 02, 2018

2-LD



GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 INCH = 30 FEET

LEGEND

- = MISC. STRUCTURE (AS LABELED)
- = BOLLARD
- = SIGN
- = LIGHT BASE
- = STREET LIGHT
- = OVERHEAD TRAFFIC SIGNAL
- = UTILITY METERS & BOXES (ELECTRIC METER, GAS METER, WATER METER, PHONE BOX, CATV BOX, MAIL BOX)
- = AIR CONDITIONER UNIT
- = UTILITY MANHOLE (AS LABELED)
- = UTILITY POLE W/GUY WIRE
- = OVERHEAD UTILITY LINES (ELECTRIC/PHONE/CABLE)
- = U/G UTILITY LINES (ELECTRIC/PHONE/CABLE)
- = DECIDUOUS TREE W/IDENTIFIER
- = CONIFEROUS TREE W/IDENTIFIER
- = BUSH
- = FENCE (CHAIN LINK UNLESS OTHERWISE STATED)
- = GUARD RAIL
- = EDGE OF GRAVEL
- = CONCRETE CURB (UNLESS OTHERWISE STATED)
- = SANITARY SEWER MANHOLE W/IDENTIFIER
- = SANITARY SEWER PIPE
- = CLEAN OUT
- = STORM WATER MANHOLE W/IDENTIFIER
- = CATCH BASIN W/IDENTIFIER
- = CONTROL STRUCTURE
- = FLARED END SECTION
- = STORM WATER DRAINAGE PIPE
- = HYDRANT
- = WATER SHUT OFF
- = WATER VALVE
- = WATER VALVE BOX
- = WATER MAIN
- = GAS SHUT OFF
- = U/G GAS
- = SPOT ELEVATION
- = 1' CONTOUR
- = 5' CONTOUR

TREE SCHEDULE

ONSITE TREES				
Tree Number	Species	Diameter	Condition	Remove / Preserve
5	Spruce	14"	Healthy	Remove
6	White Pine	12"	Healthy	Remove
34	**Apple**	**7"**	**Healthy**	**Preserve**
35	Deciduous	7"	Dead	Remove
36	Norway Maple	11"	Undesirable	Remove
37	Cottonwood	10"	Undesirable	Remove
38	Cottonwood	7"	Undesirable	Remove
39	Basswood	9"	Healthy	Remove
40	Cottonwood	9"	Undesirable	Remove
44	Deciduous	12"	Dead	Remove
46	Cottonwood	8"	Undesirable	Remove
47	Cottonwood	10"	Undesirable	Remove
48	Cottonwood	6"	Undesirable	Remove
49	Pine	8"	Healthy	Remove
50	Cottonwood	18"	Undesirable	Remove
51	Cottonwood	11"	Undesirable	Remove
52	Cottonwood	8"	Undesirable	Remove
53	Cottonwood	9"	Undesirable	Remove
54	Cottonwood	7"	Undesirable	Remove
55	Cottonwood	13"	Undesirable	Remove
56	Basswood	10"	Healthy	Remove
57	Cottonwood	6"	Undesirable	Remove
58	Cottonwood	7"	Undesirable	Remove
59	Cottonwood	6"	Undesirable	Remove
60	Cottonwood	13"	Undesirable	Remove
61	Cottonwood	12"	Undesirable	Remove
62	Cottonwood	6"	Undesirable	Remove
63	Cottonwood	12"	Undesirable	Remove
64	Cottonwood	12"	Undesirable	Remove
65	Cottonwood	8"	Undesirable	Remove
66	Cottonwood	11"	Undesirable	Remove
67	Cottonwood	6"	Undesirable	Remove
68	Cottonwood	15"	Undesirable	Remove
69	Cottonwood	8"	Undesirable	Remove
70	Cottonwood	10"	Undesirable	Remove
71	Cottonwood	12"	Undesirable	Remove
72	Cottonwood	12"	Undesirable	Remove
73	Cottonwood	8"	Undesirable	Remove
74	Cottonwood	18"	Undesirable	Remove
75	Cottonwood	22"	Undesirable	Remove
76	Cottonwood	12"	Undesirable	Remove
77	Cottonwood	9"	Undesirable	Remove
78	Cottonwood	12"	Undesirable	Remove
79	Cottonwood	9"	Undesirable	Remove
80	Cottonwood	12"	Undesirable	Remove
81	Pine	8"	Healthy	Remove
82	Apple	6"	Healthy	Remove
83	Cottonwood	7"	Undesirable	Remove
84	Norway Maple	12"	Undesirable	Remove
85	Norway Maple	18"	Undesirable	Remove
86	Pine	15"	Healthy	Remove
87	Apple	6"	Healthy	Remove
88	Pine	7"	Healthy	Remove
89	Locust	14"	Healthy	Remove
90A	Cottonwood	7"	Undesirable	Remove
90B	Cottonwood	15"	Undesirable	Remove
91A	Cottonwood	6"	Undesirable	Remove
91B	Pine	7"	Healthy	Remove
92	Cottonwood	7"	Undesirable	Remove
93	Cottonwood	7"	Undesirable	Remove
94	Cottonwood	7"	Undesirable	Remove

ONSITE TREES				
Tree Number	Species	Diameter	Condition	Remove / Preserve
95	Cottonwood	7"	Undesirable	Remove
96	Pine	6"	Healthy	Remove
97	Pine	7"	Healthy	Remove
98	Pine	9"	Healthy	Remove
99	Boxelder	9"	Undesirable	Remove
100	Apple	7"	Healthy	Remove
101	Apple	6"	Healthy	Remove
102	Pine	9"	Healthy	Remove
103	Apple	6"	Healthy	Remove
104	Cottonwood	9"	Undesirable	Remove
105	Cottonwood	9"	Undesirable	Remove
106	Cottonwood	7"	Undesirable	Remove
107	Pine	8"	Healthy	Remove
108	Cottonwood	18"	Undesirable	Remove
109	Elm	12"	Undesirable	Remove
110	Elm	8"	Undesirable	Remove
111	Elm	8"	Undesirable	Remove
112	Cottonwood	14"	Undesirable	Remove
113	Pine	10"	Healthy	Remove
114	Cottonwood	6"	Undesirable	Remove
115	Cottonwood	12"	Undesirable	Remove
116	Cottonwood	8"	Undesirable	Remove
117	Cottonwood	8"	Undesirable	Remove
118	Cottonwood	6"	Undesirable	Remove
119	Cottonwood	11"	Undesirable	Remove
120	Pine	7"	Healthy	Remove
122	Pine	8"	Healthy	Remove
126	Pine	6"	Healthy	Remove
127	Boxelder	11"	Undesirable	Remove
128	Boxelder	12"	Undesirable	Remove
129	Pine	8"	Healthy	Remove
130	Pine	6"	Healthy	Remove
131	**Poplar**	**12"**	**Undesirable**	**Preserve**
132	**Spruce**	**16"**	**Healthy**	**Preserve**
133	Apple	6"	Healthy	**Preserve**
134	Apple	6"	Healthy	**Preserve**
135	Pine	7"	Healthy	**Preserve**

Notes:
1. "Undesirable" trees are those species listed on the Pittsfield Charter Township Prohibited Weeds and Invasive Plant List dated March 25, 2015.
2. There are no heritage trees located on the proposed ALDI site.

SOILS MAP
NOT TO SCALE

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
NaB	Nappanee silty clay loam, 2 to 6 percent slopes	3.2	100.0%
Totals for Area of Interest		**3.2**	**100.0%**

SITE NOTES:

1. Wetland areas A, B and C have been delineated by ASTI Environmental. Wetland areas A, B and C are not DEQ regulated as determined by ASTI Environmental and outlined in the Wetland Delineation and Jurisdictional Assessment dated February 23, 2017.

2. The subject property is not located within a floodplain per FEMA Map Panel #26161C0406E.

BENCHMARKS

DATUM BASED ON NGS OPUS SOLUTION REPORT, DATED FEBRUARY 24, 2017 AT 9:21 AM.

BENCHMARK #200 (STATIC) **(NOT SHOWN THIS SHEET)**
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF-SITE) **(NOT SHOWN THIS SHEET)**
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

BENCHMARK #203 (OFF-SITE) **(NOT SHOWN THIS SHEET)**
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF-SITE) **(NOT SHOWN THIS SHEET)**
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

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

3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DEMOLITION NOTES:

1. The demolition specifications of the Local Municipality are a part of this work. Refer to the General Notes on the project plans for additional requirements.

2. Contractor shall contact the 811 Underground Public Utility Locating System or other appropriate local underground utility locating Agency, a minimum of three (3) working days prior to performing demolition work. Existing utility information on the project plans may be from information disclosed to this firm by the Utility Companies, Local, County or State Agencies, and/or various other sources. No guarantee is given as to the completeness or accuracy thereof. Prior to construction, locations and depths of all existing utilities (in possible conflict with the proposed improvements) shall be verified in the field.

3. Contractor shall contact the appropriate Agencies to coordinate disconnect of the electric, gas, phone, cable and other public utilities as necessary prior to performing demolition work.

4. Contractor shall contact the appropriate Agencies to coordinate removal and/or relocation of any underground and/or overhead public utility lines as necessary prior to performing demolition work.

5. Contractor shall recycle and/or dispose of all demolition debris in accordance with the appropriate Local, County, State and Federal regulations.

6. All bituminous and concrete pavement to be removed shall be saw cut at the limits of removal to provide for a clean straight edge for future abutment.

7. All existing irrigation lines to be removed shall be terminated at the limits of demolition or as necessary to allow for construction of the proposed site improvements. Ends of pipe shall be capped and the location of marked for future connection.

8. All existing water main and sanitary sewer to be removed shall be terminated at the limits of demolition or as indicated on the project plans. Temporary plugs shall be installed in the ends of pipe in accordance with the appropriate Agency and the locations of marked for future connection. Permanent plugs shall be installed in the ends of pipe in accordance with the appropriate Agency. The Contractor shall record the location of all permanent plugs and provide the location information to the appropriate Agency.

9. All existing storm sewer to be removed shall be terminated at the limits of demolition or as indicated on the project plans. Temporary plugs shall be installed in the ends of pipe in accordance with the appropriate Agency and the locations of marked for future connection. Permanent bulkheads shall be installed in the ends of pipe and/or openings in terminating structures in accordance with the appropriate Agency. The Contractor shall record the location of all permanent bulkheads and provide the location information to the appropriate Agency.

10. All existing light sources to be removed shall have their power cables removed up to the power source or properly terminated for future connection at the limits of demolition or as necessary to allow for construction of the proposed site improvements. Removal and termination of power cables shall be performed in accordance with local electric codes.

11. All existing utility meters to be removed shall be properly removed to allow for reuse. Any existing utility meters that are not to be reused as a part of this project shall be returned to the appropriate Agency.

12. All trenches and/or excavations resulting from the demolition of underground utilities, building foundations, etc., that are located within the 1 on 1 influence zone of proposed structures, paved areas and/or other areas subject to vehicular traffic shall be backfilled with MDOT Class III granular material (or better) to the proposed subgrade elevation. Backfill shall be shall be placed using the controlled density method (12" maximum lifts, compacted to 95% maximum unit weight, Modified Proctor).

13. All existing underbrush, weeds and tall grass shall be removed within the limits of the site. All existing on-site trees to be preserved shall be pruned as directed by ALDI Inc.

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	11-06-17	REVISED PER TOWNSHIP REVIEW COMMENTS
2	12-20-17	REVISED PER TOWNSHIP REVIEW COMMENTS
3	01-26-18	REVISED PER TOWNSHIP REVIEW COMMENTS
4	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
5	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS
6	05-21-18	ADD WETLAND "C" NATURAL FEATURE SETBACK PER ECT REVIEW COMMENTS
7	06-04-18	REVISED PER WCWRC REVIEW COMMENTS
8	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
9	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

EXISTING CONDITIONS AND DEMOLITION PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=30'
PROJECT No.: 9162803
DWG NAME: 2803-EXIST
ISSUED: AUG. 28, 2018

3-EX

SITE DEVELOPMENT NOTES:

1. Proposed Outlot 1 shall be split from existing parent parcel L-12-12-200-014 in accordance with the Charter Township of Pittsfield rules and regulations.

2. No outdoor storage, sales or display areas are proposed as a part of this development.

3. The proposed ALDI building shall be fire suppressed. A Knox Box shall be provided on the exterior building wall at the front entrance in accordance with the Local Fire Department requirements.

4. All barrier free sidewalk ramps shall be constructed with detectable warnings in accordance with MDOT Standard Plan R-28, latest revision.

5. The Contractor shall coordinate all site work with their Subcontractor(s), the appropriate Utility Providers and the public utility work to ensure that all public utility work is performed in a timely manner and in a proper sequence in accordance with standard acceptable construction practices and to ensure that all public utility work is completed prior to the scheduled store opening date.

6. The Contractor shall coordinate all site work with their Subcontractor(s), the Sign Contractor(s) and the sign work to ensure that all sign work is performed in a timely manner and in a proper sequence in accordance with standard acceptable construction practices and to ensure that all sign work is completed prior to the scheduled store opening date.

7. The Contractor shall maintain the project site during the construction period. Maintenance shall include, but is not limited to, routine sweeping of the parking area, routine mowing of the lawn areas and removal of trash and debris on an as needed basis and/or as directed by ALDI Inc.

8. The proposed infrastructure has been designed to accommodate the future building expansion area, as shown.

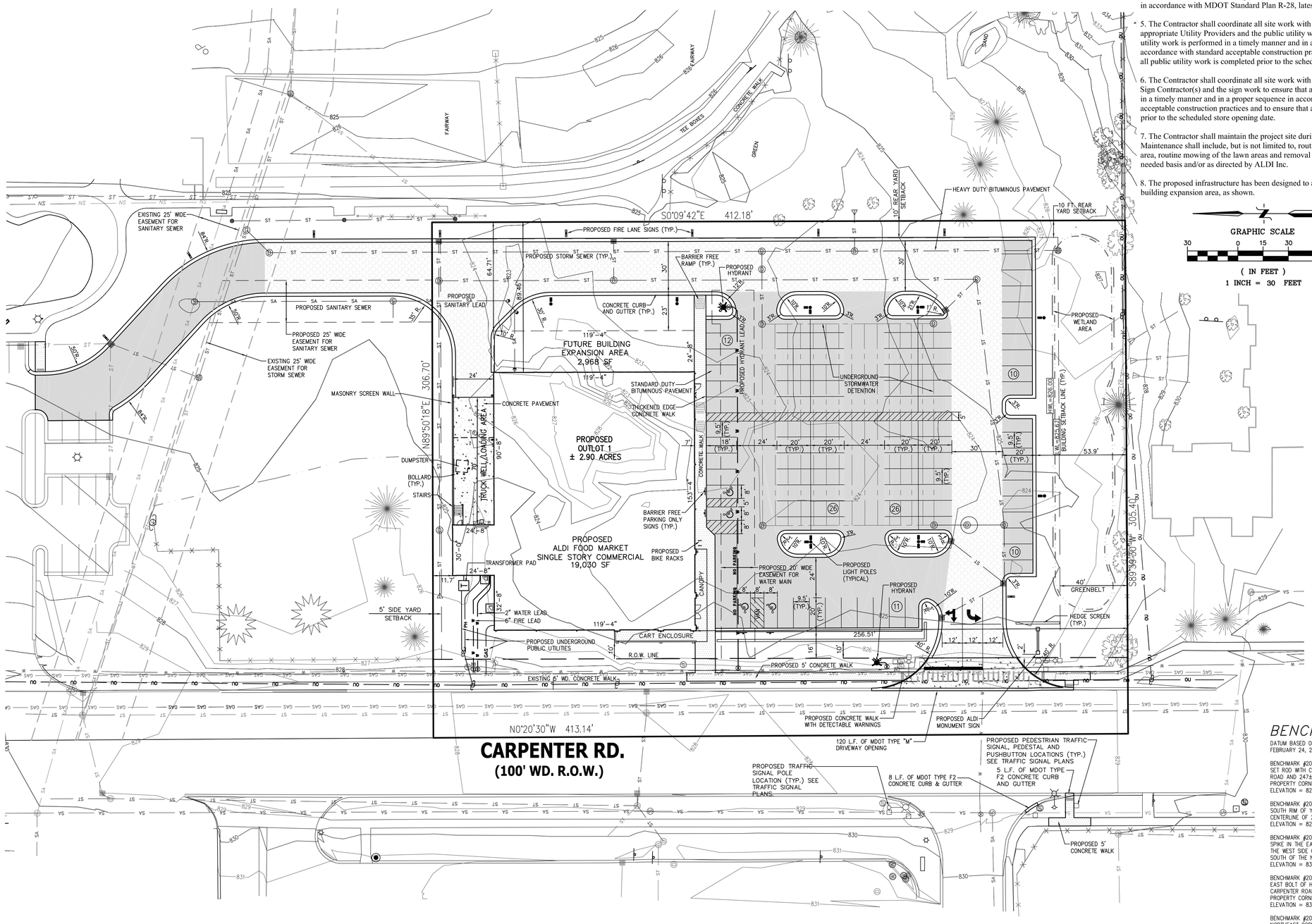
LEGEND

- = MISC. STRUCTURE (AS LABELED)
- = BOLLARD
- = SIGN
- = LIGHT BASE
- = STREET LIGHT
- = OVERHEAD TRAFFIC SIGNAL
- = UTILITY METERS & BOXES (ELECTRIC METER, GAS METER, WATER METER, PHONE BOX, CATV BOX, MAIL BOX)
- = AIR CONDITIONER UNIT
- = UTILITY MANHOLE (AS LABELED)
- = UTILITY POLE W/GUY WIRE
- = OVERHEAD UTILITY LINES (ELECTRIC/PHONE/CABLE)
- = U/G UTILITY LINES (ELECTRIC/PHONE/CABLE)
- = DECIDUOUS TREE W/IDENTIFIER
- = CONIFEROUS TREE W/IDENTIFIER
- = BUSH
- = FENCE (CHAIN LINK UNLESS OTHERWSE STATED)
- = GUARD RAIL
- = EDGE OF GRAVEL
- = CONCRETE CURB (UNLESS OTHERWISE STATED)
- = SANITARY SEWER MANHOLE W/IDENTIFIER
- = SANITARY SEWER PIPE
- = CLEAN OUT
- = STORM WATER MANHOLE W/IDENTIFIER
- = CATCH BASIN W/IDENTIFIER
- = CONTROL STRUCTURE
- = FLARED END SECTION
- = STORM WATER DRAINAGE PIPE
- = HYDRANT
- = WATER SHUT OFF
- = WATER VALVE
- = WATER VALVE BOX
- = WATER MAIN
- = GAS SHUT OFF
- = U/G GAS
- = SPOT ELEVATION
- = 1' CONTOUR
- = 5' CONTOUR
- = PROPOSED SANITARY SEWER
- = PROPOSED WATER MAIN
- = PROPOSED STORM SEWER
- = PROPOSED STORM STRUCTURES
- = PROPOSED CONCRETE WALK
- = PROPOSED HEAVY DUTY CONCRETE PAVEMENT
- = PROPOSED STANDARD DUTY BITUMINOUS PAVEMENT
- = PROPOSED HEAVY DUTY BITUMINOUS PAVEMENT

GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 INCH = 30 FEET



SITE DATA:
PARCEL: PROPOSED OUTLOT 1 (PART OF L-12-12-200-014)
ADDRESS: TO BE ASSIGNED (PART OF 3113 CARPENTER ROAD)
SITE AREA: ±2.90 ACRES / 126,295 SF (GROSS)
±2.46 ACRES / 107,274 SF (NET)
ZONING: FORM-BASED MIXED USE
PROPOSED USE: LIMITED ASSORTMENT GROCERY
LOT COVERAGE: 17.8%
IMPERVIOUS COVERAGE: 74,336 SF / 69.4%
SETBACKS:

FRONT BUILDING LINE:	10 FT
NORTH SIDE:	5 FT
SOUTH SIDE:	40 FT
REAR:	10 FT
NUMBER OF FLOORS:	1
FLOOR AREA RATIO:	17.8%

PARKING CALCULATIONS:
REQUIRED PARKING = 1 SPACE PER 250 SF GFA
(19,030 SF + 2,968 SF)/250 SF PER SPACE = 88 SPACES
PROPOSED PARKING = 95 SPACES

LOADING CALCULATIONS:
REQUIRED LOADING = 1 SPACE PER 20,000 SF.
19,030 SF/20,000 SF PER SPACE = 1 SPACE
PROPOSED LOADING = 1 SPACE

PROPOSED BITUMINOUS PAVEMENT AREA:	49,450 S.F.
PROPOSED CONCRETE TRUCK WELL AREA:	1,827 S.F.
PROPOSED PRIVATE SIDEWALK AREA:	1,989 S.F.
PROPOSED PUBLIC SIDEWALK AREA:	1,700 S.F.

BENCHMARKS

DATUM BASED ON NGS OPUS SOLUTION REPORT, DATED FEBRUARY 24, 2017 AT 9:21 AM.

BENCHMARK #200 (STATIC)
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF-SITE)
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

BENCHMARK #203 (OFF-SITE)
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF-SITE)
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

811 Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESIGN INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	11-06-17	REVISED PER TOWNSHIP REVIEW COMMENTS
2	12-20-17	REVISED PER TOWNSHIP REVIEW COMMENTS
3	01-26-18	REVISED PER TOWNSHIP REVIEW COMMENTS
4	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
5	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS
6	06-04-18	REVISED PER WCWRC REVIEW COMMENTS
7	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
8	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
9	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
10	12-19-18	REVISED BUILDING PER CLIENT REQUEST

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

SITE PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=30'
PROJECT No.: 9162803
DWG NAME: 2803-SITEPLAN
ISSUED: DEC. 19, 2018

4-SP

EXISTING UTILITY STRUCTURE INVENTORY

SANITARY MANHOLE #1
NORTH RIM 828.96
INVERTS
NORTHWEST 12" IRON 812.96
SOUTHEAST 12" IRON 812.86

CATCH BASIN #2
RIM – ROAD SIDE 828.87
INVERTS
WEST 12" RCP 825.75

STORM MANHOLE #3
NORTH RIM 829.23
INVERTS
NORTH 12" RCP 824.73
EAST 48" RCP 818.23
EAST 12" RCP 824.93
SOUTHEAST 48" RCP 818.33

STORM MANHOLE #4
NORTH RIM 829.49
INVERTS
NORTH 12" RCP 824.74
NORTHEAST 12" RCP 825.99
SOUTH 18" RCP 824.64

CATCH BASIN #5
RIM – ROAD SIDE 828.97
INVERTS
SOUTHWEST 12" RCP 826.12
EAST 4" CPP ± 825.77

SANITARY SEWER MANHOLE #6
CENTER 830.20
INVERTS
NORTH 8" IRON 813.17
NORTH 8" IRON 818.30
WEST 12" IRON 824.70
SOUTHEAST 12" IRON 812.85
SOUTH 10" IRON 812.95

CATCH BASIN #7
RIM – ROAD SIDE 828.28
INVERTS
WEST 12" RCP 824.58

STORM MANHOLE #8
NORTH RIM 828.69
INVERTS
NORTH 8" RCP 823.54
EAST 12" RCP 823.89
SOUTHWEST 12" RCP 822.69
NORTHWEST 18" RCP–T/PIPE 824.34
EAST 18" RCP 820.89

CATCH BASIN #9
RIM – ROAD SIDE 830.26
INVERTS
WEST 12" RCP 826.08

STORM MANHOLE #10
NORTH RIM 830.92
INVERTS
NORTHEAST 12" RCP 822.72
TOP WALL 827.77

STORM MANHOLE #11
NORTH RIM 831.00
INVERTS
WEST 12" RCP 822.75
TOP WALL 827.80

STORM MANHOLE #12
NORTH RIM 830.51
INVERTS
U/G DET. CMP–BOTTOM 822.86

SANITARY SEWER MH #13
NORTH RIM 828.98
INVERTS
NORTH 10" IRON 814.13
SOUTH 10" IRON 814.23

CATCH BASIN #14
RIM – ROAD SIDE 830.64
INVERTS
U/G DET. STR. BOTTOM 824.64

STORM MANHOLE #15
NORTH RIM 831.35
INVERTS
U/G DET. STRUCTURE BOTTOM 822.95

SANITARY SEWER MANHOLE #16
NORTH RIM 828.92
INVERTS
NORTH 10" IRON 814.62
SOUTH 10" IRON 814.72
WEST 8" IRON 816.12

GATE VALVE WELL #17
NORTH RIM 828.89
INVERTS
EAST–WEST SIZE UNKNOWN 819.89

STORM MANHOLE #18
NORTH RIM 830.07
INVERTS
SOUTH 12" RCP 822.22
WEST 12" RCP 822.32

SANITARY SEWER MANHOLE #19
NORTH RIM 830.64
INVERTS
NORTH 10" IRON 815.29
EAST 8" IRON 817.29
SOUTH 10" IRON 816.04

STORM MANHOLE #20
NORTH RIM 831..36
INVERTS
EAST 48" RCP 821.84
EAST 14" RCP 825.96
SOUTH 42" RCP 821.86
WEST 12" RCP – FULL DEBRIS 821.76

STORM MANHOLE #21
NORTH RIM 831.11
INVERTS
NORTH NOT AVAILABLE
SOUTH NOT AVAILABLE
EAST NOT AVAILABLE
WEST NOT AVAILABLE

CATCH BASIN #22
RIM – ROAD SIDE 830.49
INVERTS
WEST 12" RCP 827.49

CATCH BASIN #23
RIM – ROAD SIDE 830.58
INVERTS
WEST 12" RCP ± 826.83

STORM MANHOLE #24
NORTH RIM 830.82
INVERTS
EAST 12" RCP ± 825.82
NORTH 48" RCP 821.02
SOUTHEAST 18" RCP 821.52
WEST 48" RCP 821.12

GATE VALVE WELL #25
NORTH RIM 832.22
INVERTS
NORTH–SOUTH IRON–T/PIPE–TEE 823.47
EAST IRON – TOP PIPE – TEE 823.47

SANITARY SEWER MANHOLE #26
CENTER 828.31
INVERTS
WEST 8" IRON 818.51
SOUTH 8" IRON 818.71

CATCH BASIN #27
RIM – ROAD SIDE 827.85
INVERTS
WEST 12" RCP 824.85

STORM MANHOLE #28
NORTH RIM 828.09
INVERTS
NORTH 48" RCP 819.79
SOUTH 48" RCP 819.84
EAST 12" RCP ± 822.89
WEST 18" RCP 820.39

YARD BASIN #29 – ROUND
SOUTH RIM 824.42
INVERTS
NORTHWEST 817.17
SOUTHEAST 817.14

YARD BASIN #30
WEST RIM 824.04
INVERTS
SOUTHEAST 48" RCP 816.34
NORTHWEST 48" RCP 816.39

YARD BASIN #31
EAST RIM 821.55
INVERTS
EAST 60" RCP 814.35
WEST 60" RCP 814.35

SANITARY SEWER MANHOLE #32
EAST RIM 822.59
INVERTS
EAST 12" IRON 809.69
WEST 12" IRON 809.79

YARD BASIN #33
WEST RIM 827.50
INVERTS
EAST 60" RCP 814.30
WEST 60" RCP 814.30
TOP PIPE 818.00

LIFT STATION MANHOLE #34
CENTER 834.30
INVERTS
TOP PIPE IRON 828.30

STORM MANHOLE #35
CENTER 829.98
INVERTS
TOP WATER 827.58
NOT AVAILABLE – FLOODED

STORM MANHOLE #36
CENTER 820.00
INVERTS
NORTHWEST 30" RCP 810.80
EAST 30" RCP 810.20

SANITARY SEWER MANHOLE #37
CENTER 821.84
INVERTS
EAST 12" IRON 807.44
WEST 12" IRON 808.24

CATCH BASIN #38
CENTER 823.10
INVERTS
NOT FIELD VERIFIED

FLARED END SECTION #39
TOP 823.14
INVERTS
8" HDPE 822.44

FLARED END SECTION #40
TOP 818.56
INVERTS
60" RCP 813.60

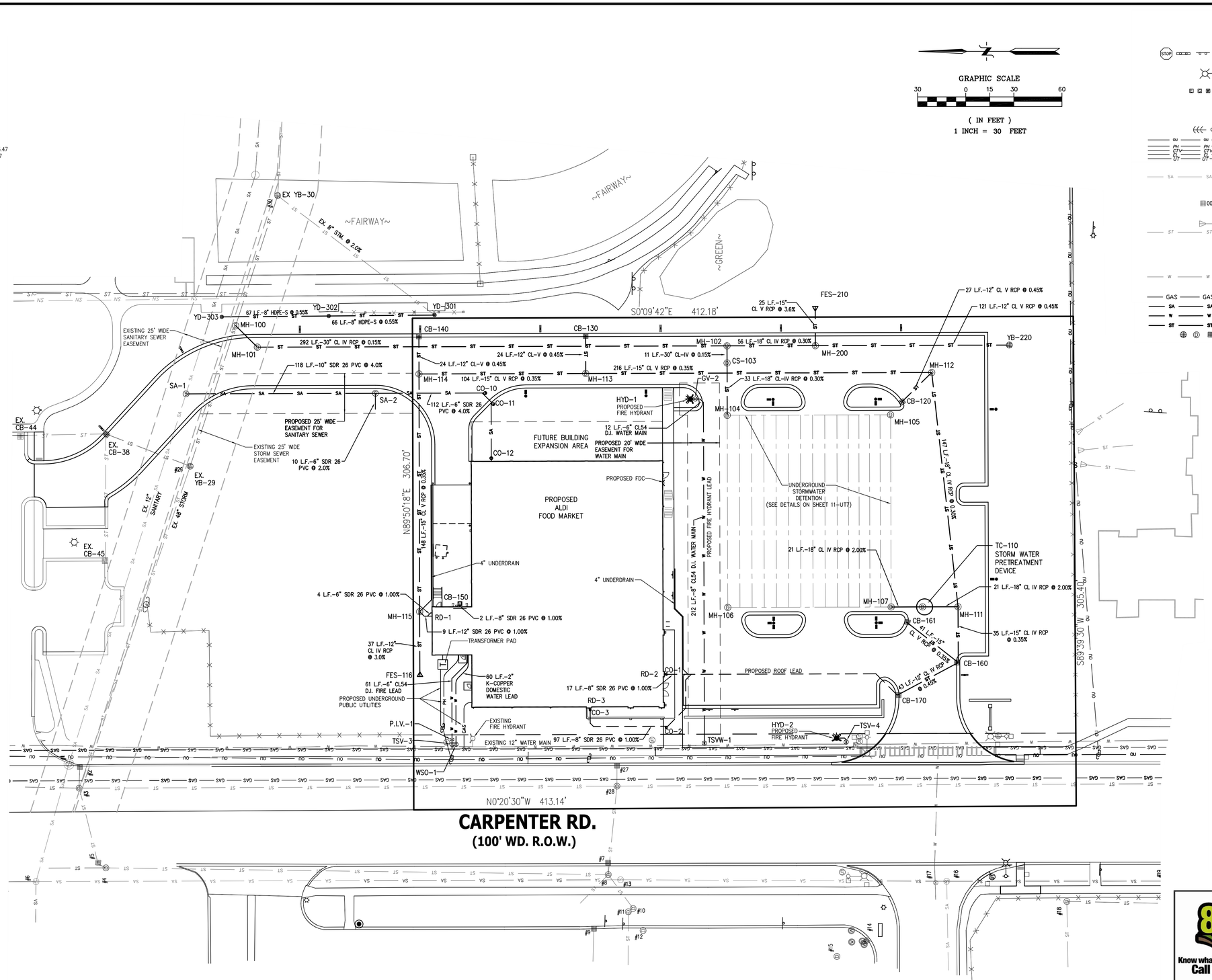
FLARED END SECTION #41
TOP 814.22
INVERTS
15" CMP 812.97

FLARED END SECTION #42
TOP 813.54
INVERTS
15" CMP 812.40

FLOW RESTRICTOR #43
TOP 814.60
INVERTS
15" RCP 811.58

CATCH BASIN #44
RIM 823.99
INVERTS
NOT FIELD VERIFIED

CATCH BASIN #45
RIM 824.95
INVERTS
NOT FIELD VERIFIED



LEGEND

- MISC. STRUCTURE (AS LABELED)
- BOLLARD
- SIGN
- LIGHT BASE
- STREET LIGHT
- OVERHEAD TRAFFIC SIGNAL
- UTILITY METERS & BOXES (ELECTRIC METER, GAS METER, WATER METER, PHONE BOX, CATV BOX, MAIL BOX)
- AIR CONDITIONER UNIT
- UTILITY MANHOLE (AS LABELED)
- UTILITY POLE W/GUY WIRE
- OVERHEAD UTILITY LINES (ELECTRIC/PHONE/CABLE)
- U/G UTILITY LINES (ELECTRIC/PHONE/CABLE)
- SANITARY SEWER MANHOLE W/IDENTIFIER
- SANITARY SEWER PIPE
- CLEAN OUT
- STORM WATER MANHOLE W/IDENTIFIER
- CATCH BASIN W/IDENTIFIER
- CONTROL STRUCTURE
- FLARED END SECTION
- STORM WATER DRAINAGE PIPE
- HYDRANT
- WATER SHUT OFF
- WATER VALVE
- WATER VALVE BOX
- WATER MAIN
- GAS SHUT OFF
- U/G GAS
- PROPOSED SANITARY SEWER
- PROPOSED WATER MAIN
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURES

UTILITY PROVIDERS:

ELECTRIC:	DTE ELECTRIC
GAS:	DTE GAS
PHONE:	AT&T
SANITARY:	PITTSFIELD TOWNSHIP
WATER:	PITTSFIELD TOWNSHIP
STORM:	WASHTENAW COUNTY

BENCHMARKS

DATUM BASED ON NGS OPUS SOLUTION REPORT, DATED FEBRUARY 24, 2017 AT 9:21 AM.

BENCHMARK #200 (STATIC)
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF–SITE)
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

BENCHMARK #203 (OFF–SITE)
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF–SITE)
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

811 Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG CALL 811 OR 1–800–482–7171 (TOLL FREE) OR VISIT CALL811.COM

DESIGN INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	11–06–17	REVISED PER TOWNSHIP REVIEW COMMENTS
2	12–20–17	REVISED PER TOWNSHIP REVIEW COMMENTS
3	04–16–18	REVISED PER WCWRC REVIEW COMMENTS
4	05–01–18	REVISED PER WETLAND MITIGATION REQUIREMENTS
5	06–04–18	REVISED PER WCWRC REVIEW COMMENTS
6	07–02–18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
7	08–28–18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
8	10–31–18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
9	12–19–18	REVISED BUILDING PER CLIENT REQUEST

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

UTILITY PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=30'
PROJECT No.: 9162803
DWG NAME: 2803-UTIL
ISSUED: DEC. 19, 2018

5-UT1

GRAVITY SANITARY SEWER NOTES:

1. The sanitary sewer specifications of the Local Municipality are a part of this work. Refer to the General Notes on the project plans for additional information and requirements.

2. Sanitary sewer work shall include clearing of vegetation and tree stumps, stripping and stockpiling of topsoil for reuse, excavation of pipe trench, placement of pipe bedding, placement of pipe and structures including castings, connection to existing structures, tuck pointing of structures, backfill of pipe trench, compaction of backfill, finish grading, adjustment of castings to match finish grade, testing of sanitary sewer, topsoil placement, seed & mulch, site cleanup and restoration, and other work as shown on the project plans and specifications.

3. Existing and proposed grades shown in profile view on the project plans may be in relation to the centerline of road or item other than the centerline of pipe. The pipe lengths and grades shown in profile view on the project plans may not be to scale.

4. RCSP when shown on the project plans shall be reinforced concrete sewer pipe and shall conform to the specifications for reinforced concrete pipe per ASTM C76. RCSP pipe joints shall be Modified Groove Tongue (MGT) type joints with a compression type rubber gasket snapped into a groove cast into the tongue. Rubber gaskets shall conform to ASTM C433. Modified groove or bell end of pipe shall be made smooth and shall not have more than a three (3) degree slope tapered to fit the rubber gasket to tolerances as determined by the gasket manufacturer. MGT joints shall be lubricated and coupled in accordance with the manufacturer's specifications. Saw cut pipes to length for connection to structures as needed. When pipe class is not shown on the project plans, provide the following:

Pipe cover to proposed grade: 0 to 4 feet Class V
4.1 to 10 feet Class III*
10.1 to 18 feet Class IV
18.1 feet and greater Class V
* Use Class IV under paved surfaces

5. PVC when shown on the project plans shall be polyvinyl chloride gravity pipe and shall conform to the specifications for polyvinyl chloride gravity pipe per ASTM D3034, maximum SDR of 26. PVC pipe joints shall be push on bell-and-spigot type joints conforming to ASTM D3212 with factory installed flexible elastomeric gaskets conforming to ASTM F477. Solvent cemented joints shall only be used when noted on the project plans for specific applications and shall conform to ASTM D2855. Tamp backfill at the spring line of PVC pipe. Saw cut pipes to length for connection to structures and fittings as needed.

6. ABS or PVC Truss Pipe when shown on the project plans shall conform to the specifications for truss pipe per ASTM D2680. ABS Truss Pipe joints shall consist of ABS plastic couplings solvent cemented to the pipe ends and shall conform to ASTM D2855. PVC Truss Pipe joints shall be bell-and-spigot type joints conforming to ASTM D3212 with factory installed flexible elastomeric gaskets conforming to ASTM F477. PVC Truss Pipe joints shall be lubricated and coupled in accordance with the manufacturer's specifications. Tamp backfill at the spring line of truss pipe. Saw cut pipes to length for connection to structures and fittings as needed.

7. Sanitary structures shall be pre-cast reinforced concrete and shall conform to the specifications for pre-cast reinforced concrete structures per ASTM C478. Sanitary structure joints shall be Modified Groove Tongue (MGT) type joints with a compression type rubber gasket snapped into a groove cast into the tongue. Rubber gaskets shall conform to ASTM C433. Pipe openings in pre-cast structures shall be water tight factory installed rubber boot connectors. Sewer pipe shall be clamped to the rubber boot with stainless steel clamps and hardware in accordance with the manufacturer's specifications. All temporary openings in sanitary structures shall be pointed up watertight with cement mortar.

8. Provide sanitary structure castings as noted on the project plans. When casting type is not noted on the project plans, provide East Jordan 1040 or Neenah R-1916 F1 with solid self sealing cover or equivalent OR as directed by the Municipality. Sanitary structure castings shall be coated with water based asphaltic paint by the manufacturer. Final casting grade adjustments shall be made with pre-cast reinforced concrete grade rings sealed with rubber "O" ring gaskets or brick and mortar pointed up and sealed water tight with cement mortar. Castings shall be secured to the pre-cast structure with a minimum of four (4) 5/8" diameter cadmium coated bolts or threaded studs with neoprene flat washers and cadmium coated nuts.

9. Connections to existing manholes shall be performed by core drilling the manhole wall and installing a resilient boot. Star drilling the opening shall ONLY be performed when core drilling is not possible. Provide a smooth hand-troweled mortared finish in the star drilled opening for installation of a resilient boot.

10. Backfill all sanitary sewer in accordance with the Pipe Trench details provided on the project plans. Provide pipe bedding that meets or exceeds both the specifications of the Pipe Trench details on the project plans and the recommendation of the pipe manufacturer, incidental to work.

11. Install removable plugs in sanitary sewer stubs as acceptable to Engineer and Municipality, incidental to work. Mark the end of all sanitary sewer stubs with a 2" x 4" wooden stake extending a minimum of 12" above finish grade, incidental to work.

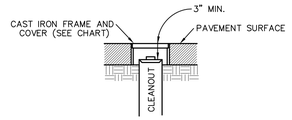
12. Install sanitary sewer service leads in accordance with the project plans. Detailed graphic representation of the sanitary lead connection to the sanitary main may not be shown in the plan and/or profile views. Contractor shall provide the necessary fittings for connection of the sanitary lead to the sanitary main in accordance with the Municipality and the Project Plans, incidental to work. See the Gravity Sanitary Sewer Service Lead Notes and Details on the project plans for additional requirements.

13. Contractor shall provide testing of the sanitary sewer in accordance with the Local Municipality requirements.

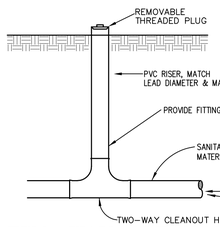
PROPOSED SANITARY STRUCTURE INVENTORY

SA-2:	SA-1:
4' DIA.	4' DIA.
1040Z-A-SANITARY	1040Z-A-SANITARY
RIM - 827.50	RIM - 824.86
6" W. INV. - 819.13	10" S. INV. - 813.41
6" E. INV. - 819.13	EX. 12" NW. INV. - 811.65
10" N. INV. - 818.13	EX. 12" SE. INV. - 811.65
DEPTH = 9.37'	DEPTH = 13.21'

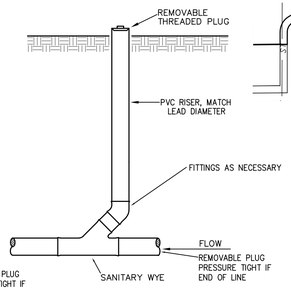
CLEANOUT DIA.	FRAME AND COVER
4"–8"	EJIW 1578
10"–18"	EJIW 1040Z-A-SANITARY



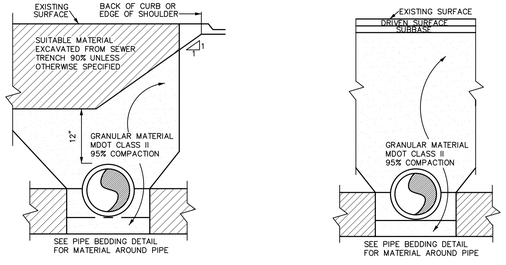
CLEANOUT IN PAVED AREA
NOT TO SCALE



TWO-WAY CLEANOUT FOR SANITARY LEAD
NOT TO SCALE

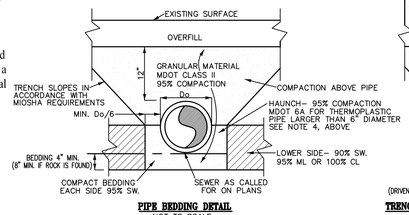


STANDARD CLEANOUT FOR SANITARY LEAD
NOT TO SCALE

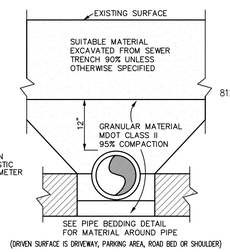


TRENCH A – PIPE UNDER OR WITHIN INFLUENCE OF DRIVEN SURFACE
NOT TO SCALE

NOTES:
1. COMPACTION PRESENTED AS STANDARD PROCTOR VALUES.
2. SOIL TYPES — AASHTO DESIG.
   GRAVEL SANDY (SW) — A1, A3
   SANDY SILTY (ML) — A2, A4
   SILTY CLAY (CL) — A5, A6, A7
3. SOIL IN HAUNCH AND LOWER SIDE ZONES OUTSIDE OF Do/6 FROM SPRING LINE SHALL BE COMPACTED TO AT LEAST THE SAME COMPACTION AS THE SOIL IN THE OVERFILL ZONE.
4. MATERIALS AROUND THERMO. PLASTIC PIPE WITH DIAMETER 6 INCHES SHALL PASS 0.5 INCH SIEVE. MATERIALS AROUND OTHER PIPES SHALL PASS 1.5 INCH SIEVE.

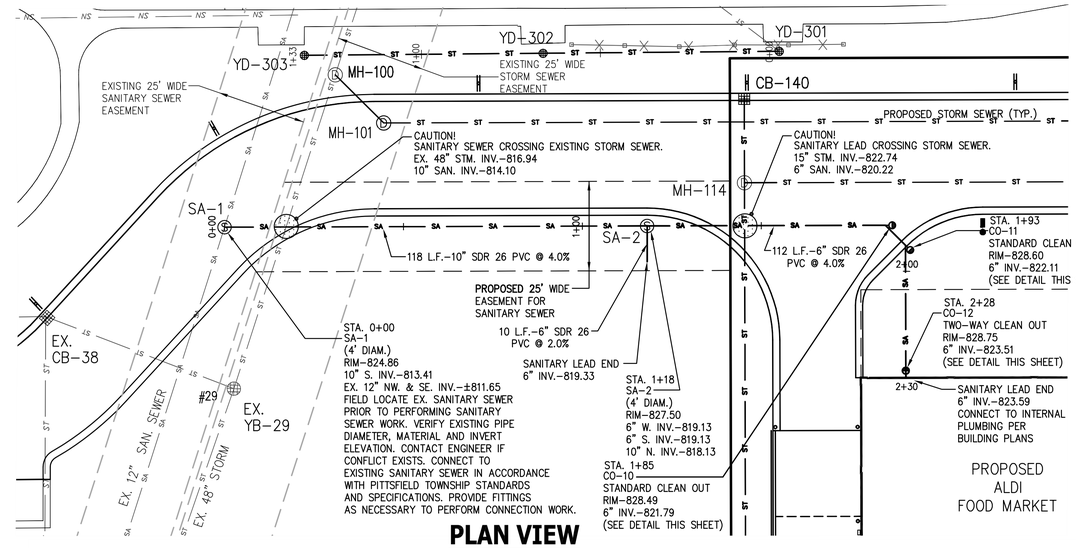


PIPE BEDDING DETAIL
NOT TO SCALE



TRENCH B – PIPE NOT UNDER DRIVEN SURFACES
NOT TO SCALE

TRENCH DETAILS
NOT TO SCALE

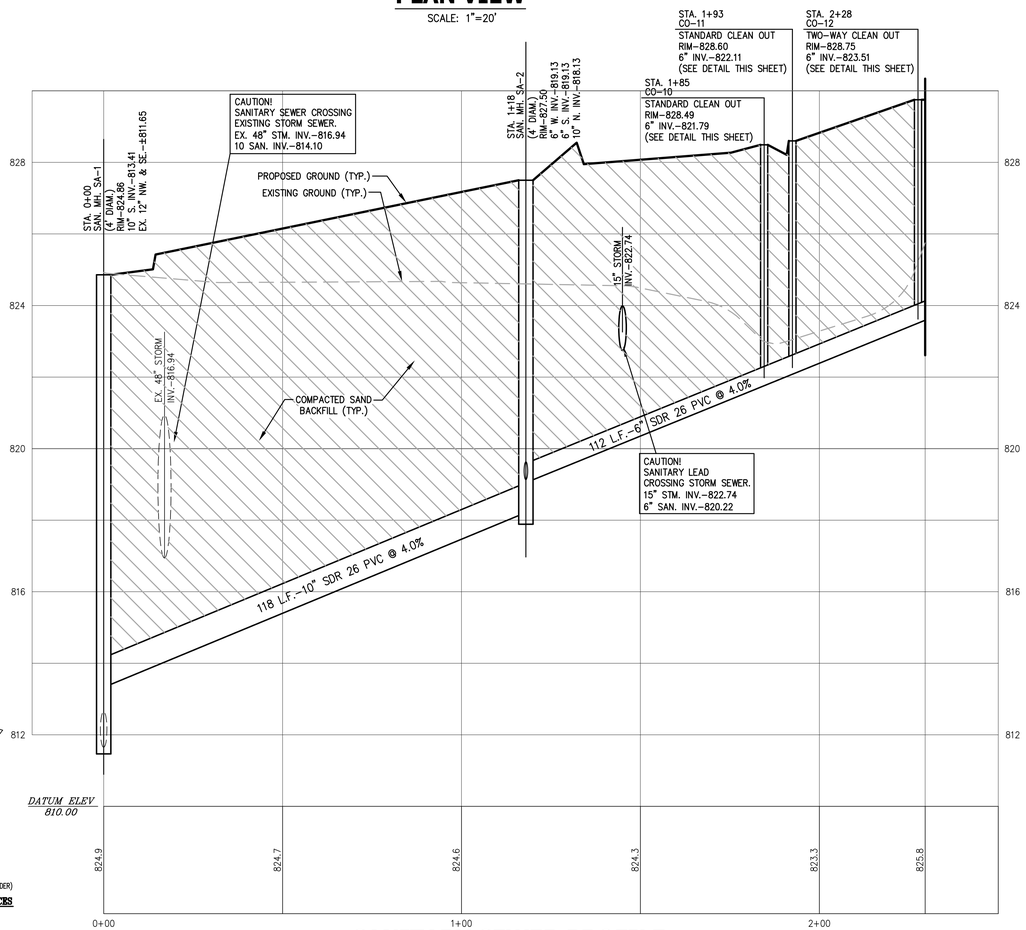


PLAN VIEW
SCALE: 1"=20'

LEGEND

- MISC. STRUCTURE (AS LABELED)
- BOLLARD
- SIGN
- LIGHT BASE
- STREET LIGHT
- OVERHEAD TRAFFIC SIGNAL
- UTILITY METERS & BOXES (ELECTRIC METER, GAS METER, WATER METER, PHONE BOX, CATV BOX, MAIL BOX)
- AIR CONDITIONER UNIT
- UTILITY MANHOLE (AS LABELED)
- UTILITY POLE W/GUY WIRE
- OVERHEAD UTILITY LINES (ELECTRIC/PHONE/CABLE)
- U/G UTILITY LINES (ELECTRIC/PHONE/CABLE)
- SANITARY SEWER MANHOLE W/IDENTIFIER
- SANITARY SEWER PIPE
- CLEAN OUT
- STORM WATER MANHOLE W/IDENTIFIER
- CATCH BASIN W/IDENTIFIER
- CONTROL STRUCTURE
- FLARED END SECTION
- STORM WATER DRAINAGE PIPE
- HYDRANT
- WATER SHUT OFF
- WATER VALVE
- WATER VALVE BOX
- WATER MAIN
- GAS SHUT OFF
- U/G GAS
- PROPOSED SANITARY SEWER
- PROPOSED WATER MAIN
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURES

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)
1 INCH = 20 FEET



SANITARY SEWER PROFILE
SCALE: HOR. 1"=20' / VERT. 1"=2'

SANITARY SEWER MATERIAL QUANTITY LIST

ITEM DESCRIPTION	QUANTITY	UNITS
6" SDR 26 PVC	122	LF
6" SDR 26 PVC 45° BEND	2	EACH
6" SDR 26 PVC 2-WAY CLEANOUT ASSEMBLY	1	EACH
6" SDR 26 PVC STANDARD CLEANOUT ASSEMBLY	2	EACH
10" SDR 26 PVC	118	LF
4' DIAMETER SANITARY MANHOLE	2	EACH
EJIW 1080 CLEANOUT COVER	1	EACH
EJIW 1040Z-A-SANITARY MANHOLE COVER, "PITTSFIELD TWP." IN RAISED LETTERS	2	EACH

BENCHMARKS
DATUM BASED ON NGS OPUS SOLUTION REPORT, DATED FEBRUARY 24, 2017 AT 9:21 AM.

BENCHMARK #200 (STATIC)
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF-SITE)
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

BENCHMARK #203 (OFF-SITE)
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF-SITE)
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG CALL 811 OR 1-800-482-7171 (TOLL FREE) OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION	REVISION #	DATE	REVISION-DESCRIPTION
1	04-16-18	REVISED PER WCWRC REVIEW COMMENTS	6	12-19-18	REVISED BUILDING PER CLIENT REQUEST
2	05-01-18	REVISED LABELS FOR CLARITY			
3	06-04-18	REVISED PER WCWRC REVIEW COMMENTS			
4	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
5	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

SANITARY SEWER PLAN AND PROFILE

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=20'
PROJECT No.: 9162803
DWG NAME: 2803-SAN PP
ISSUED: DEC. 19, 2018

6-UT2

WATER MAIN NOTES:

1. The water main specifications of the Local Municipality are a part of this work. Refer to the General Notes on the project plans for additional information and requirements.

2. Water main work shall include clearing of vegetation and tree stumps, stripping and stockpiling of topsoil for reuse, excavation of pipe trench, placement of pipe bedding, placement of pipe, fittings, valves, hydrants and structures including castings, connection to existing water main, tuck pointing of structures, backfill of pipe trench, compaction of backfill, finish grading, adjustment of valves, hydrants and castings to match proposed finish grade, flushing, testing and chlorination of water main, topsoil placement, seed & mulch, site cleanup and restoration, and other work as shown on the project plans and specifications.

3. Existing and proposed grades shown in profile view on the project plans may be in relation to the centerline of road or item other than the centerline of pipe. The pipe lengths and grades shown in profile view on the project plans may not be to scale.

4. DIP when shown on the project plans shall be ductile iron pipe conforming to ANSI A21.51 (AWWA - C151). DIP shall have a cement lining and an exterior bituminous coating conforming to ANSI A21.4 (AWWA - C104). DIP shall be class 54 unless noted otherwise on the project plans. Provide polyethylene wrap when required by the Local Municipality. Joints shall push-on type conforming to ANSI A21.11 (AWWA - C111). Sealing gaskets, retainer glands and lubricants shall be in accordance with the pipe manufacturer's specifications. Fittings shall be cast ductile iron and shall conform to ANSI-A21.10 (AWWA - C110).

5. Type K Copper when shown on the project plans shall be Type K soft temper copper water tube with flared joints for underground service conforming to ASTM B88.

6. Provide approved mechanical restraint systems at all bends of 11.25 degrees or greater, tees, crosses and hydrant shoes in accordance with the Local Municipality. Thrust blocks shall only be utilized when authorized by the Local Municipality.

7. Water main valves shall be resilient seated gate valves with box, 250 PSI rated, conforming to AWWA C-500. All valves shall open clockwise (right).

8. Fire Hydrant Assemblies shall include a hydrant, 6" gate valve with box opening counter clockwise (left) and all necessary piping and fittings for a complete assembly. Fire hydrants shall conform to AWWA C502. Fire hydrants shall be East Jordan Iron Works 5BR-250 with an integrated 4" Storz coupling or as otherwise specified by the Local Municipality and/or Fire Department. Provide 5'-6" minimum cover.

9. Tapping Sleeve and Valve shall be mechanical joint end type, 250 PSI rated. See Tapping Sleeve and Valve detail for additional requirements.

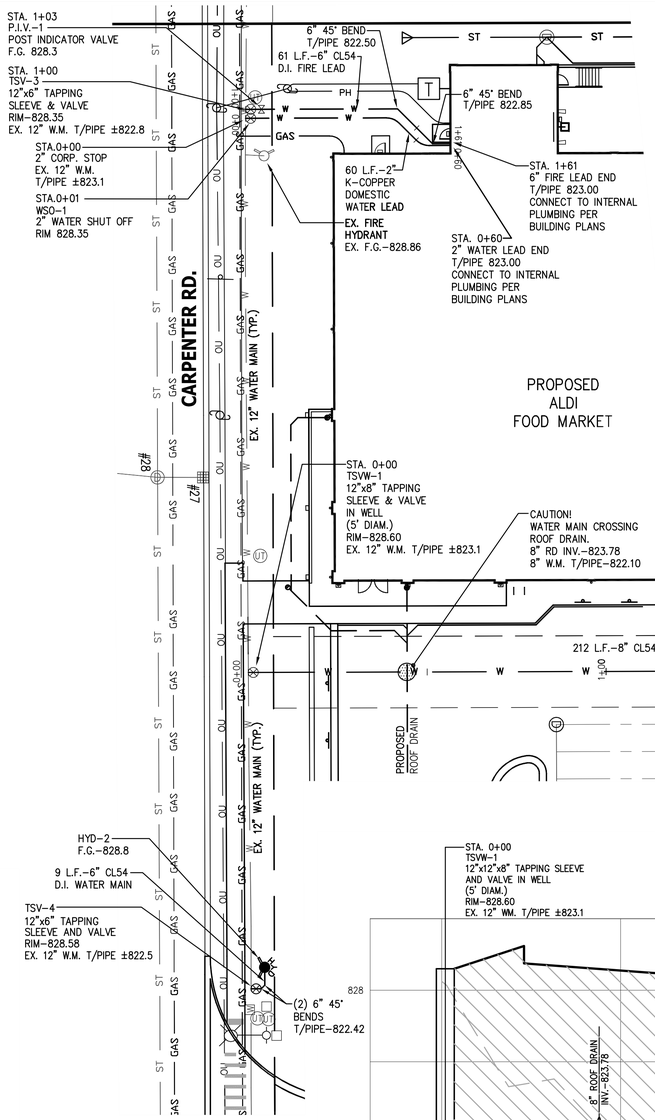
10. Connect to existing water mains in accordance with the project plans. Provide all materials and labor required for a complete watertight connection, incidental to work. Taps to existing water main shall be performed under pressure and without interruption of service.

11. Backfill all water main in accordance with the Pipe Trench details provided on the project plans. Provide pipe bedding that meets or exceeds both the specifications of the Pipe Trench details on the project plans and the recommendation of the pipe manufacturer, incidental to work. Provide 5'-6" minimum cover for all water main.

12. Provide 10' minimum horizontal separation and 1.5' minimum vertical separation between water main and both sanitary sewer and storm sewer.

13. Water service leads shall be installed in accordance with the project plans. Service leads 2" diameter or less shall be Type K copper and shall include a corporation stop, curb stop and curb box. Corporation stop shall conform to AWWA C-800 with copper American National Taper pipe threads conforming to ASA B2.1 1960. Curb stops shall conform to AWWA C-800 and shall be drip-tight, ball type with 300-psig working pressure rating. Curb boxes shall fit curb stop and be extension type of suitable length complete with lid and stationary rod. See Water Service Connection Detail for additional requirements.

14. Contractor shall flush, test and chlorinate the water main in accordance with the Local Municipality.



PLAN VIEW

SCALE: 1"=20'

WATER MAIN MATERIAL QUANTITY LIST		
ITEM DESCRIPTION	QUANTITY	UNITS
2" CORPORATION STOP WITH SADDLE	1	EACH
2" CURB STOP & CURB BOX WITH COVER	1	EACH
2" TYPE K COPPER WATER SERVICE	60	LF
8"x6" REDUCER	1	EACH
6" GATE VALVE & BOX WITH COVER	1	EACH
6" 45º BEND (HORIZONTAL)	6	EACH
6" 45º BEND (VERTICAL)	4	EACH
6" CL 54 DI WATER MAIN	82	LF
12"x12"x6" TAPPING SLEEVE & VALVE	2	EACH
12"x12"x8" TAPPING SLEEVE & VALVE	1	EACH
8" CL 54 DI WATER MAIN	212	LF
FIRE HYDRANT ASSEMBLY	2	EACH
POST INDICATOR VALVE	1	EACH

WATER LEADS FLOW AND SIZING		
LEAD	FLOW REQ'D	PIPE
FIRE LEAD	550 GPM	6" D.I.
DOMESTIC LEAD	150 GPD	2" TYPE K

GRAPHIC SCALE

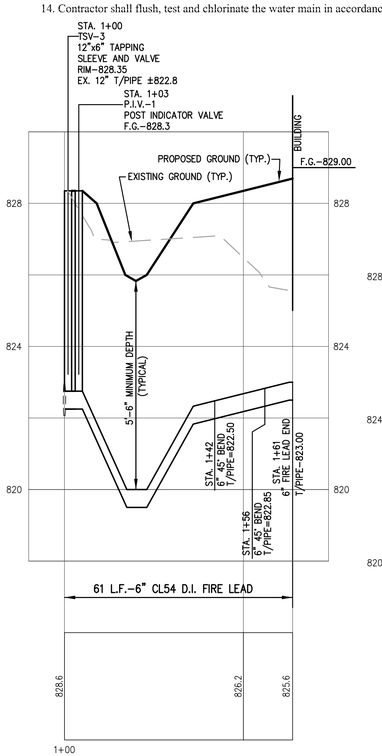
20 0 10 20 40

(IN FEET)
1 INCH = 20 FEET

LEGEND

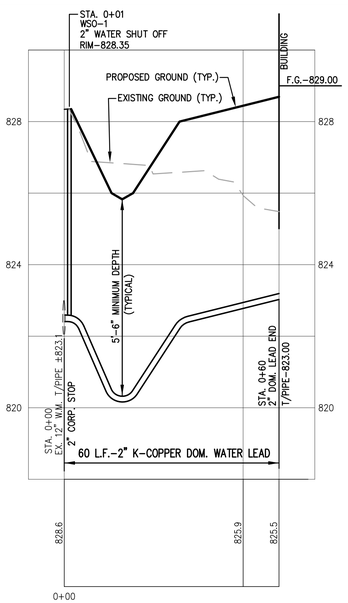
- MISC. STRUCTURE (AS LABELED)
- BOLLARD
- SIGN
- LIGHT BASE
- STREET LIGHT
- OVERHEAD TRAFFIC SIGNAL
- UTILITY METERS & BOXES (ELECTRIC METER, GAS METER, WATER METER, PHONE BOX, CATV BOX, MAIL BOX)
- AIR CONDITIONER UNIT
- UTILITY MANHOLE (AS LABELED)
- UTILITY POLE W/GUY WIRE
- OVERHEAD UTILITY LINES (ELECTRIC/PHONE/CABLE)
- U/G UTILITY LINES (ELECTRIC/PHONE/CABLE)
- SANITARY SEWER MANHOLE W/IDENTIFIER
- SANITARY SEWER PIPE
- CLEAN OUT
- STORM WATER MANHOLE W/IDENTIFIER
- CATCH BASIN W/IDENTIFIER
- CONTROL STRUCTURE
- FLARED END SECTION
- STORM WATER DRAINAGE PIPE
- HYDRANT
- WATER SHUT OFF
- WATER VALVE
- WATER VALVE BOX
- WATER MAIN
- GAS SHUT OFF
- U/G GAS
- PROPOSED SANITARY SEWER
- PROPOSED WATER MAIN
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURES

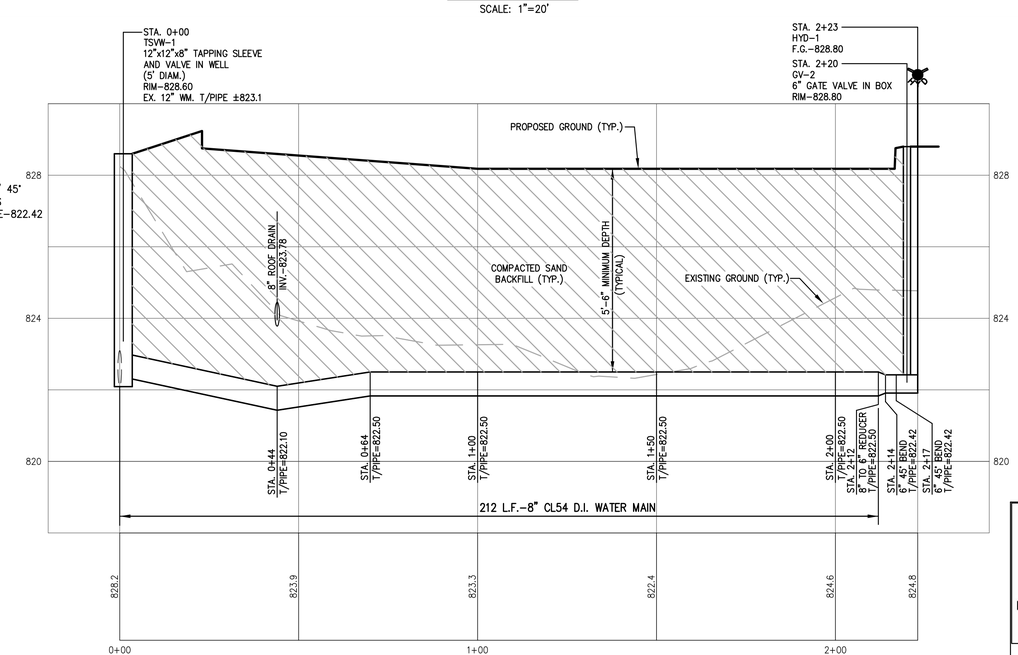
STRUCTURE SCHEDULE		
STRUCTURE NUMBER	CASTING	F.G. / RIM
TSVW-1	PITTSFIELD TWP. EJIW 1040Z-A-WATER	828.60
GV-2	TYLER 6860 DD	828.80
TSV-3	TYLER 6860 DD	828.35
TSV-4	TYLER 6860 DD	828.58
HYD-1	EJIW 5BR250	828.8
HYD-2	EJIW 5BR250	828.8
PIV-1	AMERICAN FLOW CONTROL 2500 OR CLOW F-6120	828.3



WATER MAIN PROFILE

SCALE: HOR. 1"=20' / VERT. 1"=2'





WATER MAIN PROFILE

SCALE: HOR. 1"=20' / VERT. 1"=2'

BENCHMARKS

DATUM BASED ON NGS OPUS SOLUTION REPORT, DATED FEBRUARY 24, 2017 AT 9:21 AM.

BENCHMARK #200 (STATIC)
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF-SITE)
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

BENCHMARK #203 (OFF-SITE)
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF-SITE)
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

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

3 WORKING DAYS
BEFORE YOU DIG
CALL 811 OR 1-800-482-7171
(TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION	REVISION #	DATE	REVISION-DESCRIPTION
1	04-16-18	REVISED PER WCWRC REVIEW COMMENTS	6	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
2	05-01-18	REVISED LABELS FOR CLARITY	7	12-19-18	REVISED BUILDING PER CLIENT REQUEST
3	06-04-18	REVISED PER WCWRC REVIEW COMMENTS			
4	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
5	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

WATER MAIN
PLAN AND PROFILE

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=20'
PROJECT No.: 9162803
DWG NAME: 2803-WAT PP
ISSUED: DEC. 19, 2018

7-UT3

EXISTING UTILITY STRUCTURE INVENTORY

SANITARY MANHOLE #1
NORTH RIM 828.96
INVERTS
NORTHWEST 12" IRON 812.96
SOUTHEAST 12" IRON 812.86

CATCH BASIN #2
RIM – ROAD SIDE 828.87
INVERTS
WEST 12" RCP 825.75

STORM MANHOLE #3
NORTH RIM 829.23
INVERTS
NORTH 12" RCP 824.73
EAST 48" RCP 818.23
EAST 12" RCP 824.93
SOUTHEAST 48" RCP 818.33

STORM MANHOLE #4
NORTH RIM 829.49
INVERTS
NORTH 12" RCP 824.74
NORTHEAST 12" RCP 825.99
SOUTH 18" RCP 824.64

CATCH BASIN #5
RIM – ROAD SIDE 828.97
INVERTS
SOUTHWEST 12" RCP 826.12
EAST 4" CPP ± 825.77

SANITARY SEWER MANHOLE #6
CENTER 830.20
INVERTS
NORTH 8" IRON 813.17
NORTH 8" IRON 818.30
WEST 12" IRON 824.70
SOUTHEAST 12" IRON 812.85
SOUTH 10" IRON 812.95

CATCH BASIN #7
RIM – ROAD SIDE 828.28
INVERTS
WEST 12" RCP 824.58

STORM MANHOLE #8
NORTH RIM 828.69
INVERTS
NORTH 8" RCP 823.54
EAST 12" RCP 823.89
SOUTHWEST 12" RCP 822.69
NORTHWEST 18" RCP–T/PIPE 824.34
EAST 18" RCP 820.89

CATCH BASIN #9
RIM – ROAD SIDE 830.26
INVERTS
WEST 12" RCP 826.08

STORM MANHOLE #10
NORTH RIM 830.92
INVERTS
NORTHEAST 12" RCP 822.72
TOP WALL 827.77

STORM MANHOLE #11
NORTH RIM 831.00
INVERTS
WEST 12" RCP 822.75
TOP WALL 827.80

STORM MANHOLE #12
NORTH RIM 830.51
INVERTS
U/G DET. CMP–BOTTOM 822.86

SANITARTY SEWER MH #13
NORTH RIM 828.98
INVERTS
NORTH 10" IRON 814.13
SOUTH 10" IRON 814.23

CATCH BASIN #14
RIM – ROAD SIDE 830.64
INVERTS
U/G DET. STR. BOTTOM 824.64

STORM MANHOLE #15
NORTH RIM 831.35
INVERTS
U/G DET. STRUCTURE BOTTOM 822.95

SANITARY SEWER MANHOLE #16
NORTH RIM 828.92
INVERTS
NORTH 10" IRON 814.62
SOUTH 10" IRON 814.72
WEST 8" IRON 818.12

GATE VALVE WELL #17
NORTH RIM 828.89
INVERTS
EAST–WEST SIZE UNKNOWN 819.89

STORM MANHOLE #18
NORTH RIM 830.07
INVERTS
SOUTH 12" RCP 822.22
WEST 12" RCP 822.32

SANITARY SEWER MANHOLE #19
NORTH RIM 830.64
INVERTS
NORTH 10" IRON 815.29
EAST 8" IRON 817.29
SOUTH 10" IRON 816.04

STORM MANHOLE #20
NORTH RIM 831.36
INVERTS
EAST 48" RCP 821.84
EAST 14" RCP 825.96
SOUTH 42" RCP 821.86
WEST 12" RCP – FULL DEBRIS 821.76

STORM MANHOLE #21
NORTH RIM 831.11
INVERTS
NORTH NOT AVAILABLE
SOUTH NOT AVAILABLE
EAST NOT AVAILABLE
WEST NOT AVAILABLE

CATCH BASIN #22
RIM – ROAD SIDE 830.49
INVERTS
WEST 12" RCP 827.49

CATCH BASIN #23
RIM – ROAD SIDE 830.58
INVERTS
WEST 12" RCP ± 826.83

STORM MANHOLE #24
NORTH RIM 830.82
INVERTS
EAST 12" RCP ± 825.82
NORTH 48" RCP 821.02
SOUTHEAST 18" RCP 821.52
WEST 48" RCP 821.12

GATE VALVE WELL #25
NORTH RIM 832.22
INVERTS
NORTH–SOUTH IRON–T/PIPE–TEE 823.47
EAST IRON – TOP PIPE – TEE 823.47

SANITARY SEWER MANHOLE #26
CENTER 828.31
INVERTS
WEST 8" IRON 818.51
SOUTH 8" IRON 818.71

CATCH BASIN #27
RIM – ROAD SIDE 827.85
INVERTS
WEST 12" RCP 824.85

STORM MANHOLE #28
NORTH RIM 828.09
INVERTS
NORTH 48" RCP 819.79
SOUTH 48" RCP 819.84
EAST 12" RCP ± 822.89
WEST 18" RCP 820.39

YARD BASIN #29 – ROUND
SOUTH RIM 824.42
INVERTS
NORTHWEST 817.17
SOUTHEAST 817.14

YARD BASIN #30
WEST RIM 824.04
INVERTS
SOUTHEAST 48" RCP 816.34
NORTHWEST 48" RCP 816.39

YARD BASIN #31
EAST RIM 821.55
INVERTS
EAST 60" RCP 814.35
WEST 60" RCP 814.35

SANITARY SEWER MANHOLE #32
EAST RIM 822.59
INVERTS
EAST 12" IRON 809.69
WEST 12" IRON 809.79

YARD BASIN #33
WEST RIM 827.50
INVERTS
EAST 60" RCP 814.30
WEST 60" RCP 814.30
TOP PIPE 818.00

LIFT STATION MANHOLE #34
CENTER 834.30
INVERTS
TOP PIPE IRON 828.30

STORM MANHOLE #35
CENTER 829.98
INVERTS
TOP WATER 827.58
NOT AVAILABLE – FLOODED

STORM MANHOLE #36
CENTER 820.00
INVERTS
NORTHWEST 30" RCP 810.80
EAST 30" RCP 810.20

SANITARY SEWER MANHOLE #37
CENTER 821.84
INVERTS
EAST 12" IRON 807.44
WEST 12" IRON 808.24

CATCH BASIN #38
CENTER 823.10
INVERTS
NOT FIELD VERIFIED

FLARED END SECTION #39
TOP 823.14
INVERTS
8" HDPE 822.44

FLARED END SECTION #40
TOP 818.56
INVERTS
60" RCP 813.60

FLARED END SECTION #41
TOP 814.22
INVERTS
15" CMP 812.97

FLARED END SECTION #42
TOP 813.54
INVERTS
15" CMP 812.40

FLOW RESTRICTOR #43
TOP 814.60
INVERTS
15" RCP 811.58

CATCH BASIN #44
RIM 823.99
INVERTS
NOT FIELD VERIFIED

CATCH BASIN #45
RIM 824.95
INVERTS
NOT FIELD VERIFIED

BENCHMARKS

DATUM BASED ON NGS OPUS SOLUTION REPORT, DATED FEBRUARY 24, 2017 AT 9:21 AM.

BENCHMARK #200 (STATIC)
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF–SITE)
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

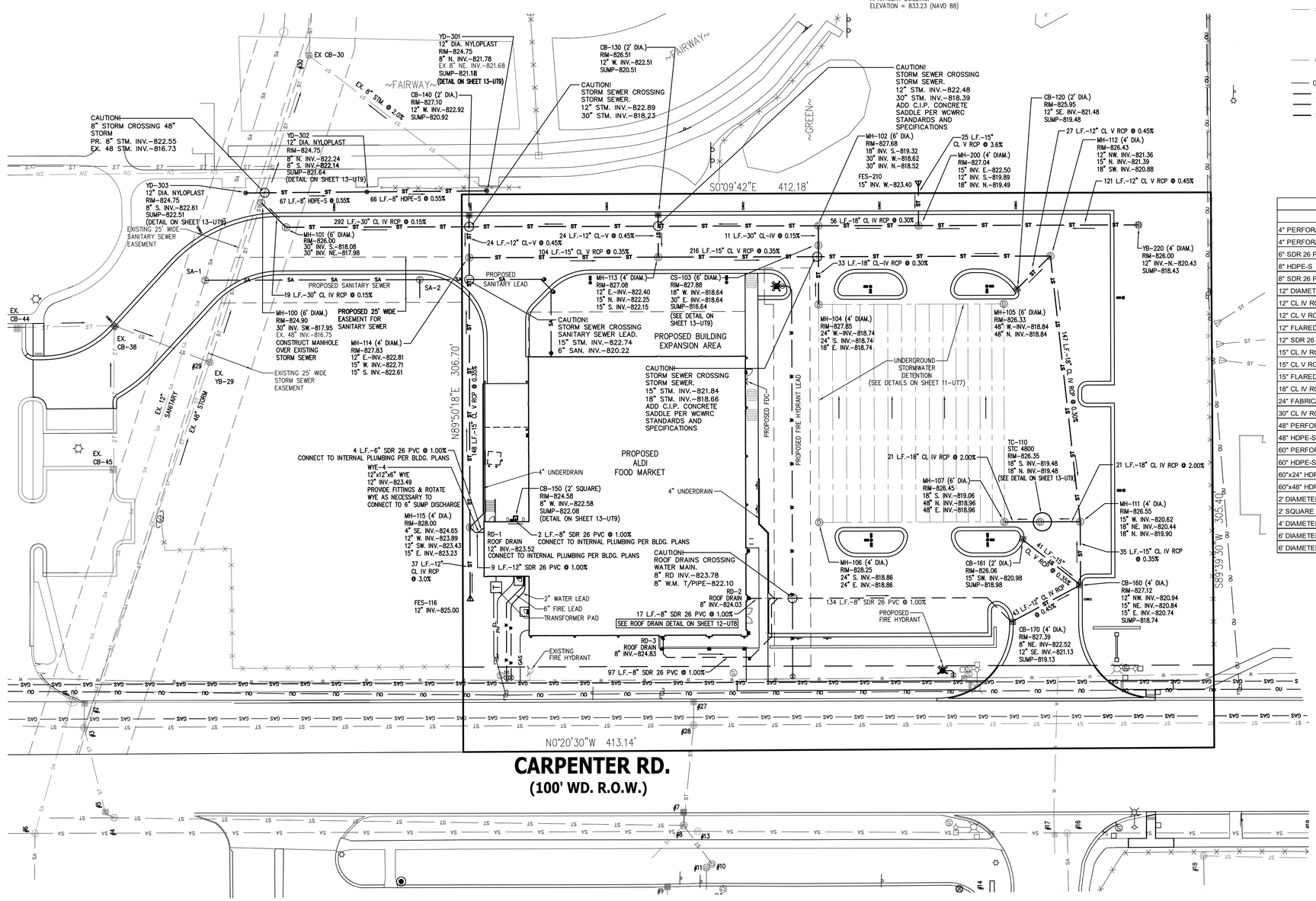
BENCHMARK #203 (OFF–SITE)
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF–SITE)
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

GRAPHIC SCALE
30 0 15 30 60
(IN FEET)
1 INCH = 30 FEET

LEGEND

- MISC. STRUCTURE (AS LABELED)
- BOLLARD
- SIGN
- LIGHT BASE
- STREET LIGHT
- OVERHEAD TRAFFIC SIGNAL
- UTILITY METERS & BOXES (ELECTRIC METER, GAS METER, WATER METER, PHONE BOX, CATV BOX, MAIL BOX)
- AIR CONDITIONER UNIT
- UTILITY MANHOLE (AS LABELED)
- UTILITY POLE W/GUY WIRE
- OVERHEAD UTILITY LINES (ELECTRIC/PHONE/CABLE)
- U/G UTILITY LINES (ELECTRIC/PHONE/CABLE)
- SANITARY SEWER MANHOLE W/IDENTIFIER
- SANITARY SEWER PIPE
- CLEAN OUT
- STORM WATER MANHOLE W/IDENTIFIER
- CATCH BASIN W/IDENTIFIER
- CONTROL STRUCTURE
- FLARED END SECTION
- STORM WATER DRAINAGE PIPE
- HYDRANT
- WATER SHUT OFF
- WATER VALVE
- WATER VALVE BOX
- WATER MAIN
- GAS SHUT OFF
- U/G GAS
- PROPOSED SANITARY SEWER
- PROPOSED WATER MAIN
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURES



STORM SEWER MATERIAL QUANTITY LIST		
ITEM DESCRIPTION	QUANTITY	UNITS
4" PERFORATED HDPE-C	85	LF
4" PERFORATED SDR 35 PVC	89	LF
6" SDR 26 PVC	7	LF
8" HDPE-S	133	LF
8" SDR 26 PVC	267	LF
12" DIAMETER NYLOPLAST DRAINAGE STRUCTURE	3	EACH
12" CL IV RCP	80	LF
12" CL V RCP	196	LF
12" FLARED END SECTION	1	EACH
12" SDR 26 PVC	9	LF
15" CL IV RCP	35	LF
15" CL V RCP	534	LF
15" FLARED END SECTION	1	EACH
18" CL IV RCP	278	LF
24" FABRICATED INSPECTION STUB WITH RIM & COVER	2	EACH
30" CL IV RCP	322	LF
48" PERFORATED HDPE-S	577	LF
48" HDPE-S FABRICATED MANIFOLD	52	LF
60" PERFORATED HDPE-S	1147	LF
60" HDPE-S FABRICATED MANIFOLD	136	LF
60"x24" HDPE-S FABRICATED REDUCER	4	EACH
60"x48" HDPE-S FABRICATED REDUCER	2	EACH
2' DIAMETER DRAINAGE STRUCTURE WITH RIM & COVER	4	EACH
2' SQUARE DRAINAGE STRUCTURE WITH RIM & COVER	1	EACH
4' DIAMETER DRAINAGE STRUCTURE WITH RIM & COVER	11	EACH
6' DIAMETER CONTROL STRUCTURE WITH RIMS & COVERS	1	EACH
6' DIAMETER DRAINAGE STRUCTURE WITH RIM & COVER	5	EACH

STORM SEWER CASTING SCHEDULE	
STORM MANHOLE (MH):	EJIW 1040Z-A-STORM
CURB LINE CATCH BASIN (CB):	EJIW 7045Z-M1-7050T1
FABRICATED INSPECTION STUB:	EJIW 1040Z-A-STORM
YARD DRAIN (YD):	NYLOPLAST 1299CGD
TRUCK WELL INLET (CB):	NEENAH R-3210-Q OR EJIW V5662 FRAME & V5662-80 GRATE
8" DIA. ROOF DRAIN CLEANOUT (CO):	EJIW 1578Z-A
YARD BASIN (YB):	EJIW 6508

811 Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1–800–482–7171 (TOLL FREE)
OR VISIT CALL811.COM

DESIGN INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	04–16–18	REVISED PER WCWRC REVIEW COMMENTS
2	05–01–18	REVISED PER WETLAND MITIGATION REQUIREMENTS
3	06–04–18	REVISED PER WCWRC REVIEW COMMENTS
4	07–02–18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
5	08–28–18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
6	10–31–18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
7	12–19–18	REVISED BUILDING PER CLIENT REQUEST

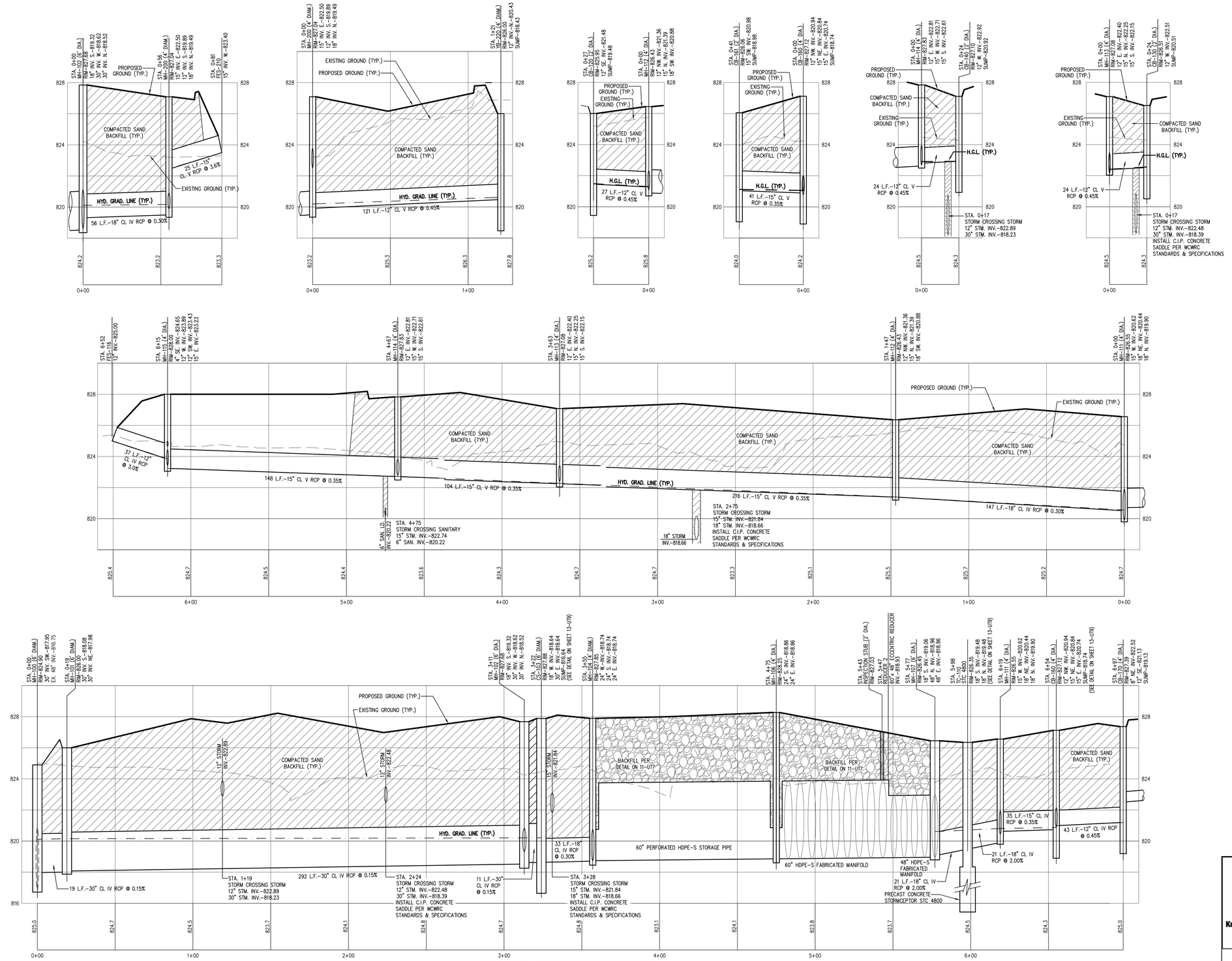
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

STORM SEWER PLAN, NOTES & DETAILS

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=30'
PROJECT No.: 9162803
DWG NAME: 2803-STORM
ISSUED: DEC. 19, 2018

8-UT4



STORM SEWER PROFILE

SCALE: HOR. 1"=30' / VERT. 1"=3'

Know what's below. Call before you dig.

3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171
(TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
2	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS
3	06-04-18	REVISED PER WCWRC REVIEW COMMENTS
4	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
5	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
6	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS

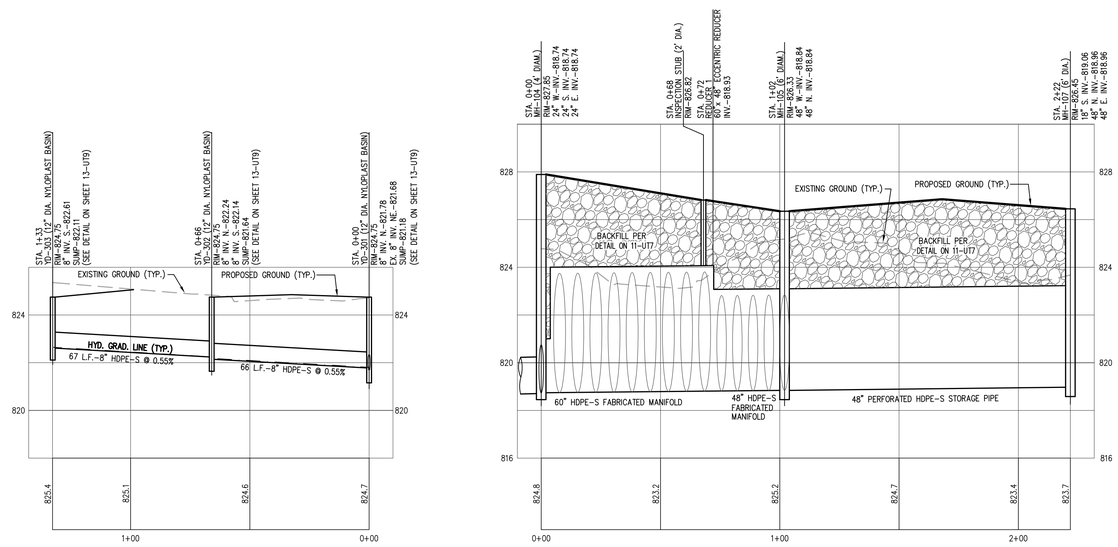
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

STORM SEWER PROFILES

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=30'
PROJECT No.: 9162803
DWG NAME: 2803-STORM
ISSUED: OCT. 31, 2018

9-UT5



STORM SEWER PROFILE

SCALE: HOR. 1"=30' / VERT. 1"=3'

PROPOSED STRUCTURE INVENTORY

YD-303: 12" DIA. NYLOPLAST NYLOPLAST 1299CGD RIM - 824.75 8" S. INV. - 822.61 SUMP - 822.11 DEPTH = 2.64'	YD-302: 12" DIA. NYLOPLAST NYLOPLAST 1299CGD RIM - 824.75 8" N. INV. - 822.24 8" S. INV. - 822.14 SUMP - 821.64 DEPTH = 3.11'	YD-301: 12" DIA. NYLOPLAST NYLOPLAST 1299CGD RIM - 824.75 8" N. INV. - 821.78 EX. 8" NE. INV. - 821.68 SUMP - 821.18 DEPTH = 3.57'	YB-220: 4' DIA. EJIW 6508 RIM - 826.00 12" N. INV. - 820.43 SUMP - 818.43 DEPTH = 7.57'
FES-210: FLARED END SECTION 15" W. INV. - 823.40	MH-200: 4' DIA. EJIW 1040Z-A-STORM RIM - 827.04 15" E. INV. - 822.50 12" S. INV. - 819.89 18" N. INV. - 819.49 DEPTH = 7.55'	CB-170: 4' DIA. EJIW 7045Z-M1-7050T1 RIM - 827.39 8" NE. INV. - 822.52 12" SE. INV. - 821.13 SUMP - 819.13 DEPTH = 8.26'	CB-161: 2' DIA. EJIW 7045Z-M1-7050T1 RIM - 826.06 15" SW. INV. - 820.98 SUMP - 818.98 DEPTH = 7.07'
CB-160: 4' DIA. EJIW 7045Z-M1-7050T1 RIM - 827.12 12" NW. INV. - 820.94 15" NE. INV. - 820.84 15" E. INV. - 820.74 SUMP - 818.74 DEPTH = 8.38'	CB-150: 2' SQUARE NEENAH R-3210-Q OR EJIW V5662 FRAME & V5662-80 GRATE RIM - 824.58 8" W. INV. - 822.58 SUMP - 822.08 DEPTH = 2.50'	CB-140: 2' DIA. EJIW 7045Z-M1-7050T1 RIM - 827.10 12" W. INV. - 822.92 SUMP - 820.92 DEPTH = 6.18'	CB-130: 2' DIA. EJIW 7045Z-M1-7050T1 RIM - 826.51 12" W. INV. - 822.51 SUMP - 820.51 DEPTH = 6.00'
CB-120: 2' DIA. EJIW 7045Z-M1-7050T1 RIM - 825.95 12" SE. INV. - 821.48 SUMP - 819.48 DEPTH = 6.47'	FES-116: FLARED END SECTION 12" E. INV. - 825.00	MH-115: 4' DIA. EJIW 1040Z-A-STORM RIM - 828.00 4" SE. INV. - 824.65 12" W. INV. - 823.89 12" SW. INV. - 823.43 15" E. INV. - 823.23 DEPTH = 4.72'	MH-114: 4' DIA. EJIW 1040Z-A-STORM RIM - 827.83 12" E. INV. - 822.81 15" W. INV. - 822.71 15" S. INV. - 822.61 DEPTH = 5.22'
MH-113: 4' DIA. EJIW 1040Z-A-STORM RIM - 827.08 12" E. INV. - 822.40 15" N. INV. - 822.25 15" S. INV. - 822.15 DEPTH = 4.93'	MH-112: 4' DIA. EJIW 1040Z-A-STORM RIM - 826.43 12" NW. INV. - 821.36 15" N. INV. - 821.39 18" SW. INV. - 820.88 DEPTH = 5.55'	MH-111: 4' DIA. EJIW 1040Z-A-STORM RIM - 826.55 15" W. INV. - 820.62 18" NE. INV. - 820.44 18" N. INV. - 819.90 DEPTH = 6.65'	TC-110: STC 4800 TREATMENT CHAMBER EJIW 1040Z-A-STORM RIM - 826.35 18" S. INV. - 819.48 18" N. INV. - 819.48 SUMP - 808.23 DEPTH = 18.12'
MH-107: 6' DIA. EJIW 1040Z-A-STORM RIM - 826.45 18" S. INV. - 819.06 48" N. INV. - 818.96 48" E. INV. - 818.96 DEPTH = 7.49'	MH-106: 4' DIA. EJIW 1040Z-A-STORM RIM - 828.25 24" S. INV. - 818.86 24" E. INV. - 818.86 DEPTH = 9.40'	MH-105: 6' DIA. EJIW 1040Z-A-STORM RIM - 826.33 48" W. INV. - 818.84 48" N. INV. - 818.84 DEPTH = 7.49'	MH-104: 4' DIA. EJIW 1040Z-A-STORM RIM - 827.85 24" W. INV. - 818.74 24" S. INV. - 818.74 18" E. INV. - 818.74 DEPTH = 9.11'
CS-103: CONTROL STRUCTURE 6' DIA. EJIW 1040Z-A-STORM RIM - 827.88 18" W. INV. - 818.64 30" E. INV. - 818.64 SUMP - 816.64 DEPTH = 11.24'	MH-102: 6' DIA. EJIW 1040Z-A-STORM RIM - 827.68 18" S. INV. - 819.32 30" W. INV. - 818.62 30" N. INV. - 818.52 DEPTH = 9.16'	MH-101: 6' DIA. EJIW 1040Z-A-STORM RIM - 826.00 30" S. INV. - 818.08 30" NE. INV. - 817.98 DEPTH = 8.02'	MH-100: 6' DIA. EJIW 1040Z-A-STORM RIM - 824.90 30" SW. INV. - 817.95 EX. 48" INV. - 816.75 DEPTH = 8.15'

Know what's below. Call before you dig.

3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171
(TOLL FREE)
OR VISIT CALLB11.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
2	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS

REVISION #	DATE	REVISION-DESCRIPTION

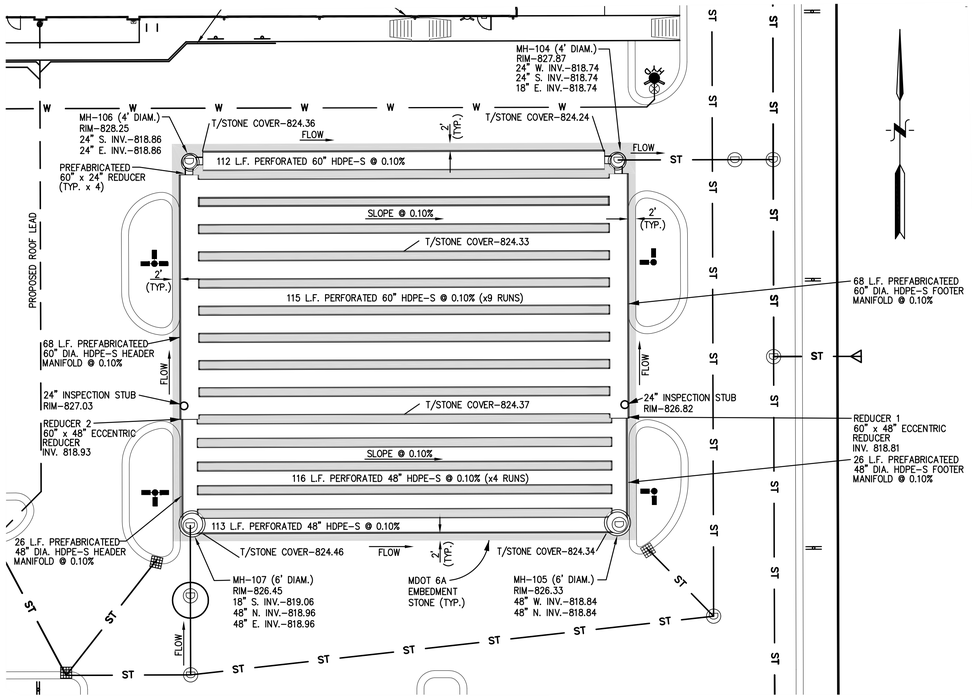
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

STORM SEWER PROFILES

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

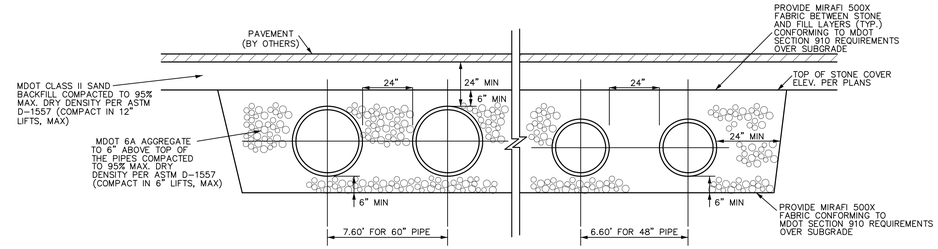
SCALE: 1"=30'
PROJECT No.: 9162803
DWG NAME: 2803-STORM
ISSUED: OCT. 31, 2018

10-UT6

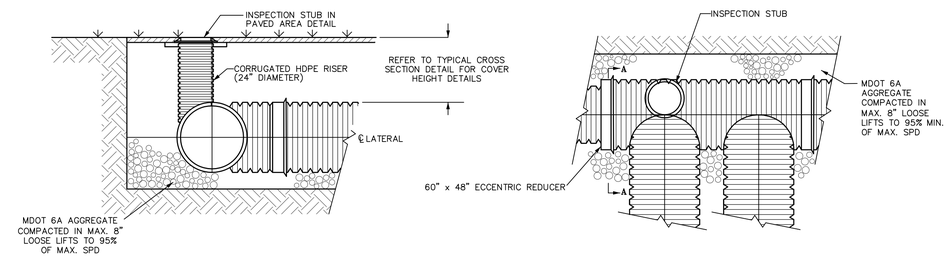


PLAN VIEW

SCALE" 1"=20'



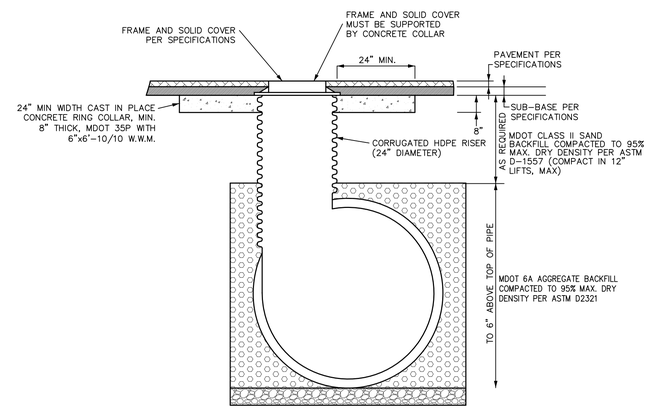
UNDERGROUND DETENTION PIPING TYPICAL CROSS SECTION DETAIL



SECTION A-A

MANIFOLD DETAIL

UNDERGROUND DETENTION TYPICAL RISER/CLEAN-OUT DETAIL



RISER IN PAVED AREA

NOT TO SCALE

BENCHMARKS

DATUM BASED ON NGS OPUS SOLUTION REPORT, DATED FEBRUARY 24, 2017 AT 9:21 AM.

BENCHMARK #200 (STATIC)
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF-SITE)
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

BENCHMARK #203 (OFF-SITE)
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF-SITE)
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

Know what's below. Call before you dig.

3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION	REVISION #	DATE	REVISION-DESCRIPTION
1	04-16-18	REVISED PER WCWRC REVIEW COMMENTS			
2	06-04-18	REVISED PER WCWRC REVIEW COMMENTS			
3	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
4	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
5	12-19-18	REVISED BUILDING PER CLIENT REQUEST			

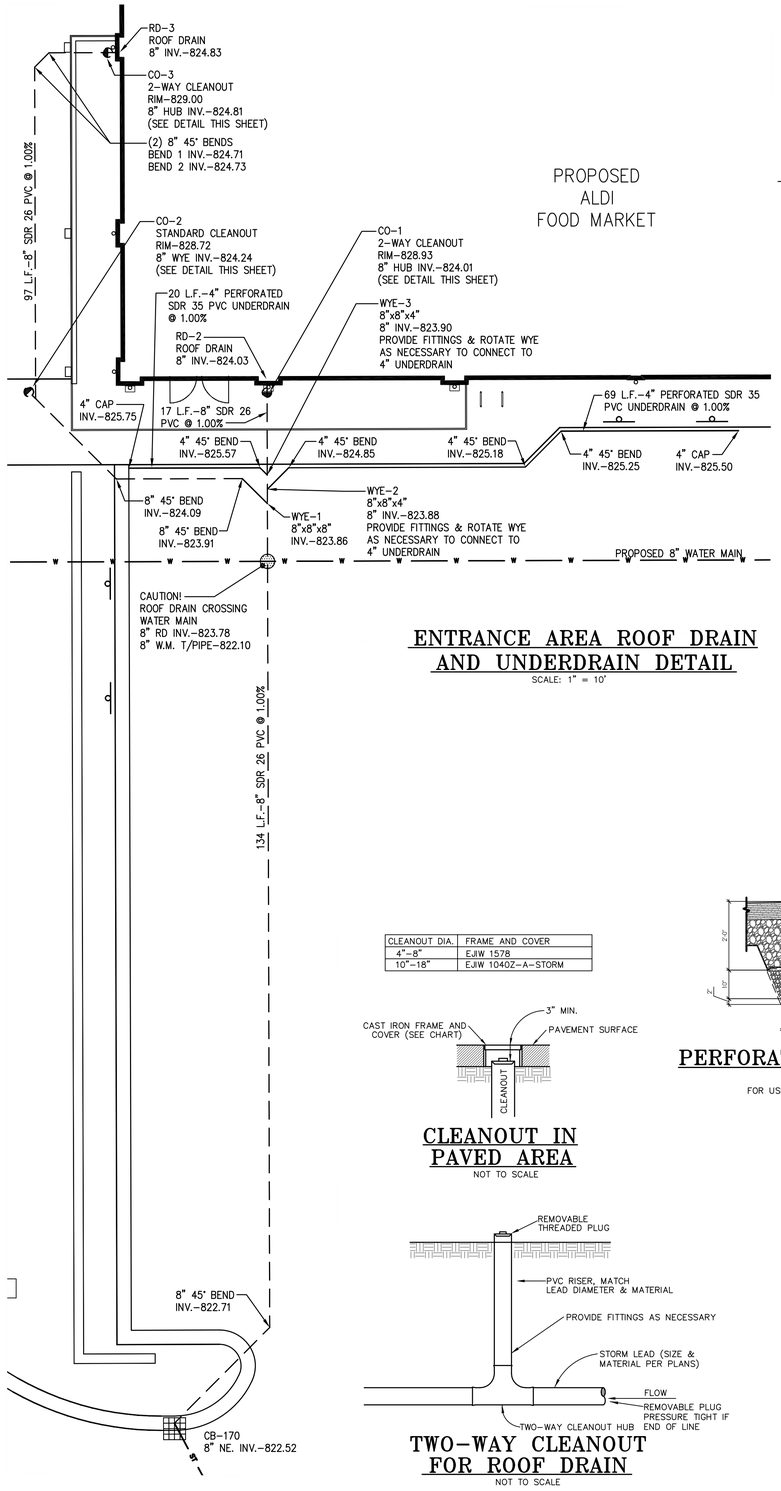
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

UNDERGROUND STORM WATER STORAGE SYSTEM PLAN, NOTES & DETAILS

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

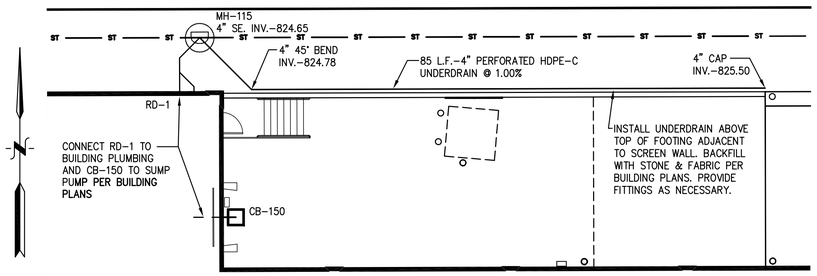
SCALE: 1"=20'
PROJECT No.: 9162803
DWG NAME: 2803-STORAGE
ISSUED: DEC. 19, 2018

11-UT7



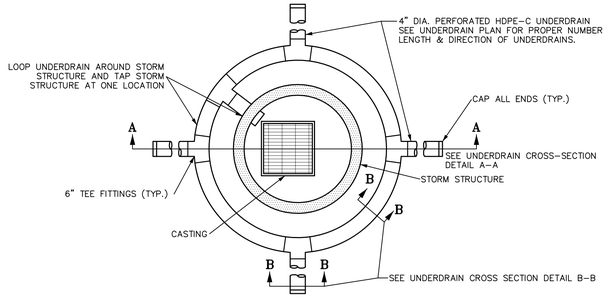
ENTRANCE AREA ROOF DRAIN AND UNDERDRAIN DETAIL

SCALE: 1" = 10'



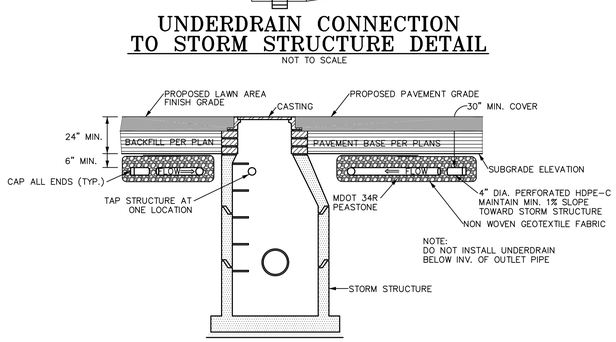
TRUCK WELL AREA ROOF DRAIN AND UNDERDRAIN DETAIL

SCALE: 1" = 10'



UNDERDRAIN CONNECTION TO STORM STRUCTURE DETAIL

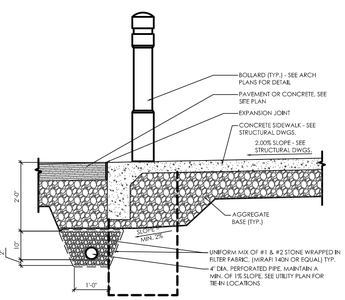
NOT TO SCALE



UNDERDRAIN CROSS SECTION DETAIL A-A

NOT TO SCALE

NOT FOR USE AT BUILDING ENTRANCE SIDEWALK



PERFORATED UNDERDRAIN DETAIL

NOT TO SCALE

FOR USE AT BUILDING ENTRANCE AREA ONLY

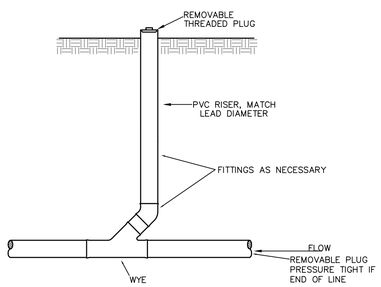
CLEANOUT DIA.	FRAME AND COVER
4"-8"	EJIW 1578
10"-18"	EJIW 1040Z-A-STORM

CLEANOUT IN PAVED AREA

NOT TO SCALE

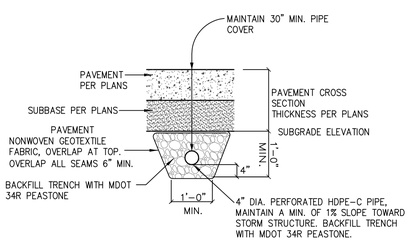
TWO-WAY CLEANOUT FOR ROOF DRAIN

NOT TO SCALE



STANDARD CLEANOUT FOR ROOF DRAIN

NOT TO SCALE



UNDERDRAIN CROSS SECTION DETAIL B-B

NOT TO SCALE

NOT FOR USE AT BUILDING ENTRANCE SIDEWALK

LEGEND

- = MISC. STRUCTURE (AS LABELED)
- = BOLLARD
- = SIGN
- = LIGHT BASE
- = STREET LIGHT
- = OVERHEAD TRAFFIC SIGNAL
- = UTILITY METERS & BOXES (ELECTRIC METER, GAS METER, WATER METER, PHONE BOX, CATV BOX, MAIL BOX)
- = AIR CONDITIONER UNIT
- = UTILITY MANHOLE (AS LABELED)
- = UTILITY POLE W/GUY WIRE
- = OVERHEAD UTILITY LINES (ELECTRIC/PHONE/CABLE)
- = U/G UTILITY LINES (ELECTRIC/PHONE/CABLE)
- = SANITARY SEWER MANHOLE W/IDENTIFIER
- = SANITARY SEWER PIPE
- = CLEAN OUT
- = STORM WATER MANHOLE W/IDENTIFIER
- = CATCH BASIN W/IDENTIFIER
- = CONTROL STRUCTURE
- = FLARED END SECTION
- = STORM WATER DRAINAGE PIPE
- = HYDRANT
- = WATER SHUT OFF
- = WATER VALVE
- = WATER VALVE BOX
- = WATER MAIN
- = GAS SHUT OFF
- = U/G GAS
- = PROPOSED SANITARY SEWER
- = PROPOSED WATER MAIN
- = PROPOSED STORM SEWER
- = PROPOSED STORM STRUCTURES

PAVEMENT UNDERDRAIN NOTES:

1. Install the appropriate number of underdrains at the length and direction shown and/or specified on the Project Plans. Maintain a minimum pipe slope of 1.0% down gradient toward the storm structure and a minimum of 30" of pipe cover. When storm sewer elevations interfere with underdrains, offset underdrain trench away from storm sewer trench as necessary to clear storm sewer pipe. Maintain proposed direction and location of underdrain to the greatest extent feasible.

2. Loop underdrain around the storm structure in a donut configuration and tap the storm structure at a single location. When storm sewer elevations interfere with underdrain loop, utilize ½ to ¾ loop as necessary to clear storm sewer. Multiple taps shall only be performed when storm sewer interference does not allow for a single tap. Locate tap(s) so as not to interfere with storm structure steps. Install a Kor-N-Seal Pipe to Manhole Connector at all tap locations. All Kor-N-Seal Pipe to Manhole Connectors shall include stainless steel or other non-corrosive bands, clamps and hardware and shall be installed in accordance with the manufacturer's standards and specifications.

3. Backfill all underdrain trenches up to the proposed pavement subgrade elevation with MDOT 34R peastone. When underdrain is located in lawn area, backfill trench to a minimum of 6" above top of underdrain pipe.

4. Wrap all underdrain trenches with nonwoven geotextile fabric. Overlap fabric at top of trench the entire width of trench. Overlap all fabric seams a minimum of 6".

5. Provide all underdrain fittings and caps incidental to underdrain work.

6. Contractor shall take caution and perform the necessary measures to protect underdrain during pavement subgrade preparation and throughout the site construction process. Any and all damage to underdrain pipe, trench and/or fabric surround shall be repaired immediately incidental to underdrain work.

7. Pavement Underdrain Details provided on this sheet are not for use at the main building entrance. See the Perforated Underdrain Detail on this sheet for building entrance underdrain specifications.

BENCHMARKS

DATUM BASED ON NGS OPUS SOLUTION REPORT, DATED FEBRUARY 24, 2017 AT 9:21 AM.

BENCHMARK #200 (STATIC)
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF-SITE)
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

BENCHMARK #203 (OFF-SITE)
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF-SITE)
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

811 Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION	REVISION #	DATE	REVISION-DESCRIPTION
1	04-16-18	REVISED PER WCWRC REVIEW COMMENTS			
2	05-01-18	REVISED TRUCK WELL DRAINAGE DETAIL			
3	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
4	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
5	12-19-18	REVISED BUILDING PER CLIENT REQUEST			

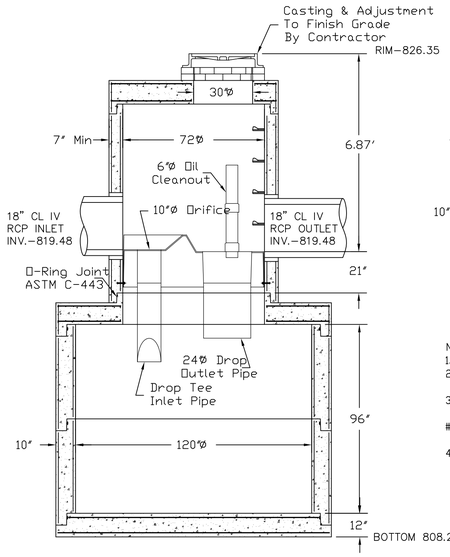
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

ROOF DRAIN AND UNDERDRAIN NOTES & DETAILS

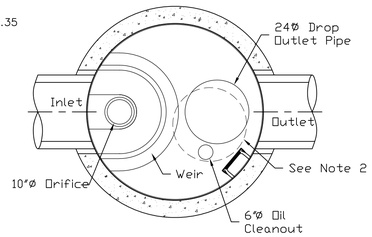
CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=30'
PROJECT No.: 9162803
DWG NAME: 2803-ROOF
ISSUED: DEC. 19, 2018

12-UT8



Section Thru Chamber

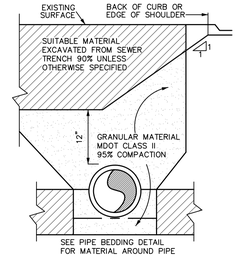


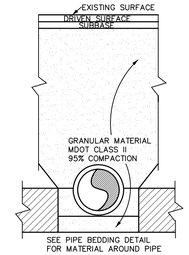
Plan View

Notes:
1. Inlet & Outlet Connections To Be Grouted After Installation.
2. The Cover Should Be Positioned Over The Inlet Drop Pipe And The Vent Pipe.
3. The Stormceptor System Is Protected By One Or More Of The Following U.S. Patents: #4985148, #5498332, #5725760, #5753115, #5849181, #6068765, #6371690.
4. Contact Northern Concrete Pipe, Inc. For Further Details Not Listed On This Drawing.

STORMCEPTOR STC 4800

NOT TO SCALE

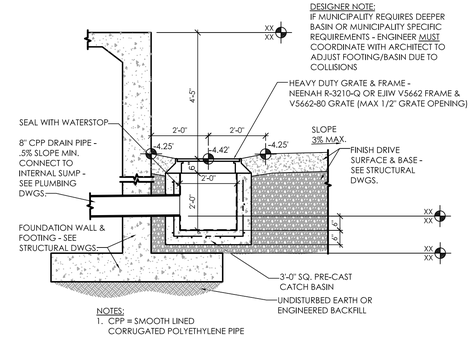




TRENCH A - PIPE UNDER OR WITHIN INFLUENCE OF DRIVEN SURFACE

NOT TO SCALE

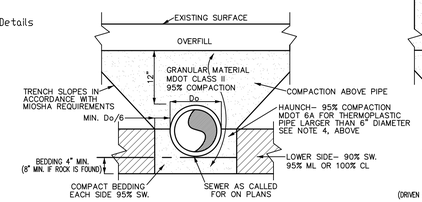
NOTES:
1. COMPACTION PRESENTED AS STANDARD PROCTOR VALUES.
2. SOIL TYPES — AASHTO DESIG.
   GRAVEL SANDY (SW) — A1, A3
   SANDY SILTY (ML) — A2, A4
   SILTY CLAY (CL) — A5, A6, A7
3. SOIL IN HAUNCH AND LOWER SIDE ZONES OUTSIDE OF Do/6 FROM SPRING LINE SHALL BE COMPACTED TO AT LEAST THE SAME COMPACTION AS THE SOIL IN THE OVERFILL ZONE.
4. MATERIALS AROUND THERMO. PLASTIC PIPE WITH DIAMETER 6 INCHES SHALL PASS 0.5 INCH SIEVE. MATERIALS AROUND OTHER PIPES SHALL PASS 1.5 INCH SIEVE.



NOTES:
1. CPP = SMOOTH LINED CORRUGATED POLYETHYLENE PIPE

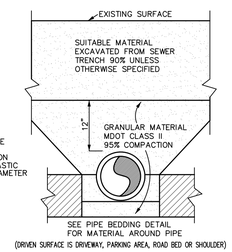
CB-150 TRUCK WELL INLET DETAIL W/SUMP PIT

NOT TO SCALE



PIPE BEDDING DETAIL

NOT TO SCALE



TRENCH B - PIPE NOT UNDER DRIVEN SURFACES

NOT TO SCALE

TRENCH DETAILS

NOT TO SCALE

STORM SEWER NOTES:

1. The storm sewer and stormwater management specifications of the Local Municipality are a part of this work. Refer to the General Notes on the project plans for additional information and requirements.

2. Storm sewer work shall include clearing of vegetation and tree stumps, stripping and stockpiling of topsoil for reuse, excavation of pipe trench, placement of pipe bedding, placement of pipe and structures including castings, connection to existing structures, tuck pointing of structures, backfill of pipe trench, compaction of backfill, finish grading to provide positive drainage to structures, adjustment of castings to match finish grade, topsoil placement, seed & mulch, site cleanup and restoration, and other storm sewer related work as shown on the project plans and specifications.

3. Existing and proposed grades shown in profile view, when provided on the project plans, may be in relation to the centerline of road or item other than the centerline of pipe. The pipe lengths and grades shown in profile view on the project plans may not be to scale.

4. RCP when shown on the project plans shall be reinforced concrete pipe and shall conform to the specifications for reinforced concrete pipe per ASTM C76. RCP pipe joints shall be bell-and-spigot with rubber gaskets conforming to ASTM C433. Non-gasketed joints shall only be utilized when authorized by the Owner, Engineer AND Municipality. Non-gasketed joints of pipe having a diameter of 30 inches or greater shall be tuck-pointed on the inside with cement mortar after the backfill process is complete. Install reinforced concrete end sections incidental to work. Saw cut pipes to length as needed. When pipe class is not shown on the project plans, provide the following:
Pipe cover to proposed grade: 0 to 4 feet Class V
4.1 to 10 feet Class III*
10.1 to 18 feet Class IV
18.1 feet and greater Class V
* Use Class IV under paved surfaces

5. CMP when shown on the project plans shall be corrugated metal pipe and shall conform to the specifications for corrugated metal pipe per AASHTO Designation M36. CMP shall be 16-guage steel minimum for 24 inch diameter or smaller and 14-guage steel minimum for 30 inch diameter or greater. Install galvanized steel end sections and connection bands, incidental to work. Connection bands for CMP pipe joints located under paved surfaces shall be gasketed couplers. Saw cut pipes to length as needed.

6. HDPE - Type S when shown on the project plans shall be high density polyethylene pipe with a smooth interior and shall conform to the specifications for high density polyethylene pipe per AASHTO Designation M252 Type S for pipes of 3" to 10" diameter and per AASHTO Designation M294 Type S for pipes of 12" to 60" diameter. HDPE - Type S pipe joints shall be bell-and-spigot type conforming to ASTM D3212 with rubber gaskets conforming to ASTM F477. Tamp backfill at spring line of HDPE - Type S pipe. Install high density polyethylene end sections incidental to work. Saw cut pipes to length as needed.

7. HDPE - Type C when shown on the project plans shall be high density polyethylene pipe with a corrugated interior and shall conform to the specifications for high density polyethylene pipe per AASHTO Designation M252 for pipes of 3" to 10" diameter and per AASHTO Designation M294 for pipes of 12" to 60" diameter. HDPE - Type C pipe joints shall be bell-and-spigot type conforming to ASTM D3212 with rubber gaskets conforming to ASTM F477. Tamp backfill at spring line of HDPE - Type C pipe. Install high density polyethylene end sections incidental to work. Saw cut pipes to length as needed.

8. CPVC when shown on the project plans shall be corrugated polyvinyl chloride pipe and shall conform to the specifications for corrugated polyvinyl chloride pipe per ASTM F794 and F949. CPVC pipe joints shall be bell-and-spigot type conforming to ASTM D3212 with rubber gaskets conforming to ASTM F477. Tamp backfill at spring line of CPVC pipe. Install high density polyethylene end sections incidental to work. Saw cut pipes to length as needed.

9. PVC when shown on the project plans shall be polyvinyl chloride pipe and shall conform to the specifications for polyvinyl chloride pipe per ASTM D2751, maximum SDR of 26. PVC pipe joints shall be bell-and-spigot type conforming to ASTM D3212 with rubber gaskets conforming to ASTM F477 or solvent welded type conforming to ASTM D2564. Tamp backfill at spring line of PVC pipe. Saw cut pipes to length as needed.

10. Concrete storm structures shall be pre-cast and shall conform to the specification of pre-cast concrete structures per ASTM C478. Joints of concrete storm structure sections shall be bell-and-spigot with rubber gaskets conforming to ASTM C433. Brick, concrete block or cast in place storm structures may be substituted for pre-cast storm structures ONLY when authorized by the Owner, Engineer AND Municipality; refer to MDOT standard plan R-1, latest revision. All pipe openings in pre-cast structures shall be factory installed and shall include a rubber boot resilient pipe to manhole connector conforming to ASTM C1478-07. All clamps, bands and hardware shall be stainless steel or other non-corrosive material. Provide the appropriate adapter(s) as necessary for corrugated pipe. Pipe to storm structure connections shall be performed in accordance with the rubber boot connector manufacturer's recommendations. All temporary openings and seams in storm structures shall be tuck-pointed watertight with cement mortar. Refer to MDOT standard plan R-2, latest revision, for alternate on-line storm structure details when pipe exceeds 42 inch diameter.

11. Tap existing structures as acceptable to the Engineer and Municipality, incidental to work. All temporary openings in storm structures shall be tuck-pointed watertight with cement mortar.

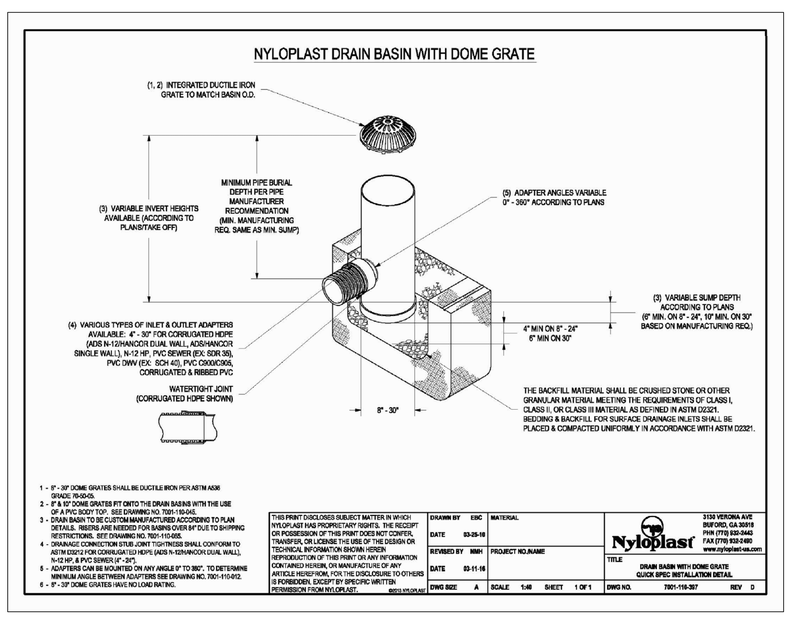
12. Backfill all storm sewer in accordance with the Pipe Trench details provided on the project plans. Provide pipe bedding that meets or exceeds both the specifications of the Pipe Trench details on the project plans and the recommendation of the pipe manufacturer, incidental to work.

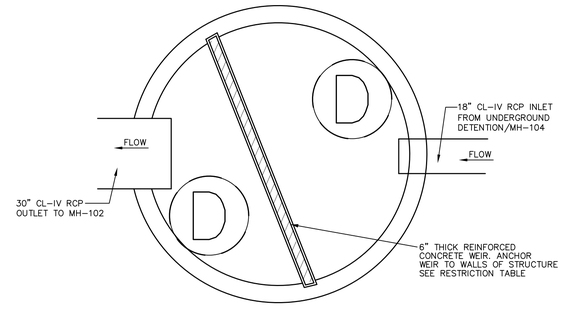
13. When edge drains and/or under drains are shown on the project plans, connection to storm structures is incidental to work. During storm sewer construction, install first 10 linear feet of edge drain and/or under drain from the storm structures in each specified direction and install temporary cap at end. Complete installation of edge drain following preparation of the subgrade when under paved surface or following finish grade when not under paved surface.

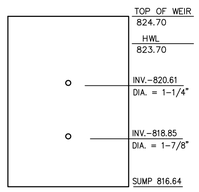
14. Install removable plugs in storm sewer stubs as acceptable to Engineer and Municipality, incidental to work. Mark the end of all storm sewer stubs with a 2" x 4" wooden stake extending a minimum of 12" above finish grade, incidental to work.

15. Storm structure castings shall be coated with water based asphaltic paint by the manufacturer. Seams and temporary openings between storm structures and castings shall be tuck-pointed water tight with cement mortar. Coordinate correct curb box / hood / "T" back as needed to match curb profile. See casting schedule on project plans for additional requirements.

16. Provide 3.5' minimum cover from the top of pipe of all roof drain pipes to the proposed finish grade when site conditions allow. When pipe cover is less than 3.5', install 2" thick by 24" wide Styrofoam insulation centered over the top of pipe at 12" above top of pipe or as required by the Local Municipality.



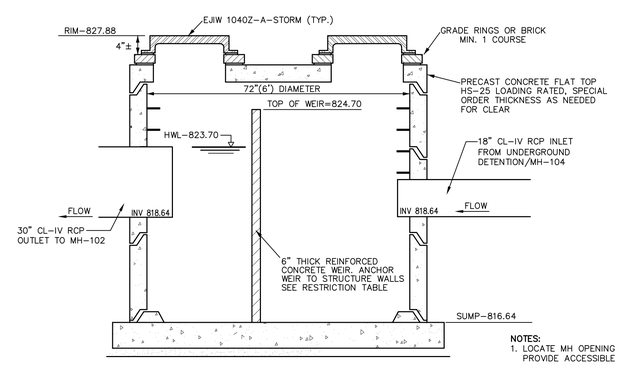




RESTRICTOR DETAIL

RESTRICTION TABLE

ROW	NUMBER ORIFICES	ORIFICE DIAMETER	CENTERLINE ELEVATION OF ORIFICE
TOP-100 YR.	1	1-1/4"	820.61
BOTTOM-F.F.	1	1-7/8"	818.85



NOTES:
1. LOCATE MH OPENING AND STEPS AS NEEDED TO PROVIDE ACCESSIBLE CLEARANCE TO PIPING.
2. CONSTRUCT OUTLET STRUCTURE AS DIRECTED BY THE COUNTY ENGINEER.

CONTROL STRUCTURE CS-103 DETAIL

NOT TO SCALE

Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESIGNE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
2	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS
3	06-04-18	REVISED PER WCWRC REVIEW COMMENTS
4	06-21-18	REVISED PER WCWRC REVIEW COMMENTS
5	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS

REVISION #	DATE	REVISION-DESCRIPTION

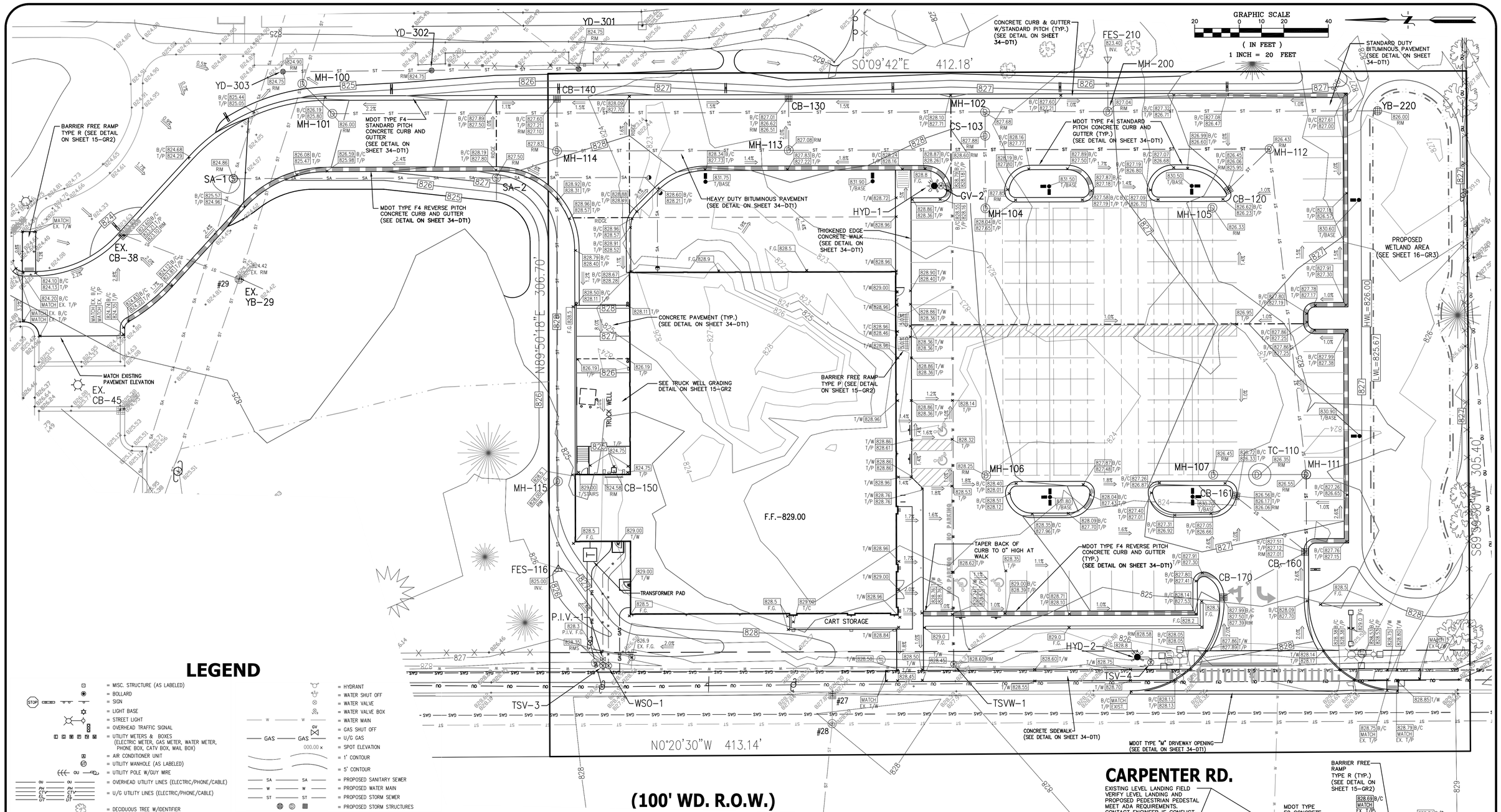
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

STORM SEWER NOTES & DETAILS

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: NO SCALE
PROJECT No.: 9162803
DWG NAME: 2803 DT
ISSUED: AUG. 28, 2018

13-UT9



LEGEND

- = MISC. STRUCTURE (AS LABELED)
- = BOLLARD
- = SIGN
- = LIGHT BASE
- = STREET LIGHT
- = OVERHEAD TRAFFIC SIGNAL
- = UTILITY METERS & BOXES (ELECTRIC METER, GAS METER, WATER METER, PHONE BOX, CATV BOX, MAIL BOX)
- = AIR CONDITIONER UNIT
- = UTILITY MANHOLE (AS LABELED)
- = UTILITY POLE W/GUY WIRE
- = OVERHEAD UTILITY LINES (ELECTRIC/PHONE/CABLE)
- = U/G UTILITY LINES (ELECTRIC/PHONE/CABLE)
- = DECIDUOUS TREE W/IDENTIFIER
- = CONIFEROUS TREE W/IDENTIFIER
- = BUSH
- = FENCE (CHAIN LINK UNLESS OTHERWISE STATED)
- = GUARD RAIL
- = EDGE OF GRAVEL
- = CONCRETE CURB (UNLESS OTHERWISE STATED)
- = SANITARY SEWER MANHOLE W/IDENTIFIER
- = SANITARY SEWER PIPE
- = CLEAN OUT
- = STORM WATER MANHOLE W/IDENTIFIER
- = CATCH BASIN W/IDENTIFIER
- = CONTROL STRUCTURE
- = FLARED END SECTION
- = STORM WATER DRAINAGE PIPE
- = HYDRANT
- = WATER SHUT OFF
- = WATER VALVE
- = WATER VALVE BOX
- = WATER MAIN
- = GAS SHUT OFF
- = U/G GAS
- = SPOT ELEVATION
- = 1' CONTOUR
- = 5' CONTOUR
- = PROPOSED SANITARY SEWER
- = PROPOSED WATER MAIN
- = PROPOSED STORM SEWER
- = PROPOSED STORM STRUCTURES
- = PROPOSED CONCRETE WALK
- = PROPOSED HEAVY DUTY CONCRETE PAVEMENT
- = PROPOSED CONCRETE CURB & GUTTER W/STD. PITCH
- = PROPOSED CONCRETE CURB & GUTTER W/REV. PITCH
- = PROPOSED SPOT ELEVATIONS
- = PROPOSED FLOW ARROW

TOP BACK OF CURB 000.00 B/C
TOP OF PAVT. 000.00 T/P
TOP OF WALK 000.00 T/W
TOP OF CONCRETE 000.00 T/W

BENCHMARKS

DATUM BASED ON NGS OPUS SOLUTION REPORT, DATED FEBRUARY 24, 2017 AT 9:21 AM.

BENCHMARK #200 (STATIC)
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF-SITE)
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

BENCHMARK #203 (OFF-SITE)
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF-SITE)
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

811 Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESIGNE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION	REVISION #	DATE	REVISION-DESCRIPTION
1	11-06-17	REVISED PER TOWNSHIP REVIEW COMMENTS	6	06-04-18	REVISED PER WCWRC REVIEW COMMENTS
2	12-20-17	REVISED PER TOWNSHIP REVIEW COMMENTS	7	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
3	01-26-18	REVISED PER TOWNSHIP REVIEW COMMENTS	8	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
4	04-16-18	REVISED PER WCWRC REVIEW COMMENTS	9	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
5	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS	10	12-19-18	REVISED BUILDING PER CLIENT REQUEST

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

GRADING PLAN

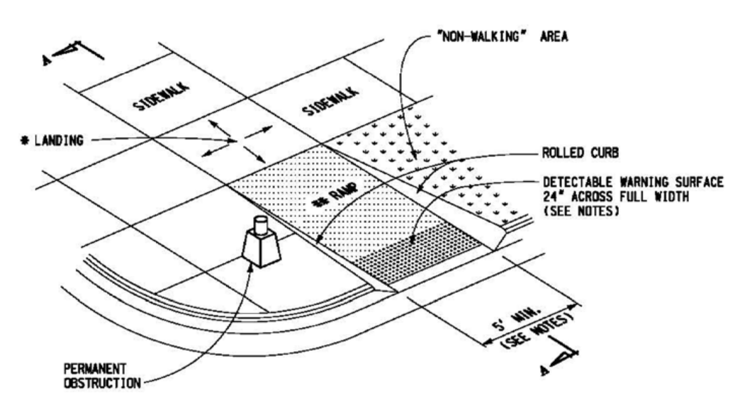
CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=20'
PROJECT No.: 9162803
DWG NAME: 2803-GRADING
ISSUED: DEC. 19, 2018

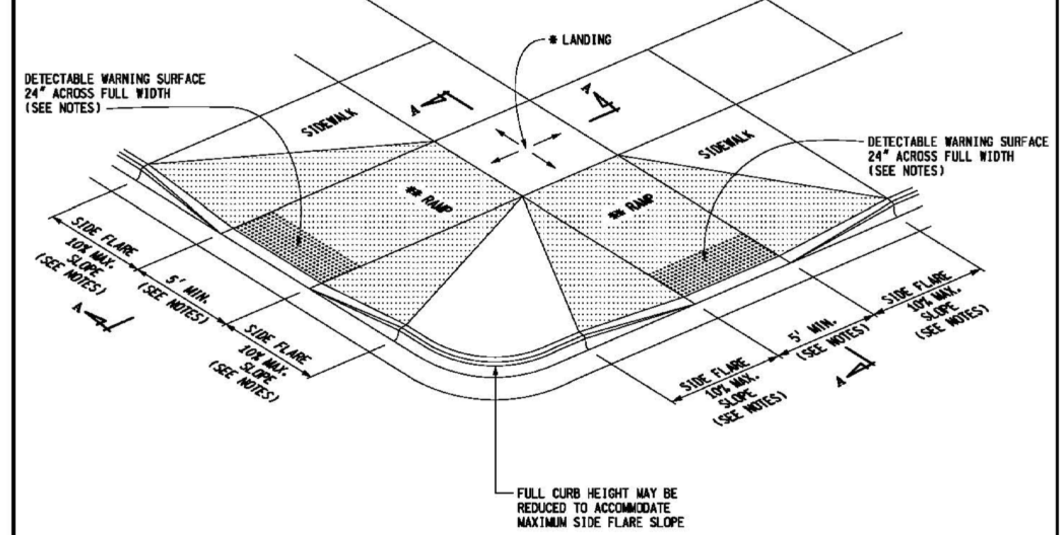
14-GR1

* MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

** MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



SIDEWALK RAMP TYPE R
(ROLLED SIDES)



SIDEWALK RAMP TYPE F
(FLARED SIDES, TWO RAMPS SHOWN)

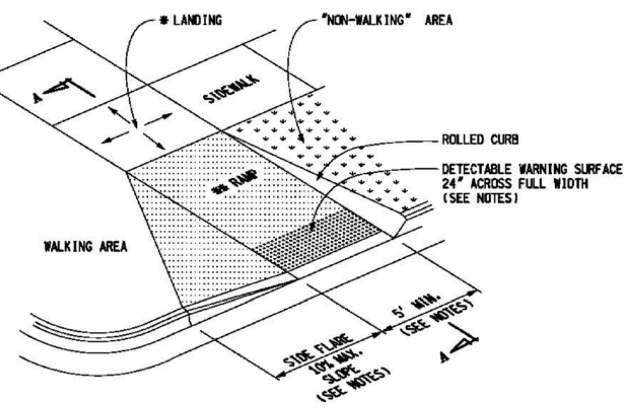
MDOT Michigan Department of Transportation
PREPARED BY DESIGN DIVISION
DRAWN BY: B.L.T.
CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR Kirk T. Steudle
APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES
APPROVED BY: DIRECTOR, BUREAU OF DEVELOPMENT

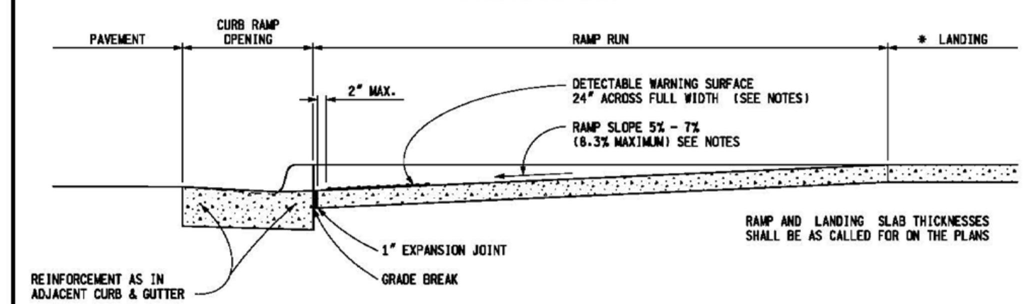
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS
F.H.W.A. APPROVAL | 12-11-2017 PLAN DATE | R-28-J | SHEET 1 OF 7

* MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

** MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



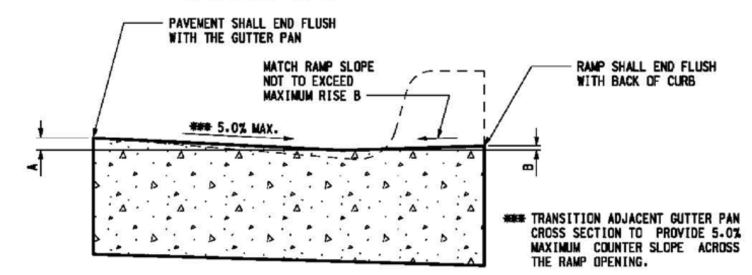
SIDEWALK RAMP TYPE RF
(ROLLED / FLARED SIDES)



SECTION A-A

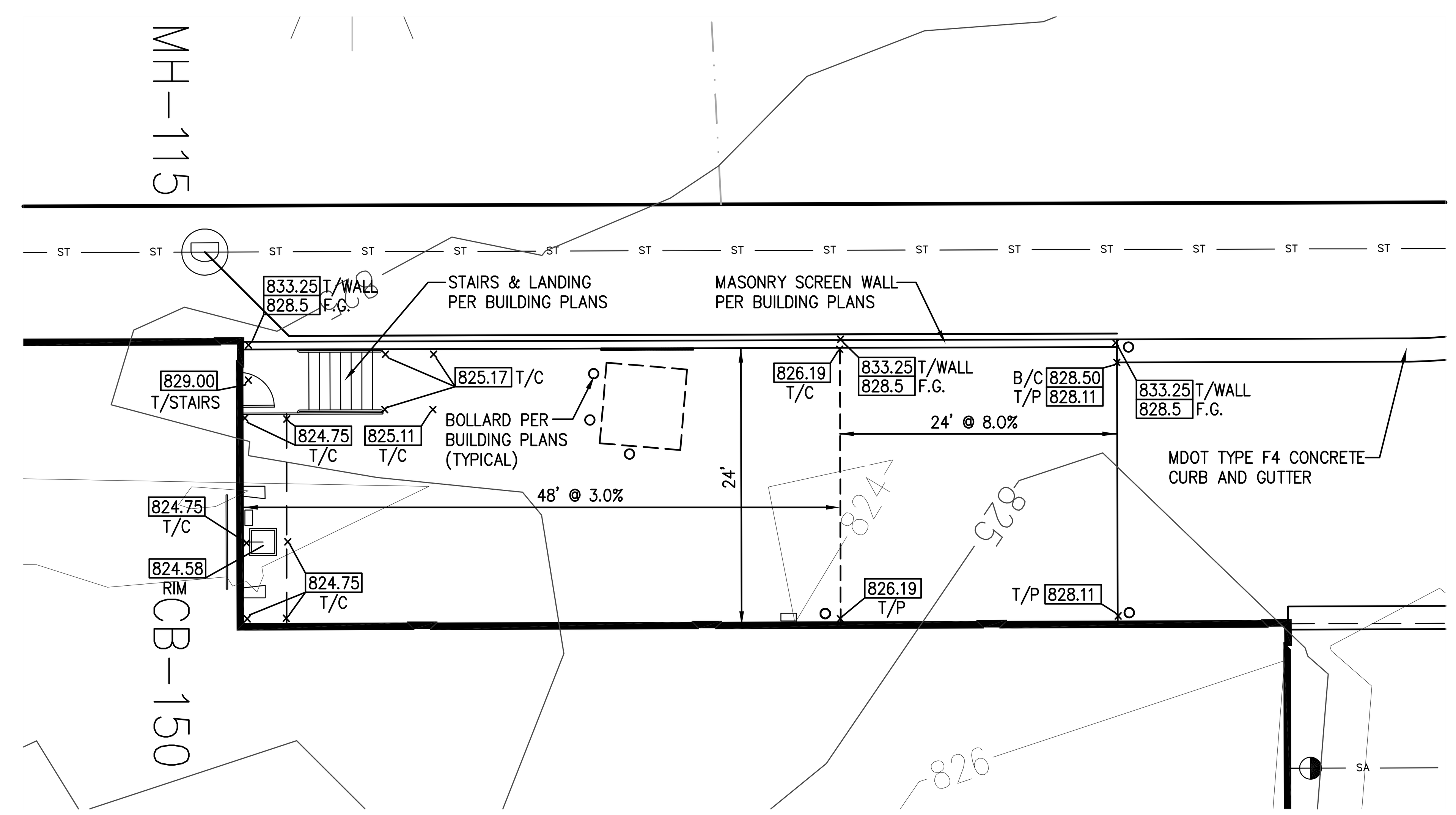
CURB TYPE	MAXIMUM RISE (INCHES) A	B
B1	3/4	1
B2	3/4	1
B3	3/4	1
D1	3/4	1
D2	3/4	1
D3	3/4	1
C1	1/2	1/2
C2	1/2	1/2
C3	3/4	1/2
C4	3/4	1/2
C5	1	1/2
C6	1	1/2
F1	1/2	1/2
F2	1/2	1/2
F3	3/4	1/2
F4	3/4	1/2
F5	1	1/2
F6	1	1/2

FOR CURB TYPES SEE STANDARD PLAN R-30-SERIES



SECTION THROUGH CURB RAMP OPENING
(TYPICAL ALL RAMP TYPES)

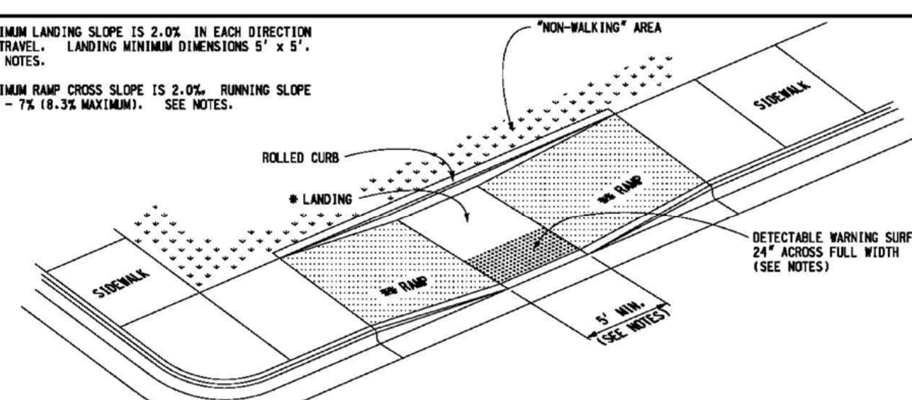
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS
F.H.W.A. APPROVAL | 12-11-2017 PLAN DATE | R-28-J | SHEET 2 OF 7



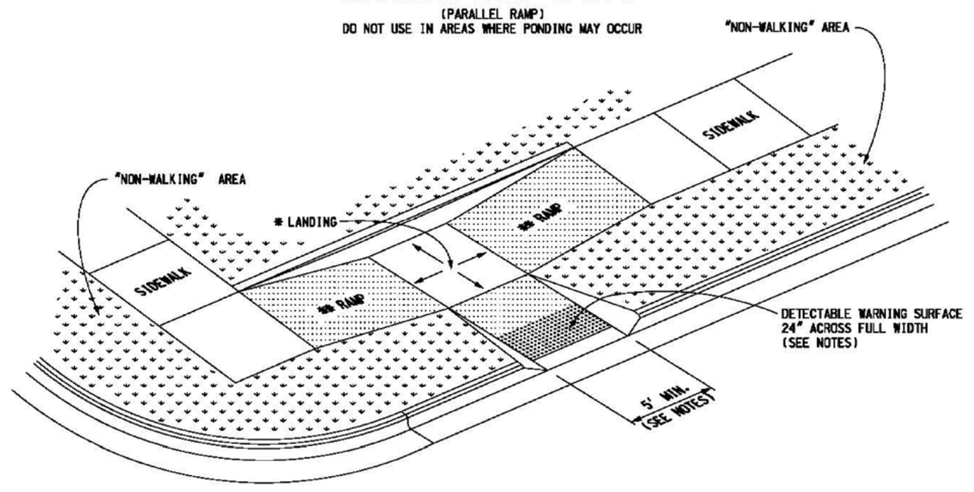
TRUCK WELL GRADING DETAIL
SCALE: 1" = 10'

* MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

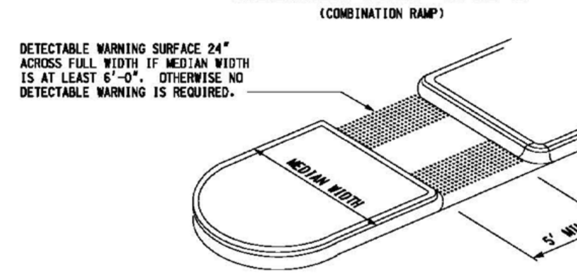
** MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



SIDEWALK RAMP TYPE P
(PARALLEL RAMP)
DO NOT USE IN AREAS WHERE PONDING MAY OCCUR

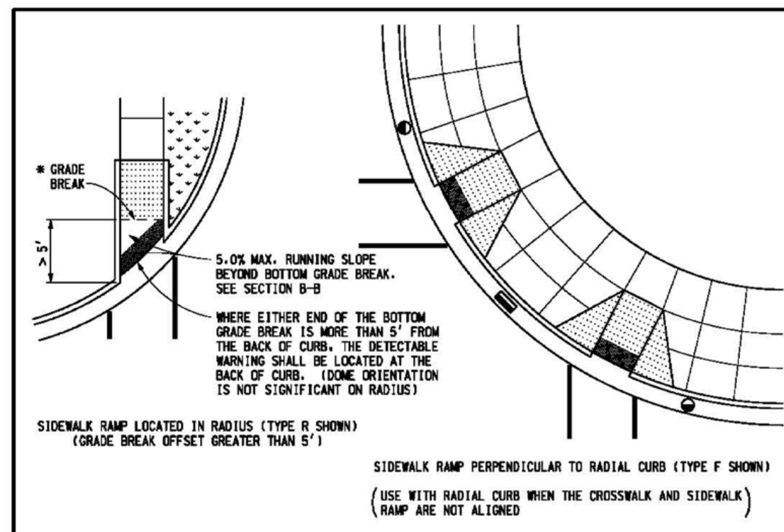


SIDEWALK RAMP TYPE C
(COMBINATION RAMP)



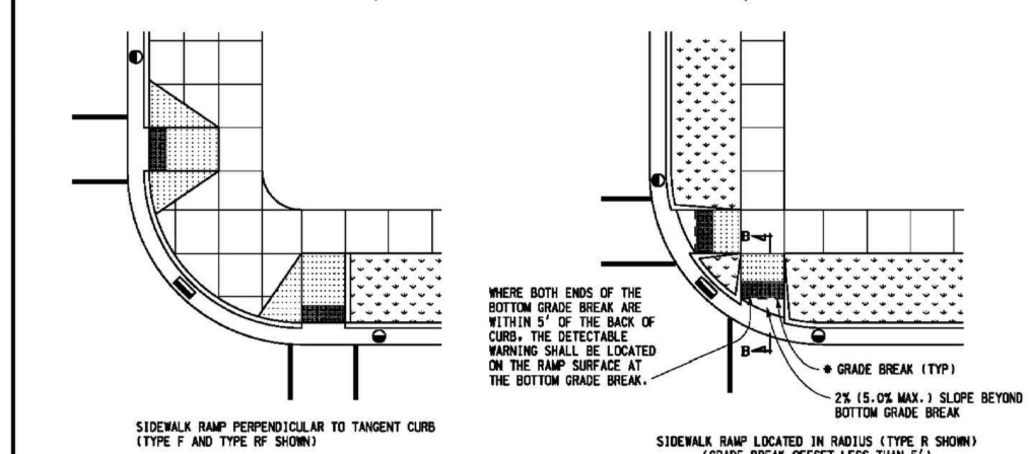
SIDEWALK RAMP TYPE M
(MEDIAN ISLAND)

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS
F.H.W.A. APPROVAL | 12-11-2017 PLAN DATE | R-28-J | SHEET 3 OF 7



LEGEND

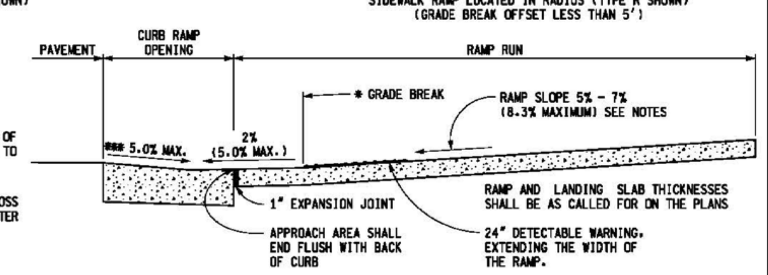
- SLOPED SURFACE
- DETECTABLE WARNING
- "NON-WALKING" AREA
- CROSSWALK MARKING
- PREFERRED LOCATION OF DRAINAGE INLET (TYP.)
- ALTERNATE LOCATION OF DRAINAGE INLET (TYP.)



* GRADE BREAKS AT THE TOP AND BOTTOM OF CURB RAMPS SHALL BE PERPENDICULAR TO THE DIRECTION OF TRAVEL.

*** TRANSITION ADJACENT GUTTER PAN CROSS SECTION TO PROVIDE 5.0% MAXIMUM COUNTER SLOPE ACROSS THE RAMP OPENING.

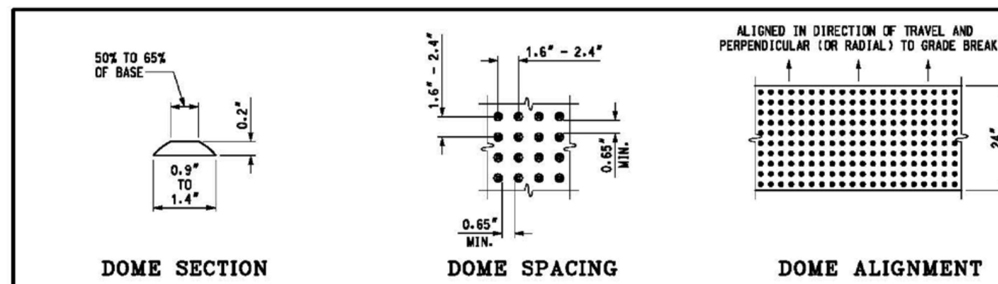
SEE SHEET 2 FOR CURB RAMP OPENING DETAILS.



SECTION B-B

SIDEWALK RAMP ORIENTATION

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS
F.H.W.A. APPROVAL | 12-11-2017 PLAN DATE | R-28-J | SHEET 6 OF 7



DETECTABLE WARNING DETAILS

NOTES:

DETAILS SPECIFIED ON THIS PLAN APPLY TO ALL CONSTRUCTION, RECONSTRUCTION, OR ALTERATION OF STREETS, CURBS, OR SIDEWALKS IN THE PUBLIC RIGHT OF WAY.

SIDEWALK RAMPS ARE TO BE LOCATED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

RAMPS SHALL BE PROVIDED AT ALL CORNERS OF AN INTERSECTION WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT MARKED AND/OR SIGNALIZED MID-BLOCK CROSSINGS.

SURFACE TEXTURE OF THE RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING, TRANSVERSE TO THE RUNNING SLOPE.

SIDEWALK SHALL BE RAMPED WHERE THE DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.

CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP. WHERE CONDITIONS PERMIT, IT IS DESIRABLE THAT THE SLOPE OF THE RAMP BE IN ONLY ONE DIRECTION, PARALLEL TO THE DIRECTION OF TRAVEL.

RAMP WIDTH SHALL BE INCREASED, IF NECESSARY, TO ACCOMMODATE SIDEWALK SNOW REMOVAL EQUIPMENT NORMALLY USED BY THE MUNICIPALITY.

WHEN 5' MINIMUM WIDTHS ARE NOT PRACTICABLE, RAMP WIDTH MAY BE REDUCED TO NOT LESS THAN 4' AND LANDINGS TO NOT LESS THAN 4' x 4'.

CURB RAMPS WITH A RUNNING SLOPE ≤5% DO NOT REQUIRE A TOP LANDING. HOWEVER, ANY CONTINUOUS SIDEWALK OR PEDESTRIAN ROUTE CROSSING THROUGH OR INTERSECTING THE CURB RAMP MUST INDEPENDENTLY MAINTAIN A CROSS SLOPE NOT GREATER THAN 2% PERPENDICULAR TO ITS OWN DIRECTION(S) OF TRAVEL.

DETECTABLE WARNING SURFACE COVERAGE IS 24" MINIMUM IN THE DIRECTION OF RAMP/PATH TRAVEL AND THE FULL WIDTH OF THE RAMP/PATH OPENING EXCLUDING CURBED OR FLARED CURB TRANSITION AREAS. A BORDER OFFSET NOT GREATER THAN 2" MEASURED ALONG THE EDGES OF THE DETECTABLE WARNING IS ALLOWABLE. FOR RADIAL CURB THE OFFSET IS MEASURED FROM THE ENDS OF THE RADIUS.

FOR NEW ROADWAY CONSTRUCTION, THE RAMP CROSS SLOPE MAY NOT EXCEED 2.0%. FOR ALTERATIONS TO EXISTING ROADWAYS, THE CROSS SLOPE MAY BE TRANSITIONED TO MEET AN EXISTING ROADWAY GRADE. THE CROSS SLOPE TRANSITION SHALL BE APPLIED UNIFORMLY OVER THE FULL LENGTH OF THE RAMP.

THE MAXIMUM RUNNING SLOPE OF 8.3% IS RELATIVE TO A FLAT (0%) REFERENCE. HOWEVER, IT SHALL NOT REQUIRE ANY RAMP OR SERIES OF RAMPS TO EXCEED 15 FEET IN LENGTH NOT INCLUDING LANDINGS OR TRANSITIONS.

DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH RAMPS. THE LOCATION OF THE RAMP SHOULD TAKE PRECEDENCE OVER THE LOCATION OF THE DRAINAGE STRUCTURE. WHERE EXISTING DRAINAGE STRUCTURES ARE LOCATED IN THE RAMP PATH OF TRAVEL, USE A MANUFACTURER'S ADA COMPLIANT GRATE. OPENINGS SHALL NOT BE GREATER THAN 1/2". ELONGATED OPENINGS SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

THE TOP OF THE JOINT FILLER FOR ALL RAMP TYPES SHALL BE FLUSH WITH THE ADJACENT CONCRETE.

CROSSWALK AND STOP LINE MARKINGS, IF USED, SHALL BE SO LOCATED AS TO STOP TRAFFIC SHORT OF RAMP CROSSINGS. SPECIFIC DETAILS FOR MARKING APPLICATIONS ARE GIVEN IN THE "MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

FLARED SIDES WITH A SLOPE OF 10% MAXIMUM, MEASURED ALONG THE ROADSIDE CURB LINE, SHALL BE PROVIDED WHERE AN UNOBSTRUCTED CIRCULATION PATH LATERALLY CROSSES THE SIDEWALK RAMP. FLARED SIDES ARE NOT REQUIRED WHERE THE RAMP IS BORDERED BY LANDSCAPING, UNPAVED SURFACE OR PERMANENT FIXED OBJECTS. WHERE THEY ARE NOT REQUIRED, FLARED SIDES CAN BE CONSIDERED IN ORDER TO AVOID SHARP CURB RETURNS AT RAMP OPENINGS.

DETECTABLE WARNING PLATES MUST BE INSTALLED USING FABRICATED OR FIELD CUT UNITS CAST AND/OR ANCHORED IN THE PAVEMENT TO RESIST SHIFTING OR HEAVING.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS
F.H.W.A. APPROVAL | 12-11-2017 PLAN DATE | R-28-J | SHEET 7 OF 7

811 Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION	REVISION #	DATE	REVISION-DESCRIPTION
1	04-16-18	REVISED PER WCWRC REVIEW COMMENTS			
2	05-01-18	REVISED TOP OF SCREEN WALL ELEVATIONS			
3	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
4	12-19-18	REVISED BUILDING PER CLIENT REQUEST			

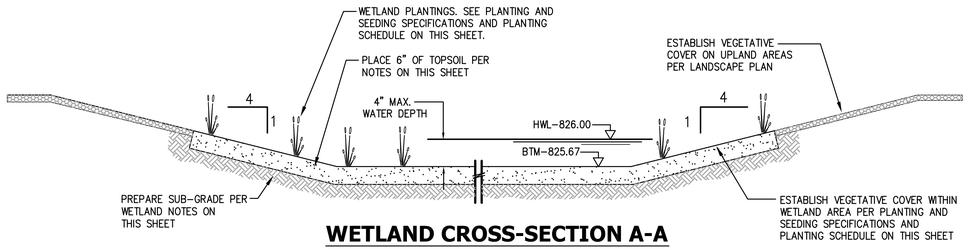
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

GRADING DETAILS

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=10'
PROJECT No.: 9162803
DWG NAME: 2803-GRADING
ISSUED: DEC. 19, 2018

15-GR2



WETLAND CROSS-SECTION A-A

NOT TO SCALE

Sequence of Construction

1. Hold a pre-construction meeting with all parties involved. Examine the site to ascertain the state and conditions under which the work is to be done and review conditions of all applicable permits.

2. Clear and grub woody vegetation within the limits of the wetland creation areas.

3. Survey and stake proposed layout for site construction. Wetland Consultant or Engineer to review contour staking for excavations and fills and review the staking for the creation areas.

4. Strip and stockpile topsoil from proposed wetland footprint.

5. Excavate and fill within limits of work to the required sub-grade elevations.

6. Survey and stake site for sub-grade elevations/contours and wetland creation areas. Wetland Consultant or Engineer to review and approve the created area of wetland prior to the placement of topsoil. Any adjustments to the acreage of wetland creation shall be decided at this time.

7. Remove any water which may have accumulated in the wetland creation areas to prevent soil changes detrimental to the stability of the sub-grade.

8. Place and spread stockpiled topsoil. Finished grades in wetland creation areas are subject to written approval from the Wetland Consultant.

9. Disk or till topsoil to create irregular finish grade.

10. Immediately following fine grading, the Wetland Consultant or Engineer and Contractor shall meet on-site to jointly examine current site conditions under which the work is to be completed.

11. Stake limits of seeding and provide submittals to Wetland Consultant or Engineer prior to seed placement. Wetland Consultant to approve seed mix and limits of seeding.

12. Immediately following seed staking, install shrubs in the wetland creation areas according to specifications and plan details.

13. Upon completion of shrub planting, restore to finish grades any disturbed areas during the planting activities.

14. Immediately following planting, seed the wetland creation areas and any disturbed upland areas.

15. Provide straw mulch over seeded areas and apply erosion control blanket on slopes adjacent to existing wetland, wetland creation areas and wetland buffers. Crimp straw mulch into ground or apply tackifier to hold straw in place. Stake erosion control blankets into place.

16. Contractor to provide as-built drawings to the Wetland Consultant, Engineer, and/or Owner.

17. Meet with Wetland Consultant to review the newly created wetland, and obtain a copy of the as-built drawings.

18. Remove soil erosion control measures if approved by Wetland Consultant and provide site clean-up.

Planting and Seeding Specifications

General Notes

1. Plants shall comply with the recommendations and requirements of ANSI Z60.1, "American Standard Nursery Stock". Plants shall be healthy, vigorous stock, grown in a recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae, and defects such as knots, sunscald, injuries, abrasions, or disfigurement.

2. Planting shall be done by a single Contractor specializing and experienced in landscape work.

3. Shrub delivery shall be the same day as planting. No plants shall be stored at the site without permission of the Wetland Consultant or Site Manager. Plants shall be carefully loaded and unloaded so as not to damage branching or root mass. Dropping of material will not be allowed. Plants in full leaf shall be thoroughly wetted down and completely covered with a wet tarp during transportation. All plant roots must be kept in a moist condition.

4. Plant material shall be the size and true native genus and species shown and scheduled on the drawings. No hybrids or cultivars will be accepted.

5. All plants shall be labeled with securely attached waterproof tag bearing legible designation of botanical and common name. See submittals for requirements of native seed.

6. Mulch shall be shredded hardwood bark, mulch free from deleterious materials, sticks, twigs, etc. and suitable for top dressing of trees, shrubs, and planting beds.

7. Warranty Period shall be at the end of the first full growing season. A full growing season is defined as the beginning of May through the end of October of the same year. If installation occurs after June 15, the warranty period shall be extended through the end of October the next year so as to achieve a full growing season.

Planting

1. Contractor shall notify Wetland Consultant, minimum of three business days, prior to planting to assist in the layout of the woody plant material and provide a copy of plant material order and receipt.

2. Complete all woody plantings between March 1 - June 15 or October 1 - November 30 or when plants are dormant or soil is not frozen.

3. All shrubs to be planted as shown on plans and details.

4. Warranty shall include a 95% survival rate for each species. Replace all plants in accordance with specifications.

5. Plant maintenance shall begin immediately after each plant is installed and shall continue as required until the end of the warranty period. Maintenance will include watering and cultivation.

Seeding

1. Install seed immediately following shrub planting.

2. Install seed between the dates of May 1 through June 15 or October 1 through November 30 or as conditions permit. If seeding occurs between June 15 through October 1, the Contractor is responsible for adequately watering the mitigation sites on a consistent basis for seed germination and establishment. Contractor shall notify the Wetland Consultant for the timing of seed installation.

3. Uniformly broadcast specified seed over the specified areas at the specified rates. Provide a carrier (silica sand or other approved material) to ensure uniform distribution of seed.

4. Immediately following seeding, apply straw mulch at the rate of 1.5 tons per acre over all seeded areas.

5. Warranty shall be 95% cover of seeded areas at the end of the first growing season.

Submittals

Contractor shall provide to the Wetland Consultant the following submittals:
- Wetland Seed Mix
- Woody Plant Material order and receipt

Grading Specifications

General Notes

1. Upon Issuance, all work shall comply with the Township permit and other issued permits.

2. The contractor is responsible for supplying all materials, labor, equipment, transportation, all services incidental to clearing, grading, seeding, soil stabilization, and clean up of the mitigation areas.

3. Erosion controls are to be installed to the limits indicated on the plans and to the detail provided. Any damage to the existing wetlands not indicated on the plans shall be repaired immediately, with these areas being restored to their original character at the Contractor's own expense. All pre-erosion control measures shall be removed after final acceptance of work, unless suggested by the Wetland Consultant to remain in place. Care shall be taken during removal to minimize the loss of the accumulated sediment. If necessary, all silt and sediment is to be immediately removed from adjacent wetland or water courses.

4. All trash and debris shall be removed from the site and legally disposed of upon completion of grading activities. Repair to original character any areas outside the official work limits accidentally damaged by earthwork activities. Repair shall include finish grading and seeding as required to match existing grade and conditions, and maintenance of repaired areas.

Earthwork

1. Sub-grades in created wetland shall be six inches lower than proposed finished grade contours and spot elevations to allow for the placement of topsoil. Topsoil shall be the top six inches of soil from the wetland creation footprint.

2. Unless indicated otherwise, grade evenly between points and contours or between such points or contours and existing grades, refer to grading detail. Acceptable grade tolerance shall not exceed three inches (0.25 feet) from proposed grades specified on the plans to accommodate minor ruts, dirt clumps, organic matter and the like. Wetland Consultant may adjust in-field based on site conditions to accommodate the intent of the wetland creation. Care shall be taken to not excavate below the depths indicated. Contractor shall be responsible for any unauthorized excavation and/or fill operations. Notify Wetland Consultant a minimum of three business days in advance for sub-grade verification.

3. Wetland Consultant may determine during sub-grade verification that existing sub-soils are too water permeable to accommodate the intent of the wetland creation. If this is determined, Contractor shall either compact native sub-soils to a degree sufficient to inhibit water percolation or excavate an additional six inches of sub-soils and back fill with clean compacted clay soils, as directed by Wetland Consultant.

4. Remove water accumulation in excavation area (if required) to prevent soil changes detrimental to the stability of the sub-grade. Provide and maintain erosion control measures and sufficient dewatering devices such as pumps, hoses, strainers and other appurtenance required to convey the water from excavations. Water shall be discharged at an upland location a sufficient distance from the excavations to prevent backflow. Care shall be taken to prevent water borne silt from dewatering operations from entering existing wetlands and watercourses.

5. Surplus excavated material or material unsuitable for landfill cover or for filling or grading operations (including all wetland excavation material) shall be disposed of in an upland location on the Owner's property as designated by the Site Manager. Stockpiled excess material shall be graded and stabilized to prevent erosion into existing wetland or watercourse.

6. Source of topsoil shall be approved by Wetland Consultant prior to use. Place and spread the approved topsoil at a minimum depth of six inches over the entire wetland creation area, see grading detail. Topsoil shall be spread roughly such that minor ruts, dirt clumps and organic matter are acceptable. Topsoil compaction during spreading operations shall occur only to the degree that shall prevent settlement beyond specified grade tolerance. Avoid over compacting beyond that provided by the spreading equipment. Over compacted topsoil shall be thoroughly loosened by scarifying or plowing to a depth of six inches. Notify Wetland Consultant a minimum three business days in advance for final acceptance of the finished grades.

Shrub Plantings
from
Wildtype Native Plants
900 North Every Road
Mason, MI 48854
info@wildtypeplants.com
517.244.1140

Scrub/Shrub Wetland Plantings
Shrub plantings within the scrub/shrub wetland (approximately 0.18 acres) will include 18 to 24-inch high, 1-gallon potted specimens. Shrub planting density will be installation on 3-foot centers and will include the following species:

Scientific Name	Common Name	Number
Rosa palustris	Swamp Rose	18
Salix discolor	Pussy Willow	18
Cornus sericea	Red Osier Dogwood	18
	Total	**54**

Storm Water Seed Mix
from
Native Connections
17080 Hoshel Road
Three Rivers, MI 49093
info@nativeconnections.net
269.580.4764

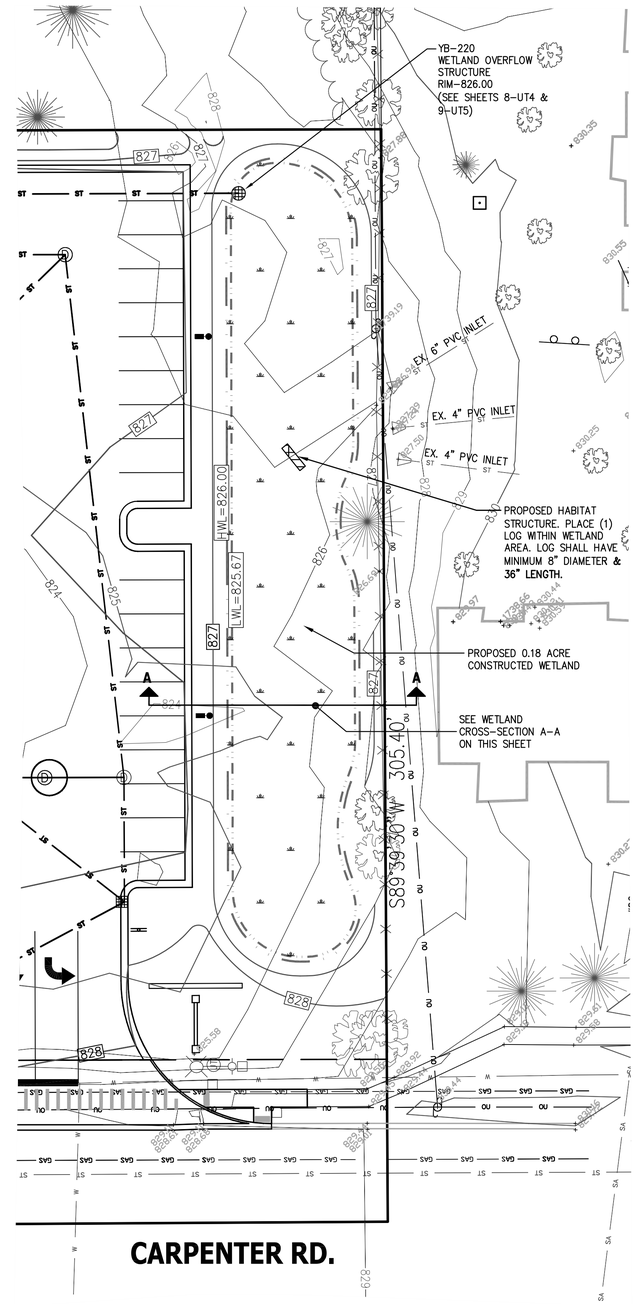
Seeding Rate: 40 pounds per acre
2.5 pounds grass; 1.5 pounds forbs; 36 pounds nurse crop
101 native seeds per square foot

Grasses, Sedges, and Rushes

Scientific Name	Common Name	PLS Oz/Acre
Carex bebbii	Bebb's Oval Sedge	1.75
Carex vulpinoidea	Fox Sedge	2.00
Eleocharis palustris	Great Spike Rush	1.00
Elymus virginicus	Virginia Wild Rye	17.00
Juncus effusus	Soft Rush	0.50
Juncus tenuis	Path Rush	0.50
Juncus torreyi	Torrey's Rush	0.25
Panicum virgatum	Switchgrass	10.00
Scirpus pungens	Three Square Rush	1.00
Scirpus validus	Soft-Stem Bulrush	1.00
Sorghastrum nutans	Indian Grass	5.00
	Total Grasses	**40.00**

Forbs

Scientific Name	Common Name	PLS Oz/Acre
Alisma subcordatum	Common Water Plantain	1.25
Asclepias incarnata	Swamp Milkweed	1.25
Aster novae-angliae	New England Aster	0.50
Aster umbellatus	Flat-Topped Aster	0.50
Bidens cernua	Nodding Bur Marigold	0.75
Echinacea purpurea	Purple Coneflower	2.75
Helenium autumnale	Sneezeweed	0.75
Liatris spicata	Marsh Blazingstar	1.25
Lycopus americanus	Water Horehound	0.50
Mimulus ringens	Monkey Flower	0.25
Monarda fistulosa	Wild Bergamot	0.60
Oenothera biennis	Common Evening Primrose	2.20
Penthorum sedoides	Ditch Stonecrop	0.40
Physostegia virginiana	Obedient Plant	0.50
Polygonum pennsylvanicum	Pennsylvania Smartweed	2.75
Rudbeckia hirta	Black-Eyed Susan	2.50
Verbena hastata	Blue Vervain	2.80
Zizia aurea	Golden Alexander	2.50
	Total Forbs	**24.00**



GRAPHIC SCALE

20 0 10 20 40

(IN FEET)
1 INCH = 20 FEET

LEGEND

- MISC. STRUCTURE (AS LABELED)
- BOLLARD
- SIGN
- LIGHT BASE
- STREET LIGHT
- OVERHEAD TRAFFIC SIGNAL
- UTILITY METERS & BOXES (ELECTRIC METER, GAS METER, WATER METER, PHONE BOX, CATV BOX, MAIL BOX)
- AIR CONDITIONER UNIT
- UTILITY MANHOLE (AS LABELED)
- UTILITY POLE W/GUY WIRE
- OVERHEAD UTILITY LINES (ELECTRIC/PHONE/CABLE)
- U/G UTILITY LINES (ELECTRIC/PHONE/CABLE)
- DECIDUOUS TREE W/IDENTIFIER
- CONIFEROUS TREE W/IDENTIFIER
- BUSH
- FENCE (CHAIN LINK UNLESS OTHERWISE STATED)
- GUARD RAIL
- EDGE OF GRAVEL
- CONCRETE CURB (UNLESS OTHERWISE STATED)
- SANITARY SEWER MANHOLE W/IDENTIFIER
- SANITARY SEWER PIPE
- CLEAN OUT
- STORM WATER MANHOLE W/IDENTIFIER
- CATCH BASIN W/IDENTIFIER
- CONTROL STRUCTURE
- FLARED END SECTION
- STORM WATER DRAINAGE PIPE
- HYDRANT
- WATER SHUT OFF
- WATER VALVE
- WATER VALVE BOX
- WATER MAIN
- GAS SHUT OFF
- U/G GAS
- SPOT ELEVATION
- 1' CONTOUR
- 5' CONTOUR
- PROPOSED SANITARY SEWER
- PROPOSED WATER MAIN
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURES
- PROPOSED CONCRETE CURB & GUTTER W/STD. PITCH
- PROPOSED WETLAND PLANTINGS

BENCHMARKS

DATUM BASED ON NGS OPUS SOLUTION REPORT, DATED FEBRUARY 24, 2017 AT 9:21 AM.

BENCHMARK #200 (STATIC)
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF-SITE)
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

BENCHMARK #203 (OFF-SITE)
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF-SITE)
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

WETLAND BUFFER IMPACTS:
1. Existing wetland buffer "C" is 18,291 SF in area (see sheet C2.0).
2. Wetland buffer "C" will be permanently impacted.

811 Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESIGN LINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION	REVISION #	DATE	REVISION-DESCRIPTION
1	05-21-18	REVISED PER ECT REVIEW COMMENTS			
2	06-04-18	REVISED PER WCWRC REVIEW COMMENTS			
3	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
4	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
5	12-19-18	REVISED BUILDING PER CLIENT REQUEST			

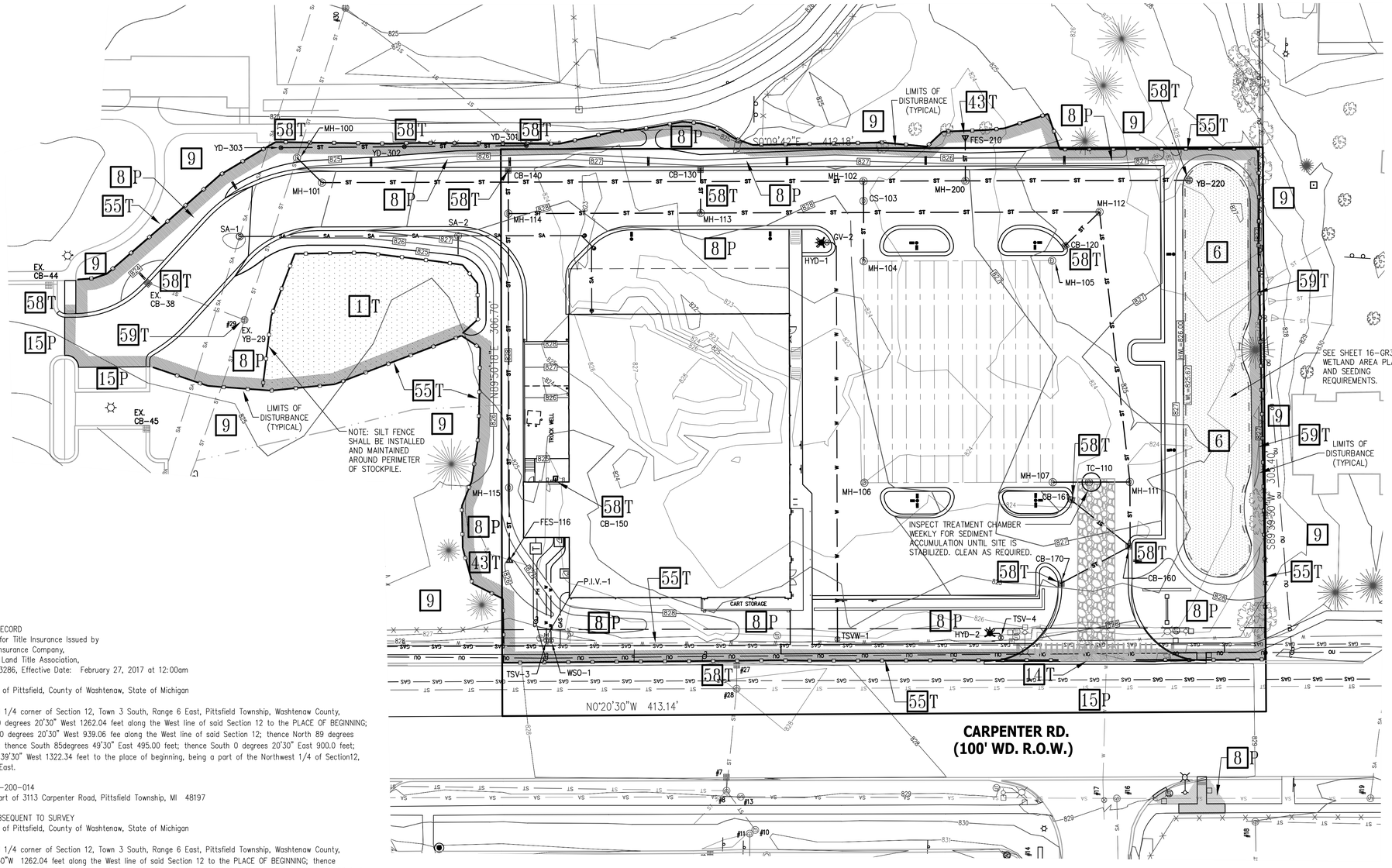
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

WETLAND GRADING PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=20'
PROJECT No.: 9162803
DWG NAME: 2803-WETLAND
ISSUED: DEC. 19, 2018

16-GR3



GRAPHIC SCALE

30 0 15 30 60

(IN FEET)

1 INCH = 30 FEET

LEGEND

- = MISC. STRUCTURE (AS LABELED)
- = BOLLARD
- = SIGN
- = LIGHT BASE
- = STREET LIGHT
- = OVERHEAD TRAFFIC SIGNAL
- = UTILITY METERS & BOXES (ELECTRIC METER, GAS METER, WATER METER, PHONE BOX, CATV BOX, MAIL BOX)
- = AIR CONDITIONER UNIT
- = UTILITY MANHOLE (AS LABELED)
- = UTILITY POLE W/GUY WIRE
- = OVERHEAD UTILITY LINES (ELECTRIC/PHONE/CABLE)
- = U/G UTILITY LINES (ELECTRIC/PHONE/CABLE)
- = DECIDUOUS TREE W/IDENTIFIER
- = CONIFEROUS TREE W/IDENTIFIER
- = BUSH
- = FENCE (CHAIN LINK UNLESS OTHERWISE STATED)
- = GUARD RAIL
- = EDGE OF GRAVEL
- = CONCRETE CURB (UNLESS OTHERWISE STATED)
- = SANITARY SEWER MANHOLE W/IDENTIFIER
- = SANITARY SEWER PIPE
- = CLEAN OUT
- = STORM WATER MANHOLE W/IDENTIFIER
- = CATCH BASIN W/IDENTIFIER
- = CONTROL STRUCTURE
- = FLARED END SECTION
- = STORM WATER DRAINAGE PIPE
- = HYDRANT
- = WATER SHUT OFF
- = WATER VALVE
- = WATER VALVE BOX
- = WATER MAIN
- = GAS SHUT OFF
- = U/G GAS
- = SPOT ELEVATION
- = 1' CONTOUR
- = 5' CONTOUR
- = PROPOSED SANITARY SEWER
- = PROPOSED WATER MAIN
- = PROPOSED STORM SEWER
- = PROPOSED STORM STRUCTURES

LEGAL DESCRIPTION OF RECORD
Reference: Commitment for Title Insurance Issued by
Fidelity National Title Insurance Company,
an Agent of American Land Title Association,
Commitment No. A0713286, Effective Date: February 27, 2017 at 12:00am

Situated in the Township of Pittsfield, County of Washtenaw, State of Michigan

Commencing at the West 1/4 corner of Section 12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; thence North 0 degrees 20'30" West 1262.04 feet along the West line of said Section 12 to the PLACE OF BEGINNING; thence continuing North 0 degrees 20'30" West 939.06 fee along the West line of said Section 12; thence North 89 degrees 39'30" East 828.88 feet; thence South 85degrees 49'30" East 495.00 feet; thence South 0 degrees 20'30" East 900.0 feet; thence South 89degrees 39'30" West 1322.34 feet to the place of beginning, being a part of the Northwest 1/4 of Section12, Town 3 South, Range 6 East.

Parcel ID No.: L-12-12-200-014
Commonly known as: Part of 3113 Carpenter Road, Pittsfield Township, MI 48197

PARCEL DESCRIPTION SUBSEQUENT TO SURVEY
Situated in the Township of Pittsfield, County of Washtenaw, State of Michigan

Commencing at the West 1/4 corner of Section 12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; thence N0°20'30"W 1262.04 feet along the West line of said Section 12 to the PLACE OF BEGINNING; thence continuing N0°20'30"W 939.35 feet (939.06 feet record) along the West line of said Section 12 to a point distant 505.00 feet S0°20'30"E from the Northwest corner of said section; thence N89°39'30"E 828.78 feet (828.88 feet record) along a line perpendicular to aforementioned West line of Section 12; thence S85°49'49"E 493.80 feet (S85°49'30"E 495.00 feet record) along a line parallel with the North line of said Section 12, same being, in part, the South line of "Arbor Heights Condominium" (according to Master Deed thereof recorded in Liber 1761, Page 899, Washtenaw County Records); thence the following two courses along the boundary of "Madison Place Condominium" (according to Master Deed thereof recorded in Liber 4026, Page 663, Washtenaw County Records): (1) S00°16'29"E (S01°19'10"E condominium deed record) 460.43 feet, and (2) S85°49'49"E 1.60 feet along a line parallel with said North line of Section 12; thence S0°20'30"E 439.95 feet along a line referred to as the West line of the East 1/2 of the Northwest 1/4 of said Section 12 in Warranty Deed recorded in Liber 3864, Page 517; thence S89°39'30"W 1322.11 feet (1322.34 feet record.) to the Place of Beginning. Containing 28.28 acres, more or less. Being a part of the Northwest 1/4 of Section12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan. Subject to the rights of the public over that portion thereof taken for Carpenter Road, also subject to and together with all easements and restrictions affecting title to the described above premises.

PROPOSED OUTLOT 1 (ALDI PARCEL)
Situated in the Township of Pittsfield, County of Washtenaw, State of Michigan, described as:

Commencing at the West 1/4 corner of Section 12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; thence N0°20'30"W 1262.04 feet along the West line of said Section 12 to the PLACE OF BEGINNING; thence continuing N0°20'30"W 413.14 feet along the West line of said Section 12; thence N89°50'18"E 46.70 feet to a point on the East line (as established by previous Surveys) of Carpenter Road Right-of-way (100-foot wide); thence continuing N89°50'18"E 260.00 feet; thence S00°09'42"E 412.18 feet along the line lying 260 feet Easterly and parallel with said East line of Carpenter Road; thence S89°39'30"W 305.40 feet to the Place of Beginning. Containing 2.90 acres, more or less. Being a part of the Northwest 1/4 of Section12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan. Subject to the rights of the public over that portion thereof taken for Carpenter Road, also subject to and together with all easements and restrictions affecting title to the described above premises.

SOIL EROSION MEASURES

1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BORROW AREAS TO ACT AS A DIVERSION STOCKPILE SHOULD BE TEMPORARILY SEEDED
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY EASILY PLACED IN SMALL QUANTITIES BY INDEPENDENT PERSONNEL SHOULD INCLUDE PREPARED TOPSOIL BED
8	SODDING	PROVIDES IMMEDIATE PROTECTION CAN BE USED ON STEEP SLOPES WHERE SEED MAY BE DIFFICULT TO ESTABLISH EASY TO PLACE, MAY BE REPAIRED IF DAMAGED SHOULD INCLUDE PREPARED TOPSOIL BED
9	VEGETATIVE BUFFER STRIP	SLOWS RUNOFF VELOCITY FILTERS SEDIMENT FROM RUNOFF REDUCES VOLUME OF RUNOFF ON SLOPES
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, THUS MINIMIZING EROSION PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF, VOLUME AND VELOCITY IRREGULAR SURFACE WILL HELP SLOW VELOCITY
43	CULVERT SEDIMENT TRAP	EASY TO INSTALL AT INLET KEEPS CULVERT CLEAN AND FREE FLOWING MAY BE CONSTRUCTED OF LUMBER OR LOGS
55	GEOTEXTILE SILT FENCE	USES GEOTEXTILE AND POSTS OR POLES MAY BE CONSTRUCTED OR PREPACKAGED EASY TO CONSTRUCT AND LOCATE AS NECESSARY
58	INLET SEDIMENT FILTER	USES PREPACKAGED GEOTEXTILE SACKS FILTERS SEDIMENT FROM RUNOFF AT CATCH BASIN INLET EASY TO INSTALL AND MAINTAIN
59	INLET FABRIC DROP	PREVENTS SEDIMENT FROM ENTERING STORM SYSTEM AT STRUCTURES USES GEOTEXTILE FABRIC AND POSTS OR POLES SILT FENCE CAN BE USED

T = TEMPORARY P = PERMANENT

PROPOSED SILT FENCE

NOTE: DEWATERING IS NOT ANTICIPATED TO BE NECESSARY FOR THIS PROJECT. SHOULD DEWATERING BECOME NECESSARY, THEN THE CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO PITTSFIELD CHARTER TOWNSHIP FOR REVIEW AND APPROVAL PRIOR TO INITIATING DEWATERING ACTIVITIES.

NOTE: BEAVER DAMS SHALL BE ADDED TO ALL CATCH BASIN SILT SACKS.

TOTAL DISTURBED AREA = 3.26 AC.

BENCHMARKS

BENCHMARK #200 (STATIC)
SET ROD WITH CAP, LOCATED EAST SIDE OF CARPENTER ROAD AND 247± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 829.75 (NAVD 88)

BENCHMARK #201 (SITE)
SOUTH RIM OF YARD BASIN (#29), LOCATED NEAR THE CENTERLINE OF 25' WD ESMT FOR STORM SEWER.
ELEVATION = 824.43 (NAVD 88)

BENCHMARK #202 (OFF-SITE)
SPIKE IN THE EAST SIDE OF A LIGHT POLE, LOCATED ON THE WEST SIDE OF CARPENTER ROAD AND 462± FEET SOUTH OF THE NORTHWEST PROPERTY CORNER.
ELEVATION = 833.07 (NAVD 88)

BENCHMARK #203 (OFF-SITE)
EAST BOLT OF HYDRANT, LOCATED EAST SIDE OF CARPENTER ROAD AND 118± FEET SOUTH OF SOUTHWEST PROPERTY CORNER.
ELEVATION = 832.59 (NAVD 88)

BENCHMARK #204 (OFF-SITE)
NORTHEAST CORNER OF CONCRETE PAD, LOCATED 22± FEET SOUTH OF PROPERTY LINE AND EAST OF FIRST APARTMENT BUILDING.
ELEVATION = 833.23 (NAVD 88)

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

3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
2	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS
3	06-04-18	REVISED PER WCWRC REVIEW COMMENTS
4	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
5	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
6	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
7	12-19-18	REVISED BUILDING PER CLIENT REQUEST

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

SOIL EROSION AND SEDIMENTATION CONTROL PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=30'
PROJECT No.: 9162803
DWG NAME: 2803-EROSION
ISSUED: DEC. 19, 2018

17-SE1

TIME LINE OF SOIL EROSION CONTROL AND CONSTRUCTION SEQUENCE

CONSTRUCTION & WORK CATEGORIES*	CONSTRUCTION PERIOD																																		
Month	1				2				3				4				5				6				7				8				9			
Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. OBTAIN PERMITS	■	■	■	■																																
2. INSTALL INITIAL SESC MEASURES					■																															
3. INSPECT & MAINTAIN SESC MEASURES					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
4. DEMOLITION WORK					■																															
5. EARTH WORK					■	■	■																													
6. BUILDING CONSTRUCTION									■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
7. UNDERGROUND UTILITY WORK								■	■	■	■																									
8. SITE LIGHTING WORK														■																						
9. CURB, SIDEWALK & PAVEMENT WORK															■	■	■																			
10. BACKFILL & FINISH GRADE WORK																		■																		
11. TOPSOIL, SEED & MULCH																			■																	
12. LANDSCAPE WORK																			■	■	■															
13. REMOVE TEMPORARY SESC MEASURES																													■							

*REFER TO THE MAJOR WORK ITEMS OUTLINED IN THE SOIL EROSION CONTROL AND CONSTRUCTION SEQUENCE NOTES.

SOIL EROSION CONTROL AND CONSTRUCTION SEQUENCE:

1. Obtain all necessary Soil Erosion and Sedimentation Control related permits from the appropriate Local, County and/or State Agencies. Refer to the General Notes on the project plans for additional requirements.

2. Prior to commencement of any earth disruption, install Silt Fence, Tree Protection, Mud Tracking Control Devices, and Inlet Sediment Filters at existing storm sewer catch basins in accordance with the Soil Erosion and Sedimentation Control Plan and the Soil Erosion and Sedimentation Control Permit.

3. Inspect and maintain all Soil Erosion Control Measures daily. Maintain all Soil Erosion Control Measures as necessary and as directed by the Engineer and/or the Permitting Agency.

4. Perform demolition work. Install appropriate Soil Erosion Control Measures in accordance with the Soil Erosion and Sedimentation Control Plan and/or as directed by the Engineer and/or the Permitting Agency.

5. Strip and dispose of topsoil offsite. Perform mass grading and land balancing. Install appropriate Soil Erosion Control Measures in accordance with the Soil Erosion and Sedimentation Control Plan and/or as directed by the Engineer and/or the Permitting Agency.

6. Construct building in accordance with the Site Plan and Architectural Plans. Install appropriate Soil Erosion Control Measures in accordance with the Soil Erosion and Sedimentation Control Plan and/or as directed by the Engineer and/or the Permitting Agency.

7. Construct underground utilities including sanitary sewer lead, sanitary sewer main, water leads, water main, storm sewer, and conduit for underground public utilities. Install appropriate Soil Erosion Control Measures, including Inlet Sediment Filters on new catch basins and Culvert Sediment Traps on new culverts, in accordance with the Soil Erosion and Sedimentation Control Plan and/or as directed by the Engineer and/or the Permitting Agency.

8. Install light pole bases and fixtures and underground electric. Install appropriate Soil Erosion Control Measures in accordance with the Soil Erosion and Sedimentation Control Plan and/or as directed by the Engineer and/or the Permitting Agency.

9. Construct curb & gutter, sidewalk and paved parking and roadway areas. Install appropriate Soil Erosion Control Measures in accordance with the Soil Erosion and Sedimentation Control Plan and/or as directed by the Engineer and/or the Permitting Agency.

10. Backfill curb and sidewalks and finish grade all disturbed areas outside of pavement areas. Install appropriate Soil Erosion Control Measures in accordance with the Soil Erosion and Sedimentation Control Plan and/or as directed by the Engineer and/or the Permitting Agency.

11. Place topsoil and hydroseed within 5 days of finish grade for establishment of vegetative ground cover outside of pavement and mulched landscape bed areas. Install appropriate Soil Erosion Control Measures in accordance with the Soil Erosion and Sedimentation Control Plan and/or as directed by the Engineer and/or the Permitting Agency.

12. Landscape site in accordance with the Project Landscape Plan. Install appropriate Soil Erosion Control Measures in accordance with the Soil Erosion and Sedimentation Control Plan and/or as directed by the Engineer and/or the Permitting Agency.

13. Following establishment of sufficient vegetative ground cover and receipt of approval from the Permitting Agency, remove all *temporary* Soil Erosion Control Measures, clean all storm sewer structures, and repair any permanent Soil Erosion Control Measures as directed by the Engineer and/or the Permitting Agency.

MAINTENANCE NOTES FOR SOIL EROSION CONTROL MEASURES:

The Construction Site and all Soil Erosion Control Measures shall be inspected periodically in accordance with the appropriate local municipality/authority and the MDEQ NPDES rules and regulations. At a MINIMUM, inspections shall be performed once a week and within 24 hours following a storm event resulting in 1" of rainfall or greater. Inspections shall be performed throughout the duration of the construction process and until the site is completely stabilized. Following construction, the owner (or its assignee) shall periodically inspect all permanent soil erosion control measures to ensure proper operation.

CATCH BASINS: Catch basins shall be inspected for accumulation of solids and sediment. Solids and sediment shall be removed from the catch basins by vacuum or adductor cleaning. Cleaning should be performed before the catch basin sumps are half full.

MUD TRACKING CONTROL DEVICE / CONSTRUCTION ACCESS: Mud tracking control devices shall be inspected for significant mud accumulation and to ensure the access is not eroding into public rights of way or drainage features. Add additional layers of stone or remove and replace stone each time the stone becomes covered with mud. All sediment dropped or eroded onto public rights of way shall be removed immediately. Sweeping of the public rights or way and/or paved access route shall be performed as necessary to maintain the access route free of sediment and debris.

SEEDING: Newly seeded areas shall be inspected until substantial vegetative growth is obtained. Seeded areas shall be inspected to ensure erosion is not occurring in the seeded area and vegetative growth is promoted. Eroded areas shall be finish graded as necessary to removal erosion channels or gulleys and new seed placed as soon as weather permits.

SILT FENCE: Silt fencing shall be inspected for soil accumulation/clogging, undercutting, overtopping and sagging. Soil accumulation shall be removed from the face of the silt fence each time it reaches half the height of the fence. Removed sediment shall be disposed of in a stable upland site or added to a spoils stockpile. When undercutting occurs, grade out areas of concentrated flow upstream of the silt fence to remove channels and/or gulleys and repair or replace silt fence ensuring proper trenching techniques are utilized. Silt fencing, which sags, falls over or is not staked in shall be repaired or replaced immediately. Silt fencing fabric, which decomposes or becomes ineffective, shall be removed and replaced with new fabric immediately. Silt fencing shall be removed once vegetation is well established and the up-slope area is fully stabilized.

SOD: Newly sodded areas shall be inspected to ensure sod is maturing. Sod shall be inspected for failure, erosion or damage. Slipping or eroding sod on steep slopes shall be immediately repaired or replaced and staked in place. Damaged or failed sod shall be immediately replaced.

STOCKPILES: Temporary and permanent topsoil and spoils stockpiles shall be seeded to promote vegetative growth. Stockpiles shall be inspected to ensure excessive erosion has not occurred. When runoff or wind erosion is evident, reduce the side slopes of the stockpile or stabilize the stockpile with pieces of staked sod laid perpendicular to the slope. When filter fencing is used around a stockpile, the fencing shall be inspected to ensure piping has not occurred under the fencing and to ensure the fencing has not collapsed due to soil slippage or access by construction equipment. Repair or replace damaged fencing immediately. Berms at the base of stockpiles, which become damaged, shall be replaced.

STORM STRUCTURE INLET FILTER: Inlet filters shall be inspected for sediment accumulation, clogging and damage. When stone is used in conjunction with inlet filter fabric, replace the stone each time it becomes clogged with sediment. Clean or replace the inlet filter fabric each time it becomes clogged with sediment. Reinstall or replace fallen filter fabrics immediately. Replace damaged filter fabrics immediately.

TREATMENT CHAMBER: Treatment chambers shall be inspected for sediment accumulation, soil caking and mechanical failure/damage. All litter and sediment accumulation shall be removed from the treatment chamber as soon as weather permits. All mechanical failure/damage shall be repaired immediately.

EXHIBIT C

Detention Pond/Forebay

REQUIRED MAINTENANCE:

- Check the outlet regularly for clogging and clean when necessary (annually).
- If necessary based on surroundings, mow grass side slopes (two times per year).
- Inspect entire system at least annually including inlet/outlet pipes, restricted outlet structure(s), animal grates and filters.
- Check banks and bottom for erosion and correct as necessary (annually).
- Remove sediment when accumulation reaches six inches or if resuspension is observed.
- Reseed banks near inlet/outlet and stabilize eroded banks as necessary.
- Add grasses such as sedges and rushes.
- Remove dead vegetation (early spring) that obstructs flow.

If the outlet is pumped, then only a licensed electrician or company that provided the pump system should conduct any maintenance. Chemicals should not be applied to your detention basin, side slopes or buffer strip.

Manufactured/Underground Detention System

REQUIRED MAINTENANCE:

- Check the outlet regularly for clogging and clean when necessary (annually).
- Inspect entire system including inlet/outlet pipes, restricted outlet structure(s), and water quality structures (two times per year).
- Clean detention system if its volume has been reduced by more than 10 percent due to accumulation of silt and sediment.

Storm Sewer Collection System

REQUIRED MAINTENANCE:

- Check the outlet regularly for clogging and clean when necessary (annually).
- Inspect entire storm sewer distribution system (two times per year).
- Clean storm sewer structures when accumulation of silt and sediment reaches 6- inches or greater.
- Clean grates on inlets, outlets, and other storm sewer structures should be cleaned regularly.
- Water channels should be cleaned regularly.

Upon completion of annual routine inspections, documentation shall be provided to Pittsfield Township

Mail to:

Pittsfield Charter Township
6205 W. Michigan Avenue
Ann Arbor MI 48108

Attn: Department of Utilities and Municipal Services

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
NaB	Nappanee silty clay loam, 2 to 6 percent slopes	3.2	100.0%
Totals for Area of Interest		**3.2**	**100.0%**

SOIL MAP & LEGEND

NOT TO SCALE

SOIL EROSION MEASURES

No.	Measure	Description
1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BORROW AREAS TO ACT AS A DIVERSION STOCKPILE SHOULD BE TEMPORARILY SEEDED
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL SHOULD INCLUDE PREPARED TOPSOIL BED
8	SODDING	PROVIDES IMMEDIATE PROTECTION CAN BE USED ON STEEP SLOPES WHERE SEED MAY BE DIFFICULT TO ESTABLISH EASY TO PLACE, MAY BE REPAIRED IF DAMAGED SHOULD INCLUDE PREPARED TOPSOIL BED
9	VEGITATIVE BUFFER STRIP	SLOWS RUNOFF VELOCITY FILTERS SEDIMENT FROM RUNOFF REDUCES VOLUME OF RUNOFF ON SLOPES
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, THUS MINIMIZING EROSION PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF, VOLUME AND VELOCITY IRREGULAR SURFACE WILL HELP SLOW VELOCITY
43	CULVERT SEDIMENT TRAP	EASY TO INSTALL AT INLET KEEPS CULVERT CLEAN AND FREE FLOWING MAY BE CONSTRUCTED OF LUMBER OR LOGS
55	GEOTEXTILE SILT FENCE	USES GEOTEXTILE AND POSTS OR POLES MAY BE CONSTRUCTED OR PREPACKAGED EASY TO CONSTRUCT AND LOCATE AS NECESSARY
58	INLET SEDIMENT FILTER	USES PREPACKAGED GEOTEXTILE SACKS FILTERS SEDIMENT FROM RUNOFF AT CATCH BASIN INLET EASY TO INSTALL AND MAINTAIN
59	INLET FABRIC DROP	PREVENTS SEDIMENT FROM ENTERING STORM SYSTEM AT STRUCTURES USES GEOTEXTILE FABRIC AND POSTS OR POLES SILT FENCE CAN BE USED

Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
2	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS
3	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS

REVISION #	DATE	REVISION-DESCRIPTION

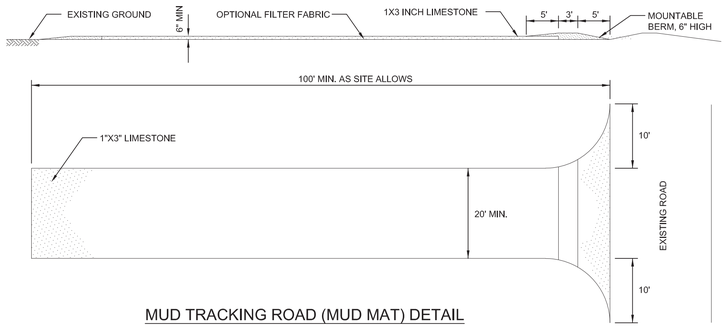
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

SOIL EROSION AND SEDIMENTATION CONTROL NOTES AND DETAILS

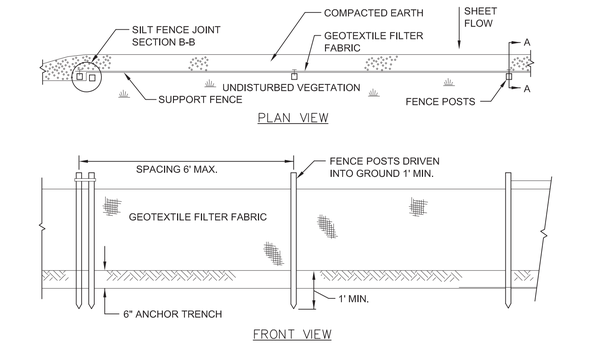
CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

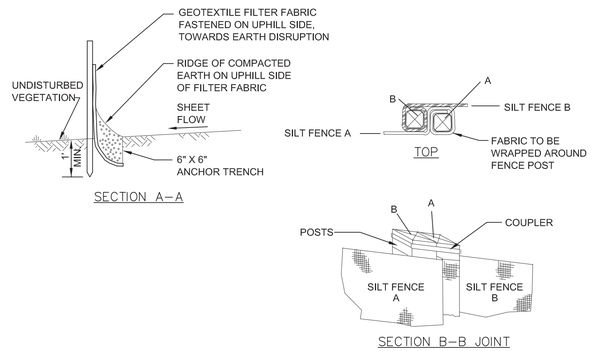
SCALE: N/A
PROJECT No.: 9162803
DWG NAME: 2803-EROSION
ISSUED: AUG. 28, 2018

18-SE2



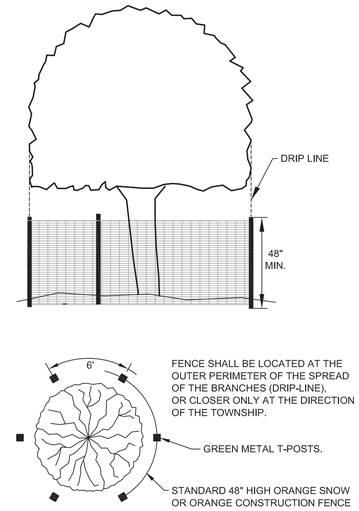
MUD TRACKING ROAD (MUD MAT) DETAIL





SILT FENCE

NOT TO SCALE



NOTES:
1. ALL TREES TO BE REMOVED WILL BE IDENTIFIED BY RED FLAGGING.
2. TREE PROTECTION FENCING IS TO BE ERECTED PRIOR TO ANY EARTHWORK OR CONSTRUCTION AND IS TO REMAIN IN PLACE UNTIL CONSTRUCTION AND GRADING IS COMPLETE.
3. ALL DEBRIS, FILL, EQUIPMENT OR MATERIAL IS TO BE KEPT CLEAR OF AREA WITHIN PROTECTIVE FENCE. NO CLEANING OF EQUIPMENT OR MATERIAL OR STORAGE OR DISPOSAL OF ANY MATERIAL WITHIN THE DRIP LINE OF ANY TREES TO BE SAVED.

TREE PROTECTION FENCE DETAIL

NOT TO SCALE

PITTSFIELD CHARTER TOWNSHIP
SOIL EROSION AND SEDIMENTATION CONTROL NOTES
GENERAL

1. The contractor shall implement and maintain the soil erosion control measures as shown on the plans at all times during construction on this project. Any modifications or additions to the soil erosion control measures due to construction or changed conditions, shall be complied with as required or directed by the owner, project engineer or Pittsfield Township.
2. All soil erosion and sedimentation control work shall conform to the permit requirements of Pittsfield Township and the laws of the State of Michigan.
3. A NPDES construction activity permit is required for all sites greater than 5 acres.
4. Daily inspections shall be made by the contractor. Periodic inspections may be made by the owner/project engineer/Township to determine the effectiveness of erosion and sedimentation control measures. Any necessary corrections shall be made without delay.
5. Erosion and sedimentation from work on the site shall be contained on the site and not be allowed to collect on any off-site areas or in waterways.
6. All mud/dirt tracked onto roads from the site due to construction, shall be promptly removed by the contractor.
7. Restoration of all disturbed areas, including placement of topsoil, seed, fertilizer and mulch and/or sod shall be done within 5 days of the completion of final grade.
8. Construction operations shall be scheduled and performed so that preventative soil erosion control measures are in place prior to excavation in critical areas and temporary stabilization measures are in place immediately following backfilling operations.
9. Special precautions will be taken in the use of construction equipment to prevent situations that promote erosion.
10. Proper dust control shall be maintained during construction by use of water trucks and/or chloride as required.
11. The contractor shall be responsible for maintaining all temporary soil erosion control measures and removal of some upon authorized completion of project. Completion of project will not be authorized until all site work, home building, road work and utility construction is complete and all soils are stabilized.
12. The contractor shall not grade in existing wetland or conservation areas to be protected. Silt fence shall be installed and maintained adjacent to existing wetland and conservation areas to prevent grading, erosion and sedimentation into them.
13. Tree protection fencing must remain intact until restoration of the site is complete.

SEQUENCE OF CONSTRUCTION

1. Install sediment fence and tree protection fencing prior to any grading operation.
2. Install mud-tracking pad.
3. Construct temporary sediment/detention basin.
4. Place topsoil, fertilizer, seed and mulch over the entire detention basin area.
5. Rough grade site, stockpile topsoil and begin building construction.
6. Install storm drainage system including riprap and parking lot inlet filters and detention basin standpipe.
7. Maintain erosion and sedimentation control measures, as required.
8. Install sanitary sewer and water systems.
9. Bring pavement areas to sub-base grade, place sub-base and bituminous pavement.
10. Install franchised utilities.
11. Finish grade, redistribute topsoil, seed and mulch all disturbed areas.
12. Remove any accumulated sediment within the detention basin and replace clean washed stone around standpipe.
13. Complete construction of site.
14. Insure all soil is stabilized. Remove all temporary soil erosion control measures.

SEEDING/SOD

1. Seed or sod in accordance with project specifications.
2. All areas of disturbed earth that are not to be paved or sodded shall have 4 inches of topsoil, seed, fertilizer and mulch.
3. Immediately after seeding, mulch all seeded areas with unweathered small grain straw (preferably wheat) or hay spread. Spread uniformly at the rate of 1 ½ to 2 tons or 100 pounds (2 to 3 bales) per 1,000 square foot. This mulch should be anchored with a disc-type mulch-anchoring tool.
4. Any disturbed area not paved, seeded or mulched, sodded or built upon by November 15, is to be mulched in the manner as specified above, in order to provide soil erosion protection during the winter and early spring.
5. All erosion and sedimentation control prevention procedures and structures are to comply with the Standards and Specifications for soil erosion and sediment control of the Washtenaw County Soil Conservation District.
6. Drainage ditches and slopes steeper than 1:4 (25%) shall be stabilized with erosion control blankets.
7. Steep slopes that do not take upon initial seeding must be re-seeded and stabilized with erosion control blankets.
8. Where excavation has been through lawn areas, the CONTRACTOR shall restore the disturbed area by placing topsoil and seeding or sodding over the final backfill material.

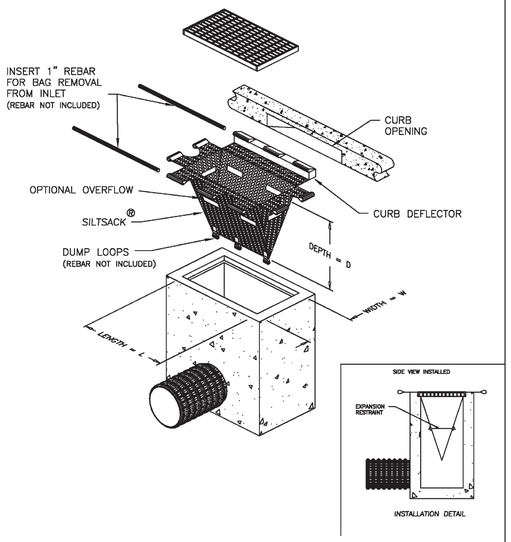
CATCH BASIN/MANHOLE PROTECTION

1. Protect storm sewer catch basins with Siltsack. or approved equivalent as follows:

ROADS

1. During construction, all roads shall be protected from unvegetated areas washing onto road surfaces by placement of silt fence behind curb or a 10 foot wide straw mulch bank behind the curb or other approved method and/or as shown on the plans.
2. During construction of any portion of the project, roads shall be maintained free of dirt, silt and construction debris.

Pittsfield SEC 9/22/2009



DETAIL OF INLET SEDIMENT CONTROL DEVICE
TYPE B – WITH CURB DEFLECTOR

ACF Environmental
Your Complete Source for Geosynthetic Solutions

ACF Environmental, Inc.
2831 Cardwell Rd.
Richmond, Virginia 23234
(800) 448-3636

SILTSACK®
SPECIFICATIONS

NOTE: THE SILTSACK® WILL BE MANUFACTURED FROM A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS.

REGULAR FLOW SILTSACK®
(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC -1

* HI-FLOW SILTSACK®
(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90 %
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC -1

OIL-ABSORBANT SILTSACK®
(FOR AREAS WHERE THERE IS A CONCERN FOR OIL RUN-OFF OR SPILLS)

DEPENDING ON YOUR PARTICULAR APPLICATION, THE SILTSACK® CAN BE MADE FROM EITHER ONE OF THE ABOVE FABRICS WITH AN OIL-ABSORBANT PILLOW INSERT OR, MADE COMPLETELY FROM AN OIL-ABSORBANT SILTSACK® WITH A WOVEN PILLOW INSERT.

(* HI-FLOW SILT SACK SHALL BE USED FOR ALL APPLICATIONS WITHIN PITTSFIELD TOWNSHIP)

SILTSACK DISTRIBUTORS:
PRICE & COMPANY
(www.priceandcompany.com)

METRO GRAND RAPIDS, MI
426 36TH STREET SW
WYOMING, MI 49548-2108
1-800-248-8230

METRO DETROIT, MI
29165 WALL STREET
WIXOM, MI 48393-3525
1-866-960-4300

SILTSACK

NOT TO SCALE

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108–9721
48108–9721
Tel. 734.822.3101
www.pittsfield-mi.gov

SILTSACK	BWA	DRW	12.01.03
TWP REV	BWA	DRW	11.04.27
UPDATES	TTN	DRW	10.01.20
Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD

File Name: SE–01	TTN	DRW	07.10.01
	Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

19-SE3

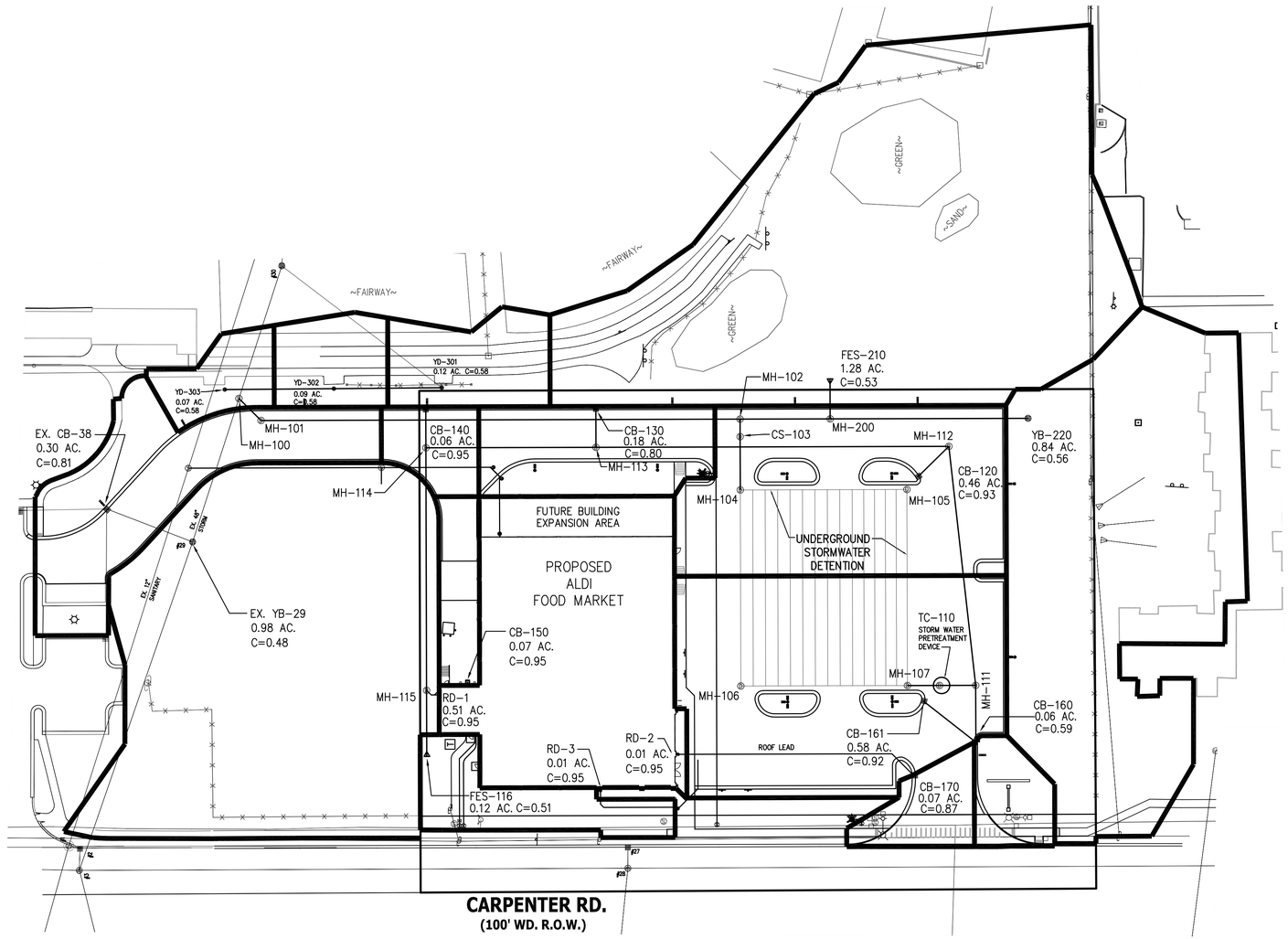
Title
SOIL EROSION DETAILS AND NOTES

Project No. 2075001300

Scale NOT TO SCALE

Revision

1



Know what's below. Call before you dig.

3 WORKING DAYS
BEFORE YOU DIG
CALL 811 OR 1-800-482-7171
(TOLL FREE)
OR VISIT CALL811.COM

DESIGN INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	11-06-17	REVISED PER TOWNSHIP REVIEW COMMENTS
2	12-20-17	REVISED PER TOWNSHIP REVIEW COMMENTS
3	01-26-18	REVISED PER TOWNSHIP REVIEW COMMENTS
4	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
5	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS

REVISION #	DATE	REVISION-DESCRIPTION
6	06-04-18	REVISED PER WCWRC REVIEW COMMENTS
7	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
8	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
9	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
10	12-19-18	REVISED BUILDING PER CLIENT REQUEST

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

WATERSHED PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=40'
PROJECT No.: 9162803
DWG NAME: 2803-WS
ISSUED: DEC. 19, 2018

20-WS1

ALDI FOOD MARKET # 48 - PITTSFIELD TOWNSHIP, MICHIGAN
WCWRC STANDARD METHOD RUNOFF VOLUME WORK SHEETS

W1: DETERMINING POST-DEVELOPMENT COVER TYPES, AREAS, CURVE NUMBERS, AND RUNOFF COEFFICIENTS

Total Site Area =	**2.12**	**acres**
Total Site Area Excluding "Self-Crediting" BMPs =	**2.12**	**acres**

Rational Method Variables[B]	Cover Type	Soil Type	Area (ft^2)	Area (ac)	Runoff Coefficient (C)	(C) (Area)
	Pavement	D	57,173	1.32	0.95	1.25
	Building	D	22,733	0.52	0.95	0.50
	Lawn, < 4%	D	11,318	0.26	0.45	0.12
	Lawn, > 8%	D	814	0.02	0.55	0.01

Total - Σ(C)(Area) = 1.88
Area Total - Σ(Area) = 2.12
Weighted C - Σ(C)(Area) / Σ(Area) = 0.89

NRCS Variables[C]	Pervious Cover Type	Soil Type	Area (ft^2)	Area (ac)	Curve Number	(CN) (Area)
	Lawns, Good Condition	D	12,132	0.28	80	22

Total - Σ(CN)(Area) = 22
Area Total - Σ(Area) = 0.28
Weighted C - Σ(C)(Area) / Σ(Area) = 80

NRCS Variables[C]	Impervious Cover Type	Soil Type	Area (ft^2)	Area (ac)	Curve Number	(CN) (Area)
	Pavement	D	57,173	1.32	98	129
	Building	D	22,733	0.52	98	51

Total - Σ(CN)(Area) = 181
Area Total - Σ(Area) = 1.84
Weighted C - Σ(C)(Area) / Σ(Area) = 98

[A] Use this area for the remainder of the runoff calculations
[B] Required for first flush runoff calculations
[C] Required for bankfull and 100-year runoff calculations

W2: FIRST FLUSH RUNOFF CALCULATIONS

V_{ff} = (1")*(1'/12")*(43,560 ft^2 / 1 ac)*A*C = 6,813 ft^3

A = Total Site Areas (ac) excluding "Self-Crediting" BMPs from Worsheet 1
C = Weighted Runoff Coefficient from Worksheet 1

W3: PRE-DEVELOPMENT BANKFULL RUNOFF CALCULATIONS ($V_{bf\text{-}pre}$)

2 year/24 hour storm event:	P =	2.35	in
Pre-development land cover:		Good Cover Woods or Meadow	
Pre-development Hydrologic Soil Group:		D	
Pre-development Curve Number:		77	
S = (1000 / CN) - 10 =		2.99	in
Q = $(P - 0.2*S)^2$ / (P + 0.8*S) =		0.65	in
Total Site Area (sf) excluding "Self-Crediting" BMPs =		92,038	sf
$V_{bf\text{-}pre}$ = Q*(1/12)*Area =		4,971	ft^3

W4: PERVIOUS COVER POST-DEVELOPMENT BANKFULL RUNOFF CALCULATIONS ($V_{bf\text{-}per\text{-}post}$)

2 year/24 hour storm event:	P =	2.35	in
Pervious Cover CN from Worksheet 1:		80	
S = (1000 / CN) - 10 =		2.50	in
Q = $(P - 0.2*S)^2$ / (P + 0.8*S) =		0.79	in
Pervious Cover Area from Worksheet 1 =		12,132	sf
$V_{bf\text{-}per\text{-}post}$ = Q*(1/12)*Area =		795	ft^3

W5: IMPERVIOUS COVER POST-DEVELOPMENT BANKFULL RUNOFF CALCULATIONS ($V_{bf\text{-}imp\text{-}post}$)

2 year/24 hour storm event:	P =	2.35	in
Impervious Cover CN from Worksheet 1:		98	
S = (1000 / CN) - 10 =		0.20	in
Q = $(P - 0.2*S)^2$ / (P + 0.8*S) =		2.12	in
Impervious Cover Area from Worksheet 1 =		79,906	sf
$V_{bf\text{-}imp\text{-}post}$ = Q*(1/12)*Area =		14,128	ft^3

W6: PERVIOUS COVER POST-DEVELOPMENT 100-YEAR STORM RUNOFF CALCULATIONS ($V_{100\text{-}per\text{-}post}$)

100-Year Storm Event:	P =	5.11	in
Pervious Cover CN from Worksheet 1:		80	
S = (1000 / CN) - 10 =		2.50	in
$Q_{100\text{-}per}$ = $(P - 0.2*S)^2$ / (P + 0.8*S) =		2.99	in
Pervious Cover Area from Worksheet 1 =		12,132	sf
$V_{100\text{-}per\text{-}post}$ = $Q_{100\text{-}per}$*(1/12)*Area =		3,022	ft^3

W7: IMPERVIOUS COVER POST-DEVELOPMENT 100-YEAR STORM RUNOFF CALCULATIONS ($V_{100\text{-}imp\text{-}post}$)

100-Year Storm Event:	P =	5.11	in
Impervious Cover CN from Worksheet 1:		98	
S = (1000 / CN) - 10 =		0.20	in
$Q_{100\text{-}imp}$ = $(P - 0.2*S)^2$ / (P + 0.8*S) =		4.87	in
Impervious Cover Area from Worksheet 1 =		79,906	sf
$V_{100\text{-}imp\text{-}post}$ = $Q_{100\text{-}imp}$*(1/12)*Area =		32,448	ft^3

W8: DETERMINE TIME OF CONCENTRATION FOR APPLICABLE FLOW TYPES ($T_{c\text{-}hrs}$)

Flow Type	K	Change in Elevation (ft)	Length (L)	Slope % (S*100%)	$S^{0.5}$	V = K*$S^{0.5}$	T_c = L / (V*3600)
Sheet Flow	0.48	3.50	168	2.08	1.443	0.69	0.07
Small Tributary	2.1	1.11	37	3.00	1.732	3.64	0.00
Small Tributary	2.1	0.52	148	0.35	0.593	1.24	0.03
Small Tributary	2.1	0.36	104	0.35	0.588	1.24	0.02
Small Tributary	2.1	0.76	216	0.35	0.593	1.25	0.05
Small Tributary	2.1	0.44	147	0.30	0.547	1.15	0.04
Small Tributary	2.1	0.22	22	1.00	1.000	2.10	0.00
Small Tributary	2.1	0.13	13	1.00	1.000	2.10	0.00

Total Time of Concentration ($T_{c\text{-}hrs}$) = 0.21

W9: RUNOFF SUMMARY & ONSITE INFILTRATION REQUIREMENT

Runoff Summary from Previous Worksheets		
First Flush Volume (V_{ff}) =	6,813	ft^3
Pre-Development Bankfull Runoff Volume ($V_{bf\text{-}pre}$) =	4,971	ft^3
Pervious Cover Post-Development		
Bankfull Volume ($V_{bf\text{-}per\text{-}post}$) =	795	ft^3
Impervious Cover Post-Development		
Bankfull Volume ($V_{bf\text{-}imp\text{-}post}$) =	14,128	ft^3
Total BF Volume ($V_{bf\text{-}post}$) = $V_{bf\text{-}per\text{-}post}$ + $V_{bf\text{-}imp\text{-}post}$ =	14,923	ft^3
Pervious Cover Post-Development		
100-Year Volume ($V_{100\text{-}per\text{-}post}$) =	3,022	ft^3
Impervious Cover Post-Development		
100-Year Volume ($V_{100\text{-}imp\text{-}post}$) =	32,448	ft^3
Total 100-Year Volume (V_{100}) = $V_{100\text{-}per\text{-}post}$ + $V_{100\text{-}imp\text{-}post}$ =	35,470	ft^3
Determine Onsite Infiltration Requirement		
Total Post-Development Bankfull Volume ($V_{bf\text{-}post}$) =	14,923	ft^3
Pre-Development Bankfull Runoff Volume ($V_{bf\text{-}pre}$) =	4,971	ft^3
Bankfull Volume Difference =	9,953	ft^3
Onsite Infiltration Requirement (V_{inf}) = the greater of the Bankfull Volume Difference and First Flush Volume =	9,953	ft^3

W10: DETENTION/RETENTION REQUIREMENT

Detention		
Peak of the Unit Hydrograph (Q_u) = 238.6*$T_c^{-0.82}$ =	841.76	cfs / in-mi^2
Total Site Area (ac) excluding "Self-Crediting" BMPs =	2.12	ac
Q_{100} = $Q_{100\text{-}per}$ + $Q_{100\text{-}imp}$ =	7.86	in
Peak Flow (PF) = (Q_u*Q_{100}*Area) / 640 =	21.92	cfs
Δ = PF - 0.15*Area =	21.60	cfs
V_{det} = (Δ / PF)*V_{100} =	34,956	ft^3
Retention		
V_{ret} = 2*V_{100} =	70,941	ft^3

W11: DETERMINE APPLICABLE BMPS AND ASSOCIATED VOLUME CREDITS

Proposed BMP[A]	Area (ft^2)	Storage Volume[B] (ft^3) Surface	Soil	Ave. Design Infiltration Rate (in/hr)	Infiltration Volume During Storm[C] (ft^3)	Total Volume Reduction[D] (ft^3)
Pervious Pavt w/Infiltration Bed	0	0		0	0	0
Infiltration Basin	0	0		0	0	0
Subsurface Infiltration Bed	0	0		0	0	0
Infiltration Trench	0	0		0	0	0
Bioretention Systems	0	0		0	0	0
Rain Gardens	0	0		0	0	0
Dry Well	0	0		0	0	0
Bioswale	0	0		0	0	0
Vegetated Filter Strip	0	0		0	0	0
Green Roof	0	0		0	0	0

Total Volume Reduction Credit by Proposed Structural BMPs (ft^3) = 0
Runoff Volume Infiltration Requirement (Vinf) from Worksheet 9 = -
Runoff Volume Credit (ft^3) = 0

[A] Complete checklist from Section VI for each Structural BMP type
[B] Storage volume as defined in individual BMP write-ups
[C] Approximated as the average design infiltration rate over 6 hours multiplied by the BMP area:
Infiltration Rate x 6 hours x BMP Area x Unit Conversions = Infiltration Volume (ft^3)
[D] Total Volume Reduction Credit is the sum of the Storage Volume and the Infiltration Volume During Storm

W12: NATURAL RESOURCES INVENTORY

Existing Natural Resources	Mapped (yes, no,	Total Area (ac)	Protected / Undisturbed Area (ac)
Waterbodies	N/A	0	0
Floodplains	N/A	0	0
Riparian Areas	N/A	0	0
Wetlands	YES	0.14	0
Woodlands	YES	2.18	0
Natural Drainage Area	N/A	0	0
Steep Slopes, 15%-25%	N/A	0	0
Steep Slopes, over 25%	N/A	0	0
Special Habitat Areas	N/A	0	0
Other	N/A	0	0
Total Existing (ac)		**2.32**	**0**

W13: SITE SUMMARY OF INFILTRATION & DETENTION

Minimum Onsite Infiltration Requirement, V_{inf} =	9,953	ft^3
Designed/Provided Infiltration Volume =	0	ft^3
% Minimum Required Infiltration Provided =	0	%
Total Calculated Detention Volume, V_{det} =	34,956	ft^3
Net Required Detention Volume =		
V_{det} - Designed/Provided Infiltration Volume =	34,956	ft^3
% Required Infiltration NOT provided =		
100% - % Minimum Required Infiltration Provided =	100	%
Net % Penalty =		
20% x % Required Infiltration NOT Provided =	20	%
Total Required Detention Volume, including penalty =		
(100% + Net % Penalty) x Net Required Detention Volume =	**41,947**	**ft^3**

DESIGN INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS
2	06-04-18	REVISED PER WCWRC REVIEW COMMENTS

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

WCWRC RUNOFF
VOLUME WORKSHEETS

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: N/A
PROJECT No.: 9162803
DWG NAME: 2803-WS
ISSUED: JULY 02, 2018

21-WS2

ALDI FOOD MARKET # 48 - PITTSFIELD TOWNSHIP, MICHIGAN
3-STAGE OUTLET DESIGN CALCULATIONS

SITE DATA

Tributary Area (A) =	2.12	Acres
Maximum Allowable Release Rate per Acre =	0.15	CFS / Acre
Maximum Allowable Release Rate, Q_{allow} =	0.32	CFS
First Flush Volume, V_{ff} =	6,813	CF
Bankfull Volume, V_{bf} =	14,923	CF
100-year Total Required Detention Volume =	41,947	CF
Underground Detention Average Invert Elevation, x_{bot} =	818.85	

Storage Provided

ELEVATION	DEPTH (FT)	VOLUME (CF)	TOTAL VOLUME (CF)
823.85	0.85	5,293	42,910
823.00	1.00	8,703	37,617
822.00	1.00	10,136	28,914
821.00	1.00	9,950	18,778
820.00	1.00	8,091	8,828
819.00	0.15	737	737
818.85	0	0	0

STORAGE ELEVATIONS

First Flush Storage Elevation, x_{ff} =	819.75
Bankfull Storage Elevation, x_{bf} =	820.61
100-year Storage Elevation, x_{100} =	823.70

FIRST FLUSH DISCHARGE

$Q_{ff\ min} = V / T_{24}$ =	0.0789	CFS
$h_{ave} = (2/3)*(x_{ff} - x_{bot})$ =	0.60	FT
$A_{ff} = Q_{ff} / (0.62*(2*g*h_{ave})^{0.5})$ =	0.0204	SF
$A_{orif\ ff}$ =	0.0192	SF for 1-7/8" dia. orifices at x_{bot}
Maximum $\#_{orif} = A_{ff} / A_{orif\ ff}$ =	1.07	
$\#_{orif\ ff}$ =	1	
$Q_{ff\ act} = 0.62*\#_{orif\ ff}*A_{orif\ ff}*(2*g*h_{ave})^{0.5}$ =	0.0739	CFS
$T_{ff\ act} = V_{ff} / Q_{ff\ act}$ =	25.6	HR
Check: Is $T_{ff\ act}$ > 24 hours?	**YES**	

BANKFULL DISCHARGE

$h_{ave} = (2/3)*(x_{bf} - x_{bot})$ =	1.18	FT
$Q_{bf} = 0.62*\#_{orif}*A_{orif\ ff}*(2*g*h_{ave})^{0.5}$ =	0.1034	CFS
$T_{bf} = V_{bf} / Q_{bf}$ =	40.1	HR
Check: Is 36 hours < T_{bf} < 48 hours?	**YES**	
	Thus: No extra orifices necessary at x_{ff}.	

100 YEAR STORM

$Q_{ff} + Q_{bf} = 0.62*\#_{orif\ ff}*A_{orif\ ff}*(2*g*(x_{100}-x_{bot}))^{0.5}$ =	0.210	CFS
$Q_{100\ max} = Q_{allow} - (Q_{ff} + Q_{bf})$ =	0.108	CFS
$A_{100\ max} = Q_{100\ max} / (0.62*(2*g*(x_{100} - x_{bf}))^{0.5})$ =	0.011	SF
$A_{orif\ 100}$ =	0.0085	SF for 1-1/4" dia. orifice at x_{bf}
Maximum $\#_{orif} = A_{100\ max} / A_{orif\ 100}$ =	1.28	
$\#_{orif\ 100}$ =	1	
$Q_{ff} + Q_{bf} + 0.62*\#_{orif\ 100}*A_{orif\ 100}*(2*g*(x_{100}-x_{bf}))^{0.5}$ =	0.284	CFS
Check: Is $Q_{ff} + Q_{bf} + Q_{100}$ < (Q_{allow} = 0.32 CFS)	**YES**	
$h_{ave\ all} = (2/3)*(x_{100} - x_{bf}) + (x_{bf} - x_{bot})$ =	3.82	FT
$Q_{all} = 0.62*\#_{orif\ ff}*A_{orif\ ff}*(2*g*h_{ave\ all})^{0.5}$ =	0.186	CFS
$Q_{bf + 100}$ =	0.000	CFS
Note: No flow contribution due to no Bankfull orifices at the First Flush elevation necessary.		
$h_{ave\ 100} = (2/3)*(x_{100} - x_{bf})$ =	2.06	FT
$Q_{100\ ave} = 0.62*\#_{orif\ 100}*A_{orif\ 100}*(2*g*h_{ave\ 100})^{0.5}$ =	0.061	CFS
$V_{rem} = V_{100} - V_{bf}$ =	27,024	CF
$T_{100} = T_{bf} + (V_{rem} / (Q_{all} + Q_{bf+100} + Q_{100\ ave}))$	70.5	HR
Check: Is T_{100} < 72 hours?	**YES**	

UNDERGROUND DETENTION TRIBUTARY AREAS (ACRES)

Drainage Structure	Runoff Coefficient: Pavement 0.95	Building 0.95	Lawn, <4% slope* 0.45	Lawn, 4-8% slope* 0.50	Lawn, >8% slope* 0.55	Total Area (ACRES)	Calculated "C" Factor
RD3	0.00	0.01	0.00	0.00	0.00	0.01	0.95
RD2	0.00	0.01	0.00	0.00	0.00	0.01	0.95
RD1	0.00	0.51	0.00	0.00	0.00	0.51	0.95
170	0.06	0.00	0.01	0.00	0.00	0.07	0.87
161	0.55	0.00	0.04	0.00	0.00	0.58	0.92
160	0.02	0.00	0.04	0.00	0.00	0.06	0.59
150	0.07	0.00	0.00	0.00	0.00	0.07	0.95
140	0.06	0.00	0.00	0.00	0.00	0.06	0.95
130	0.12	0.00	0.05	0.00	0.00	0.18	0.80
120	0.43	0.00	0.02	0.00	0.00	0.46	0.93
116	0.01	0.00	0.09	0.00	0.02	0.12	0.51
TOTALS	**1.32**	**0.52**	**0.26**	**0.00**	**0.02**	**2.12**	**0.89**

*Runoff Coefficients for "Lawn" are for Hydrologic Soil Group D, based upon on-site soil borings.

STORM SEWER TRIBUTARY AREAS (ACRES)

Drainage Structure	Runoff Coefficient: Pavement 0.95	Building 0.95	Lawn, <4% slope** 0.45	Lawn, 4-8% slope** 0.50	Lawn, >8% slope** 0.55	Total Area (ACRES)	Calculated "C" Factor
303	0.02	0.00	0.04	0.00	0.01	0.07	0.58
302	0.02	0.00	0.05	0.00	0.02	0.09	0.58
301	0.03	0.00	0.07	0.00	0.03	0.12	0.58
220	0.01	0.11	0.30	0.15	0.27	0.84	0.56
210	0.04	0.00	0.00	0.73	0.51	1.28	0.53
EX. 38	0.21	0.00	0.08	0.00	0.00	0.30	0.81
EX. 29	0.02	0.00	0.66	0.16	0.14	0.98	0.48

*Runoff Coefficients for "Lawn" are for Hydrologic Soil Group D, based upon on-site soil borings.

Project: ALDI Food Market #48 - Pittsfield Township — Project:# 162803

Design Criteria: 10 year storm event: I = 175 / (t + 25) — RCP (n = 0.013) — *PVC (n = 0.011) — **HDPE (n = 0.011) — Date: 10/31/2018

From MH# CB# FES#	To MH# CB# FES#	Inc. Acres "A"	"C"	Eqv. Area 100% CA	Total Area 100% CA	T Time Min.	I Inch Per Hour	Q (CIA) c.f.s.	Dia. of pipe inch	Slope pipe %	Slope H.G. %	Length of line ft.	Vel. Flow full ft./sec.	Time of flow min.	Cap of pipe c.f.s.	H.G. Elev. upper end	Ground Elev. Upper end	Ground Elev. Lower end	Invert Elev. Upper end	Invert Elev. Lower end
303	302	0.07	0.58	0.04	0.04	15.0	4.38	0.18	8**	0.55	0.02	67	3.04	0.4	1.06	822.61	824.75	824.75	822.61	822.24
302	301	0.09	0.58	0.05	0.09	15.4	4.33	0.39	8**	0.55	0.07	66	3.04	0.4	1.06	822.14	824.75	824.75	822.14	821.78
301	EX 30	0.12	0.58	0.07	0.16	15.8	4.29	0.69	8*	2.00	0.23	123	5.79	0.4	2.02	821.68	824.75	824.04	821.68	819.22
220	200	0.84	0.56	0.47	0.47	15.0	4.38	2.06	12	0.45	0.33	121	3.04	0.7	2.39	820.70	826.00	827.04	820.43	819.89
210	200	1.28	0.53	0.68	0.68	15.0	4.38	2.98	15	3.60	0.21	25	9.99	0.1	12.26	823.40	823.40	827.04	823.40	822.50
200	102	0.00	0.00	0.00	1.15	15.7	4.30	4.94	18	0.30	0.22	56	3.26	0.3	5.75	820.30	827.04	827.68	819.49	819.32
150	SP	0.07	0.95	0.07	0.07	15.0	4.38	0.31	8*	1.00	-	19	4.09	0.1	1.43	-	824.58	829.00	822.58	822.39
SP	WYE-4	0.00	0.00	0.00	0.07	15.1	4.36	0.31	6*	1.00	-	7	3.38	0.1	0.66	-	829.00	828.31	823.81	823.74
RD1	WYE-4	0.51	0.95	0.48	0.48	15.0	4.38	2.10	12*	1.00	0.25	3	5.36	0.1	4.21	823.52	828.50	828.31	823.52	823.49
WYE-4	115	0.00	0.00	0.00	0.55	15.2	4.35	2.39	12*	1.00	0.32	6	5.36	0.1	4.21	823.49	828.31	828.00	823.49	823.43
116	115	0.12	0.51	0.06	0.06	15.0	4.38	0.26	12	3.00	0.01	37	7.86	0.1	6.17	825.00	825.00	828.00	825.00	823.89
115	114	0.00	0.00	0.00	0.61	15.3	4.34	2.65	15	0.35	0.17	148	3.11	0.8	3.82	823.23	828.00	827.83	823.23	822.71
140	114	0.06	0.95	0.06	0.06	15.0	4.38	0.26	12	0.45	0.01	24	3.04	0.1	2.39	822.92	827.10	827.83	822.92	822.81
114	113	0.00	0.00	0.00	0.67	16.1	4.26	2.85	15	0.35	0.19	104	3.11	0.6	3.82	822.61	827.83	827.08	822.61	822.25
130	113	0.18	0.80	0.14	0.14	15.0	4.38	0.61	12	0.45	0.03	24	3.04	0.1	2.39	822.51	826.51	827.08	822.51	822.40
113	112	0.00	0.00	0.00	0.81	16.7	4.20	3.40	15	0.35	0.28	216	3.11	1.2	3.82	822.15	827.08	826.43	822.15	821.39
120	112	0.46	0.93	0.43	0.43	15.0	4.38	1.88	12	0.45	0.28	27	3.04	0.1	2.39	821.48	825.95	826.43	821.48	821.36
112	111	0.00	0.00	0.00	1.24	17.9	4.08	5.06	18	0.30	0.23	147	3.26	0.8	5.75	821.17	826.43	826.55	820.88	820.44
RD3	WYE-1	0.01	0.95	0.01	0.01	15.0	4.38	0.04	8*	1.00	0.01	97	4.09	0.4	1.43	824.83	829.00	828.69	824.83	823.86
RD2	WYE-1	0.01	0.95	0.01	0.01	15.0	4.38	0.04	8*	1.00	0.01	17	4.09	0.1	1.43	824.03	828.96	828.69	824.03	823.86
WYE-1	170	0.00	0.00	0.00	0.02	15.4	4.33	0.09	8*	1.00	0.01	134	4.09	0.5	1.43	823.86	828.69	827.39	823.86	822.52
170	160	0.07	0.87	0.06	0.08	15.9	4.28	0.34	12	0.45	0.01	43	3.04	0.2	2.39	821.13	827.39	827.12	821.13	820.94
161	160	0.58	0.92	0.53	0.53	15.0	4.38	2.32	15	0.35	0.13	41	3.11	0.2	3.82	820.94	826.06	827.12	820.98	820.84
160	111	0.06	0.59	0.04	0.65	16.1	4.26	2.77	15	0.35	0.18	35	3.11	0.2	3.82	820.89	827.12	826.55	820.74	820.62
111	110	0.00	0.00	0.00	1.89	18.7	4.00	7.57	18	2.00	0.52	21	8.41	0.1	14.85	820.83	826.55	826.35	819.90	819.48
110	107	0.00	0.00	0.00	1.89	18.8	4.00	7.55	18	2.00	0.52	21	8.41	0.1	14.85	820.72	826.35	826.45	819.48	819.06
107	REDUCER-2	0.00	0.00	0.00	-	-	-	-	48**	0.10	-	26	4.27	0.1	53.68	-	826.45	826.98	818.96	818.93
REDUCER-2	106	0.00	0.00	0.00	-	-	-	-	60**	0.10	-	68	4.96	0.2	97.33	-	826.98	828.25	818.93	818.86
106	104	0.00	0.00	0.00	-	-	-	-	60**	0.10	-	112	4.96	0.4	97.33	-	828.25	827.85	818.86	818.74
107	105	0.00	0.00	0.00	-	-	-	-	48**	0.10	-	113	4.27	0.4	53.68	-	826.45	826.33	818.96	818.84
105	REDUCER-1	0.00	0.00	0.00	-	-	-	-	48**	0.10	-	26	4.27	0.1	53.68	-	826.33	826.81	818.84	818.81
REDUCER-1	104	0.00	0.00	0.00	-	-	-	-	60**	0.10	-	68	4.96	0.2	97.33	-	826.81	827.85	818.81	818.74
104	103	0.00	0.00	0.00	1.89	-	-	7.55	18	0.30	-	33	3.26	0.2	5.75	-	827.85	827.88	818.74	818.64
103	102	0.00	0.00	0.00	1.89	-	-	0.32	30	0.15	0.01	11	3.24	0.1	15.89	820.21	827.88	827.68	818.64	818.62
102	101	0.00	0.00	0.00	-	-	-	5.26	30	0.15	0.02	292	3.24	1.5	15.89	820.21	827.68	826.00	818.52	818.08
101	100	0.00	0.00	0.00	1.47	-	-	5.26	30	0.15	0.02	19	3.24	0.1	15.89	820.15	826.00	824.90	817.98	817.95

162803.Storm Calcs.103118 — Page 1 of 1

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS
2	06-04-18	REVISED PER WCWRC REVIEW COMMENTS
3	06-21-18	REVISED PER WCWRC REVIEW COMMENTS
4	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
5	09-24-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
6	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

STORM WATER MANAGEMENT
SYSTEM CALCULATIONS

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: N/A
PROJECT No.: 9162803
DWG NAME: 2803-WS
ISSUED: OCT. 31, 2018

22-WS3

EXHIBIT A

PHYSICAL LIMITS OF STORM WATER MANAGEMENT SYSTEM

LEGAL DESCRIPTION OF RECORD
Reference: Commitment for Title Insurance Issued by
Fidelity National Title Insurance Company,
as Agent of American Land Title Association,
Commitment No. A0713396, Effective Date: February 27, 2017 at 12:00am

Situated in the Township of Pittsfield, County of Washtenaw, State of Michigan

Commencing at the West 1/4 corner of Section 12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; thence North 0 degrees 20'30" West 1262.04 feet along the West line of said Section 12 to the PLACE OF BEGINNING; thence continuing North 0 degrees 20'30" West 939.06 fee along the West line of said Section 12; thence North 89 degrees 39'30" East 828.88 feet; thence South 85degrees 49'30" East 495.00 feet; thence South 0 degrees 20'30" East 900.0 feet; thence South 89degrees 39'30" West 1322.34 feet to the place of beginning, being a part of the Northwest 1/4 of Section12, Town 3 South, Range 6 East.

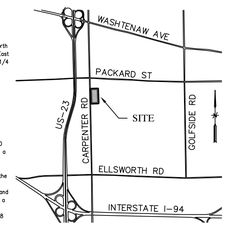
Parcel ID No.: L-12-12-200-014
Commonly known as: Part of 3113 Carpenter Road, Pittsfield Township, MI 48197

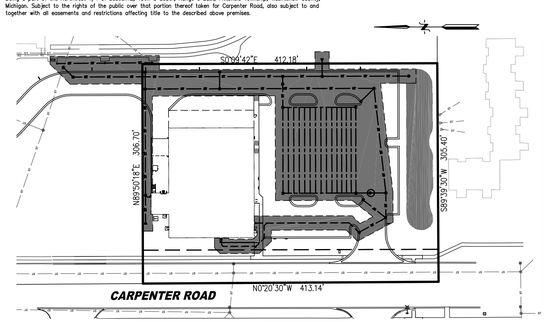
PARCEL DESCRIPTION SUBSEQUENT TO SURVEY
Situated in the Township of Pittsfield, County of Washtenaw, State of Michigan

Commencing at the West 1/4 corner of Section 12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; thence N0°20'30"W 1262.04 feet along the West line of said Section 12 to the PLACE OF BEGINNING; thence continuing N0°20'30"W 939.35 feet (939.06 feet record) along the West line of said Section 12 to a point distant 505.00 feet S0°20'30"E from the Northwest corner of said section; thence N89°39'30"E 828.78 feet (828.88 feet record) along a line perpendicular to aforementioned West line of Section 12; thence S85°49'49"E 493.80 feet (S85°49'30"E 495.00 feet record) along a line parallel with the North line of said Section 12, some being, in part, the South line of "Arbor Heights Condominium" (according to Master Deed thereof recorded in Liber 1761, Page 899, Washtenaw County Records); thence the following two courses along the boundary of "Madison Place Condominium" (according to Master Deed thereof recorded in Liber 4026, Page 663, Washtenaw County Records): (1) S00°16'29"E (S01°19'10"E condominium deed record) 460.43 feet, and (2) S85°49'49"E 1.60 feet along a line parallel with said North line of Section 12; thence S0°20'30"E 439.95 feet along a line referred to as the West line of the East 1/2 of the Northwest 1/4 of said Section 12 in Warranty Deed recorded in Liber 3864, Page 517; thence S89°39'30"W 1322.11 feet (1322.34 feet record.) to the Place of Beginning. Containing 28.28 acres, more or less. Being a part of the Northwest 1/4 of Section12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan. Subject to the rights of the public over that portion thereof taken for Carpenter Road, also subject to and together with all easements and restrictions affecting title to the described above premises.

PROPOSED OUTLOT 1 (ALDI PARCEL)
Situated in the Township of Pittsfield, County of Washtenaw, State of Michigan, described as:

Commencing at the West 1/4 corner of Section 12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan; thence N0°20'30"W 1262.04 feet along the West line of said Section 12 to the PLACE OF BEGINNING; thence continuing N0°20'30"W 413.14 feet along the West line of said Section 12; thence N89°50'18"E 46.70 feet to a point on the East line (as established by previous Surveys) of Carpenter Road Right-of-way (100-foot wide); thence continuing N89°50'18"E 260.00 feet; thence S00°09'42"E 412.18 feet along the line lying 260 feet Easterly and parallel with said East line of Carpenter Road; thence S89°39'30"W 305.40 feet to the Place of Beginning. Containing 2.90 acres, more or less. Being a part of the Northwest 1/4 of Section12, Town 3 South, Range 6 East, Pittsfield Township, Washtenaw County, Michigan. Subject to the rights of the public over that portion thereof taken for Carpenter Road, also subject to and together with all easements and restrictions affecting title to the described above premises.





LEGEND

- LIMITS OF STORM WATER MANAGEMENT SYSTEM
- ST — EXISTING STORM SEWER
- ST — PROPOSED STORM SEWER
- CATCH BASIN
- DRMANHOLE
- FLARED END SECTION
- CONTROL STRUCTURE

PROJECT:	CLIENT:	SCALE: 1"=100'	
ALDI FOOD MARKET #48 CARPENTER ROAD PITTSFIELD TOWNSHIP WASHTENAW COUNTY	ALDI Inc. 2625 N. STOCKBRIDGE ROAD WEBBERVILLE, MICHIGAN 48892 (517) 521-3907	PROJECT No.: 9162803 DWG NAME: 2803-MNGMT DEC. 19, 2018	DESINE INC (810) 227-9533 CIVIL ENGINEERS LAND SURVEYORS 2183 PLESS DRIVE BRIGHTON, MICHIGAN 48114

EXHIBIT B

STORM WATER MANAGEMENT SYSTEM MAINTENANCE PLAN

PROPERTY INFORMATION: **PROPERTY OWNER: LESSEE:**
ALDI FOOD MARKET MID PINE GOLF L.L.C. ALDI INC.
_____ CARPENTER ROAD 12134 PALMER DRIVE 2625 N. STOCKBRIDGE ROAD
PITTSFIELD TOWNSHIP, MOOR PARK, CA 93021 WEBBERVILLE, MI 48892
WASHTENAW COUNTY, MICHIGAN

A. Physical Limits of the Storm Water Management System
The Storm Water Management System (SWMS) subject to this Construction and Long-Term Maintenance Plan is depicted on Exhibit A to the Maintenance Agreement and includes, without limitations, the storm sewers, swales, manholes, catch basins, storm water inlets, manufactured treatment chamber, underground detention system, outlet structures, and closed conduits that convey flow from the underground detention system to the enclosed Carpenter Road Drain traversing the Miles of Golf property.

For purposes of this Plan, this Storm Water Management System and all of its components as shown on Exhibit A is referred to as the "ALDI SWMS".

B. Time Frame for Construction and Long-Term Maintenance Responsibility
ALDI Inc. is responsible for maintaining the ALDI SWMS during construction, which includes complying with applicable requirements of the Pittsfield Township soil erosion and sedimentation control program, until Pittsfield Township releases the construction permit. Long-Term Maintenance responsibility for the ALDI SWMS commences when defined by the Maintenance Agreement issued by Pittsfield Township. Long-Term Maintenance continues in perpetuity.

C. Manner of Ensuring Maintenance Responsibility
ALDI Inc. has assumed responsibility for the Long-Term Maintenance of the ALDI SWMS. ALDI Inc., through a Maintenance Agreement with Pittsfield Township, has agreed to perform the necessary maintenance activities required by this Plan. Pittsfield Township retains the right to enter the property and perform the necessary maintenance, repairs, or restoration of the ALDI SWMS if ALDI Inc. fails to perform the required maintenance activities, and Pittsfield Township shall be reimbursed for said activities.

To ensure that the ALDI SWMS is maintained in perpetuity, the map of the physical limits of the Storm Water Management System (Exhibit A), this Plan (Exhibit B), and the Maintenance Agreement between Pittsfield Township and the Property Owner shall be recorded with the Washtenaw County Register of Deeds. Upon recording, a copy of the recorded document will be provided to the Township.

D. Long-Term Maintenance Plan and Schedule
Table 1 identifies the Construction Maintenance activities to be performed, organized by category (monitoring / inspections, preventative maintenance and remedial actions). Table 1 also identifies site-specific work needed to ensure that the Storm Water Management System functions properly as designed during construction.

Table 2 identifies the Long-Term Maintenance activities to be performed, organized by category (monitoring / inspections, preventative maintenance and remedial actions). Table 2 also identifies site-specific work needed to ensure that the Storm Water Management System functions properly as designed, long-term.

While performing maintenance, chemicals should not be applied to the forebay, open detention basin, or in/along watercourses.

TABLE 1
STORM WATER MANAGEMENT SYSTEM CONSTRUCTION MAINTENANCE SCHEDULE

MAINTENANCE ACTIVITIES	SYSTEM COMPONENT: Catch Basins, Inlets & Storm Sewers	Channels & Swales	Basin Inlets, Outlets & Gratings	Manufactured Treatment System*	Underground Detention System	Outlet Control Structures	Pavement	FREQUENCY
MONITORING / INSPECTION								
Inspect for sediment accumulation*** and/or clogging of stone filter	X	X	X	X	X	X		Weekly
Inspect for floatables, dead vegetation, and debris	X	X	X	X	X	X		Quarterly and after major storm events
Inspect for erosion and integrity of banks and berms		X	X					Weekly and after major storm events
Inspect all components during wet weather & compare to Construction Plans	X	X	X	X	X	X	X	Quarterly
Monitor plantings and vegetation		X						Quarterly and after major storm events
Ensure means of access for maintenance remain clear and open	X	X	X	X	X	X	X	Quarterly
PREVENTATIVE MAINTENANCE								
Mowing		X						As needed**
Remove accumulated sediment	X	X	X	X	X	X		As needed***
Remove floatables, dead vegetation, and debris	X	X	X	X	X	X		As needed
Replace surface components (e.g. soil, underdrain, etc.)							X	As needed
Remove invasive plant species		X						As needed
Sweeping of paved surfaces (streets and parking lots)							X	Weekly and as needed
REMEDIAL ACTIONS								
Repair / Stabilize areas of erosion		X	X					As needed
Replace dead plantings, bushes, trees		X						As needed
Reseed bare areas		X						As needed
Structural repairs	X		X	X	X	X	X	As needed
Make adjustments / repairs to ensure proper functioning	X	X	X	X	X	X	X	As needed
Clean out oil and gas spills	X	X	X	X	X	X	X	Immediately

* Inspect and maintain the Manufactured Treatment System per the manufacturer's specifications.
** Not to exceed the length allowed by the local community ordinance.
*** Basins and swales to be cleared whenever sediments accumulate to a depth of 12 inches or 50% of depth, whichever is less.

PROJECT:	CLIENT:	SCALE: NO SCALE	
ALDI FOOD MARKET #48 CARPENTER ROAD PITTSFIELD TOWNSHIP WASHTENAW COUNTY	ALDI Inc. 2625 N. STOCKBRIDGE ROAD WEBBERVILLE, MICHIGAN 48892 (517) 521-3907	PROJECT No.: 9162803 DWG NAME: 2803-MNGMT DEC. 19, 2018	DESINE INC (810) 227-9533 CIVIL ENGINEERS LAND SURVEYORS 2183 PLESS DRIVE BRIGHTON, MICHIGAN 48114

EXHIBIT B

STORM WATER MANAGEMENT SYSTEM MAINTENANCE PLAN

TABLE 2
STORM WATER MANAGEMENT SYSTEM LONG-TERM MAINTENANCE SCHEDULE

MAINTENANCE ACTIVITIES	SYSTEM COMPONENT: Catch Basins, Inlets & Storm Sewers	Channels & Swales	Basin Inlets, Outlets & Gratings	Manufactured Treatment System*	Underground Detention System	Outlet Control Structures	Pavement	FREQUENCY
MONITORING / INSPECTION								
Inspect for sediment accumulation*** and/or clogging of stone filter	X	X	X	X	X	X		Annually
Inspect for floatables, dead vegetation, and debris	X	X	X	X	X	X		Annually and after major storm events
Inspect for erosion and integrity of banks and berms		X	X					Annually and after major storm events
Inspect all components during wet weather & compare to As-Built Plans	X	X	X	X	X	X	X	Annually
Monitor plantings and vegetation		X						2 Times per year
Ensure means of access for maintenance remain clear and open	X	X	X	X	X	X	X	Annually
Keep records of all inspections and maintenance activities	X	X	X	X	X	X	X	Annually
Keep records of all costs for inspections, maintenance, and repairs	X	X	X	X	X	X	X	Annually
PREVENTATIVE MAINTENANCE								
Mowing		X						As needed**
Remove accumulated sediment	X	X	X	X	X	X		As needed***
Remove floatables, dead vegetation, and debris	X	X	X	X	X	X		As needed
Replace surface components (e.g. soil, underdrain, etc.)							X	Every 5 years, or as needed
Remove invasive plant species		X						As needed
Sweeping of paved surfaces (streets and parking lots)							X	2 Times per year
REMEDIAL ACTIONS								
Repair / Stabilize areas of erosion		X	X					As needed
Replace dead plantings, bushes, trees		X						As needed
Reseed bare areas		X						As needed
Structural repairs	X		X	X	X	X	X	As needed
Make adjustments / repairs to ensure proper functioning	X	X	X	X	X	X	X	As needed
Clean out oil and gas spills	X	X	X	X	X	X	X	Immediately

* Inspect and maintain the Manufactured Treatment System per the manufacturer's specifications.
** Not to exceed the length allowed by the local community ordinance.
*** Basins and swales to be cleared whenever sediments accumulate to a depth of 12 inches or 50% of depth, whichever is less.

TABLE 3
STORM WATER MANAGEMENT SYSTEM ANNUAL COST ESTIMATE

MAINTENANCE ACTIVITIES	COST
MONITORING / INSPECTION	
Inspect for sediment accumulation*** and/or clogging of stone filter	$150
Inspect for floatables, dead vegetation, and debris	$250
Inspect for erosion and integrity of banks and berms	$250
Inspect all components during wet weather & compare to As-Built Plans	$400
Monitor plantings and vegetation	$100
Keep records of all inspections and maintenance activities	$150
Keep records of all costs for inspections, maintenance, and repairs	$150
PREVENTATIVE MAINTENANCE	
Mowing	$750
Remove accumulated sediment	$1,000
Remove floatables, dead vegetation, and debris	$300
Remove invasive plant species	$400
Sweeping of paved surfaces (streets and parking lots)	$200
REMEDIAL ACTIONS	
Repair / Stabilize areas of erosion	$150
Replace dead plantings, bushes, trees	$200
Reseed bare areas	$50
Clean out oil and gas spills	$100
TOTAL ANNUAL BUDGET =	**$4,600**

PROJECT:	CLIENT:	SCALE: NO SCALE	
ALDI FOOD MARKET #48 CARPENTER ROAD PITTSFIELD TOWNSHIP WASHTENAW COUNTY	ALDI Inc. 2625 N. STOCKBRIDGE ROAD WEBBERVILLE, MICHIGAN 48892 (517) 521-3907	PROJECT No.: 9162803 DWG NAME: 2803-MNGMT DEC. 19, 2018	DESINE INC (810) 227-9533 CIVIL ENGINEERS LAND SURVEYORS 2183 PLESS DRIVE BRIGHTON, MICHIGAN 48114

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	05-01-18	REVISED PER WETLAND MITIGATION REQUIREMENTS
2	06-04-18	REVISED PER WCWRC REVIEW COMMENTS
3	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
4	12-19-18	REVISED BUILDING PER CLIENT REQUEST

REVISION #	DATE	REVISION-DESCRIPTION

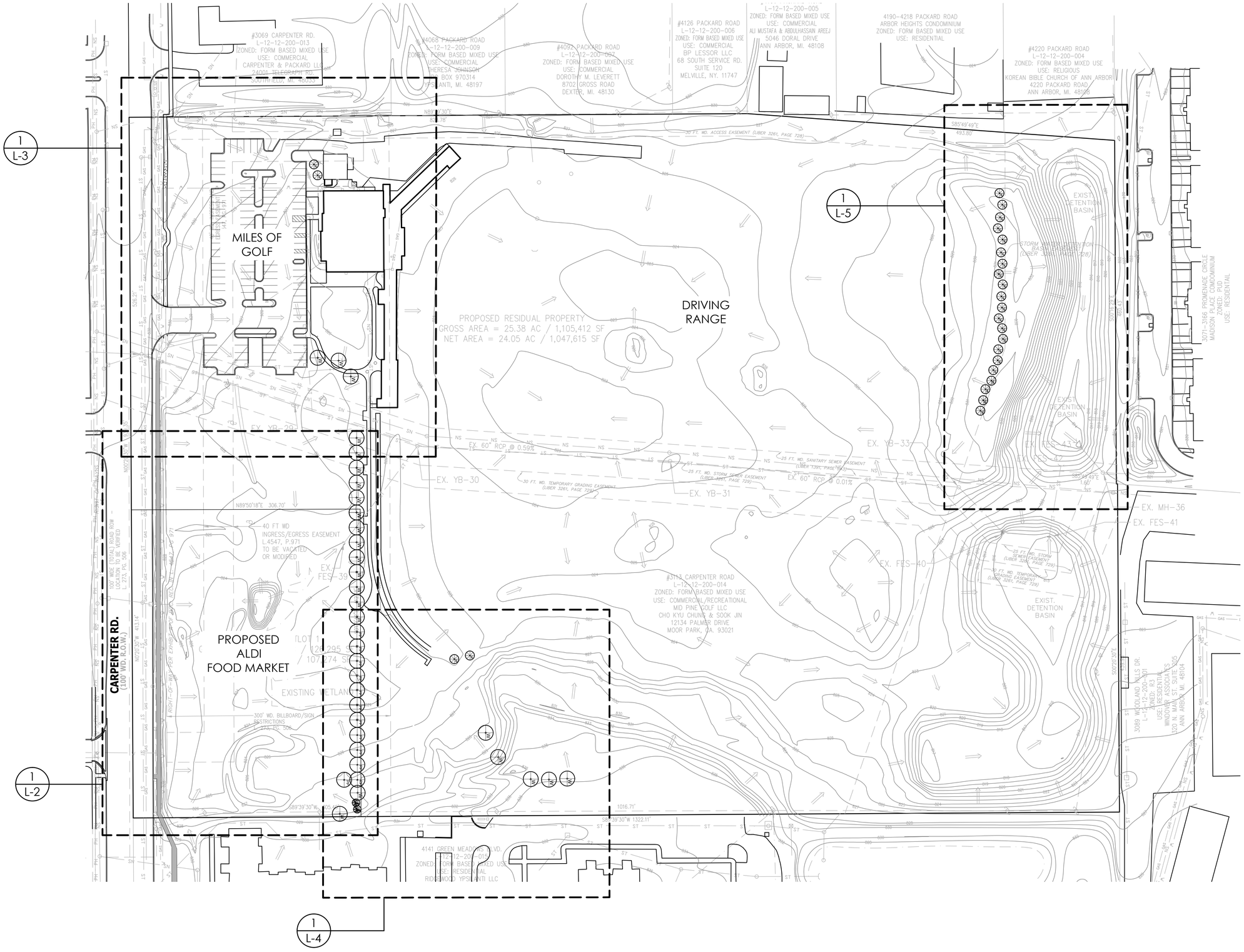
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

STORM WATER MANAGEMENT SYSTEM MAINTENANCE PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE ROAD
WEBBERVILLE, MICHIGAN 48892
(517) 521-3907

SCALE: NO SCALE
PROJECT No.: 9162803
DWG NAME: 2803 MNGMT
ISSUED: DEC. 19, 2018

23-WS4



vert verde landscape architecture
734.249.3568 Plymouth, MI
james@vertverde.com

Date:	Issued For:
05.07.2018	Revisions per Township

Project:

ALDI Food Market
Pittsfield Township, MI

Sheet Name:

Overall Plan

Seal:

STATE OF MICHIGAN
JAMES GRAY
LANDSCAPE ARCHITECT
No. 1528
REGISTERED LANDSCAPE ARCHITECT

Drawn:	JG
Checked:	JG
Date:	10.15.2017
Scale:	1" = 20'-0"

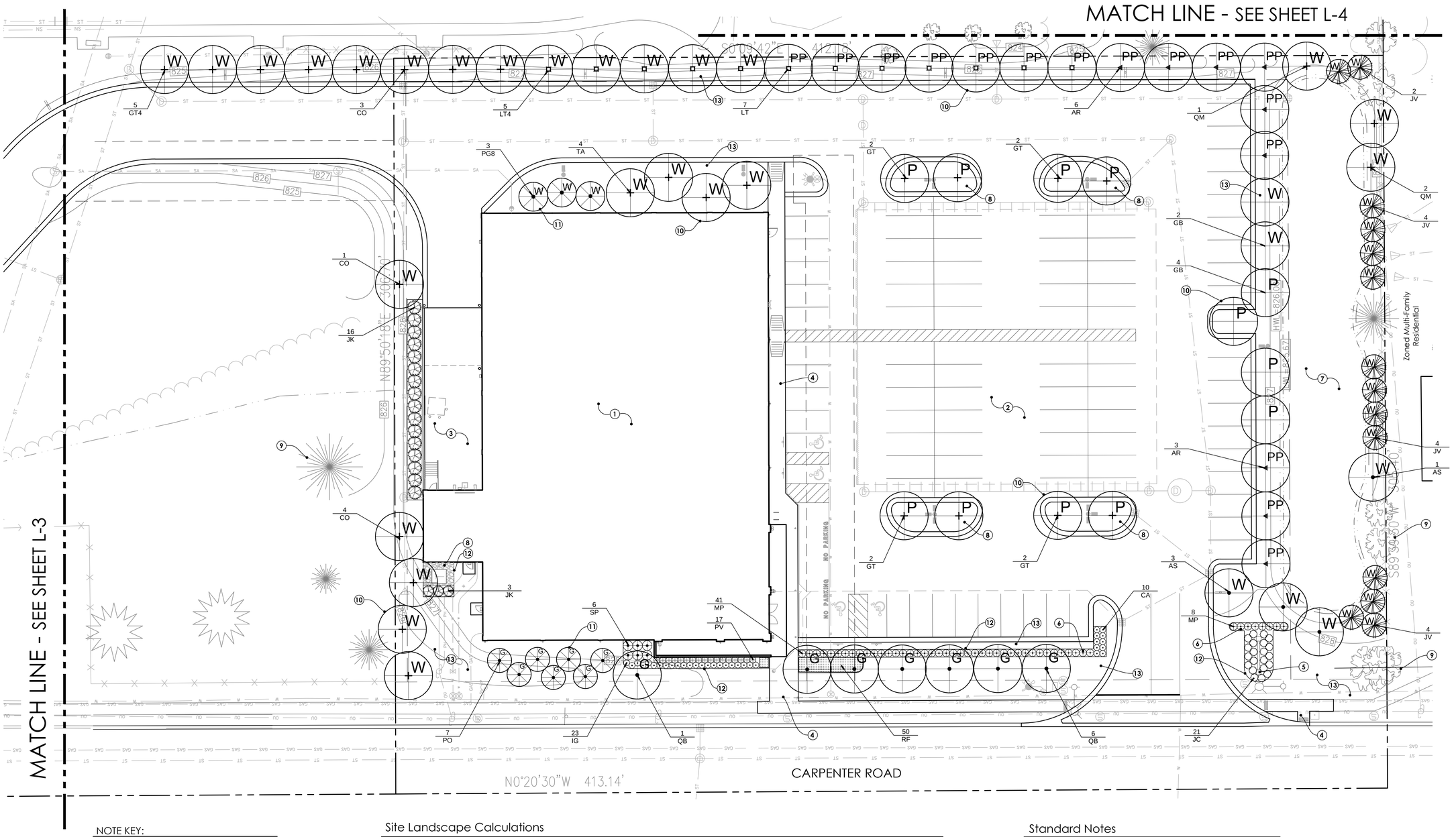
Project Number:
17.027

Sheet Number:
24-LA1

3 FULL WORKING DAYS BEFORE YOU DIG CALL
811
MISS DIG System, Inc.

0 10 20 40
SCALE: 1" = 20'-0"
NORTH

© 2018 Vert Verde Landscape Architecture, LLC



NOTE KEY:

1. PROPOSED BUILDING
2. ASPHALT PARKING LOT, SEE CIVIL ENGINEERING DRAWINGS
3. LOADING DOCK AND DUMPSTER
4. CONCRETE SIDEWALK
5. PROPOSED MONUMENT SIGN
6. PROPOSED SHRUB PLANTING, SEE TYPICAL DETAIL
7. CONSTRUCTED WETLAND, SEE CIVIL ENGINEERING DRAWINGS
8. 3" DEPTH STONE MULCH OVER FABRIC AT TRANSFORMER
9. EXISTING TREES TO REMAIN, TYPICAL
10. PROPOSED CANOPY TREES, SEE TYPICAL DETAIL
11. PROPOSED EVERGREEN TREES, SEE TYPICAL DETAIL
12. METAL EDGING BETWEEN LAWN AND LANDSCAPE BED
13. SODDED LAWN OVER MINIMUM 4" DEPTH TOPSOIL

NOTES:
ALL PLANTING BEDS TO RECEIVE A MINIMUM 4" DEPTH DOUBLE SHREDDED HARDWOOD MULCH

SEE SHEET L-4 FOR PLANT SCHEDULE AND SHEET L-5 FOR TYPICAL DETAILS

TREES ALONG THE CARPENTER ROAD FRONTAGE TO BE PLANTED A MINIMUM 10' AWAY FROM THE EXISTING WATER MAIN.

Site Landscape Calculations

PARKING LOT LANDSCAPE:
A minimum of one (1) Deciduous Tree shall be planted for each eight (8) parking spaces:

Parking Spaces Provided: 95 spaces
Trees Required (95 / 8): 12
Trees Provided: 12

5% of the total parking lot area shall be used for interior landscape

Total Parking Lot Area: 40,660 sf.
Total Landscape Area Required (40,660 * 5%): 2,033 sf.
Total Interior Landscape Area Provided: **2,240 sf.**

PARKING LOT PERIMETER LANDSCAPE:
Minimum of 1 Deciduous Canopy tree / 40 lf. of parking lot perimeter

Parking Lot Perimeter: 624 lf.

Trees Required (624 / 40): 16
Trees Provided: **16**

GENERAL SITE LANDSCAPE:
A minimum of 20% of the total site area is required to be landscaped (open space).

Total Site Area: 107,593 sf

Total Required Open Space (107,273 sf * 0.20): 21,518 sf.
Total Open Space Provided: **28,617 sf. (26.6%)**

GREENBELT LANDSCAPE:
Minimum of 1 Deciduous or 1 Evergreen tree / 30 lf. of frontage

Total Road Frontage - Carpenter Road: 413 lf.

Trees Required (413 / 30): 14
Trees Provided: **14**

Note: A masonry wall has been provided as screening for the parking lot adjacent to Carpenter Road - See Civil Engineering drawings

WOODLAND MITIGATION:
All removed trees 6" DBH and greater shall be mitigated to a minimum of 100% of the original DBH removed. Replacement trees specified using caliper inches shall be mitigated to a minimum of 140% of the original DBH removed.

All Heritage trees as designated by the Ordinance shall be mitigated to a minimum of 150% of the original DBH removed.

Total Regulated DBH Removed: 219"
Total Heritage DBH Removed: 0"

Total Regulated DBH Required (219" * 1.4): 307"
Total Regulated DBH Provided: **308"**

Note: See Civil Engineering drawings for tree survey and removals

Standard Notes

ALL LANDSCAPE MATERIALS, INSTALLATION, AND MAINTENANCE SHALL COMPLY WITH THE ZONING ORDINANCE .

ALL PLANT MATERIAL SHALL BE LOCALLY GROWN OR OF THIS NORTH MIDWEST AMERICAN REGION AND CONFORM TO THE CURRENT AAN STANDARDS. USE NO.1 GRADE PLANT MATERIAL.

ALL PLANT MATERIAL SHALL BE MAINTAINED IN A HEALTHY GROWING CONDITION FREE OF WEEDS AND DEBRIS WITH ONE CULTIVATION FOR WEED CONTROL PER MONTH DURING JUNE, JULY AND AUGUST. THIS ESTABLISHMENT PERIOD SHALL BE ONE (1) YEAR FROM THE DATE OF APPROVAL OF PLANTINGS BY PITTSFIELD TOWNSHIP. REPLACEMENT OF ANY FAILING PLANT MATERIAL, INCLUDING TREES, SHALL BE GUARANTEED DURING THE ONE (1) YEAR ESTABLISHMENT PERIOD. FAILING PLANT MATERIAL SHALL BE REPLACED WITHIN ONE YEAR, OR THE NEXT GROWING SEASON.

ALL LANDSCAPE AREAS SHALL BE IRRIGATED BY AN AUTOMATIC IRRIGATION SYSTEM. SEE IRRIGATION NOTE SHEET L-4

ALL TREE WRAP, STAKES AND GUY WIRES SHALL BE REMOVED AFTER ONE WINTER SEASON.

ANY AND ALL SUBSTITUTIONS OR DEVIATIONS SHALL BE APPROVED BY THE TOWNSHIP PRIOR TO INSTALLATION.

TREE PLANTING KEY:

P - REQUIRED PARKING LOT TREE
PP - REQUIRED PERIMETER PARKING LOT TREE
G - REQUIRED GREENBELT TREE
W - REQUIRED WOODLAND MITIGATION TREE

0 10 20 40
SCALE: 1" = 20'-0"

NORTH

3 FULL WORKING DAYS BEFORE YOU DIG CALL
811
MISS DIG System, Inc.

vert verde landscape architecture
734.249.3568 Plymouth, MI
james@vertverde.com

Date:	Issued For:
10.19.2017	Preliminary SPA
11.06.2017	Revisions per Township
01.15.2018	Revisions per Township
05.07.2018	Revisions per Township
06.26.2018	Revisions per Township
11.12.2018	Revision per Owner

Project:
ALDI Food Market
Pittsfield Township, MI

Sheet Name:
Landscape Plan

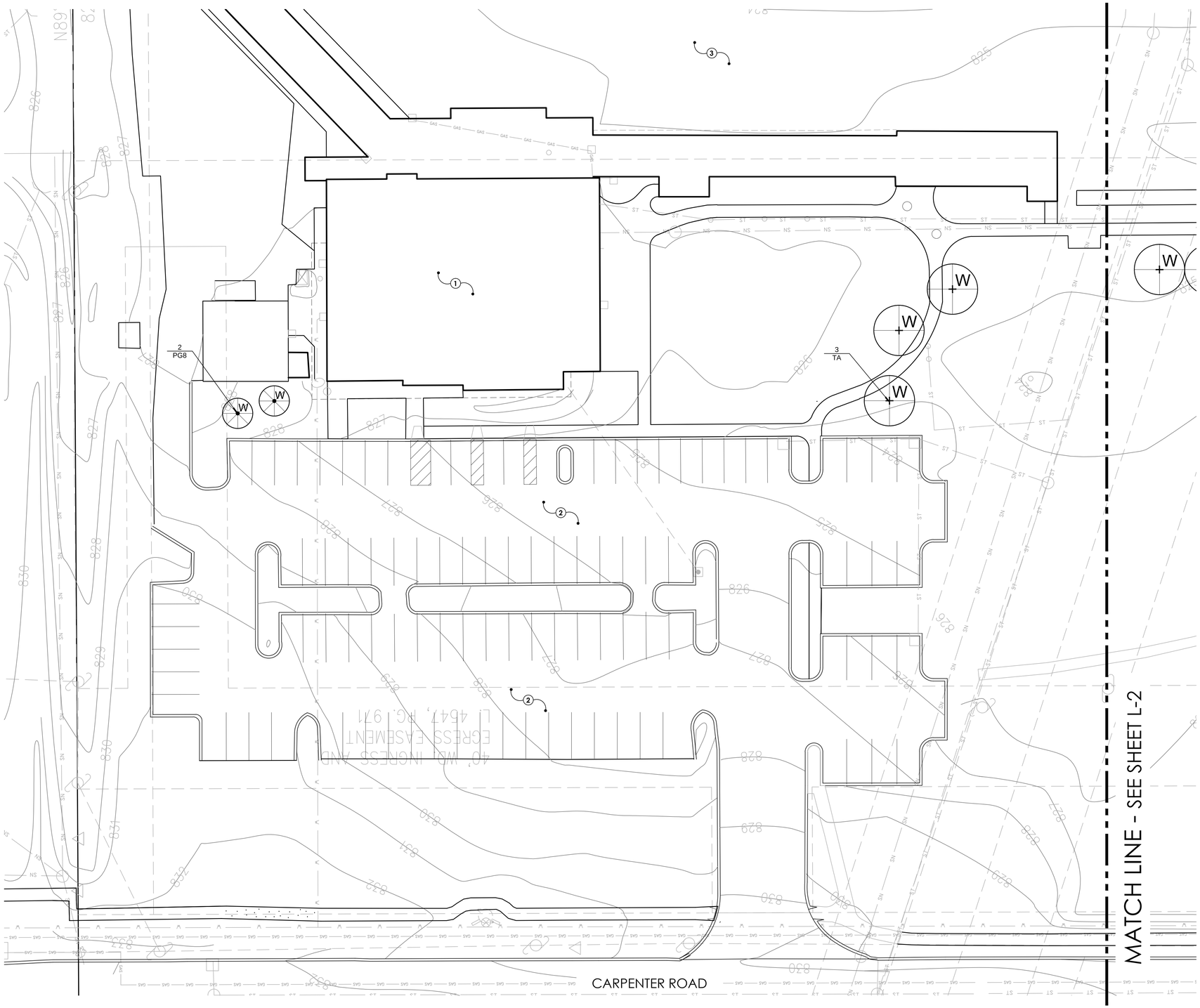
Seal:
STATE OF MICHIGAN JAMES GRAY LANDSCAPE ARCHITECT No. 1528 REGISTERED LANDSCAPE ARCHITECT

Drawn: JG
Checked: JG
Date: 10.15.2017
Scale: 1" = 20'-0"

Project Number:
17.027

Sheet Number:
25-LA2

© 2018 Vert Verde Landscape Architecture, LLC



NOTE KEY:

1. EXISTING BUILDING
2. EXISTING ASPHALT PARKING LOT
3. DRIVING RANGE

NOTE:
ALL EXISTING LANDSCAPE PLANTINGS ARE TO REMAIN ON THE MILES OF GOLF SITE

SEE SHEET L-4 FOR PLANT SCHEDULE AND SHEET L-5 FOR TYPICAL DETAILS

0 10 20 40

SCALE: 1" = 20'-0"

NORTH

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811

MISS DIG System, Inc.

vert verde landscape architecture
734.249.3568 Plymouth, MI
james@vertverde.com

Date:	Issued For:
05.07.2018	Revisions per Township

Project:

ALDI Food Market
Pittsfield Township, MI

Sheet Name:

Tree Mitigation Plan

Seal:

STATE OF MICHIGAN
JAMES GRAY
LANDSCAPE ARCHITECT
No. 1528
REGISTERED LANDSCAPE ARCHITECT

Drawn:	JG
Checked:	JG
Date:	10.15.2017
Scale:	1" = 20'-0"

Project Number: 17.027

Sheet Number: 26-LA3

© 2018 Vert Verde Landscape Architecture, LLC

PLANT SCHEDULE:

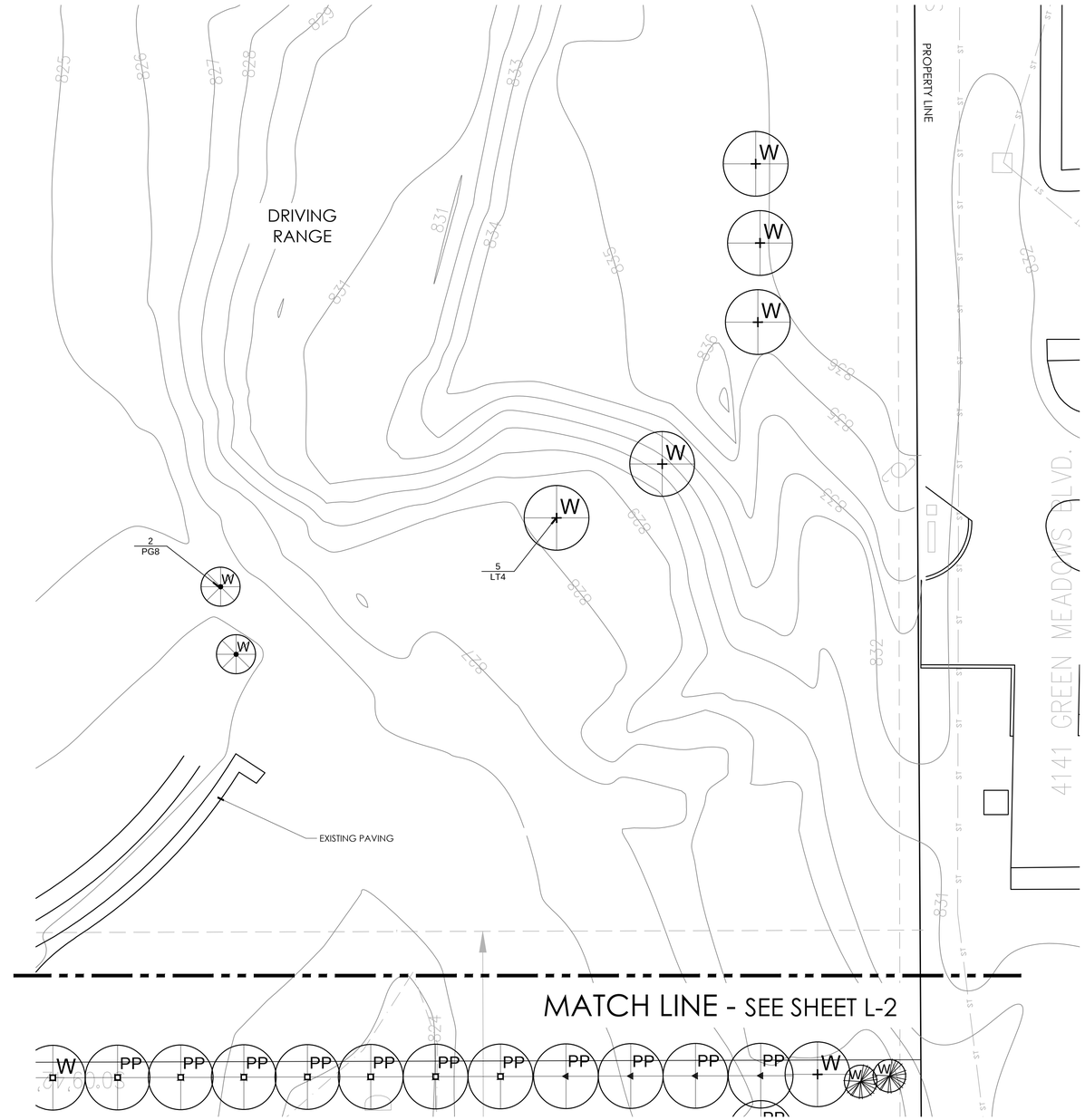
QTY	SYM	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	ROOT	COMMENTS
TREES							
9	AR	Acer r. 'October Glory'	October Glory Red Maple	2.5" cal.	as shown	B&B	Single straight trunk
4	AS	Acer s. 'Green Mountain'	Green Mountain Sugar Maple	4" cal.	as shown	B&B	Single straight trunk
8	CO	Celtis occidentalis	Northern Hackberry	4" cal.	as shown	B&B	Single straight trunk
6	GB	Ginkgo biloba	Maidenhair Tree	2.5" cal.	as shown	B&B	Male Only
8	GT	Gleditsia t. 'Skyline'	Skyline Honeylocust	2.5" cal.	as shown	B&B	Single straight trunk
5	GT4	Gleditsia t. 'Skyline'	Skyline Honeylocust	4" cal.	as shown	B&B	Single straight trunk
14	JV	Juniperus virginiana	Eastern Red Cedar	6' ht.	as shown	B&B	Well rooted
7	LT	Liriodendron tulipfera	Tulip Tree	2.5" cal.	as shown	B&B	Single straight trunk
10	LT4	Liriodendron tulipfera	Tulip Tree	4" cal.	as shown	B&B	Single straight trunk
28	PG8	Picea glauca	White Spruce	8'-9' ht.	as shown	B&B	Unsheared, branched to gorund
7	PO	Picea omorika	Serbian Spruce	6'-7' ht.	as shown	B&B	Unsheared, branched to gorund
7	QB	Quercus bicolor	Swamp White Oak	2.5" cal.	as shown	B&B	Single straight trunk
3	QM	Quercus macrocarpa	Burr Oak	4" cal.	as shown	B&B	Single straight trunk
7	TA	Tilia americana 'Redmond'	Redmon American Linden	4" cal.	as shown	B&B	Single straight trunk
SHRUBS							
23	IG	Ilex glabra 'Nordic'	Nordic Inkberry Holly	24" ht.	as shown	cont.	Well rooted
21	JC	Juniperus c. 'Grey Owl'	Grey Owl Juniper	24" sprd.	as shown	cont.	Well rooted
19	JK	Juniperus c. 'Keteleeri'	Keteleeri Juniper	5' ht.	as shown	B&B	
6	SP	Syringa p. 'Miss Kim'	Miss Kim Dwarf Korean Lilac	36" ht.	as shown	cont.	Well rooted
49	MP	Myrica pennsylvanica	Northern Bayberry	36" ht.	as shown	B&B	Trim to hedge
PERENNIALS							
17	PV	Panicum v. 'Heavy Metal'	Heavy Metal Switchgrass	#2	as shown	cont.	Well rooted
50	RF	Rudbeckia f. 'Goldstrum'	Black-eyed Susan	#1	as shown	cont.	Well rooted
10	CA	Calamagrostis a. 'Overdam'	Overdam Feather Reed Grass	#2	as shown	cont.	Well rooted

GENERAL LANDSACPE NOTES:

1. LANDSCAPE CONTRACTOR SHALL VISIT SITE, INSPECT EXISTING CONDITIONS AND REVIEW PROPOSED PLANTING AND RELATED WORK. IN CASE OF DISCREPANCY BETWEEN PLAN AND PLANT LIST, THE PLAN SHALL GOVERN QUANTIITIES. CONTACT THE LANDSCAPE ARCHITECT WITH ANY CONCERNS.
2. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ON-SITE UTILITIES PRIOR TO BEGINNING CONSTRUCTION ON HIS/HER PHASE OF WORK. ANY DAMAGE OR INTERRUPTION OF SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE CONTRACTOR SHALL COORDINATE ALL RELATED ACTIVITIES WITH OTHER TRADES, AND SHALL REPORT ANY UNACCEPTABLE SITE CONDITIONS TO THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT.
4. PLANTS SHALL BE FULL, WELL-BRANCHED, AND IN HEALTHY VIGOROUS GROWING CONDITION.
5. PLANTS SHALL BE WATERED BEFORE AND AFTER PLANTING IS COMPLETE.
6. ALL TREES MUST BE STAKED, FERTILIZED AND MULCHED AND SHALL BE GUARANTEED TO EXHIBIT A NORMAL GROWTH CYCLE FOR AT LEAST ONE (1) YEAR FOLLOWING PLANTING.
7. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED IN THE MOST RECENT EDITION OF THE "AMERICAN STANDARDS FOR NURSERY STOCK".
8. CONTRACTOR WILL SUPPLY FINISHED GRADE AND EXCAVATE AS NECESSARY TO SUPPLY PLANT MIX DEPTH IN ALL PLANTING BEDS AS INDICATED IN PLANT DETAILS.
9. PROVIDE CLEAN BACKFILL SOIL, USING MATERIAL STOCKPILED ON-SITE. SOIL SHALL BE SCREENED AND FREE OF DEBRIS, FOREIGN MATERIAL, AND STONE.
10. SLOW-RELEASE FERTILIZER SHALL BE ADDED TO THE PLANT PITS BEFORE BEING BACKFILLED. APPLICATION SHALL BE AT THE MANUFACTURERS RECOMMENDED RATES.
11. AMENDED PLANT MIX (PREPARED TOPSOIL) SHALL CONSIST OF 1/3 SCREENED TOPSOIL, 1/3 SAND, AND 1/3 "DAIRY DOO" COMPOST, MIXED WELL AND SPREAD TO A DEPTH AS INDICATED IN PLANTING DETAILS.
12. ALL PLANTINGS SHALL BE MULCHED WITH DOUBLE SHREDDED HARDWOOD BARK, SPREAD TO A DEPTH OF 3" FOR TREES AND SHRUBS, AND 2" ON PERENNIALS, AND GROUNDCOVER PLANTINGS. MULCH SHALL BE FREE FROM DEBRIS AND FOREIGN MATERIAL, AND PIECES OF INCONSISTENT SIZE.
13. NO SUBSTITUTIONS OR CHANGES OF LOCATION, OR PLANT TYPE SHALL BE MADE WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT OR OWNERS REPRESENTATIVE.
14. THE LANDSCAPE ARCHITECT SHALL BE NOTIFIED OF ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS PRIOR TO INSTALLATION.
15. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL PLANT MATERIAL IN A VERTICAL CONDITION THROUGHOUT THE GUARANTEED PERIOD.
16. THE LANDSCAPE ARCHITECT OR OWNERS REPRESENTATIVE SHALL HAVE THE RIGHT TO REJECT ANY WORK OR MATERIAL THAT DOES NOT MEET THE REQUIREMENTS OF THE PLANS AND/OR SPECIFICATIONS.
17. THE LANDSCAPE CONTRACTOR SHALL SEED AND MULCH OR SOD (AS INDICATED ON PLANS) ALL AREAS DESIGNATED AS SUCH ON THE PLANS, THROUGHOUT THE CONTRACT LIMITS. FURTHER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING AREAS DISTURBED DURING CONSTRUCTION, NOT IN THE CONTRACT LIMITS, TO EQUAL OR GREATER CONDITION.
18. ALL LANDSCAPE AREAS SHALL HAVE PROPER DRAINAGE THAT PREVENTS EXCESSIVE WATER FROM PONDING ON LAWN AREAS OR AROUND TREES AND SHRUBS.
19. ALL LANDSCAPE AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC UNDERGROUND SYSTEM.

IRRIGATION NOTE:

An irrigation system shall be installed as a part of this project. All lawn and landscape areas within the limits of Outlot 1, including parking area landscape islands, shall be irrigated. The Contractor shall submit an irrigation system design and shop drawings to the Owner for review and approval prior to installation. Irrigation systems shall be designed to utilize the minimum amount of water necessary to provide sufficient irrigation, satisfy the Local Municipal requirements and site conditions and shall include a rain sensor. A separate water meter shall be installed as a part of the irrigation system to allow for reduced rate metering by the Local Municipality and/or Water Authority. The Contractor shall be responsible for coordinating installation of irrigation lines, sleeves, plumbing connections, controls and appurtenances at the appropriate stages of construction. Any irrigation lines and/or system components that are cut, plugged, spliced, damaged and/or otherwise modified during construction activities shall be properly repaired, replaced, reconnected and/or adjusted as necessary to ensure proper operation.



3 FULL WORKING DAYS BEFORE YOU DIG CALL 811
MISS DIG System, Inc.

0 10 20 40
SCALE: 1" = 20'-0"
NORTH

vert verde landscape architecture
734.249.3568 Plymouth, MI
james@vertverde.com

Date:	Issued For:
05.07.2018	Revisions per Township
11.12.2018	Revision per Owner

Project:
ALDI Food Market
Pittsfield Township, MI

Sheet Name:
Tree Mitigation Plan

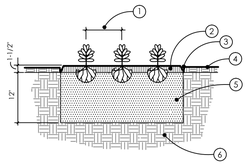
Seal:
STATE OF MICHIGAN JAMES GRAY LANDSCAPE ARCHITECT No. 1528 REGISTERED LANDSCAPE ARCHITECT

Drawn:	JG
Checked:	JG
Date:	10.15.2017
Scale:	1" = 20'-0"

Project Number:
17.027

Sheet Number:
27–LA4

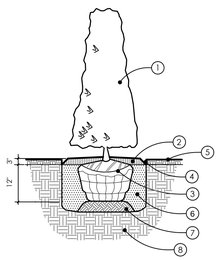
© 2018 Vert Verde Landscape Architecture, LLC



NOTES:
1. CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION

1. SEE PLANT SCHEDULE FOR SPACING
2. 2" DEPTH CANADIAN PEAT TOP DRESSING OR 2" DEPTH DOUBLE SHREDDED HARDWOOD MULCH
3. SHOVEL CUT OR METAL EDGE, SEE PLAN
4. FINISH GRADE
5. EXCAVATE EXISTING SOIL TO 12" DEPTH, REPLACE WITH PLANT MIX. SEE GENERAL LANDSCAPE NOTES SHEET L-3 AND SPECIFICATIONS
6. UNDISTURBED SUBGRADE

6 / L-2 PERENNIAL / GROUNDCOVER PLANTING
NOT TO SCALE

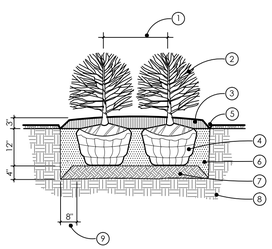


NOTES:
1. CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION

2. SET TOP OF ROOTBALL 2" ABOVE FINISH GRADE

1. HEDGE MATERIAL, SEE PLAN FOR LOCATION AND PLANT SCHEDULE
2. 3" DEPTH DOUBLE SHREDDED HARDWOOD MULCH, TYPICAL
3. REMOVE ALL NON-BIODEGRADALBE TWINE FROM ENTIRE ROOTBALL. REMOVE BURLAP FROM TOP 1/2 OF ROOTBALL.
4. SHOVEL CUT OR METAL EDGE, SEE PLAN
5. FINISH GRADE
6. EXCAVATE EXISTING SOIL TO 12" DEPTH, REPLACE WITH PLANT MIX, SEE GENERAL LANDSCAPE NOTES SHEET L-3 AND SPECIFICATIONS
7. SCARIFY TO 4" DEPTH AND RECOMPACT
8. UNDISTURBED SUBGRADE

5 / L-2 HEDGE PLANTING
NOT TO SCALE

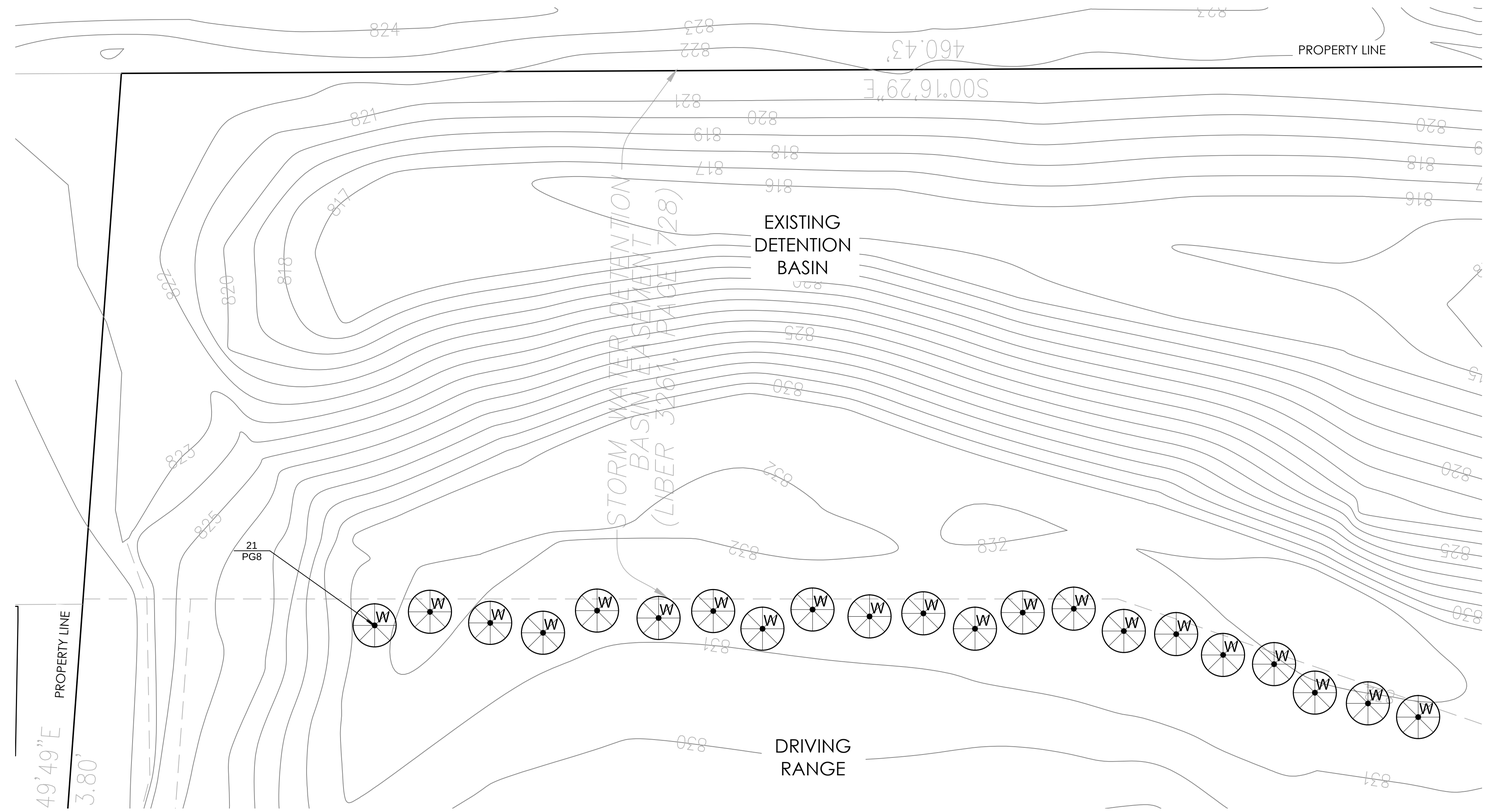


NOTES:
1. CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION

2. SET TOP OF ROOTBALL 2" ABOVE FINISH GRADE

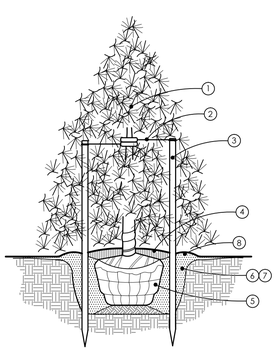
1. SEE PLAN FOR SPACING
2. SHRUBS, SEE PLANT SCHEDULE
3. 3" DEPTH DOUBLE SHREDDED HARDWOOD MULCH, TYPICAL
4. REMOVE ALL NON-BIODEGRADALBE TWINE FROM ENTIRE ROOTBALL. REMOVE BURLAP FROM TOP 1/2 OF ROOTBALL.
5. SHOVEL CUT OR METAL EDGE, SEE PLAN
6. EXCAVATE EXISTING SOIL TO 12" DEPTH, REPLACE WITH PLANT MIX. SEE GENERAL LANDSCAPE NOTES SHEET L-3 AND SPECIFICATIONS
7. SCARIFY TO 4" DEPTH AND RECOMPACT
8. UNDISTURBED SUBGRADE
9. MINIMUM 8" BETWEEN ROOTBALL AND EDGE OF PLANTING PIT

4 / L-2 SHRUB PLANTING
NOT TO SCALE



PLAN
SCALE: 1" = 20'-0"

NORTH
0 10 20 40



1. REMOVE ALL TAGS, STRINGS, PLASTICS, AND ANY OTHER MATERIALS WHICH ARE UNSIGHTLY OR COULD CAUSE GIRDLING.
2. STAKE TREES WITH 2-3" WIDE BELT-LIKE, FABRIC STRAPS ONLY, ARBOR TIE OR APPROVED EQUAL, (CONNECT FROM TREE TO STAKE OPPOSITE FROM EACH OTHER, AND ALLOW FOR SOME "FLEXING") DO NOT USE WIRE OR ROPE THROUGH A HOSE. REMOVE AFTER ONE YEAR.
3. (3) 2"X2" HARDWOOD STAKES OR EQUIVALENT DRIVEN 6-8" OUTSIDE OF ROOTBALL. REMOVE AFTER ONE YEAR.
4. COVER PLANTING W/ 3" SHREDDED HARDWOOD BARK MULCH. MINIMUM 6' DIAMETER. CONNECT EVERGREEN PLANTINGS WHERE POSSIBLE
5. REMOVE ALL NON-BIODEGRADABLE MATERIALS FROM THE ROOTBALL. FOLD DOWN ALL BURLAP AND REMOVE WIRE BASKET FROM THE TOP 1/3 OF THE ROOTBALL.
6. PLANT MIX. SEE GENERAL LANDSCAPE NOTES SHEET L-3 AND SPECIFICATIONS
7. TREE PIT TO BE 3 TIMES WIDTH OF ROOTBALL
8. 4" TOPSOIL SAUCER

NOTES:
1. STAKE EVERGREENS UNDER 12' HEIGHT

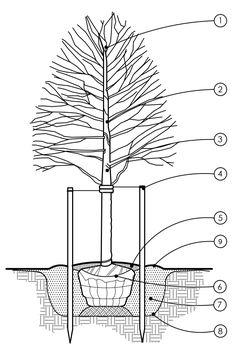
2. GUY EVERGREENS 12' HEIGHT AND OVER

3. NEVER CUT OR PRUNE CENTRAL LEADER

4. SET STAKES VERTICAL AND EVENLY SPACED

5. PRUNE ONLY TO REMOVE DEAD OR BROKEN BRANCHES

3 / L-2 EVERGREEN TREE PLANTING
NOT TO SCALE



1. REMOVE SECONDARY LEADERS. DO NOT PRUNE TERMINAL LEADER OR BRANCH TOPS. PRUNE ALL DEAD AND BROKEN BRANCHES.
2. REMOVE ALL TAGS, STRINGS, PLASTICS, AND ANY OTHER MATERIALS WHICH ARE UNSIGHTLY OR COULD CAUSE GIRDLING.
3. STAKE TREES JUST BELOW FIRST BRANCH W/ 2-3" WIDE BELT-LIKE, FABRIC STRAPS ONLY, ARBOR TIE OR APPROVED EQUAL, (CONNECT FROM TREE TO STAKE OPPOSITE FROM EACH OTHER, AND ALLOW FOR SOME "FLEXING") DO NOT USE WIRE OR ROPE THROUGH A HOSE. REMOVE AFTER ONE YEAR.
4. (2) 2"X2" HARDWOOD STAKES OR EQUIVALENT DRIVEN 6"-8" OUTSIDE OF ROOTBALL. REMOVE AFTER ONE YEAR.
5. COVER PLANTING W/ 3" DOUBLE SHREDDED HARDWOOD BARK MULCH. MINIMUM 6' DIA. LEAVE 3" CIRCLE OF BARE SOIL AROUND THE BASE OF THE TRUNK.
6. REMOVE ALL NON-BIODEGRADABLE MATERIALS FROM THE ROOTBALL. FOLD DOWN ALL BURLAP AND REMOVE WIRE BASKET FROM THE TOP 1/3 OF THE ROOTBALL.
7. PLANT MIX. SEE GENERAL LANDSCAPE NOTES SHEET L-3 AND SPECIFICATIONS
8. TREE PIT TO BE 3 TIMES WIDTH OF ROOTBALL
9. 4" TOPSOIL SAUCER

NOTE:
TREE SHALL BEAR SAME RELATION TO FINISH GRADE AS IT BORE ORIGINALLY OR SLIGHTLY HIGHER THAN FINISH GRADE UP TO 4" ABOVE GRADE. IF DIRECTED BY LANDSCAPE ARCHITECT FOR HEAVY CLAY SOIL AREAS.

NOTES:
1. STAKE TREES 3" - 5" CALIPER ONLY

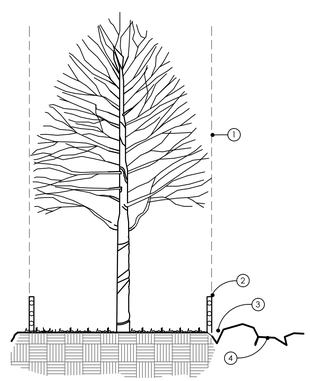
2. GUY TREES 6" CALIPER AND OVER

3. CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION

4. SET STAKES VERTICAL AND EVENLY SPACED

5. STAYS OR GUYS TO BE SET ABOVE FIRST BRANCH

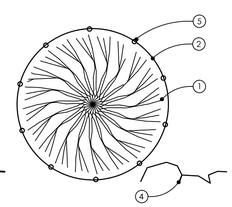
2 / L-2 DECIDUOUS TREE PLANTING
NOT TO SCALE



SECTION

NOTES:
1. 4' HEIGHT ORANGE SNOW FENCE TO BE INSTALLED AROUND DRIPLINE OF ALL TREES TO BE SAVED PRIOR TO ANY LAND CLEARING OR CONSTRUCTION.

2. NO CUTTING, FILLING OR TRESPASSING SHALL OCCUR INSIDE FENCED AREAS WITHOUT PRIOR APPROVAL FROM LANDSCAPE ARCHITECT.



PLAN

1. DRIPLINE OF TREES TO BE SAVED
2. 4' HT. ORANGE SNOW FENCE
3. TRENCH OR CURB
4. CONSTRUCTION AREA
5. STEEL POST EVERY 10' MINIMUM. INSTALL POSTS MINIMUM 2' INTO GROUND

1 / L-2 TREE PROTECTION
NOT TO SCALE

3 FULL WORKING DAYS BEFORE YOU DIG CALL
811
MISS DIG System, Inc.

vert verde landscape architecture
734.249.3568 Plymouth, MI
james@vertverde.com

Date:	Issued For:
05.07.2018	Revisions per Township

Project:
ALDI Food Market
Pittsfield Township, MI

Sheet Name:
Tree Mitigation Plan & Details

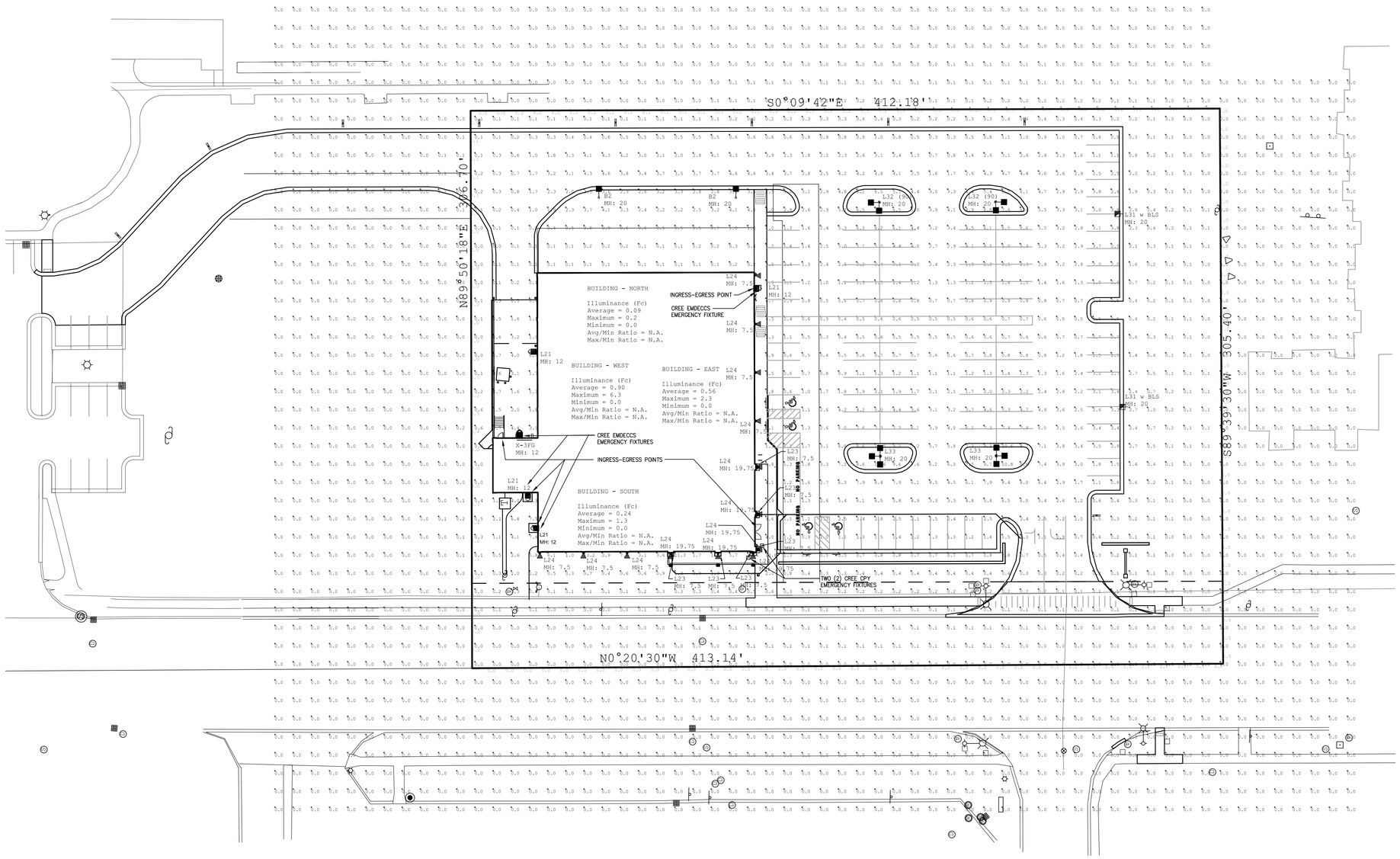
Seal:
STATE OF MICHIGAN
JAMES GRAY
LANDSCAPE ARCHITECT
No. 1528
REGISTERED LANDSCAPE ARCHITECT

Drawn:	JG
Checked:	JG
Date:	10.15.2017
Scale:	1" = 20'-0"

Project Number:
17.027

Sheet Number:
28–LA5

© 2018 Vert Verde Landscape Architecture, LLC



GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 INCH = 30 FEET

Luminaire Schedule							
Symbol	Qty	Label	Arrangement	Lumens/Lamp	LLF	Total Watts	Description
	2	B2	SINGLE	11424	1.000	172	OSQ-A-NM-2ME-B-40K-xx-xx + OSQ-DAxx
	4	L21	SINGLE	3819	1.000	168	XSPWA03FC-UCSP
	6	L23	SINGLE	N.A.	1.000	258.42	AL-42WLED-UD-CG-120
	13	L24	SINGLE	N.A.	1.000	380.9	CL-P5641-30-30K
	2	L31 w BLS	SINGLE	8779	1.000	172	OSQ-A-NM-4ME-B-40K-UL-CS w/OSQ-DACS OSQ-BLSMF
	2	L32 (90)	2 @ 90	11424	1.000	344	OSQ-A-NM-4ME-B-40K-UL-CS w/OSQ-DACS
	2	L33	3 @ 90°	11424	1.000	516	OSQ-A-NM-4ME-B-40K-UL-CS w/OSQ-DACS
	1	X-3FG	SINGLE	2529	1.000	25	XSPW-A-0-3-F-G-U-Z (LED Wall Mount) 25W, 40K

Footcandles calculated using predicted lumen values after 50K hours of operation					
Label	Avg	Max	Min	Avg/Min	Max/Min
BUILDING - EAST	0.56	2.3	0.0	N.A.	N.A.
BUILDING - NORTH	0.09	0.2	0.0	N.A.	N.A.
BUILDING - SOUTH	0.24	1.3	0.0	N.A.	N.A.
BUILDING - WEST	0.90	6.3	0.0	N.A.	N.A.
PARKING	2.69	10.8	0.0	N.A.	N.A.

LIGHTING LEVEL NOTES:
- STORE HOURS ARE 9:00 A.M. TO 9:00 P.M.
- LIGHTS ARE CONTROLLED BY PHOTOCELL AND TIMER.
- LIGHTS ILLUMINATE AT DUSK.
- LIGHTS SWITCH TO LOW LEVEL SECURITY LIGHTING AT CLOSE/9:00 P.M.
- LIGHTS SWITCH TO FULL LEVEL AT OPENING/9:00 A.M.
- LIGHTS EXTINGUISH AT DAWN.

NATIONAL ACCOUNT PRICING, PLEASE CALL MIKE KREINER AT CREE LIGHTING:
224-250-1561 OR MIKE.KREINER@CREE.COM

Additional Required Equipment:
(4) - CL-SSP-4011-17-D1-PS - (17' x 4" Steel Square Pole 11ga, Single)
(2) - CL-SSP-4011-17-D3-PS - (17' x 4" Steel Square Pole 11ga, 2@90°)
(2) - CL-SSP-4011-17-D5-PS - (17' x 4" Steel Square Pole 11ga, 3@90°)

Proposed Poles Meets 100MPH Sustained Winds.

ADDITIONAL EQUIPMENT
(14) OSQ-DAXX (DIRECT ARM MOUNT)
(2) OSQ-BLSMF (BACKLIGHT SHIELD)

CREE™

1200 92nd Street - Sturtevant, WI 53177
www.cree.com - (800) 236-6800

Project Name:ALDI - PITTSFIELD, MI | SR-27916
Date:11/9/2018 | Scale: 1"=30' | Footcandles calculated at grade
Filename: V:\Common\AppEng\NAT\ALD-171228PFMICBR6.AGI | Layout by: CHRIS BOSANEC

Illumination results shown on this lighting design are based on project parameters provided to Cree, Inc. used in conjunction with luminaire test procedures conducted under laboratory conditions. Actual project conditions differing from these design parameters may affect field results. The customer is responsible for verifying dimensional accuracy along with compliance with any applicable electrical, lighting, or energy code.

811 Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	05-01-18	REVISED WALL MOUNT FIXTURE LOCATIONS
2	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
3	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
4	09-24-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
5	12-19-18	REVISED BUILDING PER CLIENT REQUEST

REVISION #	DATE	REVISION-DESCRIPTION

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

SITE LIGHTING PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=30'
PROJECT No.: 9162803
DWG NAME: 2803-LIGHTING
ISSUED: DEC. 19, 2018

29-LT1

OSQ Series
OSQ™ LED Area/Flood Luminaire – Medium

Product Description
The OSQ™ Area/Flood luminaire blends extreme optical control, advanced thermal management and modern, clean aesthetics. Built to last, the housing is rugged cast aluminum with an integral, weathertight LED driver compartment. Versatile mounting configurations offer simple installation. Its slim, low-profile design minimizes wind load requirements and blends seamlessly into the site providing even, quality illumination. The 'B' Input power designator is a suitable upgrade for HID applications up to 250 Watt, and the 'K' Input power designator is a suitable upgrade for HID applications up to 400 Watt.
Applications: Parking lots, walkways, campuses, car dealerships, office complexes, and internal roadways

Performance Summary
NanoOptic® Precision Delivery Grid™ optic

Assembled in the U.S.A. of U.S. and imported parts

Initial Delivered Lumens: Up to 17,291

Efficacy: Up to 136 LPW

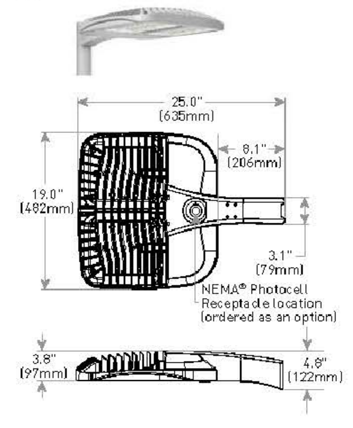
CRI: Minimum 70 CRI (4000K & 5700K; 3000K asymmetric optics); 80 CRI (3000K symmetric optics)

CCT: 3000K (+/- 300K), 4000K (+/- 300K), 5700K (+/- 500K)

Limited Warranty[1]: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish

[1] See http://lighting.cree.com/warranty for warranty terms

DA Mount



Weight
26.5 lbs. (12kg)

Accessories

Field-Installed	
Backlight Shield OSQ-BLSMF – Front facing optics OSQ-BLSMR – Rotated optics	**Hand-Held Remote** XA-SENSREM - For successful implementation of the programmable multi-level option, a minimum of one hand-held remote is required

Ordering Information
Fully assembled luminaire is composed of two components that must be ordered separately:
Example: **Mount:** OSQ-AASV + **Luminaire:** OSQ-A-NM-2ME-B-40K-UL-SV

Mount (Luminaire must be ordered separately)*	
OSQ-	
OSQ-AA Adjustable Arm **OSQ-DA** Direct Arm	**Color Options:** **SV** Silver **BK** Black **BZ** Bronze **WH** White

* Reference EPA and pole configuration suitability data beginning on page 7

Luminaire (Mount must be ordered separately)								
OSQ	A	NM						
Product	**Version**	**Mounting**	**Optic**	**Input Power Designator**	**CCT**	**Voltage**	**Color Options**	**Options**
OSQ	A	**NM** No Mount	**Asymmetric** **2ME*** Type II Medium **3ME*** Type III Medium **4ME*** Type IV Medium **Symmetric** **5ME** Type V Medium **5SH** Type V Short **WSN** Wide Sign **15D** 15° Flood **25D** 25° Flood **40D** 40° Flood **60D** 60° Flood	**B** 86W **K** 130W	**30K** 3000K **40K** 4000K **57K** 5700K	**UL** Universal 120-277V **UH** Universal 347-480V	**BK** Black **BZ** Bronze **SV** Silver **WH** White	**DIM** 0-10V Dimming - Control by others - Refer to Dimming spec sheet for details - Can't exceed wattage of specified input power designator **F** Fuse - When code dictates fusing, use time delay fuse - Available for U.S. applications only **ML** Multi-Level - Refer to ML spec sheet for details - Available with UL voltage only - Intended for downlight applications at 0° tilt **PML** Programmable Multi-Level, up to 40' Mounting Height - Refer to PML spec sheet for details - Intended for downlight applications at 0° tilt **PML2** Programmable Multi-Level, 10-30' Mounting Height - Refer to PML spec sheet for details - Intended for downlight applications at 0° tilt **Q9/Q6/Q5/Q4/Q3/Q2/Q1** Field Adjustable Output - Must select Q9, Q6, Q5, Q4, Q3, Q2, or Q1 - Offers full range adjustability - Refer to pages 9-10 for power and lumen values **R** NEMA® Photocell Receptacle - Intended for downlight applications with maximum 45° tilt - 3-pin receptacle per ANSI C136.10 - Photocell and shorting cap by others **RL** Rotate Left - LED and optic are rotated to the left **RR** Rotate Right - LED and optic are rotated to the right

* Available with Backlight Shield when ordered with field-installed accessory (see table above)

US: lighting.cree.com T (800) 236-6800 F (262) 504-5415

Rev. Date: V13 12/19/2017

Canada: www.cree.com/canada T (800) 473-1234 F (800) 890-7507

XSP Series
XSPW™ LED Wall Mount Luminaire

Product Description
The XSPW™ LED wall mount luminaire has a slim, low profile design intended for outdoor wall mounted applications. The rugged lightweight aluminum housing and mounting box are designed for installation over standard single gang J-Boxes and mud ring single gang J-Boxes. The luminaire allows for through-wired or conduit entry from the top, bottom, sides and rear. The housing design is intended specifically for LED technology including a weathertight LED driver compartment and thermal management. Optic design features industry-leading NanoOptic® Precision Delivery Grid™ system in multiple distributions.
Applications: General area and security lighting

Performance Summary
NanoOptic® Precision Delivery Grid™ optic

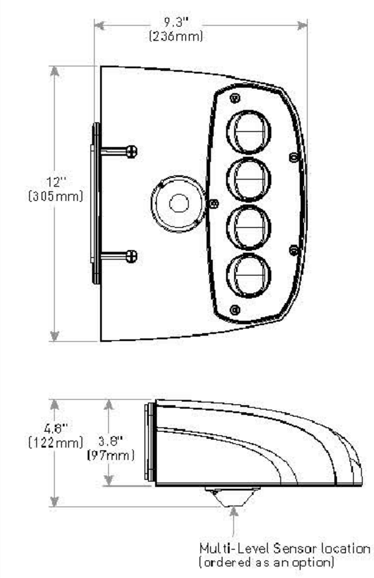
Assembled in the U.S.A. of U.S. and imported parts

CRI: Minimum 70 CRI

CCT: 3000K (+/- 300K); 4000K (+/- 300K); 5700K (+/- 500K)

Limited Warranty[1]: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish

[1] See http://lighting.cree.com/warranty for warranty terms



Weight
9.5 lbs. (4.3kg)

Accessories

Field-Installed
Beauty Plate WM-PLT12** - 12" (305mm) Square WM-PLT14** - 14" (356mm) Square - Covers holes left by incumbent wall packs

** Must specify color

Ordering Information
Example: XSPW-A-0-2-F-C-U-Z

XSPW	A	0						
Product	**Version**	**Mounting**	**Optic**	**Modules**	**Input Power Designator**	**Voltage**	**Color Options**	**Options**
XSPW	A	0 Wall	2 Type II Medium 3 Type III Medium	30K 3000K F 4000K M 5700K	C 42W G 25W	U Universal 120-277V 1 120V - Available with P option only 2 208-277V - Available with P option only 6* 347V	S Silver T Black W White Z Bronze	K Multi-Level - Refer to ML spec sheet for details - Available with Input Power Designator C only - Available with U and 6 voltages only P Photocell - Not available with K option - Available with 1 or 2 voltages only

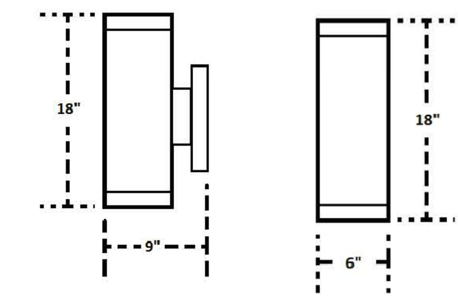
* Available in Canada only. 347V utilizes magnetic step-down transformer. For input power for 347V, refer to the Electrical Data table

US: lighting.cree.com T (800) 236-6800 F (262) 504-5415

Rev. Date: VersionA V10 02/22/2018

Canada: www.cree.com/canada T (800) 473-1234 F (800) 890-7507

18" Cylinder LED Sconce
Decorative Outdoor – Wall Mount



Performance Summary
Distribution: Uplight/Downlight

Initial Delivered Lumens: 2,400

Input Power: 29 watts

CRI: 90+ CRI

CCT: 3000K

Voltage: 120V, 60Hz

Dimmable: Yes*

Finish: Satin

Frame Material: Metal

J-Box Type: 4X4 (standard)

Dimensions: 6.0"W X 18.0"H X 9.0"D

Compliance: ETL, Title 24, and wet location listed when used with top cover

Warranty: Contact factory for warranty information

***Recommended Dimmers:** Lutron – CT-600P, CTCL-153P, MACL-153M, S-600P, S-603P, SCL-153P, TGCL-153P; Leviton – 6631, 6674, IPL06

Accessories

Field-Installed
Top Cover Lens (included with sconce) - Adapts up/down sconce for wet location use - Heat and shatter resistance clear glass lens

Ordering Information

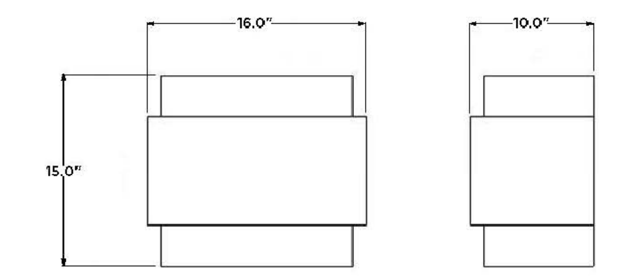
Product
CL-20364LEDD-SAT-CLR-SB

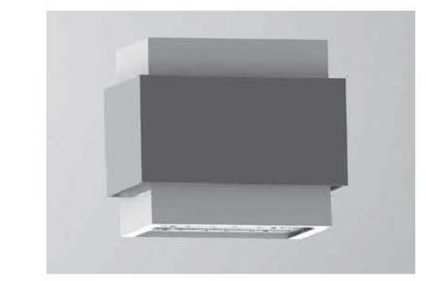
© 2017 Cree, Inc. and/or one of its subsidiaries. All rights reserved. For informational purposes only. Content is subject to change.

T (800) 236-6800 F (262) 504-5415

Outdoor Wall Sconce
LED
Exterior Series

Applications: Security, pathway and perimeter lighting; ideal for entryways, walkways, and parking facilities.





Type: L23

CATALOG #	WATTAGE / LUMENS	INPUT/OUTPUT VOLTAGE
AL-42WLED-UD-120	43W LED, 2495 Lumens	120V

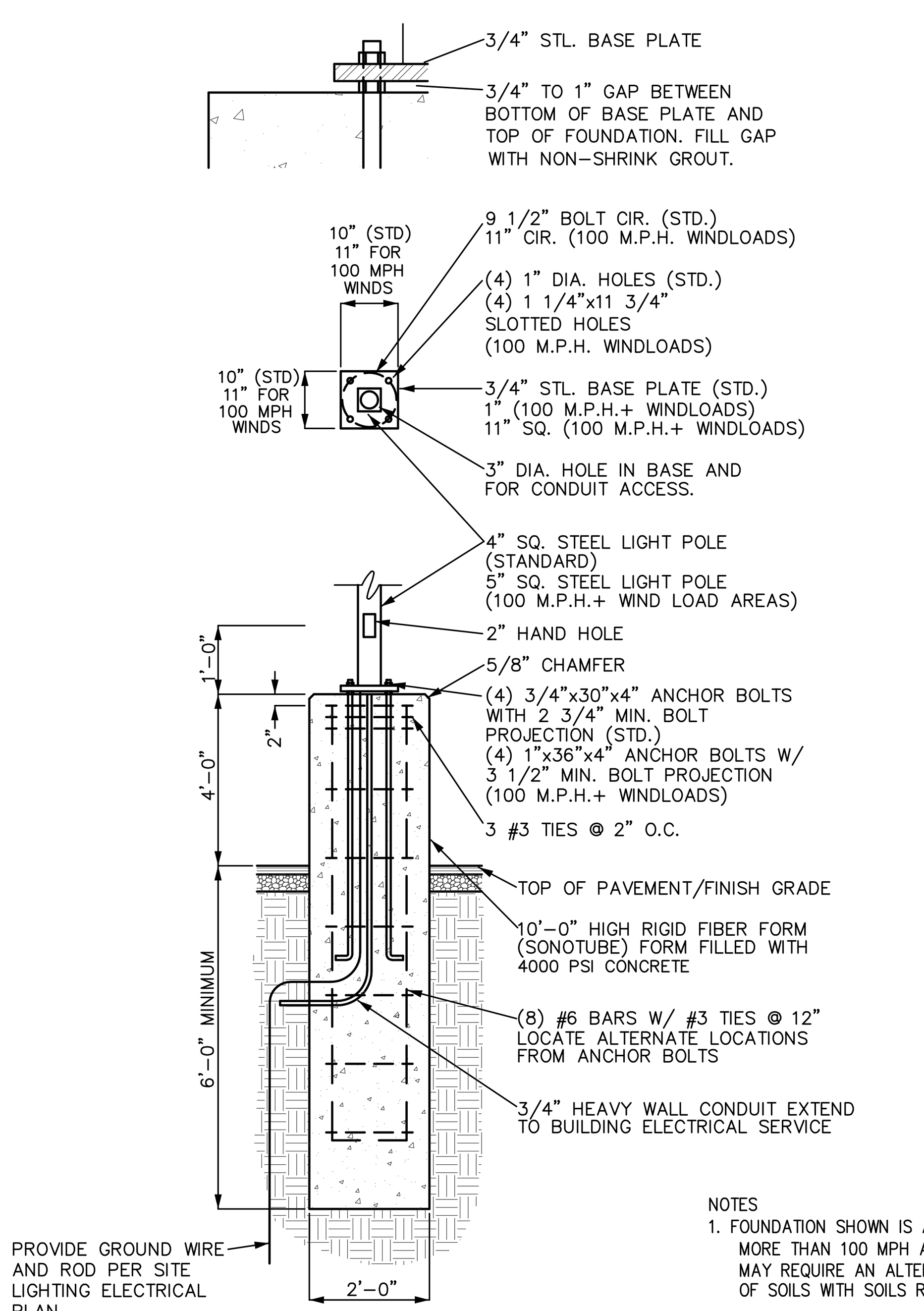
DISTRIBUTION	FINISH	FEATURES
Up & Down Distribution	Polyester Powder Coat Finish **CG -** Silver with Gray Band	• Cree LEDs • 75 CRI • 5700K (+ / - 500K) CCT

ACCESSORIES	WARRANTY
RS9062-DO-CS& - Uplight louver kit to convert luminaire to downlight distribution.	Ten-year limited warranty. Certain exclusions apply. For warranty terms, visit www.cree.com/lighting/products/warranty.

CREE INTEGRATED LIGHTING SOLUTIONS

© 2014 Cree, Inc. All Rights Reserved. The information in this document is subject to change without notice. Cree Integrated Lighting Solutions offers a full line of quality lighting products from Cree, Inc. and other manufacturers, including the product depicted above.

Cree, Inc. 9201 Washington Ave | Racine, WI 53406 | Phone: 800-288-8650 | Fax: (800) 236-7500 | nationalaccounts@cree.com | www.cree.com/lighting/ILS



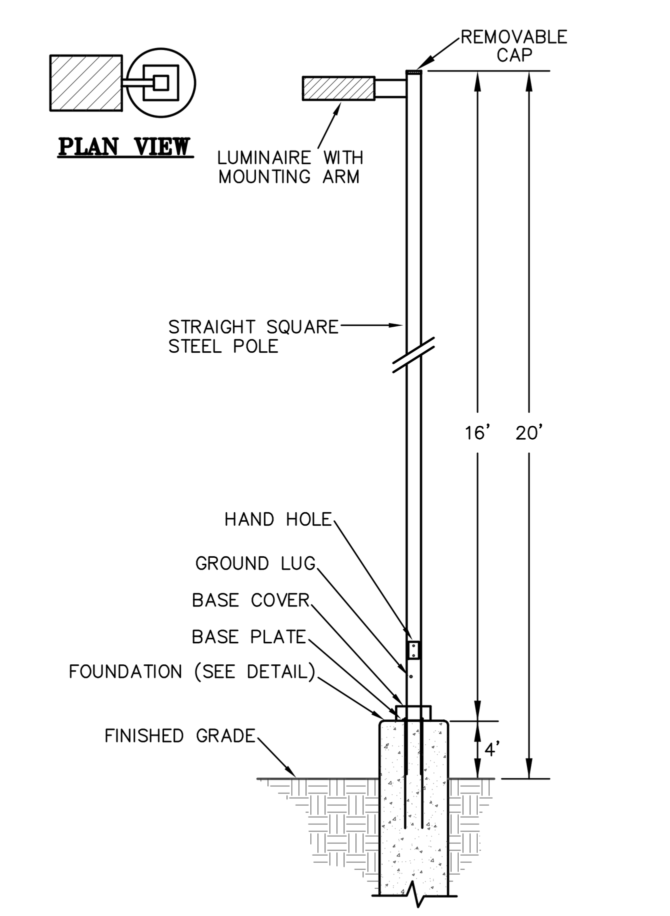
LIGHT POLE BASE STANDARD DETAIL
NOT TO SCALE

NOTES
1. FOUNDATION SHOWN IS A TYPICAL DESIGN. WIND LOADS MORE THAN 100 MPH AND/OR UNSTABLE SOIL CONDITIONS MAY REQUIRE AN ALTERNATE DESIGN. VERIFY CONDITION OF SOILS WITH SOILS REPORT.
2. FOUNDATIONS SHALL EXTEND BELOW FROST DEPTH PER LOCAL CODES.
3. CONCRETE SHALL HAVE MIN 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
4. SEE SITE LIGHTING ELECTRICAL PLAN WITHIN ARCHITECTURAL PLANS FOR ADDITIONAL REQUIREMENTS.
5. VERIFY BASE PLATE BOLT PATTERN WITH POLE MANUFACTURER AND / OR SUPPLIER PRIOR TO CONSTRUCTION.

SITE LIGHTING NOTES:

1. CAUTION!
This site contains existing underground public and private utilities. See the project plans for locations of the known existing and proposed underground utility locations. Existing utility information provided on the project plans may be from information disclosed to this firm by the Utility Companies, Local, County or State Agencies, and/or various other sources. No guarantee is given as to the completeness or accuracy thereof. The Site Electrical Contractor shall contact the 811 Underground Public Utility Locating System or other appropriate local underground utility locating Agency, a minimum of three (3) working days prior to performing the site electrical work. The Site Electrical Contractor shall field locate all potential utility conflicts and take the necessary precautions to avoid damage to the existing underground utilities. Any damage to the existing utilities as a result of the site electrical work shall be immediately brought to the attention of the General Contractor and shall be repaired as acceptable to the Owner, the General Contractor and the Appropriate Utility Provider. If the existing site conditions create a conflict and/or prevent the Site Electrical Contractor from performing the site electrical work, then contact the Engineer of Record.

2. Contact the ALDI National Account Lighting Distributor to order fixtures, mounting accessories and pole(s):
Mike Kreiner
Strategic Director - National Accounts
Cree Lighting
9201 Washington Avenue
Racine, WI 53406
Office: 262-504-5037
Cell: 224-250-1561
mike_kreiner@cree.com <mailto:mike_kreiner@cree.com>



LIGHT POLE DETAIL
NOT TO SCALE

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

	REVISION #	DATE	REVISION-DESCRIPTION	REVISION #	DATE	REVISION-DESCRIPTION
DESIGN: VFB	1	05-01-18	UPDATE XSP DETAIL			
DRAFT: L.F.	2	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
CHECK: CAG	3	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			
	4	09-24-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS			

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

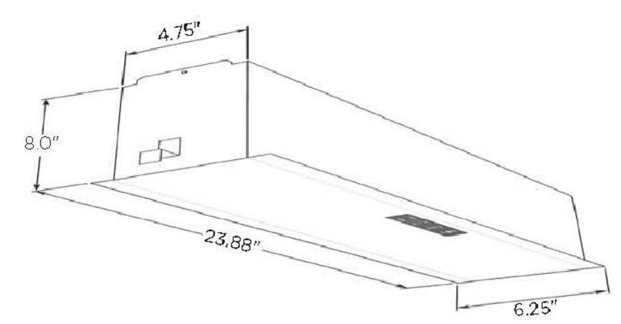
SITE LIGHTING DETAILS

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: N/A
PROJECT No.: 9162803
DWG NAME: 2803-LIGHTING
ISSUED: SEP. 24, 2018

30-LT2

Emergency Lighting Inverters for T-Grid Ceilings 125W



Type: L22 Inverter

CATALOG #	CAPACITY	SYSTEM WEIGHT
CL-IG-2T	125W / 125VA	38lbs.

BATTERY
- Sealed lead-calcium w/ 10-year life
- 90 minute runtime @ 77º F
- Two Batteries
- Battery Voltage: 24VDC
- Battery Current: 5.7A
- Low voltage battery disconnect
- DC overload
- Short circuit protection

CHARGER
- Charger Power Consumption: 15W maximum; 2.5W in standby
- Includes test switch w/ LED indicator lights: Red, AC-on; Green, Charging; Amber, Inverter-on
- AC lockout to prevent battery discharge before initial power up
- Automatic brownout protection

FEATURES
- Heavy duty steel cabinet
- White baked-on powder paint finish
- Remote mounting to 1000' from controlled luminaires
- Drop-in installation between t-grid runs. Safety wires (by others) required for attachment to building structure
- Connection to unswitched AC circuit required. Conduit knockouts in housing provided for wiring
- Powers incandescent, fluorescent, induction and LED lamps
- Compatible with dimming ballasts and drivers
- Switches to emergency mode in < 1 second
- Provides power to input side of luminaire
- 100% lumen output in emergency mode for full 90 minutes

OPERATING ENVIRON.
- Operates without derating at altitudes of < 10,000 feet
- Operating outside of the 68º F – 86º F temperature range will affect performance and life of the battery
- Operates in environments with < 95% non-condensing relative humidity

ELECTRICAL
- 120 or 277V, 60Hz Input/Output
- 98% efficiency at full load
- Input/Output Protection: AC line fuses/Line and inverter fuses
- Digitally controlled sinusodial waveform
- Static Voltage: +/- 5% during battery discharge. 0-100% linear load
- Output THD: < 3% (linear load)
- Load Power Factor Range: 0.44 Lead to 0.44 Lag
- Minimum loading is 0% of rated system capacity
- AC Input Current: 1.2 max. @ 120V, 0.52 max. @ 277V
- Online Thermal Output: 9 BTUs
- Emergency Thermal Output: 95 BTUs

COMPLIANCE
- UL924 Listed
- Meets NFPA 101 Life Safety Code, NEC, OSHA, Local and State Codes
- Plenum rated

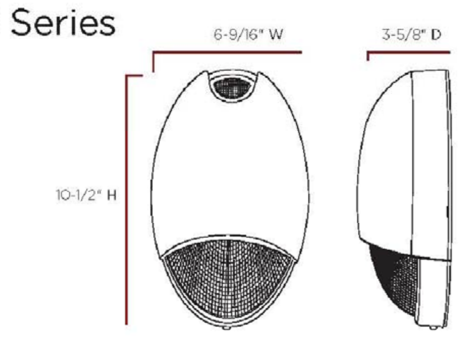
WARRANTY
One-year limited warranty. Certain exclusions apply. For details, visit www.cree.com/lighting/ILS.

© 2017 Cree, Inc. and/or one of its subsidiaries. All rights reserved. For informational purposes only. Content is subject to change.

T (800) 236-6800 F (262) 504-5415

EXIT & EMERGENCY

E.XML5 Series



Series Overview

DIMENSIONS	PRODUCT WEIGHT	MOUNTING HEIGHT	SPACING
3-5/8" D x 6-9/16" W x 10-1/2" H	4.65 lbs.	---	---

Fixture Specifications

FEATURES	12W (2 LEDs x 6W) per unit Can be used as a Normally-ON or Normally-OFF light as well as on a switched circuit Dissipates 1300 lumens in AC mode and 350 lumens in EM mode Field-selectable wiring allows for AC operation, so unit can be controlled with a wall-switch, photocell or any other switching mechanism
HOUSING	Die-cast aluminum housing Available in dark bronze, white or silver durable powder-coat finish Sealed and gasketed
MOUNTING	Back plate for wall mount Universal knockout pattern on back plate provides for easy installation over most standard junction boxes Threaded opening at the top of the enclosure for conduit mount
INCLUDES	Sealed 4.8V maintenance-free nickel cadmium battery backup (90 min.) Charge/Power on indicator LED (battery recharges within 24 hours via internal solid-state, two-rate charger) Push-to-test switch Photocell sensor and self-diagnostics come standard with fixture
CERTIFICATIONS	Meets UL924, NFPA 101 Life Safety Code, NEC & OSHA

Electrical Performance

OPERATING MINIMUM	LIFESPAN L_{70} AT 25°C (77°F)	POWER FACTOR	TOTAL HARMONIC DISTORTION	DIMMABLE
0°C (32°F) -30°C (-22°F) Cold Weather	---	---	---	No

INPUT VOLTAGE	120V	208V	240V	277V
Current Draw (Amps)	0.10A	0.058A	0.052A	0.043A

Warranty & Certifications

WARRANTY	UL LISTED	DLC	ENERGY STAR
5-Year Limited (Housing & Electronics) 5-Year Pro-Rated (Batteries)	Wet Locations	---	---

© 2017 Cree, Inc. and/or one of its subsidiaries. All rights reserved. For informational purposes only. Content is subject to change.

T (800) 236-6800 F (262) 504-5415

EMERGENCY LIGHTING POWERED BY SELF–CONTAINED BATTERY FOR 90 MINUTES.

CPY Series - Version B

CPY250® LED Canopy/Soffit Luminaire

Product Description

The CPY250® LED Canopy/Soffit Luminaire has an extremely thin profile constructed of rugged cast aluminum. It can be surface mounted easily from below the canopy deck and can be pendant mounted. Direct imaging of the LEDs is eliminated with a highly efficient patterned flat or 0.91" (23mm) drop glass lens.

Applications: Petroleum canopies, CNG fueling stations, soffits

Performance Summary

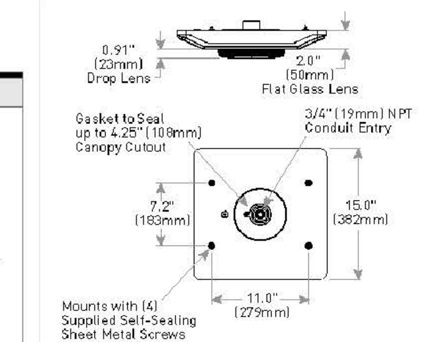
- Assembled in the U.S.A. of U.S. and imported parts
- **Initial Delivered Lumens:** Up to 20,080
- **Efficacy:** Up to 151 LPW
- **CRI:** Minimum 70 CRI
- **CCT:** 3000K (+/- 300K), 4000K (+/- 300K), 5700K (+/- 500K)
- **Limited Warranty†:** 10 years on luminaire/10 years on Colorfast DeltaGuard® finish
- IP66 Rated (Direct Mount only)
- Class I, Division 2 Hazardous Location for select models

† See http://lighting.cree.com/warranty for warranty terms

DM Mount

Flat Lens

Drop Lens



Weight
12.5 lbs. (5.7kg)

Accessories

Field-Installed

Direct Mount Luminaires

Canopy Upgrade Kits (18 ga. steel)
XA-BXCCMW - for use with Jet-Philips, 21.60" (549mm) square
XA-BXCCNW - for use with Elsco Franciscan, 22.06" (560mm) square
XA-BXCCPW - for use with LSI Dakota or Masters, 22.50" (572mm) square
XA-BXCCOW - for use with Whiteway Riviera or Rig-A-Lite, 20.60" (523mm) square
XA-BXCCRW - for use with Elsco Merrit, 18.06" (459mm) square
XA-BXCCSW - for use with LSI Richmond or Whiteway Civic, 23.00" (584mm) L x 13.00" (330mm) W

Direct Mount Junction Box/Stem Kit
XA-BXCCJBOX - 6.0" (152mm) H x 3/4" (19mm) NPT Stem
- Watertight
- Rated for feed through 8 (4 in, 4 out) #12 AWC conductors

Direct Mount Beauty Plates
XA-BXCCBPW - 26.17" (665mm) Beauty Plate Only (18 ga. steel)
XA-BXCCBPB12W - 26.17" (665mm) Beauty Plate (18 ga. steel) w/12" (305mm) Backer Plate (16 ga. steel)
- For use in canopies where deck opening is larger than what is required for mounting the CPY250 luminaire. Maximum deck opening 10.75" x 15" (183mm x 375mm)
XA-BXCCBPB16W - 26.17" (665mm) Beauty Plate (18 ga. steel) w/16" (406mm) Backer Plate (16 ga. steel)
- For use in canopies where deck opening is larger than what is required for mounting the CPY250 luminaire. Maximum deck opening 12" x 15" (305mm x 375mm)

Pendant Mount Luminaires

Pendant Mount Kits
XA-PS12KIT* - 5" (127mm) pendant
XA-PS18KIT* - 11" (279mm) pendant
XA-PS22KIT* - 15" (381mm) pendant
- Includes two conduit fittings and 3/4-14 NPT pipe threaded on two ends

Hand-Held Remote
XA-SENSREM
- For successful implementation of the programmable multi-level option, a minimum of one hand-held remote is required

* Must specify color

Ordering Information

Example: CPY250-B-DM-D-A-UL-SV

CPY250	B							
Product	**Version**	**Mounting**	**Optic**	**Input Power Designator**	**Voltage**	**Color Options**	**CCT**	**Options**
CPY250	B	**DM** Direct **HC** Hook & Cord **PD** Pendant	**D** 0.91" (23mm) Drop Lens **F** Flat Lens	**A** 60W **B** 96W **C** 31W **E** 145W **F** 85W	**UL** Universal 120-277V **UH** Universal 347-480V - Available with B, E & F input power designators only **34*** 347V - A & C input power designators only **48*** 480V - A & C input power designators only	**BK** Black **BZ** Bronze **SV** Silver **WH** White	**30K** 3000K **40K** 4000K **57K** 5700K	**DIM 0-10V Dimming** - Control by others - Refer to Dimming spec sheet for details - Can't exceed wattage of specified Input Power Designator **HZ Class I, Div. 2 Hazardous Location Certification** - Available with DM and PD mounts only - A & C input power designators are available for DM and PD mounts except PD mount with 34 & 48 voltages in Canada - Not available with K or PML options **K NSF 2 Certification** - Luminaires include NSF certification mark - Available with the DM mount only - Not available with the HZ or PML options **PML Programmable Multi-Level** - Available with UL voltage only - Refer to PML spec sheet for details

* 347 and 480V with A & C input power designators utilize a magnetic step-down transformer. For input power for 347 and 480V, refer to the Electrical Data table

Rev. Date: V1 2 05/04/2018

CREE

US: lighting.cree.com T (800) 236-6800 F (262) 504-5415

Canada: www.cree.com/canada T (800) 473-1234 F (800) 890-7507

EMERGENCY LIGHTING POWERED BY L22 INVERTER FOR 90 MINUTES.

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION	REVISION #	DATE	REVISION-DESCRIPTION

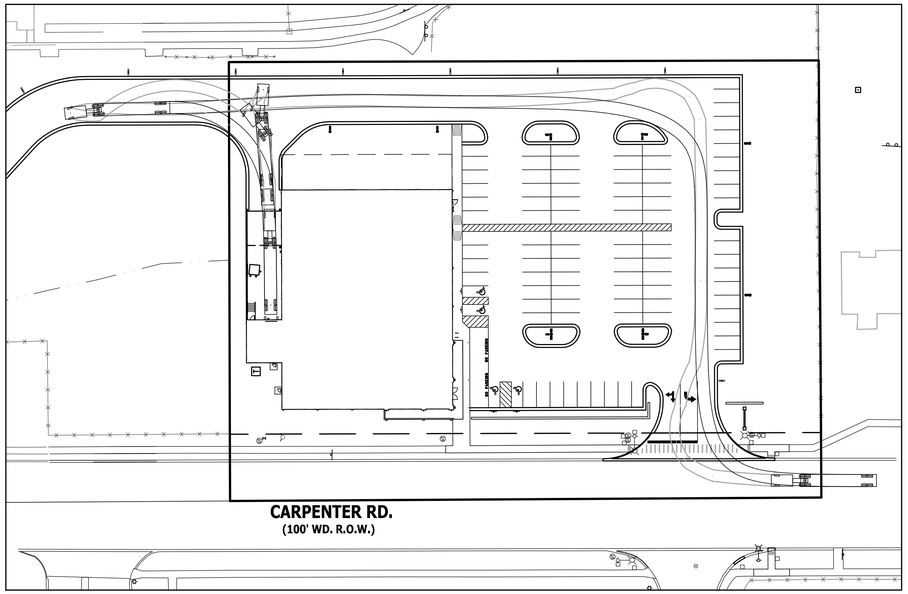
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

EMERGENCY LIGHTING DETAILS

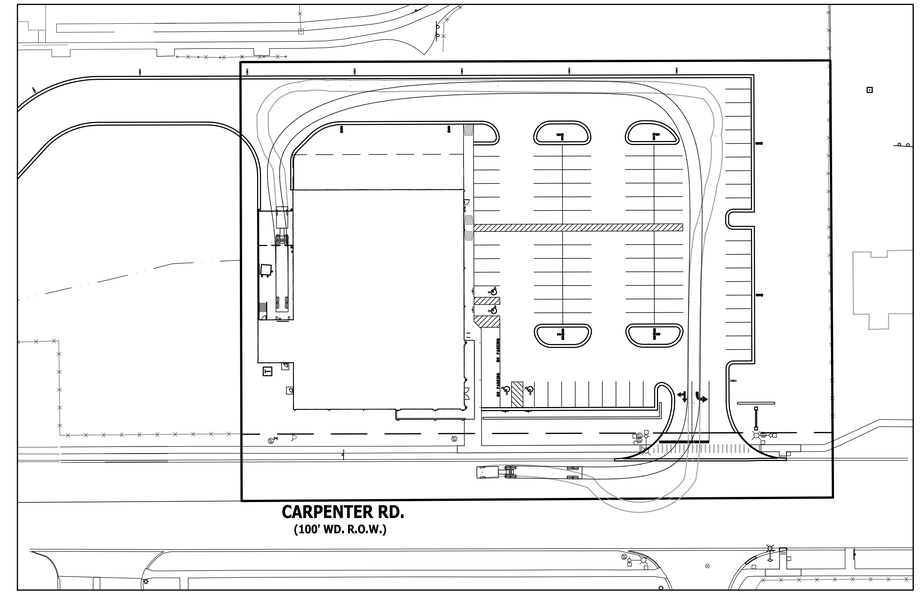
CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: N/A
PROJECT No.: 9162803
DWG NAME: 2803-LIGHTING
ISSUED: AUG. 28, 2018

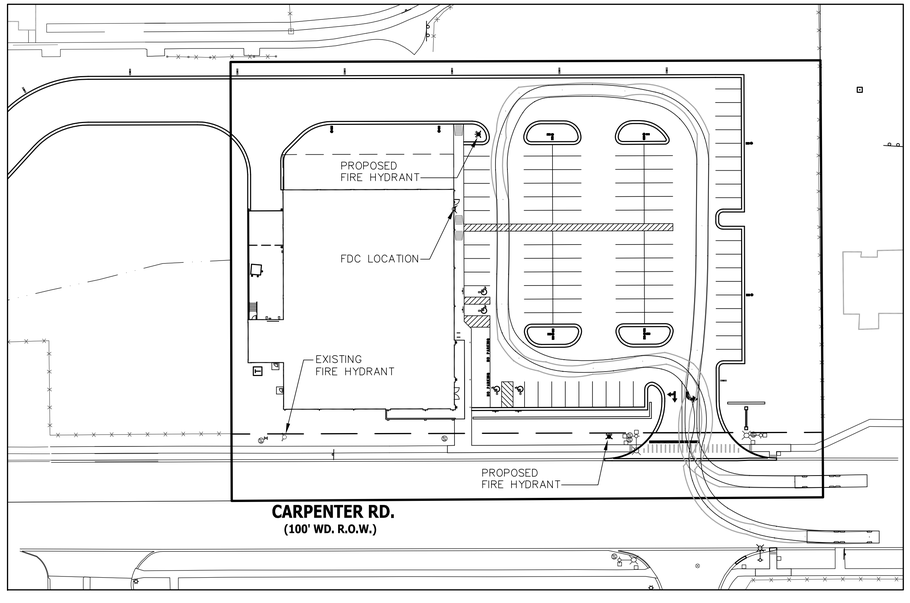
31-LT3



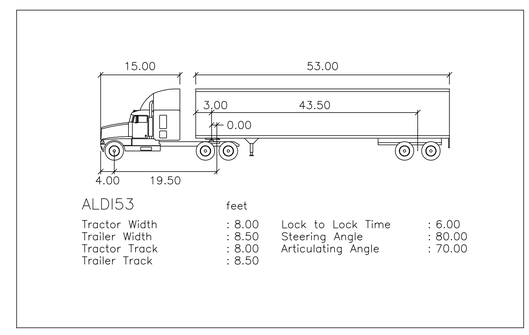
DELIVERY TRUCK IN

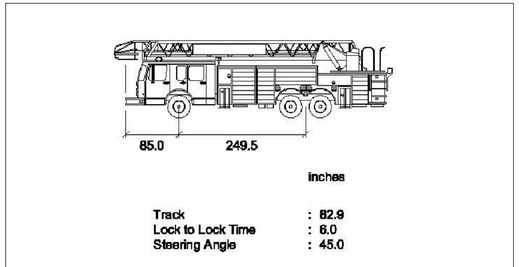


DELIVERY TRUCK OUT



FIRE TRUCK CIRCULATION





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

3 WORKING DAYS
BEFORE YOU DIG
CALL 811 OR 1-800-482-7171
(TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	11-06-17	REVISED PER TOWNSHIP REVIEW COMMENTS
2	12-20-17	REVISED PER TOWNSHIP REVIEW COMMENTS
3	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
4	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
5	12-19-18	REVISED BUILDING PER CLIENT REQUEST

REVISION #	DATE	REVISION-DESCRIPTION

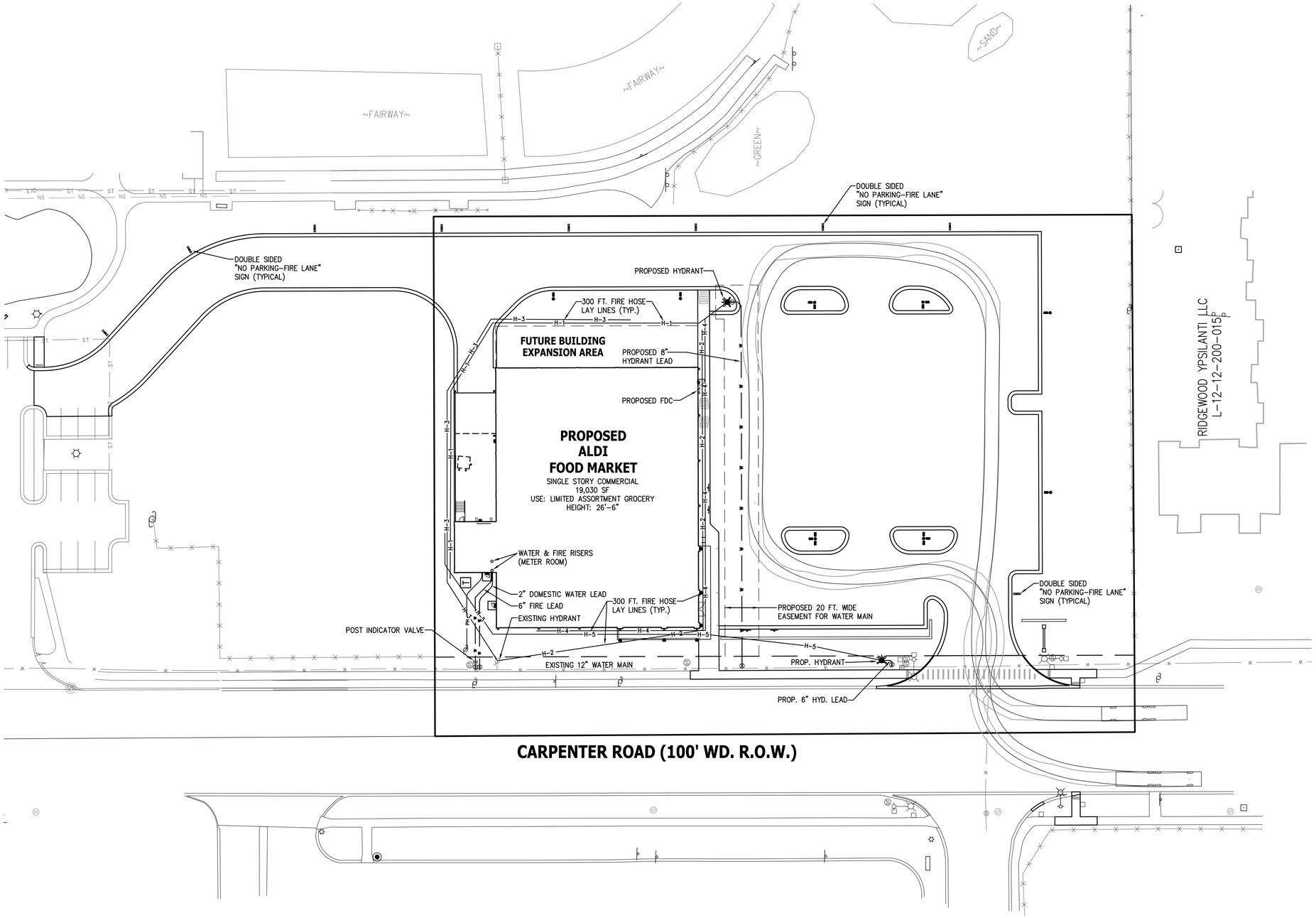
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

TRUCK CIRCULATION PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=50'
PROJECT No.: 9162803
DWG NAME: 2803-TRUCK
ISSUED: DEC. 19, 2018

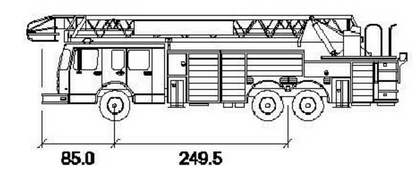
32-TR



GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 INCH = 30 FEET



inches

Track	: 82.9
Lock to Lock Time	: 6.0
Steering Angle	: 45.0

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

3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171
(TOLL FREE)
OR VISIT CALL811.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
2	05-01-18	REVISED FIRE LANE SIGN LOCATION TO AVOID UTILITY CONFLICT
3	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
4	08-28-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
5	10-31-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS
6	12-19-18	REVISED BUILDING PER CLIENT REQUEST

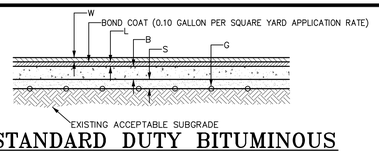
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

FIRE PROTECTION PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=30'
PROJECT No.: 9162803
DWG NAME: 2803-FIRE
ISSUED: DEC. 19, 2018

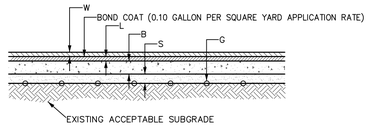
33-FP



STANDARD DUTY BITUMINOUS PAVEMENT CROSS SECTION

NOT TO SCALE

KEY	DESCRIPTION	MATERIAL SPECIFICATION	MINIMUM COMPACTED THICKNESS
W	WEARING COURSE	MDOT 4E3 OR 1100T	1.5"
L	LEVELING COURSE	MDOT 13A	2.0"
B	AGGREGATE BASE	MDOT 21AA	8"
S	GRANULAR SUBBASE	MDOT CLASS II	12"
G	GEOGRID	N/A	N/A



HEAVY DUTY BITUMINOUS PAVEMENT CROSS SECTION

NOT TO SCALE

KEY	DESCRIPTION	MATERIAL SPECIFICATION	MINIMUM COMPACTED THICKNESS
W	WEARING COURSE	MDOT 4E3 OR 1100T	2.0"
L	LEVELING COURSE	MDOT 13A	2.5"
B	AGGREGATE BASE	MDOT 21AA	10"
S	GRANULAR SUBBASE	MDOT CLASS II	12"
G	GEOGRID	N/A	N/A

BITUMINOUS PAVEMENT CROSS SECTION NOTES:

1. The construction specifications of the Local Municipality are a part of this work. Refer to the General Notes and the Bituminous Pavement Cross Section Details on the Project Plans for additional requirements. Construction of the bituminous pavement cross section is subject to inspection by the ALDI Representative and/or Project Engineer. The Contractor shall be responsible for contacting the ALDI Representative at each stage of construction of the bituminous pavement cross section to schedule the necessary inspections.

2. The Geotechnical Evaluation Report for the project site is a part of this work. The General Contractor, Earthwork Subcontractor, and Bituminous Pavement Subcontractor shall obtain, review, and become familiar with the Geotechnical Evaluation Report.

3. The bituminous pavement cross section specifications are based on typical weather conditions during the June through September Construction Season. If the bituminous parking area and/or bituminous driveways are to be constructed during any other time of the year and/or if weather conditions are unseasonably wet, then modifications to the bituminous pavement cross section specifications may be necessary. If either of these conditions exists, then contact Material Testing Engineer and/or the Project Engineer for additional requirements.

4. The existing subgrade soils shall be prepared in accordance with the Geotechnical Evaluation Report. Unsuitable soils found within the 1 on 1 influence zone of the proposed pavement areas, such as muck, peat, topsoil, marl, silt or other unstable materials shall be excavated and replaced with structural fill. Structural fill shall be MDOT Class II granular material placed in accordance with the General Notes on the Project Plans and the Geotechnical Evaluation Report.

5. The bituminous pavement subgrade shall be prepared and proof rolled in accordance with the Geotechnical Evaluation Report. The Material Testing Engineer and/or the Project Engineer shall observe the subgrade proof roll. Areas of subgrade that do not pass a proof roll inspection shall be undercut in accordance with the Subgrade Undercut Notes and Details on the Project Plans. Alternative means of subgrade stabilization may be considered when recommended by the Material Testing Engineer. Alternative methods shall not be performed without receipt of the Owner's Authorization.

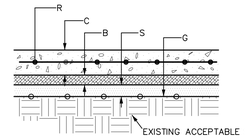
6. The bituminous pavement granular subbase material shall be MDOT Class II sand. No granular subbase material substitutions shall be permitted without prior written approval of the Project Engineer and receipt of the Owner's Authorization. The granular subbase shall be compacted to a minimum of 95% of the maximum unit weight, Modified Proctor.

7. The bituminous pavement aggregate base material shall be MDOT 21AA crushed angular limestone or crushed angular natural stone aggregate material. Crushed concrete shall NOT be utilized for the standard or heavy duty bituminous pavement aggregate base. No aggregate base material substitutions shall be permitted without prior written approval of the Project Engineer and receipt of the Owner's Authorization. The aggregate base shall be compacted to a minimum of 95% of the maximum unit weight, Modified Proctor.

8. The bituminous pavement leveling course material shall be MDOT 13A bituminous material placed in 1 lift. The bituminous pavement wearing course material shall be MDOT 4E3 or MDOT 1100T bituminous material placed in 1 lift. The bituminous pavement leveling and wearing courses shall NOT be combined into a single course. No bituminous material substitutions shall be permitted without prior written approval of the Project Engineer and receipt of the Owner's Authorization. Compaction of the leveling course shall be achieved prior to placement of the wearing course. Any sediment, soil, debris and other foreign materials that accumulate on the leveling course shall be removed prior to placement of the wearing course. The bond coat shall be sprayed on the leveling course within 24 hours of placement of the wearing course. The bituminous pavement material shall be compacted to a minimum of 95% of the 50-blow Marshall Density.

9. Placement of the bituminous pavement leveling course and bituminous pavement wearing course shall be performed in two separate mobilizations. Placement of the bituminous pavement wearing course shall be postponed as directed by the General Contractor and/or the Owner until the majority of the construction activities are complete. Repair of the bituminous leveling course may be necessary due to construction traffic and/or any delay in placement of the bituminous wearing course. The bituminous leveling course shall be repaired as directed by Material Testing Engineer and/or Owner prior to placement of the bituminous wearing course.

10. Bituminous mix designs shall be developed in accordance with the MDOT HMA Production Manual. The Contractor shall submit the bituminous pavement mix designs to the Material Testing Engineer for review and approval a minimum of 3 business days prior to use. Bituminous pavement work shall not commence without receipt of the Material Testing Engineer's approval of the bituminous mix designs. The bituminous pavement mix design shall be a virgin mix. RAP mixtures shall not be utilized without prior written approval of the Material Testing Engineer and receipt of the Owner's authorization. RAP mixtures, if authorized, shall be designed and produced in accordance with MDOT Tier I or Tier II RAP Mixture Specifications. In no instance shall MDOT Tier III or non-MDOT RAP mixtures be permitted or utilized.



HEAVY DUTY CONCRETE PAVEMENT CROSS-SECTION

NOT TO SCALE

KEY	DESCRIPTION	MATERIAL SPEC.	MIN. THICKNESS
R	REINFORCEMENT	SEE NOTE 8	SEE NOTE 8
C	CONCRETE	MDOT P1-1A - 6 SACK	8"
B	AGGREGATE BASE	N/A	N/A
S	GRANULAR SUBBASE	MDOT CLASS II	12"
G	GEOGRID	N/A	N/A

CONCRETE PAVEMENT CROSS SECTION NOTES:

1. The construction specifications of the Local Municipality are a part of this work. Refer to the General Notes and the Heavy Duty Concrete Pavement Cross Section Detail on the Project Plans for additional requirements. Construction of the concrete pavement cross section is subject to inspection by the ALDI Representative and/or Project Engineer. The Contractor shall be responsible for contacting the ALDI Representative at each stage of construction of the concrete pavement cross section to schedule the necessary inspections.

2. The Geotechnical Evaluation Report for the project site is a part of this work. The General Contractor, Earthwork Subcontractor and Concrete Pavement Subcontractor shall obtain, review and become familiar with the Geotechnical Evaluation Report.

3. The concrete pavement cross section specifications are based on typical weather conditions during the June through September Construction Season. If the concrete pavement areas are to be constructed during any other time of the year and/or if weather conditions are unseasonably wet, then modifications to the concrete pavement cross section specifications may be necessary. If either of these conditions exists, then contact the Material Testing Engineer and/or the Project Engineer for additional requirements.

4. The existing subgrade soils shall be prepared in accordance with the Geotechnical Evaluation Report. Unsuitable soils found within the 1 on 1 influence zone of the proposed pavement areas, such as muck, peat, topsoil, marl, silt or other unstable materials shall be excavated and replaced with structural fill. Structural fill shall be MDOT Class II granular material placed in accordance with the General Notes on the Project Plans and the Geotechnical Evaluation Report.

5. The concrete pavement subgrade shall be prepared and proof rolled in accordance with the Geotechnical Evaluation Report. The Material Testing Engineer and/or the Project Engineer shall observe the subgrade proof roll. Areas of subgrade that do not pass a proof roll inspection shall be undercut in accordance with the Subgrade Undercut Notes and Details on the Project Plans. Alternative means of subgrade stabilization may be considered when recommended by the Material Testing Engineer. Alternative methods shall not be performed without receipt of the Owner's Authorization.

6. The concrete pavement compacted subbase material shall be MDOT Class II granular material. No subbase material substitutions shall be permitted without prior written approval of the Project Engineer and receipt of the Owner's Authorization. The subbase shall be compacted to a minimum of 95% of the maximum unit weight, Modified Proctor.

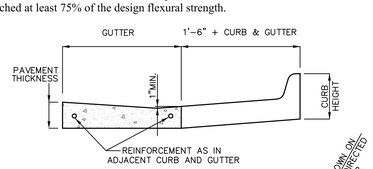
7. Concrete material shall be MDOT P1 (I-A) 6.0 sack concrete pavement mixture with a minimum 28 day design compressive strength of 4,000 PSI and 6.5% (+/-1.5%) entrained air. The Contractor shall submit concrete mix design and aggregate mechanical analysis report to the Material Testing Engineer for review and approval prior to use.

8. Heavy Duty Concrete Pavement placed within the Truck Well only shall be Reinforced with epoxy coated deformed #5 bars at 12" on center each way placed at mid-depth of the concrete, unless noted otherwise on the Project Structural Plans.

9. Install transverse contraction joints and longitudinal contraction joints at the locations specified on the Project Structural Plans. Joints shall be 2" deep, unless noted otherwise on the Project Structural Plans. Tool joints in fresh concrete or saw cut within 4 hours after placement with soft cut saws.

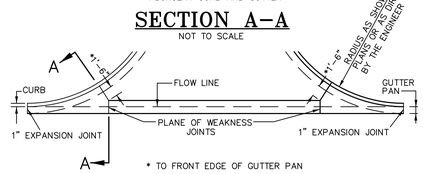
10. Provide 1" asphalt fiber control joint between concrete pavement and all other concrete structures such as concrete building foundations, concrete curb and concrete sidewalks.

11. The Concrete Pavement shall not be exposed to vehicular traffic until the concrete has reached at least 75% of the design flexural strength.



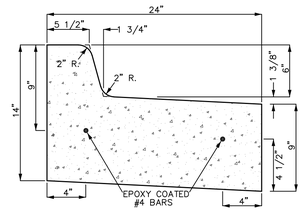
SECTION A-A

NOT TO SCALE



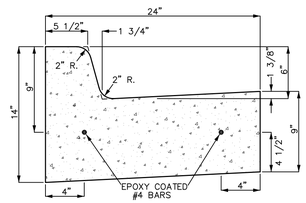
CONCRETE DRIVEWAY OPENING - MDOT DETAIL "M"

NOT TO SCALE



MDOT TYPE F4 CURB REVERSE PITCH

NOT TO SCALE



MDOT TYPE F4 CURB

NOT TO SCALE

CONCRETE CURB NOTES:

1. Refer to the project plans for the proposed locations of the specific curb types.

2. The construction specifications of the appropriate Local Municipality are a part of this work. Refer to the General Notes and Curb Cross Section Details on the project plans for additional requirements.

3. Extend the base and/or subbase material of the appropriate adjacent pavement cross-section horizontally to 1 foot behind the back of curb. Concrete curb shall be constructed on no less than 6" of combined depth of compacted base/subbase material.

4. Concrete material shall be MDOT P1 (I-A) 6.0 sack concrete pavement mixture with a minimum 28 day design compressive strength of 4,000 PSI and 6.5% (+/-1.5%) entrained air. Contractor shall submit concrete mix design and aggregate mechanical analysis report to the Local Municipality and Engineer for review and approval prior to use.

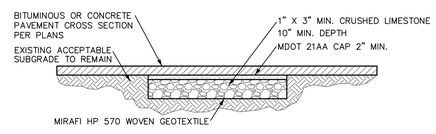
5. Install transverse contraction control joints in concrete curb with 1" minimum depth at 10' on center. Tool joints in fresh concrete or saw cut within 8 hours.

6. Install transverse expansion control joints in concrete curb as follows: 400' maximum on center, at spring points of intersecting streets and within 10' on each side of catch basins. Transverse expansion control joints shall be 1" thick asphalt fiber joint filler matching entire curb cross section.

7. Provide 1" asphalt fiber control joint between back of curb and all other concrete structures, such as concrete sidewalks and concrete driveways.

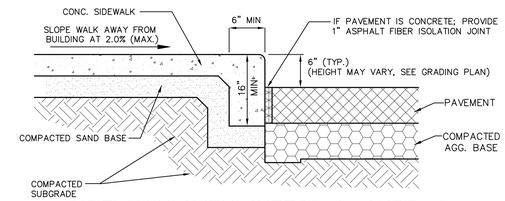
8. Curb Contractor shall provide final adjustment of catch basin castings in curb line. Castings shall be tuck pointed to structure water tight with concrete or mortar inside and outside of casting.

9. Install curb cuts for all existing and proposed sidewalks and pedestrian ramps in accordance with the American Disabilities Act and the Barrier Free Design requirements of the appropriate Local, County and/or State Agency. Refer to MDOT Standard Plan R-28, latest revision. Install curb cuts for all existing and proposed vehicular ramps and drives as noted on the project plans.



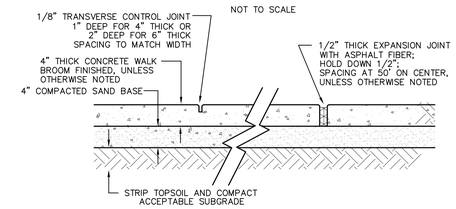
SUBGRADE UNDERCUT AND REPLACEMENT CROSS-SECTION

NOT TO SCALE



SIDEWALK WITH INTEGRAL CURB & ISOLATION JOINT DETAIL

NOT TO SCALE



SIDEWALK CROSS SECTION

NOT TO SCALE

SIDEWALK CROSS SECTION NOTES:

1. The construction specifications of the Local Municipality are a part of this work. Refer to the General Notes and the Sidewalk Cross Section Details on the Project Plans for additional requirements.

2. Sidewalk widths may vary. See the Project Plans for the proposed sidewalk width at each location. Increase sidewalks to 6" minimum thickness at driveways and other areas exposed to vehicular traffic.

3. The existing subgrade soils shall be prepared prior to placement of the granular subbase. Unsuitable soils found within the 1 on 1 influence zone of the proposed sidewalk areas, such as muck, peat, topsoil, marl, silt or other unstable materials shall be excavated and replaced with structural fill. Structural fill shall be MDOT Class II granular material placed in accordance with the General Notes on the Project Plans.

4. The sidewalk compacted subbase material shall be MDOT CL II sand. No subbase material substitutions shall be permitted without prior written approval of the Project Engineer and receipt of the Owner's Authorization. The subbase shall be compacted to a minimum of 95% of the maximum unit weight, modified proctor.

5. Concrete material shall be MDOT P1 (I-A) 6.0 sack concrete pavement mixture with a minimum 28 day design compressive strength of 4,000 PSI and 6.5% (+/-1.5%) entrained air. The Contractor shall submit the concrete mix design and aggregate mechanical analysis report to the Material Testing Engineer and/or Project Engineer for review and approval prior to use.

6. Install transverse contraction control joints in accordance with the Sidewalk Cross Section Detail. Space contraction control joints to match sidewalk width, but no greater than 10' on center. Tool joints in fresh concrete or saw cut within 8 hours.

7. Install transverse expansion control joints in accordance with the Sidewalk Cross Section Detail. Space expansion control joints at 50 feet on center maximum. Transverse expansion control joints shall be 1/2" thick asphalt fiber joint filler matching entire sidewalk cross section.

8. Provide 1" asphalt fiber control joint between concrete sidewalks and all other concrete structures, such as concrete building foundations, concrete curb and concrete driveways.

9. Construct all Barrier Free Sidewalk Ramps in accordance with the American Disabilities Act and the Barrier Free Design Requirements of the appropriate Local, County or State Agency with jurisdiction over the project. Refer to MDOT Standard Plan R-28, latest revision.

10. The Concrete Pavement shall not be exposed to vehicular traffic until the concrete has reached at least 75% of the design flexural strength.

PAVEMENT SUBGRADE UNDERCUT NOTES:

1. Areas of pavement subgrade that do not pass a proof roll inspection shall be undercut when directed by the Material Testing Engineer and/or Project Engineer. All undercut work shall be witnessed and field measured by the Material Testing Engineer and/or Project Engineer. Copies of the field notes depicting the field measurements of the undercut areas shall be provided to the General Contractor and/or Earthwork Subcontractor and ALDI Inc.

2. Undercut areas shall be excavated to a depth of 12" below the proposed subgrade elevation using an Excavator or Backhoe with a Smooth Edged Ditching Bucket so as not to scarify the underlying soils. Undercut areas shall remain free of all construction traffic and equipment to avoid rutting and/or tracking of the underlying soils.

3. Mirafi HP 570 Woven Geotextile Fabric (or approved equal) shall be placed over all undercut areas per the Manufacturer's specifications. Overlap all seams a minimum of 12" unless specified otherwise by the Manufacturer.

4. Backfill the undercut areas with 1" x 3" minimum size crushed angular limestone and cap with 21AA crushed angular limestone up to the proposed subgrade elevation. Crushed concrete material shall NOT be substituted for crushed limestone material. The backfill material shall be spread with a Wide Track Dozer to minimize loading on the underlying soils. Static roll the backfill material with a large smooth drum roller.

5. Construct the appropriate Bituminous or Concrete Pavement Cross Section over the undercut areas per the Project Plans.

6. The General Contractor and/or Earthwork Subcontractor shall provide ALDI Inc with unit pricing to perform subgrade undercut work per square yard (SY) of undercut area. Undercut Unit Pricing SHALL include excavation, loading, hauling and offsite disposal of excess spoils, placement of geotextile fabric and backfill including all labor, equipment and materials necessary to complete pavement subgrade undercut work as specified on the Project Plans.

GENERAL NOTES:

1. Contractor shall perform the work in accordance with the requirements of the appropriate Local, County and State Agencies and all other Government and Regulatory Agencies with jurisdiction over the project. Contractor shall notify the appropriate Agencies in advance of each stage of work in accordance with each Agency's requirements.

2. Contractor shall comply with all permit, insurance, licensing and inspection requirements associated with the work. Prior to construction, Contractor and Owner/Developer shall determine who is responsible for obtaining each required permit. Contractor shall verify that the each required permit has been obtained prior to commencement of the stage of work associated with the required permit(s).

3. Contractor shall furnish liability insurance and property damage insurance to save harmless the Owner, Developer, Architect, Engineer, Surveyor and Government Agencies for any accident occurring during the construction period. Refer to the appropriate Local, County and State Agencies for additional requirements. Copies of insurance certifications shall be made available to the Owner/Developer.

4. Contractor shall conduct and perform work in a safe and competent manner. Contractor shall perform all necessary measures to provide for traffic and pedestrian safety from the start of work and through substantial completion. Contractor shall determine procedures and provide safety equipment such as traffic controls, warning devices, temporary pavement markings and signs as needed. Contractor shall comply with the safety standards of the State Department of Labor, the occupational health standards of the State Department of Health and safety regulations of the appropriate Local, County, State and Federal Agencies. Refer to the safety specifications of the appropriate Regulatory Agencies. The Contractor shall designate a qualified employee with complete job site authority over the work and safety precautions; said designated employee shall be on site at all times during the work.

5. Contractor shall coordinate scheduling of all work in the proper sequence, including work by Subcontractors. Additional costs due to improper planning by Contractor or work done out of sequence as determined by standard acceptable construction practices, shall be Contractor's responsibility.

6. Contractor shall contact the 811 Public Underground Utility Locating System or other appropriate local underground utility locating Agency, a minimum of three (3) working days prior to construction. Existing utility information on the project plans may be from information disclosed to this firm by the Utility Companies, Local, County or State Agencies, and/or various other sources. No guarantee is given as to the completeness or accuracy thereof. Prior to construction, locations and depths of all existing utilities (in possible conflict with the proposed improvements) shall be verified in the field.

7. Contractor shall coordinate scheduling a Pre-Construction Meeting with Engineer prior to commencement of work.

8. The Local Municipality, County and/or State in which the project is located may require an Engineer's Certification of construction of the proposed site improvements. Contractor shall verify the certification requirements with Engineer prior to commencement of work. Contractor shall coordinate construction staking, testing, documentation submittal and observation with the appropriate Agency, Surveyor and/or Engineer as required for Engineer's Certification and Government Agency Acceptance. All materials used and work done shall meet or exceed the requirements of certification and acceptance, the contract documents and the material specifications noted on the project plans. Any materials used or work done that does not meet said requirements, contract documents and/or specifications shall be replaced and/or redone at Contractor's expense. The Owner/Developer may wait for test results, certifications and/or Agency reviews prior to accepting work.

9. Engineer may provide subsurface soil evaluation results, if available, to Contractor upon request. Subsurface soil evaluation results, soils maps and/or any other documentation does NOT guarantee existing soil conditions or that sufficient, acceptable on-site granular material is available for use as structural fill, pipe bedding, pipe backfill, road subbase or use as any other granular material specified on the project plans. On-site granular material that meets or exceeds the material specifications noted on the project plans may be used as structural fill, pipe bedding, pipe backfill and/or road subbase material. On-site granular material shall be stockpiled and tested as acceptable to the appropriate Agency and/or Engineer prior to use.

10. During the performance of their work, Contractor shall be solely responsible for determining soil conditions and appropriate construction methods based on the actual field conditions. Contractor shall furnish, install and maintain sheeting, shoring, bracing and/or other tools and equipment and/or construction techniques as needed for the safety and protection of the workers, pedestrians and vehicular traffic and for protection of adjacent structures and site improvements.

11. Contractor shall install temporary and permanent soil erosion and sedimentation control devices at the appropriate stages of construction in accordance with the appropriate regulatory Agencies. Refer to Soil Erosion and Sedimentation Control Plans and Notes on the project plans.

12. Structural fill shall be placed as specified on the project plans and within the 1 on 1 influence zone of all structures, paved areas and other areas subject to vehicular traffic. Structural fill shall be placed using the controlled density method (12" maximum lifts, compacted to 95% maximum unit weight, modified proctor). Fill material shall meet or exceed the specifications noted on the project plans or as directed by Engineer when not specified on the project plans.

13. All existing monuments, property corners, ground control and benchmarks shall be protected and preserved; and if disturbed by Contractor, shall be restored at Contractor's expense. Contractor shall notify Surveyor of any conflicts between existing monuments, property corners, ground control and/or benchmarks and the proposed site improvements.

14. Contractor shall notify Owner/Developer and Engineer immediately upon encountering any field conditions, which are inconsistent with the project plans and/or specifications.

15. When noted on the project plans for demolition and/or removal, Contractor shall remove existing structures, building and debris and recycle and/or dispose of in accordance with Local, County, State and Federal regulations.

16. Contractor shall remove excess construction materials and debris from site and perform restoration in accordance with the project plans and specifications. Disposing of excess materials and debris shall be performed in accordance with Local, County, State and Federal regulations.

17. Construction access to the site shall be located as acceptable to the Owner/Developer and to the appropriate Local, County and/or State Agency with jurisdiction over the road(s) providing access to the site. Construction access shall be maintained and cleaned in accordance with the appropriate Local, County and/or State Agencies and as directed by Owner/Developer and/or Engineer.

18. Contractor shall take necessary precautions to protect all site improvements from heavy equipment and construction procedures. Damage resulting from Contractor actions shall be repaired at Contractor's expense.

811 Know what's below. Call before you dig.
3 WORKING DAYS BEFORE YOU DIG
CALL 811 OR 1-800-482-7171 (TOLL FREE)
OR VISIT CALL811.COM

DESIGNE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	12-20-17	REVISED BITUMINOUS PAVEMENT CROSS SECTION NOTES
2	01-26-18	REVISED PER WCRC REVIEW COMMENTS
3	04-16-18	REVISED PER WCWRC REVIEW COMMENTS
4	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS

REVISION #	DATE	REVISION-DESCRIPTION

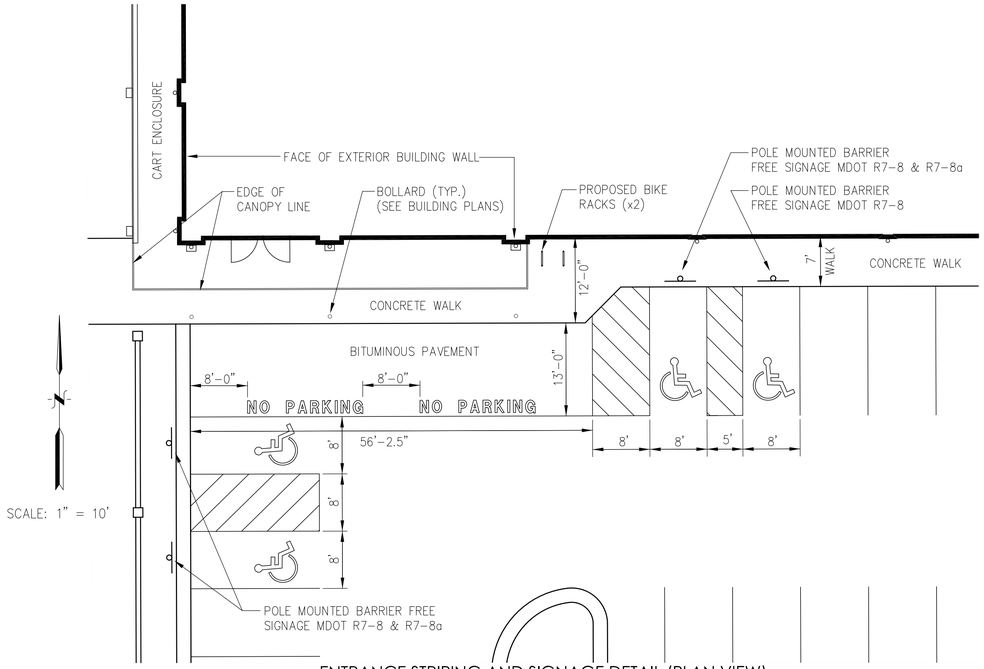
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

SITE PAVEMENT NOTES & DETAILS

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

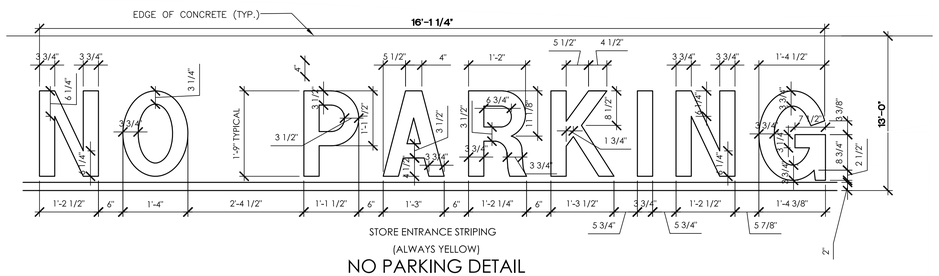
SCALE: NO SCALE
PROJECT No.: 9162803
DWG NAME: 2803 DT
ISSUED: JULY 02, 2018

34-DT1

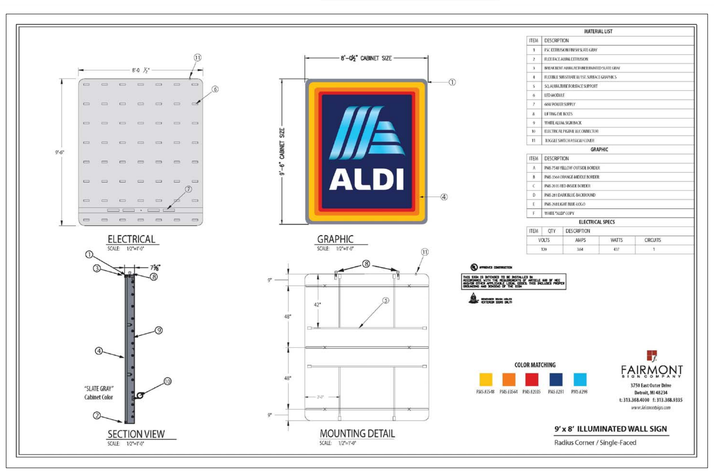


ENTRANCE STRIPING AND SIGNAGE DETAIL (PLAN VIEW)

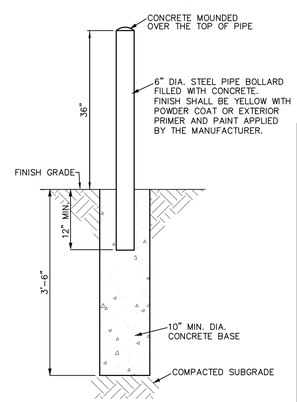
SCALE: 1IN = 10FT



NO PARKING DETAIL



WALL SIGN CABINET DETAIL



GUARD POST DETAIL

NOT TO SCALE

NOTE:
FOR USE AT PROPOSED TRANSFORMER & FIRE HYDRANT LOCATIONS ONLY.
SEE BUILDING PLANS FOR BOLLARD SPECIFICATIONS FOR ALL OTHER LOCATIONS.

MAINTENANCE-FREE BIKE RACKS

Easy to install, environmentally safe, nontoxic, and available in unlimited colors in matte or high-gloss finish. S&G Bike Racks are built to withstand the rigors of hard outdoor use yet aesthetically pleasing in any environment. Our bike racks are made from structural grade steel pipe coated with durable, weather-resistant PVC.

Material: 1 ½ Schedule 40 1.90 O.D. **Coating**: PVC Thermoplastic over Thermoset Vinyl Primer

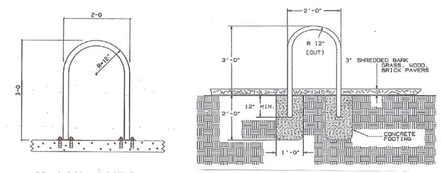
Excellent Resistance to:

Weather Acid Alkali Impact Abrasion Mildew

Installation Options

SURFACE MOUNT
Secured with two steel flange bases and three anchors at each base.

IN GROUND MOUNT
Secured using concrete footings.



Model No. 2447-S **Model No. 2447**

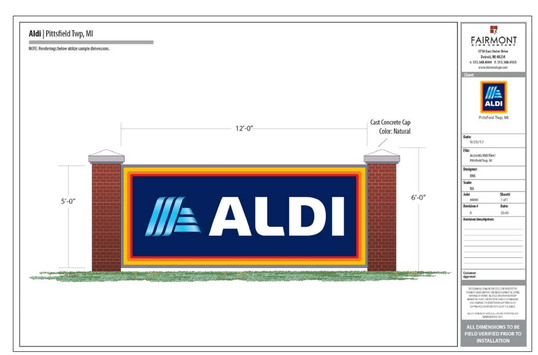
How to Specify Bike Racks

Bike racks to be Model No. 2447-S as manufactured by S&G Products, Dexter, Michigan (517-546-9240). 1 ½ " SCHD 40 PIPE (1.90" O.D.), rolled in the shape of an inverted "U" to a 12" outside radius standing 3' high with legs parallel in both planes. Mounting flanges to have minimum three holes for attachment. Coating to be polyvinyl chloride thermoplastic over a thermoset vinyl primer to ensure a complete crosslink bond. Thickness to be a minimum of 100 mils. Color selection by owner.

Bike racks to be Model No. 2447 as manufactured by S&G Products, Dexter, Michigan (517-546-9240). 1 ½ " SCHD 40 PIPE (1.90" O.D.), rolled in the shape of an inverted "U" to a 12" outside radius standing 4' high with legs parallel in both planes. Coating to be polyvinyl chloride thermoplastic over a thermoset vinyl primer to ensure a complete crosslink bond. Thickness to be a minimum of 100 mils. Color selection by owner.

S & G Products
2055 N. Lima Center Rd, Dexter, Michigan 48130
PO Box 615, Manchester, Michigan 48158
Phone (517)546-9240 Fax (517)546-9720
Email: sales@sgfabricators.com
Website: sandgproducts.com

NOTE:
SEE SHEET C3.0 FOR PROPOSED BIKE RACK LOCATIONS



MONUMENT SIGN DETAIL

NOT TO SCALE

SEE SHEET A-507 WITHIN BUILDING PLANS FOR MONUMENT SIGN FOUNDATION DETAILS

SIGNAGE AND PAVEMENT MARKING NOTES:

1. Pavement markings shall be in accordance with the type, color, size and locations shown on the plans. If the information on the plans is not complete and the authority having jurisdiction does not have specific requirements, then use the following: Paint shall be supplied in accordance with AASHTO: M 248 latest addition. Colors shall be as follows: (YELLOW- parking stalls, loading zones, parking islands, no parking zones and fire lanes) (WHITE - stop bars, pedestrian crossings, lane demarcations, directional arrows and lettering) (BLUE - handicap parking stalls and symbols). Stripe widths shall be as follows: (4" - parking spaces, driveway lanes, barrier free loading zones and no parking zones) (12" - crosswalks) (24" - stop bars).

2. The pavement shall be clean and free of dirt, dust, moisture, oils and other foreign materials at time of marking application. Any old pavement markings shall be removed unless paints are compatible and overlay identically. The surface of the pavement prior to application shall be a minimum of 45 degrees F and rising unless the Manufacturer's recommendations are greater.

3. The signage shall be in accordance with the type, color, size and locations shown on the plans in accordance with AASHTO M268. The signage shall be provided in accordance with the Local Municipality and the Michigan Manual of Uniform Traffic Devices latest edition.

4. Posts, brackets and frames shall be steel per ASTM A-36, A-242, A-441, A-572, A588, Grade 50 and hot dip galvanized in accordance with ASTM A123. All cutting, drilling and/or other pole modifications shall be painted with galvanizing paint. All mounting hardware shall be stainless steel.

5. Sign post footings shall be a minimum of 3'-6" deep and 8" in diameter unless poor soils or frost conditions require greater depth and/or diameter. Sign posts shall be kept plumb, 6 inches off the bottom of footing excavation and centered as 3000-psi concrete is placed under and around the sign post. The overall sign and post system should be able to withstand 33 pounds per square foot. All signs located in paved areas or with less than 3 feet of clearance between the centerline of sign post and the back of curb and/or edge of pavement shall be installed in a pipe bollard. Pipe bollards shall be 6" diameter schedule 40 steel pipe. Pipe bollards shall be filled with concrete that is rounded at the top of the bollard. Bollards shall be painted traffic yellow. Increase the sign post footing diameter to 14" minimum for pipe bollards and embed the bollard into the concrete footing a minimum of 3 feet below proposed finish grade.

6. Signs shall not be mounted on posts until after concrete has cured for a minimum of seven days or ¾ strength is achieved.

7. All barrier free striping and signage shall meet the Americans with Disabilities Act (ADA) requirements.

8. All Fire Lane signs shall have a Red Border and Red Letters on White Background. All Fire Lane signs shall be Reflective. Fire lane striping and signage shall meet the requirements of the Local Building Inspector and Fire Department.

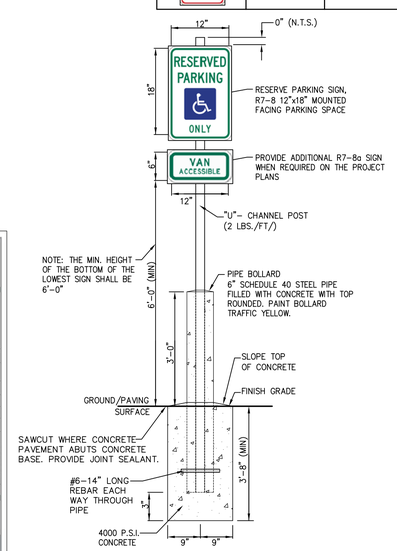
9. "Mounting Height" shall be the minimum height of the bottom of the sign above finish grade. When signs are located downhill from the roadway, driveway and/or parking area, then the "Mounting Height" shall be the height of the bottom of the sign above the top of pavement finish grade at the nearest edge of pavement adjacent to the sign.

10. All Traffic Control and Fire Lane signs shall be installed at 3 feet behind the back of curb (and/or edge of pavement) to the centerline of the sign post unless noted otherwise on the project plans.

11. The Contractor(s) and/or Subcontractor(s) responsible for installation of the sign posts shall contact the 811 Public Underground Utility Locating System a minimum of three (3) working days prior to installation of the signposts. Install the sign posts in the locations specified on the project plans. When underground utilities conflict with the proposed sign post locations, field adjust the sign locations the minimum amount necessary to safely clear the underground utilities. Maintain a minimum of 2 feet of clearance between the edge of sign and the back of curb and/or edge of sidewalk.

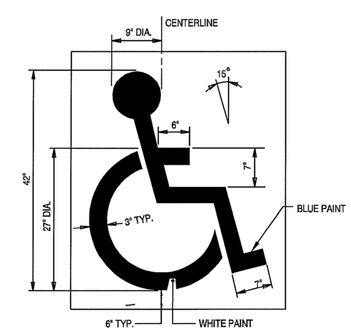
SIGN SCHEDULE

SIGN	KEY	SIZE (W x H)	TYPE OR MOUNT	MOUNTING HEIGHT	QUANTITY
RESERVED PARKING ONLY	R7-8	12" x 18"	POST MOUNTED	7'-6"	4
			BUILDING MOUNTED	7'-6"	0
VAN ACCESSIBLE	R7-8a	12" x 6"	BUILDING MOUNTED	7'-0"	3
STOP	R1-1	30" x 30"	POST MOUNTED	7'-0"	0
NO PARKING FIRE LANE	FIRE LANE	12" x 18"	POST MOUNTED	7'-0"	18



BARRIER FREE PARKING SIGN DETAIL

NOT TO SCALE



HANDICAP PARKING STRIPING DETAIL

N.T.S.

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	11-06-17	REVISED PER TOWNSHIP REVIEW COMMENTS
2	12-20-17	REVISED PER TOWNSHIP REVIEW COMMENTS
3	05-01-18	REVISED SIGN SCHEDULE

REVISION #	DATE	REVISION-DESCRIPTION

ALDI FOOD MARKET
PITTSFIELD TOWNSHIP, MI

SIGNAGE & PAVEMENT MARKING NOTES & DETAILS

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: NO SCALE
PROJECT No.: 9162803
DWG NAME: 2803 DT
ISSUED: JULY 02, 2018

35-DT2

Earthwork

1.00 GENERAL

1.01 DESCRIPTION

A. The CONTRACTOR shall perform all excavation and backfilling necessary to complete the work. This shall include the excavation of earth and rock, the removal and disposal of unsuitable material, dewatering, placement of suitable fill and backfill material, pipe boring and jacking, all quality assurance testing, and the restoration and final grading for all earth surfaces.

1.02 WORK WITHIN RIGHTS-OF-WAY

A. Where the governmental bodies having jurisdiction of the streets or rights-of-way have specific specifications relating to the requirements for work within their jurisdiction, such requirements must be met as a minimum requirement, and if these Specifications impose further limitation on the work, they shall also be met as the required work standard.

B. During all operations of the CONTRACTOR in the streets and roadways, the CONTRACTOR shall maintain barricades, lights, and warning signs as required by the agency having jurisdiction.

1.03 WORK WITHIN EASEMENTS

A. During construction within any easements, the CONTRACTOR shall confine himself to the limits shown on the Plans. He shall notify property owners in advance of moving equipment on easements and use of the access routes which will be designated by the OWNER. The OWNER will cooperate in working out the details of access. The topsoil over the trench shall be removed and carefully replaced upon completion of the work. The backfill of the trench in the easement may be left slightly high to provide for any slight residual settlement. Any trees, shrubs, or bushes removed shall be replaced to the satisfaction of the property owner.

1.04 SOIL BORINGS

A. Soil boring results, if taken on a site, are appended to these Specifications with locations noted. Boring logs are shown to be generally representative of the site and to assist in the design and construction of the work.

2.00 PRODUCTS

2.01 BACKFILL MATERIAL

A. For areas not requiring "granular backfill" material, backfill shall be of the excavated material, with the exception that materials such as soft clay, topsoil, muck, cinders, vegetable matter, refuse, boulders and other objectionable and non-packing earth shall be excluded from the backfill and removed from the site. Stone larger than 3 inches in any dimension shall be excluded from the backfill and removed from the site by the CONTRACTOR.

B. Where "granular material" backfill is required as specified herein, backfill material shall be defined as a material meeting granular material Class II as defined in 2003 MDOT 902.08.

C. All utilities within road right-of-way corridor (existing or proposed) shall be backfilled with MDOT CL II granular material compacted to 95% maximum unit weight.

D. All utilities shall be installed with 2 NS sand bedding or better.

2.02 ENCASING PIPE

A. Steel encasing pipe for boring and jacking shall conform to the requirements of either, ASTM A53, Type E or S, Grade B or ASTM A139, Grade B.

B. Steel encasing pipe used under channels and highways shall meet the requirements of the governmental agency having jurisdiction and the following minimum requirements:

Nominal Diameter (Inches)	Maximum Wall Thickness
Under 13	0.188 inches
13-24	0.250 inches
25-36	0.312 inches
42	0.438 inches
48	0.500 inches
54	0.563 inches

C. Steel encasing pipe used under railroads shall meet the requirements of the railroad and the following minimum requirements:

	Minimum Wall Thickness (inches)	
Nominal Diameter (Inches)	Coated or Cathodically Protected	Uncoated & Unprotected
Under 14	0.180	0.251
14-16	0.219	0.282
18	0.250	0.313
20	0.281	0.344
22	0.312	0.375
24	0.344	0.407
26	0.375	0.438
28-30	0.406	0.469
32	0.438	0.501
34-36	0.469	0.532
38-42	0.500	0.563
48	0.563	0.626

D. Casing pipe joints shall be welded to form a leak-proof continuous casing.

E. The inside diameter of casing pipe shall be at least 2 inches greater than the largest outside diameter of the carrier pipe joints or couplings for carrier pipe less than 6 inches in diameter, and at least 4 inches greater than the largest outside diameter of the carrier pipe joints for carrier pipe 6 inches and over in diameter, unless otherwise shown on the Plans.

F. The steel casing pipe shall be of smooth interior and shall be placed accurately to line and grade, allowing for the encased pipe thickness and supports under each length of encased pipe.

3.00 EXECUTION

3.01 GENERAL EXCAVATION

A. Excavation shall be performed by any practicable method consistent with the integrity and protection of the work and neighboring structures, workmen, and the public. Topsoil shall be separately removed and stockpiled for reuse.

B. All excavation, except where necessary to tunnel, bore or jack under roads, railroads, tree roots and other obstructions within the limits indicated on the Plans, may be open cut from the surface. Tunnelling or boring under trees shall be considered as incidental to construction and will not be considered as cause for request for additional payment.

C. Foreign material or unsuitable foundation material encountered such as wood, boulders, etc., which obstruct the excavation, shall be removed. Such materials found at the bottom of the excavation shall be removed and the foundation restored with approved materials.

D. If excess excavation is made or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be filled with selected material solidly tamped into place, in not more than 6-inch layers to the satisfaction of the ENGINEER, before the construction work proceeds. At the direction of the ENGINEER, the excess excavation may be filled with 2000 psi concrete at the CONTRACTOR's expense.

E. The excavation shall be kept dry during the work. Where water is encountered in the excavation, it shall be removed by pumping or well points. All necessary precautions shall be taken to prevent damage to existing wells and to completed or partially completed structures. The CONTRACTOR shall be responsible for all damages caused by him due to inadequate or improper protection.

F. The CONTRACTOR shall take ample precautions to protect all trees and ornamental shrubbery not within the limits of the construction areas, or within the construction areas shown on the Plans to be retained from injury by workmen, equipment, or any other agencies connected with the work, including subcontractors. Such protection shall be provided during the progress of the excavation, grading, or other phases of the work as necessary. Such trees or shrubbery shall be surrounded by protective posts or fencing before construction begins, when in judgment of the ENGINEER, such precautionary measures are necessary. If, as a result of any phase of the work, trees are damaged or it is necessary to remove limbs in the way of construction, the repair of the damage and such limb removal shall be done by the CONTRACTOR as directed by the ENGINEER. All costs for the protective work shall be borne by the CONTRACTOR as incidental the Contract work.

G. Any excavation not backfilled at the end of each day must be clearly marked and surrounded by appropriate safety fencing as directed by the ENGINEER. If directed by the ENGINEER, the CONTRACTOR shall cover the open excavation with a steel plate and light the excavated area.

3.02 EXCAVATION FOR SEWERS AND WATER MAINS

A. Trenches shall be excavated to the depth required with allowance for bedding the pipe. The trench shall be cut wider and deeper at each pipe joint location to provide for properly completing the pipe joint and to relieve the joint of all loadings.

B. The width of the trench at the top of a rigid pipe shall be sufficient to allow the pipe to be laid and jointed properly and shall provide for a minimum net clearance of 6 inches and a maximum net clearance of 12 inches on each side of the barrel of the pipe and to allow the backfill to be placed and properly compacted.

C. The width of trench at the top of a flexible pipe backfill when using concrete bedding shall be sufficient to allow the pipe to be laid and jointed properly with the minimum net clearance of 12 inches and a maximum net clearance of 18 inches on each side of the barrel of the pipe.

D. Where the conditions of the ground require or where the work is in close proximity of existing structures, the sides of excavation shall be securely held by bracing and/or sheeting which may be removed in units when the level of the backfill has reached a point where it is safe to pull the sheeting without disturbing the protected feature. No sheeting, bracing, or other timber shall be left in the excavation upon the completion of the main or other structures, except with the specific review and direction of the ENGINEER.

E. Other underground mains, sewers or structures encountered in the excavation shall be adequately supported during the CONTRACTOR's operations, and before backfilling, shall be given permanent support as directed by the ENGINEER to meet the standards or requirements of the owning utility or agency.

F. Water, sewer, gas and other utility services disturbed by the CONTRACTOR in his operations shall be repaired or replaced in a manner equal to the original condition by the CONTRACTOR at his own expense. Where these services are encountered and are undamaged, they shall be supported and/or protected by the CONTRACTOR at his expense against later settlement and/or damage after backfill. The CONTRACTOR shall consult the agency or the utility firm having jurisdiction over any duct line, gas main, etc., which may cross the excavation to determine method of supporting such duct or pipe.

G. All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants under pressure, valve manhole covers, valve boxes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed. Gutters shall be kept clean, or other satisfactory provisions made for street drainage, and natural water courses shall not be obstructed except as otherwise provided for herein on a temporary basis.

3.03 EXCAVATION FOR STRUCTURES

A. Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for form construction and for practicable construction methods to be followed.

B. Requirements for excavation of sewers and water mains shall also apply to this Section.

3.04 EXCAVATION FOR PAVED SURFACES

A. In excavating around manholes and catch basins or inlets, care shall be exercised to avoid removing the casings and pushing dirt into the structures. Dirt pushed into manholes, catch basins or inlets by the CONTRACTOR's operations shall be immediately removed so that the dirt will not be carried into the sewer by the flow of sewage or storm water.

B. The CONTRACTOR shall take ample precautions to protect all trees and ornamental shrubbery not within the limits of the construction area, or within the construction areas shown on the Plans to be retained from injury by workmen, equipment, or any other agencies connected with the work, including subcontractors. Such protection shall be provided during the progress of the excavation, grading, or other phases of the work as necessary. Such trees or shrubbery shall be surrounded by protective posts or fencing before construction begins, when in the judgment of the ENGINEER, such precautionary measures are necessary. If, as a result of any phase of the work, trees are damaged or it is necessary to remove limbs in the way of construction, the repair of the damage and such limb removal shall be done by the CONTRACTOR as directed by the ENGINEER. All costs for the protective work shall be borne by the CONTRACTOR as incidental to the Contract work.

3.05 ROCK EXCAVATION

A. Rock excavation shall consist of excavating igneous, metamorphic and sedimentary rock which cannot be excavated without continuous drilling and blasting or drilling and splitting to fracture the rock. Blasting shall be permitted only after it has been shown that other methods of excavation are impractical. All rock excavation shall be carried to a minimum depth of 8 inches below the pipe or manhole bottom and to the bottom of all footings. The width of the rock excavation shall not exceed the diameter of the pipe plus 12 inches on either side or the edge of the foundation footing.

B. When the use of explosives is necessary for the progression of the work, the CONTRACTOR shall comply with all laws, ordinances and applicable safety code requirements and regulations relative to the handling, storage and use of explosives and protection of life and property. A person competent and experienced in the use of explosives shall be employed to supervise the work. The CONTRACTOR shall schedule all blasting for a definite hour of the day and shall so notify all residents and businesses in the area as to the scheduled day and hour for such blasting operations. Explosive materials shall not be stockpiled and stored in residential areas. Explosives and initiating devices shall not be carried in the same vehicle.

C. Suitable weighted plank coverings or timber mats shall be provided to confine all materials lifted by blasting within the limits of the excavation of trench. Excessive blasting or overshooting shall not be permitted. Any material outside of the authorized excavation cross section which may be shattered or loosened shall be removed at the CONTRACTOR's expense. The CONTRACTOR shall be responsible for all damage resulting from the use of explosives.

3.06 PIPE BORING AND JACKING

A. The CONTRACTOR shall obtain all necessary permits for jacking the encasing pipe under channels, highways and/or railroads and shall notify the governmental agency and/or company having jurisdiction 48 hrs before work at any crossing is started. The CONTRACTOR shall pay all costs for an inspector and/or flagmen required by a railroad or governmental agency.

B. A suitable approach trench shall be opened, adjacent to the toe of the slope of the embankment. The approach trench shall be long enough to accommodate the length of pipe units to be placed, and wide enough to provide sufficient working room. Guide timbers or rails for keeping the pipe on-line and grade shall be installed in the bottom of the trench and heavy timber backstop supports installed at the rear of the trench to take the thrust of the jacks. A timber bearing a "pushing frame" shall be built and furnished to fit or match the end of the pipe to be jacked, so that the pressure of the jacks will be evenly distributed over the end of the pipe. Two (2) hydraulic jacks of sufficient power shall be used to apply pushing or jacking pressure. For firm ground, excavation shall be carried on from inside the pipe, not to exceed twelve (12) inches ahead of the lead pipe. For unstable ground, the lead pipe shall precede the auger. Excavation at the top and sides shall be accurately cut to line and grade. Adjoining sections of steel pipe shall be welded. Pipe shall be jacked on successive shifts until completed to guard against the "freezing of the line" due to settlement and compaction of surrounding soil.

C. The sheeting of pits along any road will be required if the leading edge of all work pits will be closer to the pavement edge than the shoulder point or ten (10) ft, which ever distance is greater, or on curb and gutter sections, at least five (5) ft from back of curb.

D. Upon completion of the installation of the steel pipe encasement, the contractor shall furnish and install a bolted style casing spacer as described below on the carrier pipe. Casing spacers shall be placed a maximum of seven (7) feet apart along the length of the carrier pipe with one casing spacer within 2-1/2 feet of each side of a pipe joint and the rest evenly spaced. Wood skids are not an acceptable method of supporting the carrier pipe.

1. Casing spacers for carrier pipes from 4" - 24" shall be made of a molded, segmented high density polyethylene plastic with 304 stainless steel connecting nuts and bolts. Minimum spacer width shall be 5.2" for carrier pipes from 4" - 12" and 7.0" for carrier pipes 14" - 24". Each casing spacer shall have at least six (6) integrally molded skids extending 1" beyond the bell or mechanical joint of the carrier pipe. The casing spacers shall be equal to the PSI Ranger as manufactured by Pipeline Seal and Insulator, Inc., Houston, TX.

2. Casing spacers for carrier pipes larger than 24" shall be a PVC fusion bonded coated (10-16 mils) steel shell (minimum 14 gauge steel) with a 90 mil PVC inner liner and 2" wide 30% glass reinforced polyester runners (minimum compressive strength = 18,000 psi) (polyethylene is not an acceptable runner material) attached by 3/8" coated steel studs welded to the steel shell. All bolts and nuts used to fasten the shell to the carrier pipe shall be cadmium plated steel. Where riser are required under the runners they shall be a minimum 10 gauge steel welded to the shell and coated as specified for the shell (epoxy is not an acceptable coating for the shell riser). The casing spacers shall be equal to the PSI Model C as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.

E. Boring shall be performed by accepted and recognized methods which will provide adequate safety and protection at all times to workmen employed in the work and to inspectors and others involved in the construction.

F. If voids should develop around the outside of the encasing pipe, grouting or other methods approved by the ENGINEER shall be employed to fill such voids.

G. After the pipes are tested satisfactorily, the remaining space between the carrier pipe and the encasing pipe shall be pressure grouted or otherwise filled with concrete. The carrier pipe shall be adequately braced to prevent floating or movement of the pipe.

3.07 SHORING, SHEETING AND BRACING

A. Where sheet piling, shoring, sheeting, bracing, or other supports are necessary, they shall be furnished, placed, maintained, and except as shown or specified otherwise, removed by the CONTRACTOR.

B. All sheet piling, shoring, sheeting and bracing shall be designed by a professional engineer engaged by the CONTRACTOR with demonstrated competence and experience in such work. The sheeting system shall be designed to prevent bottom failure and hydrostatic uplift within the excavation. Provision shall also be made in the design for lateral pressures due to side slope and construction equipment or other surcharge loads, as applicable.

C. The CONTRACTOR shall provide to the ENGINEER for his review, design calculation and arrangement drawings of the sheeting system prior to ordering any materials for bracing, sheeting, etc., and prior to the commencement of the excavation.

D. All materials, except as otherwise specified, used for sheeting and sheet piling, lagging, braces, shores, and stringers, or waling strips shall be of approved quality and dimensions throughout.

E. Materials for sheeting systems shall be furnished and driven or set in place by the CONTRACTOR, where necessary or wherever ordered by the ENGINEER, whether the same is or is not considered necessary by the CONTRACTOR. If, in the opinion of the ENGINEER, the materials furnished by the CONTRACTOR are not of proper quality or sufficient size or not properly placed to ensure the safety of the work or of adjacent structures and property, the CONTRACTOR shall, upon notice from the ENGINEER to that effect, forthwith procure, furnish and set in place or drive other and satisfactory materials, or place the material in a satisfactory manner; and if he shall fail or neglect to do so, the ENGINEER may order all or any part of the work to be stopped until such materials so used are furnished and placed; and the CONTRACTOR shall not be entitled to claim, demand, or receive any compensation for larger size or better quality or different disposal of materials ordered by the ENGINEER, nor any compensation for allowance of any kind whatsoever for or on account of any damage or delay resulting from such stoppage of work.

F. Steel sheet piling may be either new or used. It shall be of adequate strength, straight and properly braced. Steel sheet piling shall be of the interlocking type. Friction in the interlocks shall not be assumed to contribute to the strength of the sheet piling.

G. The design, planning, installation and removal, if required, of all sheet piling, shoring, sheeting, and bracing shall be accomplished in such a manner as to maintain the required excavation or trench section and to maintain the undisturbed state of the soils below and adjacent to the excavation.

H. Steel sheet piling for the excavation shall be driven straight and in-line. The piling shall be supported above ground, before driving, by a guide frame at least 20 ft high which will keep the piling accurately in the required position and vertical. Each piece of piling shall be driven only a few feet at a time and driving shall proceed continuously around the perimeter so that the piles shall reach their full penetration together.

I. Walers and bracing shall be supplied and installed as required to complete the sheeting system. Walers and braces shall be of adequate strength for the load imposed. Splices in walers shall develop the full strength of the member in bending, shear, and axial compression.

J. If bracing members are to be removed during construction, the timing and procedure for removal shall not induce excessive stresses in the permanent structures or in steel sheet piling and bracing members.

K. If the construction sequence of structures requires the transfer of bracing to the completed portions of any structure, the CONTRACTOR shall secure written acceptance of the ENGINEER prior to the installation of such bracing.

L. In trenching operations the use of horizontal strutting below the barrel of pipe or the use of the pipe as support for trench racing will not be permitted. The use of a travelling shield for sewer construction shall require that the device be approved for use by a professional engineer. Sheet piling and timbers in trench excavations shall be withdrawn in a manner so as to prevent subsequent settlement of the pipe or additional backfill loadings which might overload the pipe.

M. The neglect, failure, or refusal of the ENGINEER to order the use of sheeting, or sheet piling or steel, or to order the same to be left in place, or the giving or failure to give of any order or directions as to the manner or methods of driving or placing sheeting, sheet piling, bracing, shores, etc., shall not in any way relieve the CONTRACTOR of any or all obligations under this Contract. Sheeting left in place shall be cut off one (1) ft below existing grade.

N. The rules of the OSHA and the State Department of Labor with respect to excavation and construction shall at all times be strictly observed.

3.08 GENERAL BACKFILLING

A. For all areas, unless otherwise noted, backfilling shall consist of placing excavated material as defined in Paragraph 2.01.A. of this Section, in 12-inch lifts to finish grade. Compaction of backfill shall be such as to obtain 90% of the maximum density.

B. Under pavements, curb, paved driveways, and sidewalks, and where pipe is within a one on one influence of pavement, compaction testing shall be performed by an independent testing laboratory. Testing shall be performed at intervals of one test per lift per 50 feet of trench or as determined necessary by the ENGINEER.

C. In residential developments, all backfill within the road corridor shall be granular material compacted in layers not to exceed 12 inches loose thickness with backfilling carried up to subgrade. Compaction of backfill shall be as such to obtain 95% of the maximum unit density as determined at the optimum moisture content. For purposes of this section, the road corridor is defined as front of house to front of house, including right-of-way and adjacent easements and setbacks.

3.09 BACKFILLING FOR SEWERS AND WATER MAINS

A. Backfilling shall consist of placement of the prescribed materials from a level 12 inches above the crown of the pipe. Placement shall be as follows:

1. Under gravel driveways, gravel roads and shoulders, the backfill shall be granular material which shall be solidly compacted by mechanical tamps in layers of not more than 12 inches loose thickness with backfilling carried up to within 12 inches of finished grade. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content.

2. Under pavements, curb, paved driveways, and sidewalks, the backfill shall be granular material compacted in layers not to exceed 12 inches loose thickness with backfilling carried up to subgrade. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content. After a period of about 60 days or less, if the backfill compaction is satisfactory to the ENGINEER, to provide for any slight settlement, the CONTRACTOR shall retrim neatly any broken edges of pavement and replace the top surface of the backfill within the pavement area with pavement surface equal to that surface which was removed. The pavement shall be replaced in accordance with the standard specifications of the agency having jurisdiction.

3. Backfill around lift stations, or buried underground structures shall be granular material compacted in 12-inch lifts. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content.

4. For all other areas, backfilling shall consist of placing excavated material as defined in Paragraph 2.01.A. of this Section, in 12-inch lifts to finish grade. Compaction of backfill shall be such as to obtain 90% of the maximum unit density as determined at the optimum moisture content.

3.10 FILLING AND BACKFILLING FOR STRUCTURES

A. Embankments underlying structural footings, streets and drives, sidewalks and around structures shall be granular material meeting the requirements of the Michigan Department of Transportation for granular material compacted to 95% density.

B. In all other areas, material required for embankments and backfilling shall be soil or soil-rock mixture free of organic and other deleterious matter and shall contain no more than 15% rocks or lumps larger than 2-1/2 inches in the greatest dimension, compacted to 90% density.

C. Under all interior and exterior floor slabs, an 8-inch thick granular cushion shall be placed. This material shall be clean mineral aggregate meeting the following gradation requirements:

Passing the No. 4 Sieve	100%
Passing the No. 200 Sieve	0-3%

D. Where embankment material is placed to achieve a new surface elevation, the top 4 inches shall be approved topsoil either salvaged from the site or hauled in by the CONTRACTOR.

3.11 FILLING AND BACKFILLING FOR PAVED SURFACES

A. Embankments, including sand cushions and granular fills, shall be placed in successive layers not more than 6 inches in depth the full width of the cross section, each layer to be thoroughly compacted by means of vibratory compactors or by an approved pneumatic-tired roller or combination thereof, as required by the ENGINEER. Each layer shall be compacted to not less than 95% of the maximum unit density as determined at the optimum moisture content. All parts of the embankment shall be uniformly compacted and the CONTRACTOR shall so direct all earthmoving equipment used in the work so that the same shall be attained. Embankment or fill outside the limits of the subgrade where sand or gravel is not required shall be made with suitable material which is free from perishable organic matter, rubbish, stones, broken concrete, roots, or other foreign materials, at no additional compensation. Before any embankments are begin, the base shall be made firm and cleared of topsoil, sod or other perishable material. The sides of the embankment shall be neatly and evenly dressed to the slope shown on the Plans, or such other slope as the ENGINEER may direct.

B. Upon completion of the placing of the curbs, and after the concrete has cured sufficiently, forms shall be removed and the excavated space behind the curb shall be backfilled with a good quality of surface soil, free of rubbish, stone, broken concrete, roots or other foreign material. Where adequate acceptable material for backfill behind the curb is not available, granular fill conforming to 2003 MDOT 8.02.06, Class II, shall be used. Where the area behind the curb is in cut, it shall be trimmed from the top of the curb on the slope shown on the Plans. If the area is in embankment or fill, an earth berm shall be placed immediately adjacent to the top of the curb and then the embankment of fill shall be finished to the slope shown on the Plans. All trimming and finishing shall be done in a neat, workmanlike manner. All excess concrete and debris shall be removed from the excavation behind the curb line before backfilling begins.

C. In construction of non-rigid pavements, backfilling back of curb and gutter shall be completed before placement and compaction of the base course of the roadway.

3.12 PREPARATION OF SUBGRADE FOR ROADWAY SURFACES

A. The bottom of the excavation for the pavement or top of the fill shall be known as the pavement subgrade and shall be smoothed, trimmed and compacted to the required line, grade and cross section to receive the road metal. It shall be thoroughly compacted by rolling with a roller of approved type weighing not less than 8 tons. The subgrade shall be compacted to at least 95% of the maximum density as designated by the test method AASHTO T-180. Inaccessible areas, where rolling is not practical, shall be thoroughly compacted by mechanical tampers capable of striking a blow equivalent to at least 250 foot-pounds per square foot. The subgrade thus formed shall be maintained in a smooth and compacted condition until the pavement has been placed. No base course, surfacing, curb, or curb and gutter, shall be placed until the subgrade has been reviewed by the ENGINEER. The subgrade shall be finished in an acceptable condition at least one day in advance of the pavement construction at all times. Six inches of compacted depth of granular material shall be used where uncompactable soil is encountered. The granular fill shall conform to the 2003 MDOT 9.02.08., Class II, compacted to 95% of its density.

B. Immediately prior to placing the pavement, the subgrade shall be tested for conformity with the cross section shown on the Plans by means of an approved template riding on the curb and gutter sections or on side forms. If necessary, materials shall be removed or added, as required, to bring all portions of the subgrade to the correct elevation. Corrected portions shall then be thoroughly compacted and again tested with the template. Pavement material shall not be placed at any portion of the subgrade which has not been tested for correct elevation.

C. The finished subgrade shall be maintained in a smooth and compacted condition until the pavement is placed. No storage piles of fine or coarse aggregate shall be placed directly upon the finished subgrade. Should the subgrade become rutted or disturbed in any manner, it shall be reshaped and recompacted.

3.13 GRADING

A. The CONTRACTOR shall grade the site to achieve the elevations as shown on the Plans. All disturbed areas beyond the grading limits shall be restored to prior condition.

B. Surplus excavated material not needed for embankment shall be disposed of by the CONTRACTOR. Headwalls, culverts, drains, sewers and appurtenances filled or damaged by the CONTRACTOR during the course of his operations shall be cleaned, repaired, or replaced at his expense.

C. All temporary earth changes shall be in conformance with the Soil and Erosion Control Act.

3.14 RESTORATION

A. Headwalls, culverts, and drainage systems filled or damaged by the CONTRACTOR during the course of his operations shall be cleaned, relaid or rebuilt with new materials to a condition equal to the original state, and of thickness equal to the original structure and to the original line and grade at the CONTRACTOR's expense.

B. Where the excavation is located beside a ditch and/or where an existing ditch is filled or disturbed in the CONTRACTOR's operations, the CONTRACTOR shall clean, repair, or replace the ditch with properly pitched bottom and side slopes and of section and capacity not less than the original section.

C. Where excavation has been through lawn areas, the CONTRACTOR shall restore the disturbed area by placing topsoil and seeding or sodding over the final backfill material.

D. The CONTRACTOR shall remove excess dirt and other construction material from the site of the work and leave the site in a condition equal to its original state.

E. The final condition of the streets and roadways shall be subject to the approval of the governmental body having jurisdiction thereof, as well as review by the ENGINEER.

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108-9721
48108-9721
Tel. 734.822.3101
www.pittsfield-mi.gov

TWP REV	BWA	DRW	11.04.27
UPDATES	TTN	DRW	10.01.20
Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD

File Name: SE-02	TTN	DRW	DRW	07.10.01
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

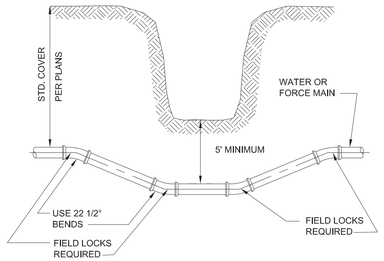
36-E

Title
EARTHWORK SPECIFICATIONS

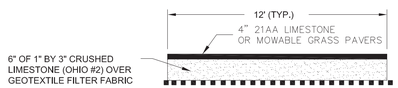
Project No.
2075001300

Scale
NOT TO SCALE

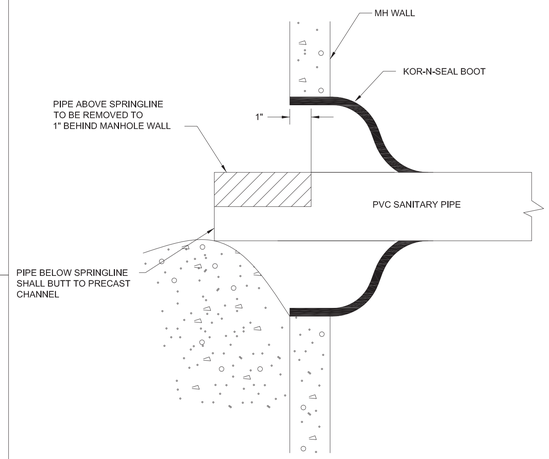
Revision
1



DITCH & STREAM CROSSING



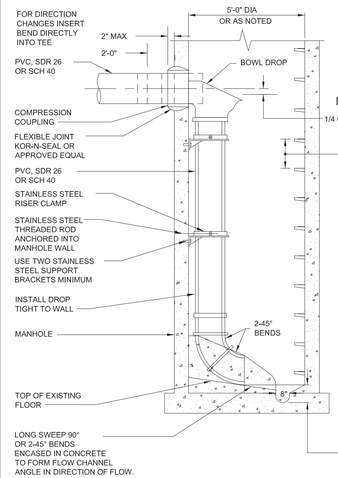
SANITARY SEWER ACCESS PATH

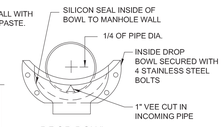


SANITARY PIPE PENETRATION

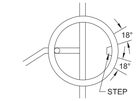
NOTES:

1. SECURE DROP PIPE TO MANHOLE WALL WITH RELINER-DURAN, INC STAINLESS STEEL ADJUSTABLE CLAMPING BRACKETS OR EQUAL.
2. ATTACH THE DROP BOWL & EACH CLAMPING BRACKET TO THE MANHOLE WALL WITH 3/8" x 3 3/4" RAMSET/RED HEAD BOLTS HELD INPLACE WITH 2 STAGE EPOXY PASTE.





DROP BOWL
MOUNTING POSITION



DROP SHALL
BE NO CLOSER
THAN 18" FROM
STEP

SIZE

LINE	LINE
4"	4"
6"	6"
8"	8"
10"	8"

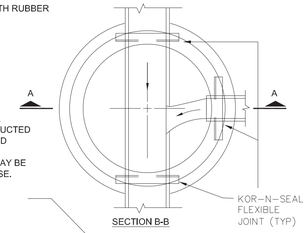
MH DIA.	MAX. DROPS
4'	2-6"
5'	4-6"
5'	2-8"
6'	3-8"

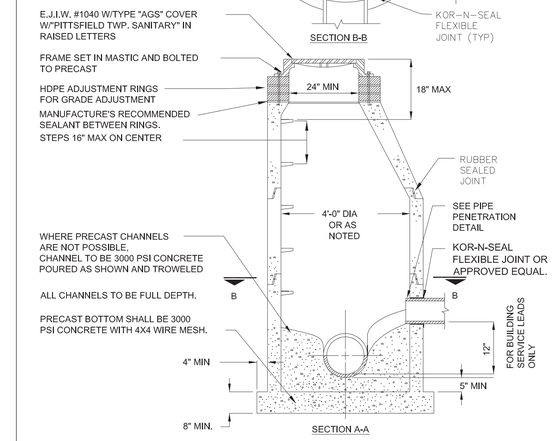
NO UTILITY STRUCTURES (ie. MANHOLES, CURB BOXES etc.) SHALL BE PLACED IN ANY DRIVEWAY OR SIDEWALK

INTERIOR DROP SANITARY MANHOLE

PRE-CAST CONCRETE MANHOLE

1. SECTIONS SHALL MEET ASTM C478.
2. ALL JOINTS MADE WATERTIGHT WITH RUBBER GASKET JOINTS
3. CONE TO BE ECCENTRIC TYPE
4. ALL MANHOLE COMPONENT PARTS SHALL HAVE THE NAME OF THE MANUFACTURER STENCILED ON THE INSIDE. THE LETTERING SHALL BE A MINIMUM OF 4" HIGH.
5. PROVIDE INTEGRAL BASE WITH PRECAST CONCRETE CHANNELS.
6. WHERE MANHOLES ARE CONSTRUCTED OVER EXISTING SEWERS, POURED IN PLACE OR PRECAST COOKIE AND DOGHOUSE STRUCTURES MAY BE USED IN PLACE OF INTEGRAL BASE.



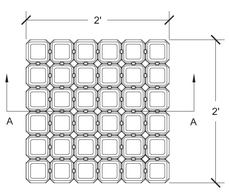


NO UTILITY STRUCTURES (ie. MANHOLES, CURB BOXES etc.) SHALL BE PLACED IN ANY DRIVEWAY OR SIDEWALK

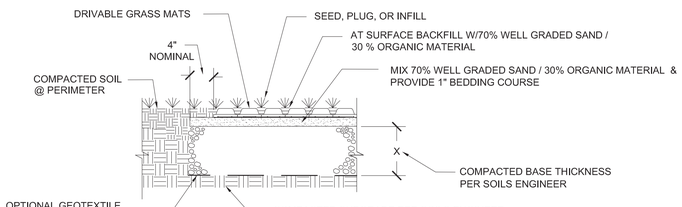
SANITARY MANHOLE

NOTE:

FOR STORMWATER MANAGEMENT APPLICATIONS INCLUDING STORAGE AND INFILTRATION, ALTERNATE INFILLS, BASE MATERIAL, AND DRAINAGE MAY BE REQUIRED

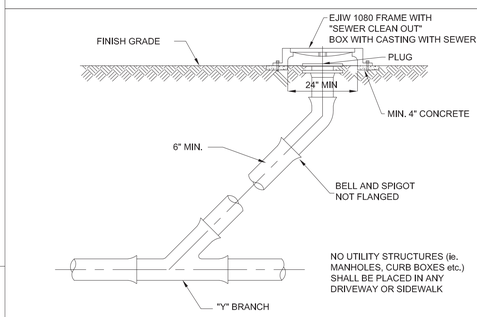


PLAN VIEW

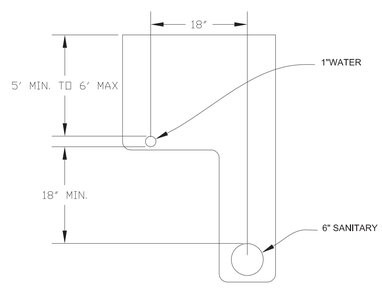


SECTION A-A

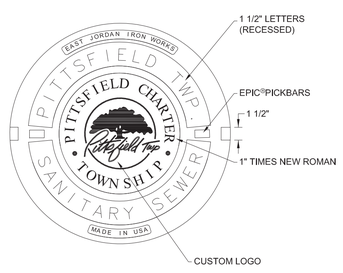
TYPICAL HEAVY TRAFFIC DRIVABLE GRASS DETAIL



SANITARY SEWER CLEANOUT

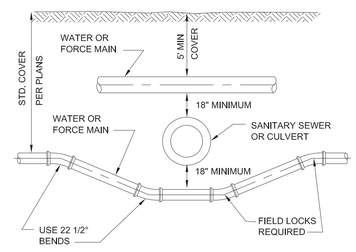


TYPICAL L TRENCH DETAIL HOUSE LEADS

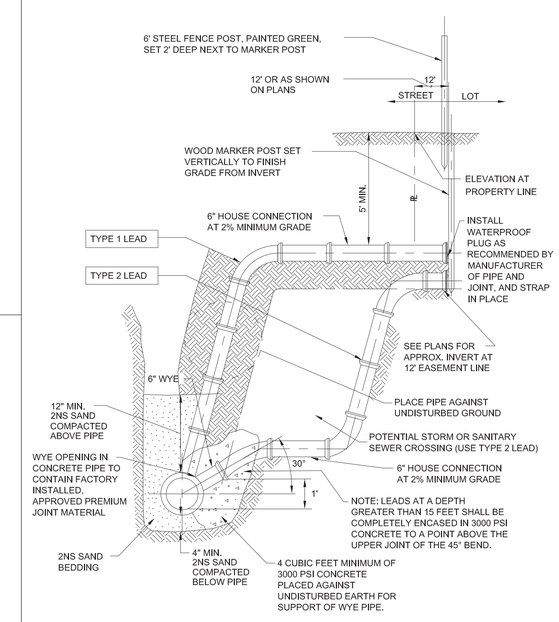


EAST JORDAN IRON WORKS 1040 Z BOLT DOWN FRAME
EAST JORDAN IRON WORKS 1040 AGS COVER

COVER DETAIL



SEWER OR CULVERT CROSSING



SANITARY SEWER SERVICE & RISER CONNECTION DETAIL

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108-9721
48108-9721
Tel. 734.822.3101
www.pittsfield-mi.gov

Revision	By	Appd.	YY.MM.DD
COVER DETAIL UPDATE	MRH	DRW	14.01.24
TWP REV	BWA	DRW	11.04.27
MANHOLE UPDATES	BWA	DRW	10.10.25
UPDATES	TTN	DRW	10.01.20

Issued	By	Appd.	YY.MM.DD
File Name: SS-01	BWA	DRW	07.10.01
	Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

37-S1

Title
SANITARY SEWER DETAILS

Project No.
2075001300

Scale
NOT TO SCALE

Revision

SANITARY SEWER AND MANHOLES

1.00 GENERAL

1.01 DESCRIPTION

A. The CONTRACTOR shall furnish all labor, tools, equipment and materials to construct all sanitary sewers, manholes and necessary appurtenant work as herein specified. No sewers shall be accepted until the sewer system has passed the system acceptance tests.

1.02 TESTING

A. General

1. The CONTRACTOR shall furnish all equip\-ment and personnel to conduct system acceptance tests as specified herein on all completed sewers. All tests shall be conducted under the supervision of the ENGINEER. No acceptance tests shall be conducted until the entire sewer system is constructed and has been installed for not less than 30 days.

2. The CONTRACTOR may desire to make an air test prior to backfill for his own purposes but the line acceptance tests shall be conducted after backfilling or extensions.

3. All sewer lines shall be televised while running enough water through the line to be visible at the next downstream manhole.

4. All sewer lines shall be checked for alignment.

5. All manholes shall be tested for leakage. All PVC lines shall be tested for deflection.

6. Sewer pipe 30 inches and smaller shall be air tested. Sewer pipe larger than 30 inches shall be tested by either infiltration or exfiltration and shall be tested in lengths of 1600 feet or less.

7. Should the results of any test fail to meet the criteria established in this Specification, the CONTRACTOR shall, at his own expense, locate and repair rejected section and retest until it is within specified allowance.

B. Test for Leakage - Air Test

1. Section 33-95 (pg 30-6) 2004-Ten State Standards.

2. After a manhole-to-manhole section of line has been backfilled and cleaned, it shall be plugged at each manhole with pneumatic plugs inflated to 35 psig internal pressure. The design of the pneumatic plugs shall be such that they will hold against the line test pressure without requiring external blocking or bracing.

3. There shall be three (3) hose connections to the pneumatic plug. One hose shall be used only for inflation of the pneumatic plug. The second hose shall be used for continuously reading the air pressure rise in the sealed line. The third hose shall be used only for introducing low pressure air into the sealed line.

4. There shall be a 0-30 psig gauge for reading the internal pressure of the line being tested. Calibrations from the 1-10 psig range shall be in tenths of lbs (not ounces) and this 0-10 portion shall cover 90% of the complete dial range.

5. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure of any ground water pressure that may be over the pipe. At least two (2) minutes shall be allowed for the air pressure to stabilize. After the stabilization period, the third hose shall be disconnected.

6. The portion of line being tested shall be accepted if the portion under test meets the following conditions.

a. DI, and RCP Pipes

(1) The time requirement for the pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than the time given in the following table:

Pipe	Min. Holding Time Seconds/100 ft. Pipe
4-inch	18
6-inch	42
8-inch	72
10-inch	90
12-inch	108
15-inch	126
18-inch	144
21-inch	180
24-inch	216
27-inch	252
30-inch	288

(2) In areas where ground water is known to exist, the CONTRACTOR shall install a 1/2-inch diameter capped pipe nipple, approximately 10 inches long, through the manhole wall on top of one of the sewer lines entering the manhole. This shall be done at the time the sewer line is installed. Immediately prior to the performance of the line acceptance test, the ground water level shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic tube to the pipe nipple. The hose shall be held vertically and a measurement of the height in feet of water shall be taken after the water stops rising in this plastic tube. The height in feet shall be divided by 2.3 to establish the lbs of pressure that will be added to all readings. For example, if the height of water is 11-1/2 ft, then the added pressure will be 5 psig. This makes the 3.5 psig to be 8.5 psig, and the 2.5 psig to be 7.5 psig. The 1 lb allowable drop and the timing remains the same.

a. PVC Pipe

(1) The time requirement for the pressure to decrease from 3.5 to 3.O psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than that shown in the following table:

Pipe Size (inches)	Holding Time (seconds)	Minimum Holding Time (seconds)
4-inch	0.190xL	113
6-inch	0.427xL	170
8-inch	0.760xL	227
10-inch	1.187xL	283
12-inch	1.709xL	340
15-inch	2.671xL	425
18-inch	3.846xL	512

(2) If any section of the sewer fails to meet this requirement, the CONTRACTOR shall perform a television inspection of the faulty section and repair or replace at his own expense all defective materials and/or workmanship to the satisfaction of the ENGINEER. The test procedure shall be repeated until the results are acceptable.

C. Test for Infiltration

1. Sewer pipe over 18 inches shall be tested to measure the infiltration of ground water. If the measured leakage exceeds 100 gallons per inch diameter per mile of pipe per 24 hr period, the CONTRACTOR shall locate the points of excessive leakage and make the necessary repairs at his own expense.

2. In the event the line does not pass the infiltration test as stated above, the test shall be repeated after suitable repairs have been completed.

D. Test for Exfiltration

1. Where the ground water provides less than a 2 ft head on the sewer, an exfiltration test shall be conducted by filling the sewer with water to a 4 ft head or 4 ft above the ground water level, whichever is greater. The allowable water loss shall be 100 gal/in./mi/day as calculated above for infiltration.

2. After the sewer has been filled with water, 4 hrs time shall be allowed for water absorption by the pipe before exfiltration tests are initiated.

3. For the purpose of establishing the 4 ft test head, the head shall be measured from the center of the sewer pipe at the midpoint of the test section length. This procedure shall be used for both infiltration and exfiltration tests.

E. Test for Manhole Leakage

1. All manholes shall be tested for leakage by using plugs on inleting-outleting sewers, and filling the manholes with water to the top of the man\-hole. Four hours shall be allowed for water absorption by the manhole before testing is initiated. Allowable exfiltration for 48-inch diameter manholes shall be 2 gallons per foot of depth per day.

F. Test for Alignment

1. All sewers shall be laid accurately to the line and grade designed by the ENGINEER. The sewers will be tested for alignment by shining a light through the pipe at a manhole and viewing the light from an adjacent manhole. Any section of sewer in which a light cannot be seen from one manhole to the next shall be corrected to the satisfaction of the ENGINEER to pass this test.

G. Test for Deflection of PVC Pipe

1. PVC pipe sewers shall be installed in such a manner that the initial deflection of the conduit shall conform to the latest revision of ASTM D-3034.

2. Deflection of PVC pipe shall be tested by pulling a rigid pig or equivalent through the pipe. The pig shall be constructed in accordance with the following table of maximum outside diameters and shall be submitted to the ENGINEER for review before testing is initiated.

Pipe I.D.	Pig O.D.
6 inches	5.33 inches
8 inches	7.11 inches
10 inches	8.87 inches
12 inches	10.55 inches
15 inches	12.90 inches
18 inches	15.74 inches

3. The pig shall be drawn by hand through the pipe from manhole to manhole. Any portion of pipe through which the pig passes freely shall be deemed to have passed the deflection test. Sections of pipe through which the pig does not pass shall be located, un\-covered and the pipe zone bedding improved and backfilled by the CONTRACTOR at his own expense. The pipe shall then be retested before acceptance is granted.

H. Material Tests

1. The CONTRACTOR shall have tests of pipe and strength made by an independent testing laboratory. Tests of up to 4 lengths of sewer pipe per hundred lengths may be required to show compliance with the Specifications. All pipe delivered to the job site shall be accompanied with a manufacturer's certificate of compliance to the Specifications.

1.03 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings or data sheets for all pipe, manholes, manhole castings, pipe to manhole connections, and valves. The Contractor shall submit certification letter for all pipe proposed on the project. The letters shall contain the following: Contractor name, project name, township name, current date, certification of pipe provided and letterhead of the certifying company.

2.00 PRODUCTS

2.01 SEWER PIPE

A. Pipe for sewer 24-inch diameter and smaller shall be polyvinyl chloride (PVC). Pipe for 30-inch diameter and larger shall be PVC truss pipe. Ductile iron pipe and reinforced concrete pipe shall be used as specified by the ENGINEER.

B. Pipe for service leads 4 though 8 inches in diameter shall be polyvinyl chloride (PVC).

C. Reinforced concrete pipe shall be no less than the latest revision of ASTM C76, with the class designation as shown on the Plans or in the Pro\-posal.

D. PVC pipe 4 inches through 15 inches in diameter shall meet or exceed all of the requirements of the current ASTM D-3034 SDR-26 polyvinyl chloride sewer pipe and fittings. 18-inch diameter PVC pipe shall meet or exceed all the requirements of the current ASTM F-794 SDR 26 polyvinyl chloride sewer pipe and fittings. Samples of pipe and physical and chemical data sheets shall be submitted to the ENGINEER for review. Approval shall be obtained before pipe is purchased.

E. If the sewer pipe is greater than 15 feet deep PVC pipe shall be SDR 21.

F. Truss pipe shall meet or exceed all of the requirements of the current ASTM D2680.

G. Ductile iron pipe shall meet or exceed all the requirements of ANSI A21.50 with a cement lining.

2.02 SEWER PIPE FITTINGS

A. Fittings shall be of the same material as the pipe, and in no case shall the walls be thinner than that of the pipe furnished.

B. Wye and tee fittings for PVC pipe shall be reviewed by the ENGINEER before purchasing.

C. The dry fit of all fittings must be snug. If the fit is such that it is loose, the pipe or fitting will be rejected as faulty and of improper size.

2.03 SEWER PIPE JOINTS

A. Concrete pipe joints shall be made of a resilient material conforming to the latest revision of ASTM Designation C443. Proper lubricant shall be furnished by the joint manufacturer.

B. Concrete pipe for use with rubber joints shall be smooth and precisely formed to provide a uniform annular space for joint materials.

C. PVC pipe shall be jointed with ring gusseted bell ends. (ASTM-D3212) Jointing materials shall be applied to the bell end of the pipe at the point of manufacture in such a manner that a tight uniform joint will be achieved and such that when the joint is made up in the field, the joint material will not roll or tear from the pipe. A proper joint lubricant shall be furnished by the pipe manufacturer.

2.04 REINFORCED CONCRETE MANHOLES

A. Manholes shall conform to the current ASTM specifications for precast reinforced concrete manhole sections, serial designation C478. Manhole section joints shall conform to ASTM C990-96. Cone sections shall be straight side type, with an offset step configuration.

B. All manhole component parts shall have the name of the manufacturer stenciled on the inside. The lettering or logo shall be a minimum of 4-inches high.

C. Manholes constructed over an existing sewer line shall have a doghouse mudded to an 8-inch thick cookie. The bottom of the existing pipe shall be the channel. All other manholes shall have precast integral base sections with pre-formed concrete channels.

D. All channels shall be constructed to the full flow depth of the pipe.

2.05 MORTAR FOR MANHOLES

A. Mortar for plastering manholes shall be made of one part Portland cement and two parts fine aggregate.

2.06 MANHOLE FRAMES AND COVERS

A. Manhole frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitably notched for convenient removal of the cover. Each cover shall be marked with the Pittsfield Township logo and the letters, PITTSFIELD TWP SANITARY SEWER integrally cast into the cover.

B. Covers shall be of the "self-sealing" design having a continuous gasket glued in a machined groove and a concealed pickhole. Frames and covers shall be East Jordan 1040Z, with Type AGS cover.

C. All manhole frames and covers shall be coated by the manufacturer with coal tar pitch varnish or other asphaltum coating reviewed by the ENGINEER.

2.07 MANHOLE STEPS

A. Steps shall be plastic coated steel. They shall be M.A. Industries PS1-PF or PS1-B, or approved equal.

2.08 MANHOLE CONNECTIONS

A. Sewer pipe (6-inch to 24-inch) to manhole connections shall be through: 1) a flexible rubber boot which shall be securely clamped into a core-drilled pipe port. Pipe ports shall be core-drilled at the point of manhole manufacturer and shall be accurately located within 1/2-inch of proposed sewer centerline (Kor-N-Seal); or, 2) a self-adjusting mechanical pipe to manhole seal which provides a resilient flexible and infiltration-proof joint (Res-seal); or, 3) a flexible rubber wedge firmly rammed into a rubber gasket which is cast into the manhole (Press Wedge II), or equal. All flexible pipe to manhole connections shall be installed per the manufacturers specifications.

B. Neoprene rubber for the manhole boot shall meet ASTM Specification C443 and shall have a minimum thickness of 3/8-inch. Pipe clamp bands shall be of corrosion-resistant steel.

C. Sewer pipe over 24 inches to manhole connections shall be in accordance with details shown on the Plan.

2.09 SANITARY MANHOLE ADJUSTMENTS

A. All final grade adjustment of manhole covers and frame assemblies shall be completed utilizing injection molded High Density Polyethylene (HDPE) adjustment rings as manufactured by LADTECH, INC. or approved equal. The adjustment rings shall be manufactured from polyethylene plastic as identified in ASTM Designation D 1248.

B. All adjustment for matching road grade shall be made utilizing a molded indexed slope ring.

C. Each adjustment ring shall be sealed with a 3/16 to ¼ inch bead of butyl rubber sealant per the manufacturer's instructions. Sealant shall meet ASTM specification C-990.

D. All castings and adjustment rings shall be securely fastened to the cone of the structure with four 3/8-inch threaded rods. The rods shall be galvanized or stainless steel anchored to the structure with Redhead concrete anchors or equal. Stainless steel or galvanized nuts and washers shall be used to attach the casting.

2.10 MANHOLE DROPS

A. Manhole drop connections shall be interior drops using the drop bowl as produced by Reliner-Duran Inc. or approved equal.

B. Drop bowl model A-4" shall be used for all lines up through full 6-inch inlets. Drop bowl model A-6" shall be used for all 8-inch inlets. Drop bowl model B-8" shall be used for all 10-inch inlets. Lines larger than 10 inches shall be as directed by the ENGINEER.

C. The force line hood shall be attached on models A-4" and A-6" when the incoming line is from a force main or the slope is 3 percent or greater.

D. The drop pipe shall be secured to the manhole wall with Reliner-Duran, Inc. stainless steel adjustable clamping brackets or approved equal.

E. The drop bowl and each clamping bracket shall be attached to the manhole wall with 3/8-inch x 3 3/4-inch bolts.

F. The incoming pipe shall be trimmed such that it protrudes 2 inches into the manhole .

G. A 1-inch V shaped notch shall be cut into the bottom edge of the incoming pipe.

3.00 EXECUTION

3.01 EXCAVATION AND BACKFILL

A. All excavation and backfill above a line 12 inches above the crown of the pipe shall conform to Section 2.04, Earthwork, of these Specifications.

3.02 BEDDING

A. Reference Section 33.83a of 10 State Standards.

B. Reference Section 33.83b of 10 State Standards.

C. Ductile iron, and concrete pipes shall be laid on a compacted granular material placed on the bottom of the trench to a depth of not less than 3 inches for 24-inch and smaller pipe and not less than 4 inches for pipe larger than 24-inch conforming to Class B bedding as shown on the Plans. Where shown on the Plans or required by the ENGINEER, concrete encasement or concrete cradle shall be used.

D. PVC pipe shall be laid on a compacted granular material placed on the bottom of the trench to a depth of not less than 4 inches conforming to Class B bedding as shown on the Plans. Where shown on the Plans, or where the pipe passes under a road with less than 4 ft of cover, the pipes shall be encased.

E. For all pipes, compacted granular material shall be placed at the sides of the pipe and cover not less than 12 inches above the crown of the pipe.

F. "Granular Material" shall be class 2NS sand, pea gravel or crushed stone conforming to ASTM C33 Size No. 67 placed in not more than 6-inch layers and com\-pacted to not less than 95% standard density for PVC and 90% standard density for reinforced concrete.

G. Pea gravel or crushed stone used for bedding shall be separated from the sand backfill with a non-woven geotextile fabric. The fabric shall be Amoco 4551, or approved equal.

3.03 PIPE INSTALLATION

A. Installation of PVC pipe shall be in confor\-mance with ASTM D2321-89.

B. All pipe shall be laid true to the required lines and grades. All trenches when pipe laying is in progress shall be kept dry; and all pipes and fittings shall be uniformly supported on a properly trimmed bedding with holes at each joint to receive bells. All pipe shall be laid with bells uphill.

C. All joints shall be made up in accordance with the manufacturer's instructions using materials and equipment especially prepared for the type of joint to be used.

D. The grade as shown on the profiles is that of the pipe invert and that to which the work must conform. The grade shall be kept by levels, laser or other tools which shall be furnished by the CONTRACTOR at his expense. Each pipe shall be laid accurately to the line and grade as shown on the Plans and in such manner as to form a close concentric joint with the adjoining pipe and prevent sudden offsets of the invert. The interior of sewers shall, as the work progresses, be cleaned of all dirt, cement, debris and other superfluous materials of every description. Bulkheads shall be used to keep foreign materials out of the open end of the sewer when work is not in progress.

E. The location of the piping as shown on the Plans has been determined to avoid, insofar as possible, interference with trees or structures or fixtures above ground and other underground mains, services, utilities, or structures. Any change in location or alignment of piping which may be found more feasible or practicable as the work progresses shall be made by the CONTRACTOR, as the ENGINEER may direct.

F. All pipe and fittings shall be carefully lowered and moved into position in trench or vault in a controlled manner such as will prevent damage to the pipe and any coatings or lining. An excessive amount of scratching on the surface of the PVC pipe will be considered cause for rejection.

G. The trench shall be backfilled closely behind the pipe laying. Unless otherwise directed or permitted by the ENGINEER, the backfilling shall follow and be completed to the top of the trench within two pipe lengths behind pipe laying.

H. All cutting of the pipe shall be done in a neat workmanlike manner with the least amount of waste and without damage to existing or new lines. A fine tooth saw, tubing cutter or similar tool may be used to cut PVC pipe. Cuts must be square. Ragged edges shall be removed with a cutting tool or file.

I. After cutting bell and spigot or socket pipe, a stop mark shall be made with a pencil or crayon using dimensions as shown by the manufacturer's instructions or by using another pipe in the field as a guide.

J. Breaks in pipe or joints shall be repaired to the satisfaction of the ENGINEER and at the expense of the CONTRACTOR.

3.04 CONNECTIONS TO EXISTING MANHOLES AND OTHER RIGID STRUCTURES

A. When a sewer is connected to an existing manhole, a hole adequate to receive the new pipe shall be cut into the manhole.

B. If the existing manhole is of brick construction, a single rowlock of brick shall be turned over the new pipe and the existing manhole brick work shall be cleaned, pointed and given a 1/2-inch mortar coat on the outside surface.

C. For connections to existing precast reinforced concrete manholes, a hole shall be cored into the concrete manhole wall to receive the pipe. A Kor-N-Seal boot or engineer approved equal shall be clamped into the cored hole and used to make the connection.

D. For connections to existing fiberglass manholes, a hole shall be cored into the manhole wall to receive the pipe. A Kor-N-Seal boot or engineer approved equal shall be installed using fiberglass reinforced pipe stubout for Kor-N-Seal boot sealing surface.

3.05 STREAM AND RIVER CROSSING

A. Whenever a pipe is required to cross a stream or river, all work shall be in accordance with the provisions of Act 346, the Inland Lakes and Streams Act of 1962, and the rules and regulations promulgated thereunder. Stream crossings and all restoration required shall be completed within five days of the construction.

B. The CONTRACTOR shall utilize such con\-struction methods as are feasible and practicable to divert or stop stream flow to lay the pipe in the dry. Pipe shall be ductile iron, mechanical joint, or compression gasket joint pipe with joints at transition to other types of sewer pipe encased with no less than 1 cu yd of concrete, placed at a minimum of 6 inches thickness around the pipe. After the sewer is properly laid, jointed and encased, the stream-channel shall be cleaned of dirt and debris resulting from the CONTRACTOR's operations.

C. After the crossing is made, heavy riprap and sodding shall be placed to protect the banks from corrosion as shown on the Plans.

PCT July 2008

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108–9721
48108–9721
Tel. 734.822.3101
www.pittsfield-mi.gov

Revision	By	Appd.	YY.MM.DD
TWP REV	BWA	DRW	11.04.27
UPDATES	BWA	DRW	10.10.25
UPDATES	TTN	DRW	10.01.20

Issued	By	Appd.	YY.MM.DD

File Name: SS–02	BWA	DRW	DRW	07.10.01
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

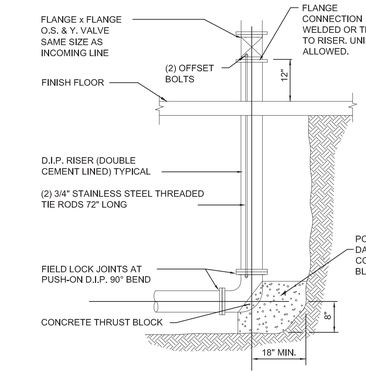
38-S2

Title
SANITARY SEWER SPECIFICATIONS

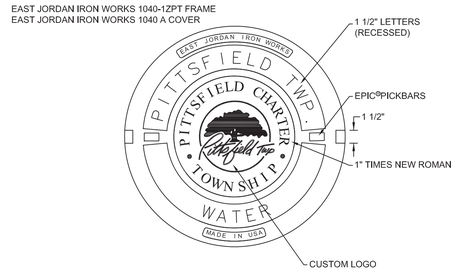
Project No.
2075001300

Scale
NOT TO SCALE

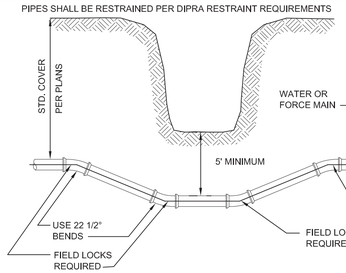
Revision
1



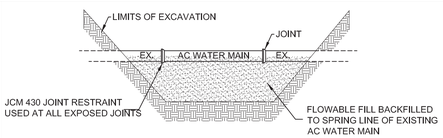
FIRE PROTECTION RISER DETAIL



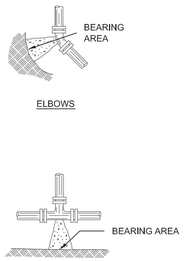
COVER DETAIL



DITCH & STREAM CROSSING



ASBESTOS CEMENT (AC) WATER MAIN



ELBOWS					
PIPE DIA. INCHES		BEARING AREA SQUARE FEET			
		90°	45°	22 1/2°	11 1/4°
4		2.1	1.1	0.6	0.3
6		4.1	2.2	1.1	0.6
8		6.8	3.7	1.9	0.9
10		10.1	5.5	2.8	1.4
12		14.1	7.6	3.9	2.0
16		24.2	13.0	6.7	3.3
18		30.0	16.3	8.3	4.2
20		36.8	19.9	10.1	5.1

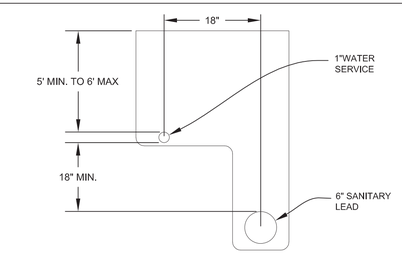
TEES, CROSSES & HYDRANTS		
PIPE DIA. INCHES		BEARING AREA SQUARE FEET
4		1.5
6		2.9
8		4.8
10		7.1
12		10.0
16		17.1
18		21.0
20		26.0

NOTES:
1. CONCRETE FOR ALL THRUST BLOCKS SHALL BE 3000 PSI, 28 DAY STRENGTH MIN.
2. ALL THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED EARTH
3. BOLTS, FITTINGS & JOINTS SHALL BE KEPT CLEAR OF CONCRETE
4. A BEARING CAPACITY OF 2000# PER FOOT WAS USED IN DETERMINING THE MINIMUM "BEARING AREAS" IN THE ABOVE TABLE
5. THE CROSS SECTION OF THE THRUST BLOCKS SHALL BE SQUARE
6. IN ADDITION TO THRUST BLOCKS, ALL PIPE JOINTS SHALL BE RESTRAINED WITH LOCKING GASKETS PER DIPRA'S STANDARDS.

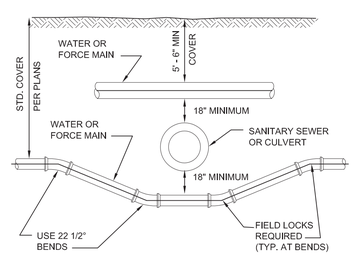
SOIL CHARACTERISTICS	FACTOR
(A) LOOSE COARSE OR MEDIUM SAND; COMPACT FINE SAND; COMPACT SAND-CLAY SOILS; STIFF CLAY	0.33
(B) FIRM FINE SAND; COMPACT INORGANIC SILT; FIRM SAND-CLAY SOILS; MEDIUM CLAY	0.50
(C) LOOSE FINE SAND; FIRM INORGANIC SILT	0.67
(D) LOOSE SAND-CLAY SOILS; LOOSE INORGANIC SILT SOFT CLAY	1.00

"BEARING AREA" x FACTOR = ACTUAL BEARING AREA
2.1 x .5 = 1.05 SQ. FT.
BASED UPON 150# TEST PRESSURE

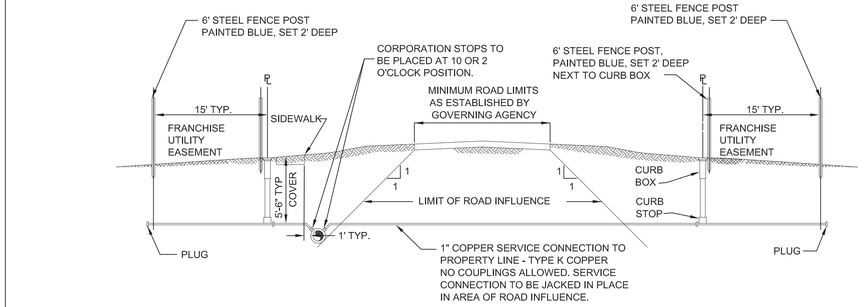
THRUST BLOCK



TYPICAL L TRENCH DETAIL HOUSE LEADS

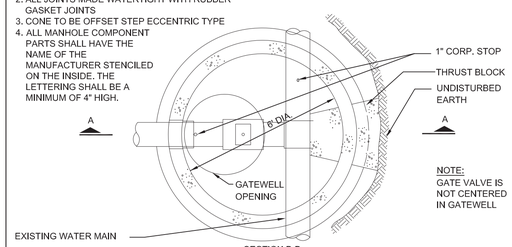


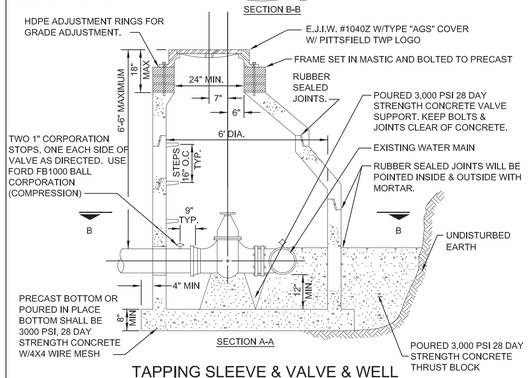
SEWER OR CULVERT CROSSING



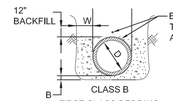
WATER MAIN CONNECTION

PRE-CAST CONCRETE MANHOLE
1. SECTIONS SHALL MEET ASTM C478.
2. ALL JOINTS MADE WATERTIGHT WITH RUBBER GASKET JOINTS
3. CONE TO BE OFFSET STEP ECCENTRIC TYPE
4. ALL MANHOLE COMPONENT PARTS SHALL HAVE THE NAME OF THE MANUFACTURER STENCILED ON THE INSIDE. THE LETTERING SHALL BE A MINIMUM OF 4" HIGH.





TAPPING SLEEVE & VALVE & WELL

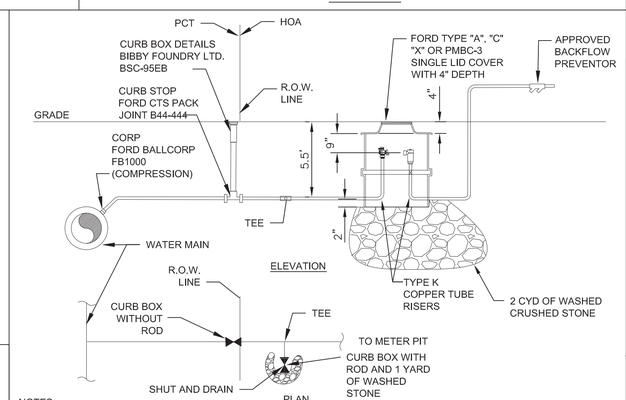


BLUE, 12 GAUGE SINGLE STRAND TRACER WIRE ATTACHED TO WATER MAIN PIPE MUST BE WRAPPED WITH POLLY WRAP AND SECURELY TAPED AT ENDS.

PIPE	D	W	B
PVC	0"-12"	12" MIN. 18" MAX.	4"
A-C,V.C.P.	0"-12"	6" MIN. 12" MAX.	4"
DIP	0"-24"	6" MIN. 12" MAX.	4"
A-C,CONC.	0"-24"	6" MIN. 12" MAX.	4"
CONC. DIP	24" +	6" MIN. 12" MAX.	4"

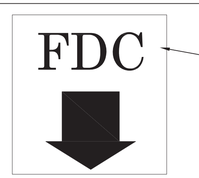
NOTES:
1. MINIMUM TRENCH WIDTH (SEE TABLE).
2. RECESS TRENCH TO RELIEVE THE BELL OF ALL LOAD. PIPE HAUNCHES SHALL BE COMPACTED.
3. 2NS BACKFILL TO DEPTH OF ONE FOOT ABOVE PIPE. TAMPED LAYERS NOT TO EXCEED 6" IN DEPTH. PLATE COMPACT ABOVE PIPE (ON 1st LIFT)
4. ALL PIPE TO BE PLACED AND JOINTED IN A DRY TRENCH AND LAID ACCURATELY TO LINE AND GRADE WITH BELLS UPHILL.
5. ALL CONCRETE ENCASEMENT AND CRADLING TO BE CLASS "A" CONCRETE.

BEDDING



NOTES:
1. SADDLE MAY BE REQUIRED ON MAIN BASED ON LEAD SIZE, MAIN SIZE, AND MAIN PRESSURE
2. ALL WATER MAIN TAPS AND COMPONENT PARTS SHALL BE APPROVED BY THE PITTSFIELD TOWNSHIP UTILITIES DEPARTMENT PRIOR TO INSTALLATION.
3. INSTALLATION SHALL BE INSPECTED AND APPROVED BY THE PITTSFIELD TOWNSHIP UTILITIES DEPARTMENT.

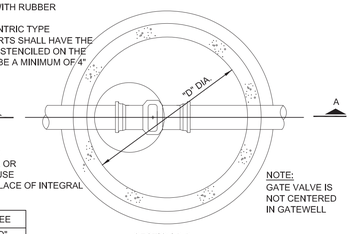
IRRIGATION METER PIT DETAIL



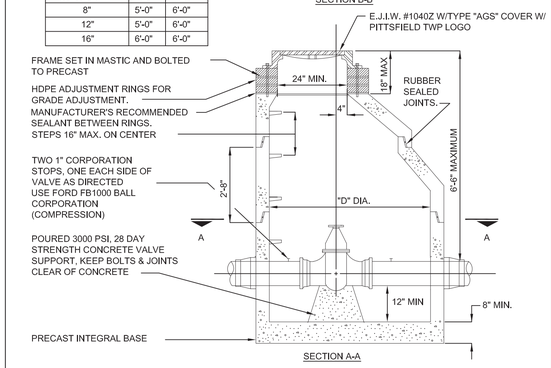
RED "REFLECTIVE" LETTERS WITH WHITE "REFLECTIVE" BACKGROUND. LETTERS WILL BE A MINIMUM OF 8" TALL BY 4" WIDE WITH 2" GIRTH, WITH AN 8" TALL 4" WIDE RED ARROW UNDER LETTERS POINTING DIRECTLY AT THE CONNECTION. TALLER BUILDINGS MAY REQUIRE LARGER LETTERING. SIGN SIZE AND LOCATION DETERMINED BY FIRE MARSHALL

FIRE DEPARTMENT CONNECTION LABEL DETAIL

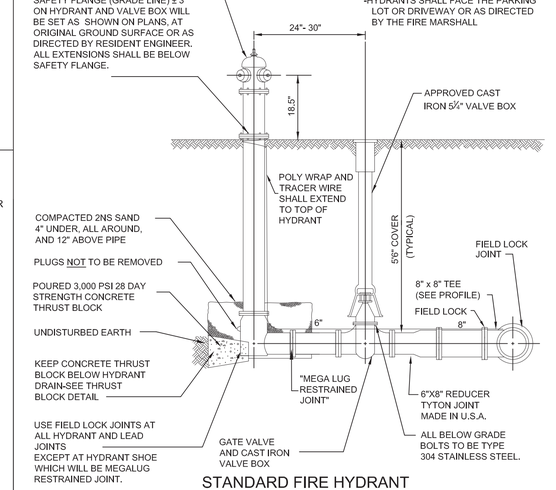
PRE-CAST CONCRETE MANHOLE
1. SECTIONS SHALL MEET ASTM C478.
2. ALL JOINTS MADE WATERTIGHT WITH RUBBER GASKET JOINTS
3. CONE TO BE OFFSET STEP ECCENTRIC TYPE
4. ALL MANHOLE COMPONENT PARTS SHALL HAVE THE NAME OF THE MANUFACTURER STENCILED ON THE INSIDE. THE LETTERING SHALL BE A MINIMUM OF 4" HIGH.
5. PROVIDE INTEGRAL BASE.
6. KOR-N-SEAL BOOTS OR APPROVED EQUAL TO BE INSTALLED AT PIPE PENETRATIONS.
7. WHERE GATE WELLS ARE CONSTRUCTED OVER EXISTING WATERMAIN, POURED IN PLACE OR PRECAST COOKIE AND DOGHOUSE STRUCTURES MY BE USED IN PLACE OF INTEGRAL BASE.



STRAIGHT THRU		TEE
VALVE SIZE	"D"	"D"
8"	5'-0"	6'-0"
12"	5'-0"	6'-0"
16"	6'-0"	6'-0"

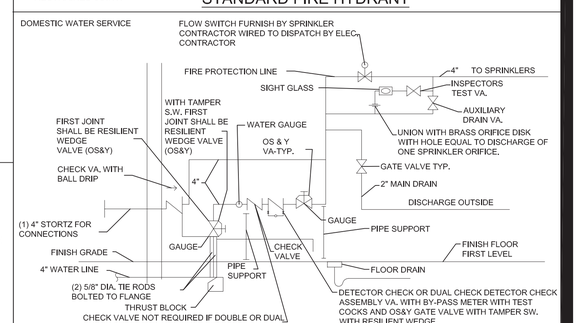


STANDARD GATE VALVE & WELL



NOTES:
-PROVIDE ONE 4-INCH STORZ CONNECTION ON EACH HYDRANT ON THE LEFT NOZZLE WHEN FACING THE HYDRANT
-HYDRANTS SHALL FACE THE PARKING LOT OR DRIVEWAY OR AS DIRECTED BY THE FIRE MARSHALL

STANDARD FIRE HYDRANT



METER ROOM DETAIL

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108-9721
48108-9721
Tel. 734.822.3101
www.pittsfield-mi.gov

Revision	By	Appd.	YY.MM.DD
UPDATES	MRH	DRW	14.01.24
FDC UPDATE	BWA	DRW	11.09.13
TWP REV	BWA	DRW	11.04.27
HYDRANT, MANHOLE UPDATE	BWA	DRW	10.10.25
UPDATES	TTN	DRW	10.01.20

Issued	By	Appd.	YY.MM.DD
File Name: W-01	BWA	DRW	07.10.01
	Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

39-W1

Title
WATER MAIN DETAILS

Project No.
2075001300

Scale
NOT TO SCALE

Revision

1.00 GENERAL

1.01 DESCRIPTION

A. The CONTRACTOR shall furnish all labor, materials, and equipment required to construct a water main and necessary appurtenant work as herein specified. The water main shall be installed in the locations as shown on the Plans and shall meet all acceptance tests.

1.02 NOTIFICATION

A. CONTRACTOR shall notify the ENGINEER and the Pittsfield Township Utilities Department at (734) 882-2110, 24 hours prior to flushing or chlorination of the water main.

B. CONTRACTOR shall schedule bacteriological testing with the ENGINEER 48 hours prior.

C. CONTRACTOR shall notify the ENGINEER and the Pittsfield Township Utilities Department 48 hours prior to connecting to an existing water main.

1.03 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings or data sheets for all pipe, manholes, manhole castings, pipe to manhole connections, valves, hydrants and the B-1 Poly Pig. The Contractor shall submit a certification letter for all pipe proposed on the project. The letters shall contain the following: Contractor name, project name, Township name, current date, certification of pipe provided and letterhead of the certifying company.

1.04 TESTING

A. General

1. CONTRACTOR shall furnish all equipment and personnel to conduct system acceptance tests as specified herein. All tests shall be conducted under the supervision of the ENGINEER. All water mains, branches and valves shall be subject to cleaning with a poly-pig, hydrostatic pressure testing, disinfection and bacteriological testing. No acceptance tests shall be conducted until the water main has been installed and backfilled for not less than 30 days. A copy of all test results shall be furnished to the ENGINEER.

2. Hydrostatic pressure testing must be performed in accordance with ANSI/AWWA C600, Disinfection and bacteriological testing must be performed in accordance with ANSI/AWWA C651.

3. CONTRACTOR shall furnish all material and labor to provide for an acceptable full size blow-off to flush the poly-pigs out of the main at the far end of the project not connected to the existing system.

4. Should the results of any test fail to meet the criteria established in this Specification, the CONTRACTOR shall, at his own expense, locate and repair the rejected section and retest until it is within the specified allowance.

5. Only Pittsfield Township personnel or the CONTRACTOR under direct supervision of Pittsfield Township personnel may fill or flush lines.

B. Preparation

1. After the pipe has been laid and backfilled as specified, the CONTRACTOR shall fill the line, or a valve section thereof, to be tested with water in such a manner as to expel all air from the pipe. This may be done through fire hydrants at the high points; or, if no hydrant is available at such point, the CONTRACTOR shall make the taps necessary to accomplish the expulsion of all air. At the close of the test, all taps shall be satisfactorily plugged with brass plugs.

C. Sequence

1. All water mains connected to an existing water system shall be flushed, swabbed, chlorinated and bacteriological tested prior to pressure testing. The sequence for acceptance testing shall be:

   a. Flushing with approved B-1 Poly-Pig
   b. Chlorination
   c. Flushing
   d. Bacteriological Testing
   e. Pressure Testing

2. Where mains can be totally isolated from the existing water system with airgaps, pressure testing shall precede chlorination and bacteriological testing. The sequence for acceptance testing shall be:

   a. Pressure Testing
   b. Connect to System
   c. Flushing with approved B-1 Poly Pig
   d. Chlorination
   e. Flushing
   f. Bacteriological Testing

3. If a hydrostatic pressure test fails, the chlorination and flushing process must be repeated after repairs to the system are completed.

D. Flushing

1. All flushing will be conducted by the TOWNSHIP with clean potable water until the water runs clear.

E. Chlorination

1. All new mains and pipe or any existing mains contaminated by the CONTRACTOR shall be chlorinated to a minimum residual chlorine concentration of fifty (50) parts per million with commercial liquid chlorine solution or approved equal. The chlorinated water shall be allowed to stand in the mains for 24 hours. The end of the 24-hour period the chlorinated water at all parts of the mains shall show a free available chlorine residual of not less than twenty-five (25) parts per million. If less than twenty-five (25) parts per million residual is shown at the end of the first 24 hours period, additional chlorine shall be added until a residual of not less than twenty-five (25) parts per million at all parts of the system is shown after a subsequent 24 hour period. The chlorinated water shall then be removed from the mains and the mains flushed with potable water for bacteriological testing. No flushing shall take place between the two required bacteriological testing.

F. Bacteriological Testing

1. The Pittsfield Township Utilities Department will take bacteriological samples of the water in the mains for analysis at two different times. The first samples will be taken 24 hours after the mains have been satisfactorily chlorinated, flushed and filled with potable water. The second sample will be taken 24 hours later. Each sample will be incubated for 48 hours. No flushing shall be done during or between tests, unless supervised and approved by ENGINEER. Two sets of safe consecutive bacteriological samples, collected at least 24 hours apart, must be obtained before placing the water main in service.

2. The CONTRACTOR shall provide a sufficient number of corporation cocks and copper tubing for taking samples. Samples shall not be collected from hoses or fire hydrants.

3. Bacteriological testing must begin on Mondays to allow Pittsfield Township personnel and the testing laboratory a full work week to conduct the testing.

G. Hydrostatic Pressure Testing

1. The CONTRACTOR shall pressure test sections of water main as sections of 2,000 feet or less unless otherwise authorized by the ENGINEER. When permitted to test lengths in excess of 2,000 feet, only the allowable leakage for 2,000 feet will be permitted.

2. All water mains shall be subjected to a hydrostatic pressure of 150 psi based on the elevation of the lowest point in the system. The main shall be maintained under the test pressure for a minimum continuous period of two (2) hours by pumping potable water into the line at frequent intervals. The volume of water so added shall be measured and considered to represent the leakage from the main. No pipeline installed will be accepted until the leakage measured is less than 0.092 gallons per inch diameter of the pipe per 1 hour per 1,000 feet.

3. In the event that the leakage exceeds the specified amount, the main shall be carefully inspected for leaks and repaired as necessary. Any cracked or defective pipe, fittings, valves or hydrants discovered shall be removed and replaced with sound material and the test repeated to the satisfaction of the ENGINEER.

4. If the CONTRACTOR chooses to pressure test against an existing valve he assumes the responsibility of meeting the leakage requirements. The CONTRACTOR may at his discretion provide a physical break and cutting in sleeve for pressure testing.

5. Temporary connections (jumpers) between existing water mains and the newly constructed system for testing purposes, shall include a reduced zone backflow preventer to prevent backflow and possible contamination of the public water.

H. Material Tests

1. The CONTRACTOR shall have test of pipe and strength made by an independent testing laboratory. Tests of up to 4 lengths of water main per hundred lengths may be required to show compliance with the Specifications. All pipe delivered to the job site shall be accompanied with a manufacturers certificate of compliance to the specifications.

2.00 PRODUCTS

A. All products shall be consistent with the current component part submittal sheet posted on the Township website.

2.01 PIPE AND FITTINGS

A. Ductile-iron pipe water main shall meet all the requirements of the latest revision of ANSI/AWWA C151/A21.51. Pipe shall be furnished in eighteen-foot or twenty-foot lengths, unless otherwise required. All joints, to include joints for fittings, valves and hydrants, must be of the push on joint type and compatible tyton joint gaskets. Ductile iron pipe must be designed in accordance with the latest revision of ANSI/AWWA C150/A21.50 to meet requirements for Pressure Class 350.

B. Ductile iron pipe and fittings shall be double-cement lined with an approved bituminous seal coat in accordance with ANSI/AWWA C104/A21.4.

C. Ductile iron fittings shall meet all the requirements of the latest revision of ANSI/AWWA C110/A21.10 for full body fittings and ANSI/AWWA C153/A21.53 for compact fittings for a minimum working pressure of 250 psi and be of the push-on joint type. Plugs, where shown on the plans, shall be solid mechanical joint plug type.

D. Restrained mechanical joints of the wedge action type shall use a follower gland and shall include a restraining mechanism which, when activated, impart multiple wedging action against the pipe, increasing its resistance as the pressure increases. Twist off nuts shall be used to insure proper actuating of the restraining device. Restrained mechanical joints for ductile iron pipe shall be Megalug, Series 1100, or approved equal. Mechanical joints shall be in conformity with the requirements of the latest revision of the ANSI AWWA C111/A21.11. Bolts and nuts must be type 304 stainless steel.

E. Push-on joints shall meet all requirements of ANSI/AWWA C111/A21.11. Push-on joints shall consist of a ductile-iron bell provided with a recess to receive a circular molder rubber gasket to effect the joint seal. A rubber gasket and sufficient lubricant to assemble the joint shall be furnished with each joint. The lubricant shall have no deleterious effect upon the color, taste or odor of potable water and shall not be corrosive to either the pipe or gasket. Pipe furnished with push-on type joints shall be equal in strength and leak tightness to pipe furnished with mechanical joints as specified when installed under identical conditions, and shall meet all other requirements of these specifications. In addition to the above requirements, the gasket and lubricant shall conform to the latest revision of ANSI/AWWA C111/A21.11. When it is necessary to utilize a locking mechanism for a push-on joint upstream or downstream of a restrained mechanical joint, field-lok gaskets or equal shall be utilized and shall be used in conformance with DIPRA Standards for restraint distance from a restrained mechanical joint fitting.

F. All pipe and fittings shall be manufactured in the United States of America.

G. The ENGINEER shall witness the delivery and unloading of all pipe and collect the appropriate manufacturer's certificate of compliance per Section 1.04 of this Specification.

2.02 VALVES

A. All valves installed under this Specification shall conform to the applicable requirements of ANSI/AWWA C500, C504 and C509 standards governing construction materials and workmanship. Each valve shall carry the name or trademark of the manufacturer. All valves shall have operating nuts that turn to the right (clockwise) to open.

B. Resilient-Seated Gate Valves

1. Resilient seated gate valves shall conform to the applicable requirements of ANSI/AWWA C515. Valves shall have a minimum working pressure of 250 psi. The gate shall be ductile iron encased in a bonded synthetic rubber to form resilient seating surfaces. Stem shall be bronze with a non-rising design and double o-ring packing. Joints shall be push-on type.

2. Resilient Seated Gate Valves shall be manufactured by American Flow Control or Clow.

C. Tapping Sleeves and Valves

1. Tapping sleeves shall be full length of heavy-duty stainless steel construction designed for use with the type of pipe to be tapped. Tapping sleeve flange and body shall be type 304 stainless steel. Bolts and nuts shall be 304 stainless steel. Gasket shall be full circumferential SBR compounded for water service. Tapping sleeve shall contain a test plug to assure seal prior to tapping. Tapping sleeve shall be JCM Industries 432; Romac Industries SST; Ford FAST, Powerseal 3490AS; Dresser 630 or equal.

2. Tapping valves shall meet the specifications for gate valves except that the valve shall have a flange compatible with the tapping sleeve.

3. The tapping sleeves and valves shall be subjected to a hydrostatic pressure of 200 psi. The sleeves and valves shall be maintained under pressure for a minimum continuous period of 5 minutes by pumping potable water into the sleeve. Upon any visual leakage observed by the ENGINEER, the tapping sleeve and valve shall be removed and replaced, and the test repeated at the CONTRACTOR's expense to the satisfaction of the ENGINEER.

D. Corporation Stops

1. Corporation stops used for insertion into mains shall be ball valve type. All stops shall have no lead brass bodies, keys, stem washers and nuts. Inlet threads shall conform to the latest revision of AWWA C800. The outlet connection shall be of the compression type to receive copper service pipe.

E. Valve Boxes

1. Valves boxes shall be 5-1/4-inch and be of cast-iron construction. They shall be of three-piece, screw-type adjustment design. All valve boxes shall be installed flush with the top of the proposed site grade. Cover shall be designed to be removed easily to provide access to the valve. The base shall not rest upon the valve assembly. Valve boxes shall be Tyler 6860 Item DD with number 6 base, or equal.

F. Valve Extensions

1. All gate valves with operating nuts at a distance greater than 6.5 feet below ground surface shall be provided with an extension stem. The length of the extension stem shall reach within 6.5 feet of the ground surface. Details of the extension system and method of installation shall be approved by the ENGINEER prior to installation.

G. Post Indicators and Valves

1. Post indicators, when specified, shall be American Flow Control series A240 or Clow series 2945A with aluminum plates indicating OPEN and SHUT. Post indicators shall open left.

2. Post indicator valves shall be American Flow Control Model 2500 or Clow model F-6120. All valves shall open left.

3. Post indicators and their corresponding valves must be made by the same manufacturer.

4. Bollards must be placed to protect post indicators, except as specified by the ENGINEER.

5. Bollards shall be 4-inch diameter galvanized schedule 40 steel posts 36 to 48 inches high with minimum depth of 24 inches. The posts shall be set in and filled with 3000 psi concrete. Bollards protecting hydrants and PIVs shall be painted red.

2.03 GATEWELLS

A. Gatewells shall conform to the latest revision of ASTM C478 for Precast Reinforced Concrete Manhole Sections. Section joints shall be rubber gasketed and shall conform to ASTM C990. Cone sections shall be eccentric, with an offset step configuration.

B. All gatewell components shall have the name of the manufacturer stenciled on the inside. The lettering shall be a minimum of 4-inches high.

C. Gatewells constructed over an existing water main shall have a doghouse mudded to an 8-inch thick cookie. All other gatewells shall have precast integral base sections.

D. Mortar for masonry or plastering outside of gatewells shall be made of one part of Portland Cement to two parts fine aggregate. Mortar materials and mixing shall correspond, in general, to those for concrete. All openings in gate wells shall be closed with brick and mortar in a manner that will make them watertight.

E. Gatewell steps shall be reinforced polypropylene coated steel. They shall be M.A. Industries models PS1-PF or PS1-B, or approved equal.

2.04 GATEWELL FRAMES AND COVERS

A. Gatewell frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitable notched for convenient removal of the cover.

B. Frames and covers shall be East Jordan Iron Works Model 1040Z frame with 1040 A cover. Each cover shall have the Pittsfield Township logo and the letters "PITTSFIELD TWP WATER" cast integrally into the cover.

C. All frames and covers shall be coated at the place of manufacturer with coal tar pitch varnish or other asphaltum coating approved by the ENGINEER.

2.05 GATEWELL CONNECTIONS

A. Water pipe to gate well connections shall be through a watertight flexible pipe-to-manhole connector, which shall be securely clamped into a core-drilled port. Pipe ports shall be core-drilled at the point of manufacturer and shall be accurately located within 1/2-inch of the proposed water main centerline. Flexible pipe-to-manhole connectors shall meet the requirements of ASTM C923 and shall be NPC, Kor-N-Seal, or equal.

B. All non-rubber components including wedges, bands and pipe clamps shall be stainless steel.

2.06 GATEWELL ADJUSTMENTS

A. All final grade adjustment of gatewell cover and frame assemblies shall be completed utilizing injection molded High Density Polyethylene (HDPE) adjustment rings as manufactured by Ladtech, Inc., or approved equal. The adjustment rings shall be manufactured from polyethylene plastic meeting the requirements of ASTM D4976. Brick adjustments are not acceptable.

B. All adjustment for matching road grade shall be made utilizing a molded indexed slope ring.

C. Each adjustment ring shall be sealed with a 3/16 to 1/4-inch bead of butyl rubber sealant per the manufacturer's instructions. Sealant shall meet the requirements of ASTM C990.

D. All castings and adjustment rings shall be securely fastened to the cone of the structure with four 3/8-inch threaded rods. The rods shall be galvanized or stainless steel anchored to the structure with Redhead Trubolt concrete anchors, or equal. Stainless steel or galvanized nuts and washers shall be used to attach the casting.

E. When the depth of the gate well requires an adjustment greater than the maximum allowed, the CONTRACTOR shall provide additional pre-cast gate well barrel sections required to maintain acceptable chimney heights.

2.07 HYDRANTS

A. Fire hydrants shall comply with the latest revision of ANSI/AWWA C502. Hydrants shall be compression type to open with the pressure. They shall have a 5-1/4" valve opening and 6" mechanical joint inlet. Hydrants shall have two 3-1/2" (4.05" O.D.) pumper connections with National Standard 7-1/2 threads per inch. All hydrants shall have City of Ann Arbor standard thread pattern.

B. Fire hydrants shall have an inside barrel dimension of not less than 7.375" I.D. from top to bottom. The 1-1/8" pentagon operating nut shall open left (counter clockwise).

C. All nozzles shall be on a removable head with a flange so that they may be rotated by changing the position of the flange.

D. Hydrant shall be fully bronze mounted, including top of the operating stem where it passes through the double o-ring seal in the bronze packing gland. The forged operating stem in the base and the valve seat shall also be of bronze. The molded valve shall be of compositions rubber and the cast iron valve clamps shall be packed with o-ring seals and held tight to the stem by a threaded bronze hex retainer ring and threaded bronze locknut, anchored with set screws.

E. Hydrant shall be designed for 150 psi working pressure and tested to 300 psi. Those portions of the hydrant above grade shall have two coats of red enamel. All unpainted surfaces shall have two coats of coal tar pitch varnish.

F. The hydrants shall be EJIW WaterMaster 5BR-250 with mechanical joint connections and break flange barrel with standard head.

G. Hydrant bolts located below grade shall be type 304 stainless steel

H. All hydrants shall have a 4" Harrington Integral Hydra-Storz (HIHS) adaptor. The HIHS shall meet the requirements of AWWA C502 regarding material and pressure testing. Stortz nozzle shall have a brass metal face and hard anodized ramps and lugs. The aluminum finish shall be hardcoat anodized to MIL-A-8625f, type 3 dark gray. The adapter shall be made from forged or extruded 6061-T6 aluminum.

I. The blind cap shall have hard anodized aluminum Storz ramps and lugs, made of forged or extruded 6061-T6 aluminum, the cap shall be equipped with suction seal. The cap shall be connected to the adapter or the hydrant with 0.125 vinyl coated aircraft cable.

J. Fire hydrant extensions shall be manufactured by the hydrant manufacturer for use with the model hydrant being installed.

K. Hydrants adjacent to truck routes on commercial developments shall be protected by bollards.

2.08 SERVICE LEADS

A. Pipe for service leads 1-inch to 2-inch shall be soft annealed Type K copper. Service leads 4-inch to 8-inch shall be Pressure Class 350 Ductile Iron, Double cement lined.

B. Curb Stops

1. Curb stops used for service connections shall be ball valve type. All parts shall be no lead brass. Both the inlet and outlet connections shall be of the compression type to receive copper service pipe. Curb stops shall be consistent with the most current shop drawing checklist posted on the Township website.

C. Curb Boxes

1. Curb boxes shall be the Bibby Screw Style V010 with S169 top, V201 bottom, V223 extention, and V240 water cover . All curb boxes shall be coated inside and out with a tar base enamel. The minimum bury shall be 5'-0" (60") and the maximum 6' (72"). Curb boxes shall be consistent with the most current shop drawing checklist posted on the Township website.

D. Couplings

1. Couplings used for service connections shall be located outside the pavement and more than 10 feet from any building wherever possible. They shall have a three part union, and both connections shall be of the compression type to receive copper service pipe. All parts shall be no lead brass..

2. All service connections between two copper service pipes (two-inch or less in diameter) located under the pavement or within 10 feet of a building shall be connected using wrought copper, solder-sweat type couplings conforming to ASME B16.18 or ASME B16.22. Fittings shall bear made in USA labels. Joining of copper piping shall be a solder-sweat connection using lead free Silfos. The use of 95-5, Tin-Antimony or equivalent solders will not be allowed.

2.09 TRACER WIRE

A. Tracer wire to be used on open cut pipe shall be AWG #12 single strand copper with blue 30 mil HDPE insulation. Connections shall be made using 3M DBR-6 wire connectors, or equal.

2.10 POLYETHYLENE ENCASEMENT

A. All ductile iron pipe and fittings must be polyethylene encased. In addition, the initial 24-inches of copper service lead must be encased from the corporation stop. Polyethylene encasement must be manufactured in accordance with the requirements of the latest revision of ANSI/AWWA C105/A21.5.

B. Polyethylene Encasement shall be black linear low-density polyethylene with a minimum thickness of 8 mils.

C. The wrap shall overlap the joint by 12 inches to either side and be secured to the pipe with polyethylene adhesive tape.

3.00 EXECUTION

3.01 EXCAVATION AND BACKFILL

A. All excavation and backfill shall conform to the Earthwork specification.

3.02 PIPE INSTALLATION

A. The installation of ductile iron water main must conform to the requirements of ANSI/AWWA C600.

B. Any pipe damaged in transport or handling shall be rejected and removed from the site of the work.

C. Before lowering in the trench, and while suspended, each pipe and fitting shall be inspected for defects. Defective, damaged or unsound pipe shall immediately be removed from the construction site. The interior of each pipe shall be inspected for cleanness and cleared of all dirt and foreign matter before being lowered into the trench.

D. In handling and placing ductile iron pipe and fittings, no metal shall be used in contact with the inside of the pipe to fit or support the pipe. The pipe shall be moved only through the use of belt slings or automatic release type pipe tongs. Care shall be taken not to injure the pipe or pipe coating, and no damaged or imperfect pipe shall be used in the work except that minor damage to pipe coating may be repaired subject to the review of the ENGINEER.

E. Unless otherwise directed, pipe shall be laid with bell ends facing in the direction of laying. After a length of pipe is placed in the trench, the spigot shall be centered in the bell of the adjacent pipe; the pipe shoved into position and brought to a true alignment. It will then be secured with sand backfill tamped under and on each side of the pipe, except at bell holes. No earth or other foreign matter shall be allowed to enter the joint space.

F. All excavation and backfill above the pipe shall conform to specifications under Earthwork and as shown on the Drawings.

G. A minimum of 18-inches vertical clearance shall be provided between the water main and any existing underground facility, unless otherwise approved by the ENGINEER. Whenever a main is installed under any existing utility line such as gas, buried electric power, telephone line, sewer or water, provisions shall be made to properly support or distribute any concentrated load to avoid settlement and possible failure of either main. Such provisions shall consist of concrete bedding of the main, complete concrete encasement, or some other method as shown on the plans. Water mains passing under sewers, in addition, shall be protected by providing:

1. A vertical separation of at least 18-inches between the bottom of the sewer and the top of the water main.

2. Adequate structural support for the sewer to prevent excessive deflection of joints and settlement of the sewer about the water main; i.e., a concrete saddle under the pipe with a span length extending to undistributed earth bearing.

H. Water mains shall be installed at least 10 feet horizontally from any existing or proposed gravity sanitary or storm sewer, septic tank, or subsoil treatment system. The distance shall be measured edge to edge.

I. In assembly of push-on or shove type joints, the bell socket recess and the gasket shall be wiped clean and the gasket placed properly in position. A thin film of lubricant shall then be applied to the surface of the gasket to come into contact with the entering pipe. The plain end of the entering pipe shall be cleaned and then entered and forced home to the base of the socket.

J. Where necessary to cut pipe, cutting shall be done with approved tools and cut ends of pipe shall be square and regular. Cutting shall be done in a manner to avoid damage to lining and coating. Minor damage may be repaired subject to review of the ENGINEER.

K. To prevent trench water from entering the pipe, joints, which for any reason may not be completed as the pipe is laid, shall be thoroughly packed with approved material, in a manner to make them watertight. Open ends of fittings shall be tightly closed with approved plugs and well packed, as shall the end of the last pipe laid whenever work is not in progress.

L. Each pipe shall be laid accurately to the line and grade shown on the Plans. Wherever deflections at joints are required by changes in grade or alignment or to plumb valve stems, the deflection at any bell and spigot joint shall not exceed that which will cause the spigot end of pipe to be away from home in the bell of the adjacent pipe a distance of 1/4 inch at the point of greatest opening.

M. The deflection at any mechanical joint shall not exceed three-quarters of the maximum deflection recommended by the manufacturer or 3 degrees, whichever is more conservative of the joint used.

N. The CONTRACTOR shall not be entitled to any additional compensation because depth is more than specified at certain locations or due to clearances at manholes, or due to unforeseen obstacles, or occasioned in order to avoid undue changes in grade.

O. Pipe shall be laid at depths to provide minimum cover of 5' - 6" over the top of the pipe unless otherwise noted on the Drawings or elsewhere in these specifications.

3.03 GATE VALVES AND WELLS

A. All pre-cast section joints and lift holes shall be pointed and plugged, inside and outside, with mortar.

B. Gate valves shall be of the size and installed at the location as shown on the plans. They shall be set square with the line of the main, and unless otherwise directed by the Township ENGINEER, all gate valves shall be set with stems plumb. At each side of gate valve, the CONTRACTOR shall furnish and install a 1-inch corporation stop on the main as shown on the Standard Details.

C. All gate valves with operating nuts at a distance greater than 6.5 feet below ground surface shall be provided with an extension stem.

3.04 HYDRANTS

A. Fire hydrants shall be constructed in accordance with the details shown on the plans. Finish grade level to center of nozzle caps shall measure between 24 and 30 inches. A maximum of one hydrant barrel extension and one operating stem extension may be used to accommodate changes in grade. Under no conditions shall extended hydrant have more than one coupling in the operating stem. Pumper connections shall point toward the street.

B. Fire hydrants shall be installed with barrel vertical and properly based. Concrete thrust blocks shall be placed behind the hydrant, tee, and every bend. Care should be taken to insure the drain holes on the hydrant are not plugged by the thrust blocks. Hydrant shall be set in 1 yard of coarse gravel for drainage purposes. If ground water is encountered, the drain hole shall be plugged as directed by the manufacturer. The backfill shall be sand thoroughly tamped around the hydrant and valve box in 1 ft layers.

C. Fire hydrant and gate valve shall be set apart 24 inches. Gate valves and valve box shall be as specified under the valve paragraphs of this section.

D. Hydrant leads shall have a minimum of 5.5 feet of cover in all areas, including crossings through ditch sections.

E. Hydrants shall be carefully plumbed, braced and backfilled so they remain plumb.

F. All grade, facing, and vertical alignment adjustment of hydrants shall be completed prior to pressure testing and charging of the hydrants.

G. All hydrants shall be cleaned and painted with a rust inhibitive, oil base paint such as "rustoleum" or approved equal to the Township's color code prior to acceptance.

H. The lubricant reservoirs in all hydrants having such construction shall be filled with a lubricant acceptable to the Michigan Department of Environmental Quality and recommended by the hydrant manufacturer.

I. Backfilling around fire hydrants shall be carefully tamped sand in 12-inch layers from the centerline of the lead main to a height of 1-foot below finished grade.

J. CONTRACTOR shall place burlap sack or equivalent material over the hydrant nozzles after installation.

K. Fire hydrant nozzles shall be aligned as required by the Township Fire Marshal.

L. Fire hydrant extensions shall be provided as necessary so that the safety flange is located at or above surface grade.

3.05 TRACER WIRE

A. Tracer wire shall be installed along the top of all water mains. For directional drilling, the tracer wire shall be installed at the same time as the pipe. For open cut construction, the tracer wire shall be installed at a height of not more than 6 inches above the main line pipe or service leads. Wire shall be extended to all hydrants, blow-offs, dead ends, service leads and post indicator valves. Tracer wire shall be brought to grade, leaving enough excess material to avoid loss or damage to the wire during construction and subsequent activities. Wire shall be trimmed to finish grade following completion of the landscaping.

B. When tracer wire is to be run along short offsets (less than 20 feet), a loop of wire shall be utilized to loop to the end of the offset, bring the loop to grade and terminate it in an approved manner. For service leads and offsets of more than 20 feet in length, or installed by directional drilling method, a splice may be utilized to make the connection at the main. The tracer wire shall then be installed and terminated in an approved manner.

C. Tracer wire terminations shall be made by one of the following methods:

1. Tracer wire shall be terminated at hydrants by tying off the wire at the head flange, leaving excess material for future trimming following landscape activities.

2. Terminations at valve/curb boxes, post indicators, valves and blow-offs shall be made with 2 wraps of wire at grade around the box or pipe, leaving excess material for future trimming following landscaping.

3. Gatewell terminations shall be made by running the tracer wire through the pipe opening in the wall, down to and across the floor to the steps, up the wall and secure to the top step leaving the stub accessible at the casting. Wire shall be run through the gatewell such that it does not create a hazard.

4. Terminations at existing water mains without tracer wire shall be made at the nearest hydrant or gate well as outlined above. If no hydrant or gatewell is available, an upper section of valve box shall be installed with the tracer wire stubbed up inside

D. When connections are made to existing water mains which do not have tracer wire, the following method most applicable to field conditions shall be used.

1. When connection is made at/near a valve or hydrant, the connection shall be made in the same manner as the termination at said structures in Item C(2) above.

2. When connection takes place in a gatewell, the same procedure shall be used as in termination at a gatewell (see Item C(3) above).

3. If no valve or hydrant is available, the upper section only of a valve box shall be set with the tracer wire stubbed up inside.

3.06 POLYETHYLENE ENCASEMENT

A. The polyethylene encasement must be installed in accordance with the specifications and requirements of ANSI/AWWA C105/A21.5. For open cut applications a single wrap is required, and for directional drill applications a double wrap is required.

B. The polyethylene encasement must be taped and overlapped at pipe joints and must be taped in a spiral configuration along the length of the pipe.

3.07 CONNECTION TO EXISTING MAINS

A. All connections to existing water mains shall be made at the locations as shown on the plans.

B. All valves shall be operated by the Pittsfield Township Utilities Department.

C. Prior to beginning construction of the final connections, the CONTRACTOR shall provide sequence of all final connections to the existing system and coordinate a meeting between the ENGINEER, OWNER and CONTRACTOR in the field to review the procedure.

D. When making a dry connection to an existing main, the existing main to which a connection is to be made shall be isolated by the closing of the necessary existing valves, and the water from the existing main shall then be pumped out or removed by other means so the connection may be made in the dry. After the connection has been acceptably made, the portion of the new line to the nearest valve shall be satisfactorily tested and disinfected, along with the drained portion of the existing water main, before the isolated existing main is placed back in service, except as the ENGINEER may otherwise direct. In as much as residents served by this isolated main will be temporarily out of water during this period, the work shall be executed as rapidly as possible, and the time of, and the procedure in, making such connections shall be subject to the review of the ENGINEER. Such work may be required to be done at night in order to minimize inconvenience of water users. The CONTRACTOR shall not be entitled to any additional compensation because of night work or other special requirements in work under this section.

E. The CONTRACTOR shall make particular effort, prior to bidding, to ascertain whether or not valves in the existing mains to be connected to the new mains are so located as to provide isolation. If valves are not found to be adequate, then the CONTRACTOR shall utilize other means to make the connections with a minimum of interruption to service.

F. When making a wet tap connection to an existing main, a tapping sleeve designed for the type of pipe being tapped shall be utilized and the tap shall be made in accordance with the manufacturer of the tapping equipment.

G. Wherever adapters are required to properly connect the pipe with existing pipe or other material or manufacturer, the nominal I.D. of adapters shall be the same size as the nominal diameter of pipe connected thereto. Adapters shall also be furnished and used as required by the manufacturer for connection to fittings.

3.08 BEDDING

A. Ductile iron pipes shall be fully enclosed in polywrap and laid on a compacted sand cushion, 4 inches thick. Sand shall conform to fine aggregate 2NS as defined in 2003 MDOT, Section 902.

B. 2NS sand bedding material shall be placed around and above the main to a height of 12 inches above the main.

C. Sand shall be compacted on top of the 12-inches of sand above the pipe to not less than 95 percent of the maximum unit density as determined at optimum moisture content.

PITTSFIELD CHARTER TOWNSHIP

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108-9721
48108-9721
Tel. 734.822.3101
www.pittsfield-mi.gov

Revision	By	Appd.	YY.MM.DD
SPEC. UPDATES	MRH	DRW	14.01.24
TWP REV	BWA	DRW	11.04.27
SPEC. UPDATES	BWA	DRW	10.10.25
SPEC. UPDATES	TTN	DRW	10.01.19

Issued	By	Appd.	YY.MM.DD
File Name: W-02	BWA	DRW	DRW	07.10.01
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

40-W2

Title
WATER MAIN SPECIFICATIONS

Project No.
2075001300

Scale

Revision

STORM SEWER AND DRAINAGE STRUCTURES

1.00 GENERAL

1.01 DESCRIPTION

A. Furnish all labor, tools, equipment and materials to construct all storm sewers, and drainage structures as herein specified. No sewers shall be accepted until the sewer system has passed the system acceptance tests.

1.02 TESTING

A. General

1. The CONTRACTOR shall furnish all equipment and personnel to conduct system acceptance tests as specified herein on all completed sewers. All tests shall be conducted under the supervision of the ENGINEER. No acceptance tests shall be conducted until the entire sewer system is constructed or just prior to placing the line in service providing the sewer pipe has been installed for not less than 30 days.

B. Test for Alignment

1. All sewers shall be laid accurately to the line and grade designed by the ENGINEER. The sewers will be tested for alignment by shining a light through the pipe at a manhole and viewing the light from an adjacent manhole. Any section of sewer in which a light cannot be seen from one manhole to the next shall be corrected to the satisfaction of the ENGINEER to pass this test.

C. Material Tests

1. The CONTRACTOR shall have tests of pipe strength made by an independent testing laboratory. Tests of up to 4 lengths of sewer pipe per hundred lengths may be required to show compliance with the Specifications. All pipe delivered to the job site shall be accompanied with a manufacturer's certificate of compliance to the Specifications.

D. Submittals

1. The CONTRACTOR shall submit shop drawings, or data sheets for all castings, steps and manholes.

2. The CONTRACTOR shall submit certification letters for all pipes. All letters must contain the following: Contractors name, project name, township name, current date, certification of pipe provided and letterhead of the certifying company.

2.00 PRODUCTS

2.01 PIPE

A. Reinforced concrete pipe and manhole tees shall be no less than the latest revision of ASTM C76, with the class designation as shown on the Plans or in the Proposal.

B. Concrete pipe shall have tongue and groove gasketed premium joints.

C. Corrugated steel pipe shall meet the requirements of AASHO M-190 for coated pipe latest revision. Minimum gage thickness shall be as shown on the Plans.

2.02 REINFORCED CONCRETE MANHOLES

A. Manholes shall conform to the current ASTM Specifications for precast reinforced concrete Manhole Sections, serial designation C478. Manhole section joints shall conform to ASTM Designation C990. All cones shall be eccentric with an offset step configuration. Concrete adjustment rings or riser rings shall not be used for adjusting the height of the structure.

B. All manhole component parts shall have the name of the manufacturer stencilled on the inside. The lettering or logo shall be a minimum of 4 inches high.

2.03 MORTAR FOR MANHOLES

A. Mortar for plastering manholes and drainage structures shall be made of one part Portland cement and two parts fine aggregate.

2.04 BRICK AND BLOCK

A. Brick for brick and mortar structures shall conform to the current ASTM Specification C32. Block for block and mortar structures shall conform to the current ASTM Specification C135.

B. The concrete block masonry used to construct manhole and catch basin walls shall be solid curved blocks with the inside and outside surfaces curved to the required radii. The blocks shall have tongue and groove or other approved type of joint at the ends so that the units interlock to form a strong, rigid structure. Curved blocks shall have the inside and outside surfaces parallel.

C. The block shall not exceed 18 inches in length or 8 inches in depth (height). No block shall be less than 6 inches in width (thickness). All blocks in one structure shall be of the same height dimension. The blocks shall be designed for length so that only full-length or half-length blocks are required to lay the circular wall of any one course.

D. Blocks intended for use in the cones or tops of manholes and catch basins shall have such shape as may be required to form the structure as shown on the Plans with inside and outside joint not to exceed 1/4-inch in thickness.

2.05 STRUCTURE FRAMES AND COVERS

A. Structures frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitably notched for convenient removal of the cover. Each solid manhole cover shall be marked Storm Sewer with letters integrally cast into the cover.

B. Frames and Covers shall be as follows:
1. For use on manholes: East Jordan 1040Z, with Type B cover lettered "STORM SEWER", or equal. Structures 24-inches in diameter shall have the 1045 Z frame.
2. For use on drainage structures in paved areas: East Jordan 1040Z, with Type M1 cover, with "DUMP NO WASTE" lettering and trout logo.
3. For use on drainage structures in curbed areas: East Jordan 7045 or 7065, with "DUMP NO WASTE" lettering and trout logo.
4. For use on drainage structures in landscaped areas: East Jordan 1040Z, with 1040 N 7", with "DUMP NO WASTE" lettering and trout logo.

C. All frames and covers shall be coated by the manufacturer with coal tar pitch varnish or other asphaltum coating reviewed by the ENGINEER.

D. All covers for drainage structures shall have storm drain markers affixed to the nearest available flat surface. The storm drain markers shall be manufactured by Das Manufacturing and shall be #SDR "No Dumping. Drains to River." The storm drain markers shall be installed per the manufacturer's recommendations.

2.06 MANHOLE STEPS

A. Steps shall be plastic coated steel. They shall be M.A. Industries PS1-PF for precast manholes, PS1-B for block manholes, or equal.

2.07 DRAINAGE STRUCTURES

A. All manholes and catch basins shall be precast unless otherwise specified.

B. Manhole and catch basin bottoms shall be concrete and top of slab shall have a troweled finish.

C. Upon approval by the ENGINEER, the manhole and catch basin walls may be constructed of concrete block masonry or concrete manhole pipe conforming to the requirements of the specifications previously listed. Construction shall be in accordance with the details for Catch Basin and Storm Sewer Manhole shown on the Plans.

D. A plaster coat of mortar 1/2-inch in thickness shall be applied to the inside and outside surface of all manholes and catch basins constructed with concrete block masonry or sewer brick. The inside coat of mortar shall be applied in a smooth, neat workmanlike manner.

E. Final adjustment of the top of manholes and catch basins, so that the manhole or catch basin cover is at finished elevations as shown on the Plans or meets the finished surface, may be accomplished with sewer brick conforming to the previously listed Specifications. The total height of brick for this purpose shall not exceed 9 inches. The total chimney height shall not exceed 18 inches.

F. All block and brick masonry units shall be laid in a full bed of mortar. The inside joints of the block masonry construction shall be tooled in a neat and workmanlike manner.

3.00 EXECUTION

3.01 EXCAVATION AND BACKFILL

A. All excavation and backfill 12 inches above the crown of pipe shall conform to Section 2.04, Earthwork of these specifications.

B. The trench shall be backfilled closely behind the pipe laying. Unless otherwise directed or permitted by the ENGINEER, the backfilling shall follow and be completed to the top of the trench within four pipe lengths behind pipe laying.

3.02 BEDDING

A. Concrete pipe shall be laid on a compacted granular material placed on the bottom of the trench to a depth of not less than 4 inches. Where indicated on the Plans or required by the ENGINEER, concrete encasement or cradle shall be used.

B. For all pipes, compacted aggregate material shall be placed at the sides of the pipe in 12-inch lifts and cover not less than 12 inches above the crown of the pipe.

C. "Granular Material" shall be MDOT class II, placed in not more than 6-inch layers and compacted to not less than 90% standard density.

3.03 PIPE INSTALLATION

A. All pipe shall be laid true to the required lines and grades. All trenches when pipe laying is in progress, shall be kept dry, and all pipes and fittings shall be uniformly supported on a properly trimmed bedding with holes at each joint to receive bells. All pipe shall be laid with bells uphill.

B. The grade as shown on the profiles is that of the pipe invert and that to which the work must conform. The grade shall be kept by laser or other tools which shall be furnished by the CONTRACTOR at his expense. Each pipe shall be laid accurately to the line and grade as shown on the Plans and in such manner as to form a close concentric joint with the adjoining pipe and prevent sudden offsets of the invert. The interior of sewers shall, as the work progresses, be cleaned of all dirt, cement, debris and other superfluous materials of every description. Bulkheads shall be used to keep foreign materials out of the open end of the sewer when work is not in progress.

C. The location of the piping as shown on the Plans has been determined to avoid, insofar as possible, interference with trees or structures or fixtures above ground and other underground mains, services, utilities or structures. Any change in location or alignment of piping, which may be found more feasible or practicable as the work progresses, shall be made by the CONTRACTOR, as the ENGINEER may direct.

D. All pipe shall be carefully lowered and moved into position in trench or vault in a controlled manner such as will prevent damage to the pipe and any coatings or lining. An excessive amount of scratching on the surface of the concrete pipe will be considered cause for rejection.

E. All cutting of the pipe shall be done in a neat workmanlike manner with the least amount of waste and without damage to existing or new lines. A fine toothsaw, tubing cutter or similar tool may be used to cut concrete pipe. Cuts must be square. Ragged edges shall be removed with a cutting tool or file.

F. Breaks in pipe or joints shall be repaired to the satisfaction of the ENGINEER and at the expense of the CONTRACTOR.

3.04 CONNECTIONS TO EXISTING MANHOLES

A. When a sewer is connected to an existing manhole, a hole adequate to receive the new pipe shall be cored into the manhole.

B. If the existing manhole is of brick construction, a single rowlock of brick shall be turned over the new pipe and the existing manhole brick work shall be cleaned, pointed and given a 1/2-inch mortar coat on the outside surface.

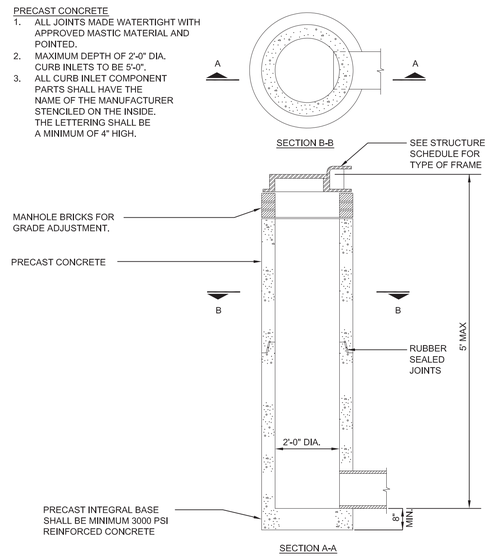
C. For connections to existing precast reinforced concrete manholes, a hole shall be cored into the concrete manhole wall to receive the pipe. Reinforcing steel shall not be cut out shall be bent and replaced in the area that is to be patched. A form shall be constructed over the area of pipe penetration. The formed area shall then be filled with concrete.

D. Closure of the manhole wall shall be made watertight using concrete.

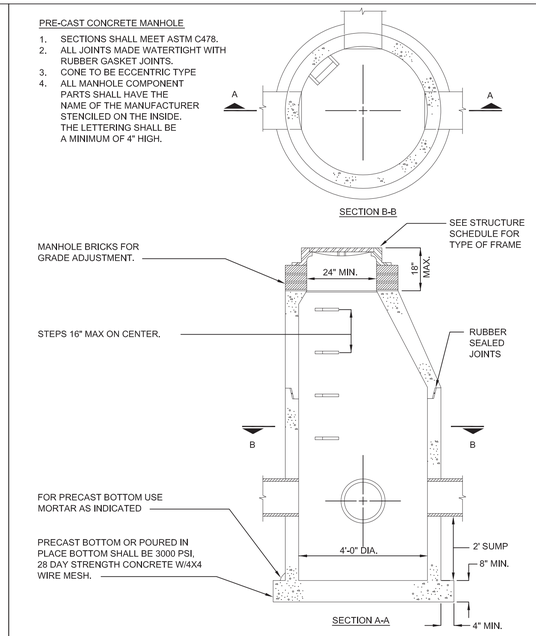
3.05 ANIMAL GRATES

A. Animal grates shall be required on all endsections greater than 12-inch diameter.

PCT February 2008



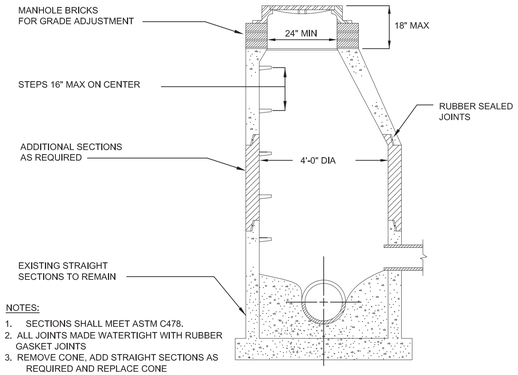
2' DIAMETER INLET



4' DIAMETER CATCH BASIN

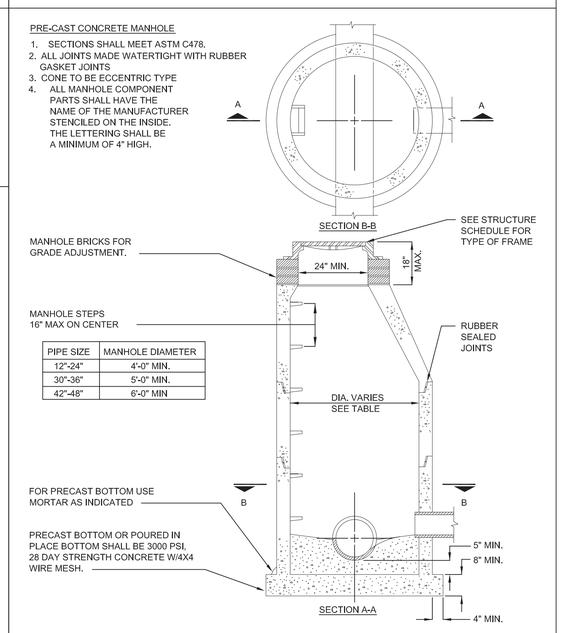
AFFIX TO SURFACE ON OR NEAR ALL DRAINAGE COVERS.

STORM DRAIN MARKER



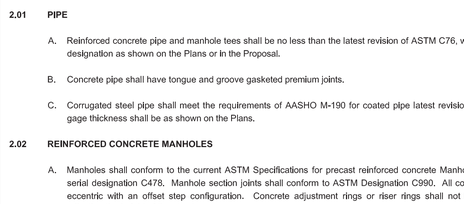
NOTES:
1. SECTIONS SHALL MEET ASTM C478.
2. ALL JOINTS MADE WATERTIGHT WITH RUBBER GASKET JOINTS
3. REMOVE CONE, ADD STRAIGHT SECTIONS AS REQUIRED AND REPLACE CONE
4. ADD MANHOLE STEPS AS NECESSARY
5. ADD ADJUSTMENT RINGS FOR RIM GRADE ADJUSTMENT

MANHOLE & CATCH BASIN RECONSTRUCTION DETAIL



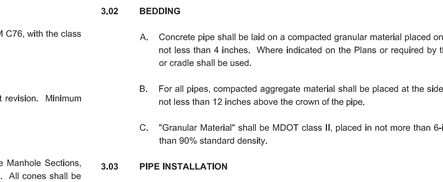
PIPE SIZE	MANHOLE DIAMETER
12"-24"	4'-0" MIN.
30"-36"	5'-0" MIN.
42"-48"	6'-0" MIN

STORM SEWER MANHOLE



PLAN VIEW

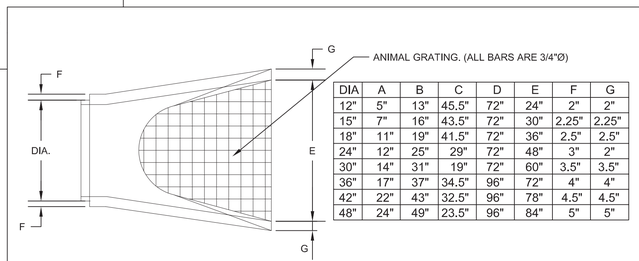
1. RIPRAP THICKNESS AS SHOWN ON PLANS.



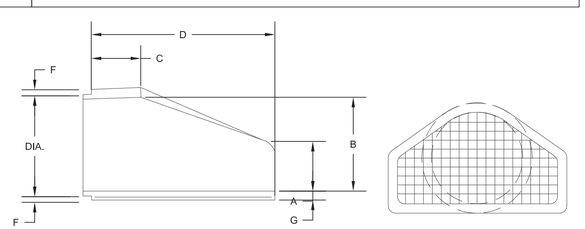
NOTES:
EXTENT OF RIPRAP SHALL BE AS SHOWN HERE OR AS SHOWN ON PLANS, WHICHEVER IS GREATEST.

SECTION A–A

END SECTION AND RIPRAP DETAIL



DIA	A	B	C	D	E	F	G
12"	5"	13"	45.5"	72"	24"	2"	2"
15"	7"	16"	43.5"	72"	30"	2.25"	2.25"
18"	11"	19"	41.5"	72"	36"	2.5"	2.5"
24"	12"	25"	29"	72"	48"	3"	2"
30"	14"	31"	19"	72"	60"	3.5"	3.5"
36"	17"	37"	34.5"	96"	72"	4"	4"
42"	22"	43"	32.5"	96"	78"	4.5"	4.5"
48"	24"	49"	23.5"	96"	84"	5"	5"



NOTE:
FLARED END SECTIONS SHALL BE MANUFACTURED TO THE CLASS SPECIFICATIONS AS THE PIPE ITSELF.

STANDARD END SECTIONS FOR PRECAST CONCRETE

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108–9721
48108–9721
Tel. 734.822.3101
www.pittsfield-mi.gov

Revision	By	Appd.	YY.MM.DD
UPDATES	MRH	DRW	14.01.24
TWP REV	BWA	DRW	12.08.09
TWP REV	BWA	DRW	11.04.27
UPDATES	BWA	DRW	10.10.25
UPDATES	TTN	DRW	10.01.20

Issued	By	Appd.	YY.MM.DD
File Name: ST–01	TTN	DRW	07.10.01
	Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

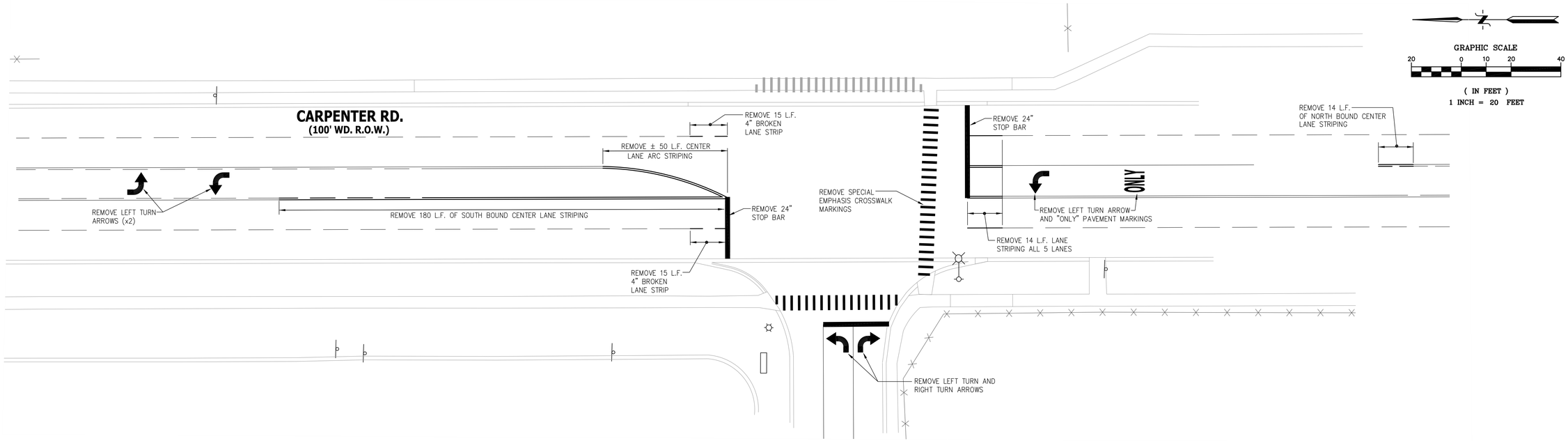
41-ST

Title
STORM SEWER DETAILS AND SPECIFICATIONS

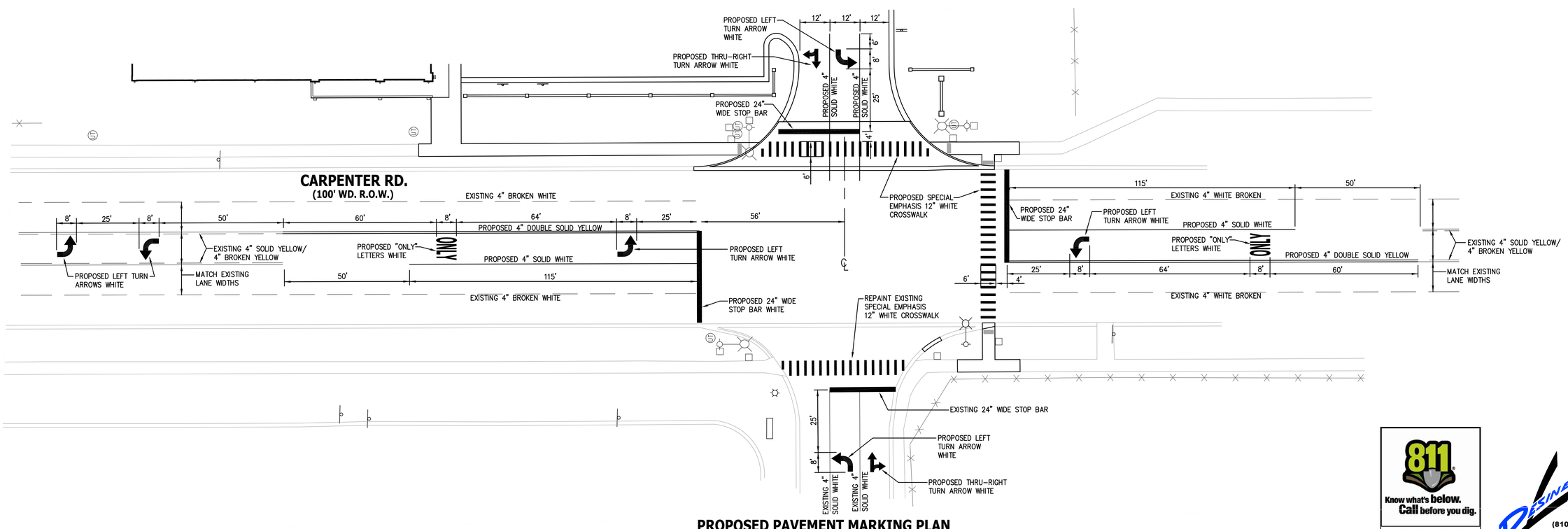
Project No.
2075001300

Scale
NOT TO SCALE

Revision



PAVEMENT MARKING REMOVAL PLAN



PROPOSED PAVEMENT MARKING PLAN

Know what's below. Call before you dig.

3 WORKING DAYS BEFORE YOU DIG CALL 811 OR 1-800-482-7171 (TOLL FREE) OR VISIT CALLB11.COM

DESINE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION
1	07-02-18	REVISED PER TOWNSHIP ENGINEERING REVIEW COMMENTS

REVISION #	DATE	REVISION-DESCRIPTION

ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

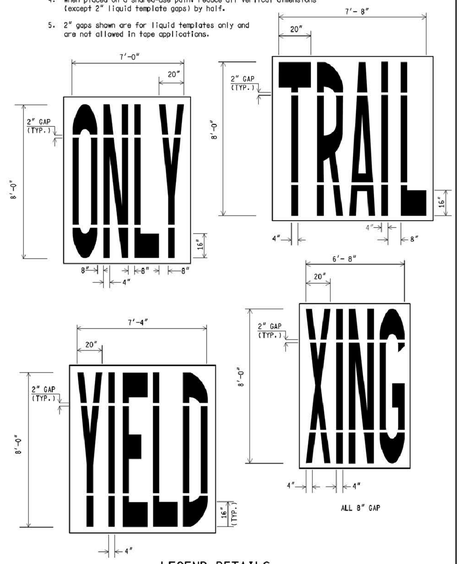
CARPENTER ROAD
PAVEMENT MARKING PLAN

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: 1"=20'
PROJECT No.: 9162803
DWG NAME: 2803-STRP
ISSUED: JULY 02, 2018

42-PM1

NOTES:
1. All letters are 16 inches wide unless noted otherwise.
2. All gaps between letters are 4 inches unless noted otherwise.
3. Rectangular area containing legend indicates template for liquid applied materials.
4. When placed on a shared-use path, reduce all vertical dimensions (except 2" liquid template gaps) by half.
5. 2" gaps shown are for liquid templates only and are not allowed in tape applications.



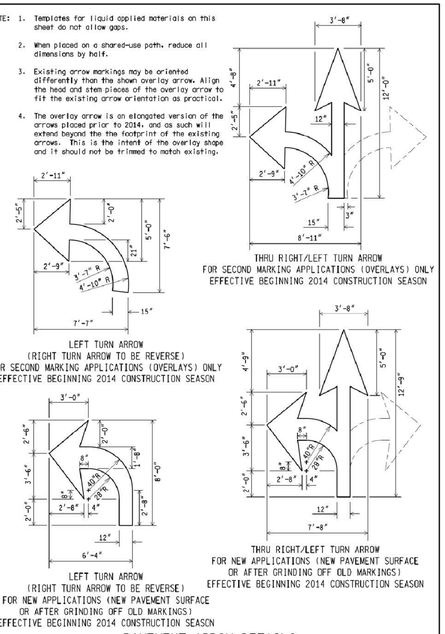
LEGEND DETAILS

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN	08/23/17 F.H.W.A. APPROVAL	01/22/17 PLAN DATE	PAVE-900-F	SHEET 2 OF 8

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.

NOTE:
1. Templates for liquid applied materials on this sheet do not allow gaps.
2. When placed on a shared-use path, reduce all dimensions by half.
3. Existing arrow markings may be oriented differently than the shown overlay arrow. Align the head and stem pieces of the overlay arrow to fit the existing arrow orientation as practical.
4. The overlay arrow is an elongated version of the arrows placed prior to 2014, and as such will extend beyond the the footprint of the existing arrows. This is the intent of the overlay shape and it should not be trimmed to match existing.



THRU RIGHT/LEFT TURN ARROW
FOR SECOND MARKING APPLICATIONS (OVERLAYS) ONLY
EFFECTIVE BEGINNING 2014 CONSTRUCTION SEASON

LEFT TURN ARROW
(RIGHT TURN ARROW TO BE REVERSE)
FOR SECOND MARKING APPLICATIONS (OVERLAYS) ONLY
EFFECTIVE BEGINNING 2014 CONSTRUCTION SEASON

LEFT TURN ARROW
(RIGHT TURN ARROW TO BE REVERSE)
FOR NEW APPLICATIONS (NEW PAVEMENT SURFACE
OR AFTER GRINDING OFF OLD MARKINGS)
EFFECTIVE BEGINNING 2014 CONSTRUCTION SEASON

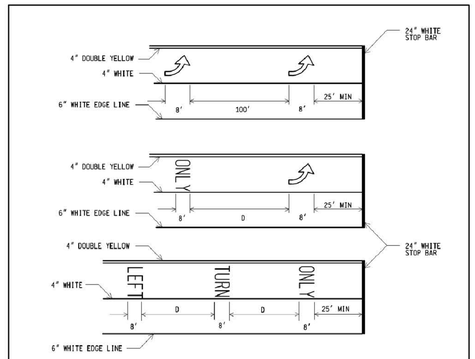
THRU RIGHT/LEFT TURN ARROW
FOR NEW APPLICATIONS (NEW PAVEMENT SURFACE
OR AFTER GRINDING OFF OLD MARKINGS)
EFFECTIVE BEGINNING 2014 CONSTRUCTION SEASON

PAVEMENT ARROW DETAILS

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN	08/23/17 F.H.W.A. APPROVAL	01/22/17 PLAN DATE	PAVE-900-F	SHEET 5 OF 8

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



TYPICAL SPACING OF ARROW AND PAVEMENT MESSAGES

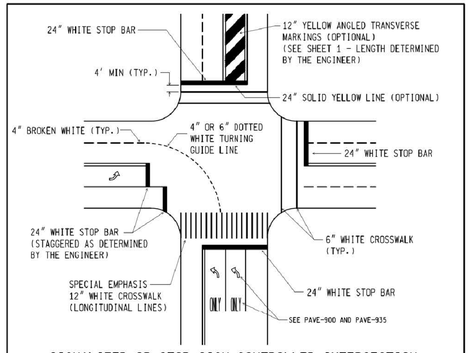
POSTED SPEED (MPH)	DISTANCE "D" (FT)
25 AND BELOW	32
30-35	48
40-45	64
50 AND ABOVE	80

NOTES:
1. All special markings (arrow, message and symbol) shall be white.
2. When arrow and pavement message are used together, the arrow should be located downstream of the pavement message and separated from the pavement message by a distance of "D" (measured from the top of the message to the base of the arrow) as shown above.
3. When a series of pavement messages are used, they should be separated by a distance of "D" related to the posted speed, as shown in the table above. All symbols and legends shall be positioned in the center of the lane.

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN	08/23/17 F.H.W.A. APPROVAL	01/22/17 PLAN DATE	PAVE-900-F	SHEET 8 OF 8

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



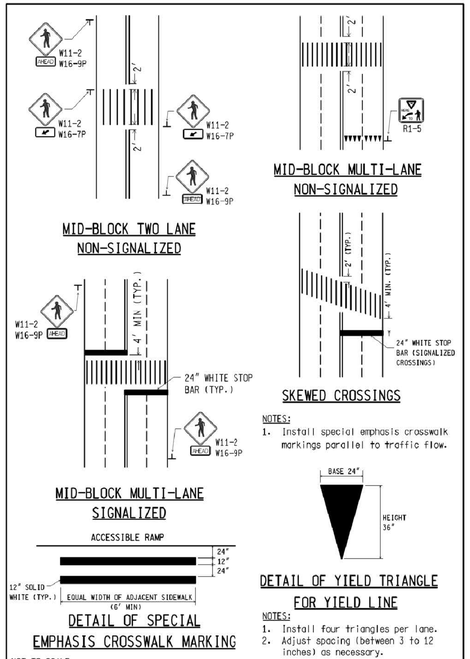
SIGNALIZED OR STOP SIGN CONTROLLED INTERSECTION

NOTES:
1. Stop Bars should be located 40-150 ft from the signal head. Optional stop bars, if used at stop controlled intersections, should be 4-30 ft from the edge of the intersecting roadway. Exact location to be determined by the Engineer.
2. Standard crosswalk is two 6 inch white transverse lines. Special emphasis crosswalk is 12 inch white longitundinal lines.
3. Install special emphasis crosswalks at mid-block crossings, established school crossings (as defined by the MMUTCD), where crossing uncontrolled traffic at an intersection or ramp, or when directed by the Engineer. See Sheet 3 for detail of special emphasis crosswalk markings.
4. Width of crosswalk should equal width of the adjacent sidewalk, but shall not be less than 6 ft (measured inside the lines).
5. 12 inch tranverse lines can be used in place of 6 inch transverse lines at the Engineer's discretion.
6. When practical, crosswalk location should avoid conflict with drainage inlets.
7. Turning guide lines should be placed to direct the driver into the closest through lane. Include a dotted turning guide line for all double turn movements.

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN	08/23/17 F.H.W.A. APPROVAL	01/22/17 PLAN DATE	PAVE-945-C	SHEET 2 OF 3

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



MID-BLOCK TWO LANE
NON-SIGNALIZED

MID-BLOCK MULTI-LANE
NON-SIGNALIZED

MID-BLOCK MULTI-LANE
SIGNALIZED

SKEWED CROSSINGS

NOTES:
1. Install special emphasis crosswalk markings parallel to traffic flow.

DETAIL OF SPECIAL
EMPHASIS CROSSWALK MARKING

DETAIL OF YIELD TRIANGLE
FOR YIELD LINE

NOTES:
1. Install four triangles per lane.
2. Adjust spacing (between 3 to 12 inches) as necessary.

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN	08/23/17 F.H.W.A. APPROVAL	01/22/17 PLAN DATE	PAVE-945-C	SHEET 3 OF 3

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.

DESIGNE INC
(810) 227-9533
CIVIL ENGINEERS
LAND SURVEYORS
2183 PLESS DRIVE
BRIGHTON, MICHIGAN 48114

DESIGN: VFB
DRAFT: L.F.
CHECK: CAG

REVISION #	DATE	REVISION-DESCRIPTION	REVISION #	DATE	REVISION-DESCRIPTION

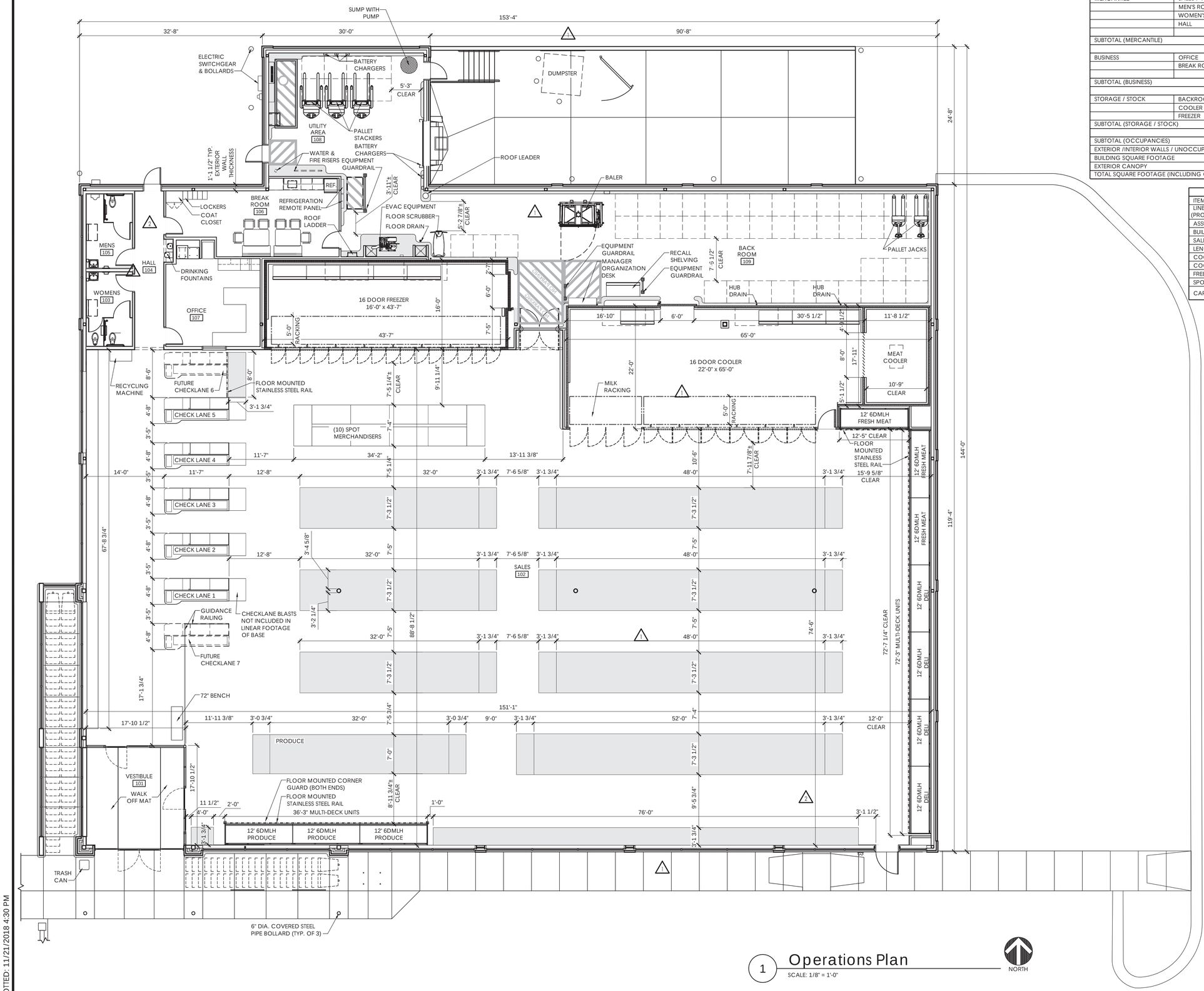
ALDI FOOD MARKET #48
PITTSFIELD TOWNSHIP, MI

MDOT PAVEMENT
MARKING TYPICALS

CLIENT:
ALDI Inc.
2625 N. STOCKBRIDGE RD.
WEBBERVILLE, MICHIGAN 48892
517-521-3907

SCALE: N/A
PROJECT No.: 9162803
DWG NAME: 2803-STRP
ISSUED: JULY 02, 2018

43-PM2



1 Operations Plan
SCALE: 1/8" = 1'-0"

REAR DOCK AREA SUMMARY		
OCCUPANCY USE	ROOM NAME	SQUARE FOOTAGE
MERCANTILE	SALES / VESTIBULE	12,529
	MEN'S ROOM	107
	WOMEN'S ROOM	107
	HALL	151
SUBTOTAL (MERCANTILE)		12,894
BUSINESS	OFFICE	283
	BREAK ROOM	359
SUBTOTAL (BUSINESS)		642
STORAGE / STOCK	BACKROOM	2,600
	COOLER	1,314
	FREEZER	648
SUBTOTAL (STORAGE / STOCK)		4,562
SUBTOTAL (OCCUPANCIES)		18,098
EXTERIOR /INTERIOR WALLS / UNOCCUPIED SPACE		932
BUILDING SQUARE FOOTAGE		19,030
EXTERIOR CANOPY		733
TOTAL SQUARE FOOTAGE (INCLUDING CANOPY)		19,763

REAR DOCK OPERATIONS DATA		
ITEM	PITTSFIELD, MI	V7.0 PROTOTYPE
LINEAR FOOTAGE OF BASE (PRODUCE INCLUDED)	828'-10"	828'-10"
ASSUMED PALLET STORAGE	52	52
BUILDING DIMENSIONS	119'-4" X 153'-4"	119'-4" X 153'-4"
SALES FLOOR DIMENSIONS	74'-6" X 151'-1"	74'-6" X 151'-1"
LENGTH OF MULTIDECK	120'	120'
COOLER MILK DOORS	4	4
COOLER GENERAL DOORS	12	12
FREEZER GENERAL DOORS	16	16
SPOT MERCHANDISERS	10	10
CART STORAGE	(116) MODEL 563W	(119) MODEL 563W

Issued:		Date:
A	Issued for Client Review	04/10/18
B	Issued for Steel Bid	04/13/18
C	Issued to Client	11/21/18
D		
E		

Revisions:		Date:
1	ADD NO. 04	08/06/18
2	ADD NO. 05	08/14/18
3		
4		
5		
6		
7		
8		
9		

STATE OF MICHIGAN
GASPARD
LICENSED ARCHITECT
N
13010611O
LICENSED ARCHITECT

Seal Seal

PROJECT ARCHITECT/ENGINEER DATE

PROJECT LEAD DATE

PROJECT DESIGNER DATE

Copyright © 2018
APD Engineering & Architecture, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914 fax
www.apd.com

Drawing Alteration

It is a violation of law for any person, unless acting under the direction of licensed Architect, Professional Engineer, Landscape Architect, or Land Surveyor to alter any item on this document in any way. Any licensee who alters this document is required by law to affix his or her seal and to add the notation "Altered By" followed by his or her signature and the specific description of the alteration or revision.

DO NOT SCALE PLANS

Copying, Printing, Software and other processes required to produce these prints can stretch or shrink the actual paper or layout. Therefore, scaling of this drawing may be inaccurate. Contact APD E&A with any need for additional dimensions or clarifications.

APD ENGINEERING & ARCHITECTURE, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914.fax
www.apd.com

ALDI Inc.
2625 North Stockbridge Road
Webberville, MI 48892
(517) 521-3907
(517) 521-3953 fax

ALDI Inc. Store #: 48
Pittsfield Township, MI
3113 Carpenter Road
Ypsilanti, MI, 48197
Washtenaw County

Project Name & Location:

Operations Plan

Drawing Name: 44-A1

Date: 02/15/18

Type: RHRD-V7

Drawn By: VLV

Scale: As Noted

Project No. 17-0147A

Drawing No. A-131

PLOTTED: 11/21/2018 4:30 PM

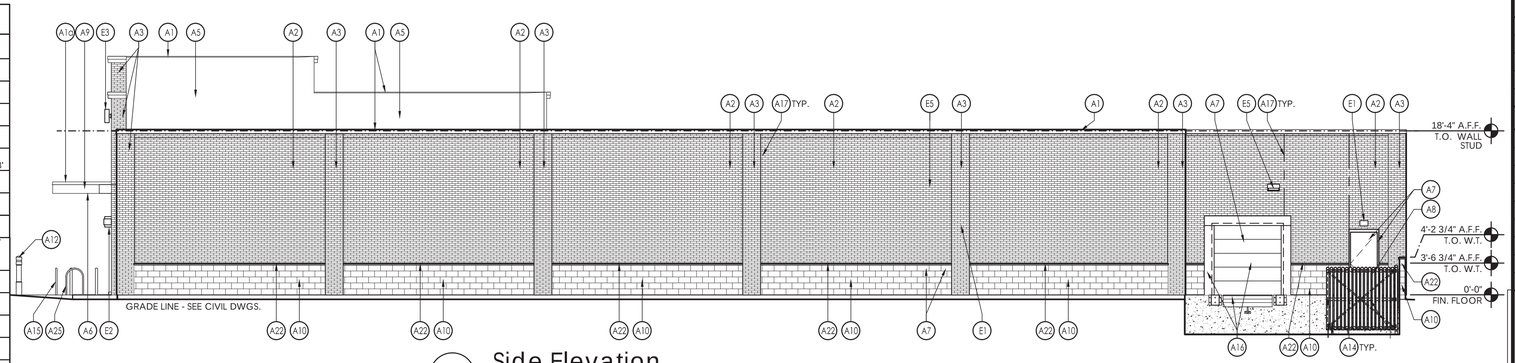
EXTERIOR FINISH SCHEDULE

KEY	MATERIAL / MFG.	COLOR / NO.	NOTES
A1	EDGE METAL	A1 - SLATE GRAY A1a - SILVER METALLIC	SEE SPECIFICATIONS APPENDIX 'B'
A2	MODULAR BRICK	FIELD COLOR - SEE SPEC	FIELD AND TRANSOM WINDOW SILLS
A3	MODULAR BRICK	ACCENT COLOR - SEE SPEC	PILASTERS
A4	STOREFRONT	ANODIZED ALUM.	RE: DWG. A602
A5	MEMBRANE ROOFING	GRAY	AT BACK OF ALDI LOGO SIGN TOWER, FOOD MARKET SIGN TOWER AND CANOPY ROOF - SEE SPECIFICATIONS APPENDIX 'B'
A6	METAL SOFFIT PANELS	SOLID PANELS - SEE SPEC; SILVER METALLIC	RE: DWG. A301-A304
A7	EXTERIOR PAINT	PT-19 / CL-5	RE: DWG. A603
A8	DUMPSTER ENCLOSURE		RE. DWG A505
A9	ALUMINUM COMPOSITE PANEL	A9 - BRIGHT SILVER	PROVIDE PANEL JOINTS AS SHOWN - PROVIDE ONE PIECE TIGHT FIT EXTRUDED MOLDING INSTALLATION SYSTEM WITH CENTER REVEAL TRIM BETWEEN PANELS AND J TRIM AT PANEL EDGES.
A9c	FIBER CEMENT WALL PANELS	VINTAGEWOOD "CEDAR" PANELS	PROVIDE PANEL JOINTS AS SHOWN
A10	SPLIT-FACE CMU	SEE SPEC	WATER TABLE FIELD - USE SMOOTH FACE BEHIND TRUCK DOCK SEAL.
A11	BLRD-2	PT-19 / CL-4	RE: DWG A603
A12	BLRD-4	FACTORY FINISH - CHARCOAL	RE: DWG A603
A13	GUARD RAIL TYPE "A"	PT-19 / CL-5	RE: DWG A3/A503, A603
A14	GUARD RAIL TYPE "B"	PT-19 / CL-5	RE: DWG A3/A503, A603
A15	CART RAIL & STARTER POST	GALVANIZED	
A16	DOCK LEVELER / SEAL AND BUMPERS	LEVELER - FACTORY FINISH / SEAL AND BUMPERS - FACTORY FINISH - BLACK	PROVIDE BRICK BEHIND DOCK SEAL IN LIEU OF CAST STONE SILL
A17	CONTROL JOINT		MAX 30' OC RE: DWG. A504
A18	OVERFLOW SCUPPER	PT-19 / CL-5	RE: DWG C3/A503
A19	CONDUIT	EXTEND CONDUIT 1" BEYOND FACE OF FIBER CEMENT WALL PANEL & PAINT TO MATCH PANEL. FILL OPEN END WITH SEALANT AND SEAL AROUND PENETRATION	CONTRACTOR TO COORDINATE FINAL LOCATION PRIOR TO INSTALLATION
A20	ALDI TOWER SIGN	BY SIGN VENDOR	7'-11 1/8" w. x 9'-5 1/2" h. SEE DETAIL D1/A504; VERIFY SIGN SIZE PRIOR TO FRAMING OPENING
A21	CRTB	NATURAL	RE: DWG A603 - SEE STRUCTURAL DWGS
A22	CAST STONE SILL	SEE SPEC	WATER TABLE TRIM
A23	PREFABRICATED SUN SHADE	SILVER POWDER COAT	MANUFACTURED BY C. R. LAURENCE; RE: DWGS A306, A505; ALIGN OUTRIGGERS w/ WINDOW MULLIONS BELOW
A24	KNOX BOX	FACTORY FINISH	CONFIRM TYPE AND LOCATION WITH LOCAL FIRE MARSHAL
A25	BIKE RACK	S&G BIKE RACKS - PER ALDI (PROVIDE 2)	PVC THERMOPLASTIC OVER THERMOSET VINYL PRIMER ON 1 1/2" SCHEDULE 40 STEEL PIPE
E1	EXIT DISCHARGE LIGHT	FACTORY FINISH	MOUNT @ 8'-0" A.F.F. UNLESS NOTED OTHERWISE.
E2	WALL SCONCE	FACTORY FINISH	MOUNT @ 7'-6" A.F.F.
E3	CYLINDER WALL SCONCE	FACTORY FINISH	MOUNT HEIGHT SEE DIMENSION
E4	UTILITY METERING & C.T.	FACTORY FINISH	SEE ELECTRICAL DWGS
E5	EXTERIOR WALL PACK	FACTORY FINISH	MOUNT @ 12'-0" A.F.F. UNLESS NOTED OTHERWISE.
E6	EXTERIOR DUPLEX RECEPTACLE	FACTORY FINISH	MOUNT @ 1'-6" A.F.F. IN 4" SQUARE J-BOX
F1	FIRE DEPT. CONNECTION	FACTORY FINISH	SEE FIRE PROTECTION DWGS
F2	MOTOR GONG	FACTORY FINISH	SEE FIRE PROTECTION DWGS
P1	HOSE BIB	FACTORY FINISH	SEE PLUMBING DWGS
P2	RPZ DISCHARGE	FACTORY FINISH	SEE PLUMBING DWGS
XX	STOREFRONT KEY	ANODIZED ALUMINUM	SHADED WINDOWS ARE SPANDREL - RE: DWG A602

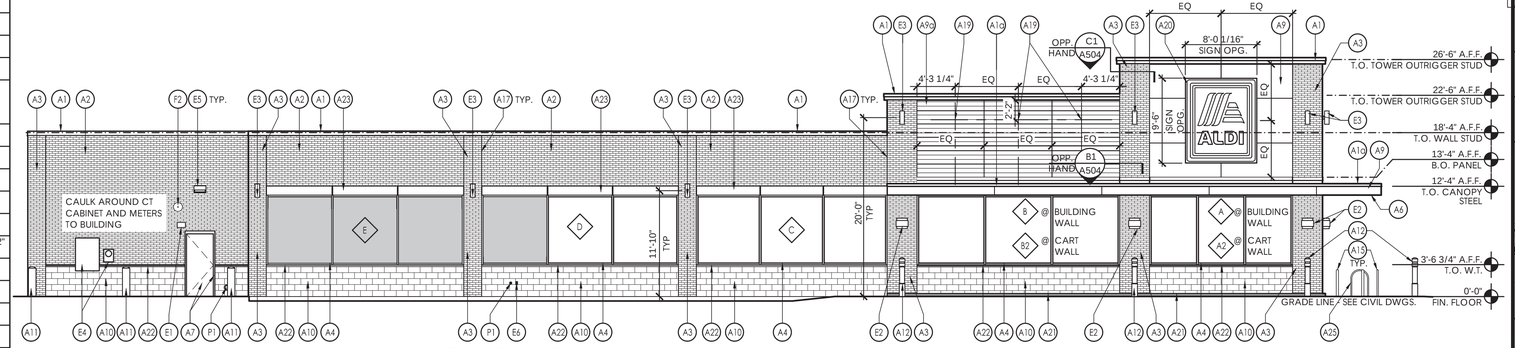
SIGNAGE

DESCRIPTION	QUANTITY	SQ. FT. PER SIGN	TOTALS
TOWER SIGN	2	74.9	149.8
TOTAL SIGNAGE			149.8

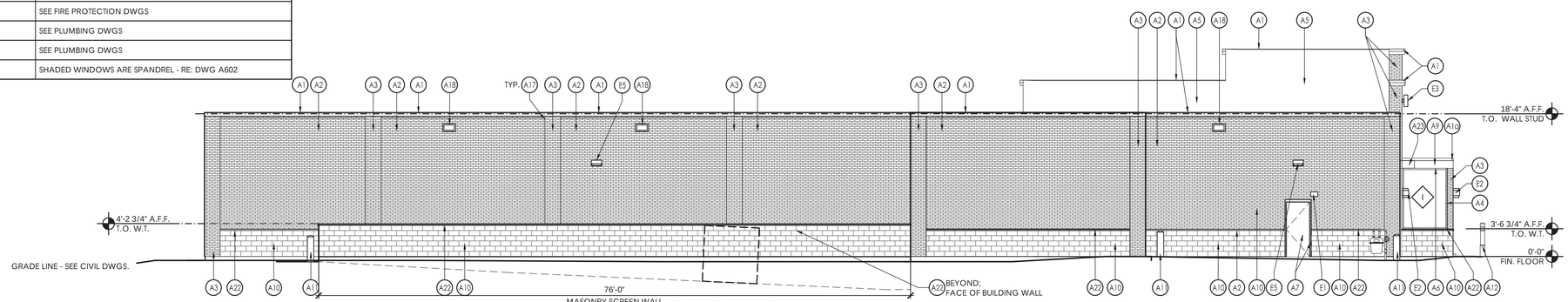
SIGNAGE IS SHOWN FOR REFERENCE ONLY AND SHALL BE UNDER SEPARATE PERMIT SUBMITTAL



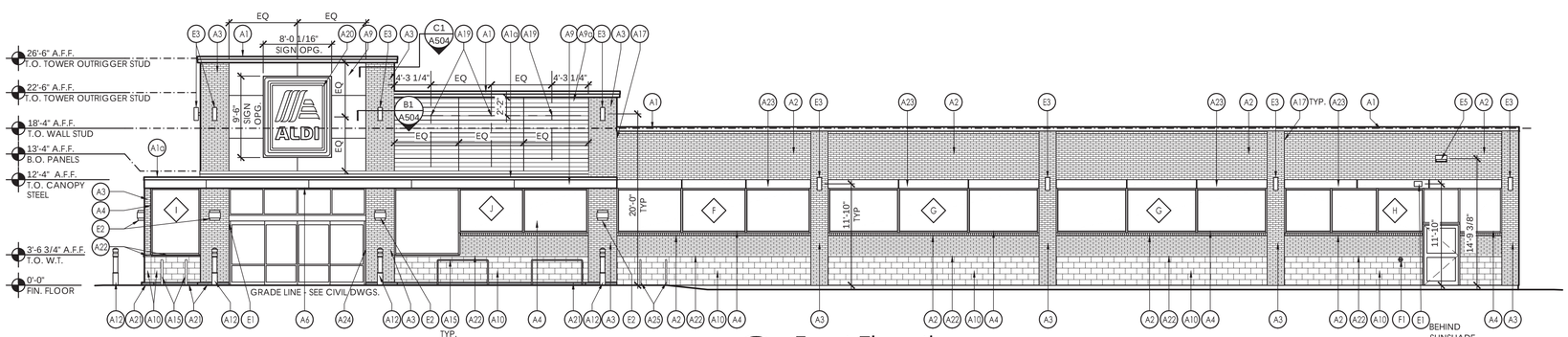
4 Side Elevation
SCALE: 1/8" = 1'-0"



3 Side Elevation
SCALE: 1/8" = 1'-0"



2 Rear Elevation
SCALE: 1/8" = 1'-0"



1 Front Elevation
SCALE: 1/8" = 1'-0"

Issued:		Date:
A	Issued for Client Review	04/10/18
B	Issued for Steel Bid	04/13/18
C	Issued to Client	11/21/18
D		
E		

Revisions:		Date:
1		
2		
3		
4		
5		
6		
7		
8		
9		

STATE OF MICHIGAN
GASPARE ALBERO ARCHITECT
No. 1301056110
LICENSED ARCHITECT

Seal Seal

PROJECT ARCHITECT/ENGINEER DATE

PROJECT LEAD DATE

PROJECT DESIGNER DATE

Copyright © 2018
APD Engineering & Architecture, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914 fax
www.apd.com

Drawing Alteration

It is a violation of law for any person, unless acting under the direction of licensed Architect, Professional Engineer, Landscape Architect, or Land Surveyor to alter any item on this document in any way. Any licensee who alters this document is required by law to affix his or her seal and to add the notation "Altered By" followed by his or her signature and the specific description of the alteration or revision.

DO NOT SCALE PLANS

Copying, Printing, Software and other processes required to produce these prints can stretch or shrink the actual paper or layout. Therefore, scaling of this drawing may be inaccurate. Contact APD E&A with any need for additional dimensions or clarifications.

APD ENGINEERING & ARCHITECTURE, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914.fax
www.apd.com

ALDI Inc.
2625 North Stockbridge Road
Webberville, MI 48892
(517) 521-3907
(517) 521-3953 fax

ALDI Inc. Store #: 48
Pittsfield Township, MI
3113 Carpenter Road
Ypsilanti, MI, 48197
Washtenaw County

Project Name & Location:

Exterior Elevations
Drawing Name: 45-A2

Date: 02/15/18
Project No. 17-0147A
Type: RHRD-V7
Drawn By: VLV
A-201
Scale: As Noted
Drawing No.

PLOTTED: 11/21/2018 2:38 PM

SIGNAGE			
DESCRIPTION	QUANTITY	SQ. FT. PER SIGN	TOTALS
TOWER SIGN	2	74.9	149.8
TOTAL SIGNAGE			149.8
SIGNAGE IS SHOWN FOR REFERENCE ONLY AND SHALL BE UNDER SEPARATE PERMIT SUBMITTAL			

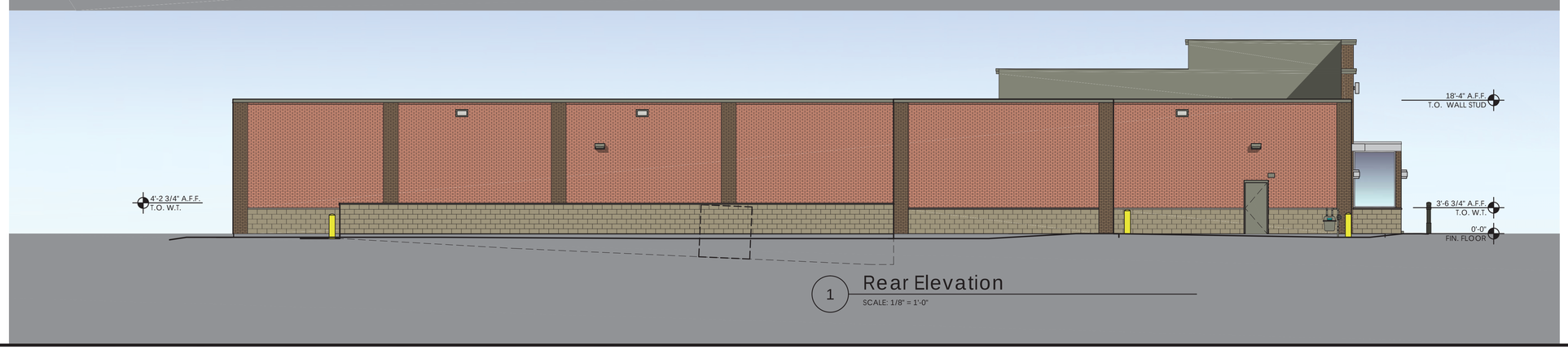
Please note that the colors shown here are a graphical representation to show contrast in materials only. Due to the nature of electronic media, colors may vary depending on computer or printer used.

For review of actual colors, a material sample board should be created on a project specific basis.

4 Side Elevation
SCALE: 1/8" = 1'-0"

3 Side Elevation
SCALE: 1/8" = 1'-0"

2 Front Elevation
SCALE: 1/8" = 1'-0"



1 Rear Elevation
SCALE: 1/8" = 1'-0"

Issued:		Date:
A	Issued for Client Review	04/10/18
B	Issued for Steel Bid	04/13/18
C	Issued to Client	11/21/18
D		
E		

Revisions:		Date:
1		
2		
3		
4		
5		
6		
7		
8		
9		

STATE OF MICHIGAN
GASPARD
ARCHITECT
13010106110
LICENSED ARCHITECT

Seal Seal

PROJECT ARCHITECT/ENGINEER DATE

PROJECT LEAD DATE

PROJECT DESIGNER DATE

Copyright © 2018
APD Engineering & Architecture, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914 fax
www.apd.com

Drawing Alteration

It is a violation of law for any person, unless acting under the direction of licensed Architect, Professional Engineer, Landscape Architect, or Land Surveyor to alter any item on this document in any way. Any licensee who alters this document is required by law to affix his or her seal and to add the notation "Altered By" followed by his or her signature and the specific description of the alteration or revision.

DO NOT SCALE PLANS

Copying, Printing, Software and other processes required to produce these prints can stretch or shrink the actual paper or layout. Therefore, scaling of this drawing may be inaccurate. Contact APD E&A with any need for additional dimensions or clarifications.

APD ENGINEERING & ARCHITECTURE, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914.fax
www.apd.com

ALDI Inc.
2625 North Stockbridge Road
Webberville, MI 48892
(517) 521-3902
(517) 521-3953 fax

ALDI Inc. Store #: 48
Pittsfield Township, MI
3113 Carpenter Road
Ypsilanti, MI, 48197
Washtenaw County
Project Name & Location:

Exterior Elevations
Drawing Name: 46-A2C

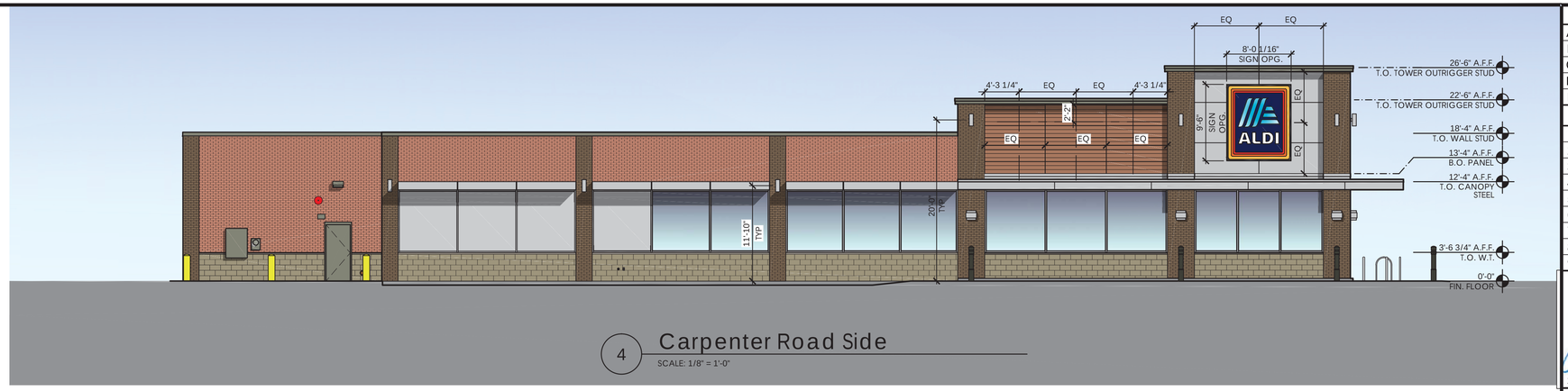
Date: 02/15/18	Project No. 17-0147A
Type: RHRD-V7	
Drawn By: VLV	A-201
Scale: As Noted	Drawing No.

PLOTTED: 11/21/2018 2:58 PM

SIGNAGE			
DESCRIPTION	QUANTITY	SQ. FT. PER SIGN	TOTALS
TOWER SIGN	2	74.9	149.8
TOTAL SIGNAGE			149.8
SIGNAGE IS SHOWN FOR REFERENCE ONLY AND SHALL BE UNDER SEPARATE PERMIT SUBMITTAL			

Please note that the colors shown here are a graphical representation to show contrast in materials only. Due to the nature of electronic media, colors may vary depending on computer or printer used.

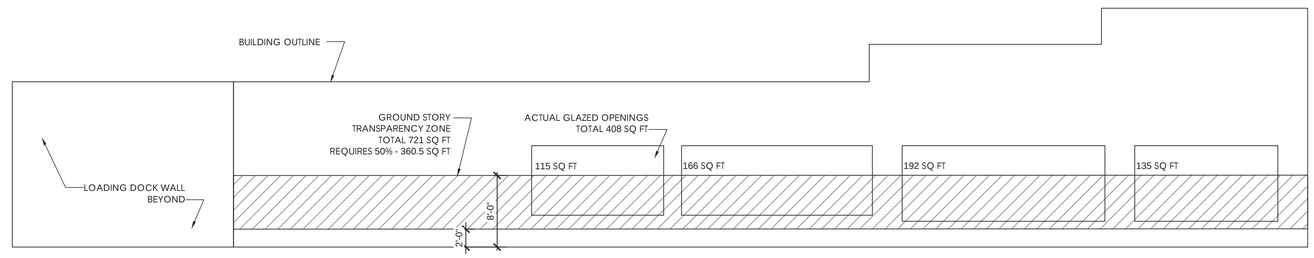
For review of actual colors, a material sample board should be created on a project specific basis.



4 Carpenter Road Side

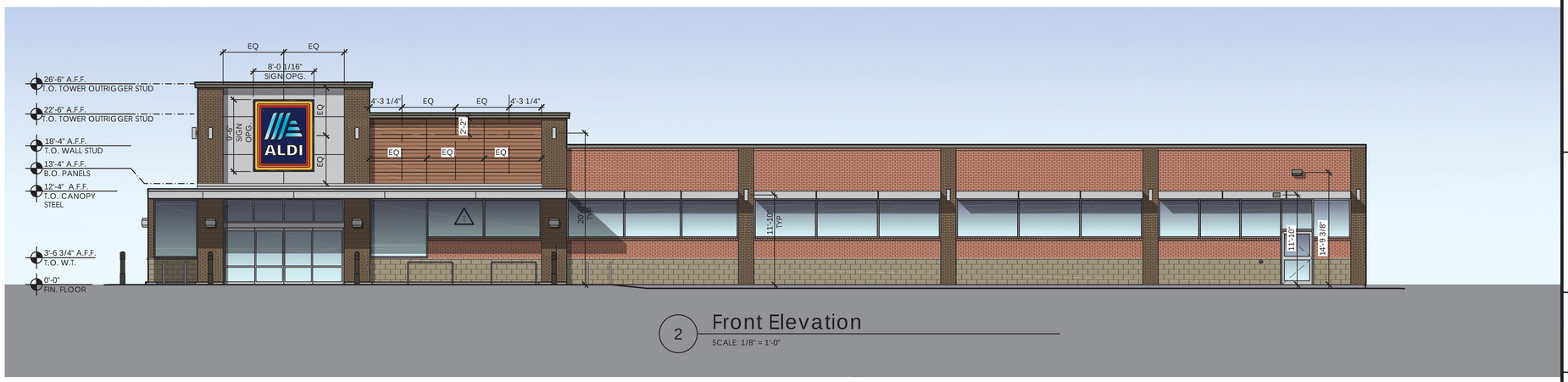
SCALE: 1/8" = 1'-0"

TRANSPARENCY TABLE - ALDI PITTSFIELD TOWNSHIP			
	ROOM NAME	GROSS SQUARE FOOTAGE	NET SF WITHIN THE T ZONE
SIDE ELEVATION	WINDOW 1	115	66
	WINDOW 2	166	95
	CART CORRAL 1	192	117
	CART CORRAL 2	135	83
TOTAL TRANSPARENCY - FRONT ELEVATION		608	361
TRANSPARENCY ZONE FRONT ELEVATION			721
TRANSPARENCY PERCENTAGE REQUIRED - 50%			361
TRANSPARENCY PERCENTAGE PROVIDED WITHIN THE ZONE			50



3 Transparency Diagram
Carpenter Road Side

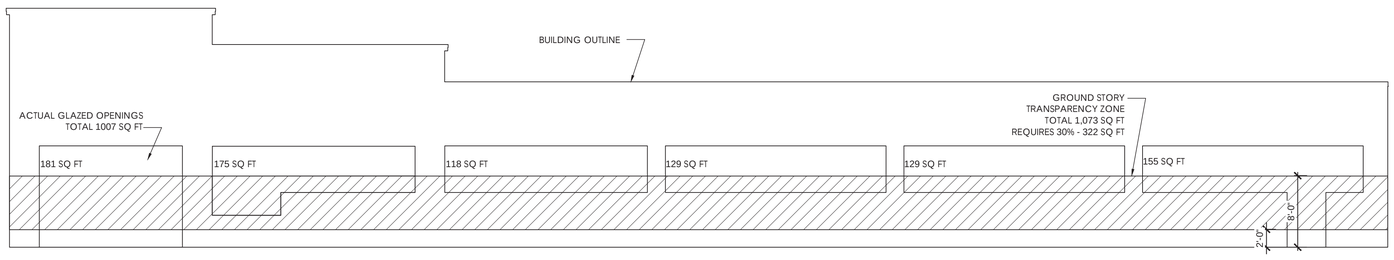
SCALE: 1/8" = 1'-0"



2 Front Elevation

SCALE: 1/8" = 1'-0"

TRANSPARENCY TABLE - ALDI PITTSFIELD TOWNSHIP			
	ROOM NAME	GROSS SQUARE FOOTAGE	NET SF WITHIN THE T ZONE
FRONT ELEVATION	ENTRY DOORS/TRANSOM	181	96
	WINDOW 1	137	61
	WINDOW 2	118	42
	WINDOW 3	129	46
	WINDOW 4	129	46
	WINDOW 5	155	63
TOTAL TRANSPARENCY - FRONT ELEVATION		849	354
TRANSPARENCY ZONE FRONT ELEVATION			925
TRANSPARENCY PERCENTAGE REQUIRED - 30%			278
TRANSPARENCY PERCENTAGE PROVIDED WITHIN THE ZONE			38



1 Transparency Diagram
Front Elevation

SCALE: 1/8" = 1'-0"

Issued:		Date:
A	Issued for Client Review	04/10/18
B	Issued for Steel Bid	04/13/18
C	Issued to Client	11/21/18
D		
E		

Revisions:		Date:
1	Window @ First Aisle	03/19/18
2		
3		
4		
5		
6		
7		
8		
9		

STATE OF MICHIGAN
GASPARE ALBERO
ARCHITECT
No. 1301056110
LICENSED ARCHITECT

Seal Seal

PROJECT ARCHITECT/ENGINEER DATE

PROJECT LEAD DATE

PROJECT DESIGNER DATE

Copyright © 2018
APD Engineering & Architecture, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914 fax
www.apd.com

Drawing Alteration

It is a violation of law for any person, unless acting under the direction of licensed Architect, Professional Engineer, Landscape Architect, or Land Surveyor to alter any item on this document in any way. Any licensee who alters this document is required by law to affix his or her seal and to add the notation "Altered By" followed by his or her signature and the specific description of the alteration or revision.

DO NOT SCALE PLANS

Copying, Printing, Software and other processes required to produce these prints can stretch or shrink the actual paper or layout. Therefore, scaling of this drawing may be inaccurate. Contact APD E&A with any need for additional dimensions or clarifications.

APD ENGINEERING & ARCHITECTURE, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914.fax
www.apd.com

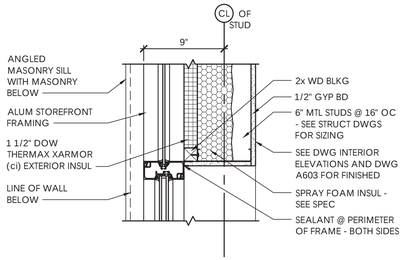
ALDI Inc.
2625 North Stockbridge Road
Webberville, MI 48892
(517) 521-3907
(517) 521-3953 fax

ALDI Inc. Store #: 48
Pittsfield Township, MI
3113 Carpenter Road
Ypsilanti, MI, 48197
Washtenaw County
Project Name & Location: 47-A3

Transparency Study
Exterior Elevations
Drawing Name:

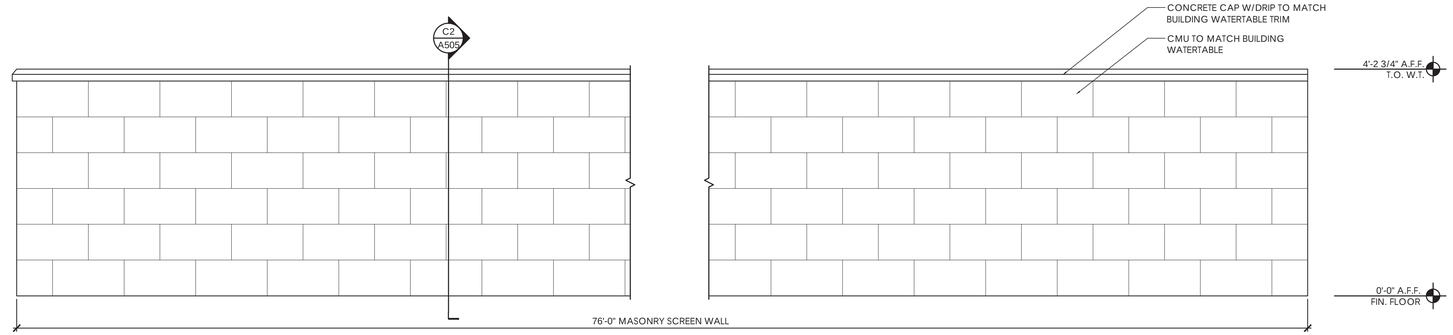
Date: 02/15/18
Project No. 17-0147A
Type: RHRD-V7
Drawn By: VLV
Drawing No. A201C-T
Scale: As Noted

PLOTTED: 11/21/2018 2:55 PM



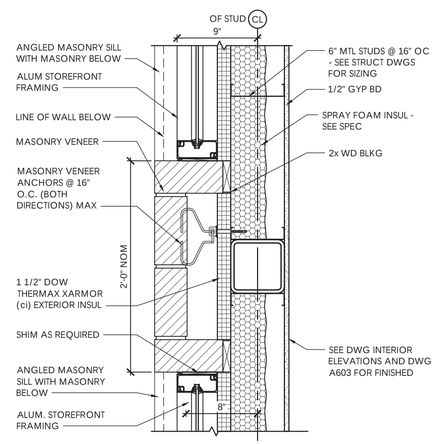
D3 Exterior Plan Detail @ Partial Spandrel Window

SCALE: 1 1/2" = 1'-0"



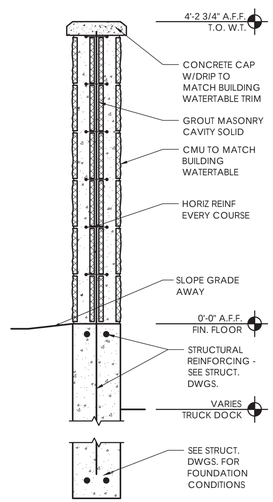
C3 Exterior Elevation Masonry Screen Wall @ Dumpster

SCALE: 3/4" = 1'-0"



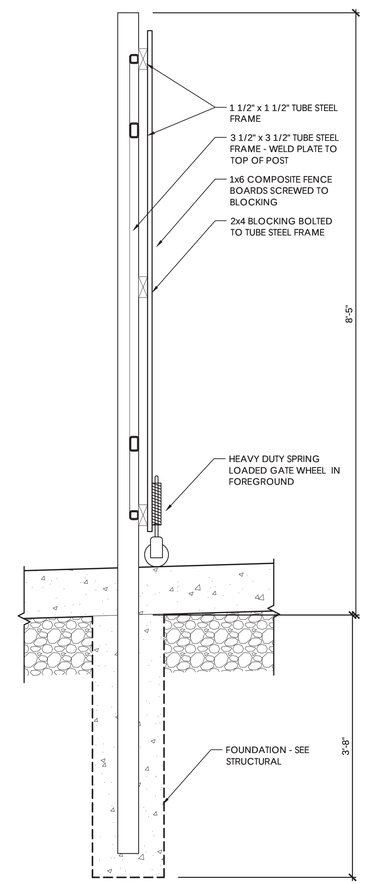
D2 Exterior Plan Detail @ Window

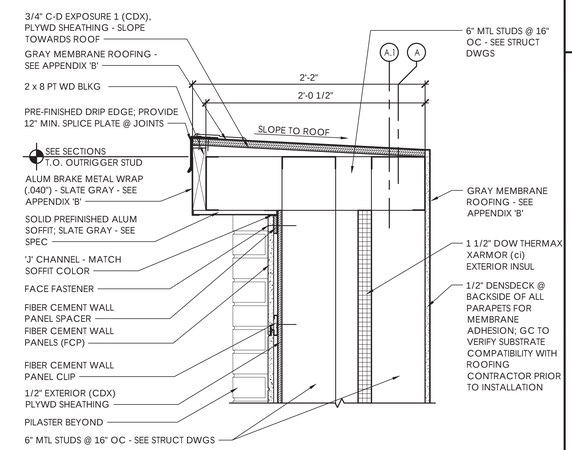
SCALE: 1 1/2" = 1'-0"



C2 Exterior Section Detail Masonry Screen Wall @ Dumpster

SCALE: 1 1/2" = 1'-0"

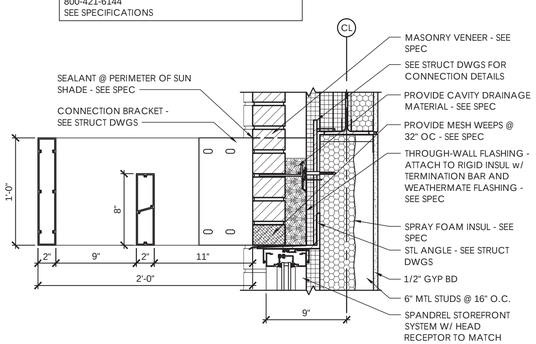




A2 Exterior Section Detail (Low Tower) - Parapet at Tower

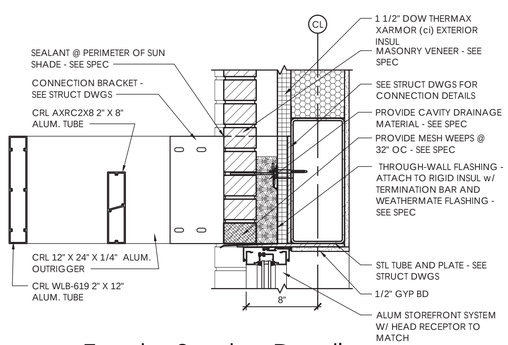
SCALE: 1 1/2" = 1'-0"

BASIS OF DESIGN:
ALUMINUM SUN SHADE BY C.R. LAURENCE CO, INC., OR APPROVED EQUAL
CONTACT BRIAN CLIFFORD
BRIAN_CLIFFORD@CRLAURENCE.COM
800-421-6144
SEE SPECIFICATIONS



D1 Exterior Section Detail - Sun Shade at Spandrel Window

SCALE: 1 1/2" = 1'-0"

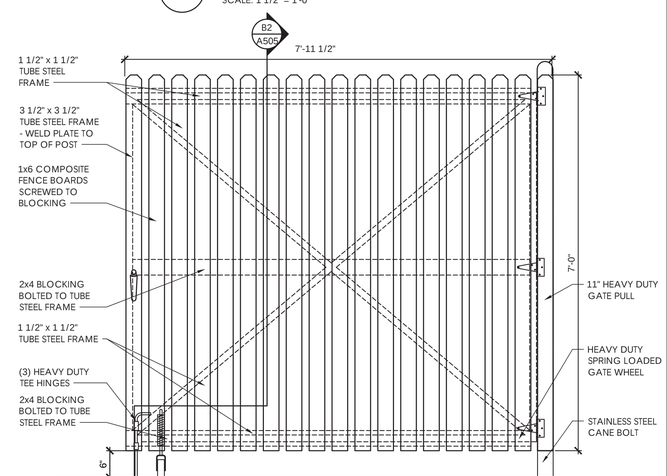


C1 Exterior Section Detail - Sun Shade at Clerestory Window

SCALE: 1 1/2" = 1'-0"

B2 Exterior Section Detail - Clerestory Window

SCALE: 1" = 1'-0"



A1 Exterior Elevation Dumpster Gate

SCALE: 3/4" = 1'-0"

Issued:		Date:
A	Issued for Client Review	04/10/18
B	Issued for Steel Bid	04/13/18
C	Issued to Client	11/21/18
D		
E		

Revisions:		Date:
1		
2		
3		
4		
5		
6		
7		
8		
9		

3

STATE OF MICHIGAN GASPARE CARRABBA LICENSED ARCHITECT 13010106110 LICENSED ARCHITECT

Seal Seal

PROJECT ARCHITECT/ENGINEER DATE

PROJECT LEAD DATE

PROJECT DESIGNER DATE

Copyright © 2018
APD Engineering & Architecture, PLLC
STATE OF NEW YORK
095075-1
STATE OF OHIO
#85-0203

Drawing Alteration
It is a violation of law for any person, unless acting under the direction of licensed Architect, Professional Engineer, Landscape Architect, or Land Surveyor to alter any item on this document in any way. Any licensee who alters this document is required by law to affix his or her seal and to add the notation "Altered By" followed by his or her signature and the specific description of the alteration or revision.

DO NOT SCALE PLANS
Copying, Printing, Software and other processes required to produce these prints can stretch or shrink the actual paper or layout. Therefore, scaling of this drawing may be inaccurate. Contact APD E&A with any need for additional dimensions or clarifications.

2

APD ENGINEERING & ARCHITECTURE, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914.fax
www.apd.com

ALDI Inc.
2625 North Stockbridge Road
Webberville, MI 48892
(517) 521-3907
(517) 521-3933 fax

1

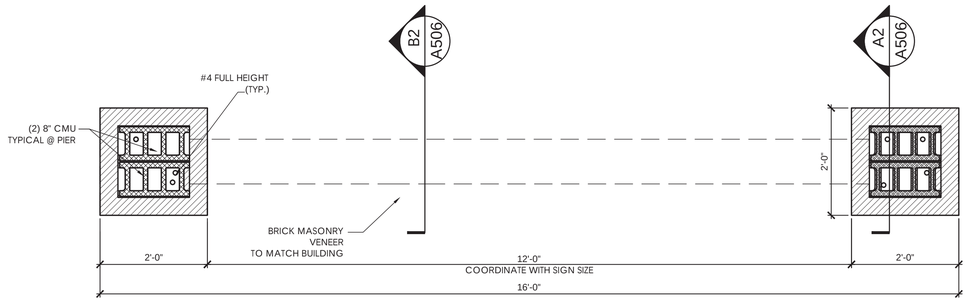
ALDI Inc. Store #: 48
Pittsfield Township, MI
3113 Carpenter Road
Ypsilanti, MI, 48197
Washtenaw County
Project Name & Location:

Exterior Details
Drawing Name: 48-A4

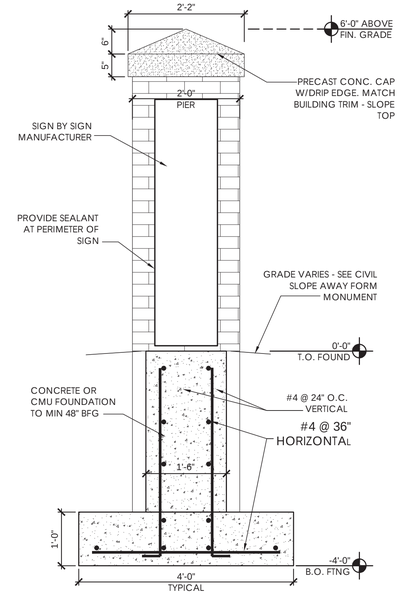
Date: 02/15/18	Project No. 17-0147A
Type: RHRD-V7	
Drawn By: SRS	A-505
Scale: As Noted	Drawing No.

PLOTTED: 11/21/2018 3:03 PM

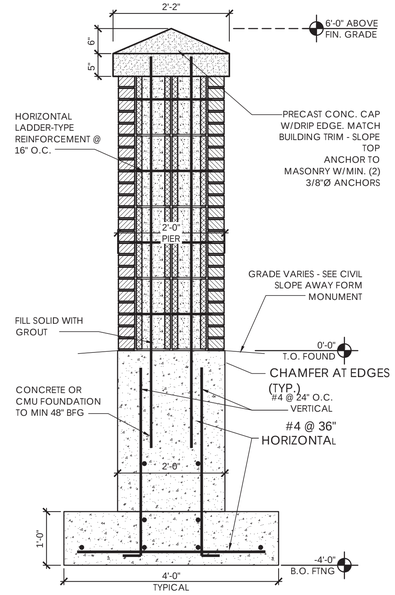
D C B A



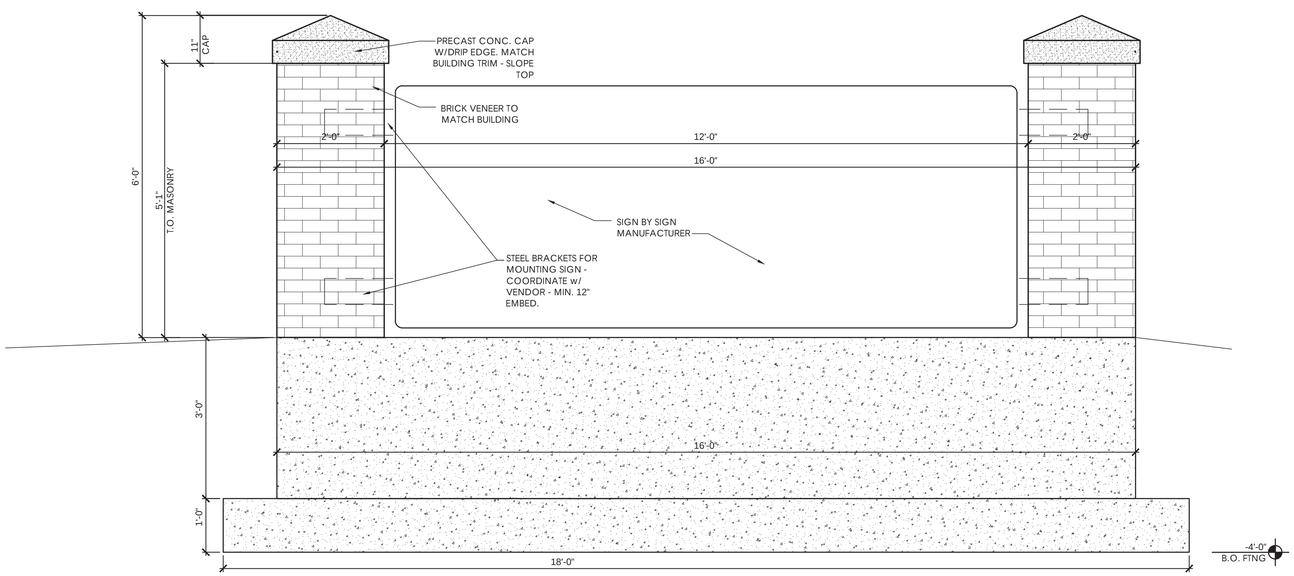
D3 Plan
SCALE: 3/4" = 1'-0"



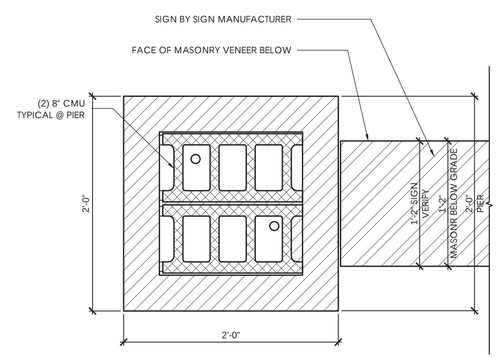
B2 Sign Section
SCALE: 3/4" = 1'-0"



A2 Pier Section
SCALE: 3/4" = 1'-0"



D1 Elevation
SCALE: 3/4" = 1'-0"



A1 Pier Detail
SCALE: 1 1/2" = 1'-0"

Issued:		Date:
A	Issued for Client Review	04/10/18
B	Issued for Steel Bid	04/13/18
C	Issued to Client	11/21/18
D		
E		

Revisions:		Date:
1		
2		
3		
4		
5		
6		
7		
8		
9		

3

STATE OF MICHIGAN
GASPARI
LICENSED
ARCHITECT
No.
1301056110
LICENSED ARCHITECT

Seal Seal

PROJECT ARCHITECT/ENGINEER DATE

PROJECT LEAD DATE

PROJECT DESIGNER DATE

2

Copyright © 2018
APD Engineering & Architecture, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914 fax
www.apd.com

Drawing Alteration

It is a violation of law for any person, unless acting under the direction of licensed Architect, Professional Engineer, Landscape Architect, or Land Surveyor to alter any item on this document in any way. Any licensee who alters this document is required by law to affix his or her seal and to add the notation "Altered By" followed by his or her signature and the specific description of the alteration or revision.

DO NOT SCALE PLANS

Copying, Printing, Software and other processes required to produce these prints can stretch or shrink the actual paper or layout. Therefore, scaling of this drawing may be inaccurate. Contact APD E&A with any need for additional dimensions or clarifications.

APD ENGINEERING & ARCHITECTURE, PLLC
615 Fishers Run
Victor, NY 14564
585.742.2222
585.924.4914.fax
www.apd.com

1

ALDI Inc.
2625 North Stockbridge Road
Webberville, MI 48892
(517) 521-3907
(517) 521-3933 fax

ALDI Inc. Store #: 48
Pittsfield Township, MI
3113 Carpenter Road
Ypsilanti, MI, 48197
Washtenaw County
Project Name & Location: 49-A5

Exterior Details
Monument Sign
Drawing Name:

Date: 02/15/18	Project No. 17-0147A
Type: RHRD-V7	
Drawn By: GA	A-506
Scale: As Noted	Drawing No.

D | C | B | A

PLOTTED: 11/21/2018 3:02 PM