March 2, 2018

ADDENDUM NO. ONE to the plans and specifications for the VAN BUREN TOWNSHIP DDA 2016 PLACEMAKING PROJECT, VAN BUREN CHARTER TOWNSHIP, MI, Architect's Project No. 161675, dated February 08, 2018.

The above plans and specifications are modified, supplemented or augmented as follows, and this ADDENDUM NO. ONE, is hereby made a part of the contract documents.

Drawings S4.0, AS1.1, A1.1, A1.2, A2.1, A3.1, A5.4, A5.6 and A6.0 are issued with this Addendum.

Specification Table of Contents and Specification Sections 02020 Geotechnical Investigation, 07462-Siding, 08413 Aluminum Clad Wood Commercial Out-Swing French Doors, 08520- Aluminum Clad Wood Double Hung Window, 08520- Aluminum Clad Wood Custom Elliptical Fixed Window and 09970- High Performance Coating Systems are issued with this Addendum.

STRUCTURAL DRAWINGS:

ITEM NO. S1: Refer to Sheet S4.0 Sections and Details (Re-Issued):
a. Add (3) 2 x 6s, laid flat header.

ARCHITECTURAL SPECIFICATIONS:

ITEM NO. AS1: Refer to Specification Table of Contents (Re-Issued):
a. Refer to revised Table of Contents.

ITEM NO. AS2: Refer to Specification Section 02020 Geotechnical Investigation
a. Added specification section.

ITEM NO. AS3: Refer to Specification Section 07462 Siding (Re-issued):
a. Change all references to "HZ10" to "HZ5"
b. Changed "Sierra 8" to "Cedarmill" in Paragraph 2.2C1.
c. Added "at Township logo on North elevation only" to Paragraph 2.2C2.
d. Added batten boards to the trim products in paragraph 2.2F:

ITEM NO. AS4: Refer to Specification Section 08413 Aluminum Clad Wood Commercial Out-Swing French Doors (Issued):
b. Added specification section.

ITEM NO. AS5: Refer to Specification Section 08520 Aluminum Clad Wood Casement Window (Not -Issued):
a. Remove section in its entirety.

ITEM NO. AS6: Refer to Specification Section 08520 Aluminum Clad Wood Double Hung Window (Re-Issued):
a. Added specification section.

ITEM NO. AS7: Refer to Specification Section 08520 Aluminum Clad Wood Custom Elliptical Fixed Window (Issued):
a. Added specification section.

ITEM NO. AS8: Refer to Specification Section 09650 Resilient Flooring (Not Re-Issued):
a. Delete paragraph 2.01 A.1 in its entirety.
b. Add paragraph 2.01 A.1 as follows:
   1. Tandus Centiva, Adaptt, Woodlot, Coventry SSP 2315 RT installed in Ashlar pattern.
c. Add paragraph 2.01 A.-2 as follows:

2. Install all LVT on top of new ¼" APA plywood subfloor. Secure all joints in plywood subfloor flush and level.

ITEM NO. AS9: Refer to Specification Section 09970 High Performance Coating Systems (Issued):
a. Added specification section.

ITEM NO. AS10: Refer to Specification Section 10800 Toilet Accessories (Not Re-Issued):
a. Refer to Paragraph 2.10, Two (2) baby changing stations will be provided for 101 and C102 (one in each toilet room).

ITEM NO. AS11: Refer to Specification Section 10400 Identification Devices (Not Re-Issued):
a. Add paragraph 2.05 as follows:

2.05 EXTERIOR CAST ALUMINUM SIGN:

A. Provide 32" diameter, cast aluminum plaque with multi-color paint on foreground with background 'Stipple' texture Mount to exterior wall with boss & stud installation and all necessary accessories for a complete installation. Refer to North Elevation on sheet A3.1.

ARCHITECTURAL DRAWINGS:

ITEM NO. A1: Refer to Sheet AS-1.1 Architectural Site Plan (Re-Issued):
a. Add note: "All concrete walks shall be colored stamped concrete with the exception of the curbs and approach onto Belleville Road. "
b. Add note to brick pier.
c. Revised note for 6" H. letters on monument sign.

ITEM NO. A2: Refer to Sheet A1.1 Floor Plan – New Work Plan (Re-issued)

a. Revised window tags at windows in north wall.
b. Added window tag for transom above Door A112A.
c. Add Township plaque and dimensions.

ITEM NO. A3: Refer to Sheet A1.2 Roof Plan (Re-Issued):

a. Revised overhang dimension.

ITEM NO. A4: Refer to Sheet A2.1 Reflected Ceiling Plan (Re-issued)

a. Revised soffit as shown.

ITEM NO. A5: Refer to Sheet A3.1 Exterior Elevations (Re-Issued):

a. Revised door/window frames on the east elevation.
b. Revised overhang on east elevation.
c. Revised the windows on the north elevation.
d. Added Vertical Siding detail.

ITEM NO. A6: Refer to Sheet A4.2 Interior Elevations (Not Re-Issued):

a. Revised window to reflect changes to East elevation on Interior Elevation 21.

ITEM NO. A7: Refer to Sheet A5.1 Building Sections (Not Re-Issued):

a. Revised window to reflect changes to East elevation on Building Section 3.

ITEM NO. A8: Refer to Sheet A5.4 Wall Sections (Re-Issued):

a. Added wood header and revised window on Wall Section 1.
b. Removed note regarding window wood sill/trim on Wall Sections 3 and 4.
c. Added jamb extension and wood casing note to windows on Wall Section 3 and 4. This is typical at all windows.

ITEM NO. A9: Refer to Sheet A5.6 Wall Sections (Re-Issued):

a. Added elevation of plaque on Detail 4.
b. Revised note regarding material and pinning of plaque on Detail 4.

ITEM NO. A10: Refer to Sheet A6.0 Schedules (Re-Issued):

a. Added Notes to Door Elevations.
b. Revised Door Elevation C and C2.
c. Added Door Elevation C3, E and F.
d. Added Door Frame Elevation 1.
e. Revised Door Frame Elevation 3 and 4.
f. Revised all Windows in Window Schedule.
g. Deleted Window 4 in Window Schedule.
h. Added W5 in Window Schedule.
i. Revised all alum/clad doors width and heights in Door Schedule.

j. Revised all door frame types for wood and Door A114B in Door Schedule.
k. Revised the door width for Door A101B in Door Schedule.
l. Added Note 5 to Remarks – Door Schedule.
m. Added Note 5 to all wood doors in Door Schedule.
n. Added Head and Jamb details for the wood doors.

END OF ADDENDUM NO. 1

Cc: Deib Mougrabi, Axiom Construction Services Group, L.L.C.
Susan Ireland, Van Buren Township Downtown Development Authority

TABLE OF CONTENTS

			PAGES
	Title Page		1
	Table of Contents		4
DIVISION 0	**BIDDING AND CONTRACT REQUIREMENTS "BY AXIOM CONSTRUCITON SERVICES"**		
	00851	Index of Drawings	2
DIVISION 1	**GENERAL REQUIREMENTS "BY AXIOM CONSTRUCTION SERVICES"**		
	01090	Reference Standards	7
DIVISION 2	**SITE**		
	02020	Geotechnical Investigation	30
	02070	Selective Demolition	7
	02220	Demolition	8
	02230	Site Clearing	4
	02300	Earthwork	15
	02370	Soil Erosion & Sedimentation Control	6
	02411	Foundation Drainage System	3
	02480	Landscape Work	14
	02484	Topsoil	3
	02499	Landscape Maintenance & Warranty Standards	3
	02530	Sanitary Sewerage	9
	02620	Sub Drainage	3
	02630	Storm Drainage	9
	02665	Water Distribution	9
	02740	Hot Mix Asphalt Paving	8
	02751	Concrete Pavement	14
	02760	Pavement Markings	5
	02821	Vinyl Fence and Gates	6
	02835	Ornamental Metal Fencing System	4
	02836	Alum. Cantilever Gate System	4
	02925	Cleanup and Restoration	2
DIVISION 3	**CONCRETE**		
	03001	Concrete Work	15
DIVISION 4	**MASONRY**		
	04100	Mortar & Grout	4
	04300	Unit Masonry Work	14
	04720	Cast Stone	9
DIVISION 5	**METALS**		
	05120	Structural Steel	10
	05500	Metal Fabrications	7

DIVISION 6	**WOOD AND PLASTICS**		
	06100	Carpentry, Wood Trusses & Wood Framing	6
	06185	Structural Glued-Laminated Timber	6
	06402	Interior Architectural Woodwork	13
DIVISION 7	**THERMAL AND MOISTURE PROTECTION**		
	07110	Sheet Membrane Waterproofing	4
	07160	Bituminous Dampproofing	4
	07175	Water Repellant Coatings	4
	07200	Insulation	6
	07462	Siding (Hardie Board)	11
	07600	Flashing & Sheet Metal	2
	07610	Standing Seam Metal Roofing System	7
	07711	Commercial Gutter System	5
	07840	Firestopping	6
	07910	Joint Fillers and Gaskets	5
	07920	Sealants and Caulking	11
DIVISION 8	**DOORS AND WINDOWS**		
	08210	Wood Doors	7
	08305	Access Doors and Panels	5
	08310	Wood Pocket Doors	7
	08333	Overhead Doors	4
	08410	FRP Doors-Alum. Framing Systems	7
	08413	Alum Clad Wood Comm. French Doors	
	08520	Alum Clad Wood Double Hung Windows	16
	08520	Alum Clad Wood Elliptical Fixed	
	08710	Finish Hardware	19
		Door Index	1
	08800	Glass & Glazing	10
DIVISION 9	**FINISHES**		
	09250	Gypsum Drywall	17
	09300	Tile Work	9
	09614	ADA Replaceable Cast In Place Detectable Warning Surfaces	8
	09650	Resilient Flooring	5
	09680	Carpeting	10
	09970	High Performance Coating Systems	
	09900	Painting	13
DIVISION 10	**SPECIALTIES**		
	10200	Architectural Louvers	5
	10400	Identification Devices	4
	10522	Fire Extinguishers and Cabinets	2
	10800	Toilet Accessories	7
	10999	Miscellaneous Specialties	5

DIVISION 20 - MECHANICAL GENERAL

200010	BASIC MECHANICAL REQUIREMENTS	5
200020	ELECTRICAL REQUIREMENTS FOR MECHANICAL WORK	1

DIVISION 22 - PLUMBING

220519	METERS AND GAGES FOR PLUMBING PIPING	2
220553	IDENT. FOR PLUMBING PIPING & EQUIPMENT	2
220719	PLUMBING PIPING INSULATION	3
221005	PLUMBING PIPING	6
221006	PLUMBING PIPING SPECIALTIES	4
223000	PLUMBING EQUIPMENT	3
224000	PLUMBING FIXTURES	5

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

230593	TESTING, ADJUSTING, AND BALANCING FOR HVAC	1
230713	DUCT INSULATION	3
232300	REFRIGERANT PIPING	3
233100	HVAC DUCTS AND CASINGS	6
233300	AIR DUCT ACCESSORIES	2
233423	POWER VENTILATORS	2
233700	AIR OUTLETS AND INLETS	2
235400	FURNACES	2
238200	CONVECTION HEATING AND COOLING UNITS	2

DIVISION 26 - ELECTRICAL

260500	BASIC ELECTRICAL REQUIREMENTS	5
260501	MINOR ELECTRICAL DEMOLITION	2
260519	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS & CABLES	6
260526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS	3
260529	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	5
260534	CONDUIT	7
260535	SURFACE RACEWAYS	3
260537	BOXES	4
260923	LIGHTING CONTROL DEVICES	4
262416	PANELBOARDS	6
262701	ELECTRICAL SERVICE ENTRANCE	2
262726	WIRING DEVICES	6
262813	FUSES	1
262818	ENCLOSED SWITCHES	3
262913	ENCLOSED CONTROLLERS	4
263213	ENGINE GENERATORS	8
263600	TRANSFER SWITCHES	6

265100 INTERIOR LIGHTING 4
265600 EXTERIOR LIGHTING 5
265701 OCCUPANCY SENSORS AND INDOOR PHOTOCELLS 6

DIVISION 27 – TELECOMMUNICATIONS GENERAL REQUIREMENTS

270501 Telecommunications General Requirements 5
270801 Cable Plant Administration and Testing 3
271005 Structured Cabling for Voice and Data 6
271101 Communications Equipment Spaces Support Hardware 3

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

283101 FIRE ALARM SYSTEMS 13

GEOTECHNICAL EVALUATION REPORT

BELLEVILLE DOWNTOWN DEVELOPMENT AUTHORITY
VAN BUREN TOWNSHIP, MICHIGAN

SME Project 077253.00
August 30, 2017

SME

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August 30, 2017

Mr. William Wiemer
Director of Construction Operations
Wakely Associates, Inc. / Architects
30500 Van Dyke Avenue, Suite 209
Warren, Michigan 48093

Transmitted via email: *bwiemer@wakelyaia.com*

RE: Geotechnical Evaluation Report
Belleville Downtown Development Authority (DDA)
Van Buren Township, Michigan
SME Project 077253.00

Dear Mr. Wiemer:

We have completed our geotechnical evaluation for the DDA project in Van Buren Township, Michigan. This report presents the results of our observations and analyses: our geotechnical recommendations for general site preparation, subgrade preparation for slabs, compaction and materials requirements for engineered fill, re-use of on-site soils as engineered fill, foundation design, seismic design: and general construction considerations based on the information disclosed by the borings.

We appreciate the opportunity to be of service. If you have questions or require additional information, please contact me.

Very truly yours,

SME

Christopher G. Naida, PE
Senior Project Engineer

TABLE OF CONTENTS

SUMMARY i

1. INTRODUCTION 1
   - 1.1 SITE CONDITIONS 1
   - 1.2 PROJECT DESCRIPTION 1

2. EVALUATION PROCEDURES 1
   - 2.1 FIELD EXPLORATION 1
   - 2.2 LABORATORY TESTING 2

3. SUBSURFACE CONDITIONS 2
   - 3.1 SOIL CONDITIONS 2
   - 3.2 GROUNDWATER CONDITIONS 3

4. ANALYSIS AND RECOMMENDATIONS 4
   - 4.1 SITE PREPARATION AND EARTHWORK 4
     - 4.1.1 EXISTING FILL CONSIDERATIONS 4
     - 4.1.2 GENERAL SITE SUBGRADE PREPARATION 5
     - 4.1.3 SUBGRADE PREPARATION FOR FLOOR SLABS 6
     - 4.1.4 ENGINEERED FILL REQUIREMENTS 6
   - 4.2 FOUNDATIONS 7
   - 4.3 SEISMIC SITE CLASS 9
   - 4.4 CONSTRUCTION CONSIDERATIONS 10

APPENDIX A

BORING LOCATION PLAN
BORING LOG TERMINOLOGY
BORING LOGS (B1 THROUGH B8)

APPENDIX B

IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL ENGINEERING REPORT
GENERAL COMMENTS
LABORATORY TESTING PROCEDURES

SUMMARY

We summarized the report conclusions and recommendations as follows:

1. The soil conditions encountered at the boring locations generally consist of topsoil, gravel, or asphalt pavement underlain by sand fill overlying natural sands that are underlain by natural clays to the explored depths of the borings. Groundwater was encountered at each of the borings at about 8 feet below the existing ground surface. The fill extended to a depth of about 3 feet below the existing ground surface at borings B1 through B3, B6, and B7.

2. The naturally occurring inorganic soils are considered suitable for support of grade slabs and pavements. Also, the fill encountered generally appears to be an adequate subgrade material for support of the grade slabs and pavements, provided the subgrade is properly prepared during construction and a relatively low risk for undesirable subgrade movement is acceptable. Prior to placement of engineered fill or construction of pavements, we recommend thoroughly compacting the sandy subgrade as some of the natural sands are in a loose condition below the surficial materials. Also, further assessment of the condition of the fill, along with improvement of marginal fills and removal of unsuitable fills (such as construction debris), is recommended during site earthwork, utility, and foundation construction after demolition of the existing buildings (particularly within the footprints of the existing buildings).

3. The existing fill and natural soils (excluding topsoil and soils with significant debris, organics, and/or other unsuitable materials) are considered suitable for reuse onsite as a general engineered fill. Some moisture conditioning may be required. prior to compaction. Also, we encountered glass and/or asphalt pieces within the existing fill at some of the borings (refer to B6 and B7). Do not use topsoil and/or soils containing significant debris or organics as engineered fill.

4. Shallow spread foundations, bearing on suitable naturally occurring soils or on engineered fill placed directly over suitable natural soils, are recommended for support of the proposed buildings. We recommend using a maximum net allowable bearing pressure of 2,500 psf for shallow foundation design. Suitable naturally occurring soils were generally encountered at about 3 feet below the existing ground surface. Therefore, we anticipate that some relatively minor undercutting will be required to extend interior foundations through the existing fill. It may be possible to bear some of the foundations on the existing fill, however the fill would need to be carefully evaluated by SME geotechnical engineers during construction through thorough probing and testing, and a risk of poor foundation performance would need to be acceptable to the Owner.

5. We anticipate conventional sump pit and pump methods would be adequate for controlling water in excavations, provided the excavations extend no more than about 1 foot below groundwater levels. A layer of crushed stone/aggregate may need to be placed in areas that remain in a wet condition to protect the subgrade from disturbance.

The summary presented above includes selected elements of our findings and recommendations and provided solely for purposes of overview. It does not present crucial details needed for the proper application of our findings and recommendations. Do not consider it apart from the entire text of this report and appendices, with all of the qualifications and considerations mentioned therein which are best evaluated with the active participation of SME.

REPORT PREPARED BY:

Alex Kuisell, EIT, SMSI
Staff Engineer

REPORT REVIEWED BY:

Robert C. Rabeler, PE
Principal Consultant

1. INTRODUCTION

This report presents the results of our geotechnical evaluation for the subject project. We prepared this report based on your authorization of SME proposal P02352.17 dated August 10, 2017. You requested that SME explore the subsurface conditions on the site to develop geotechnical engineering recommendations for the proposed construction.

1.1 SITE CONDITIONS

The project site is located south of Tyler Road on the east side of Belleville Road. The overall site appears relatively flat with grass landscaped areas and gravel lots with a few existing structures. The site covers multiple property addresses summarized below.

- 10101 Belleville Road: Existing home that has been demolished
- 10151 Belleville Road: Existing slab-on-grade house to be demolished and replaced by new structure
- 10085 Belleville Road: Existing slab-on-grade house to be demolished
- 10065 Belleville Road: Existing slab-on-grade house to be demolished

Based on Google Earth, existing site grades are relatively flat across the site, as they vary from about elevation 692 to 695 feet.

1.2 PROJECT DESCRIPTION

The project will consist of demolishing the existing residential structures and construction of a new commercial building and associated structures. The proposed wood-framed commercial building will have a crawl space, and be located slightly north and generally within the existing footprint of the 10151 Belleville Road structure. A new block-wall structure bathroom and storage area will be constructed to replace an existing stable near the center of the site. Parking will be located near the northwest portion of the site, with an open pavilion structure to the northeast. Structural loads were not provided to us prior to preparing this report, but based on our experience with similar structures and projects we anticipate maximum column loads of about 150 kips and wall loads of about 4 kips per lineal foot (klf) or less.

2. EVALUATION PROCEDURES

2.1 FIELD EXPLORATION

SME and Wakely Associates, Inc. jointly determined the number, locations, and depths of the borings. SME explored subsurface conditions at the site with eight (8) soil borings performed on August 17, 2017. See summary table below for proposed improvement and boring locations.

SOIL BORING SUMMARY TABLE

SITE FEATURE DESCRIPTION	BORING LOCATIONS	BORING DEPTHS (feet)
Wood-framed commercial building with a crawl space	B1 and B2	20
Block-wall structure bathroom and storage area	B3	15
Open pavilion structure	B4 and B8	15
Surface parking	B5, B6 and B7	10

The boring locations were staked prior to the field exploration using existing site features for reference. The boring logs and Boring Location Plan are included in Appendix A.

SME drilled and sampled the borings in general accordance with ASTM Standards. The borings were advanced using solid-stem augers. SME measured and recorded groundwater depth (or lack thereof) during and immediately after completion of each boring. Then, we backfilled the boreholes with excess auger cuttings. We took the recovered soil samples to our laboratory for further observation and testing.

2.2 LABORATORY TESTING

The laboratory testing program consisted of visual soil classification on recovered samples along with moisture content and hand penetrometer shear tests on portions of cohesive samples obtained. The Laboratory Testing Procedures in Appendix B provide descriptions of the laboratory tests given above.

Upon completion of the laboratory testing, we prepared boring logs including materials encountered, penetration resistances, pertinent field observations made during the drilling operations, and the results of certain laboratory tests. We developed the soil descriptions included on the boring logs from both visual classification and the results of laboratory tests.

Soil samples retained over a long time, even sealed in jars, are subject to moisture loss and are no longer representative of the conditions initially encountered in the field. Therefore, we retain soil samples in our laboratory for a maximum of 60 days unless instructed otherwise.

3. SUBSURFACE CONDITIONS

3.1 SOIL CONDITIONS

The soil conditions encountered at the borings generally consisted of variable surficial materials overlying existing sand fill, underlain by natural sands, which were underlain by natural clays. The following is a summary of the materials encountered at the boring locations, beginning at the existing ground surface and proceeding downward.

Stratum 1: Surficial Materials. We encountered about 6 to 12 inches of gravel at borings B1 through B3, and about 5 inches of asphalt at boring B6, beginning at the ground surface. At the remaining borings (B4, B5, B7, and B8), we encountered about 2 to 8 inches of topsoil at the ground surface. Refer to the boring logs for more information.

Stratum 2: Sand Fill. We encountered sand fill below the surficial materials at borings B1 through B3 and B6 through B7, extending about 3 feet below the existing ground surface. Standard Penetration Test (SPT), or N-values, obtained within the fill and ranged from 11 to 25 blows per foot (bpf), indicating a medium dense condition. At borings B6 and B7, we encountered construction debris (asphalt and glass pieces) within the sand fill.

Stratum 3: Natural Sands. We encountered natural sands with varying silt and gravel contents below the existing fill (or immediately below the surficial materials at borings B4, B5 and B8), extending about 8 to 14 feet below the existing ground surface (or to the explored depth at some of the 10-foot borings). N-values obtained within the natural sands ranged from 6 to 20 bpf, indicating a loose to medium dense condition.

Stratum 4: Natural Clays. We encountered stiff to very stiff natural clays with varying sand and silt content below the natural sands, extending to the explored depths of borings B1 through B4, and B8. Moisture contents of the clays ranged between about 15 to 20 percent. Measured shear strengths of the natural clays ranged from 1.0 to 3.5 kips per square-foot (ksf).

The soil profile described above and included on the appended boring logs are generalized descriptions of the conditions encountered. The stratification depths described above and shown on the boring logs indicate a zone of transition from one soil type to another and do not show exact depths of change from one soil type to another. We based the soil descriptions on visual classification of the soils encountered. Soil conditions may vary between or away from the boring locations. Please refer to the boring logs for the soil conditions at the specific boring locations.

Thickness measurements of surficial materials reported on the boring logs (e.g., topsoil, gravel, asphalt, etc.) need to be considered approximate since mixing of these materials can occur in small diameter boreholes. Therefore, if accurate thickness measurements are required for inclusion in bid documents or purposes of design, perform additional evaluations such as shallow test pits or pavement cores.

It is sometimes difficult to distinguish between fill and natural soils based on samples and cuttings from small-diameter boreholes, especially when portions of the fill do not contain man-made materials, debris, topsoil or organic layers, and when the fill appears similar in composition to the local natural soils. Therefore, the delineations of fill described above and on the appended boring logs are considered approximate only. Make a more comprehensive evaluation of the extent and composition of the suspect fill by reviewing former site topography plans such as grading plans from the original construction, aerial photographs, and other historic site records and also by observing test pit excavations.

3.2 GROUNDWATER CONDITIONS

During drilling, we encountered groundwater at each boring around 8 feet below the existing ground surface. Refer to the table below for a summary of our groundwater observations and measurements. The groundwater appears to be perched in the natural sands overlying less permeable natural clays at the site.

GROUNDWATER SUMMARY TABLE

BORING NO.	DEPTH OF GROUNDWATER INITIALLY ENCOUNTERED (feet)	GROUNDWATER DEPTH UPON COMPLETION OF DRILLING (feet)
1	8	10
2	8	10
3	8	9
4	8	10
5	8	8
6	8	8
7	8	8
8	8	8

We expect groundwater levels and the potential rate of infiltration into excavations to fluctuate throughout the year, based on variations in precipitation, evaporation, run-off, and other factors. The groundwater levels indicated by the borings represent conditions at the time we took the readings. The actual groundwater levels at the time of construction may vary. If more information regarding groundwater levels at this site is required, then we recommend performing additional subsurface assessments.

4. ANALYSIS AND RECOMMENDATIONS

4.1 SITE PREPARATION AND EARTHWORK

4.1.1 EXISTING FILL CONSIDERATIONS

We encountered sand fill extending about 3 feet below the existing ground surface at borings B1 through B3, and B6 through B7. We expect the fill was placed to raise site grades during the development for the current residential/commercial buildings on this site. Based on the test results obtained during drilling (i.e. the SPT blow counts), the existing fill at the borings appears to have been somewhat compacted. We encountered some construction debris (glass and asphalt pieces) in the existing fill at borings B6 and B7 within the proposed parking area. We consider the fill to be undocumented or uncontrolled since the origin of the existing fill is not known, we are not aware of records that document the fill placement and any compaction operations, and because of the variable composition and density of the fill.

We recommend the foundation excavations extend through any existing fill to bear on suitable natural soils. Another option for foundations situated at higher levels (i.e. interior foundations) would be to support them on the existing fill, however the fill would require careful evaluation by an SME geotechnical engineer during construction and the risk of poor foundation performance must be acceptable to the owner. Refer to Section 4.2 for recommendations regarding foundation construction.

The existing fill encountered at the borings is generally considered adequate for support of the grade slabs and pavements, provided a minor risk for poor performance (e.g. settlement and/or cracking) of the structures supported on the existing fill is acceptable. Based on the borings, we anticipate the risk for poor performance of grade slabs and pavements is low, provided the subgrade is properly prepared during construction and final site grades remain relatively unchanged from existing site grades. Proper subgrade preparation typically includes removing unsuitable fill (such as construction debris) and buried topsoil, uniformly compacting existing fill with appropriate compaction equipment, performing proofroll tests, undercutting overly soft/loose subgrade, and replacing undercuts with suitable engineered fill.

Our field exploration was limited to areas outside of the existing buildings on the project site. Based on our understanding of the project, the proposed buildings and new pavements will overlap with the existing structures on the site in several areas. Therefore, it will be important to perform further subsurface evaluation(s) in these overlap areas during construction to reduce the potential for poor grade slab and/or foundation performance. We recommend that SME further evaluate the existing fill during construction.

As is typical for conventional site earthwork projects, further evaluation(s) can be performed using construction equipment (e.g. backhoes for test pits, fully loaded dump trucks for proofrolls, etc.) and would occur on a case-by-case basis to address the specific needs of each situation where existing fill remains in-place. We recommend the contractor remove (and properly dispose of) any unsuitable existing fill and replace with an appropriate engineered fill material. To address budgetary concerns, we recommend including a contingency for additional earthwork (e.g. undercutting, in-place compaction, removal of unsuitable fill, importing suitable fill, etc.) that may be required to improve subsurface conditions.

If even a low risk for poor performance of grade slabs and pavements supported by the existing fill is not acceptable, then we recommend completely removing the existing fill and replacing it with properly compacted soils (i.e. an engineered fill). Refer to Section 4.1.4 of this report for recommendations regarding placement of engineered fill.

4.1.2 GENERAL SITE SUBGRADE PREPARATION

Upon removal of existing structures (i.e., walks, pavements, slabs, foundations, etc.) and other unsuitable surficial materials, remove any remaining topsoil, buried topsoil, concentrated root zones, construction debris, unsuitable fill and other undesirable materials to expose a suitable existing subgrade. We recommend site clearing extend a minimum of 5 feet beyond the limits of the proposed improvement areas, or to the edge of existing structures to remain, to ensure uniform support of proposed improvements.

We expect that existing sand fill or natural sands will be exposed after site stripping and clearing of surface topsoil and pavements. Some of the on-site subgrade soils are sensitive to disturbances during construction and the overall success of the subgrade preparation during mass earthwork operations will directly affect the suitability of slab and pavement subgrade soils as the existing ground surface is near/at the anticipated design final subgrade levels. As such, take care during site earthwork operations to prepare the subgrade for slab support in the building pad and pavement areas.

Depending on the season and the amount of precipitation received immediately prior to the subgrade preparation activities, and the degree of construction equipment trafficking over the subgrade, the subgrade may become softened/loosened and disturbed. For areas of disturbed subgrade, it will be necessary to improve the disturbed soils or remove and replace them with engineered fill. Improvement of the exposed subgrade may consist of aerating and drying disturbed soils, recompacting these soils in-place, as well as placement of crushed aggregate or crushed concrete, possibly with a geotextile for separation.

To reduce the amount of potential subgrade improvements required at this site, we recommend the contractor establish positive site drainage as soon as possible and remove ponded water from exposed and prepared subgrades. Also, we recommend construction traffic use designated haul roads and not randomly traffic the site.

In the proposed pavement areas, remove existing below-grade obstructions to at least 2.5 feet below design final subgrade levels. For obstructions that may remain in-place below this level, further evaluate the existing fill (if any) around the obstructions for suitability to support new pavements, and fully grout any voids (e.g. abandoned pipes) associated with the abandoned obstructions. Protect adjoining/neighboring utilities and building structures to remain from damage during construction. The proposed buildings and new pavements will overlap with the existing structures on the site in several areas. Therefore, it will be important to replace the removed below-grade structures with engineered fill to the final subgrade elevation, as these areas will be used to support new slabs, pavements, and foundations. Refer to Section 4.1.4 for recommendation regarding placement of engineered fill.

After stripping and removal of unsuitable materials and making cuts to design subgrade levels, the exposed subgrade needs to be uniformly compacted using large construction equipment. This is an important consideration for properly preparing the sandy subgrade as some of the natural sands are in a loose condition below the surficial materials as indicated by the borings B3 through B5, and B7. Improvement (compaction) of the sand subgrade prior to placement of engineered fill to raise site grades is critical for reducing the potential for undercutting/additional improvement efforts during foundation and slab construction. Due to the predominantly granular profile, we anticipate that large, smooth drum (vibratory) rollers will be most effective for compacting the subgrade. Take care during compaction not to damage nearby existing structures. The type of compaction equipment will depend upon site-specific conditions and the proximity (and sensitivity) of existing structures. We recommend at least several passes be made with the compaction equipment. In some areas, moisture conditioning and/or undercutting may be necessary to enhance the effectiveness of the compaction operation.

After the subgrade is compacted, we recommend testing the subgrade for stability. Typically, such testing involves a proofroll with a large piece of construction equipment. Where areas are accessible for proofrolling, we recommend using a fully loaded tandem axle truck (50,000 lbs. minimum) to perform the proofroll test. We recommend an SME representative be on-site to observe the testing of the exposed subgrade. Based on the results of the field tests and observations (and lab tests, as applicable), the SME representative can provide recommendations in the field as to the suitability of the subgrade for structural support. Areas of unsuitably loose/wet subgrade will need to be either improved in-place (e.g., dried and recompacted) or be removed (undercut) and replaced with engineered fill.

After making cuts to design grades and after the exposed subgrade is evaluated (as mentioned above) and improved as necessary, engineered fill may be placed on the exposed subgrade to establish final subgrade levels. See Section 4.1.4 of this report for materials and compaction requirements for engineered fill.

4.1.3 SUBGRADE PREPARATION FOR FLOOR SLABS

We anticipate the final subgrade for the proposed floor slabs will consist of existing sand fill, natural sands, or engineered fill placed over properly prepared soils. Prior to concrete placement for floor slabs, we recommend observation and testing of the final subgrade for suitability of floor slab support.

We recommend the top 4 inches of the slab subgrade consist of an approved granular material. The purpose of this is to provide a leveling surface for construction of the slab and a moisture capillary break between the slab and the underlying soils. We recommend MDOT Class II sand for this purpose. The granular material must also be compacted per the "Engineered Fill Requirements" section of this report (Section 4.1.4). We do not recommend relying on the leveling course to protect the underlying subgrade from disturbances. Therefore, place the concrete slab soon after the leveling course, and ensure proper placement and compaction of the underlying subgrade.

Provide a vapor retarder below the interior floor slab(s) if the slab(s) are to receive an impermeable floor finish/seal or a floor covering which would act as a vapor retarder. Even if these floor coverings are not planned, the vapor retarder can reduce the transmission of moisture vapor from the ground into the structure due to thermal and humidity variations, and other conditions. However, the placement of a vapor retarder affects construction of the floor slab, concrete curing, and the rate of moisture loss as the concrete dries. The flatwork contractor must use the appropriate equipment, materials, and methods to prevent undesirable slab curling/warping.

We recommend floor slabs be separated by isolation joints from structural walls and columns bearing on their own foundations to permit relative movement. Provide a minimum of 6 inches of engineered fill between the bottom of the slab and the top of the shallow spread foundation below. Otherwise, we recommend the structural engineer account for potential relative settlements, such as grade beams, thickened slabs with appropriate reinforcing steel, or other appropriate details.

Protect the slab-on-grade subgrade soils from frost action during winter construction. Any frozen soils must be thawed and compacted, or removed and replaced prior to slab-on-grade construction.

4.1.4 ENGINEERED FILL REQUIREMENTS

Any fill placed within the construction area, including utility trench backfill, must be an approved material, free of organics (organic content less than 4 percent), frozen soils, or other unsuitable materials. We recommend the fill be spread in level layers not exceeding 9 inches in loose thickness and be compacted to a minimum 95 percent of the maximum dry density as determined in accordance with the Modified Proctor Test.

Thicker lifts of backfill may be acceptable, provided the type of compaction equipment can achieve the minimum compaction criterion throughout the entire thickness of the lift within the area of placement and with the type of backfill used. SME can provide recommendations in the field for adjusting lift thicknesses based on the specific type of compaction equipment/methods used during construction and verification the entire lift of fill is compacted to the project requirements.

We believe that the natural soils, along with most of the existing fill, encountered at the site are suitable for reuse as engineered fill, provided they meet the requirements listed in the previous paragraph. Based on the limited information from the soil borings the sand fill and natural sands appear to be relatively "clean" with a reduced fine-grained soil (silt and clay) content. As such, some of the onsite sands may meet MDOT Class II granular material specifications and we recommend grain-size testing during mass earthwork to verify.

We do not recommend that topsoil or construction debris be reused as engineered fill. We encountered some construction debris (glass and/or asphalt pieces) within the existing fill at borings B6 and B7. Therefore, we recommend further evaluation the existing fill soils in the field during construction to verify that the fill being reused as engineered fill does not contain significant debris.

Some drying/aeration of on-site soils may be necessary to allow for proper compaction. For placement and compaction of granular soils, we recommend the project specifications include moisture conditioning to within 2 percent of optimum moisture content, unless otherwise approved (in writing) by the geotechnical engineer.

For backfill in confined areas, and where drainage is required, we recommend using imported granular backfill such as MDOT Class II sand, MDOT 21AA crushed aggregate, and/or MDOT 6A crushed stone. The specific type of imported fill will depend on a variety of factors. For most instances, we anticipate MDOT Class II sand will be adequate. Crushed aggregate/stone would be necessary where the existing subgrade is in a wet condition and/or where site drainage is critical. In addition to the use of crushed stone, it would likely be necessary to cap the stone with crushed aggregate, or wrap the crushed stone with a heavy-duty non-woven geotextile fabric, to prevent the surrounding soils from infiltrating into the crushed stone.

For trenches and other excavations, we recommend the upper 18 inches of backfill consist of soils that are similar with the surrounding subgrade. The purpose for this is to limit mixing of different soil types near final subgrade levels.

4.2 FOUNDATIONS

We recommend shallow spread foundations, bearing on suitable natural sands, or on engineered fill placed over suitable natural soils for foundation support. We recommend a net allowable bearing pressure of 2,500 pounds per square-foot (psf) for the foundations (based on a factor of safety of 3 or more). Suitable bearing soils are anticipated at normal frost depths for exterior foundations (about 42 inches below final site grades) in most locations. Some localized undercutting will likely be required to extend interior foundations through the existing fill. Another option for the interior foundations would be to construct them over the existing fill, provided that these soils are thoroughly probed and tested during construction, and a risk for poor foundation performance is acceptable to the Owner. The method used for testing the bearing soils must be capable of extending at least 3 feet (or possibly more) below the bottom of footing elevation.

We recommend additional subsurface exploration (borings and/or test pit excavations) within the footprint of the existing buildings after they have been demolished, to further evaluate the existing fill on the site. The information obtained will be valuable for preparing bid documents/cost estimates associated with foundation undercutting. Also, we recommend that an SME representative be on site during foundation construction to observe and test the subgrade, to verify that suitable bearing soils are exposed and that subgrade conditions are representative of those encountered at the borings.

In areas where the exposed subgrade cannot attain the recommended soil bearing pressure:

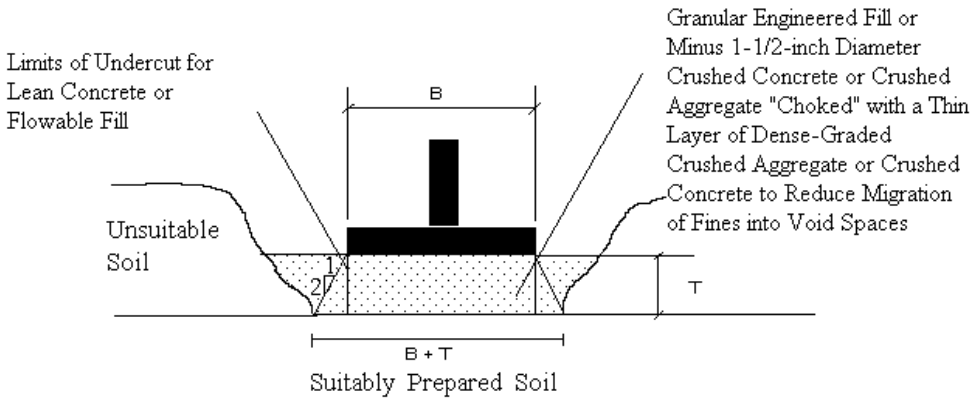
- The foundation(s) could be re-designed at a reduced bearing pressure (this requires input from the project structural engineer).

- Shallow subgrade improvements of the subgrade within 1 to 3 feet of the bottom of foundation could be thoroughly compacted in-place with several passes from a vibratory smooth drum roller or other relatively large piece of vibratory compaction equipment (e.g. hoe-pac mounted onto a large excavator such as a CAT 330). It may also be necessary to moisture condition the granular soils to achieve the required compaction.

- Undercutting of the unsuitable foundation bearing soils.

    - Foundation undercuts that extend through unsuitable subgrade (and reach suitable bearing soils) can be backfilled with footing concrete.

    - Place select engineered fill (MDOT 6A crushed stone; MDOT 21AA crushed aggregate; MDOT Class II sand) to design foundation bearing level within the undercut. Extend the undercut laterally on a two vertical to one horizontal slope from the outside edge of the foundation where undercutting and backfilling to the design bearing level. Please refer to the following Typical Foundation Undercutting Diagram:



Based on the measurements taken during drilling, groundwater is generally not expected to be encountered during the foundation construction activities for the bathroom or pavilion structure foundations (anticipated up to 4 feet below the existing ground surface). However, it is possible some groundwater may be encountered during excavation for the commercial building crawl space foundations (anticipated near the sand to clay interface). The groundwater encountered at the site appeared to be perched in the natural sands overlying the less permeable natural clays. Groundwater seepages, if/where encountered, could be significant when initially encountered but are anticipated to dissipate with time. Overall, we anticipate temporary dewatering using standard sump pits and pumps will be adequate to control groundwater seepages on a local basis. If seepage into the excavations occurs, the underlying subgrade may remain in a wet condition and be sensitive to disturbances, even after dewatering. If the foundation subgrade becomes disturbed, it would be necessary to undercut the foundation subgrade and place a layer of crushed stone to protect the underlying subgrade from disturbances. The thickness of the crushed stone/aggregate layer depends upon the sensitivity of the subgrade to disturbance, but typically ranges from 6 to 18 inches.

Foundations must be situated a minimum of 42 inches below final site grades along exterior walls or in any unheated areas for protection against frost action during normal winters. Foundations on interior areas may be situated on suitable natural soils at higher levels (or existing fill verified as suitable by SME during construction as described above), provided the contractor protects foundations and proposed bearing soils from freezing during construction if work occurs in the winter months, and provided the building is heated.

The natural sands and existing fill soils are subject to side-wall caving and/or sloughing. Therefore, construction using "neat-trench" methods are not considered feasible for the project. Rather, we anticipate that the foundation excavations will need to be open-cut/sloped back and the footings constructed using formwork. If/where trench foundation construction is feasible, we recommend the foundation side-walls be shaped in a vertical manner and not be allowed to 'mushroom out' near the top as this can create a "frost lip" at the top of the foundation. If side-wall caving occurs, remove the sloughed soils and re-establish an undisturbed bearing surface.

For bearing capacity and settlement considerations, we recommend continuous (wall) foundations have a minimum width of 16 inches and spread (column) foundations have a minimum dimension of 30 inches. In some cases, where there are relatively light structural loads, the minimum foundation size criteria may dictate the size of the foundation and not the allowable soil bearing pressure.

We estimate total settlement for shallow foundations using the recommended design soil bearing pressure and bearing on suitable natural soils as described above to be 1 inch or less. We estimate differential settlements to be about one-half the total settlement. We base the settlement estimates on the available boring information, the estimated structural loads, our experience with similar structures and soil conditions and field verification of suitable bearing soils by SME.

4.3 SEISMIC SITE CLASS

The site is located at approximately geographic location latitude N42.228640 degrees and longitude W83.484635 degrees. From available information available for purposes of identifying the depth to bedrock, the approximate ground surface at the site is about elevation 695 feet. Based on Plate 13 – (Topography of the Bedrock Surface) in the Hydrogeological Atlas of Michigan, the estimated level of the top of rock is between about elevations 550 to 600 feet from linear interpolation of contours plotted at 50-foot intervals. Based on the above information, the glacial drift is roughly 95 to 145 feet thick.

The known shear strength and N-values for drift at this site are limited to the explored depth of about 20 feet below the ground surface at the borings drilled for this evaluation, which we anticipate to be of similar or better strength with increasing depth. Based on the referenced soil conditions, averaged over the upper 100 feet of the profile, seismic site Class D applies to this site in accordance with the 2015 Michigan Building Code (MBC) referencing Table 20.3-1 in ASCE Standard ASCE/SEI 7-10.

Based on the location of the site at the indicated approximate latitude and longitude, the mapped short-period spectral response acceleration, S_S, and mapped spectral response acceleration at 1-second period, S_1, is 0.098g and 0.048g, respectively. Based on the mapped accelerations, the calculated short-period spectral response acceleration S_{DS}, and calculated spectral response acceleration at 1-second period, S_{D1}, is 0.105g (less than 0.167g) and 0.077g (between 0.133g than 0.067g), respectively. Therefore, Seismic Design Category B is applicable for this site.

4.4 CONSTRUCTION CONSIDERATIONS

Based on the short-term groundwater information obtained during the field exploration, we do not anticipate that groundwater will be a major factor during construction. However, groundwater seepages may be encountered during deeper utility excavations, or during foundation undercutting, depending on the excavation depths and the groundwater levels at the time of construction. The groundwater levels are expected to fluctuate throughout the year, so the contractor will need to be prepared to control groundwater, surface run-off, and water from wet periods using standard sump pit and pumping procedures. Multiple sump pits will likely be required for deeper utility excavations (excavations more than about 1 to 2 feet below the groundwater levels).

In excavation areas where seepage accumulates, a working surface of either crushed aggregate or crushed concrete may be required to protect the exposed surface from disturbance. The thickness of the crushed stone/aggregate layer depends upon the sensitivity of the subgrade to disturbance, but typically ranges from 6 to 18 inches. SME can provide recommendations in the field regarding the thickness (and type) of crushed stone/aggregate required for a specific condition.

The contractor will need to remove ponded or standing water from areas where water collects and prevent surface water runoff from reaching foundation excavations or the prepared subgrade. In addition, use designated haul roads for construction traffic and do not randomly traffic the site. Remove and replace disturbed subgrade soils with engineered fill. Under adverse weather conditions, protect areas of exposed subgrade at the site by placing crushed concrete or crushed aggregate on the exposed subgrade. In addition, place foundation concrete as soon as foundation excavations have been completed and approved to reduce the potential for disturbance of the foundation subgrade.

We recommend the bid documents require prospective contractors to include unit prices for removing (and properly disposing of) unsuitable materials such as debris-laden fill, buried organics, overly fine-grained, disturbed soils, impacted groundwater, etc. and replacing it with suitable engineered fill. Also, we recommend establishing a contingency in the construction budget for this work. The actual quantity of unsuitable soils onsite will vary, and can be significantly impacted by the contractor's means-and-methods (e.g. equipment and/or effort), time of year, variable subsurface conditions, etc. Actual undercut quantities must be determined during construction by additional subsurface evaluations in the field (e.g. test pits, proofrolls, hand auger probes, etc.). Verify actual quantities during construction by measuring excavation volumes, counting truck loads, or a combination of methods.

The contractor must provide a safely sloped excavation or an adequately constructed and braced shoring system in accordance with federal, state and local safety regulations for individuals working in an excavation that may expose them to the danger of moving ground. Additionally, if storing material or operating equipment near an excavation, use appropriate shoring to resist the extra pressure due to the superimposed loads.

APPENDIX A

BORING LOCATION PLAN
BORING LOG TERMINOLOGY
BORING LOGS (B1 THROUGH B8)

Boring Location Plan

Belleville DDA

Van Buren Twp, MI

Project No. 077253.00	Drawn by: AK
Drawing No.: 1	Checked by: JWR
Date: 8-28-17	Scale: As shown

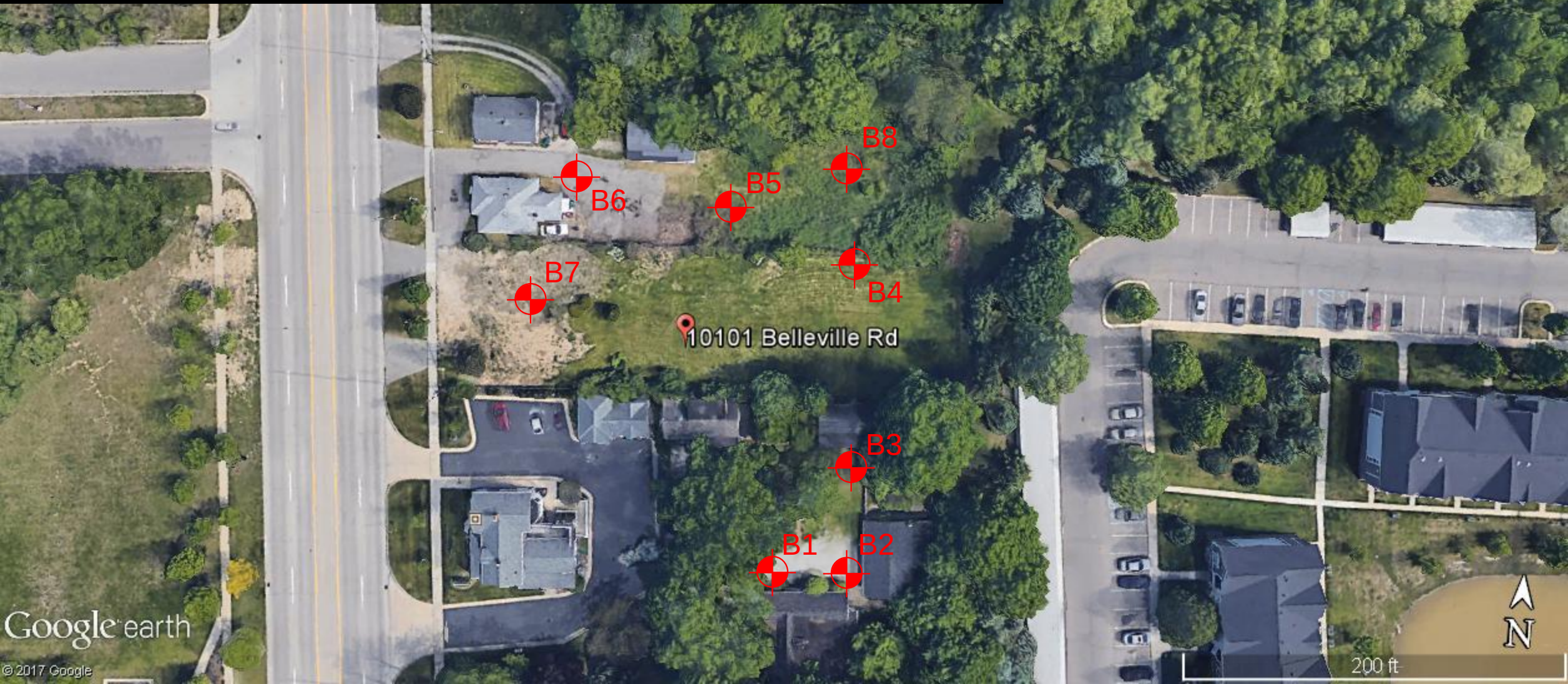
SME

Drawing taken from Google Earth Pro (August 2017)

LEGEND

Soil Boring Location

*Locations are approximate



BORING LOG TERMINOLOGY

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOIL
(more than 50% of material is larger than No. 200 sieve size.)

GRAVEL More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravel (Less than 5% fines)	GW	Well-graded gravel; gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravel; gravel-sand mixtures, little or no fines
	Gravel with fines (More than 12% fines)	GM	Silty gravel; gravel-sand-silt mixtures
		GC	Clayey gravel; gravel-sand-clay mixtures
SAND 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sand (Less than 5% fines)	SW	Well-graded sand; sand-gravel mixtures, little or no fines
		SP	Poorly graded sand; sand-gravel mixtures, little or no fines
	Sand with fines (More than 12% fines)	SM	Silty sand; sand-silt-gravel mixtures
		SC	Clayey sand; sand–clay-gravel mixtures

FINE-GRAINED SOIL
(50% or more of material is smaller than No. 200 sieve size)

SILT AND CLAY Liquid limit less than 50%		ML	Inorganic silt; sandy silt or gravelly silt with slight plasticity
		CL	Inorganic clay of low plasticity; lean clay, sandy clay, gravelly clay
		OL	Organic silt and organic clay of low plasticity
SILT AND CLAY Liquid limit 50% or greater		MH	Inorganic silt of high plasticity, elastic silt
		CH	Inorganic clay of high plasticity, fat clay
		OH	Organic silt and organic clay of high plasticity
HIGHLY ORGANIC SOIL		PT	Peat and other highly organic soil

OTHER MATERIAL SYMBOLS

Topsoil, Void, Sandstone, Asphalt, Glacial Till, Siltstone, Base, Coal, Limestone, Concrete, Shale, Fill

LABORATORY CLASSIFICATION CRITERIA

GW	$C_U = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with PI greater than 7	
SW	$C_U = \frac{D_{60}}{D_{10}}$ greater than 6; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring use of dual symbols
SC	Atterberg limits above "A" line with PI greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent……..GW, GP, SW, SP
More than 12 percent……..GM, GC, SM, SC
5 to 12 percent……..Cases requiring dual symbols

- SP-SM or SW-SM (SAND with Silt or SAND with Silt and Gravel)
- SP-SC or SW-SC (SAND with Clay or SAND with Clay and Gravel)
- GP-GM or GW-GM (GRAVEL with Silt or GRAVEL with Silt and Sand)
- GP-GC or GW-GC (GRAVEL with Clay or GRAVEL with Clay and Sand)

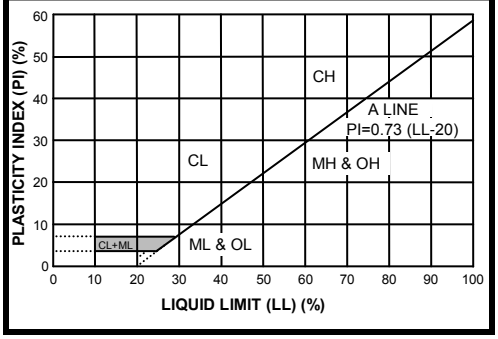
If the fines are CL-ML:

- SC-SM (SILTY CLAYEY SAND or SILTY CLAYEY SAND with Gravel)
- SM-SC (CLAYEY SILTY SAND or CLAYEY SILTY SAND with Gravel)
- GC-GM (SILTY CLAYEY GRAVEL or SILTY CLAYEY GRAVEL with Sand)
- GM-GC (CLAYEY SILTY GRAVEL or CLAYEY SILTY GRAVEL with Sand)

PARTICLE SIZES

Boulders	-	Greater than 12 inches
Cobbles	-	3 inches to 12 inches
Gravel- Coarse	-	3/4 inches to 3 inches
Fine	-	No. 4 to 3/4 inches
Sand- Coarse	-	No. 10 to No. 4
Medium	-	No. 40 to No. 10
Fine	-	No. 200 to No. 40
Silt and Clay	-	Less than (0.0074 mm)

PLASTICITY CHART



VISUAL MANUAL PROCEDURE

When laboratory tests are not performed to confirm the classification of soils exhibiting borderline classifications, the two possible classifications would be separated with a slash, as follows:

For soils where it is difficult to distinguish if it is a coarse or fine-grained soil:

- SC/CL (CLAYEY SAND to Sandy LEAN CLAY)
- SM/ML (SILTY SAND to SANDY SILT)
- GC/CL (CLAYEY GRAVEL to Gravelly LEAN CLAY)
- GM/ML (SILTY GRAVEL to Gravelly SILT)

For soils where it is difficult to distinguish if it is sand or gravel, poorly or well-graded sand or gravel; silt or clay; or plastic or non-plastic silt or clay:

- SP/GP or SW/GW (SAND with Gravel to GRAVEL with Sand)
- SC/GC (CLAYEY SAND with Gravel to CLAYEY GRAVEL with Sand)
- SM/GM (SILTY SAND with Gravel to SILTY GRAVEL with Sand)
- SW/SP (SAND or SAND with Gravel)
- GP/GW (GRAVEL or GRAVEL with Sand)
- SC/SM (CLAYEY to SILTY SAND)
- GM/GC (SILTY to CLAYEY GRAVEL)
- CL/ML (SILTY CLAY)
- ML/CL (CLAYEY SILT)
- CH/MH (FAT CLAY to ELASTIC SILT)
- CL/CH (LEAN to FAT CLAY)
- MH/ML (ELASTIC SILT to SILT)
- OL/OH (ORGANIC SILT or ORGANIC CLAY)

DRILLING AND SAMPLING ABBREVIATIONS

2ST	–	Shelby Tube – 2" O.D.
3ST	–	Shelby Tube – 3" O.D.
AS	–	Auger Sample
GS	–	Grab Sample
LS	–	Liner Sample
NR	–	No Recovery
PM	–	Pressure Meter
RC	–	Rock Core diamond bit. NX size, except where noted
SB	–	Split Barrel Sample 1-3/8" I.D., 2" O.D., except where noted
VS	–	Vane Shear
WS	–	Wash Sample

OTHER ABBREVIATIONS

WOH	–	Weight of Hammer
WOR	–	Weight of Rods
SP	–	Soil Probe
PID	–	Photo Ionization Device
FID	–	Flame Ionization Device

DEPOSITIONAL FEATURES

Parting	–	as much as 1/16 inch thick
Seam	–	1/16 inch to 1/2 inch thick
Layer	–	1/2 inch to 12 inches thick
Stratum	–	greater than 12 inches thick
Pocket	–	deposit of limited lateral extent
Lens	–	lenticular deposit
Hardpan/Till	–	an unstratified, consolidated or cemented mixture of clay, silt, sand and/or gravel, the size/shape of the constituents vary widely
Lacustrine	–	soil deposited by lake water
Mottled	–	soil irregularly marked with spots of different colors that vary in number and size
Varved	–	alternating partings or seams of silt and/or clay
Occasional	–	one or less per foot of thickness
Frequent	–	more than one per foot of thickness
Interbedded	–	strata of soil or beds of rock lying between or alternating with other strata of a different nature

CLASSIFICATION TERMINOLOGY AND CORRELATIONS

Cohesionless Soils

Relative Density	N-Value (Blows per foot)
Very Loose	0 to 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	50 to 80
Extremely Dense	Over 80

Cohesive Soils

Consistency	N-Value (Blows per foot)	Undrained Shear Strength (kips/ft^2)
Very Soft	0 - 2	0.25 or less
Soft	2 - 4	0.25 to 0.50
Medium	4 - 8	0.50 to 1.0
Stiff	8 - 15	1.0 to 2.0
Very Stiff	15 - 30	2.0 to 4.0
Hard	> 30	4.0 or greater

Standard Penetration 'N-Value' = Blows per foot of a 140-pound hammer falling 30 inches on a 2-inch O.D. split barrel sampler, except where noted.

BORING B 1

PROJECT NAME: Belleville Downtown Development Authority
PROJECT NUMBER: 077253.00
CLIENT: Wakely & Associates
PROJECT LOCATION: Belleville, Michigan
DATE STARTED: 8/17/17 **COMPLETED:** 8/17/17
BORING METHOD: Solid-stem Augers
DRILLER: JR **RIG NO.:** 253 (CME 75)
LOGGED BY: KJT **CHECKED BY:** AK

DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES	N-VALUE -- ○ (10 20 30 40)	DRY DENSITY (pcf) -- ■ (90 100 110 120) / MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)	SHEAR STRENGTH (KSF) (1 2 3 4) ▽ HAND PENE. ⊠ TORVANE SHEAR ○ UNC.COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ◈ TRIAXIAL (UU)	REMARKS
0	FILL- 12 inches of GRAVEL (1.0)							
	FILL- Fine to Coarse SAND with Gravel- Brown- Moist- Medium Dense (SP) (3.0)	SB1	13	6 7 7	14			
		SB2	15	6 8 8	16			
5	Fine to Medium SAND- Brown- Moist- Medium Dense (SP) (8.0)	SB3	12	7 6 7	13			
▽		SB4	16	7 8 9	17	16	▽	
▼ 10								
	LEAN CLAY with Sand- Gray- Very Stiff (CL) (20.0)	SB5	16	8 9 8	17	17	▽	
15								
		SB6	18	5 5 6	11	17	▽	
20	END OF BORING AT 20.0 FEET.							
25								
30								

GROUNDWATER & BACKFILL INFORMATION

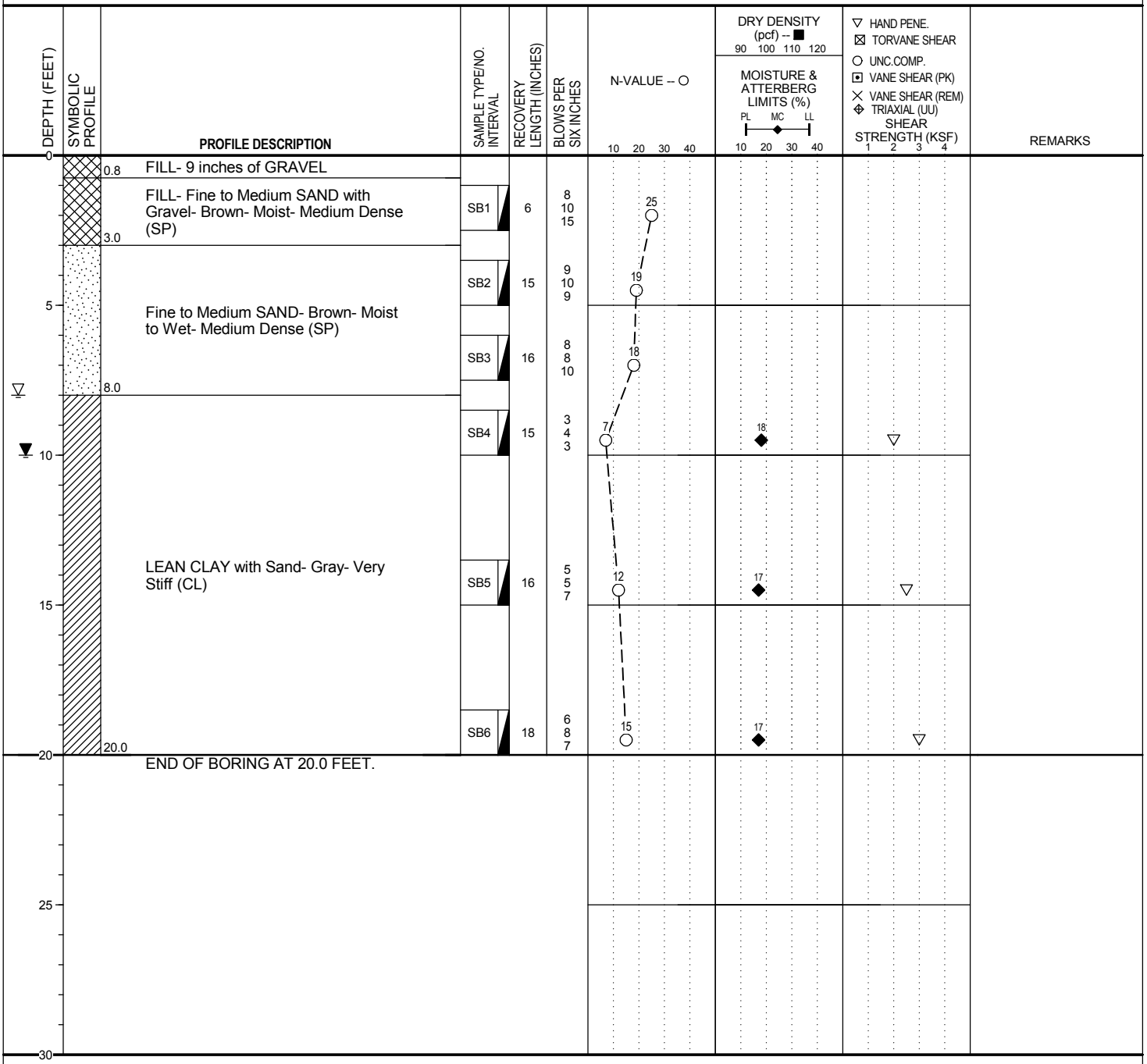
	DEPTH (FT)
▽ **DURING BORING:**	8.0
▼ **AT END OF BORING:**	10.0

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

BORING B 2

PROJECT NAME: Belleville Downtown Development Authority
PROJECT NUMBER: 077253.00
CLIENT: Wakely & Associates
PROJECT LOCATION: Belleville, Michigan
DATE STARTED: 8/17/17 **COMPLETED:** 8/17/17
BORING METHOD: Solid-stem Augers
DRILLER: JR **RIG NO.:** 253 (CME 75)
LOGGED BY: KJT **CHECKED BY:** AK



GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)
▽ DURING BORING:	8.0
▼ AT END OF BORING:	10.0

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

BORING B 3

PROJECT NAME: Belleville Downtown Development Authority
PROJECT NUMBER: 077253.00
CLIENT: Wakely & Associates
PROJECT LOCATION: Belleville, Michigan

DATE STARTED: 8/17/17 **COMPLETED:** 8/17/17 **BORING METHOD:** Solid-stem Augers
DRILLER: JR **RIG NO.:** 253 (CME 75) **LOGGED BY:** KJT **CHECKED BY:** AK

DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES	N-VALUE -- ○ (10 20 30 40)	DRY DENSITY (pcf) -- ■ (90 100 110 120) / MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)	SHEAR STRENGTH (KSF) (1 2 3 4)	REMARKS
0	0.5 FILL- 6 inches of GRAVEL							
	FILL- Fine to Medium SAND- Brown- Moist- Medium Dense (SP)	SB1	16	5 6 6	12			
	3.0 Fine to Medium SAND with Silt- Brown- Moist- Loose (SP-SM)	SB2	14	4 5 4	9			
5	5.0 Fine to Medium SAND- Brown- Moist to Wet- Medium Dense (SP)	SB3	13	5 5 5	10			
	▽ ▼ 8.0	SB4	14	5 6 5	11	17	▽	
10	LEAN CLAY with Sand- Gray- Very Stiff (CL)	SB5	16	6 7 6	13	18	▽	
15	15.0 END OF BORING AT 15.0 FEET.							
20								
25								
30								

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)
▽ **DURING BORING:**	8.0
▼ **AT END OF BORING:**	9.0

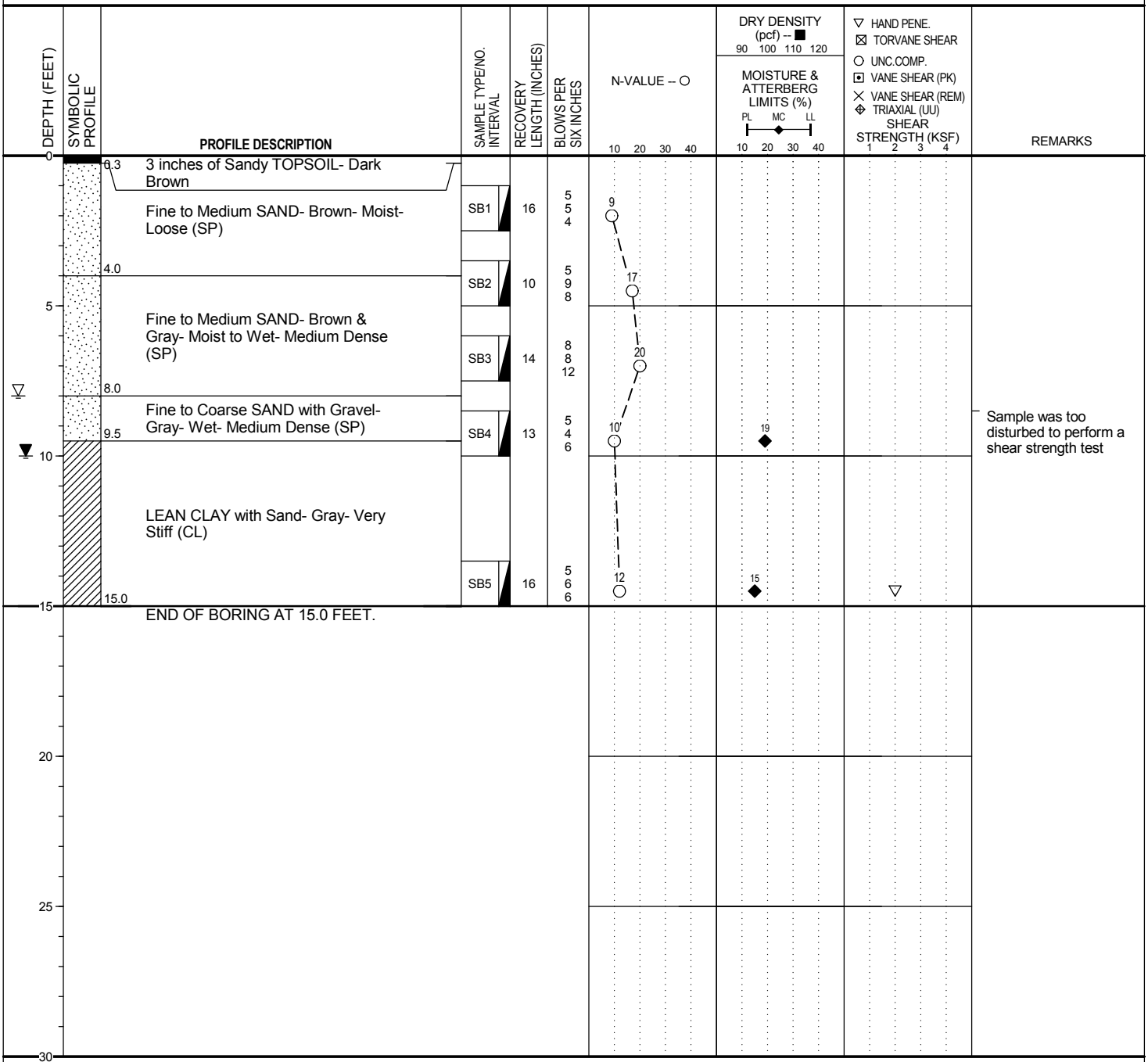
BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

BORING B 4

PROJECT NAME: Belleville Downtown Development Authority
PROJECT NUMBER: 077253.00
CLIENT: Wakely & Associates
PROJECT LOCATION: Belleville, Michigan

DATE STARTED: 8/17/17 **COMPLETED:** 8/17/17 **BORING METHOD:** Solid-stem Augers
DRILLER: JR **RIG NO.:** 253 (CME 75) **LOGGED BY:** KJT **CHECKED BY:** AK



GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)
▽ DURING BORING:	8.0
▼ AT END OF BORING:	10.0

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

BORING B 5

PROJECT NAME: Belleville Downtown Development Authority
PROJECT NUMBER: 077253.00
CLIENT: Wakely & Associates
PROJECT LOCATION: Belleville, Michigan

DATE STARTED: 8/17/17 **COMPLETED:** 8/17/17 **BORING METHOD:** Solid-stem Augers
DRILLER: JR **RIG NO.:** 253 (CME 75) **LOGGED BY:** KJT **CHECKED BY:** AK

DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES	N-VALUE -- ○ (10 20 30 40)	DRY DENSITY (pcf) -- ■ (90 100 110 120); MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)	▽ HAND PENE. ⊠ TORVANE SHEAR ○ UNC.COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ◈ TRIAXIAL (UU) SHEAR STRENGTH (KSF) (1 2 3 4)	REMARKS
0	0.5 6 inches of Sandy TOPSOIL- Dark Brown							
	Fine to Medium SAND- Brown- Moist- Loose (SP)	SB1	14	2 3 3	6			
	3.0	SB2	13	4 5 4	9			
5	Fine to Medium SAND- Occasional Silt Seams- Brown & Gray- Moist- Loose to Medium Dense (SP)	SB3	16	5 5 5	10			
▽▼	8.0							
	Fine SAND- Gray- Wet- Medium Dense (SP)	SB4	14	5 5 5	10			
10	10.0 END OF BORING AT 10.0 FEET.							
15								
20								
25								
30								

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)
▽ **DURING BORING:**	8.0
▼ **AT END OF BORING:**	8.0

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

BORING B 6

PROJECT NAME: Belleville Downtown Development Authority
PROJECT NUMBER: 077253.00
CLIENT: Wakely & Associates
PROJECT LOCATION: Belleville, Michigan

DATE STARTED: 8/17/17 **COMPLETED:** 8/17/17 **BORING METHOD:** Solid-stem Augers
DRILLER: JR **RIG NO.:** 253 (CME 75) **LOGGED BY:** KJT **CHECKED BY:** AK

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES	N-VALUE -- ○ (10 20 30 40)	DRY DENSITY (pcf) -- ■ (90 100 110 120); MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)	▽ HAND PENE. ☒ TORVANE SHEAR ○ UNC.COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ◈ TRIAXIAL (UU) SHEAR STRENGTH (KSF) (1 2 3 4)	REMARKS
0		0.4 5 inches of ASPHALT CONCRETE							
		FILL- Fine to Medium SAND- Occasional Asphalt Pieces- Dark Brown & Black- Moist- Medium Dense (SP)	SB1	14	12 5 6	11			
		3.0	SB2	13	4 4 6	10			
5		Fine to Medium SAND- Frequent Silty Sand Seams- Brown- Moist- Medium Dense (SP)	SB3	14	4 5 6	11			
▽▼		8.0							
		Fine SAND- Gray- Wet- Medium Dense (SP)	SB4	16	6 6 7	13			
10		10.0 END OF BORING AT 10.0 FEET.							
15									
20									
25									
30									

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)
▽ **DURING BORING:**	8.0
▼ **AT END OF BORING:**	8.0

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

BORING B 7

PROJECT NAME: Belleville Downtown Development Authority
PROJECT NUMBER: 077253.00
CLIENT: Wakely & Associates
PROJECT LOCATION: Belleville, Michigan

DATE STARTED: 8/17/17 **COMPLETED:** 8/17/17 **BORING METHOD:** Solid-stem Augers
DRILLER: JR **RIG NO.:** 253 (CME 75) **LOGGED BY:** KJT **CHECKED BY:** AK

DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES	N-VALUE -- ○ (10 20 30 40)	DRY DENSITY (pcf) -- ■ (90 100 110 120); MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)	▽ HAND PENE. ⊠ TORVANE SHEAR ○ UNC.COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ◈ TRIAXIAL (UU) SHEAR STRENGTH (KSF) (1 2 3 4)	REMARKS
0	0.2 2 inches of TOPSOIL							
	FILL- Fine to Medium SAND with Gravel- Trace Construction Debris (Asphalt & Glass Pieces)- Brown- Moist- Medium Dense (SP)	SB1	10	6 7 6	13			
	3.0	SB2	13	4 4 4	8			
5	Fine to Medium SAND with Silt- Brown & Gray- Moist- Loose (SP-SM)	SB3	16	4 3 4	7			
▽▼	8.0							
	Fine to Medium SAND- Gray- Wet- Medium Dense (SP)	SB4	13	5 6 6	12			
10	10.0 END OF BORING AT 10.0 FEET.							
15								
20								
25								
30								

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)
▽ **DURING BORING:**	8.0
▼ **AT END OF BORING:**	8.0

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

BORING B 8

PROJECT NAME: Belleville Downtown Development Authority
PROJECT NUMBER: 077253.00
CLIENT: Wakely & Associates
PROJECT LOCATION: Belleville, Michigan

DATE STARTED: 8/17/17 **COMPLETED:** 8/17/17 **BORING METHOD:** Solid-stem Augers
DRILLER: JR **RIG NO.:** 253 (CME 75) **LOGGED BY:** KJT **CHECKED BY:** AK

DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES
0	0.7 8 inches of Sandy TOPSOIL- Dark Brown			
	Fine to Medium SAND- Brown- Moist- Medium Dense (SP)	SB1	17	5 6 6
	3.0			
		SB2	16	7 8 7
5	Fine to Medium SAND- Brown & Gray- Moist- Medium Dense (SP)			
		SB3	14	10 10 9
	8.0 ▽▼			
		SB4	12	4 5 4
10	Fine to Coarse SAND with Gravel- Gray- Wet- Loose (SP)			
	14.0			
	15.0 LEAN CLAY with Sand- Gray- Stiff (CL)	SB5	14	5 6 6
15	END OF BORING AT 15.0 FEET.			
20				
25				
30				

N-VALUE -- ○ (10 20 30 40)
DRY DENSITY (pcf) -- ■ (90 100 110 120)
MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)
▽ HAND PENE. ⊠ TORVANE SHEAR ○ UNC.COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ⊕ TRIAXIAL (UU)
SHEAR STRENGTH (KSF) (1 2 3 4)
REMARKS

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)
▽ DURING BORING:	8.0
▼ AT END OF BORING:	8.0

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

APPENDIX B

IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL ENGINEERING REPORT
GENERAL COMMENTS
LABORATORY TESTING PROCEDURES

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

GENERAL COMMENTS

BASIS OF GEOTECHNICAL REPORT

This report has been prepared in accordance with generally accepted geotechnical engineering practices to assist in the design and/or evaluation of this project. If the project plans, design criteria, and other project information referenced in this report and utilized by SME to prepare our recommendations are changed, the conclusions and recommendations contained in this report are not considered valid unless the changes are reviewed, and the conclusions and recommendations of this report are modified or approved in writing by our office.

The discussions and recommendations submitted in this report are based on the available project information, described in this report, and the geotechnical data obtained from the field exploration at the locations indicated in the report. Variations in the soil and groundwater conditions commonly occur between or away from sampling locations. The nature and extent of the variations may not become evident until the time of construction. If significant variations are observed during construction, SME should be contacted to reevaluate the recommendations of this report. SME should be retained to continue our services through construction to observe and evaluate the actual subsurface conditions relative to the recommendations made in this report.

In the process of obtaining and testing samples and preparing this report, procedures are followed that represent reasonable and accepted practice in the field of soil and foundation engineering. Specifically, field logs are prepared during the field exploration that describe field occurrences, sampling locations, and other information. Samples obtained in the field are frequently subjected to additional testing and reclassification in the laboratory and differences may exist between the field logs and the report logs. The engineer preparing the report reviews the field logs, laboratory classifications, and test data and then prepares the report logs. Our recommendations are based on the contents of the report logs and the information contained therein.

REVIEW OF DESIGN DETAILS, PLANS, AND SPECIFICATIONS

SME should be retained to review the design details, project plans, and specifications to verify those documents are consistent with the recommendations contained in this report.

REVIEW OF REPORT INFORMATION WITH PROJECT TEAM

Implementation of our recommendations may affect the design, construction, and performance of the proposed improvements, along with the potential inherent risks involved with the proposed construction. The client and key members of the design team, including SME, should discuss the issues covered in this report so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for performance and maintenance.

FIELD VERIFICATION OF GEOTECHNICAL CONDITIONS

SME should be retained to verify the recommendations of this report are properly implemented during construction. This may avoid misinterpretation of our recommendations by other parties and will allow us to review and modify our recommendations if variations in the site subsurface conditions are encountered.

PROJECT INFORMATION FOR CONTRACTOR

This report and any future addenda or other reports regarding this site should be made available to prospective contractors prior to submitting their proposals for their information only and to supply them with facts relative to the subsurface evaluation and laboratory test results. If the selected contractor encounters subsurface conditions during construction, which differ from those presented in this report, the contractor should promptly describe the nature and extent of the differing conditions in writing and SME should be notified so that we can verify those conditions. The construction contract should include provisions for dealing with differing conditions and contingency funds should be reserved for potential problems during earthwork and foundation construction. We would be pleased to assist you in developing the contract provisions based on our experience.

The contractor should be prepared to handle environmental conditions encountered at this site, which may affect the excavation, removal, or disposal of soil; dewatering of excavations; and health and safety of workers. Any Environmental Assessment reports prepared for this site should be made available for review by bidders and the successful contractor.

THIRD PARTY RELIANCE/REUSE OF THIS REPORT

This report has been prepared solely for the use of our Client for the project specifically described in this report. This report cannot be relied upon by other parties not involved in the project, unless specifically allowed by SME in writing. SME also is not responsible for the interpretation by other parties of the geotechnical data and the recommendations provided herein.

LABORATORY TESTING PROCEDURES

VISUAL ENGINEERING CLASSIFICATION

Visual classification was performed on recovered samples. The appended General Notes and Unified Soil Classification System (USCS) sheets include a brief summary of the general method used visually classify the soil and assign an appropriate USCS group symbol. The estimated group symbol, according to the USCS, is shown in parentheses following the textural description of the various strata on the boring logs appended to this report. The soil descriptions developed from visual classifications are sometimes modified to reflect the results of laboratory testing.

MOISTURE CONTENT

Moisture content tests were performed by weighing samples from the field at their in-situ moisture condition. These samples were then dried at a constant temperature (approximately 110º C) overnight in an oven. After drying, the samples were weighed to determine the dry weight of the sample and the weight of the water that was expelled during drying. The moisture content of the specimen is expressed as a percent and is the weight of the water compared to the dry weight of the specimen.

HAND PENETROMETER TESTS

In the hand penetrometer test, the unconfined compressive strength of a cohesive soil sample is estimated by measuring the resistance of the sample to the penetration of a small calibrated, spring-loaded cylinder. The maximum capacity of the penetrometer is 4.5 tons per square-foot (tsf). Theoretically, the undrained shear strength of the cohesive sample is one-half the unconfined compressive strength. The undrained shear strength (based on the hand penetrometer test) presented on the boring logs is reported in units of kips per square-foot (ksf).

TORVANE SHEAR TESTS

In the Torvane test, the shear strength of a low strength, cohesive soil sample is estimated by measuring the resistance of the sample to a torque applied through vanes inserted into the sample. The undrained shear strength of the samples is measured from the maximum torque required to shear the sample and is reported in units of kips per square-foot (ksf).

LOSS-ON-IGNITION (ORGANIC CONTENT) TESTS

Loss-on-ignition (LOI) tests are conducted by first weighing the sample and then heating the sample to dry the moisture from the sample (in the same manner as determining the moisture content of the soil). The sample is then re-weighed to determine the dry weight and then heated for 4 hours in a muffle furnace at a high temperature (approximately 440º C). After cooling, the sample is re-weighed to calculate the amount of ash remaining, which in turn is used to determine the amount of organic matter burned from the original dry sample. The organic matter content of the specimen is expressed as a percent compared to the dry weight of the sample.

ATTERBERG LIMITS TESTS

Atterberg limits tests consist of two components. The plastic limit of a cohesive sample is determined by rolling the sample into a thread and the plastic limit is the moisture content where a 1/8-inch thread begins to crumble. The liquid limit is determined by placing a ½-inch thick soil pat into the liquid limits cup and using a grooving tool to divide the soil pat in half. The cup is then tapped on the base of the liquid limits device using a crank handle. The number of drops of the cup to close the gap formed by the grooving tool ½ inch is recorded along with the corresponding moisture content of the sample. This procedure is repeated several times at different moisture contents and a graph of moisture content and the corresponding number of blows is plotted. The liquid limit is defined as the moisture content at a nominal 25 drops of the cup. From this test, the plasticity index can be determined by subtracting the plastic limit from the liquid limit.

Passionate People Building
and Revitalizing our World

SME

SECTION 07462 - SIDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Factory-finished fiber cement lap siding, panels, shingle, trim, fascia, moulding and accessories; James Hardie **HZ5** Engineered for Climate Siding.

1.2 RELATED SECTIONS

A. Section 06100 - Carpentry: Wood framing and bracing.

B. Section 07210 - Insulation: Exterior wall insulation.

1.3 REFERENCES

A. AS D3359 - Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.

B. AS E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.

B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Remodel mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. Product Warranty: Limited, non-pro-rated product warranty.
   1. HardiePlank **HZ5** lap siding for 30 years.
   2. HardiPanel **HZ5** vertical siding for 30 years.
   3. HardiTrim HZ5 boards for 15 years.

B. Finish Warranty: Limited product warranty against manufacturing finish defects.
   1. When used for its intended purpose, properly installed and maintained according to Hardie's published installation instructions, James Hardie's ColorPlus finish with ColorPlus Technology, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and material.

C. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La Alameda Suite 400 ; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Fax: 949-367-4981; Email: request info (info@jameshardie.com); Web: www.jameshardiepros.com.

B. Requests for approval of equal substitutions will be considered in accordance with specifications.

2.2 SIDING AND TRIM

A. HardiePlank **HZ5** lap siding, HardiPanel **HZ5** vertical siding, HardieSoffit **HZ5** panels and HardieShingle **HZ5** siding requirement for materials:
   1. Fiber-cement siding - complies with ASTM C 1186 Type A Grade II.
   2. Fiber-cement siding - complies with ASTM E 136 as a noncombustible material.

3. Fiber-cement siding - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.
4. CAL-FIRE, Fire Engineering Division Building Materials Listing - Wildland Urban Interface (WUI) Listed Product.
5. ICC-ES evaluation reports ESR-2290, ESR-1844, and ESR-2273 (IBC, IRC, CBC, CRC)
6. City of Los Angeles, Research Report No. 24862.
7. Miami Dade County, -Notice of Acceptance -15-0122.04.
8. US Department of Housing and Urban Development Materials Release -1263f.
9. California DSA PA-019.
10. City of New York M EA 223-93-M.
11. Florida State Product Approval -FL13192, FL13223, and FL13265
12. Texas Department of Insurance Product Evaluation EC-23.

B. Lap Siding: HardiePlank **HZ5** Lap siding as manufactured by James Hardie Building Products, Inc.
1. Type: Select Cedarmill 7-1/4 inches (184 mm) with 6 inches (152 mm) exposure.

C. Vertical Siding: HardiePanel **HZ5** siding as manufactured by James Hardie Building Products, Inc.
1. Type: **Cedarmill** siding panel 4 feet by 10 feet (1219 mm by 3048 mm).
2. Type: Smooth panel 4 feet by 8 feet (1219 mm by 3048 mm) **at Township logo on North elevation only.**

D. Soffit Panels: HardieSoffit **HZ5** soffit panel, factory sealed on 5 sides as manufactured by James Hardie Building Products, Inc.
1. Type: Smooth non-vented, 24 inches (610 mm) by 8 feet (2438 mm).

F. Trim:
1. HardieTrim **HZ5** boards as manufactured by James Hardie Building Products, Inc.

a. Product: 5/4 Boards, 3-1/2 inch (89 mm) width.
b. Product: 5/4 Boards, 5-1/2 inch (140 mm) width.
c. Product: 5/4 Boards, 7-1/4 inch (184 mm) width.
d. Product: 5/4 Boards, 9-1/4 inch (235 mm) width.
e. Product: 5/4 Boards, 11-1/4 inch (286 mm) width.
f. See elevations and wall sections and details for required widths.
g. Product: Batten boards, 2-1/2″ (63 mm) width at 8″ o.c.

2. HardieTrim **HZ5** Fascia boards as manufactured by James Hardie Building Products, Inc.
3. Fiber-cement trim - complies with ASTM C 1186 Type A Grade II.
4. Fiber-cement trim - complies with ASTM E 136 as a noncombustible material.
5. Fiber-cement trim - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.
6. Intertek Product Listing.

2.3 FASTENERS

A. Wood Framing Fasteners:
1. Wood Framing: 8d box ring common corrosion resistant nails.

B. Masonry Walls:
1. Masonry Walls: Aerico Stud Nail, ET&F ASM No.-144-125, 0.14 inch (3.6 mm) shank by 0.30 inch (7.6 mm) head by 2 inches (51 mm) long corrosion resistant nails.

2.4 FlNlSHES

A. Factory Finish: Multiple colors to be selected, Refer to Finish Schedule.
1. Product: ColorPlus Technology by James Hardie.
2. Definition: Factory applied finish; defined as a finish applied in the same facility and company that manufactures the siding substrate.

3. Process:
   a. Factory applied finish by fiber cement manufacturer in a controlled environment within the fiber cement manufacturer's own facility utilizing a multi-coat, heat cured finish within one manufacturing process.
   b. Each finish color must have documented color match to delta E of 0.5 or better between product lines, manufacturing lots or production runs as measured by photospectrometer and verified by third party.
4. Protection: Factory applied finish protection such as plastic laminate that is removed once siding is installed
5. Accessories: Complete finishing system includes pre-packaged touch-up kit provided by fiber cement manufacturer. Provide quantities as recommended by manufacturer.

B. Factory Finish Color for Trim, Soffit and Siding Colors to be selected by owner. Multiple colors will be used:
1. Alpine Frost JH50-10.
2. Arctic White JH10-20.
3. Autumn Tan JH20-20.
4. Boothbay Blue JH70-20.
5. Chestnut Brown JH80-30.
6. Cobble Stone JH40-10.
7. Countrylane Red JH90-20.
8. Evening Blue JH70-30.
9. Frosted Green JH60-20.
10. Harris Cream JH80-10.
11. Heathered Moss JH50-20.
12. Iron Gray JH90-30.
13. Khaki Brown JH20-30.
14. Light Mist JH70-10.
15. Monterey Taupe JH40-20.
16. Mountain Sage JH50-30.
17. Navajo Beige JH30-10.
18. Parkside Pine JH60-30.
19. Sail Cloth JH20-10.
20. Sandstone Beige JH30-20.
21. Soft Green JH60-10.

22. Timber Bark JH40-30.
23. Traditional Red JH90-10.
24. Tuscan Gold JH80-20.
25. Woodland Cream JH10-30.
26. Woodstock Brown JH30-30.
27. Terra Cotta JH15-20.
28. Coral Coast JH25-20.
29. Aqua Marine JH35-20.
30. Cool Breeze JH45-20.
31. Pink Sand JH55-20.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Nominal 2 inch by 4 inch (51 m by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
   1. Install water-resistive barriers and claddings to dry surfaces.
   2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
   3. Protect siding from other trades.

D. Clean surfaces thoroughly prior to installation.

E. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

F. Install a water-resistive barrier is required in accordance with local building code requirements.

G. The water-resistive barrier must be appropriately

installed with penetration and junction flashing in accordance with local building code requirements.

H. Install Engineered for Climate HardieWrap weather barrier in accordance with local building code requirements.

I. Use HardieWrap Seam Tape and joint and laps.

J. Install and HardieWrap flashing, HardieWrap Flex Flashing.

3.2 INSTALLATION - HARDIEPLANK **HZ5** LAP SIDING, WITH LOCK JOINT SYSTEM

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.

C. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

D. Align vertical joints of the planks over framing members.

E. Butt joints must not fall within 4 inches (102 mm) of a stud. Do not nail within 2 inches (51 mm) of the end of planks.

F. Maintain clearance between siding and adjacent finished grade.

G. Locate splices at least one stud cavity away from window and door openings.

H. For proper fastener selection and fastening schedules for various wind load requirements and framing options, refer to the Technical Data Sheet at www.aspyredesign.com.

I. Face nail to sheathing.

J. Locate splices at least 12 inches (305 mm) away from window and door openings.

3.3 INSTALLATION - HARDIEPANEL **HZ5** VERTICAL SIDING

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Block framing between studs where HardiePanel siding horizontal joints occur.

C. Install metal Z flashing and provide a 1/4 inch (6 mm) gap at horizontal panel joints.

D. Place fasteners no closer than 3/8 inch (9.5 mm) from panel edges and 2 inches (51 mm) from panel corners.

E. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

F. Maintain clearance between siding and adjacent finished grade.

G. Specific framing and fastener requirements refer to Tables 2 and 3 in National Evaluation Service Report No. NER-405.

H. Factory Finish Touch Up: Apply touch up paint to cut edges in accordance with manufacturer's printed instructions.
   1. Touch-up nicks, scrapes, and nail heads in pre-finished siding using the manufacturer's touch-up kit pen.
   2. Touch-up of nails shall be performed after application, but before plastic protection wrap is removed to prevent spotting of touch-up finish.
   3. Use touch-up paint sparingly. If large areas require touch-up, replace the damaged area with

new pre-finished siding. Match touch up color to siding color through use of manufacturer's branded touch-up kits.

3.4 INSTALLATION - HARDIETRIM **HZ5** BOARDS

A. Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.

B. Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum 3/4 inch (19 mm) or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.

C. Place fasteners no closer than 3/4 inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.

D. Maintain clearance between trim and adjacent finished grade.

E. Trim inside corner with a single board trim both side of corner.

F. Outside Corner Board Attach Trim on both sides of corner with 16 gage corrosion resistant finish nail 1/2 inch (13 mm) from edge spaced 16 inches (406 mm) apart, weather cut each end spaced minimum 12 inches (305 mm) apart.

G. Allow 1/8 inch gap between trim and siding.

H. Seal gap with high quality, paint-able caulk.

I. Shim frieze board as required to align with corner trim..

J. Fasten through overlapping boards. Do not nail between lap joints.

K. Overlay siding with single board of outside corner board then align second corner board to outside edge of first corner board. Do not fasten HardieTrim boards to HardieTrim boards.

L. Shim frieze board as required to align with corner trim.

M. Install HardieTrim Fascia boards to rafter tails or to sub fascia.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08413-ALUMINUM-CLAD WOOD COMMERCIAL OUT-SWING FRENCH HINGED DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum-clad wood commercial out-swing French hinged doors.

1.2 RELATED SECTIONS

A. Section 07920 (07 92 00) - Joint Sealants: Sealants and caulking.

B. Section 08710 (08 71 00) - Door Hardware.

1.3 REFERENCES

A. American Architectural Manufacturers Association (AAMA):
   1. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Doors.
   2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
   3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

B. American Society for Testing and Materials (ASTM):
   1. ASTM B 117 - Operating Salt Spray (Fog) Apparatus.
   2. ASTM C 1036 - Flat Glass.
   3. ASTM C 1048 - Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated Glass.
   4. ASTM D 1149 - Rubber Deterioration – Surface Ozone Cracking in a Chamber.
   5. ASTM D 2803 - Filiform Corrosion Resistance of Organic Coatings on Metal.
   6. ASTM D 3656 - Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns.
   7. ASTM D 4060 - Abrasion Resistance of Organic Coatings by the Taber Abraser.
   8. ASTM E 283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.

9. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
10. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential.
11. ASTM E 1105 – Standard Test Method for Field Determination of Water Penetration of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
12. ASTM G 85 - Modified Salt Spray (Fog) Testing.

C. Window and Door Manufacturers Association (WDMA):
1. ANSI/AAMA/NWWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
2. ANSI/AAMA/NWWDA 101/I.S.2/NAFS-02 - Voluntary Performance Specification for Windows, Skylights and Glass Doors.
3. WDMA I.S.4 - Industry Standard for Water-Repellent Preservative Non-Pressure Treatment for Millwork.

1.4 PERFORMANCE REQUIREMENTS

A. Doors not rated due to 0 psf water performance with low profile sill.

B. Door Unit Air Leakage, ASTM E 283, 1.57 psf (25 mph): 0.15 cfm per square foot of frame or less.

1.5 SUBMITTALS

A. Comply with Division 1 requirements.

B. Product Data: Submit manufacturer's product data, including installation instructions.

C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.

D. Samples: Submit full-size or partial full-size sample of door illustrating glazing system, quality of construction, and color of finish.

E. Warranty: Submit manufacturer’s standard warranty.

1.6 QUALITY ASSURANCE

A. Mockup:
   1. Provide sample installation for field testing door performance requirements and to determine acceptability of door installation methods.
   2. Approved mockup shall represent minimum quality required for the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.

B. Storage: Store materials in an upright position, off ground, under cover, and protected from weather, direct sunlight, and construction activities.

C. Handling: Protect materials and finish during handling and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Pella Corporation, 102 Main Street, Pella, Iowa 50219. Toll Free (800) 54-PELLA. Phone (641) 621-1000. Website www.pella.com.

2.2 ALUMINUM-CLAD WOOD COMMERCIAL OUT-SWING FRENCH HINGED DOORS

A. Aluminum-Clad Wood Commercial Out-Swing French Hinged Doors: Architect Series factory-assembled aluminum-clad wood doors with outward-swing door panels installed in frame.

B. Frame:
   1. Select woods, water-repellent, preservative-treated with EnduraGuard® in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the frame.
   2. Interior Exposed Surfaces: [Pine] veneered and edge-banded with no visible fastener holes.
   3. Exterior Surfaces: Clad with aluminum at head and jambs.

4. Metal Sill: Solid aluminum, ADA approved, low profile.

   a. Finish: Mill finish

5. Overall Frame Depth: 5-7/8 inches (149 mm).

C. Door Panel:
1. Select woods, water-repellent, preservative-treated with EnduraGuard in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the panel.
2. Panels: Three-ply construction. Randomly finger-jointed blocks laminated with water-resistant glue.
3. Interior Exposed Surfaces: Pine core veneered with [Pine] [Mahogany] [Douglas Fir], with glass stops.
4. Exterior Surfaces: Clad with aluminum.
5. Intermediate Bar: 5-1/4 inches high.
6. Corners: Urethane-sealed and secured with metal fasteners.
7. Sash Thickness: 2-1/16 inches (52 mm).

D. Weather Strip:
1. Panel mounted, dual-durometer extruded polymer, one-piece design.

2.3 GLAZING

A. Glazing:
1. Float Glass: ASTM C 1036, Quality 1.
   a. Tempered Glass: ASTM C 1048.

2. Type: Silicone-glazed 1” triple-pane, dual-seal, fully tempered, insulating glass, [clear] [multi-layer Low-E coated with [argon] [krypton]] [bronze air-filled multi-layer, Low-E coated] [gray air-filled multi-layer, Low-E coated] [green air-filled multi-layer, Low-E coated].

2.4 OPTIONS

A. Interior Removable Grilles (for doors without integral grilles):
1. Profile: 1-1/4-inch Colonial.
2. Removable, solid wood bars, steel-pinned at joints and fitted to sash with steel clips and tacks.
3. Finish color matches interior and exterior finish colors.
4. Provide custom pattern shown on elevations.

2.5 HARDWARE

A. Hinges:
1. Doors 6' 10" and under frame height will have three (3) ball-bearing hinges.
2. Doors over 6' 10" frame height up to and including 8' 0" frame height will have four (4) ball bearing hinges.
3. Finish: compliments the finish of the sill.

2.6 TOLERANCES

A. Doors shall accommodate the following opening tolerances:
1. Vertical Dimensions Between High and Low Points: Plus 1/8 inch, minus 0 inch.
2. Width Dimensions: Plus 1/8 inch, minus 0 inch.
3. Building Columns or Masonry Openings: Plus or minus 1/8 inch from plumb.

2.7 FINISH

A. Exterior Finish System: Pella EnduraClad.
1. Exterior aluminum surfaces shall be finished with the following multi-stage system:
   a. Clean and etch aluminum surface of oxides.
   b. Pre-treat with conversion coating.
   c. Top coat with baked-on polyester enamel.
2. Color: TBD
3. Performance Requirements: Exterior aluminum finishes shall meet or exceed all performance requirements of AAMA 2603 and the following performance requirements of AAMA 2605:
   a. Dry Film Hardness: Eagle Turquoise Pencil, H minimum.
   b. Film Adhesion: 1/16-inch crosshatch, dry, wet, boiling water.
   c. Impact Resistance: 1/10-inch distortion, no film removal.
   d. Chemical Resistance: 10 percent Muriatic acid, 15 minutes. Mortar pat test, 24 hours.
   e. Detergent Resistance: 3 percent at 100 degrees F, 72 hours.
   f. Corrosion Resistance (ASTM G85-A5): Humidity, 3,000 hours. Salt spray exceeds 3,000 hours.

B. Interior Finish: Factory finished stain. Color: TBD

2.8 INSTALLATION ACCESSORIES

A. Flashing/Sealant Tape: Pella SmartFlash.
   1. Aluminum-foil-backed butyl window and door flashing tape.
   2. Maximum Total Thickness: 0.013 inch.
   3. UV resistant.
   4. Verify sealant compatibility with sealant manufacturer.

B. Interior Insulating-Foam Sealant: Low-expansion, low-pressure polyurethane insulating window and door foam sealant.

C. Exterior Perimeter Sealant: "Pella Window and Door Installation Sealant" or equivalent high quality, multi-purpose sealant as specified in the joints sealant section.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and approved shop drawings.

B. Install doors to be weather-tight and freely operating.

C. Maintain alignment with adjacent work.

D. Secure assembly to framed openings, plumb and square, without distortion.

E. Integrate door system installation with exterior weather-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with weather-resistant barrier using watershed principles in accordance with door manufacturer's instructions.

F. Place interior seal around door perimeter to maintain continuity of building thermal and air barrier using [backer rod and sealant] [insulating-foam sealant].

G. Seal door to exterior wall cladding with sealant and related backing materials at perimeter of assembly.

H. Leave doors closed.

3.3 FIELD QUALITY CONTROL

A. Field Testing: Field water testing shall be conducted in accordance with ASTM E1105 Test Procedure B. The test pressure shall be based on the maximum positive components and cladding design pressure. Utilizing the AAMA 502 field test reduction, the water test pressure is 10% of the maximum positive design pressure.

3.4 CLEANING

A. Clean door frames and glass in accordance with Division 1 requirements.

B. Do not use harsh cleaning materials or methods that would damage finish.

C. Remove labels and visible markings.

3.5 PROTECTION

A. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 08520 - ALUMINUM-CLAD WOOD DOUBLE-HUNG WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum-clad wood double-hung windows.

1.2 RELATED SECTIONS

A. Section 07920 (07 92 00) - Joint Sealants: Sealants and caulking.

1.3 REFERENCES

A. American Architectural Manufacturers Association (AAMA):
   1. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Doors.
   2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
   3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

B. American Society for Testing and Materials (ASTM):
   1. ASTM B 117 - Operating Salt Spray (Fog) Apparatus.
   2. ASTM C 1036 - Flat Glass.
   3. ASTM C 1048 - Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated Glass.
   4. ASTM D 1149 - Rubber Deterioration – Surface Ozone Cracking in a Chamber.
   5. ASTM D 2803 - Filiform Corrosion Resistance of Organic Coatings on Metal.
   6. ASTM D 3656 - Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns.
   7. ASTM D 4060 - Abrasion Resistance of Organic Coatings by the Taber Abraser.
   8. ASTM E 283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
   9. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

10. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential.
11. ASTM E 1105 - Standard Test Method for Field Determination of Water Penetration of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
12. ASTM G 85 - Modified Salt Spray (Fog) Testing.

C. Screen Manufacturers Association (SMA):
1. SMA 1201 - Specifications for Insect Screens for Windows, Sliding Doors and Swinging Doors.

D. Window and Door Manufacturers Association (WDMA):
1. ANSI/AAMA/NWWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
2. ANSI/AAMA/NWWDA 101/I.S.2/NAFS-02 - Voluntary Performance Specification for Windows, Skylights and Glass Doors.
3. WDMA I.S.4 - Industry Standard for Water-Repellent Preservative Non-Pressure Treatment for Millwork.

1.4 PERFORMANCE REQUIREMENTS

A. Windows shall be Hallmark certified to a rating of H-LC-PG[_____] specifications in accordance with ANSI/AAMA/NWWDA 101/I.S.2/A440-08 or ANSI/AAMA/NWWDA 101/I.S.2/A440-11.

B. Window Unit Air Leakage, ASTM E 283, 1.57 psf (25 mph): 0.3 cfm per square foot of frame or less.

C. Window Unit Water Penetration: No water penetration through window unit when tested in accordance with ASTM E 547, under static pressure of [4.5 psf (42 mph)] [7.5 psf (52 mph)] after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot.

1.5 SUBMITTALS

A. Comply with Division 1 requirements.

B. Product Data: Submit manufacturer's product data, including installation instructions.

C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.

D. Samples: Submit full-size or partial full-size sample of window illustrating glazing system, quality of construction, and color of finish.

E. Warranty: Submit manufacturer’s standard warranty.

1.6 QUALITY ASSURANCE

A. Mockup:
   1. Provide sample installation for field testing window performance requirements and to determine acceptability of window installation methods.
   2. Approved mockup shall represent minimum quality required for the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.

B. Storage: Store materials in an upright position, off ground, under cover, and protected from weather, direct sunlight, and construction activities.

C. Handling: Protect materials and finish during handling and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Pella Corporation, 102 Main Street, Pella, Iowa 50219. Toll Free (800) 54-PELLA. Phone (641) 621-1000. Website www.pella.com.

2.2 ALUMINUM-CLAD WOOD DOUBLE-HUNG WINDOWS

A. Aluminum-Clad Wood Double-Hung Windows: Designer Series® factory-assembled aluminum-clad wood double-hung windows. Sash shall tilt to interior without removal for cleaning.

B. Frame:
1. Select softwood, water-repellent, preservative-treated with EnduraGuard® in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the frame.
2. Interior Exposed Surfaces: [Clear Pine] with no visible fastener holes..
3. Exterior Surfaces: Clad with aluminum.
4. Overall Frame Depth: 5 inches (127 mm).

C. Sash:
1. Select softwood, water water-repellent, preservative-treated with EnduraGuard in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the sash.
2. Interior Exposed Surfaces: [Clear Pine] with no visible fastener holes..
3. Exterior Surfaces: Clad with aluminum, lap-jointed at corners.
4. Corners: Mortised and tenoned, glued and secured with metal fasteners.
5. Operable sash tilt to interior for cleaning or removal.
6. Sash Thickness: 2-3/32 inches (53 mm)

D. Weather Stripping:

1. Foam with 3-mil vinyl skin at frame head and at lower sash bottom rail.
2. Thermal-plastic elastomer with slip-coating set into upper sash for tight contact at checkrail.
3. Secondary polyvinyl chloride (PVC) leaf-type weather strip on bottom sash at sill.

2.3 GLAZING

A. Glazing:
1. Float Glass: ASTM C 1036, Quality 1.
a. Tempered Glass: ASTM C 1048.

2. Type:
a. Triple-Pane Glazing System: 5/8-inch [annealed/heat strengthened] [tempered] dual-seal insulating glass, polyurethane reactive hot melt (PUR)-glazed, [clear] [multi-layer Low-E coated with argon] [bronze air-filled multi-layer, Low-E coated] [gray air-filled multi-layer,

Low-E coated] [green air-filled multi-layer, Low-E coated]. Interior-hinged glass panel set in veneer covered aluminum frame, fitted to sash with continuous gasket seal, [clear] [obscure].

2.4 OPTIONS

A. Insect Screens: Vivid View® [full] [half].
   1. Compliance: ASTM D 3656 and SMA 1201.
   2. Screen Cloth: Vinyl-coated fiberglass, 21/17 mesh, with minimum 78 percent light transmissivity.
   3. Set in aluminum frame fitted to inside of window.
   4. Complete with necessary hardware.
   5. Screen Frame Finish: Baked enamel.
      a. Color: Finish to match exterior window cladding.

B. Cellular Fabric Shades:
   1. Spun-bond polyethylene terephthalate (PET) cellular fabric, 0.687 inch wide, hidden polyester cord.
   2. Installed in Designer glazing systems between panels of glass.
   3. [Raise and Lower] [Top-Down] type, operated with cordless operator.
   4. Controlled by built-in operating mechanism.
   5. Type: Snap-in/snap-out, attached to top of hinged-glass panel.
   6. Color: TBD

2.5 HARDWARE

A. Balances:
   1. Block-and-tackle balances.
   2. Balances are attached to frame and connected to sash with polyester cord.

B. Locking System:

   1. Self-aligning sash lock factory-installed.
   2. One installed on units with frame width less than 37 inches, 2 locks installed on units with frame width of 37 inches or greater.

C. Sash Lifts:
   1. Sash lift furnished for field installation.
   2. One sash lift on units with frame width less than 37 inches, 2 sash lifts on units with frame width of 37 inches or greater.

D. Lock and Sash Lift Finish: Baked enamel, champagne

E. Limited Opening Device: Factory applied in stainless steel device concealed from view. Nominal 3-3/4" opening.

2.6 TOLERANCES

A. Windows shall accommodate the following opening tolerances:
   1. Vertical Dimensions Between High and Low Points: Plus 1/4 inch, minus 0 inch.
   2. Width Dimensions: Plus 1/4 inch, minus 0 inch.
   3. Building Columns or Masonry Openings: Plus or minus 1/4 inch from plumb.

2.7 FINISH

A. Exterior Finish System: Pella EnduraClad.
   1. Exterior aluminum surfaces shall be finished with the following multi-stage system:
      a. Clean and etch aluminum surface of oxides.
      b. Pre-treat with conversion coating.
      c. Top coat with baked-on polyester enamel.
   2. Color: TBD
   3. Performance Requirements: Exterior aluminum finishes shall meet or exceed all performance requirements of AAMA 2603 and the following performance requirements of AAMA 2605:
      a. Dry Film Hardness: Eagle Turquoise Pencil, H minimum.
      b. Film Adhesion: 1/16-inch crosshatch, dry, wet, boiling water.
      c. Impact Resistance: 1/10-inch distortion, no film removal.
      d. Chemical Resistance: 10 percent Muriatic acid, 15 minutes. Mortar pat test, 24 hours.
      e. Detergent Resistance: 3 percent at 100 degrees F, 72 hours.
      f. Corrosion Resistance (ASTM G85-A5): Humidity, 3,000 hours. Salt spray exceeds 3,000 hours.

B. Interior Finish: Factory finished stain. Color: TBD

2.8 INSTALLATION ACCESSORIES

A. Flashing/Sealant Tape: Pella SmartFlash.
   1. Aluminum-foil-backed butyl window and door flashing tape.
   2. Maximum Total Thickness: 0.013 inch.
   3. UV resistant.
   4. Verify sealant compatibility with sealant manufacturer.

B. Interior Insulating-Foam Sealant: Low-expansion, low-pressure polyurethane insulating window and door foam sealant.

C. Exterior Perimeter Sealant: "Pella Window and Door Installation Sealant" or equivalent high quality, multi-purpose sealant as specified in the joints sealant section.

2.9 SOURCE QUALITY CONTROL

A. Factory Testing: Factory test individual standard operable windows for air infiltration in accordance with ASTM E 283, to ensure compliance with this specification.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive windows. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install windows in accordance with manufacturer's instructions and approved shop drawings.

B. Install windows to be weather-tight and freely operating.

C. Maintain alignment with adjacent work.

D. Secure assembly to framed openings, plumb and square, without distortion.

E. Integrate window system installation with exterior weather-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with weather-resistant barrier using watershed principles in accordance with window manufacturer's instructions.

F. Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using [backer rod and sealant] [insulating-foam sealant].

G. Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly.

H. Leave windows closed and locked.

3.3 FIELD QUALITY CONTROL

A. Field Testing: Field water testing shall be conducted in accordance with ASTM E1105 Test Procedure B. The test pressure shall be based on the maximum positive components and cladding design pressure. Utilizing the AAMA 502 field test reduction, the water test pressure is 10% of the maximum positive design pressure.

3.4 CLEANING

A. Clean window frames and glass in accordance with Division 1 requirements.

B. Do not use harsh cleaning materials or methods that would damage finish.

C. Remove labels and visible markings.

3.5 PROTECTION

A. Protect installed windows to ensure that, except for normal weathering, windows will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 08520-ALUMINUM-CLAD WOOD CUSTOM HALF ELLIPTICAL FIXED FRAME WINDOW

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum-clad wood circlehead windows.

1.2 RELATED SECTIONS

A. Section 07920 (07 92 00) - Joint Sealants: Sealants and caulking.

1.3 REFERENCES

A. American Architectural Manufacturers Association (AAMA):
   1. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Doors.
   2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
   3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

B. American Society for Testing and Materials (ASTM):
   1. ASTM B 117 - Operating Salt Spray (Fog) Apparatus.
   2. ASTM C 1036 - Flat Glass.
   3. ASTM C 1048 - Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated Glass.
   4. ASTM D 1149 - Rubber Deterioration – Surface Ozone Cracking in a Chamber.
   5. ASTM D 2803 - Filiform Corrosion Resistance of Organic Coatings on Metal.
   6. ASTM D 4060 - Abrasion Resistance of Organic Coatings by the Taber Abraser.
   7. ASTM E 283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
   8. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

9. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential.
11. ASTM E 1105 – Standard Test Method for Field Determination of Water Penetration of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
12. ASTM G 85 - Modified Salt Spray (Fog) Testing.

C. Window and Door Manufacturers Association (WDMA):
1. ANSI/AAMA/NWWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
2. ANSI/AAMA/NWWDA 101/I.S.2/NAFS-02 - Voluntary Performance Specification for Windows, Skylights and Glass Doors.
3. WDMA I.S.4 - Industry Standard for Water-Repellent Preservative Non-Pressure Treatment for Millwork.

1.4 PERFORMANCE REQUIREMENTS

A. Windows shall be Hallmark certified to a rating of FW-[CW] [AW]-PG[____] specifications in accordance with ANSI/AAMA/NWWDA 101/I.S.2/A440-08 or ANSI/AAMA/NWWDA 101/I.S.2/A440-11.

B. Window Unit Air Leakage, ASTM E 283, 6.24 psf (50 mph): 0.05 cfm per square foot of frame or less.

C. Window Unit Water Penetration: No water penetration through window unit when tested in accordance with ASTM E 547, under static pressure of 14.2 psf (75 mph) after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot.

1.5 SUBMITTALS

A. Comply with Division 1 requirements.

B. Product Data: Submit manufacturer's product data, including installation instructions.

C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.

D. Samples: Submit full-size or partial full-size sample of window illustrating glazing system, quality of construction, and color of finish.

E. Warranty: Submit manufacturer’s standard warranty.

1.6 QUALITY ASSURANCE

A. Mockup:
   1. Provide sample installation for field testing window performance requirements and to determine acceptability of window installation methods.
   2. Approved mockup shall represent minimum quality required for the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.

B. Storage: Store materials in an upright position, off ground, under cover, and protected from weather, direct sunlight, and construction activities.

C. Handling: Protect materials and finish during handling and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Pella Corporation, 102 Main Street, Pella, Iowa 50219. Toll Free (800) 54-PELLA. Phone (641) 621-1000. Website www.pella.com.

2.2 ALUMINUM-CLAD WOOD CIRCLEHEAD WINDOWS

A. Aluminum-Clad Wood Fixed-Frame Windows: Pella “Clad Frame” factory-assembled, aluminum-clad wood, fixed-frame windows.

B. Frame (Sill):
1. Select woods, water-repellent, preservative-treated with EnduraGuard® in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the frame.
2. Interior Exposed Surfaces: [Clear Pine] with no visible fastener holes..
3. Exterior Surfaces: Clad with aluminum.
4. Sill Assembly: Mitered at ends where joined to curved head member.
5. Overall Frame Depth: 5 inches (127 mm).

C. Frame (Curved Head Member):
1. Select woods, water-repellent, preservative-treated with EnduraGuard in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the frame.
2. Solid-wood-core blocks bonded with water-resistant glue to stabilized cellulose fiber.
3. Two sheets laminated with veneers at interior.
4. Interior Exposed Surfaces: [Clear Pine] with no visible fastener holes..
5. Exterior Surfaces: Clad with aluminum.
6. Curved Head Assembly: Mitered at ends where joined to sill, screwed and sealed.
7. Overall Frame Depth: 5 inches (127 mm).

2.3 GLAZING

A. Glazing:
1. Float Glass: ASTM C 1036, Quality 1.
a. Tempered Glass: ASTM C 1048.

2. Type: Silicone-glazed 1” triple-pane, dual-seal, [annealed] [tempered] insulating glass, [clear] [multi-layer Low-E coated with [argon] [krypton]] [bronze air-filled multi-layer, Low-E coated] [gray air-filled multi-layer, Low-E coated] [green air-filled multi-layer, Low-E coated].

2.4 TOLERANCES

A. Windows shall accommodate the following opening tolerances:
1. Vertical Dimensions Between High and Low Points: Plus 1/4 inch, minus 0 inch.

2. Width Dimensions: Plus 1/4 inch, minus 0 inch.
3. Building Columns or Masonry Openings: Plus or minus 1/4 inch from plumb.

2.6 FINISH

A. Exterior Finish System: Pella EnduraClad.
   1. Exterior aluminum surfaces shall be finished with the following multi-stage system:
      a. Clean and etch aluminum surface of oxides.
      b. Pre-treat with conversion coating.
      c. Top coat with baked-on polyester enamel.
   2. Color: TBD
   3. Performance Requirements: Exterior aluminum finishes shall meet or exceed all performance requirements of AAMA 2603 and the following performance requirements of AAMA 2605:
      a. Dry Film Hardness: Eagle Turquoise Pencil, H minimum.
      b. Film Adhesion: 1/16-inch crosshatch, dry, wet, boiling water.
      c. Impact Resistance: 1/10-inch distortion, no film removal.
      d. Chemical Resistance: 10 percent Muriatic acid, 15 minutes. Mortar pat test, 24 hours.
      e. Detergent Resistance: 3 percent at 100 degrees F, 72 hours.
      f. Corrosion Resistance (ASTM G85-A5): Humidity, 3,000 hours. Salt spray exceeds 3,000 hours.

B. Interior Finish: Factory finished stain. Color: TBD.

2.7 INSTALLATION ACCESSORIES

A. Flashing/Sealant Tape: Pella SmartFlash.
   1. Aluminum-foil-backed butyl window and door flashing tape.
   2. Maximum Total Thickness: 0.013 inch.
   3. UV resistant.
   4. Verify sealant compatibility with sealant manufacturer.

B. Interior Insulating-Foam Sealant: Low-expansion, low-pressure polyurethane insulating window and door foam sealant.

C. Exterior Perimeter Sealant: “Pella Window and Door Installation Sealant” or equivalent high quality, multi-purpose sealant as specified in the joints sealant section.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive windows. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install windows in accordance with manufacturer's instructions and approved shop drawings.

B. Install windows to be weather-tight.

C. Maintain alignment with adjacent work.

D. Secure assembly to framed openings, plumb and square, without distortion.

E. Integrate window system installation with exterior water-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with water-resistant barrier using watershed principles in accordance with window manufacturer's instructions.

F. Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using [backer rod and sealant] [insulating-foam sealant].

G. Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly.

3.3 FIELD QUALITY CONTROL

A. Field Testing: Field water testing shall be conducted in accordance with ASTM E1105 Test Procedure B. The test pressure shall be based on the maximum positive components and cladding design pressure. Utilizing the AAMA 502 field test reduction, the water test pressure is 10% of the maximum positive design pressure.

3.4 CLEANING

A. Clean window frames and glass in accordance with Division 1 requirements.

B. Do not use harsh cleaning materials or methods that would damage finish.

C. Remove labels and visible markings.

3.5 PROTECTION

A. Protect installed windows to ensure that, except for normal weathering, windows will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 09970 – HIGH PERFORMANCE COATING SYSTEMS

COATINGS PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coating systems for accessory buildings - Buildings B & C: Concrete floors, with decorative chips, concrete walls, concrete structure/precast concrete, interior masonry walls, previously painted and new interior steel (metal doors, HM frames, stair stringers, guardrails, balusters, steel walkways, ladders, grilles, etc. and exterior light pole concrete bases). Note: Multiple colors will be used in individual areas. For painting of Building A – refer to Section 09900 “Painting”.

1.2 REFERENCES

A. ASTM D 16 - Terminology Relating to Paint, Varnish, Lacquer and Related Products.

B. SSPC-SP 2 - Hand Tool Cleaning.

C. SSPC-SP 3 - Power Tool Cleaning.

D. SSPC-SP 6/NACE 3 - Commercial Blast Cleaning.

E. SSPC-SP 11 - Power Tool Cleaning to bare metal.

F. SSPC-SP 13/NACE 6 Surface Preparation of Concrete

G. ICRI – Concrete Surface Preparation Standards

1.3 DEFINITIONS

A. Definitions of Painting Terms: ASTM D 16, unless otherwise specified.

B. Dry Film Thickness (DFT): Thickness of a coat of paint in fully cured state measured in mils (1/1000 inch).

C. Concrete Surface Standard (CSP): Standard for roughness of the surface profile of the concrete measured 1-9 with 9 being the roughest measured with a visual mold.

1.4 SUBMITTALS

A. Comply with Section 01340 – “Shop Drawings, Product Data and Samples”.

B. Product Data: Submit manufacturer's product data for each coating, including generic description, complete technical data, surface preparation and application instructions.

C. Color Samples: Submit manufacturer’s color samples showing full range of standard colors.

D. Manufacturer’s Quality Assurance: Submit manufacturer’s certification that coatings comply with specified requirements and are suitable for intended application.

E. Applicator’s Quality Assurance: Submit list of a minimum of 5 completed projects of similar size and complexity to this Work. Include for each project:
1. Project name and location.
2. Name of owner.
3. Name of contractor.
4. Name of architect.
5. Name of coating manufacturer.
6. Approximate area of coatings applied.
7. Date of completion.

F. Warranty: Submit manufacturer’s standard warranty.

1.5 QUALITY ASSURANCE

A. Manufacturer’s Qualifications:
1. Specialize in manufacture of coatings with a minimum of 10 years successful experience.
2. Able to demonstrate successful performance on comparable projects.
3. Single Source Responsibility: Coatings and coating application accessories shall be products of a single manufacturer.

B. Applicator’s Qualifications:
1. Experienced in application of specified coatings for a minimum of 5 years on projects of similar size and complexity to this Work.

2. Applicator's Personnel: Employ persons trained for application of specified coatings.

C. Preapplication Meeting: Convene a pre-application meeting [2] two weeks before start of application of coating systems. Require attendance of parties directly affecting work of this section, including Construction Manager, Architect, applicator and manufacturer’s representative. Review the following:

1. Environmental requirements.
2. Protection of surfaces not scheduled to be coated.
3. Surface preparation.
4. Application.
5. Repair.
6. Field quality control.
7. Cleaning.
8. Protection of coating systems.
9. One-year inspection.
10. Coordination with other work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying:
1. Coating or material name.
2. Manufacturer.
3. Color name and number.
4. Batch or lot number.
5. Date of manufacture.
6. Mixing and thinning instructions.

B. Storage:
1. Store materials in a clean dry area and within temperature range in accordance with manufacturer's instructions.
2. Keep containers sealed until ready for use.

3. Do not use materials beyond manufacturer's shelf life limits.

C. Handling: Protect materials during handling and application to prevent damage or contamination.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Weather:
1. Air and Surface Temperatures: Prepare surfaces and apply and cure coatings within air and surface temperature range in accordance with manufacturer's instructions.
2. Surface Temperature: Minimum of 5 degrees F (3 degrees C) above dew point.
3. Relative Humidity: Prepare surfaces and apply and cure coatings within relative humidity range in accordance with manufacturer's instructions.
4. Precipitation: Do not prepare surfaces or apply coatings in rain, snow, fog or mist.
5. Wind: Do not spray coatings if wind velocity is above manufacturer's limit.

B. Ventilation: Provide ventilation during coating evaporation stage in confined or enclosed areas in accordance with manufacturer's instructions.

C. Dust and Contaminants:
1. Schedule coating work to avoid excessive dust and airborne contaminants.
2. Protect work areas from excessive dust and airborne contaminants during coating application and curing.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. PPG High Performance Coatings, 23361 Telegraph Road, Southfield, MI 48034 Contact: Jim Kacir Phone: (248) 520-9864. Web Site: www.ppghpc.com

B. Tnemec Company Incorporated, 6800 Corporate Drive, Kansas City, Missouri 64120-1372. Toll Free (800) 863-6321. Phone (816) 483-3400. Fax (816) 483-3969. Web Site www.tnemec.com.

2.2 COATING SYSTEMS FOR NEW CONCRETE FLOORS (DECORATIVE CHIP)

A. Chemical Exposure, Physical Abuse:
1. System Type: Modified polyamine epoxy.
2. Surface Preparation: SSPC-SP 13/ICRI-CSP 3-5.

PPG
1. Prime Coat: MegaSeal HSPC 99-12700 at 8.0 to 10.0 mils
2. Intermediate Coat: MegaSeal SL 99-12600 15.0 to 20.0 mils DFT with complete broadcast to refusal of MegaSeal FLK decorative flake.
3. Finish Coat: MegaSeal SL 99-12600 10.0 to 20.0 mils DFT.

Tnemec
1. Surface Preparation: SSPC-SP 13/ICRI-CSP 3-5.
2. Prime Coat: Tnemec Series 281 tneme-glaze at 8.0 to 10.0 mils DFT with complete broadcast to refusal of Tnemec Series 224C decorative flake.
3. Intermediate Coat: Tnemec Series 284 deco-clear at 8.0 to 10.0 mils DFT.
4. Finish Coat: Tnemec Series 284 deco-clear at 8.0 to 10.0 mils DFT.

2.3 CONCRETE WALLS/STRUCTURAL CONCRETE/PRECAST CONCRETE

A. Chemical Exposure, Physical Abuse:
1. System Type: Waterborne acrylic epoxy.
2. Surface Preparation: SSPC-SP 13/ICRI-CSP 2-3.

PPG
1. Prime Coat: PITT-GLAZE® WB 16-551 Water-Borne Acrylic Epoxy at 2.0 to 3.0 mils DFT.
2. Finish Coat: PITT-GLAZE® WB 16-551 Water-Borne Acrylic Epoxy at 2.0 to 3.0 mils DFT.

Tnemec
1. Prime Coat: Tnemec Series 113 H.B. tneme-tufcoat at 4.0 to 6.0 mils DFT.
2. Finish Coat: Tnemec Series 113 H.B. tneme-tufcoat at 4.0 to 6.0 mils DFT.

2.4 INTERIOR MASONRY WALLS

A. Chemical Exposure, Physical Abuse:
1. System Type: Waterborne cementitious acrylic/waterborne acrylic epoxy.
2. Surface Preparation: Clean and dry.

PPG
1. Prime Coat: PITT-GLAZE 16-90 Interior/Exterior Block Filler Latex at 6.0 to 13.0 DFT.
2. Intermediate Coat: PITT-GLAZE® WB 16-551 Acrylic Epoxy at 2.0 to 3.0 mils DFT.
3. Finish Coat: PITT-GLAZE® WB 16-551 Acrylic Epoxy at 2.0 to 3.0 mils DFT.

Tnemec
1. Prime Coat: Tnemec Series 130 envirofill at manufacturers recommended spreading rate.
2. Intermediate Coat: Tnemec Series 113 H.B. tneme-tufcoat at 4.0 to 6.0 mils DFT.
3. Finish Coat: Tnemec Series 113 H.B. tneme-tufcoat at 4.0 to 6.0 mils DFT.

2.5 PREVIOUSLY PAINTED OR NEW INTERIOR STEEL (METAL DOORS, METAL FRAMES, GRILLES, ETC.)

A. Chemical Exposure, Physical Abuse:

1. System Type: Modified aromatic polyurethane/waterborne epoxy-amine adduct/ceramic modified waterborne aliphatic polyurethane.
2. Surface Preparation: SSPC-SP 2/3 hand/power tool cleaning.

PPG
1. Prime Coat: 97-145 PITT-GUARD Direct-to-Rust Epoxy Mastic at 4.0 to 7.0 DFT
2. Intermediate Coat: PITT-GLAZE® WB 16-551 Acrylic Epoxy at 2.0 to 3.0 mils DFT.
3. Finish Coat: PITT-GLAZE® WB 16-551 Acrylic Epoxy at 2.0 to 3.0 mils DFT.

Tnemec

1. Prime Coat: Tnemec Series 1 omnithane at 2.5 to 3.5 mils DFT.
2. Intermediate Coat: Tnemec Series 287 enviro-pox at 2.0 to 3.0 mils DFT.
3. Finish Coat: Tnemec Series 297 enviro-pox at 2.0 to 3.0 mils DFT.

2.6 COATING SYSTEMS FOR EXTERIOR GALVANIZED STEEL AND NONFERROUS METAL - MODERATE TO SEVERE EXPOSURE

PPG

Tnemec

A. Mild to Moderate Atmospheric or UV Exposure:
   1. System Type: Epoxy/urethane.
   2. Surface Preparation: Abrasive blast and/or chemically clean.
   3. Shop or Field Primer: Series N69 Hi-Build Epoxoline II. DFT 3.0 to 5.0 mils.
   4. Field Finish Coat: Series 1075 Endura-Shield. DFT 2.0 to 3.0 mils.
   5. Total DFT: 5.0 to 8.0 mils.
   6. Finish Color: As selected by Architect from manufacturer’s standard colors.

2.7 PAINTED EXTERIOR STEEL

PPG

Tnemec

A. Atmospheric, Chemical, or UV Exposure, Physical Abuse:
   1. System Type: Epoxy/urethane.
   2. Surface Preparation: SSPC-SP 6/NACE 3.
   3. Shop or Field Primer: Series N69 Hi-Build Epoxoline II. DFT 4.0 to 6.0 mils.
   4. Field Intermediate Coat: Series N69 Hi-Build Epoxoline II. DFT 2.0 to 3.0 mils.
   5. Field Finish Coat: Series 1075 Endura-Shield. DFT 2.0 to 3.0 mils.
   6. Total DFT: 8.0 to 12.0 mils.
   7. Finish Color: As selected by Architect from manufacturer’s standard colors.

2.8 INTERIOR GYPSUM BOARD

PPG

Tnemec

A. Chemical Exposure, Physical Abuse, Impact:
   1. System Type: 100% solids epoxy.
   2. Surface Preparation:
   3. Prime Coat: Tnemec Series 201, epoxoprime 6.0 to 8.0 mils DFT.
   4. Intermediate Coat: Tnemec Series 270 stranlok, 25.0 to 40.0 mils DFT.
   5. Finish Coat: Tnemec Series 280 tneme-glaze 6.0 to 8.0 mils DFT.
   6. Total DFT: 37.0 to 56.0 mils.

2.9 ACCESSORIES

A. Coating Application Accessories:
   1. Accessories required for application of specified coatings in accordance with manufacturer's instructions, including thinners.
   2. Products of coating manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which coating systems are to be applied. Notify the General Contractor in writing of areas or conditions not acceptable. Do not begin surface preparation or application until unacceptable areas or conditions have been corrected.

3.2 PROTECTION OF SURFACES NOT SCHEDULED TO BE COATED

A. Protect surrounding areas and surfaces not scheduled to be coated from damage during surface preparation and application of coatings.

B. Immediately remove coatings that fall on surrounding areas and surfaces not scheduled to be coated.

3.3 SURFACE PREPARATION OF STEEL

A. Prepare steel surfaces in accordance with manufacturer's instructions.

B. Fabrication Defects:
   1. Correct steel and fabrication defects revealed by surface preparation.
   2. Remove weld spatter and slag.
   3. Round sharp edges and corners of welds to a smooth contour.
   4. Smooth weld undercuts and recesses.
   5. Grind down porous welds to pinhole-free metal.
   6. Remove weld flux from surface.

C. Ensure surfaces are dry.

D. Interior Steel Surfaces, Moderate to Severe Exposure: Remove visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter in accordance with SSPC- SP6.

E. Abrasive Blast-Cleaned Surfaces: Coat abrasive blast-cleaned surfaces with primer before visible rust forms on surface. Do not leave blast-cleaned surfaces uncoated for more than 8 hours.

F. Primer: Prepare field primer to receive field coat in accordance with manufacturer’s instructions.

3.4 SURFACE PREPARATION OF CONCRETE

A. Prepare concrete surfaces in accordance with manufacturer’s instructions.

B. Defects
1. Remove spalled or deteriorated areas.
2. Remediate concrete surfaces per Section 03730 “Concrete Rehabilitation”. Let remediated areas cure per manufacturers recommendations.
3. Remove deteriorated mortar joints in masonry. Tuckpoint and cure per manufacturer’s recommendations.

C. Ensure surfaces are dry.

D. Remove visible oil, grease, dirt, dust, rust stains, paint, and other foreign matter in accordance with SSPC – SP13/NACE 6 surface preparation of concrete.

E. Primer: Prepare field primer to receive field coat in accordance with manufacturer’s instructions.

3.5 SURFACE PREPARATION OF GYPSUM BOARD SURFACES

A. Prepare gypsum materials in accordance with manufacturer’s instructions.

B. Defects: Repair drywall surfaces of nail holes, scratches, dents, holes and other surface imperfections per 09250 “Gypsum Drywall”. Sand joint compound smooth and feather edge.

C. Ensure surfaces are dry and free of oil, grease, curing compounds/sealers, dirt, dust, and other contaminants.

D. Primer: Prepare field primer to receive field coat in accordance with manufacturer’s instructions.

3.6 APPLICATION

A. Apply coatings in accordance with manufacturer's instructions.

B. Mix and thin coatings, including multi-component materials, in accordance with manufacturer’s instructions.

C. Keep containers closed when not in use to avoid contamination.

D. Do not use mixed coatings beyond pot life limits.

E. Use application equipment, tools, pressure settings and techniques in accordance with manufacturer’s instructions.

F. Uniformly apply coatings at spreading rate required to achieve specified DFT.

G. Apply coatings to be free of film characteristics or defects that would adversely affect performance or appearance of coating systems.

H. Stripe paint with brush critical locations on steel such as welds, corners and edges using specified primer.

3.7 REPAIR

A. Materials and Surfaces Not Scheduled To Be Coated: Repair or replace damaged materials and surfaces not scheduled to be coated.

B. Damaged Coatings: Touch-up or repair damaged coatings. Touch-up of minor damage shall be acceptable where result is not visibly different from adjacent surfaces. Recoat entire surface where touch-up result is visibly different, either in sheen, texture or color.

C. Coating Defects: Repair in accordance with manufacturer's instructions coatings that exhibit film characteristics or defects that would adversely affect performance or appearance of coating systems.

3.8 FIELD QUALITY CONTROL

A. Inspector's Services:
   1. Verify coatings and other materials are as specified.
   2. Verify surface preparation and application are as specified.
   3. Verify DFT of each coat and total DFT of each coating system are as specified using wet film and dry film gauges.
   4. Coating Defects: Check coatings for film characteristics or defects that would adversely affect performance or appearance of coating systems.
      a. Check for holidays on interior steel immersion surfaces using holiday detector.
   5. Report:
      a. Submit written reports describing inspections made and actions taken to correct nonconforming work.
      b. Report nonconforming work not corrected.
      c. Submit copies of report to Architect, Owner's Representative and Construction Manager.

B. Manufacturer's Field Services: Manufacturer's representative shall provide technical assistance and guidance for surface preparation and application of coating systems.

3.9 CLEANING

A. Remove temporary coverings and protection of surrounding areas and surfaces.

3.10 PROTECTION OF COATING SYSTEMS

A. Protect surfaces of coating systems from damage during construction.

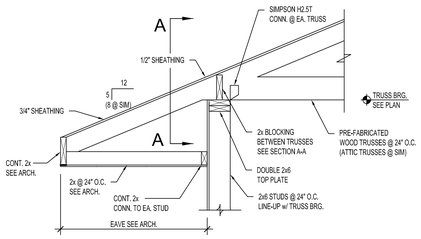
3.11 ONE-YEAR INSPECTION

A. Owner will set date for one-year inspection of coating systems.

B. Inspection shall be attended by Owner, Contractor, Architect and manufacturer’s representative.

C. Repair deficiencies in coating systems as determined by Architect in accordance with manufacturer’s instructions.

END OF SECTION 09970



1 S4.0 SECTION
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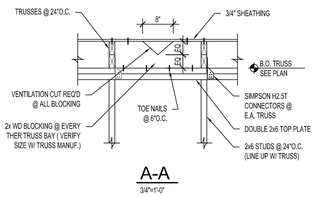

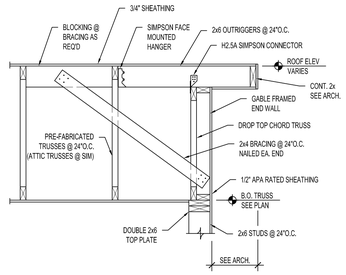

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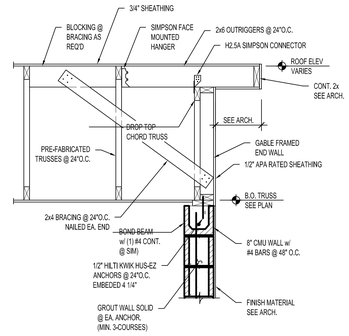

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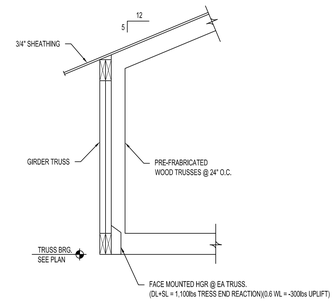

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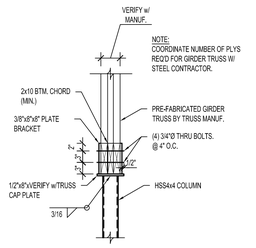

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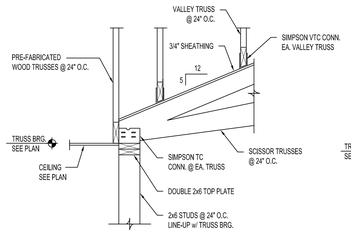

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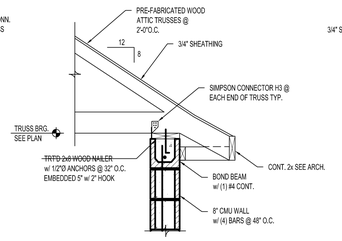

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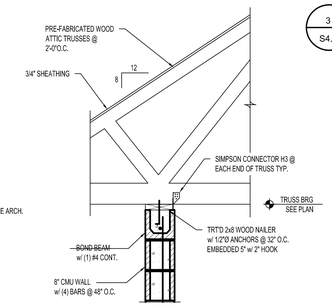

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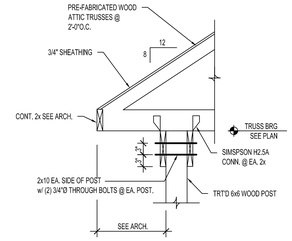

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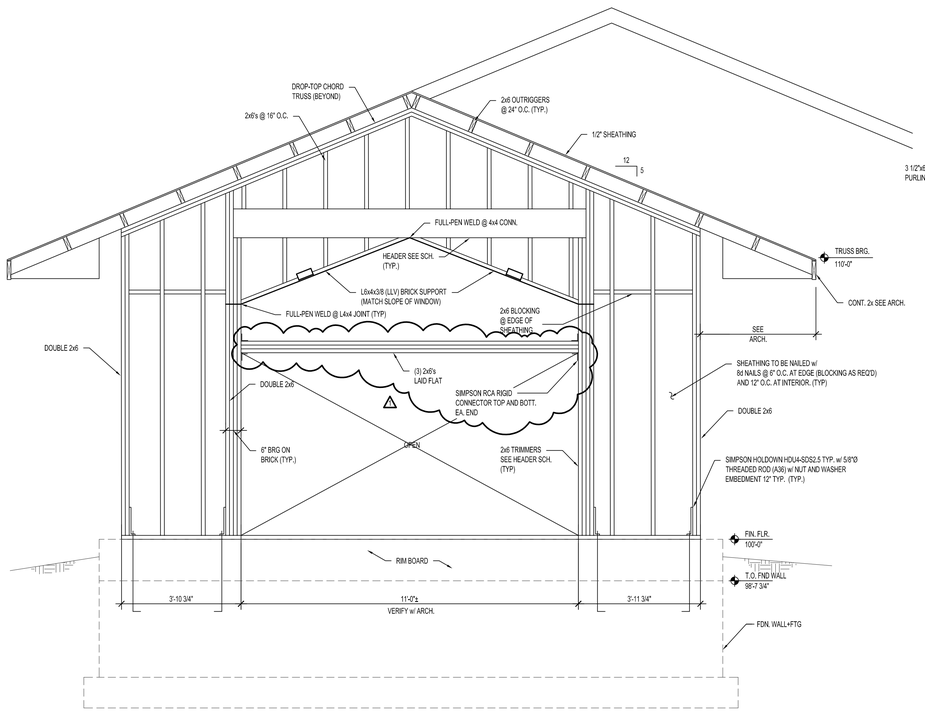

10 S4.0 SECTION
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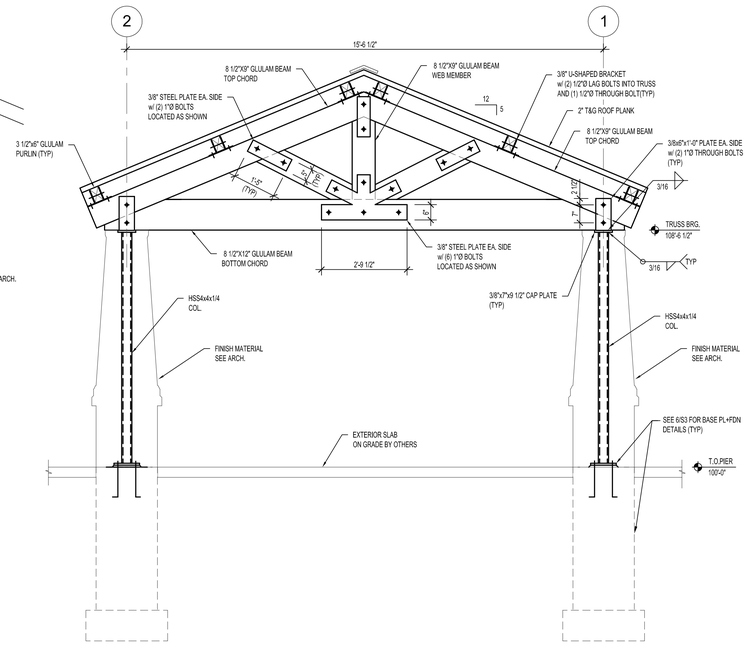

11 S4.0 SECTION
SCALE: 1/2" = 1'-0"

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DDA PLACEMAKING
DOWNTOWN DEVELOPMENT AUTHORITY
46425 TYLER RD, VAN BUREN CHARTER TOWNSHIP, MI 48111

SECTIONS AND DETAILS

PRELIMINARY	☐
DESIGN DEVELOPMENT	☐
CONSTRUCTION	■
FINAL RECORD	☐

DRAWN BY:	CAM
CHECKED BY:	JWQ

REVISIONS:

BID ISSUE	02/09/2018
ADDENDUM 1	03/02/2018

DATE: 08/11/17

SHEET NO.: S4.0

JOB NO.: 161675

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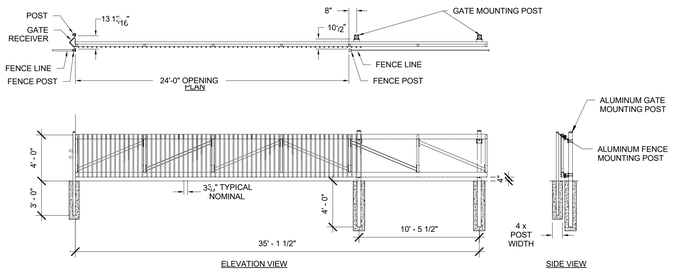
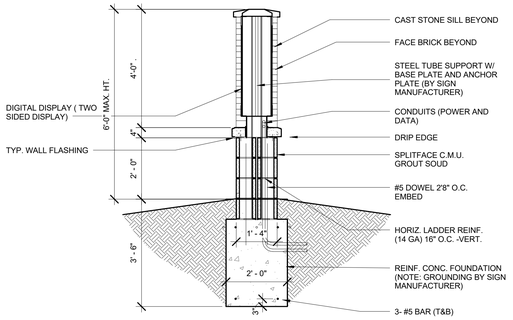
PROJECT NO. 16-828-288



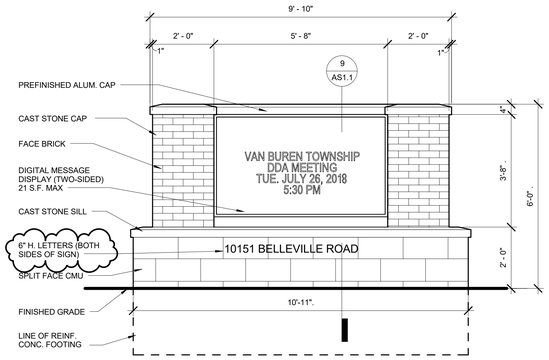
8 AS1.1 ALUM. GATE DETAIL

3/16" = 1'-0"



9 AS1.1 SITE SIGN SECTION

1/2" = 1'-0"

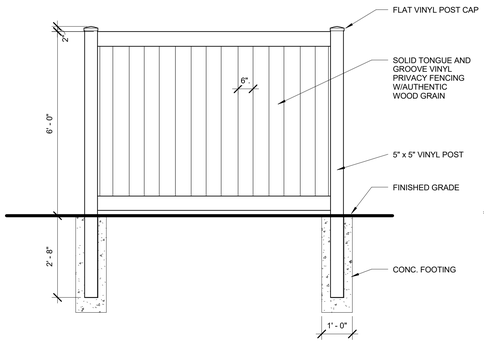


6 AS1.1 SITE SIGN ELEVATION

1/2" = 1'-0"

GENERAL NOTES

1. PAVED SURFACES, WALKWAYS, SIGNS, LIGHTING AND OTHER STRUCTURES AND SURFACES SHALL BE MAINTAINED IN A SAFE, ATTRACTIVE CONDITION AS ORIGINALLY DESIGNED AND CONSTRUCTED.
2. PARKING LOT STRIPING AND MARKINGS SHALL BE MAINTAINED IN A CLEARLY VISIBLE CONDITION.
3. ALL PARKING SPACES SHALL BE CLEARLY STRIPED WITH (4) FOUR INCH WIDE DOUBLE LINES, (24") TWENTY-FOUR INCHES APART AS PER THE ORDINANCE REQUIREMENTS.
4. A SHARED PARKING AGREEMENT EXISTING BETWEEN THE PROPERTY OWNER AND THE REAL ESTATE OFFICE FOR SPECIAL EVENTS ON THE PROPERTY.
5. TRASH RECEPTACLES WILL BE STORED IN GARAGE BUILDING 'B' AND/OR BUILDING 'C'
6. OWNER AGREES TO SEASONAL MAINTENANCE PROGRAM AND WILL REPLACE ALL DISEASED, DEAD OR DAMAGED PLANTS, REPLENISH MULCH, CONTROL WEEDS, FERTILIZE AND PRUNE BEGINNING UPON COMPLETION OF CONSTRUCTION OF LANDSCAPING.
7. OWNER AGREES TO COMBINE ALL PARCELS INTO ONE ONCE EXISTING BUILDINGS ARE REMOVED.
8. OWNER OF 10145 BELLEVILLE ROAD HAS AGREED TO ALLOW SOUTHERLY SPACE BETWEEN THE BUILDING TO BE REMARKED FOR HANDICAPPED PARKING AS PART OF SHARED PARKING AGREEMENT.

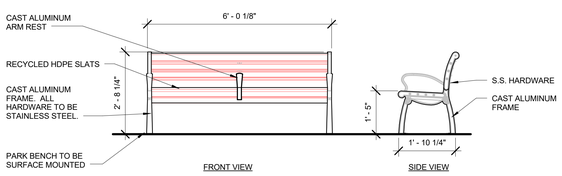


7 AS1.1 PRIVACY FENCE DETAIL

1/2" = 1'-0"

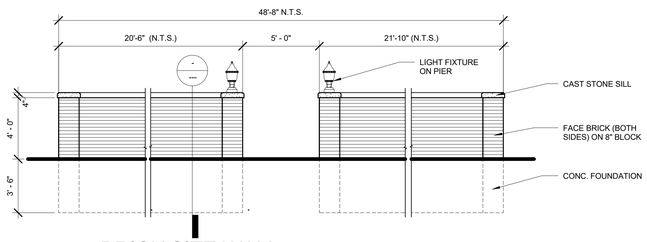
5 AS1.1 ALUM. FENCE DETAIL

1/2" = 1'-0"



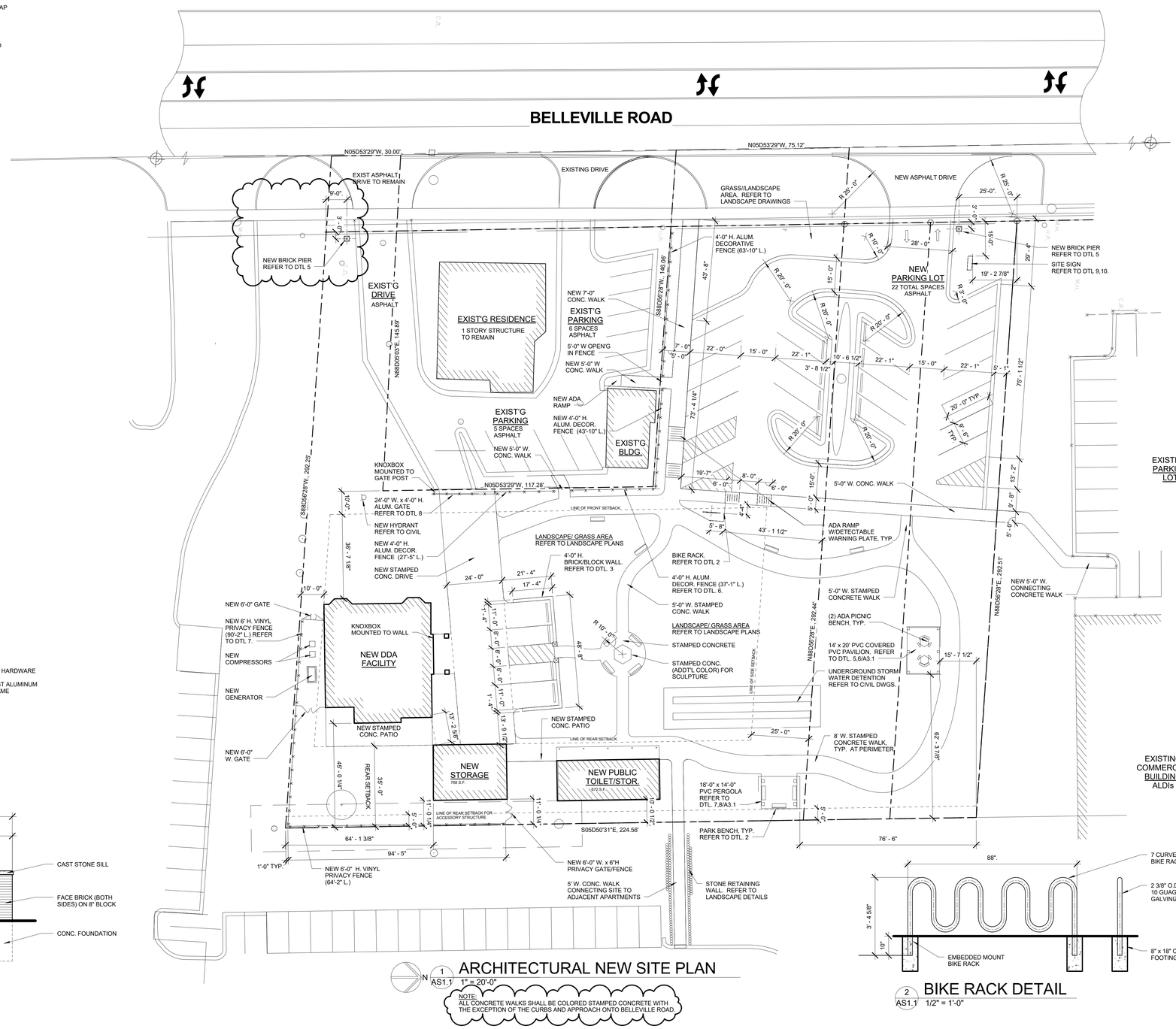
4 AS1.1 PARK BENCH DETAIL

1/2" = 1'-0"



3 AS1.1 BRICK SITE WALL

1/4" = 1'-0"



N

1 AS1.1 ARCHITECTURAL NEW SITE PLAN

1" = 20'-0"

NOTE:
ALL CONCRETE WALKS SHALL BE COLORED STAMPED CONCRETE WITH THE EXCEPTION OF THE CURBS AND APPROACH ONTO BELLEVILLE ROAD.

2 AS1.1 BIKE RACK DETAIL

1/2" = 1'-0"

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VAN BUREN TOWNSHIP
DDA 2016 PLACEMAKING PROJECT
10151 BELLEVILLE RD, VAN BUREN CHARTER TOWNSHIP, MI 48111

SITE PLAN

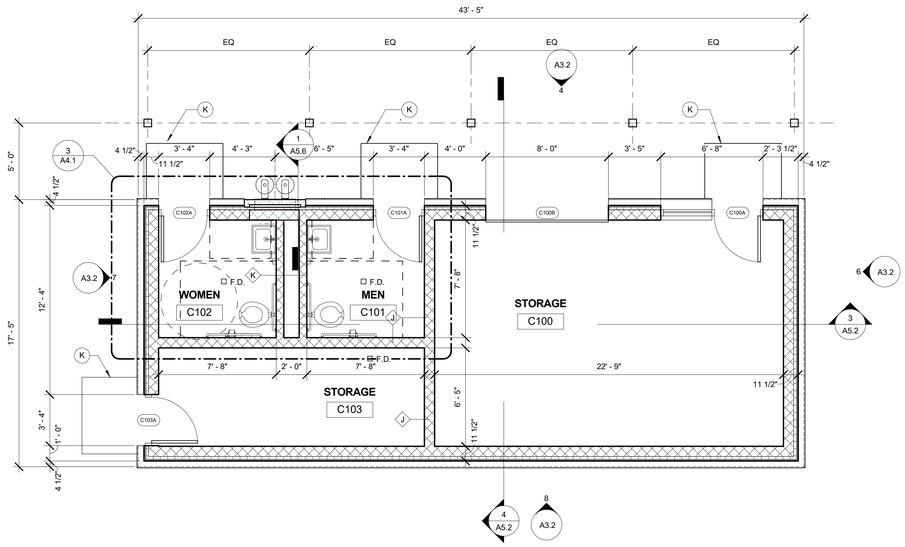
PRELIMINARY	☐
DESIGN DEVELOPMENT	☐
CONSTRUCTION	■
FINAL RECORD	☐
DRAWN BY:	KAN
CHECKED BY:	BS

REVISIONS:
03/02/18 ADDENDUM 1

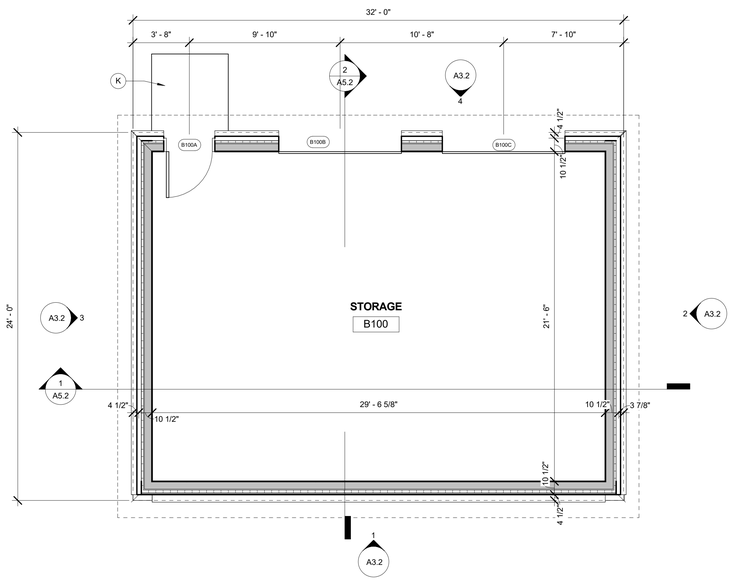
DATE: 05/10/17

SHEET NO.:
AS1.1

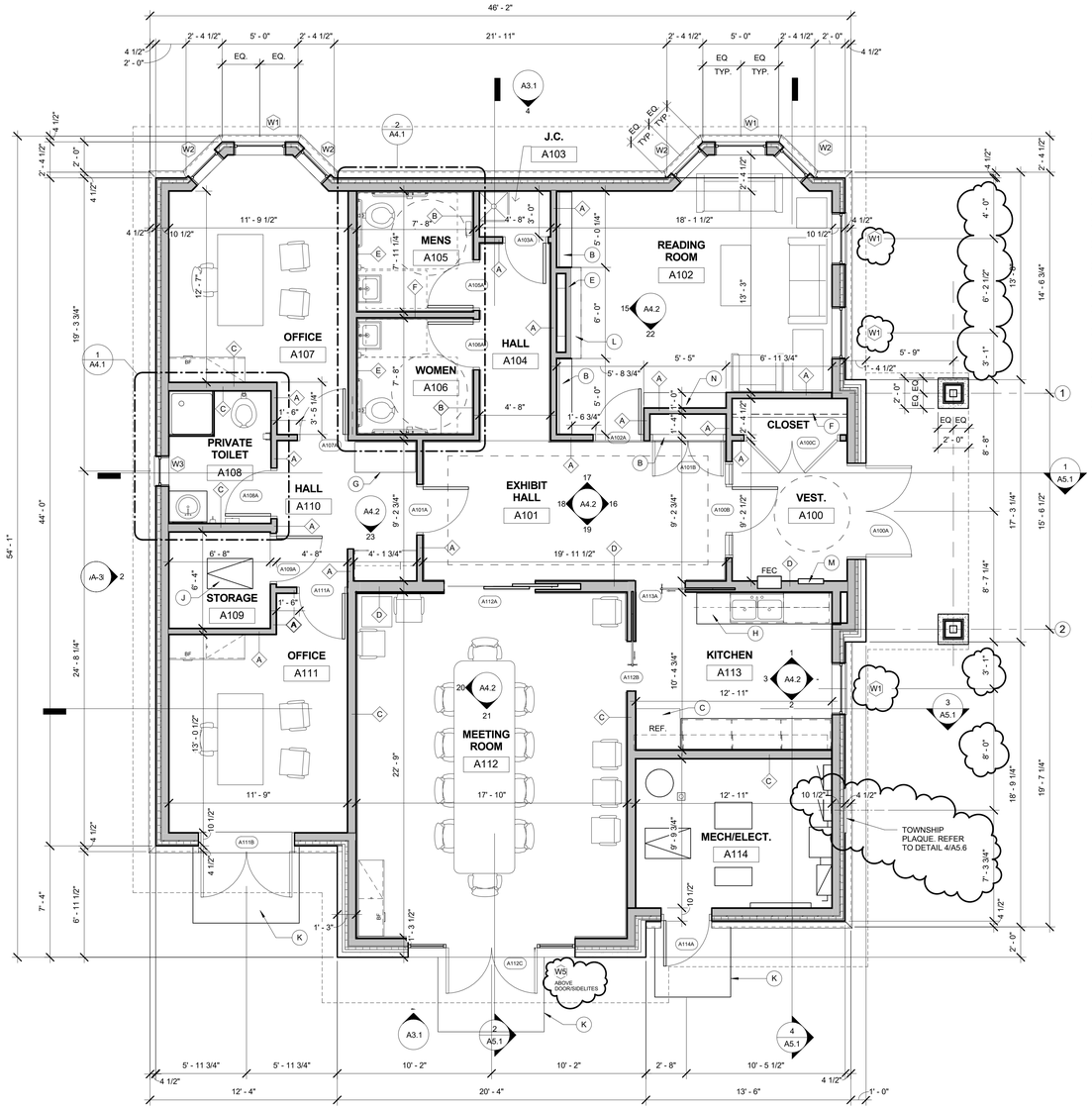
JOB NO.: 161675



N 2 A1.1 FLOOR PLAN - BUILDING C
1/4" = 1'-0"



N 3 A1.1 FLOOR PLAN - BUILDING B
1/4" = 1'-0"



N 1 A1.1 FIRST FLOOR PLAN NEW WORK - BUILDING A
1/4" = 1'-0"

WALL PARTITION LEGEND

	DESCRIPTION
A	5" NOM., 4 3/4" ACTUAL 1 LAYER OF 5/8" GYP. BD. ON EACH SIDE OF 2 x 4 WOOD FRAMING AT 16" O.C. MIN.
B	5" NOM., 4 3/4" ACTUAL 5/8" CEMENT BOARD (ON ONE SIDE) ON 2 x 4 WOOD FRAMING AT 16" O.C. MIN. WITH 5/8" GYP. BOARD
C	7" NOM., 6 3/4" ACTUAL 1 LAYER OF 5/8" GYP. BD. ON EACH SIDE OF 2 x 6 WOOD FRAMING WITH BATT SOUND INSULATION AT 16" O.C. MIN.
D	9" NOM. 8 3/4" ACTUAL 1 LAYER OF 5/8" GYP. BD. ON EACH SIDE OF 2 x8 WOOD FRAMING WITH BATT SOUND INSULATION AT 16" O.C. MIN.
E	7" NOM., 6 3/4" ACTUAL 5/8" CEMENT BOARD ON ONE SIDE OF 2 x 6 WOOD FRAMING WITH BATT SOUND INSULATION AT 16" O.C. MIN. ON 5/8" GYP. BOARD
F	5" NOM., 4 3/4" ACTUAL 5/8" CEMENT BOARD ON BOTH SIDES OF 2 x 4 WOOD FRAMING AT 16" O.C. MIN.
J	8" NOM., 7 5/8" ACTUAL MASONRY CONCRETE BLOCK WITH LOOSE FILL INSULATION
K	6" NOM., 5 5/8" ACTUAL MASONRY CONCRETE BLOCK

NOTE:
1. REFER TO INTERIOR ELEVATIONS AND ROOM FINISH SCHEDULE FOR WALL FINISHES.
2. DIMENSIONS ARE TO THE FACE OF THE GYPSUM BOARD.
3. 5/8" CEMENT BOARD TO BE USED ON ALL TILE WALLS.

NEW WORK KEYNOTES

- (A) FURNITURE BY OWNER
- (B) DISPLAY CASE. REFER TO DETAILS.
- (C) REFRIGERATOR BY OWNER
- (D) 36" H. TILE BEHIND AND ON SIDE WALL AT THE JANITOR CLOSET SINK.
- (E) ELECTRIC FIREPLACE. REFER TO SPEC.
- (F) SHELF AND COAT RACK. REFER TO DETAILS.
- (G) PRINTER BY OWNER.
- (H) DISHWASHER BY OWNER.
- (J) CRAWL SPACE ACCESS HATCH
- (K) CONCRETE SUPPORT HATCH. REFER TO STRUCT.
- (L) 12 x 12 PORCELAIN TILE HEARTH
- (M) ELECTRICAL CABINET HEATER UNIT. REFER TO MECHELECT. DRAWING.
- (N) SHELVING UNIT. REFER TO INTERIOR ELEVATIONS.

GENERAL NOTES

1. ALL FURNITURE SHOWN ON THE DRAWINGS IS BY THE OWNER UNLESS OTHERWISE NOTED.
2. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR LAYOUT OF EQUIPMENT IN HVAC ROOM 114.
3. REFER TO MECHANICAL DRAWINGS FOR SUPPLY AND RETURN DIFFUSERS.

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VAN BUREN TOWNSHIP
DDA 2016 PLACEMAKING PROJECT
10151 BELLEVILLE RD, VAN BUREN CHARTER TOWNSHIP, MI 48111

FLOOR PLANS - NEW WORK

PRELIMINARY	☐
DESIGN DEVELOPMENT	☐
CONSTRUCTION	■
FINAL RECORD	☐

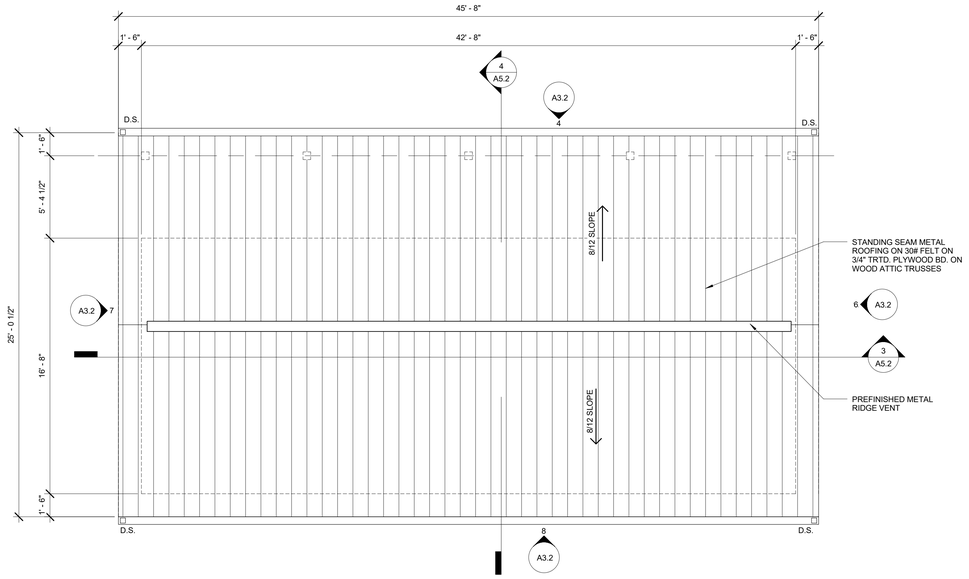
DRAWN BY: KAN
CHECKED BY: BS

REVISIONS:
03/02/18 ADDENDUM 1

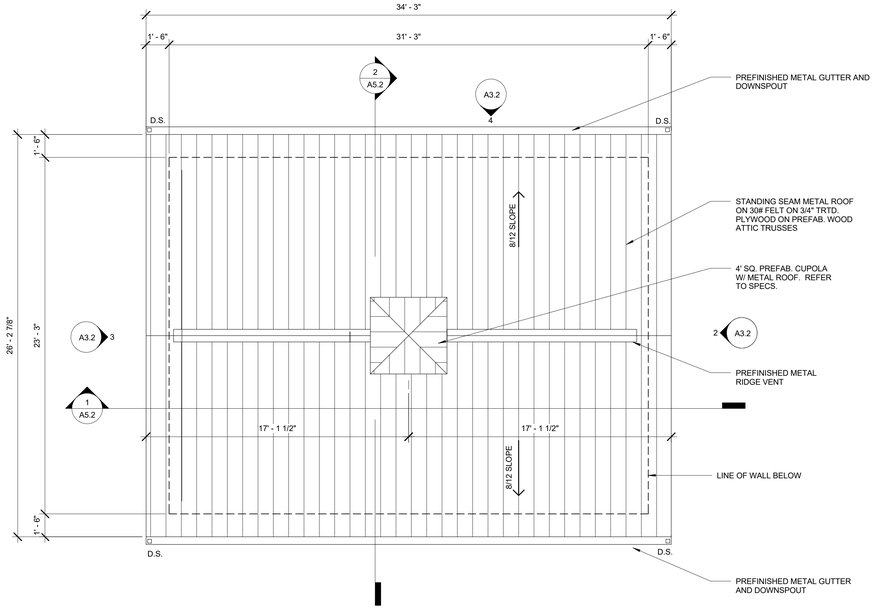
DATE: 05/10/17

SHEET NO.:
A1.1

JOB NO.: 161675



N 3 A1.2 ROOF PLAN - BUILDING C
1/4" = 1'-0"



N 2 A1.2 ROOF PLAN - BUILDING B
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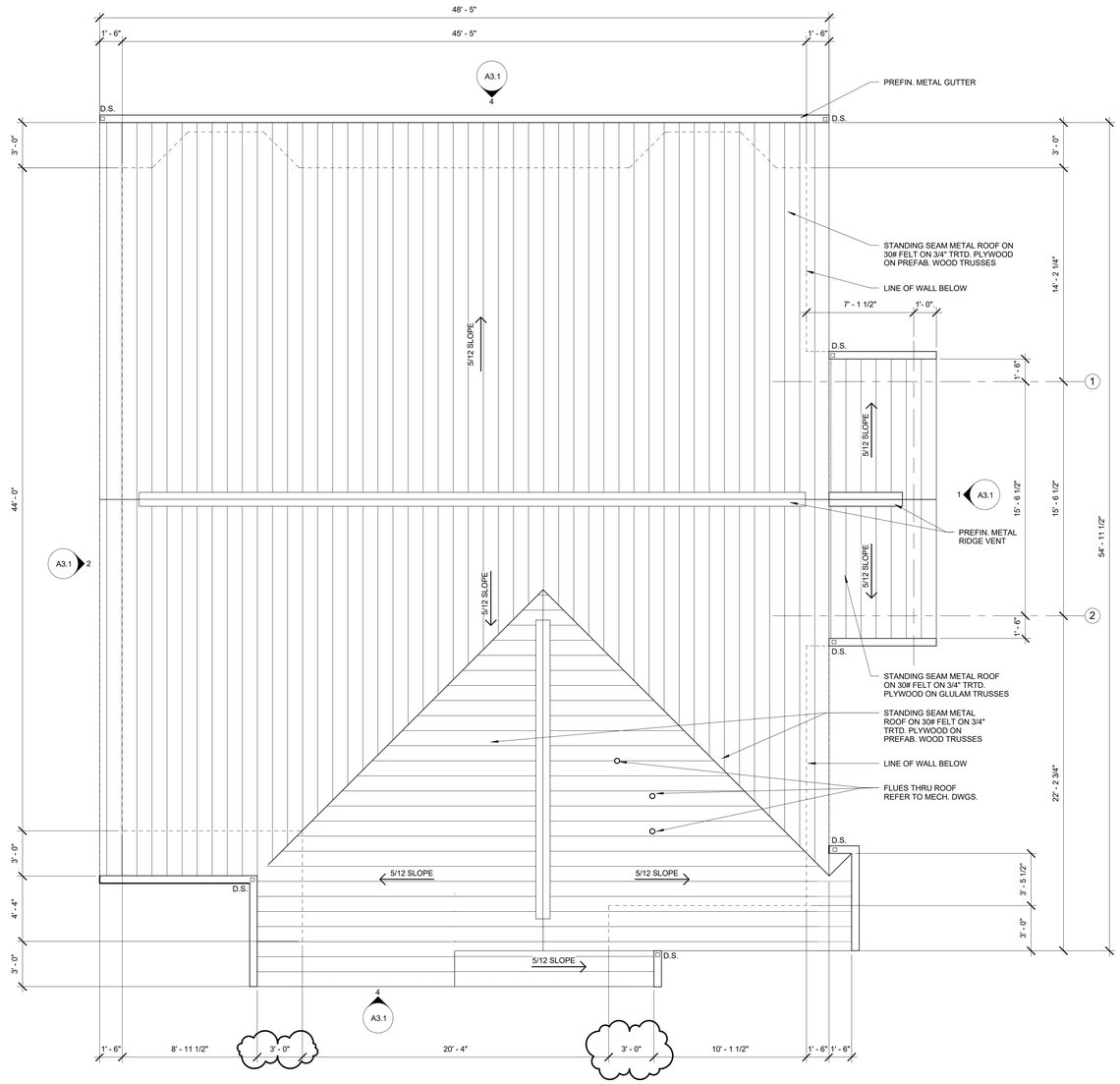

N 1 A1.2 FIRST FLOOR PLAN - BUILDING A
1/4" = 1'-0"

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VAN BUREN TOWNSHIP
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ROOF PLANS

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY: KAN
CHECKED BY: BS

REVISIONS:
03/02/18 ADDENDUM 1

DATE: 05/25/17

SHEET NO.:
A1.2

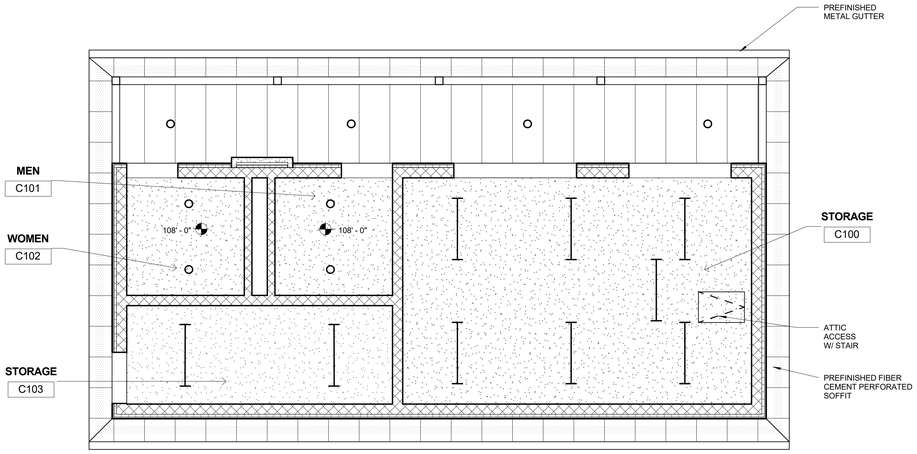
JOB NO.: 161675

GENERAL CEILING NOTES:

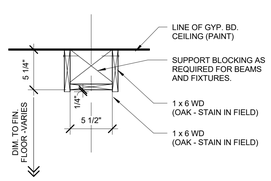
1. REFER TO ELECTRICAL DRAWING FOR LIGHT FIXTURE TYPE, LAYOUT AND QUANTITY.
2. REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS FOR DIFFUSER AND GRILLES LOCATION AND SIZES.
3. REFER TO FINISH ROOM SCHEDULE FOR CEILING HEIGHTS.

REFLECTED CEILING LEGEND:

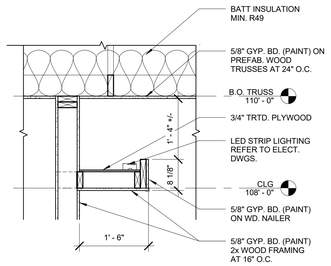
SYMBOL:	DESCRIPTION:
	NEW PAINTED GYPSUM BOARD CEILING
	LINEAR LIGHT FIXTURE
	DOWNLIGHT
	36" DIA. DRUM PENDANT
	EXT. COACH LIGHTING \
	EXHAUST FAN
	LED LANTERN LIGHT FIXTURE



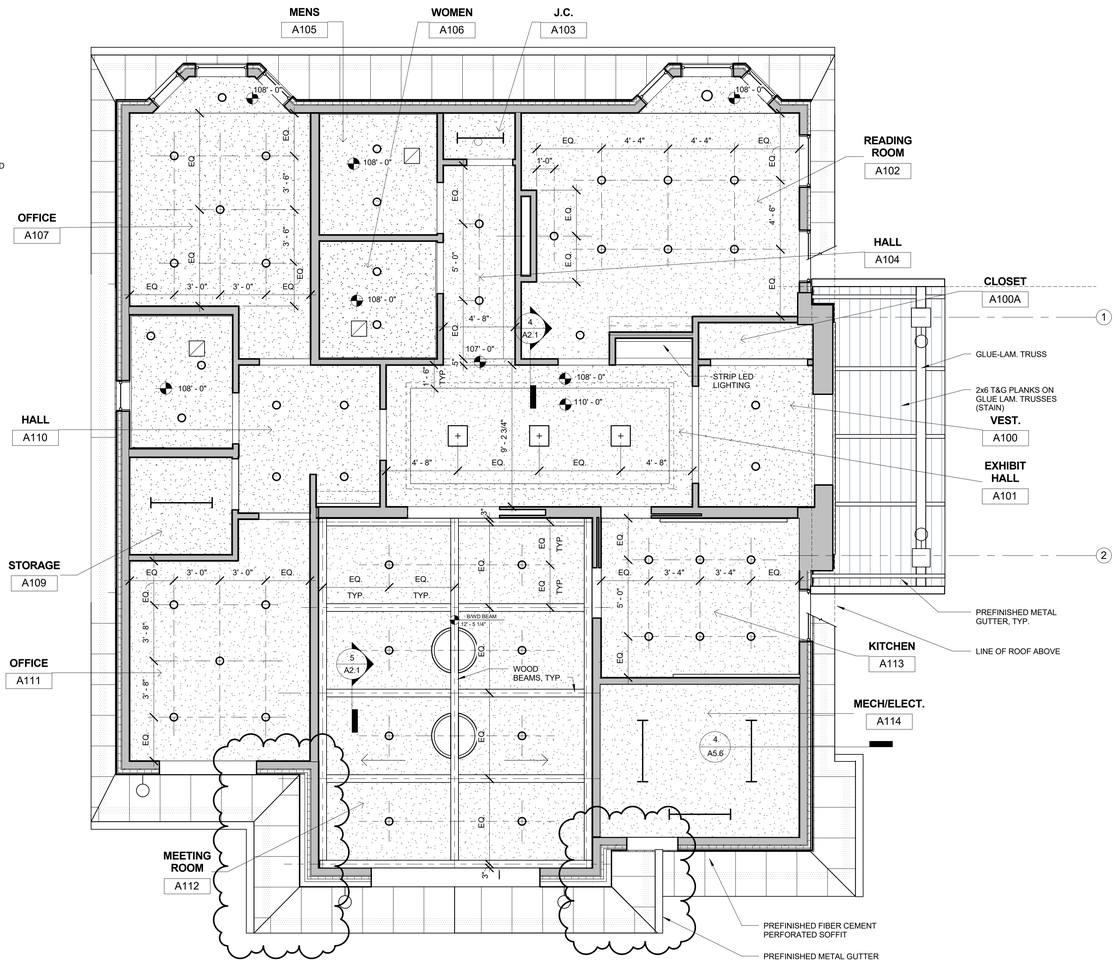
N 3 A2.1 REFLECTED CEILING PLAN - BUILDING C
1/4" = 1'-0"



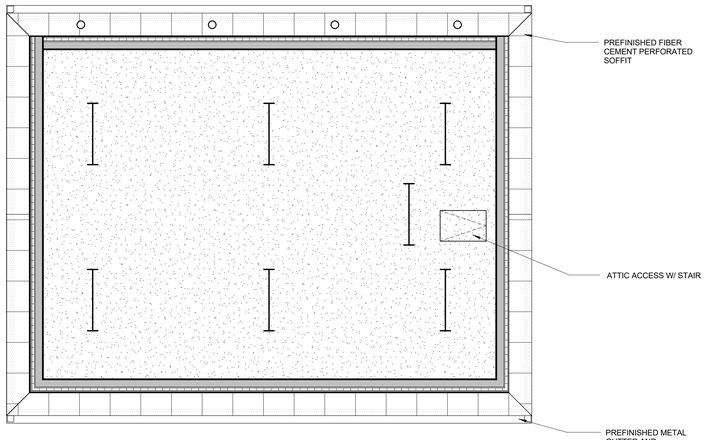
5 A2.1 SECTION DETAIL
1 1/2" = 1'-0"



4 A2.1 SECTION DETAIL
3/4" = 1'-0"



N 2 A2.1 REFLECTED CEILING PLAN - BUILDING A
1/4" = 1'-0"



N 1 A2.1 REFLECTED CEILING PLAN - BUILDING B
1/4" = 1'-0"

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DDA 2016 PLACEMAKING PROJECT
10151 BELLEVILLE RD, VAN BUREN CHARTER TOWNSHIP, MI 48111

REFLECTED CEILING PLANS

PRELIMINARY	☐
DESIGN DEVELOPMENT	☐
CONSTRUCTION	■
FINAL RECORD	☐

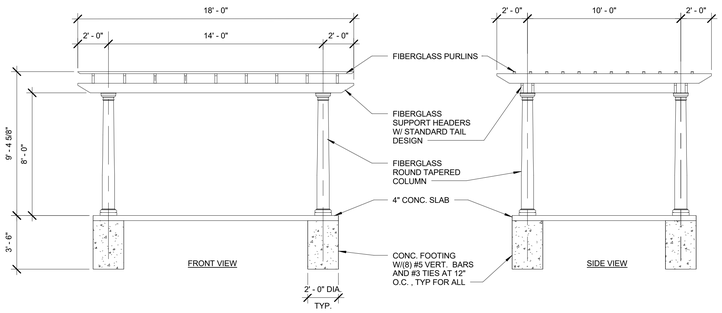
DRAWN BY: KAN
CHECKED BY: BS

REVISIONS:
03/02/18 ADDENDUM 1

DATE: 05/25/17

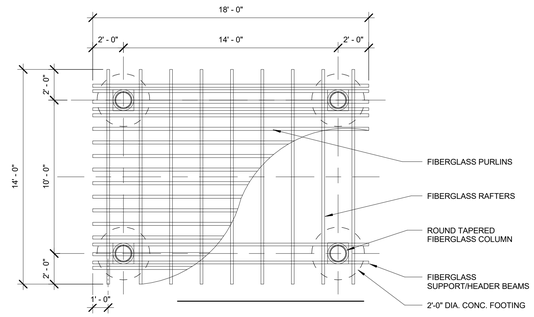
SHEET NO.:
A2.1

JOB NO.: 161675

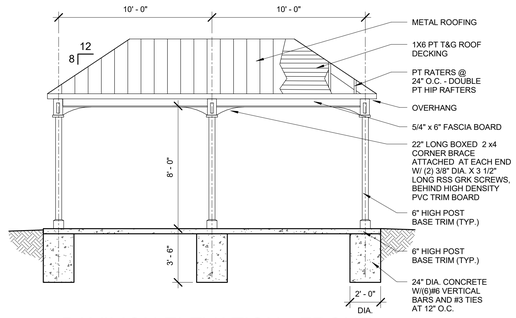


8 A3.1 **PERGOLA - ELEVATIONS**
1/4" = 1'-0"

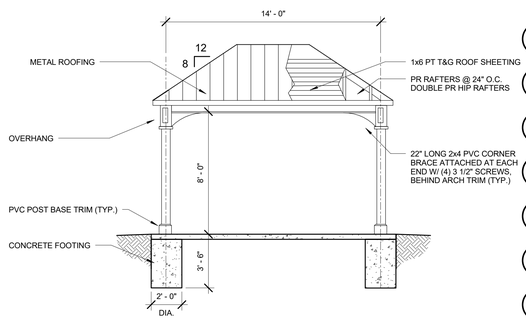
NOTE:
1. THE FREESTANDING PVC PAVILION AND THE FIBERGLASS PERGOLA ARE A READY-TO-ASSEMBLE KIT. THE BASIS OF DESIGN IS PERGOLA KITS USA. REFER TO SPECIFICATIONS.



7 A3.1 **PERGOLA -PLAN**
1/4" = 1'-0"

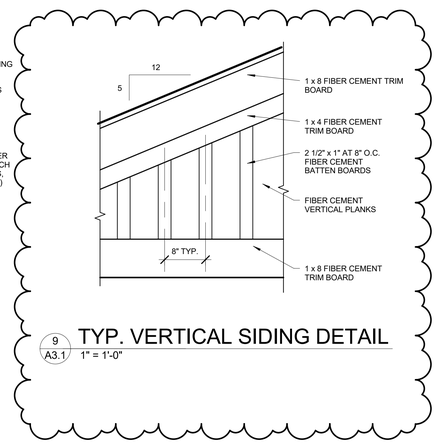


5 A3.1 **PAVILION ELEVATION - FRONT**
1/4" = 1'-0"

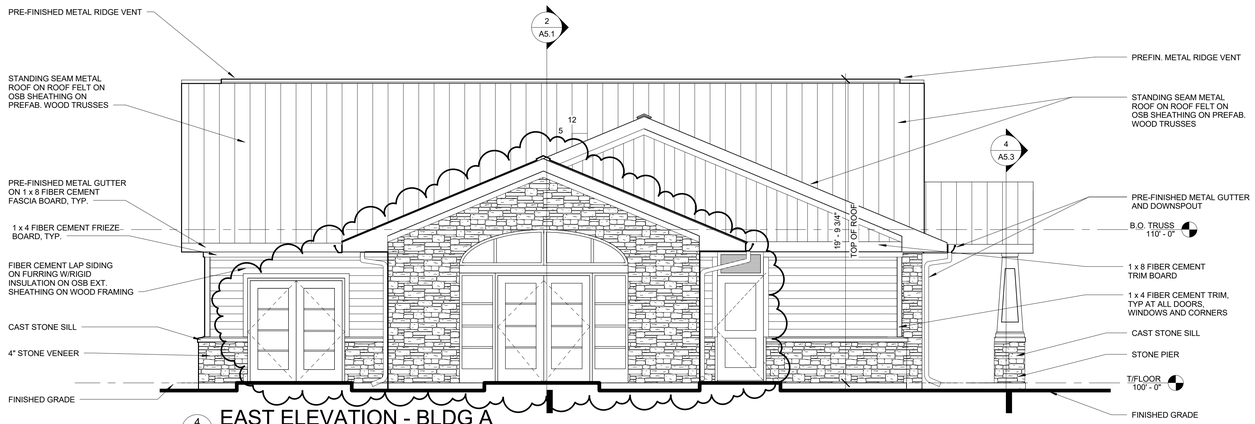


6 A3.1 **PAVILION ELEVATION - SIDE**
1/4" = 1'-0"

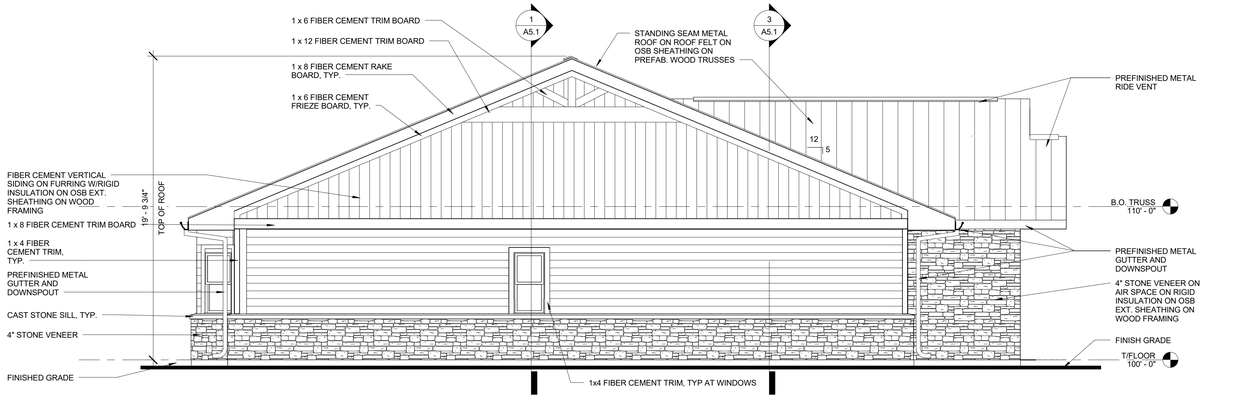
NOTES:
1. BASIS OF DESIGN IS PERGOLA KITS USA: PREMIUM VINYL PAVILION WITH TRADITIONAL METAL ROOF. REFER TO SPECIFICATIONS.
2. WEDGE BOTS MUST BE A MINIMUM OF 8" AWAY FROM ANY EDGE OF CONCRETE FOOTING OR SLAB.



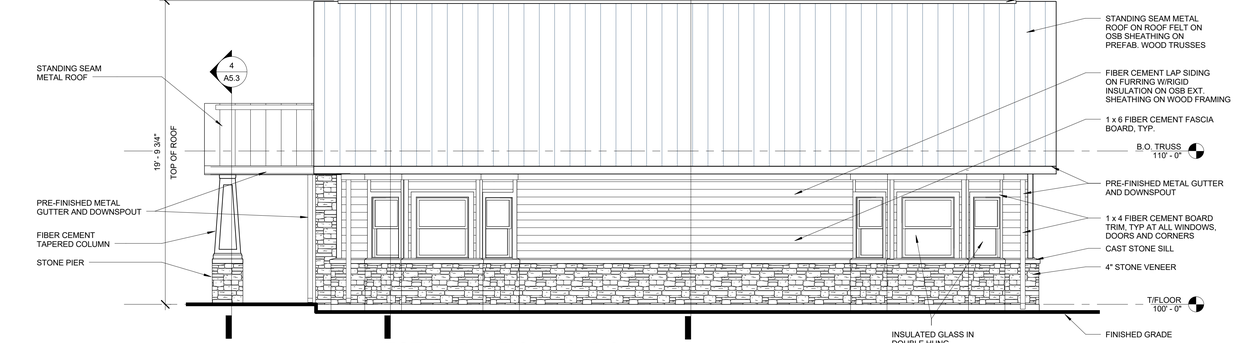
9 A3.1 **TYP. VERTICAL SIDING DETAIL**
1" = 1'-0"



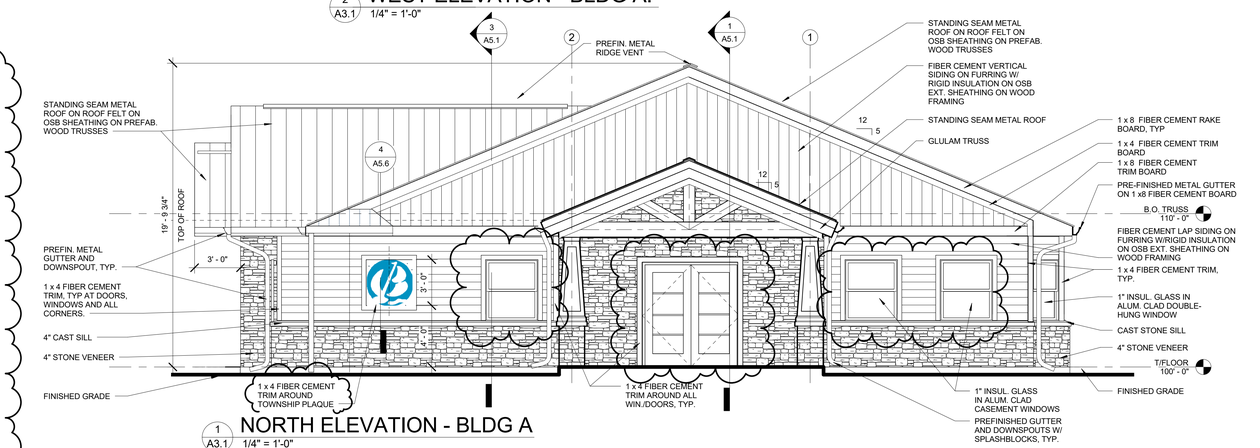
4 A3.1 **EAST ELEVATION - BLDG A**
1/4" = 1'-0"



3 A3.1 **SOUTH ELEVATION - BLDG A**
1/4" = 1'-0"



2 A3.1 **WEST ELEVATION - BLDG A.**
1/4" = 1'-0"



1 A3.1 **NORTH ELEVATION - BLDG A**
1/4" = 1'-0"

WAKELY ASSOCIATES, INC.
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VAN BUREN TOWNSHIP
DDA 2016 PLACEMAKING PROJECT
10151 BELLEVILLE RD, VAN BUREN CHARTER TOWNSHIP, MI 48111

EXTERIOR ELEVATIONS

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

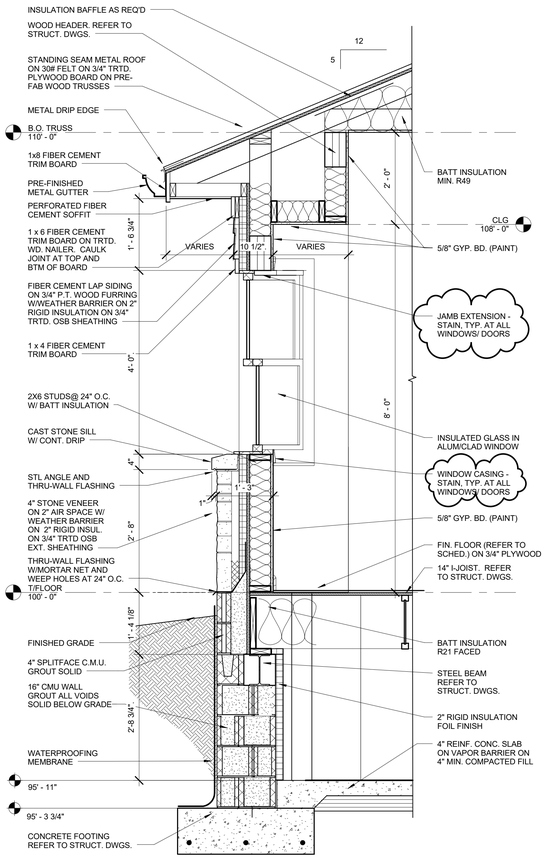
DRAWN BY: KAN
CHECKED BY: BS

REVISIONS:
03/02/18 ADDENDUM 1

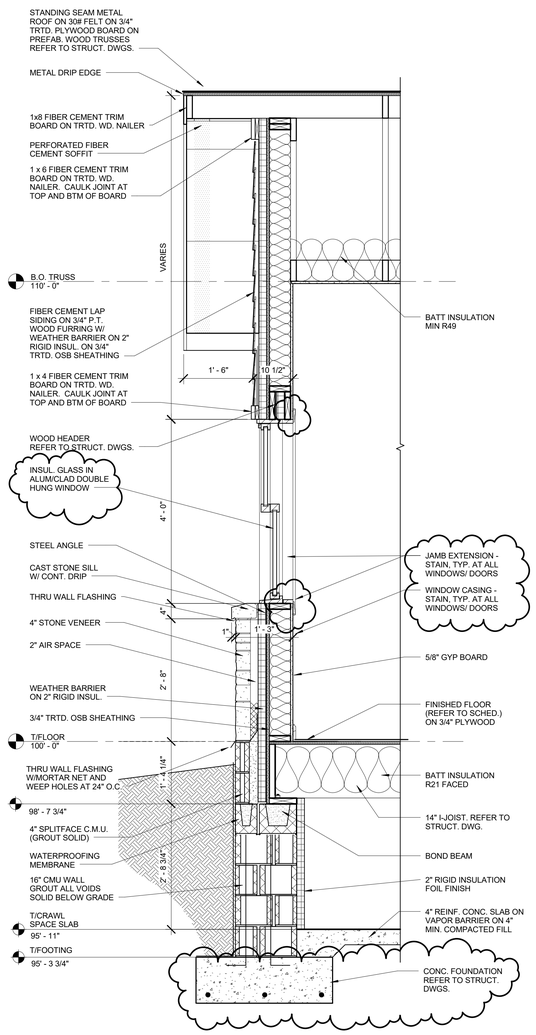
DATE: 05/12/17

SHEET NO.:
A3.1

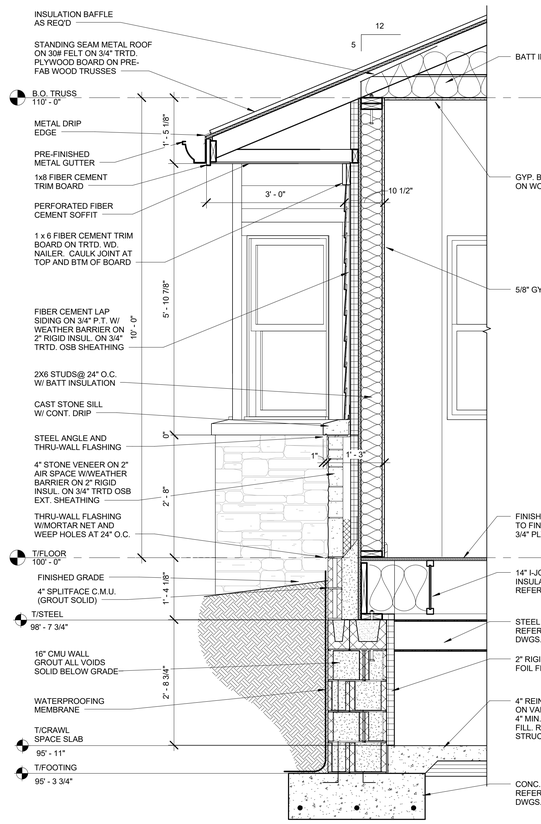
JOB NO.: 161675



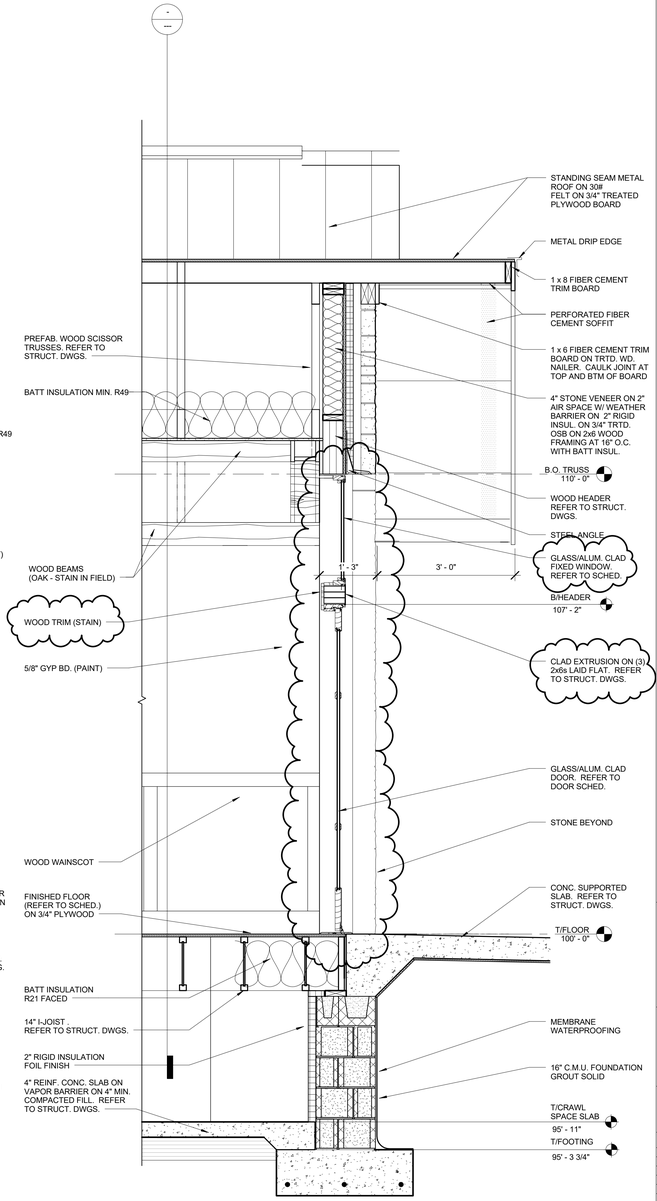
4 A5.4 WALL SECTION
3/4" = 1'-0"



3 A5.4 WALL SECTION
3/4" = 1'-0"



2 A5.4 WALL SECTION
3/4" = 1'-0"



1 A5.4 WALL SECTION
3/4" = 1'-0"

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WALL SECTIONS

PRELIMINARY	☐
DESIGN DEVELOPMENT	☐
CONSTRUCTION	■
FINAL RECORD	☐

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REVISIONS:
03/02/18 ADDENDUM 1

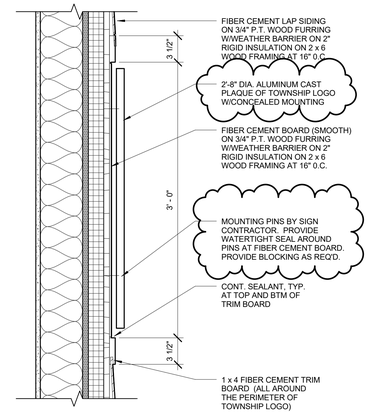
DATE: 05/25/17

SHEET NO.:
A5.4

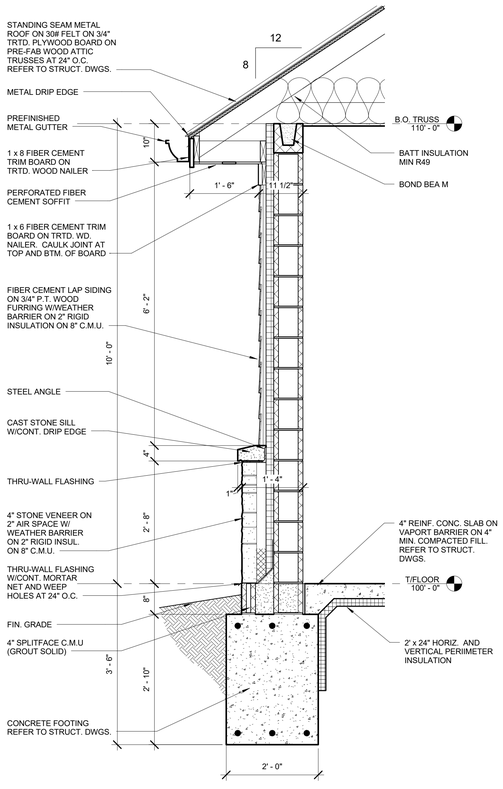
JOB NO.: 161675

ELEVATION

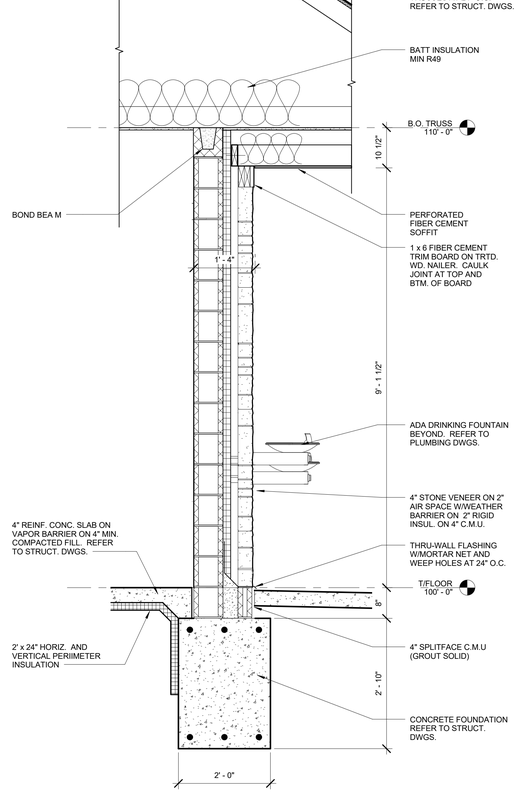
CONFIRM FINAL IMAGE WITH OWNER
PRIOR TO FABRICATION



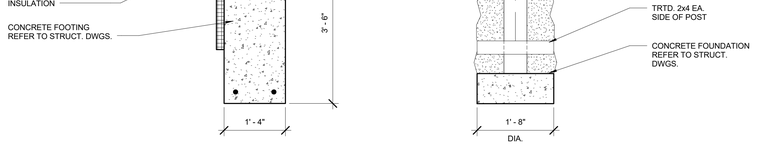
4 / A5.6 SECTION DETAIL
1 1/2" = 1'-0"



3 / A5.6 WALL SECTION
3/4" = 1'-0"



1 / A5.6 WALL SECTION
3/4" = 1'-0"



2 / A5.6 WALL SECTION
3/4" = 1'-0"

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WALL SECTIONS

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY: KAN
CHECKED BY: BS

REVISIONS:
03/02/18 ADDENDUM 1

DATE: 02/08/18

SHEET NO.:
A5.6

JOB NO.: 161675

REMARKS - DOOR SCHEDULE

1	REFER TO SPECIFICATION FOR DOOR HARDWARE FOR ALL DOORS.
2	PROVIDE INSULATED GLASS IN DOOR AND FRAME OPENINGS
3	SLIDING POCKET DOOR WITH 1/4" OPAQUE LAM. GLASS PANELS.
4	PROVIDE 1/4" LAM. GLASS IN DOOR AND FRAME OPENINGS. REFER TO SPECS.
5	REFER TO WOOD HEAD AND JAMB DETAIL 1 AND 3.
6	REFER TO WOOD HEAD AND JAMB DETAIL 1, 2 AND 3.

GENERAL DOOR NOTES:

1. ALL FRP DOOR AND ALUMINUM FRAMES TO RECEIVE MANUFACTURER FINISH. REFER TO SPECIFICATIONS.
2. ALL NEW WOOD DOORS CALLING FOR STAIN TO BE FACTORY STAINED AND SEALED ON ALL SURFACES, SIDES AND ENDS. DO NOT LEAVE RAW WOOD OIENDS EXPOSED.

ROOM FINISH SCHEDULE NOTES

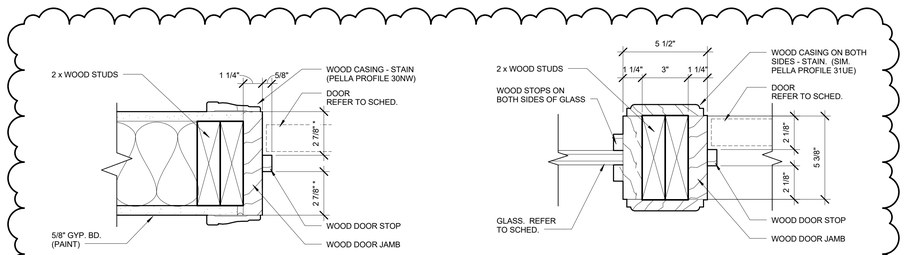
1	REFER TO INTERIOR ELEVATIONS FOR WALL MATERIALS.
2	PAINT ALL PIPES, CONDUIT, DUCTWORK, ETC. EXPOSED IN THE CEILING.
3	PROVIDE NEW WINDOW SHADES ON ALL WINDOW OPENINGS. VERIFY OPENING SIZES IN FIELD.
4	REFER TO REFLECTED CEILING PLAN FOR CEILING HEIGHTS.
5	PROVIDE 36" H. TILE ON WALL BEHIND AND ADJACENT TO THE JANITOR'S CLOSET SINK.
6	SHOWER ENCLOSURE TO HAVE FULL HEIGHT PORCELAIN TILE WALL. REFER TO INTERIOR ELEVATIONS.

ABBREVIATIONS

AL OR ALUM	ALUMINUM
CPT	CARPET
HM	HOLLOW METAL
MAR	MARBLE
PFN	PRE-FINISHED
PT	PAINTED
STN	STAINED
TG	TEMPERED GLASS
WD	WOOD

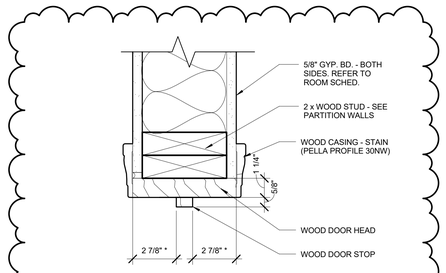
ROOM FINISH SCHEDULE ABBREVIATIONS

6PCT	6" PORCELAIN CERAMIC TILE COVE BASE
AP	ACOUSTIC WALL PANELS
CPT	CARPET - SEE SPECIFICATIONS
EP	EPOXY PAINT
ETR	EXISTING TO REMAIN
EXP	EXPOSED CONSTRUCTION
GB	GYPSUM BOARD
PCT	PORCELAIN CERAMIC TILE
PT	PAINT
RAF	RAISED ACCESS FLOORING SYSTEM
RB	4" RESILIENT COVE BASE
RF	RUBBER FLOORING
RTR	RUBBER TREADS / RISERS
VIF	VERIFY IN FIELD
VWC	VINYL WALL COVERING
WB	6" WOOD BASE (OAK - STN)
WCPT	WALK OFF CARPETING
WP	WOOD PLANKS
WW	WOOD PANELING WAINSCOT



1 A6.0 WOOD FRAME DETAIL - JAMB 3" = 1'-0"

2 A6.0 WOOD FRAME DETAIL - JAMB 3" = 1'-0"



3 A6.0 WOOD FRAME DETAIL - HEAD 3" = 1'-0"

DOOR SCHEDULE

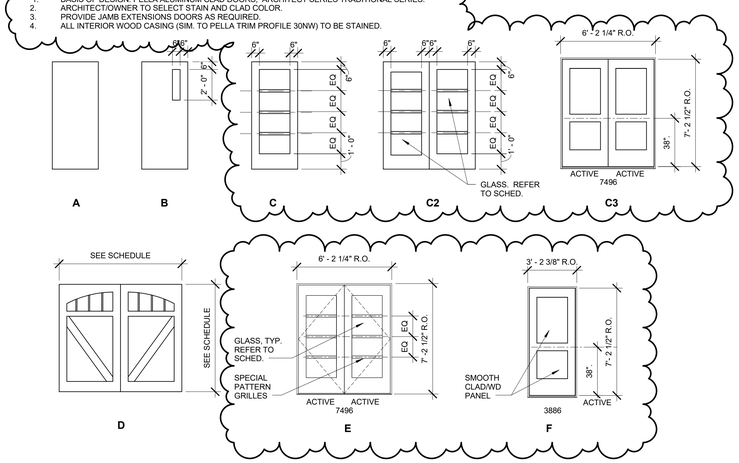
No.	DOOR WIDTH	DOOR HEIGHT	DOOR TYPE	DOOR MAT'L	DOOR FINISH	FRAME TYPE	FRAME MAT'L	FRAME FINISH	THRESHOLD	REMARKS
A100A	6'-2 1/4" R.O.	7' - 2 1/2" R.O.	C3	ALUM/WD.	PFN/STN	2	ALUM/WD	PFN/STN	ALUM	2
A100B	3'-0"	7'-0"	C	WD	STN	4	WD	STN	-	2,6
A100C	(2) @ 3'-0"	7'-0"	A	WD	STN	2	WD	STN	-	5
A101A	3'-0"	7'-0"	B	WD	STN	1	WD	STN	-	4,5
A101B	(2) @ 2'-6"	7'-0"	C2	WD	STN	1	WD	STN	-	4,5
A102A	3'-0"	7'-0"	C	WD	STN	1	WD	STN	-	4,5
A103A	3'-0"	7'-0"	A	WD	STN	1	WD	STN	-	5
A105A	3'-0"	7'-0"	A	WD	STN	1	WD	STN	1/2" MAR	5
A106A	3'-0"	7'-0"	A	WD	STN	1	WD	STN	1/2" MAR	5
A107A	3'-0"	7'-0"	A	WD	STN	1	WD	STN	-	5
A108A	3'-0"	7'-0"	A	WD	STN	1	WD	STN	1/2" MAR	5
A109A	3'-0"	7'-0"	A	WD	STN	1	WD	STN	-	5
A111A	3'-0"	7'-0"	A	WD	STN	1	WD	STN	-	5
A111B	6'-2 1/4" R.O.	7' - 2 1/2" R.O.	E	ALUM/WD.	PFN/STN	2	ALUM/WD	PFN/STN	-	2
A112A	4'-0"	7'-0"	C	WD	STN	1	WD	STN	-	3,5 SIM.
A112B	3'-0"	7'-0"	C	WD	STN	1	WD	STN	-	3,5 SIM.
A112C	6'-2 1/4" R.O.	7' - 2 1/2" R.O.	E	ALUM/WD.	PFN/STN	3	ALUM/WD	PFN/STN	ALUM	2
A113A	3'-0"	7'-0"	A	WD	STN	1	WD	PFN/STN		3,5 SIM.
A114A	3'-2 3/8" R.O.	7' - 2 1/2" R.O.	F	ALUM/WD.	PFN/STN	1	ALUM/WD	PFN/STN	ALUM	2
B100C	8'-0"	8'-0"	D	STL	PFN	-	-	PFN		
C100A	3'-0"	7'-0"	A	FRP	PFN	5	AL	PFN	ALUM	
C100B	8'-0"	8'-0"	D	STL	PFN	-	-	PFN	ALUM	
C101A	3'-0"	7'-0"	A	FRP	PFN	1B	AL	PFN	ALUM	
C102A	3'-0"	7'-0"	A	FRP	PFN	1B	AL	PFN	ALUM	
C103A	3'-0"	7'-0"	A	FRP	PFN	1B	AL	PFN	ALUM	

ROOM FINISH SCHEDULE

NO.	ROOM NAME	FLOOR	BASE	WALL	CEILING MATERIAL	CEILING HEIGHT	REMARKS
A100	VEST.	WCPT	WCPT	GB-PT	GB-PT	10'-0"	
A100A	CLOSET	CPT	CPT	GB-PT	GB-PT	10'-0"	
A101	EXHIBIT HALL	LVT	WD	GB-PT/WW	GB-PT	VARIES	1,4
A102	READING ROOM	CPT	WD	GB-PT	GB-PT	VARIES	1,3
A103	J.C.	EPT	-	GB-EP	GB-EP	10'-0"	5
A104	HALL	LVT	WD	GB-PT/WW	GB-PT	10'-0"	1
A105	MENS	PCT	6PCT	PCT/GB-PT	GB-PT	8'-0"	1
A106	WOMEN	PCT	6PCT	PCT/GB-PT	GB-PT	8'-0"	1
A107	OFFICE	CPT	WD	GB-PT	GB-PT	10'-0"	3
A108	PRIVATE TOILET	PCT	6PCT	PCT	GB-PT	10'-0"	1,3,6
A109	STORAGE	EPT	-	GB-PT	GB-PT	10'-0"	
A110	HALL	LVT	WD	GB-PT/WW	GB-PT	10'-0"	1
A111	OFFICE	CPT	WD	GB-PT	GB-PT	10'-0"	3
A112	MEETING ROOM	LVT	WD	GB-PT/WP/WW	GB-PT	VARIES	1,3,4
A113	KITCHEN	LVT	WD	GB-PT	GB-PT	10'-0"	3
A114	MECH/ELECT.	EP	-	CMU-EP	GB-PT	10'-0"	
B100	STORAGE	EP	-	CMU-EP	GB-EP	10'-0"	
C100	STORAGE	EP	-	GB-EP	GB-EP	10'-0"	
C101	MEN	EP	-	CMU-EP	GB-EP	8'-0"	1
C102	WOMEN	EP	-	CMU-EP	GB-EP	8'-0"	1
C103	STORAGE	EP	-	CMU-EP	GB-EP	10'-0"	

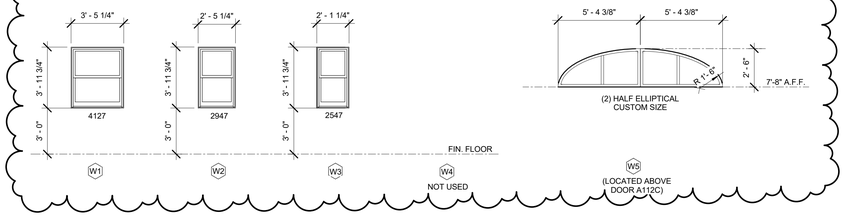
DOOR ELEVATIONS:

NOTES:
1. BASIS OF DESIGN: PELLA ALUMINUM CLAD DOORS, ARCHITECT SERIES TRADITIONAL SERIES.
2. ARCHITECT/OWNER TO SELECT STAIN AND CLAD COLOR.
3. PROVIDE JAMB EXTENSIONS DOORS AS REQUIRED.
4. ALL INTERIOR WOOD CASING (SIM. TO PELLA TRIM PROFILE 30NW) TO BE STAINED.

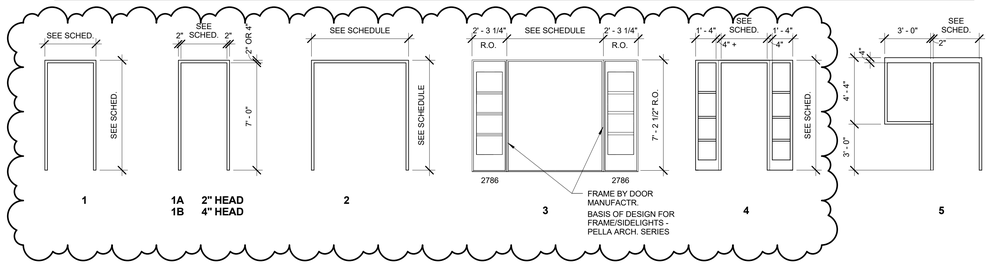


WINDOW SCHEDULE

NOTES:
1. BASIS OF DESIGN: PELLA ALUMINUM CLAD WINDOWS, DESIGNER SERIES.
2. ARCHITECT/OWNER TO SELECT STAIN AND CLAD COLOR.
3. PROVIDE JAMB EXTENSIONS FOR ALL WINDOWS.
4. ALL DIMENSIONS SHOWN BELOW ARE FOR ROUGH OPENINGS.
5. ALL INTERIOR WOOD CASING (SIM. TO PELLA TRIM PROFILE 30NX) TO BE STAINED.



FRAME ELEVATIONS:



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03/02/18 ADDENDUM 1

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SHEET NO.:
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JOB NO.: 161675