BAY MILLS INDIAN COMMUNITY
"*GNOOZHEKAANING*" PLACE OF THE PIKE

BAY MILLS TRIBAL ADMINISTRATION
12140 West Lakeshore Drive
Brimley, Michigan 49715

WEBSITE: BAYMILLS.ORG

PHONE: (906) 248-8100
FAX: (906) 248-3283

UPDATED Request for Proposals

Request for Proposals for the Construction of Houses on the Bay Mills Indian Community Reservation

The deadline has been extended. Bids are now due on Friday March 14th, 4pm EST
Additional foundation design documents will be provided as soon as possible.

The Bay Mills Indian Community is requesting proposals from qualified contractors to construct 8ea houses in the Elders Housing Development in Brimley, Michigan.

Background:
The BMIC is a federally recognized Native American Tribe that is located in the rural Eastern Upper Peninsula of Michigan on the shores of Lake Superior. The people of Bay Mills are Ojibwa (or Chippewa) and they have resided in this area for hundreds of years. BMIC was granted a federal Corporate Charter pursuant to Section 16 of the Indian Reorganization Act on June 18, 1934. BMIC is one of the four original reservations established in Michigan. There are currently 2,258 tribal members.

Project Description:
To date, 8ea homes have been developed in the Spectacle Village Elder's Housing Development.

A schematic layout for the 8ea additional houses to be constructed are shown on an attachment to this RFP (Attachment 1). Design drawings are attached to this RFP for the original 8ea houses (Attachment 2). The new additional 8ea houses would adhere to the same design except for the four following changes: the foundations would be crawl spaces adhering to Michigan Residential Building Code, the garage doors width increased to 9ft, the driveway length increased to 27ft and the garages would be 2ft wider than shown on the existing house design.

Additional Project elements
No permits are required for this project. Contractor needs to be licensed, insured and bonded.

Site Conditions
Bidders need to read the attached geotechnical report as it contains requirements for excavation, foundation construction, drainage and grading (Attachment 4). The lot is wooded, and will require tree clearing. An Autocad file containing existing surveyed grades of the area can be supplied upon request.

Scope of Work:
The successful Proposer (Contractor) shall perform the tasks listed below for this project and shall be expected to work closely with designated Tribal personnel to accomplish these goals:

Site Preparation
The contractor will be responsible for tree clearing and stump removal. The site will require fill to bring the site to grade and ensure proper drainage and stability. A culvert and driveway must be installed.

Construction Scope

- The contractor will be responsible for constructing the houses per the engineering drawings provided, with the following changes: crawlspace foundation design adhering to Michigan Residential Building Code, garage doors width increased to 9ft, driveway length increased to 27ft and widening the interior of the garages by 2ft.
- Extension of the watermain and laterals to supply the additional 8ea houses.
- Extension of the natural gas piping to supply the additional 8ea houses.
- Construction of the sanitary sewer network and lift station for the additional 8ea houses, system to mirror the original network but be independent of the original network.
- Extension of electrical service to supply the additional 8ea houses.
- Construction of roads (tie in to match existing road), curbs, driveways and sidewalks
- Extension of the fiber optic service to the additional 8ea houses.
- The site will be finish graded to match existing contours of existing adjacent yards and facilitate drainage away from all houses (fill imported to accomplish this as needed)
- Contractor responsible for survey, staking and site layout

Utilities

The contractor is responsible for coordinating installation of all utilities. Cloverland Electric Cooperative power, DTE natural gas and BMIC water and sewer are available onsite. Facilties to include construction of septic tanks, sewer service lines, and water service lines to be connected to community mains.

Proposals to construct these houses must be submitted to the Bay Mills Indian Community by ~~Friday, March 7th, 4pm EST.~~ Friday March 14th, 4pm EST

Please email proposals in PDF format to Brianna Gunka at bgunka@baymills.org . Proposals received after the deadline will not be accepted. Please contact Brianna Gunka via email or at 906-248-8125 with any questions you may have regarding this Request for Proposals or any of the requirements outlined in the scope of work to be completed.

Proposal Requirements:

Cover letter

1. Cost proposal: Please detail all costs required to assist with these services and required timelines for payments. Provide separate costs for each project as identified. This project will require BMIC Prevailing Wage Rates. Please see attachment 6.
2. Construction Schedule: Provide a detailed timeline of construction progression and expected 100% completion.
3. Indian Preference (Optional): Please provide any evidence to demonstrate that the firm is a qualified, Indian-owned enterprise, with at least 51% active ownership by a member of federally recognized Indian tribe.
4. Associations: Please provide a description of any associations with other firms or any form of subcontracting that is planned for the project. Please include pertinent information as to subcontracted firms.
5. Certifications and Licenses: Please include a copy of any pertinent licenses or certifications.
6. References: Please include a minimum of three references that can be contacted by the Owner. Provide three references of significant subcontractors as well.

7. Disclosure of Claims: Please disclose any claims, lawsuits, or formal disputes for work or services previously or currently being performed.

Evaluation Criteria

	Score Received: 1-5	Weight	Weighted Scores
Demonstrated experience with similar construction projects		15%	
Approach to successfully complete project		15%	
Schedule- timeliness and value for money		30%	
Cost- reasonableness of rate schedule and within grant budget		30%	
Successful previous work history with BMIC		5%	
Indian Preference		5%	
Total	**0**	**100%**	**0**

Ratings:	
Clearly Outstanding-Above and Beyond Expectation	5
Well qualified	4
Average	3
Weak	2
Unsatisfactory	1
Insufficient Response	0

Compensation

The proposal should provide a cost for all work associated with the provision of these services. The final cost of services may be negotiated, prior to award of the contract.

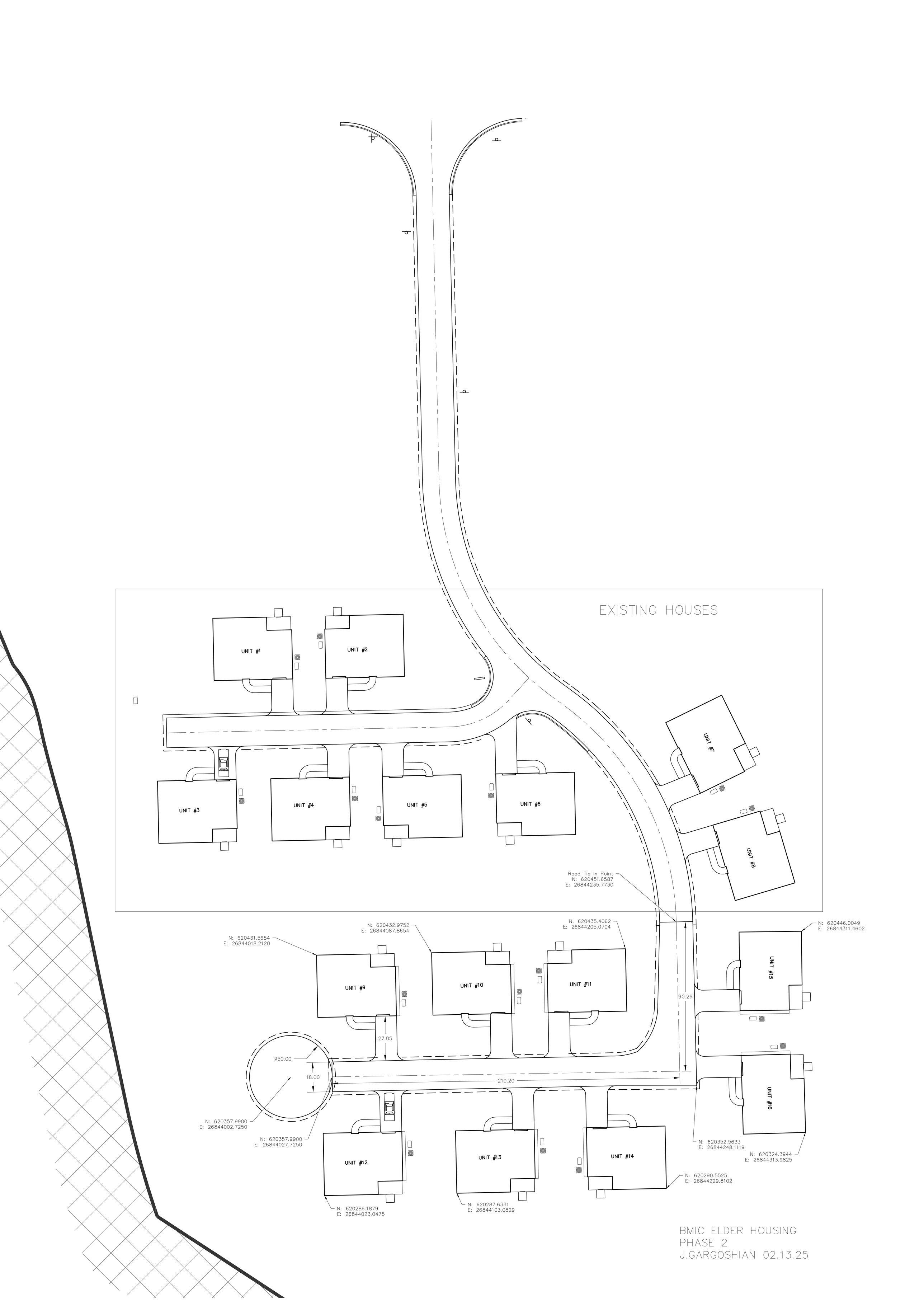
Attachments

- Site Layout for 8ea New Houses
- Design drawing set for existing houses to be used for bidding the 8ea new houses w/ 2ea changes: adding crawlspace foundation and widening garages by 2ft
- Electrical utility schematic for the existing 8ea houses for informational purposes
- Geotechnical Report for the project site
- Sample Typical Crawlspace Cross Section
- BMIC Prevailing Wage Schedule

Attachment 1

Site Layout for 8ea New Houses


W Spectacle Lake Rd
Spectacle Lake Park Rd
S Red Pine Ln
Maxar, Microsoft, Esri Community Maps Contributors, Province of Ontario, LTC, © OpenStreetMap, Microsoft, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, NRCan, Parks Canada


EXISTING HOUSES
UNIT #1
UNIT #2
UNIT #3
UNIT #4
UNIT #5
UNIT #6
UNIT #7
UNIT #8
UNIT #9
UNIT #10
UNIT #11
UNIT #12
UNIT #13
UNIT #14
UNIT #15
UNIT #16
Road Tie In Point
N: 620451.6587
E: 26844235.7730
N: 620431.5654
E: 26844018.2120
N: 620432.9752
E: 26844087.8654
N: 620435.4062
E: 26844205.0704
N: 620446.0049
E: 26844311.4602
27.05
90.26
ø50.00
18.00
210.20
N: 620357.9900
E: 26844002.7250
N: 620357.9900
E: 26844027.7250
N: 620352.5633
E: 26844248.1119
N: 620324.3944
E: 26844313.9825
N: 620290.5525
E: 26844229.8102
N: 620286.1879
E: 26844023.0475
N: 620287.6331
E: 26844103.0829
BMIC ELDER HOUSING
PHASE 2
J.GARGOSHIAN 02.13.25

WEST SPECTACLE LAKE ROAD

SB-2
SB-3
SB-4
SB-5
SB-6
SB-7
SB-8

UNIT #1
UNIT #2
UNIT #3
UNIT #4
UNIT #5
UNIT #6
UNIT #7
UNIT #8
UNIT #9
UNIT #10
UNIT #11
UNIT #12
UNIT #13
UNIT #14
UNIT #15
UNIT #16

ELDER HOUSING
PHASE 2
UTILITY LAYOUT
J.GARGOSHIAN 02.13.25

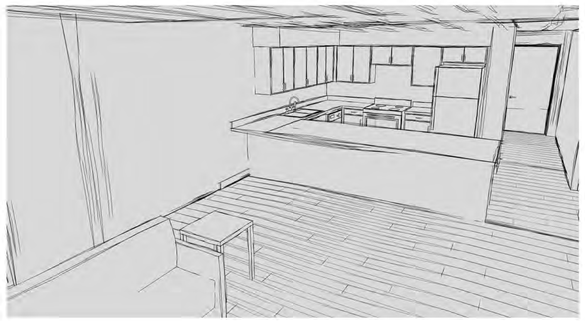
Attachment 2

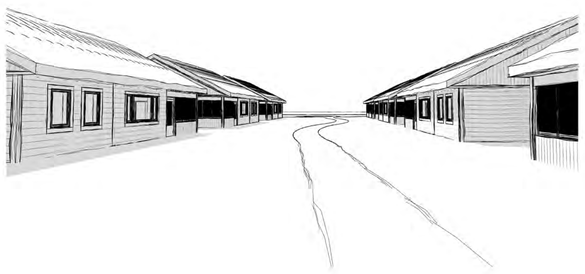
Design drawing set for existing houses to be used for bidding the 8ea new houses w/ 4ea changes: adding crawlspace foundation, widening garages by 2ft, lengthening driveways and making garage doors 9ft wide

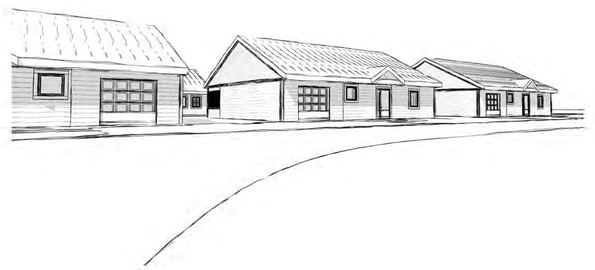
BAY MILLS INDIAN COMMUNITY

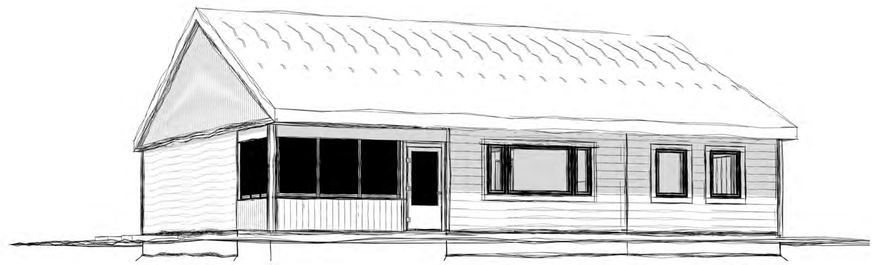
ELDERS HOUSING

Single-Family Residential Development









Vicinity map:

Location map:

ARCHITECT-OF-RECORD

SEVEN GENERATIONS ARCHITECTURE & ENGINEERING, LLC
CONTACT STEVE VANDENBUSSCHE
(269) 927-0144

OWNER:

BAY MILLS INDIAN COMMUNITY

CONTRACTOR:

T.B.D

DESIGN TEAM

ASSOCIATE ARCHITECT
BLUE STAR INTEGRATIVE STUDIO, INC
CONTACT SCOTT MOORE Y MEDINA
(918) 359-5641 EXT 641

CIVIL ENGINEERING
WBK ENGINEERING
(630) 443-7755

STRUCTURAL ENGINEERING
NEHIL-SIVAK PC
CONTACT THOMAS PALARZ
(269) 383-3111

MEP ENGINEERING
SEVEN GENERATIONS ARCHITECTURE + ENGINEERING, LLC
CONTACT STEVE VANDENBUSSCHE
(269) 927-0144

AUTHORITIES

ZONING:
- NOT REQUIRED

ENGINEERING:
MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS
(517) 241-9313

BUILDING PERMITS:
- NOT REQUIRED

FIRE:
- NOT REQUIRED

UTILITIES

GAS:
DTE GAS COMPANY
(800) 533-6220

TELEPHONE:
TBD

ELECTRIC:
CLOVERLAND ELECTRIC COOPERATIVE
(800) 562-4953

WATER/ SEWER:
TBD

PROJECT INFORMATION

SUMMARY OF WORK:

NEW, ENERGY-EFFICIENT, RESIDENTIAL CONSTRUCTION OF EIGHT 2-BEDROOM UNITS AND ASSOCIATED DRIVEWAY, SIDEWALK, LANDSCAPE, SITE AND UTILITY WORK. EACH 2-BEDROOM UNIT CONTAINS A CENTRALIZED STORAGE SHED AND ATTACHED GARAGE. SITE WORK INCLUDES GRADING, CONNECTING THE EXISTING RESIDENTIAL STREET TO THE NEW RESIDENTIAL STREET SERVING A GROUP OF 2-BEDROOM UNITS, STORMWATER MANAGEMENT SYSTEMS AND TECHNIQUES, SIDEWALKS, CURBING AND UTILITY INSTALLATION AND CONNECTIONS

ZONING

JURISDICTION: BAY MILLS INDIAN COMMUNITY
ADDRESS: 12140 W LAKESHORE DR
BRIMLEY, MI 49715

CODE SUMMARY

APPLICABLE CODES

FEDERAL:
• ADAAG
• OSHA

TRIBAL:
BAY MILLS INDIAN COMMUNITY TRIBAL ORDINANCES

STATE:
MICHIGAN RESIDENTIAL CODE 2015

LOCAL:
CHIPPEWA COUNTY, MI ORDINANCES

CODE SUMMARY

	AREA (GSF)
AREA OF SINGLE UNIT	1,012 GSF
AREA OF STORAGE	84 GSF
NEW BUILDING HEIGHT:	1 STORY
CONSTRUCTION CLASSIFICATION:	SINGLE FAMILY RESIDENTIAL
FULLY SPRINKLERED?	NO
FIRE ALARM?	YES. NEW FIRE & SMOKE DETECTION WILL BE PROVIDED. SEE ELECTRICAL

FIRE RESISTANCE RATINGS

1-HR RATING BETWEEN HOUSE AND GARAGE.

SHEET INDEX

SEVEN GENERATIONS architectur +

600 E. Michigan Ave., Suite B
Kalamazoo, MI 49007
P: 269.927.0144
www.7GenAE.com

ELDERS HOUSING
BAY MILLS INDIAN COMMUNITY
Red Pine Lane, Bay Mills Township, MI 49715
100% Design Review

95% CONSTRUCTION DOCUMENTS

ISSUE DATE:
10/23/2020

REVISIONS

PRELIMINARY
NOT FOR CONSTRUCTION

JOB NUMBER:
220046

SHEET TITLE
COVER SHEET

SHEET NO.

G001

ABBREVIATIONS

#	NUMBER
&	AND
@	AT
ACP	ACOUSTICAL CEILING PANEL
AD	ACCESS DOOR
ADJ	ADJACENT
AFF	ABOVE FINISH FLOOR
AIW	ACRYLIC IMPREGNATED WOOD
ALT	ALTERNATIVE
ALUM	ALUMINUM
ARCH	ARCHITECTURAL
ASTM	AMERICAN SOCIETY OF TESTING & MATERIALS
BCJ	BRICK CONTROL JOINT
BD	BOARD
BLDG	BUILDING
BLKG	BLOCKING
BOT	BOTTOM
BRG	BEARING
BSMT	BASEMENT
CBB	CEMENT BACKER BOARD
CI	CAST IRON
CJ	CONTROL JOINT
CLG	CEILING
CLO	CLOSET
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CPT	CARPET
CT	CERAMIC TILE
DEMO	DEMOLITION
DIA	DIAMETER
DIM	DIMENSIONS
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
EIFS	EXTERIOR INSULATE FINISH SYSTEM
EL	ELEVATION
ELEC	ELECTRIC
EQ	EQUAL
EQUIP	EQUIPMENT
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXPN	EXPANSION
EXT	EXTERIOR
FBR	FABRIC
FCU	FAN COIL UNIT
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FLR	FLOOR
FRP	FIBER REINFORCED PLASTER
FRT	FIRE RETARDENT TREATED
FT	FEET/FOOT
FTG	FOOTING
GA	GAUGE
GALV	GALVINIZED
GP	GLAZING PANEL
GWB	GYPSUM WALL BOARD
H	HIGH
HC	HOLLOW CORE
HDWR	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HR	HOUR
IN	INCH
INSUL	INSULATION
INT	INTERIOR
JAN	JANITORS
JT	JOINT
L	LONG
LVL	LEVEL
MANF	MANUFACTURER
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MDF	MEDIUM DENSITY FIBERBOARD
MDO	MEDIUM DENSITY OVERLAY
MECH	MECHANICAL
MEMB	MEMBRANE
MEP	MECHANICAL, ELECTRICAL & PLUMBING
MIN	MINIMUM
MO	MASONRY OPENING
MTL	METAL
NIC	NOT IN CONTRACT
NO	NUMBER
OC	ON CENTER
OD	OUTSIDE DIAMETER
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLUMB	PLUMBING
PLYWD	PLYWOOD
PT	PRESSURE TREATED
PTD	PAINTED
PVC	POLYVINYL CHLORIDE
QTR	QUARTER
RAD	RADIUS
RB	RESILIENT BASE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REINF	REINFORCED
REQ	REQUIRED
RM	ROOM
RO	ROUGH OPENING
SIM	SIMILAR
SQ	SQUARE
SS	STAINLESS STEEL
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPENDED
THK	THICK
THRU	THROUGH
TOF	TOP OF FOUNDATION
TOS	TOP OF STEEL
TYP	TYPICAL
UL	UNDERWRITER'S LABORATORIES
UNO	UNLESS NOTED OTHERWISE
VCT	VINYL COMPOSITE TILE
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VWC	VINYL WALL COVERING
W/	WITH
W/O	WITHOUT
WC	WALL COVERING
WD	WOOD

FILL PATTERN LEGEND

CONCRETE

CONCRETE · CEMENTITIOUS TOPPING · PRECAST CONCRETE · GROUT

MASONRY

BRICK · CAST STONE · MARBLE

CMU · SLATE · CUT STONE · SAND

METALS

STEEL · OTHER METALS · ALUMINUM

WOOD & INTERIOR

CONT. WD · INTERMITTENT WOOD · GLUE-LAM · PLYWOOD · CORK

FINISH WOOD · HARD BOARD · SOLID SURFACE · GYPSUM WALL BOARD · PARTICLE BOARD

THERMAL & MOISTURE

BATT / BLOWN INSUL. · LOOSE FILL INSULATION · RIGID INSULATION · SEALANT & BACKER ROD · SEALANT & COMPRESSIBLE MATERIAL

OPENINGS

GLASS · PLASTIC GLAZING

SITE

EARTH · BASE COURSE · BACKFILL · GRANULAR FILL · DRAINAGE FILL

GRAPHIC SYMBOLS

LEVEL INDICATOR

ROOM TAG (NAME / 101)

WALL TAG

DOOR TAG

WINDOW TAG

CEILING TAG (12'-0" A.F.F.)

EXISTING DOOR

NEW DOOR

SECTIONS — SECTION NUMBER; SHEET NUMBER WHERE SECTION IS LOCATED

ELEVATIONS — ELEVATION NUMBER; SHEET NUMBER WHERE ELEVATION IS LOCATED

ELEVATIONS (INTERIOR) — ELEVATION NUMBER (A909); SHEET NUMBER WHERE ELEVATION IS LOCATED

DETAILS — DETAIL NUMBER; SHEET NUMBER WHERE DETAIL IS LOCATED

CLIMATE DATA

CLIMATE ZONE: XXX PER FIGURE C301.1

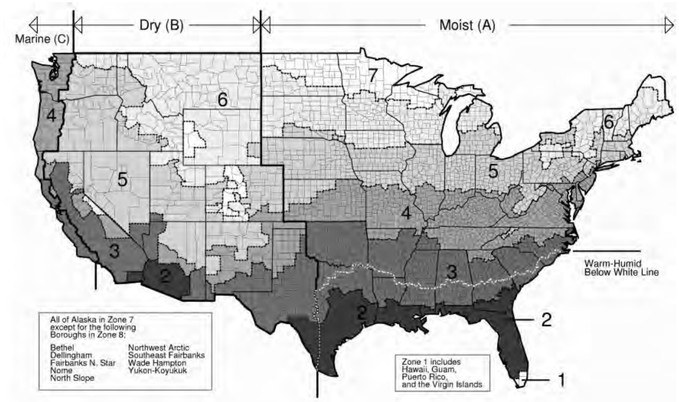


TABLE N1101.10.2(2) [R301.3(2)]
CLIMATE ZONE DEFINITIONS

ZONE NUMBER	THERMAL CRITERIA	
	IP UNITS	SP UNITS
7	9000 < HDD65°F ≤ 12600	5000 < HDD18°C ≤ 7000

ENERGY & INSULATION REQUIREMENTS

TABLE N1102.1.1 (R402.1.1)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[g]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
7	0.32	0.55	49	20 OR 13 + 5[f]	19/21	38[e]	15/19	10, 4 FT	15/19

a. R-VALUES ARE MINIMUMS. U-FACTORS ARE MAXIMUMS. WHEN INSULATION IS INSTALLED IN A CAVITY WHICH IS LESS THAN THE LABEL OR DESIGN THICKNESS OF THE INSULATION, THE INSTALLED R-VALUE OF THE INSULATION SHALL NOT BE LESS THAN THE R-VALUES SPECIFIED IN THE TABLE.
b. THE FENESTRATION U-FACTOR COLUMN EXCLUDES SKYLIGHTS.
c. "15/19" MEANS R-15 CONTINUOUS INSULATION ON THE INTERIOR OR EXTERIOR OF THE HOME OR R-19 CAVITY INSULATION AT THE INTERIOR OF THE BASEMENT WALL. "15/19" MAY BE MET WITH R-13 CAVITY INSULATION ON THE INTERIOR OF THE BASEMENT WALL PLUS R-5 CONTINUOUS INSULATION ON THE INTERIOR OR EXTERIOR OF THE HOME. "10/13" MEANS R-10 CONTINUOUS INSULATION ON THE INTERIOR OR EXTERIOR OF THE HOME OR R-13 CAVITY INSULATION AT THE INTERIOR OF THE BASEMENT WALL.
d. R-5 SHALL BE ADDED TO THE REQUIRED SLAB EDGE R-VALUES FOR HEATED SLABS.
e. OR INSULATION SUFFICIENT TO FILL THE FRAMING CAVITY, R-19 MINIMUM.
f. FIRST VALUE IS CAVITY INSULATION, SECOND IS CONTINUOUS INSULATION OR INSULATED SIDING, SO "13 + 5" MEANS R-13 CAVITY INSULATION PLUS R-5 CONTINUOUS INSULATION OR INSULATED SIDING. IF STRUCTURAL SHEATHING COVERS 40% OR LESS OF THE EXTERIOR, CONTINUOUS INSULATION R-VALUE MAY BE REDUCED BY NO MORE THAN R-3 IN THE LOCATIONS WHERE STRUCTURAL SHEATHING IS USED - TO MAINTAIN A CONSISTENT TOTAL SHEATHING THICKNESS.
g. THE SECOND R-VALUE APPLIES WHEN MORE THAN HALF THE INSULATION IS ON THE INTERIOR OF THE MASS WALL.

GENERAL NOTES

1. **INTENT**
CONTRACTOR SHALL MAKE SURE THAT THE INTENT OF THE DRAWINGS IS MET. ACTUAL CONDITIONS SHALL GOVERN OVER WRITTEN DIMENSIONS. WRITTEN DIMENSIONS SHALL GOVERN OVER ACTUAL DRAWING REPRESENTATION, ATTEMPTS TO UTILIZE SCALING OR ELECTRONIC MEANS TO DETERMINE QUANTITY TAKE-OFF MAY BE AFFECTED BY NOT-TO-SCALE ITEMS. THE ARCHITECT AND CONSULTING ENGINEERS ARE NOT RESPONSIBLE FOR, AND SHALL NOT BE HELD LIABLE FOR THE ACCURACY OF RESULTS OF SUCH TAKE-OFFS.

2. **GOVERNING CODE**
ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2015 MRC, INCLUDING REFERENCES TO FIRE CODES THEREIN, AND LOCAL CODES, LAWS, REGULATIONS, AND ORDINANCES. THE GENERAL CONTRACTOR SHALL MAINTAIN A COPY OF THE ABOVE DOCUMENTS AT THE SITE. ADDITIONALLY, ALL ASPECTS OF THE AMERICANS WITH DISABILITIES ACT SHALL BE FOLLOWED ON THIS PROJECT.

3. **OWNER OCCUPANCY**
THE BUILDING AND SITE WILL BE OCCUPIED DURING CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN THE OWNER'S APPROVAL AND COORDINATE AND SCHEDULE IN ADVANCE WITH THE OWNER ALL WORK THAT MAY AFFECT THE OWNER'S OPERATIONS. SUCH WORK INCLUDES DELIVERIES, STORAGE OF MATERIALS, STAGING OPERATIONS, INTERIOR WORK INCLUDING REMOVAL AND REPLACEMENT INTERIOR FINISHES AND WORK ABOVE THE CEILINGS, INTERRUPTIONS IN POWER, AIR CONDITIONING AND HEATING, AND SIMILAR WORK. IF NECESSARY TO ACCOMMODATE THE OWNER'S SCHEDULE, SOME OUTAGES MAY NEED TO BE SCHEDULED AFTER HOURS OR ON WEEKENDS. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

4. **MEASUREMENTS & EXISTING CONDITIONS**
DIMENSIONS ARE FROM FACE OF FRAMING LAYER TO FACE OF FRAMING LAYER UNLESS NOTED OTHERWISE. INFORMATION CONTAINED IN THESE DOCUMENTS IS BASED ON EXISTING DOCUMENTS AND FIELD MEASUREMENTS. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND ALL MEASUREMENTS AT THE BUILDING AND SHALL BE RESPONSIBLE FOR CORRECTNESS OF SAME. WHERE CONFLICTS OCCUR BETWEEN THE DOCUMENTS AND THE EXISTING CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT FOR RESOLUTION OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. IF THE CONTRACT ENCOUNTERS MATERIAL SUSPECTED MATERIAL SUSPECTED OF CONTAINING HAZARDOUS SUBSTANCES HE SHALL STOP WORK AND NOTIFY THE ARCHITECT AND OWNER IMMEDIATELY.

5. **DEMOLITION**
DEMOLITION INCLUDES CONTROLLED DESTRUCTION OF EXISTING CONSTRUCTION AND THE REMOVAL AND DISPOSAL OF DEMOLISHED MATERIALS AS SHOWN ON THE DRAWINGS AND/OR INCLUDED IN THESE NOTES. DEMOLITION SHALL BE PERFORMED IN SECTIONS SMALL ENOUGH SO AS NOT TO ENDANGER ANY ADJACENT MATERIALS OR FACILITIES TO REMAIN IN PLACE. PROVIDE ADEQUATE SHORING, BRACING, AND PROTECTION TO PREVENT MOVEMENT, SETTLEMENT, COLLAPSE, OR DAMAGE TO EXISTING MATERIALS OR FACILITIES WHICH ARE TO REMAIN. CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR REVIEW AND ACCEPTANCE, PRIOR TO BEGINNING THE WORK, COMPLETE DETAILS OF SHORING PROCEDURES SIGNED BY A REGISTERED PROFESSIONAL ENGINEER. PROMPTLY REPAIR ALL DAMAGES CAUSED BY THE DEMOLITION TO ADJACENT FACILITIES OR MATERIALS AT NO COST TO THE OWNER.

6. **CUTTING & PATCHING OF THE WORK**
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING, FITTING, AND PATCHING THAT MAY BE REQUIRED TO COMPLETE THE WORK AND MAKE ITS SEVERAL PARTS FIT TOGETHER TO ACHIEVE THE PROFESSIONAL QUALITY OF NEW WORK. WHERE EXISTING CONSTRUCTION IS DISTURBED, THE AFFECTED AREA SHALL BE REPLACED AND REPAIRED WITH MATCHING MATERIALS AND FINISHES AND BLENDED WITH EXISTING WORK. WHERE PAINT CANNOT BE TOUCHED UP TO MATCH, REPAINT ENTIRE SURFACE. HOLES CUT IN SURFACES, NEW OR EXISTING, SHALL BE CORED OR DRILLED FIRST AT ALL CORNERS TO ELIMINATE OVERCUTTING. AS AN OPTION, IF CUTTING TOOLS ARE AVAILABLE THAT ELIMINATE OVERCUTTING THEY MAY BE USED. OVERCUTTING AND PATCHING WILL NOT BE ACCEPTED.

7. **TEMPORARY FACILITIES**
THE OWNER WILL PROVIDE UTILITIES AVAILABLE FROM THE EXISTING BUILDING FOR USE BY THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE TEMPORARY TOILET FACILITIES FOR THE WORKMEN AND SHALL MAKE ADDITIONAL PROVISIONS IF REQUIRED TO ACCOMPLISH THE WORK. AT THE COMPLETION OF CONSTRUCTION AND BEFORE REQUEST FOR FINAL PAYMENT, ALL EXISTING FACILITIES USED BY THE CONTRACTOR SHALL BE CLEANED AND RESTORED TO ORIGINAL CONDITION TO THE OWNER'S SATISFACTION.

8. **TEMPORARY CONSTRUCTION BARRIERS**
THE CONTRACTOR WILL COMPLY WITH THE OWNER'S AND LOCAL JURISDICTION'S REQUIREMENTS FOR ERECTION OF NON-COMBUSTIBLE SAFETY BARRICADES FOR PROTECTION OF PEOPLE AND PROPERTY AT AND AROUND ALL WORK AREAS. PAINT WITH APPROPRIATE COLORS, GRAPHICS, AND WARNING SIGNS TO INFORM PERSONNEL AND THE PUBLIC OF THE HAZARD BEING PROTECTED AGAINST. THE CONTRACTOR MUST MAINTAIN ACCESS TO ALL EXITS AND MAINTAIN REQUIRED EGRESS PASSAGE WIDTHS THROUGHOUT THE DEMOLITION AND CONSTRUCTION PERIOD. THE EGRESS PASSAGE MAY NOT BE USED AS A PATHWAY TO TRANSPORT MATERIALS TO AND FROM THE AREA OF WORK WHILE THE BUILDING IS OCCUPIED.

9. **FIELD COORDINATION**
CONTRACTOR SHALL COORDINATE BUILDING ACCESS NECESSARY TO PERFORM THE WORK WITH THE OWNER'S REPRESENTATIVE. CONTRACTOR SHALL PROTECT THE SPACE AND EQUIPMENT THAT IS OUTSIDE OF THE SPECIFIC AREA OF WORK FROM DAMAGE. SHOULD ANY DAMAGE OCCUR, CONTRACTOR SHALL REPAIR TO THE OWNER'S SATISFACTION AT NO ADDITIONAL COST TO THE OWNER.

10. **WORK EXECUTION**
ALL MATERIALS AND PRODUCTS ARE TO BE MANUFACTURED, ASSEMBLED, AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, REQUIREMENTS, AND SHOP DRAWINGS. THE CONTRACTOR AGREES TO TAKE ALL NECESSARY SAFETY PRECAUTIONS AS REQUIRED BY FEDERAL, TRIBAL, STATE AND LOCAL AUTHORITIES TO PROTECT PEDESTRIAN AND VEHICULAR TRAFFIC IN THE CONSTRUCTION AREA, WHICH INCLUDES, BUT IS NOT LIMITED TO: MAINTAINING ADEQUATE WARNING SIGNS, BARRICADES, LIGHTS, GUARD FENCES, WALKS AND BRIDGES.

11. **CLEANING**
THE WORK SITE MUST BE KEPT CLEAN OF CONSTRUCTION DEBRIS AND DISCARDED PACKAGING MATERIAL. THE CONTRACTOR SHALL ARRANGE FOR HIS OWN TRASH CONTAINERS AND THEIR REMOVAL. LOCATION OF THE CONTAINERS MUST BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. ALL WORK SHALL BE THOROUGHLY CLEANED AND POLISHED BEFORE FINAL INSPECTION. CLEANING MUST BE APPROVED BY THE OWNER PRIOR TO FINAL ACCEPTANCE.

12. **PRICING**
THE GENERAL CONTRACTOR SHALL PROMPTLY NOTIFY THE ARCHITECT AND OWNER FOR CLARIFICATION OF ANY AMBIGUITY OR INCONSISTENCY WHICH HE MAY DISCOVER UPON EXAMINATION OF THE CONSTRUCTION DOCUMENTS OR THE SITE AND EXISTING CONDITIONS PRIOR TO SUBMITTING HIS PRICE. THE GENERAL CONTRACTOR, BY MAKING HIS BID, REPRESENTS THAT:

1. HE HAS READ AND UNDERSTANDS THE DOCUMENTS AND HIS BID IS MADE IN ACCORDANCE THEREWITH.
2. HE HAS VISITED THE SITE, HAS FAMILIARIZED HIMSELF WITH THE SITE AND JOB CONDITIONS AND JURISDICTIONAL REQUIREMENTS UNDER WHICH THE WORK IS TO BE PERFORMED AND HAS CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
3. HIS PRICE IS BASED UPON THE MATERIALS, SYSTEMS, AND EQUIPMENT REQUIRED BY THE BIDDING DOCUMENTS WITHOUT EXCEPTION. THE GENERAL CONTRACTOR SHALL CONTACT THE OWNER'S REPRESENTATIVE TO MAKE AN APPOINTMENT TO VISIT THE SITE. FAILURE TO VISIT THE SITE WILL NOT RELIEVE THE GENERAL CONTRACTOR OF THE OBLIGATION TO FURNISH ALL MATERIAL AND LABOR NECESSARY TO CARRY OUT THE PROVISIONS OF THE CONTRACT DOCUMENTS AND TO COMPLETE THE WORK FOR THE CONSIDERATION SET FORTH IN HIS BID. THE OWNER'S REPRESENTATIVE IS JASON MCBRIDE AND HIS PHONE NUMBER IS 918-287-5312.

13. **SHOP DRAWINGS & SUBMITTALS**
SUBMIT SHOP DRAWINGS AND PRODUCT DATA TO THE ARCHITECT AS INDICATED IN EACH SECTION OF THE SPECIFICATIONS, OR AS LISTED BELOW. NEITHER THE SPECIFICATIONS, NOR THE LIST BELOW SHALL PRECLUDE THE VALIDITY OF EITHER. SHOP DRAWINGS, PRODUCT DATA, WARRANTIES, OPERATION AND MAINTENANCE MANUALS, QUALIFICATIONS, AND OTHER REQUIRED APPLICABLE INFORMATION FOR A SINGLE SPECIFICATION SECTION SHALL BE CONSOLIDATED INTO ONE SUBMITTAL OR AS FEW SUBMITTALS AS ECONOMICALLY POSSIBLE. SHOP DRAWINGS SHALL BE SUFFICIENT IN SCALE AND DETAIL TO INDICATE MATERIALS, METHODS OF FABRICATION, JOINTS, AND GENERAL CONFIGURATION. WORK SHALL NOT COMMENCE ON EACH ITEM UNTIL THE OWNER HAS APPROVED THE SUBMITTAL.
- DOORS, FRAMES, SIDELITES, & HARDWARE
- ALUMINUM FRAMED ENTRANCES & SIDELITES
- TUBULAR DAYLIGHTING DEVICES
- WINDOWS
- GLAZING
- PAINT COLORS AND CUT SHEETS ON PRODUCT DATA
- INTERIOR TILE
- WINDOW BLINDS
- ROOF SHINGLES AND TRIM
- EXTERIOR SIDING AND TRIM
- CABINET FACES AND PULLS
- BASE TRIM WITH FINISH OPTIONS
- MECHANICAL EQUIPMENT
- ELECTRICAL EQUIPMENT
- PLUMBING FIXTURES
- LIGHT FIXTURES
- SIGNAGE

14. **REMOVAL & DISPOSAL**
THE OWNER HAS THE OPTION OF KEEPING OR SALVAGING ITEMS WITH THE RIGHT OF FIRST REFUSAL. OTHERWISE, THE CONTRACTOR SHALL PROMPTLY REMOVE ANY CONSTRUCTION DEBRIS FROM THE PROJECT SITE AS IT IS PRODUCED. WASTE MATERIALS SHALL BE REMOVED IN A MANNER WHICH PREVENTS INJURY OR DAMAGE TO PERSONS, ADJOINING PROPERTIES AND THE PUBLIC RIGHTS-OF-WAY. PLACE IN LARGE COLLECTION CONTAINERS, AND DEPOSIT OFF OF THE OWNER'S PROPERTY IN A LEGAL DUMP UNLESS OTHERWISE INSTRUCTED. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE DISPOSING OF ALL WASTE. THE TERM "REMOVE" USED IN THE CONSTRUCTION DOCUMENTS INCLUDES THE DISPOSAL OF SAID MATERIAL IN ACCORDANCE WITH THE SPECIFICATIONS.

15. **COORDINATION**
THE CONTRACTOR SHALL NOTIFY HIS SUBCONTRACTORS OF ANY WORK ON THE ARCHITECTURAL SHEETS/SPECIFICATIONS NOT SHOWN ON THE LANDSCAPE, CIVIL, STRUCTURAL, MECHANICAL, ELECTRICAL OR PLUMBING SHEETS/SPECIFICATIONS AND VISA-VERSA.

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ISSUE DATE:
10/23/2020

REVISIONS

PRELIMINARY
NOT FOR CONSTRUCTION

JOB NUMBER:
220046

SHEET TITLE
GENERAL NOTES

SHEET NO.
G002

SPECIFICATIONS TABLE OF CONTENTS

DIVISION 03 - CAST-IN-PLACE CONCRETE

1 CAST-IN-PLACE CONCRETE

1. CONCRETE FLOOR FINISH APPLICATIONS

a. GENERAL
  i. Section Includes:
    1. Structural Concrete
    2. Concrete Reinforcing and Connection Steel
    3. Clear Coating:
    4. Polished Finish:

b. PRODUCTS
  i. STRUCTURAL CONCRETE
    1. Material Properties:
      a.

Name	f'c @ 28 days	Max. W/C	Air +/- 1.5%
Spread Footings	3,000 psi	0.58	No test
Cst-in-place walls	4,000 psi	0.44	6.0
Slab-on-grade Interior	4,000 psi	0.44	No test
Slab-on-grade Exterior	4,000 psi	0.44	6.0

    2. Application
      a. Provide a ¾" chamfer on all exposed corners of concrete. Top edge walls may be tooled
      b. Provide control joins as shown noted on drawings.
  ii. CONCRETE REINFORCING AND CONNECTION STEEL
    1. Material Properties:
      a.

Name	Fy	ASTM
Welded Bars	60,000	A706
	Or 60,000	A615
	Or 40,000	A615
#3	40,000	A615
#4 and larger	60,000	A615
W.W.F	65,000	A815

    2. Application
      a. Where shown hooked, provide standard 90 deg bar hooks unless otherwise noted on drawings
      b. When reinforcing is lap spliced, provide Class B splice, typical, unless otherwise noted.
    3. Protection for Reinforcement
      a. The minimum concrete protection for reinforcement shall be per ACI 318 Section 7.7.
  iii. COATINGS
    1. Concrete Stain or Dye: Translucent, penetrating compound for interior or exterior use; must be finished with a topical sealer.
    2. High Gloss Clear Coating: Transparent, non-yellowing, water- or solvent-based coating.
      a. Composition: Acrylic polymer-based.
  iv. POLISHED CONCRETE SYSTEM
    1. A. Polished Concrete System: Materials, equipment, and procedures designed and furnished by a single manufacturer to produce dense polished concrete of the specified sheen.
    2. Basis of design Manufacturer or equal: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the Following:
      a. **PROSOCO, inc.**

c. EXECUTION
  i. Apply materials in accordance with manufacturer's instructions.
  ii. POLISHED CONCRETE Coefficient of Friction: Greater than 0.60 dry, Greater than 0.60 wet when tested in accordance with ASTM C1028.
  iii. COATING APPLICATION
    1. Verify that surface is free of previous coatings, sealers, curing compounds, water repellents, laitance, efflorescence, fats, oils, grease, wax, soluble salts, residues from cleaning agents, and other impediments to adhesion.
    2. Protect adjacent non-coated areas from drips, overflow, and overspray; immediately remove excess material.
    3. Apply coatings in accordance with manufacturer's instructions, matching approved mockups for color, special effects, sealing and workmanship.
  iv. CONCRETE POLISHING
    1. Execute using materials, equipment, and procedures specified by manufacturer, using manufacturer approved installer.

DIVISION 06 - WOOD, PLASTICS AND COMPOSITES

1 ROUGH CARPENTRY

1. WOOD FRAMING

a. GENERAL
  i. Section Includes
    1. Dimension lumber framing.
    2. Timber.
    3. Engineered wood products
      a. Laminated-veneer lumber.
      b. Parallel-strand lumber.
      c. Rim boards.
    4. Wood preservative treated lumber
    5. Miscellaneous lumber.
    6. Fasteners
  ii. STANDARDS
    1. DIMENSIONAL LUMBER FRAMING
      a. Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship"
      b. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the
      c. ALSC Board of Review to inspect and grade lumber under the rules indicated.
        i. Factory mark each piece of lumber with grade stamp of grading agency.
        ii. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
        iii. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
        iv. Provide dressed lumber, S4S, unless otherwise indicated on Contract Drawings.
      d. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated on Contract Drawings.
    2. Engineered Wood Products: Provide engineered wood products acceptable to
      a. authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
      b. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

b. PRODUCTS
  i. DIMENSION LUMBER FRAMING
    1. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 3 grade.
      a. Application: Interior partitions not indicated as load-bearing.
      b. Species:
        i. Mixed southern pine; SPIB.
        ii. Hem-fir; WCLIB, or WWPA.
        iii. Western woods; WCLIB or WWPA.
        iv. Spruce-Pine-Fir No. 2
    2. Load-Bearing Partitions: No. 2 grade.
      a. Application: Exterior walls and interior load-bearing partitions.
      b. Species:
        i. Douglas fir-south; WWPA.
        ii. Spruce-Pine-Fir No. 2
    3. C. Joists, Rafters, and Other Framing: No. 2 grade.
      a. Species:
        i. Southern Pine No. 1, SPIB
    4. Exposed Framing: Provide material hand-selected for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.
      a. Application: Exposed exterior and interior framing indicated to receive a stained or natural finish.
      b. Species and Grade: Western Cedars No. 2.
  ii. TIMBER FRAMING
    1. Provide timber framing complying with the following requirements, according to grading rules of grading agency indicated:
      a. Species and Grade: Western Cedars No. 2.
      b. Maximum Moisture Content: 20 percent.
      c. Additional Restriction: Free of heart centers.
      d. Tongue and groove decking – Western Cedars no.2.
  iii. ENGINEERED WOOD PRODUCTS
    1. Engineered Wood Products, General: Products shall contain no urea formaldehyde and comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources
      a. Using Small-Scale Environmental Chambers."
    2. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.
    3. Laminated-Veneer Lumber:
      a. Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
      b. Basis of design Manufacturers or equal: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the
      c. Following:
        i. Boise Cascade Corporation.
        ii. Jager Building Systems Inc.
        iii. Louisiana-Pacific Corporation.
        iv. Weyerhaeuser Company.
      d. Extreme Fiber Stress in Bending, Edgewise: 2,6000 PSI
      e. Modulus of Elasticity, Edgewise: 1,900,000 PSI
    4. Parallel-Strand Lumber:
      a. Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
      b. Basis of design or equal Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the
      c. Following:
        i. Louisiana-Pacific Corporation.
        ii. Weyerhaeuser Company.
      d. Extreme Fiber Stress in Bending, Edgewise: 2,900 psi for 12-inch nominal-depth members.
      e. Modulus of Elasticity, Edgewise: 2,000,000 psi.
    5. Rim Boards:
      a. Product designed to be used as a load-bearing member and to brace wood rafters at bearing ends.
      b. Material: All-veneer product glued-laminated wood or product made from any combination solid lumber, wood strands, and veneers.
      c. Thickness: As specified on Contract Drawings.
      d. Provide performance-rated product complying with APA PRR-401, rim board or rim board plus grade, factory marked with APA trademark indicating thickness, grade, and compliance with APA standard.
  iv. WOOD-PRESERVATIVE-TREATED LUMBER
    1. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
      a. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
      b. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
    2. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
      a. Do not use material that is warped or that does not comply with requirements for untreated material.
    3. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
      a. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.
    4. Application: Treat items indicated on Contract Drawings, and the following:
      a. Wood cants, nailers, curbs, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
      b. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
      c. Wood framing and furring attached directly to masonry or concrete walls.
      d. Wood floor plates that are installed over concrete slabs-on-grade.
  v. MISCELLANEOUS LUMBER
    1. A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other
    2. construction, including the following:
      a. 1. Blocking.
      b. 2. Nailers.
      c. 3. Cants.
      d. 4. Furring.
      e. 5. Grounds.
    3. B. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber and any of the following species:
      a. Hem-fir (north); NLGA.
      b. Mixed southern pine; SPIB.
      c. Spruce-pine-fir; NLGA.
      d. Hem-fir; WCLIB or WWPA.
      e. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
      f. Western woods; WCLIB or WWPA.
      g. Northern species; NLGA.
      h. Eastern softwoods; NeLMA.
    4. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
      a. Mixed southern pine; No. 2 or 3 grade; SPIB.
      b. Eastern softwoods; No. 2 or 2 Common grade; NeLMA.
      c. Northern species; No. 2 or 3 Common grade; NLGA.
      d. Western woods; Construction, No. 2 Common, Standard or No. 3 Common grade; WCLIB or WWPA.
    5. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
    6. For furring strips for installing finishes or paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.
  vi. FASTENERS
    1. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
    2. Where rough carpentry is exposed to weather, in wet or damp locations, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153 or of Type 304 stainless steel.
    3. Nails, Brads, and Staples: ASTM F 1667.
    4. Power-Driven Fasteners: NES NER-272.
    5. Wood Screws: ASME B18.6.1.
    6. Lag Bolts: ASME B18.2.1.
    7. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
  vii. MISCELLANEOUS MATERIALS
    1. A. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's
    2. standard widths to suit width of sill members indicated.
    3. B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl
    4. rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum
    5. foil, or unbonded polyolefin to produce an overall thickness of not less than 0.025 inch.
    6. C. Adhesives for Gluing Furring and sleepers to Concrete or Masonry: Formulation complying with
    7. ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
      a. 1. Adhesives shall have a VOC content of 70g/L or less when calculated according to
    8. 40 CFR 59, Subpart D (EPA Method 24).
    9. A. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-
    10. propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active
    11. Ingredient.

2. WOOD CONNECTORS, ANCHORS AND ACCESSORIES

a. GENERAL
  i. Section Includes:
    1. Wood Connectors
b. PRODUCTS
  i. WOOD CONNECTORS
    1. Basis-of-Design Product or equal: Subject to compliance with requirements, provide product indicated on Contract Drawings or approved shop drawings or comparable approved product by one of the following:
      a. Simpson Strong-Tie Co., Inc.
      b. Cleveland Steel Specialty Co.
      c. KC Metals Products, Inc.
      d. Phoenix Metal Products, Inc.
      e. USP Structural Connectors.
    2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of basis-of-design products.
    3. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
    4. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 coating designation.
      a. Use for interior locations unless otherwise indicated.
    5. Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A 653; Structural Steel (SS), high- strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
      a. Use for wood-preservative-treated lumber and where indicated.
    6. Stainless-Steel Sheet: ASTM A 666, Type 304.
      a. Use for exterior locations and where indicated.
    7. Roof Truss Bracing/Spacers: U-shaped channels, 1-1/2 inches wide by 1 inch deep by 0.040 inch thick, made to fit between two adjacent trusses and accurately space them apart, and with tabs having metal teeth for fastening to trusses.
  ii. 1.6 MISCELLANEOUS MATERIALS
    1. Galvanizing Repair Paint: SSPC-Paint 20, with dry film containing a minimum of 94 percent zinc dust by weight.
    2. Protective Coatings: SSPC-Paint 22, epoxy-polyamide primer or SSPC-Paint 16, coaltar epoxy-polyamide paint.

2 STRUCTURAL SHEATHING

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REVISIONS

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER: 220046

SHEET TITLE
SPECIFICATIONS

SHEET NO.
G003

1. WOOD PANEL PRODUCTS

a. GENERAL
  i. Section Includes:
    1. Plywood Wall Sheathing
    2. Preservative-treated plywood wall sheathing
    3. Plywood Roof Sheathing
    4. Shear Wall Panels
    5. Plywood Backing Panels
    6. Fasteners
    7. Miscellaneous materials
  ii. STANDARDS
    1. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated on Contract Drawings.
    2. Oriented Strand Board: DOC PS 2.
    3. Thickness: As needed to comply with requirements specified, but not less than
    4. thickness indicated on Contract Drawings.
    5. Factory mark panels to indicate compliance with applicable standard.

b. PRODUCTS
  i. 2.2 PLYWOOD WALL SHEATHING
    1. Plywood Wall Sheathing: As specified on Contract Drawings.
      a. Span Rating: Not less than 24/0.
      b. Nominal Thickness: As specified on Contract Drawings.
    2. Oriented-Strand-Board Wall Sheathing (Possible substitution) : As specified on Contract Drawings.
      a. Span Rating: Not less than 24/0.
      b. Nominal Thickness: As specified on Contract Drawings.
  ii. 2.1 PRESERVATIVE-TREATED PLYWOOD WALL SHEATHING
    1. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
      a. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
    2. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
    3. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.
  iii. PLYWOOD ROOF SHEATHING
    1. Plywood Roof Sheathing: As specified on Contract Drawings.
      a. Span Rating: As specified on Contract Drawings.
      b. Nominal Thickness: As specified on Contract Drawings.
    2. Oriented-Strand-Board Roof Sheathing (Possible substitution): As specified on Contract Drawings.
      a. Span Rating: As specified on Contract Drawings.
      b. Nominal Thickness: As specified on Contract Drawings.
  iv. SHEAR WALL PANELS
    1. Basis-of-Design Product or equal: Subject to compliance with requirements, provide product indicated on Drawings or comparable to approved product by one of the following:
      a. Shear Transfer Systems.
      b. Simpson Strong-Tie Co., Inc.
      c. Weyerhaeuser Company.
    2. Wood-Framed Shear Wall Panels: Prefabricated assembly consisting of wood perimeter framing, tie downs, and Exposure I, Structural I plywood or OSB sheathing.
      a. Products shall contain no urea formaldehyde and comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
    3. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of basis-of-design products. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
    4. Substitution requests for products other than those specified on the Contract Drawings shall be submitted by the contractor to the Engineer-of-Record along with comparison documents demonstrating that the substituted product is capable of achieving the design loads published by the manufacturer for the products specified on the Contract Drawings. At a minimum the comparison documents shall include the manufacturer's product information and capacities of the substitution product and the manufacturer's product capacities of the product specified on the Contract Drawings for which the substitution is replacing. Substitutions shall be approved by the Engineer-of-Record prior to use.
  v. PLYWOOD BACKING PANELS
    1. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.
      a. Plywood shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
  vi. FASTENERS
    1. A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
      a. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153 or of Type 304 stainless steel.
    2. Nails, Brads, and Staples: ASTM F 1667.
    3. Power-Driven Fasteners: NES NER-272.
    4. Wood Screws: ASME B18.6.1.
  vii. MISCELLANEOUS MATERIALS
    1. A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 or ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

3 SHOP-FABRICATED WOOD TRUSSES

1. WOOD TRUSSES

a. GENERAL
  i. Section includes
    1. Shop-fabricated wood roof trusses
      a. Gable
      b. Shed
  ii. PERFORMANCE REQUIREMENTS
    1. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal-plate-connected wood trusses.
    2. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.
      a. Design Loads: As indicated on Contract Drawings.
      b. Maximum Deflection Under Design Loads: Vertical deflection of span/240 with total loads and span/360 with live loads, unless noted otherwise on Contract Drawings.
    3. Comply with applicable requirements and recommendations of the following Publications:
      a. TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."
      b. TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."
      c. TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."
    4. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

b. PRODUCTS
  i. DIMENSION LUMBER
    1. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
      a. Factory mark each piece of lumber with grade stamp of grading agency.
      b. Provide dressed lumber, S4S.
      c. Provide dry lumber with 19 percent maximum moisture content at time of dressing.
    2. Trusses shall be Douglas Fir or Southern Pine species. Finger scarfing is not permitted.
    3. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Section 061000 – Rough Carpentry.
  ii. METAL CONNECTOR PLATES
    1. Basis of design Manufacturers or equal: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the Following:
      a. Alpine Engineered Products, Inc.; an ITW company.
      b. Cherokee Metal Products, Inc.; Masengill Machinery Company.
      c. CompuTrus, Inc.
      d. Eagle Metal Products.
      e. Jager Building Systems, Inc.; a Tembec/SGF Rexfor company.
      f. MiTek Industries, Inc.; a subsidiary of Berkshire Hathaway Inc.
      g. Robbins Engineering, Inc.
      h. Truswal Systems Corporation; an ITW company.
    2. Source Limitations: Obtain metal connector plates from single manufacturer.
    3. General: Fabricate connector plates to comply with TPI 1.
    4. Hot-Dip Galvanized-Steel Sheet: ASTM A 653; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 coating designation; and not less than 0.036 inch thick.
      a. Use for interior locations unless otherwise indicated on Contract Drawings.
    5. Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A 653; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
      a. Use for wood-preservative-treated lumber and where indicated on Contract Drawings.
    6. Stainless-Steel Sheet: ASTM A 666, Type 304, and not less than 0.035 inch thick.
      a. Use for exterior locations, wood-preservative-treated lumber, fire-retardant treated lumber, and where indicated on Contract Drawings.
  iii. FASTENERS
    1. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
      a. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.
      b. Where trusses are exposed to weather, in ground contact, made from pressure- preservative treated wood, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153 or of Type 304 stainless steel.
    2. Nails, Brads, and Staples: ASTM F 1667.

4 WOOD TRIM

1. WOOD TRIM

a. GENERAL
  i. Section Includes:
    1. Interior wood trim
  ii. STANDARDS
    1. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of wood trim indicated for construction, finishes, installation, and other requirements.
  iii. FABRICATION
    1. Fabricate wood trim to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
      a. Edges of Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.
    2. Assemble moldings in the shop to maximum extent possible. Miter corners in shop and prepare for field assembly with bolted fittings designed to pull connections together.
  iv. SHOP PRIMING
    1. Interior Wood Trim for Transparent Finish: Shop seal with stain (if required), other required pretreatments, and first coat of finish as specified in Section 099300 "Staining and Transparent Finishing."
    2. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing wood trim, as applicable to each unit of work.

b. PRODUCTS
  i. INTERIOR WOOD TRIM
    1. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of wood trim and quality grade specified unless otherwise indicated.
      a. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75mm) wide.
      b. Wood Moisture Content for Interior Materials: 5 to 10 percent.

2. INTERIOR WINDOW SILLS & WOOD BASE

a. Grade: Economy
b. Wood Species and Cut: Match species and cut indicated for other types of transparent-finished architectural woodwork located in same area of building unless otherwise Indicated.
  i. Species: Birch
  ii. Cut: Plain sliced/plain sawn
c. For base wider than available lumber, glue for width. Do not use veneered construction.
d. For rails thicker than available lumber, use veneered construction. Do not glue for thickness.

5 MISC ROUGH CARPENTRY

1. BLOCKING

a. GENERAL
  i. Section Includes
    1. Miscellaneous Blocking
  ii. Applications
    1. Miscellaneous locations as required
    2. Sheathing support
    3. Finish material support
    4. ADA accessories
    5. Flashing support
    6. Framing support
    7. Trusses
b. PRODUCTS
  i. MISCELLANEOUS BLOCKING
    1. Finishes: Visible wood blocking materials shall be painted to match adjacent materials.

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

1 THERMAL INSULATION

1. MINERAL WOOL INTERIOR, CAVITY INSULATION

a. GENERAL
  i. SUMMARY
    1. Section Includes
      a. Mineral wool insulation for the following applications:
    2. Applications: Thermal insulation between stud cavities
b. Product Information
  i. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
  ii. Thickness: 5.5"
  iii. R-Value: R-23
  iv. Density: > 2 lbs/ft2 (>32 kg/m³), nominal.
  v. Surface Burning Characteristics: Tested in accordance with ASTM E84
  vi. Unfaced: Flame Spread 0 and Smoke Developed 0
  vii. Moisture Resistance: Absorption of less than 0.03 percent by volume, when tested in accordance with ASTM C1104.
  viii. Corrosion Resistance: Non-corrosive/Passed, when tested in accordance with ASTM C665 for Steel & ASTM C795 for Stress Corrosion Cracking Tendency of Austenitic Stainless Steel.
  ix. Fungi resistance: Zero mold growth to ASTM C1338
  x. Recyclability: Material to be capable of being fully recyclable at end of life with the intention of sending zero waste to landfill.
  xi. Environmental Product Declaration (EPD): Material must be included on a UL Certified EPD in accordance with EN 15804 and ISO 14025.
  xii. GREENGUARD Gold Certified
c. Basis of Design: **ROCKWOOL Comfortbatt 80** for Wood Stud; unfaced.
  i. https://www.rockwool.com/

2. MINERAL WOOL EXTERIOR, FOUNDATION INSULATION

a. Mineral wool insulation for the following applications:
b. GENERAL
  i. SUMMARY
    1. Section Includes
      a. Mineral wool insulation
    2. Applications: Below-grade, foundation insulation.
c. PRODUCTS
  i. Rigid exterior non-structural mineral wool insulation sheathing board that is non-combustible, water-repellent, fire-resistant and sound absorbent and provides a continuous layer of insulation around the commercial or residential building envelope.
    1. Thickness: 5.5"
    2. R-value: 4.2 /inch at 75oF.
    3. Cladding Attachment Method: Screw-through Method.
    4. Cladding Weight: Refer to Manufacturer's Cladding Attachment and Support Guidelines
    5. Facing: Unfaced.
    6. Melting Point – Minimum melting point temperature of 1177oC (2150oF).
    7. Surface Burning Characteristics: Tested in accordance with ASTM E84
      a. Unfaced: Flame Spread 0 and Smoke Developed 0
    8. Density: 8.0 lbs/ft³ (128 kg/m³), actual.
    9. Compressive Strength: 439 lbs./ft2 (21kPa) @ 10% compression; 1065 lbs./ft2 (50kPa) @ 25% compression
    10. Moisture Resistance: Absorption of less than 0.05% by volume when tested in accordance with ASTM C1104
    11. Vapor Permeability: 31 perm when tested in accordance with ASTM E96.
    12. Corrosion Resistance: Non-corrosive/Passed, when tested in accordance with ASTM C665 for Steel & ASTM C795 for Stress Corrosion Cracking Tendency of Austenitic Stainless Steel.
    13. Fungi resistance: Zero mold growth to ASTM C1338
    14. Linear Shrinkage at 1200oF (650oC): Average linear shrinkage in all dimensions not to exceed 0.7% when tested to ASTM C356 at 1200oF (650oC).
    15. Listed with California Office of the State Fire Marshal (Cal Fire) Building Material Listing Service
    16. Breaking Load and Flexural Strength (Thickness: 2"): Minimum 200 kPa when tested to ASTM C203.
    17. Recyclability: Material to be capable of being fully recyclable at end of life with the intention of sending zero waste to landfill.
    18. Environmental Product Declaration (EPD): Material must be included on a UL Certified EPD in accordance with EN 15804 and ISO 14025.
    19. DECLARE Certified
  ii. Basis of Design: **ROCKWOOL Comfortboard 80**
    1. https://www.rockwool.com/
  iii. Anchors
    1. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.
    2. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

3. BLOWN FIBERGLASS INSULATION

a. GENERAL
  i. SUMMARY
    1. Section Includes
      a. Glass-Fiber Loose-Fill Insulation
    2. Applications: Provide blown insulation in roof, exterior walls, and ceiling as indicated on drawings.
b. PRODUCTS
  i. Glass-Fiber Loose-Fill Insulation
    1. Flame-Spread Index: Not more than 5 when tested in accordance with ASTM E84.
    2. Smoke-Developed Index: Not more than 5 when tested in accordance with ASTM E84.
    3. Basis of Design: **CERTAINTEED Optima Blown-in Insulation** or approved equal
  ii. Accessories
    1. Insulation for Miscellaneous Voids:
      a. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.
      b. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.
    2. Roof Ventilation Baffles: Prefabricated ventilation channels for placement under roof sheathing with baffles to prevent wind-washing and to provide ventilation between insulated attic spaces and vented eaves..
      a. Material: Polyvinyl chloride (PVC).
      b. Roof Joist/Truss Spacing: 24 inch (406 mm) on center, nominal.
      c. Basis of design: **Brentwood Industries, Inc; AccuVent Original** or approved equal
c. EXECUTION
  i. INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION
    1. Loose-Fill Insulation: Apply in accordance with ASTM C1015 and manufacturer's written instructions.
    2. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
      a. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
      b. Spray Polyurethane Insulation: Apply in accordance with manufacturer's written instructions.

4. ENGINEERED INSULATION SYSTEM

a. GENERAL
  i. SUMMARY
    1. Section includes:
      a. Exterior rigid insulation system with integrated attachment frame
  ii. ENVIRONMENTAL REQUIREMENTS
    1. Do not install adhesives when temperature or weather conditions are detrimental to successful installation. Refer to manufacturer's product information for recommended temperatures and conditions.
  iii. SEQUENCING
    1. Sequence Work to ensure weather barrier materials are in place before beginning Work of this section.
  iv. COORDINATION
    1. Coordinate work with Division 07 for installation of weather barriers.
    2. Coordinate work with Division 07 for installation of exterior cladding as follows: Vinyl Siding.
b. PRODUCTS
  i. Engineered Insulated ribbed foam panel system incorporating a drainage plane, wiring and utility chases, and molded-in attachment studs.
    1. Basis of design: **InSoFast - EX2.5 Exterior Panels** or approved equal
  ii. PANEL DESCRIPTION
    1. Foam Panels: Below grade fire-retardant closed-cell ribbed foam board. Type III vapor retarder preventing mold growth. R-value = 4.45 per inch.
    2. Attachment Studs: 100 percent recycled co-polymer polypropylene fully flush with panels.
    3. Edges: Tongue and Groove.
    4. Chaseways: Wiring chases running vertically at 16 inches on center and horizontally at 24 inches on center for each panel. Design as required by Electrical code.
    5. Gluing Surface: Ribbed surface to allow compliant wall adhesion.
    6. Attachment Points: Three recessed attachment points located 6 inches o.c. along the stud for mechanically fastened projects.
  iii. ACCESSORIES
    1. Adhesive: Type recommended by system manufacturer for application.
    2. Fasteners: Type recommended by system manufacturer for application.
c. EXECUTION
  i. EXAMINATION
    1. Verify substrate, and adjacent materials are dry and ready to receive insulation
  ii. INSTALLATION
    1. Begin installation of InSoFast panels at a corner.
    2. Attach panel to substrate choosing the method of mechanical attachment
      a. Mechanical Attachment Method:
        i. Utilize, as required, recessed attachment points on the surface of studs to avoid protruding fastener heads.
        ii. Follow fastener specifications, instructions for installation for proper spacing and size of fasteners.
    3. Install panels in a running bond utilizing the tongue and groove connection.
    4. Cut panels to fit around openings. Panels can be cut with a long blade utility knife, reciprocating saw, saber saw, hand saw, or circular saw. Use additional adhesive directly on foam at corners and any cut around openings.
      a. Installation of new wiring and boxes.
        i. New wiring can be pulled through factory-formed chases when using flexible or armored wiring or cabling.
        ii. Boxes are cut into panels using a long-blade utility knife or hot knife and fastened to substrate.
      b. All electrical boxes should be sealed to prevent moisture from penetrating boxes when utilizing the draining plane. Electrical boxes shall be sealed with expanding foam sealant above the box.
    5. Periodically check panels for proper vertical and horizontal alignment.

2 WEATHER BARRIERS

1. WEATHER-RESISTIVE BARRIER

a. GENERAL
  i. STANDARDS
    1. Water Vapor Permeance: To ASTM E96 (Procedure A) 31 perms, (Procedure B) 50 perms.
    2. Water Vapor Transmission: To ASTM E96 (Procedure A), 214 g/m2/24 hr, (Procedure B) 343 g/m2/24 hr.
    3. Water Penetration: AATCC 127, Pass.
    4. Air Permeance: To ASTM E2178, <0.0034 cfm/sq ft @ 0.3 inches wg (< 0.02 l/(s x m²) @ 75 Pa).
    5. Air Permeance: To CAN/ULC-S741 <0.0034 cfm/sq ft @ 0.3 inches wg (< 0.02 l/(s x m²) @ 75 Pa).
    6. Air Assembly: To CAN/ULC-S742-11, Class A1
    7. Resistance to Puncture: To ASTM E154, 78.6 lbs.
    8. Breaking Strength: To ASTM D5034, MD 71 lb, CD 65.4 lb minimum.
    9. Elongation at Break: To ASTM D5034, MD 27.8 %, CD 60.1 % minimum.
    10. 90° Peel Adhesion: To ASTM D3330, Pass.
    11. Peel Adhesion at Elevated Temperatures (176° F): To ASTM D3330, Pass (Level 3).
    12. Linear Dimensional Change at Elevated Temperature: To ASTM D1204, MD -1.4 %, CD +0.1 %.
    13. Fire Rating Characteristics: To ASTM E84:
      a. Rating: NFPA Class A, IBC Class A minimum.
      b. Flame Spread: 14 maximum.
      c. Smoke Developed: 47 maximum.
b. PRODUCTS
  i. WEATHER RESISTIVE BARRIER
    1. Water-resistive Barrier for Walls: Self-adhesive vapor permeable water-resistive barrier; highly tear-resistant 3-layer membrane, with two outer layers of spun-bonded polypropylene fabric and a water-tight polymeric middle layer and factory applied adhesive edge strip.
    2. Weight: 40 lb/roll nominal.
    3. Roll Dimensions: [4'11" (1.5 m) x 115' (35 m)], [19.5" (50 cm) x 115' (35 m)], [9.75" (25 cm) x 115' (35 m)].
    4. Color: Matte Gray.
    5. Basis of design: **DELTA®-VENT SA** or approved equal.
    6. Possible substitutions include but aren't limited to:
      a. HydroGap Drainable House Wrap
      b. Typar HouseWrap
      c. Weathersmart
c. ACCESSORIES
  i. Seam tape: Acrylic-based adhesive tape in accordance with [air] [water-resistive] barrier manufacturer's written recommendations.
    1. Basis of design: **Dörken Systems Inc., DELTA®-MULTIBAND (2-1/2" x 65' 7")** or approved equal
  ii. Flashings: Self-adhering, butyl-rubber based water-resistive flashing membrane in accordance with water-resistive barrier manufacturer's written recommendations
    1. Basis of design: **Dörken Systems Inc., DELTA®-FLASHING** [(4" x 75')] or approved equal
    2. For flashing around windows, doors and general flashing areas.
  iii. Penetration Flashings: Stretchable butyl-rubber based adhesive on non-woven fabric flashing membrane in accordance with water-resistive barrier manufacturer's written recommendations.
    1. Basis of design: Dörken Systems Inc, **DELTA®-FLEXX BAND** 4" x 33" or approved equal
    2. for flashing around penetrations and protrusions.
  iv. Sealants and Adhesives: Elastomeric sealant and adhesive in accordance with water-resistive barrier manufacturer's written recommendations
    1. Ensure sealants are compatible with adjacent materials.
    2. Basis of design: **Dörken Systems Inc., DELTA®-THAN, DELTA®-TILAXX** or approved equal
  v. Window Corner: Prefabricated rubber-compound window corner.
    1. Basis of design: **Dörken Systems Inc., DELTA®-FAS CORNER** or approved equal
  vi. Primers: In accordance with water-resistive barrier manufacturer's written recommendations.
    1. Basis of design: **Dörken Systems Inc., DELTA®-HF PRIMER** or **DELTA®-LVC PRIMER** or approved equal
  vii. Flexible Membrane Through-wall Flashing: Self-adhering, butyl-rubber based flashing membrane.
    1. Basis of design: **Dörken Systems Inc., DELTA®-TW FLASHING** (18" x 75') or approved equal

3 WATERPROOFING

1. FLEXIBLE FLASHING:

a. Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.040 inch (1.0 mm).
b. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

SEVEN GENERATIONS architectur +
600 E. Michigan Ave., Suite B
Kalamazoo, MI 49007
P: 269.927.0144
www.7GenAE.com

ELDERS HOUSING
BAY MILLS INDIAN COMMUNITY
Red Pine Lane, Bay Mills Township, MI 49715
100% Design Review

95% CONSTRUCTION DOCUMENTS

ISSUE DATE: 10/23/2020

REVISIONS

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER: 220046

SHEET TITLE SPECIFICATIONS

SHEET NO. G004

i. DuPont (E. I. du Pont de Nemours and Company); DuPont Flashing Tape.
ii. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Vycor Butyl Self Adhered Flashing.
iii. Protecto Wrap Company; BT-25 XL.
iv. Raven Industries Inc.; Fortress Flashshield.

2. FLUID-APPLIED MEMBRANE AIR BARRIERS

a. GENERAL
i. Section Includes:
1. Liquid-applied opening and joint flashing membrane,
ii. Application
1. To create continuous waterproofing membrane layer on and around sensitive areas of the project such as windows, doors, substrate penetrations, abutting of materials, etc.
iii. PERFORMANCE REQUIREMENTS
1. The building envelope shall be constructed with a continuous, air and water-resistive barrier to control air leakage, avoid condensation in the interior wall assembly and prevent water intrusion.
2. Joints, penetrations and paths of water and air infiltration shall be made watertight and airtight.
3. System shall be capable of withstanding positive and negative combined wind, stack and HVAC pressures on the envelope without damage or displacement.
4. System shall be installed in an airtight and flexible manner, allowing for the relative movement of systems due to thermal and moisture variations.
b. PRODUCTS
i. MATERIALS
1. LIQUID-APPLIED FLASHING AND DETAILING MEMBRANE
a. Gun-grade, spread and tool or roller apply waterproofing, adhesive and detailing compound that combines the best of silicone and polyurethane properties. The single component, Silyl-Terminated-Polymer (STP) produces a highly durable, seamless, elastomeric should treat joints, seams, cracks and provide the flashing membrane in rough openings of structural walls and to counter-flash waterproofing and air barrier components.
i. Basis of Design: **PROSOCO R-Guard FastFlash** or approved equal
1. Lawrence, KS, (800) 255-4255,
2. www.prosoco.com.
2. AIR AND WEATHER BARRIER SEALANT FOR WINDOWS & DOORS
a. High performance, gun-grade waterproofing sealant that combines the silicone and polyurethane properties. Single component, Silyl-Terminated-Polymer (STP) that is that is durable, and stops the movement of moist air through cracks surrounding windows and doors.
i. Basis of Design: **PROSOCO R-Guard AirDam** or approved equal
1. Lawrence, KS, (800) 255-4255,
2. www.prosoco.com.
b. Backer rod: In deep joints, control sealant depth by installing closed cell backer rod. Diameter of the soft-backer rod should be 25 percent greater than the joint width. Do not puncture backer rod.

3. INTERIOR VAPOR BARRIER

a. GENERAL
i. Section Includes:
1. Interior air and vapor control layer
b. PRODUCTS
i. Airtight Layer System
1. Moisture variable vapour control layer for permanently airtight building envelopes for roof, wall and ceiling structures.
2. Basis of Design: **SIGA Majrex** or approved equal
ii. Airtight interior double-sided adhesive assembly-aid tape
1. Pressure sensitive, with acrylic based adhesive for the pre-installation of membranes on hard substrates.
2. Thickness: 0.014" (0.35 mm).
3. Width: 0.79"(20 mm).
4. Twinet is not suitable for permanent load-bearing applications. After installation, the vapour control layer must be additionally fastened, e.g. using jack rafters, counter battens, facing.
5. Basis of design: **SIGA Twinet** or approved equal
iii. Airtight interior joint tape
1. Pressure sensitive, with acrylic based adhesive for seams, pipe/cable penetrations on penetrations in vapor control layers and wood-based panels.
2. Widths: 2.4" (60mm) ,4" (100mm), 6" (150mm).
3. Performance Characteristics:
a. Special, reinforced PE film, elastic.
b. Water Vapor Transmission: 0.09 perms, when tested in accordance with ASTM E 96, Method A.
c. Slit backing strip on SIGA Rissan® 4" and 6"
4. Basis of design: **SIGA Fentrim® IS 20** or approved equal
iv. Airtight interior pre-folded tape: SIGA Fentrim® IS 20
1. Pressure sensitive, with acrylic based adhesive for sealing windows, doors.
2. Widths: 3" (75mm) , 3.9" (100mm), 5.9" (150mm), 7.9" (200mm), 9.8" (250mm), 11.8" (300mm).
3. Performance Characteristics:
a. Special film/fleece combination made of PO.
b. Water Vapor Transmission: 0.17 US perms for SIGA Fentrim® IS 20, when tested in accordance with ASTM E 96, Method A.
c. Thickness: 26 mils/ 0.7mm for SIGA Fentrim®.
d. Specification for self-adhered flashing used for exterior wall fenestration installation: TYPE A (no primers needed), level 3 thermal exposure.
e. Tensile strength: Pass, when tested in accordance with ASTM D5034 per AAMA 711-13.
f. Water penetration resistance around nails: Pass/Dry when tested in accordance with ASTM D1970 per AAMA 711-13.
g. 90 peel adhesion: Pass all conditions and standard test substrates; OSB, anodized aluminum extruded PVC plywood, accelerated aging w/UV-A, elevated temperature exposure, thermal cycling, adhesion after water immersion, when tested in accordance with D3330 and conditioning per AAMA 711-13.
4. Basis of design: **SIGA Fentrim® IS 20** or approved equal

4. SILL GASKET

a. GENERAL
i. Section Includes:
1. EPDM air leakage gaskets
ii. Application
1. Between treated wood sill plates and concrete slab
b. PRODUCT
i. Cellular (foam) EPDM
ii. Basis of design: **CONSERVATION TECHNOLOGY, BG65 For 2x6 Plates** or approved equal

4 ASPHALT SHINGLES

1. GLASS-FIBER-REINFORCED ASPHALT SHINGLES

a. Laminated-Strip 40-year Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
b. Basis-of-Design: **Certainteed Solaris Gold** or comparable product by one of the following:
i. Atlas Roofing Corporation.
ii. CertainTeed Corporation.
iii. Elk Premium Building Products, Inc.; an ElkCorp company.
iv. Emco Building Products Corp.
v. GAF Materials Corporation.
vi. IKO.
c. Color: As selected by Owner from manuf. full, standard color choices.

5 PLASTIC SIDING

1. VINYL SIDING

a. MATERIALS
i. General Requirements:
1. Siding: Complying with ASTM D3679.
2. Soffit: Complying with ASTM D4477.
3. Wind Resistance: Capable of withstanding minimum of 30 psf (1.4 kPa) negative
4. pressure, when tested in accordance with ASTM D5206.
5. Horizontal Flammability: When tested in accordance with ASTM D635.
a. Burn Distance: 0.79 inch (20 mm), maximum.
b. Burn Time: Less than five seconds.
b. Basis of design: **REVERE BUILDING PRODUCTS, Sovereign Select**
1. www.reverebuildingproducts.com.
ii. Color: As selected by Owner from manuf. Full, standard color choices.
c. ACCESSORIES
i. Trims: Provide coordinating accessories made of the same material as required for complete and proper installation.
1. Length: specifically indicated on drawings.
a. Color: As selected by Owner from manuf. Full, standard color choices.
b. Corner Posts: 10 feet (3050 mm), minimum.
c. Other Trim: 12-1/2 feet (3800 mm), minimum.
2. Profiles: Provide types similar as indicated on drawings.
3. Color: As selected by Owner from manuf. Full, standard color choices.

2. VINYL UNVENTED SOFFIT PANELS

a. Basis of design: Revere Building Products, Sovereign Select:
i. www.reverebuildingproducts.com.
b. Color: As selected by Owner from manuf. Full, standard color choices.

3. VINYL VENTED SOFFIT PANELS

a. Basis of design: Revere Building Products, Sovereign Select:
i. www.reverebuildingproducts.com.
b. Color: As selected by Owner from manuf. Full, standard color choices.

6 FIBER-CEMENT TRIM

1. GENERAL
a. SUMMARY
i. Section includes:
1. Fiber cement trim boards
ii. Applications:
1. Around windows and doors per drawings
2. PRODUCTS
a. FIBER CEMENT TRIM
i. Basis of design: **Hardietrim Boards 5-4 Smooth SE** or approved equal
ii. Color: As selected by Owner from manuf. Full, standard color choices.
iii. Fasteners: Per manuf. Installation instructions.

7 SHEET METAL FLASHING AND TRIM

1. SHEET METALS

a. GENERAL
i. PERFORMANCE REQUIREMENTS
ii. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction.
iii. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
iv. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
v. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces
vi. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
b. PRODUCTS
i. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat embossed surface.
1. 1. Exposed Coil-Coated Finish:
a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
b. Color shall be a standard 'white'
ii. Metallic-Coated Steel Sheet: Provide prepainted by coil-coating process to comply with ASTM A 755/A 755M.
1. Surface: Smooth, flat
2. Exposed Coil-Coated Finish:
a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
iii. MISCELLANEOUS MATERIALS
1. General: Provide materials and types of fasteners[, solder], protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal[or manufactured item] unless otherwise indicated.
2. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
a. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
3. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on the weather side of metal.
4. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
5. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
6. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
7. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
8. Fasteners for Galvanized Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
9. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
10. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
11. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
12. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
13. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
14. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for Application.

c. STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

i. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
1. Exposed Coil-Coated Steel: [0.022 inch (0.56 mm)] thick.
ii. Valley Flashing: Fabricate from the following materials:
1. Exposed Coil-Coated Steel: [0.028 inch (0.71 mm)] thick.
iii. Drip Edges: Fabricate from the following materials:
1. Exposed Coil-Coated Steel: [0.022 inch (0.56 mm)] thick.
iv. Eave, Rake Ridge Flashing: Fabricate from the following materials:
1. Exposed Coil-Coated Steel: [0.022 inch (0.56 mm)] thick.
v. Counterflashing: Fabricate from the following materials:
1. Exposed Coil-Coated Steel: [0.022 inch (0.56 mm)] thick.
vi. Flashing Receivers: Fabricate from the following materials:
1. Exposed Coil-Coated Steel: [0.022 inch (0.56 mm)] thick.
vii. Roof-Penetration Flashing: Fabricate from the following materials:
1. Exposed Coil-Coated Steel: [0.028 inch (0.71 mm)] thick.

d. WALL SHEET METAL FABRICATIONS

i. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings. Form head and sill flashing with 2-inch-(50- mm-) high, end dams. Fabricate from the following materials:
1. Exposed Coil-Coated Steel: [0.022 inch (0.56 mm)] thick.
ii. Base z flashing at siding: Fabricate from the following materials:
1. Exposed Coil-Coated Steel: 0.0375 inch thick.

e. MISCELLANEOUS SHEET METAL FABRICATIONS

i. Equipment Support Flashing: Fabricate from the following materials:
1. Exposed Coil-Coated Steel: [0.028 inch (0.71 mm)] thick.
ii. FABRICATION, GENERAL
1. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standards that apply to design, dimensions, geometry, metal thickness, and other characteristics of the item required. Fabricate sheet metal flashing and trim in shop to the greatest extent possible.
2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
3. Obtain field measurements for accurate fit before shop fabrication.
4. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
a. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
6. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
a. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25mm) deep, filled with butyl sealant concealed within joints.
7. Sealant Joints: Where movable, non expansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
8. Fabricate cleats and attachment devices from the same material as accessory being anchored or from compatible, noncorrosive metal.
9. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
10. Do not use graphite pencils to mark metal surfaces.

8 ROOF ACCESSORIES

1. SNOW GUARDS

a. Unit Snow Guards: Individual projecting polycarbonate shapes, set between roofing shingles/tiles, and mechanically fastened to roof deck.
i. Projecting Polycarbonate Shapes: Clear polycarbonate plastic with UV stabilizers, semi-circular design.
b. Fence Type Snow Guard: Continuous snow guard; manufacturer's standard pipe, bar, channel, or solid rod, set in brackets or posts, with optional plates and metal trim to match the roof.
i. Extruded Aluminum Channel: Manufacturer's standard shape; with slot for insertion of metal trim matching roof.
ii. Supplemental Plates and Clips: Attached to horizontal component; match finish of pipe, tube, rod, or channel.

2. RIDGE VENTS

a. GENERAL
i. Section Includes:
1. Gable ridge vents
2. Shed peak ridge vent
3. Shed Transition ridge vent
b. PRODUCTS
i. GABLE RIDGE VENT
1. Rigid Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent with nonwoven geotextile filter strips and external deflector baffles; for use under ridge shingles.
2. Basis of design: **AIR VENT INC, Shinglevent II** or approved equal
a. http://www.airvent.com/products/exhaust-vents/ridge-vents/shinglevent2
ii. SHED PEAK RIDGE VENT
1. Provides minimum 9 sq NFA per linear foot
2. 3/12 to 12/12 roof pitch
3. Integral weather filter
4. Material: 0.014 thick aluminum with embossed stucco pattern
5. Attach with nails of sufficient length to fully penetrate the roof deck.
6. Basis of design: **AIR VENT INC, PFV** or approved equal
iii. SHED ROOF-TO-WALL RIDGE VENT
1. Basis of design: **DCI PRODUCTS SmartVent** or approved equal

9 FIRE STOPPING

1. FIRESTOPPING SYSTEMS

a. Firestopping: Any material meeting requirements.
i. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in
ii. Fire Ratings: See drawings for required systems and ratings.

10 JOINT SEALANTS

1. SEALANTS, GENERAL

a. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
b. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
i. Architectural Sealants: 250 g/L.
ii. Sealant Primers for Nonporous Substrates: 250 g/L.
iii. Sealant Primers for Porous Substrates: 775 g/L.
c. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
d. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
e. Colors of Exposed Joint Sealants: selected by Owner from manufacturer's full range.

2. SILICONE JOINT SEALANTS

a. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
i. Products: Subject to compliance with requirements, manufacturers whose products that may be incorporated into the Work include, but are not limited to, the following:
1. Dow Corning Corporation.
2. GE Advanced Materials - Silicones.
3. May National Associates, Inc.
4. Pecora Corporation.
5. Sika Corporation
6. Tremco Incorporated.
b. Single-Component, Pourable, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade P, Class 100/50, for Use T.
i. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
1. Dow Corning Corporation; 890-SL or SL Parking Structure Sealant.
2. May National Associates, Inc.; Bondaflex Sil 728 SG or Sil 728 SL.
3. Pecora Corporation; 300 SL or 310 SL.
4. Tremco Incorporated; Spectrem 900 SL.

3. JOINT SEALANT BACKING

a. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
b. Cylindrical Sealant Backings: ASTM C 1330, Type As approved in writing by joint-sealant manufacturer for joint application indicated and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
c. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

4. MISCELLANEOUS MATERIALS

a. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
b. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

DIVISION 08 - OPENINGS

1 STEEL DOORS

1. STEEL DOORS

a. Exterior Steel Doors:
i. 1. Basis-of-Design Product or equal: Subject to compliance with requirements, provide **PELLA, insulated flush steel exterior door with side lite** or approved equal..
ii. Surface Finish – Smooth
iii. Steel skin gauge 24 – cold rolled galvanized
iv. Steel Edge gauge – 22
v. Core – polystyrene.
vi. Finish and Grade: Opaque and Standard.
vii. Edge construction - steel
viii. Thickness 1 3/4"
ix. Profile: Rabbeted
x. Jamb width 6 9/16"
xi. Jamb type – flat
xii. Jamb – preservative treated – pine treated in accordance with WDMA-1.S.4
xiii. Hardware see Section "Door Hardware"
xiv. Weather stripping at perimeter.
xv. Threshold – ADA compliant at certain units.

2 MOLDED COMPOSITE WOOD DOORS

1. INTERIOR MOLDED WOOD COMPOSITE DOORS

a. A. Interior Flush Wood Doors:
i. Basis-of-Design Product or equal: Subject to compliance with requirements, provide **JELD-WEN, Red Oak Flush All Panel procore solid core wood door**, imperial oak finish. or comparable product by one of the following:
1. International Door and Latch.
2. Karona, Inc.
3. QSM Enterprise, Inc.
4. Simpson Door Company.
ii. Surface Finish - Smooth
iii. Finish and Grade: Opaque and Standard.
iv. Solid core with combination wood frame
v. Thickness 1 3/8"
vi. Jamb width 4 9/16"
vii. Jamb type – flat
viii. Jamb species finger jointed pine
ix. Hardware see Section "Door Hardware"

3 SCREEN DOORS

1. SCREEN DOORS

a. Basis-of-Design: **SCREENTIGHT Vinylcraft Solid Vinyl Screen Door** or approved equal.
b. Provide Screen Door indicated on Drawings or a comparable product by architect approved manufacturer.

4 SECTIONAL DOORS

1. GARAGE DOORS

a. Basis-of-Design Product or equal: Subject to compliance with requirements, provide **Clopay Building Products 8' x 7' Standard Sectional Overhead Door** indicated on Drawings or a comparable product by architect approved manufacturer.

5 WINDOWS

1. VINYL WINDOWS

a. GENERAL
i. Section Includes:
1. 1. Vinyl Casement windows, fixed and operational. See window schedule
b. PRODUCTS
i. VINYL WINDOWS
1. MATERIALS
a. Vinyl Extrusions: Rigid (unplasticized) hollow PVC extrusions, formulated and extruded for exterior applications, complying with AAMA/WDMA 101/I.S.2/NAFS and the Following:
i. PVC Formulation: High impact, low heat buildup, lead free, nonchalking, and color and UV stabilized.
ii. Extrusion Wall Thickness: Not less than 0.060 inch (1.5 mm)
iii. Multichamber Extrusions: Profile designed with multichambers between interior and exterior faces of the extrusions.
b. Vinyl Trim and Glazing Stops: Material and finish to match frame members.
c. Fasteners: Aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be noncorrosive and compatible with vinyl window members, cladding, trim, hardware, anchors, and other components.
i. Exposed Fasteners: Unless unavoidable for applying hardware, do not use exposed fasteners. For application of hardware, use fasteners that match finish of member or hardware being fastened, as appropriate.
d. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
e. Reinforcing Members: Aluminum, or nonmagnetic stainless steel, or

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REVISIONS

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER: 220046

SHEET TITLE
SPECIFICATIONS

SHEET NO.
G005

nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

f. Compression-Type Weather Stripping: Provide compressible weather stripping designed for permanently resilient sealing under bumper or wiper action, and for complete concealment when vinyl window is closed.
   i. Weather-Stripping Material: Elastomeric cellular preformed gaskets complying with ASTM C 509.
   ii. Weather-Stripping Material: Dense elastomeric gaskets complying with ASTM C864.
   iii. Weather-Stripping Material: Manufacturer's standard system and materials complying with AAMA/WDMA 101/I.S.2/NAFS.

g. Replaceable Weather Seals: Comply with AAMA 701/702.

2. Basis-of-Design: **JELD-WEN Premium Vinyl** Casement Windows, Fixed Windows and other Premium Vinyl Specialty Products or approved equal

ii. GLAZING
1. Glass Clear, insulating-glass units, argon gas filled, with low-E coating pyrolytic on second surface or sputtered on second or third surface.

iii. HARDWARE
1. Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with vinyl; designed to smoothly operate, tightly close, and securely lock vinyl windows, and sized to accommodate sash or ventilator weight and dimensions. Do not use aluminum in frictional contact with other metals..
2. Counterbalancing Mechanism: Comply with AAMA 902.
3. Gear-Type Rotary Operators: Comply with AAMA 901 when tested according to ASTM E405, Method A.
   a. Operation Function: All ventilators move simultaneously and securely close at both jambs without using additional manually controlled locking devices.
   b. Locking mechanism and handles for manual operation.
   c. Friction Shoes: Provide friction shoes of nylon or other nonabrasive, nonstaining,
   d. noncorrosive, durable material.

iv. INSECT SCREENS
1. General: Design windows and hardware to accommodate screens in a tight-fitting,removable arrangement, with a minimum of exposed fasteners and latches. Fabricate insect screens to fully integrate with window frame. Locate screens on outside of window and provide for each operable exterior sash or ventilator.

c. FABRICATION
i. Fabricate vinyl windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
ii. Fabricate vinyl windows that are reglazable without dismantling sash or ventilator framing.
iii. Weather Stripping: Provide full-perimeter weather stripping for each operable sash and ventilator, unless otherwise indicated.
iv. Factory-Glazed Fabrication: Except for light sizes in excess of 100 united inches (2500 mm width plus length), glaze vinyl windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 08 Section "Glazing" and with AAMA/WDMA 101/I.S.2/NAFS.
v. Hardware: Mount hardware through double walls of vinyl extrusions or provide corrosion-resistant steel reinforcement complying with requirements for reinforcing members, or do both.
vi. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

d. VINYL FINISHES
i. Integral Finish and Color: Uniform, solid, homogeneous white interior and exterior.

6 DOOR HARDWARE

1. SCHEDULED DOOR HARDWARE

a. Provide door hardware for each door as to comply with requirements in this Section.
   i. Door Hardware Sets: Provide quantity, item, size, finish or color indicated.
   ii. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

b. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
   i. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements.
   ii. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.

2. HINGES

a. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
   i. Basis of design Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the Following:
      1. Baldwin Hardware Corporation.
      2. Bommer Industries, Inc.
      3. Cal-Royal Products, Inc.
      4. Hager Companies.
      5. IVES Hardware; an Ingersoll-Rand company.
      6. Lawrence Hardware Inc.
      7. McKinney Products Company; an ASSA ABLOY Group company.
      8. PBB, Inc.
      9. Stanley Commercial Hardware; Div. of The Stanley Works.

3. MECHANICAL LOCKS AND LATCHES

a. Lock Functions: As indicated in door hardware schedule.
b. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
   i. Bored Locks: Minimum 1/2-inch (13-mm) latchbolt throw.
   ii. Deadbolts: Minimum 1-inch (25-mm bolt throw.
c. Lock Backset: 2-3/8 inches , unless otherwise indicated.
d. Lock Trim:
   i. Description: As indicated on Drawings
   ii. Levers: Wrought.
      1. Schlage Latitude F51
   iii. Escutcheons (Roses): Wrought
   iv. Dummy Trim: Match lever lock trim and escutcheons.
   v. Operating Device: Lever with escutcheons (roses).
e. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
   i. Flat-Lip Strikes: For locks with three-piece antifriction latch bolts, as recommended by Manufacturer.
   ii. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
   iii. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.
   iv. Rabbet Front and Strike: Provide on locksets for rabbeted meeting stiles.
   v. Bored Locks: BHMA A156.2; Grade [1] [2]; Series 4000.
      1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following
         a. Arrow USA; an ASSA ABLOY Group company.
         b. Best Access Systems; Div. of Stanley Security Solutions, Inc.
         c. Cal-Royal Products, Inc.
         d. Corbin Russwin Architectural Hardware; n ASSA ABLOY Group Company.
         e. Falcon Lock; An Ingersoll-Rand Company.
         f. K2 Commercial Hardware; a Black & Decker Corp. company.
         g. Marks USA.
         h. Medeco Security Locks, Inc.; an ASSA ABLOY Group company.
         i. PDQ Manufacturing.

j. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
k. Schlage Commercial Lock Division; an Ingersoll-Rand company.
l. Weiser Lock Corp.; a Black & Decker Corp. company.
m. Yale Security Inc.; an ASSA ABLOY Group company.

4. LOCK CYLINDERS

a. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
   i. Manufacturer: Same manufacturer as for locking devices.
   ii. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      1. Arrow USA; an ASSA ABLOY Group company.
      2. ASSA, Inc.; An ASSA ABLOY Group Company.
      3. Best Access Systems; Div. of Stanley Security Solutions, Inc.
      4. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
      5. Falcon Lock; an Ingersoll-Rand company.
      6. Medeco Security Locks, Inc.; an ASSA ABLOY Group company.
      7. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
      8. Schlage Commercial Lock Division; an Ingersoll-Rand company.
      9. Yale Security Inc.; an ASSA ABLOY Group company.
b. Standard Lock Cylinders: BHMA A156.5; Grade 1 permanent cores that are; face finished to match lockset.
c. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.
d. Construction Cores: Provide construction cores that are replaceable by permanent cores.
e. Provide 10 construction master keys.

5. KEYING

a. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A.
b. Incorporate decisions made in keying conference.
   i. No Master Key System: Only change keys operate cylinder.
   ii. Master Key System: Change keys and a master key operate cylinders.
   iii. Grand Master Key System: Change keys, a master key, and a grand master key operate Cylinders.
   iv. Great-Grand Master Key System: Change keys, a master key, a grand master key, and
      1. a great-grand master key operate cylinders.
   v. Existing System:
      1. Master key or grand master key locks to Owner's existing system.
      2. Re-key Owner's existing master key system into new keying system.
   vi. Keyed Alike: Key all cylinders to same change key.
c. Keys: Nickel silver
   i. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
      1. Notation: Information to be furnished by Owner.
   ii. Quantity: In addition to one extra key blank for each lock, provide the following:
      1. Cylinder Change Keys: Three.
      2. Master Keys: Five.
      3. Grand Master Keys: Five.
      4. Great-Grand Master Keys: Five.

6. DOOR GASKETING

a. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot (0.000774 cu. m/s per m) of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
   i. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following
      1. Hager Companies.
   ii. M-D Building Products, Inc.
   iii. National Guard Products.
   iv. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
   v. Reese Enterprises, Inc.
   vi. Sealeze; a unit of Jason Incorporated.
   vii. Zero International.

7. THRESHOLDS

a. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
   i. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following
      1. Hager Companies.
      2. M-D Building Products, Inc.
      3. National Guard Products.
      4. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
      5. Reese Enterprises, Inc.
      6. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
      7. Sealeze; a unit of Jason Incorporated.
      8. Zero International.

8. AUXILIARY DOOR HARDWARE

a. Auxiliary Hardware: BHMA A156.16.
   i. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to,the following
      1. Baldwin Hardware Corporation.
      2. Cal-Royal Products, Inc.

9. DOOR HARDWARE SCHEDULE

Door Hardware HW-1 (Keyed Entry) 103A, 104A

Qty.	Item	Manufacturer	Product	Finish
1	Deadbolt	Schlage	JD60	Brushed Nickel
1	Keyed Lever	Schlage	F51 LAT	Brushed Nickel
1	Rose	Schlage	Standard	Brushed Nickel
1 ½ Pair	Hinges	Ives	3PB1	Brushed Nickel
1	Threshold	PEMKO	94518	Brushed Nickel

Door Hardware HW-2 (Privacy) 106A, 108A, 110A, 111A

Qty.	Item	Manufacturer	Product	Finish
1	Lever	Schlage	F40 LAT	Brushed Nickel
1	Rose	Schlage	Standard	Brushed Nickel
1 ½ Pair	Hinges	Ives	3PB1	Brushed Nickel

Door Hardware HW-3 (Passage) 101A, 109A

Qty.	Item	Manufacturer	Product	Finish
1	Lever.	Schlage.	F10 LAT	Brushed Nickel
1	Rose	Schlage.	Standard	Brushed Nickel
1 ½ Pair	Hinges.	Ives	3PB1	Brushed Nickel

Door Hardware HW-5 (Bifold) 107A, 107B, 112A, 112B, 114A, 116A

Qty.	Item	Manufacturer	Product	Finish
2	Pull	Schlage	TBD	Brushed Nickel
2 Pair	Hinges	Ives	TBD	Brushed Nickel
2	Door Guide	Schlage	TBD	Brushed Nickel
2	Door Guide	Schlage	TBD	Brushed Nickel

DIVISION 09 - FINISHES

1 GYPSUM BOARD

1. INTERIOR GYPSUM BOARD

a. GENERAL
   i. Section includes:
      1. Gypsum Wall Boards, typical and moisture resistant
      2. Gypsum Ceiling Boards, typical and moisture resistant
   ii. Application
      1. Non-moisture resistant Gypsum Wall & Ceiling Boards at most locations except wet

2. Moisture resistant Gypsum Wall & Ceiling Boards in bathrooms

b. PRODUCT
   i. GYPSUM WALL & CEILING BOARDS
      1. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with the support system indicated.
      2. Basis of design Manufacturers or equal: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the Following:
         a. American Gypsum.
         b. CertainTeed Corp.
         c. Georgia-Pacific Gypsum LLC.
         d. Lafarge North America Inc.
         e. National Gypsum Company.
         f. PABCO Gypsum.
         g. Temple-Inland.
         h. USG Corporation.
      3. B. Gypsum Wallboard: ASTM C 1396/C 1396M.
         a. Thickness: 1/2 inch (12.7 mm).
         b. Long Edges: Tapered
      4. C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
         a. Thickness: 1/2 inch (12.7 mm).
         b. Long Edges: Tapered.
      5. Moisture- and Mold-Resistant Gypsum Wall and Ceiling Board: ASTM C 1396/C 1396M. With moisture-and mold-resistant core and paper surfaces.
         a. Core: 1/2 inch (12.7 mm), regular type.
         b. Long Edges: Tapered.
         c. Mold Resistance: ASTM D 3273, score of 10.
   ii. TILE BACKING PANELS
      1. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.
         a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
            i. C-Cure; C-Cure Board 990.
            ii. CertainTeed Corp.; FiberCement BackerBoard.
            iii. James Hardie Building Products, Inc.; Hardiebacker
            iv. National Gypsum Company, Permabase Cement Board.
            v. USG Corporation; DUROCK Cement Board.
         b. Thickness: 1/2 inch (12.7 mm)
         c. Mold Resistance: ASTM D 3273, score of 10.
   iii. TRIM ACCESORIES
      1. Interior Trim: ASTM C 1047.
         a. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet
         b. Shapes:
            i. Bullnose bead.
            ii. LC-Bead: J-shaped; exposed long flange receives joint compound.
            iii. L-Bead: L-shaped; exposed long flange receives joint compound.
            iv. U-Bead: J-shaped; exposed short flange does not receive joint compound.
            v. Expansion (control) joint.
   iv. JOINT TREATMENT MATERIALS
      1. General: Comply with ASTM C 475/C 475M.
      2. Joint Tape:
         a. Interior Gypsum Board: Paper.
         b. Tile Backing Panels: As recommended by panel manufacturer.
      3. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
         a. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
         b. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
            i. Use setting-type compound for installing paper-faced metal trim accessories.
         c. Fill Coat: For second coat, use setting-type, sandable topping compound.
         d. Finish Coat: For third coat, use drying-type, all-purpose compound.
         e. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.
      4. Joint Compound for Tile Backing Panels:
         a. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel Manufacturer.
         b. Cementitious Backer Units: As recommended by backer unit manufacturer.
         c. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting type,sandable topping compound.
   v. AUXILIARY MATERIALS
      1. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
      2. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
      3. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
         a. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturers.
      4. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool. (Required at Bath Room, Laundry and Mechanical)
      5. Acoustical Joint Sealant: Manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
         a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
            i. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
            ii. Grabber Construction Products; Acoustical Sealant GSC.
            iii. Pecora Corporation.
            iv. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
            v. USG Corporation; SHEETROCK Acoustical Sealant.
            vi. Thermal Insulation: As specified in Division 07 Section "Thermal Insulation."
            vii. Vapor Retarder: As specified in Division 07 Section "Thermal Insulation."
   vi. TEXTURE FINISHES
      1. Primer: As recommended by textured finish manufacturer.
      2. Non-Aggregate Finish: Pre-mixed, vinyl texture finish for spray application.
         a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
            i. CertainTeed Corp.; ProRoc Easi-Tex Spray Texture.
            ii. National Gypsum Company; Perfect Spray EM Texture.
            iii. USG Corporation; BEADEX FasTex Wall and Ceiling Spray Texture.
         b. Texture: As selected by Owner from standard textures.

2 TILING

1. PORCELAIN TILE

a. GENERAL
   i. Section Contains:
      1. Glazed Porcelain Tile for floors
      2. Grout
      3. Sealants
b. PRODUCTS
   i. PORCELAIN TILE
      1. Tile Type: Factory-mounted ceramic wall tile.
         a. Basis-of-Design Product or equal: Subject to compliance with requirements, provide **Daltile Concrete Masonry PTS Glazed Porcelain Tile 16"x32"**.
   ii. TILE BACKING PANELS

1. Cementitious Backer Units: See Gypsum Board Tile Backing Panels.

iii. SETTING MATERIALS
1. Dry-Set Portland Cement Mortar (Thin Set): ANSI A118.1.
2. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.

iv. GROUT MATERIALS
1. Standard Cement Grout: ANSI A118.6.

v. ELASTOMERIC SEALANTS
1. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 07 Section
2. "Joint Sealants."
3. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
4. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

vi. MISCELLANEOUS MATERIALS
1. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
   a. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F (49 to 60 deg C) per ASTM D 87.
   b. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
2. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
3. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

3 RESILIENT FLOORING

1. TILE FLOORING

a. Vinyl Tile - Class III Printed Film Vinyl Plank Type B (embossed)
   i. Basis of design: **Patcraft, Click Refresh I600V with finish Khaki 00125** or approved equal
   ii. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
   iii. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   iv. Mold and Microbial Resistance: Highly resistant when tested in accordance with ASTM D6329; certified in accordance with UL 2824.
   v. Plank Tile Size: 7 by 48 inch.
   vi. Color: Khaki .

4 SHEET CARPETING

1. CARPET

a. GENERAL
   i. Section Includes:
      1. Sheeting Carpeting
      2. Backer
b. PRODUCTS
   i. CARPET
      1. Basis of Design: Product: **SHAW FLOORS 5E292 Mainstay** or approved equal
   ii. CUSHION
      1. Basis of design: **SHAW FLOORS SOFTBAC PLATINUM** or approved equal
      2. Material: Cellular rubber.
         a. VOC Content: Comply with Section 016116.
   iii. ACCESSORIES
      1. Tackless Strip: Carpet gripper, of type recommended by carpet manufacturer to suit application, with attachment devices.
      2. Seam Adhesive: Recommended by carpet manufacturer.
      3. Carpet Adhesive: Recommended by carpet manufacturer; releasable type.

5 EXTERIOR PAINTING

1. EXTERIOR PAINT

a. GENERAL
   i. Section Contains:
      1. Exterior, water-based latex paints
   ii. STANDARDS
      1. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
      2. Material Compatibility:
         a. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
         b. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
      3. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
      4. Colors: From the manufacturers full range.
   iii. SOURCE QUALITY CONTROL
      1. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
         a. 1. Owner will engage the services of a qualified testing agency to sample paint materials.
         b. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
         c. Testing agency will perform tests for compliance with product requirements.
         d. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are Incompatible.
b. PRODUCTS
   i. PRIMERS/SEALERS
      1. A. Primer, Alkali Resistant, Water Based: MPI #3.
   ii. WATER-BASED PAINTS
      1. A. Latex, Exterior Semi-Gloss (Gloss Level 5): MPI #11.

2. EXTERIOR PAINT COLOR SCHEDULE

a. Color Selection: By Owner from manufacturer's full, standard color selections.

6 INTERIOR PAINTING

1. INTERIOR PAINT

a. GENERAL
   i. STANDARDS
      1. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
      2. Material Compatibility:
         a. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and

SEVEN GENERATIONS architectur +
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REVISIONS

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER: 220046

SHEET TITLE SPECIFICATIONS

SHEET NO. G006

application as demonstrated by manufacturer, based on testing and field experience.
b. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
3. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPAMethod 24)].
a. 1. Flat Paints and Coatings: 50 g/L.
b. 2. Nonflat Paints and Coatings: 150 g/L.
c. 3. Dry-Fog Coatings: 400 g/L.
d. 4. Primers, Sealers, and Undercoaters: 200 g/L.
e. 5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
f. 6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
g. 7. Pretreatment Wash Primers: 420 g/L.
h. 8. Floor Coatings: 100 g/L.
i. 9. Shellacs, Clear: 730 g/L.
j. 10. Shellacs, Pigmented: 550 g/L.
4. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

ii. SOURCE QUALITY CONTROL
1. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
a. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
b. Testing agency will perform tests for compliance with product requirements.
c. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

b. PRODUCTS
i. WATER-BASED PAINTS
1. Latex, Interior, Low VOC, "Egg Shell Finish"(Gloss Level 3 or 4):
a. Gypsum Board Walls and Ceilings
i. Basis of Design Product: **Benjamin Moore Natura – Eco Friendly Paint** or approved equal.
2. B. Latex, Interior, Low VOC, Semi-Gloss, (Gloss Level 5):
a. Wood Doors and Wood Door Trim
i. Basis of Design Product: **Benjamin Moore Natura – Eco Friendly Paint** or approved equal.
3. Colors:.
a. See the Interior Paint Color Schedule following this section.

c. PRIMERS/SEALERS
i. Primer Sealer, Latex, Interior: MPI #50.
ii. Primer, Latex, for Interior Wood: MPI #39.
iii. Primer, Bonding, Water Based: MPI #17.
iv. Wood-knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in paint systems indicated.
v.

d. FLOOR COATINGS
i. Sealer, Water Based, for Concrete Floors:
1. Concrete Slab
2. Basis of Design: **Enviroseal Duraseal Zero – VOC** (ASTM) D-3960 or approved equal
a. Clear – Abrasion Resistance (AStM D-658-44)

2. INTERIOR PAINT SCHEDULE
a. PT-1 Sherwin Williams Interior Latex Low Sheen Egg-Shell, SW6385 Dover White
b. PT-2 Sherwin Williams Interior Latex Flat Paint SW6385 Dover White
c. PT-3 Sherwin Williams Interior Latex Semi-Gloss SW70006 Extra White

7 STAINING AND TRANSPARENT FINISHES

1. WOOD STAIN
a. GENERAL
i. A. Provide solid color stain as selected by owner from manufacturers full range of colors- Sherwin Williams Woodscapes Exterior Acrylic Solid color house stain.
ii. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
iii. Material Compatibility:
1. Provide materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in the finish system and on substrate indicated.
iv. D. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior stains and finishes applied at project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
1. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
v. Low-Emitting Materials: Interior stains and finishes shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

b. SOURCE QUALITY CONTROL
i. A. Testing of Materials: Owner reserves the right to invoke the following procedure:
1. Owner will engage the services of a qualified testing agency to sample wood finishing materials. Contractor will be notified in advance and may be present when samples are taken. If materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying wood finishes if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying materials from Project site, pay for testing, and refinish surfaces finished with rejected materials. Contractor will be required to remove rejected materials from previously finished surfaces before refinishing with complying materials if the two finishes are incompatible or produce results that, in the opinion of the Architect, are aesthetically Unacceptable.

c. PRODUCTS
i. WOOD STAIN
1. Provide solid color stain as selected by owner from manufacturers full range of colors-
2. Basis of design: **Sherwin Williams Woodscapes Exterior Acrylic Solid color house stain** or approved equal.

d. WOOD FILLERS
i. Wood Filler Paste: MPI #91.

e. WATER-BASED VARNISHES
i. Varnish, Water Based, Clear, Satin (Gloss Level 4): MPI #128.

DIVISION 10 - SPECIALTIES

1 TOILET, BATH AND LAUNDRY ACCESSORIES

1. GRAB BARS
a. Basis-of-Design Product or equal: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
i. Gatco
ii. A & J Washroom Accessories, Inc.
iii. American Specialties, Inc.
iv. Bobrick Washroom Equipment, Inc.
v. Bradley Corporation.
vi. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
vii. Tubular Specialties Manufacturing, Inc..
b. Grab Bar at ADA Bathrooms:
i. Basis-of-Design: **Bobrick Stainless Steel Grab Bars** or approved equal.
ii. Mounting: Flanges with concealed fasteners.
iii. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
1. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
iv. Outside Diameter: 1-1/4 inches (32 mm)
v. Configuration and Length:
1. Straight, 36 inches at Toilet
2. Straight 42" at Toilet
3. Straight, 24" at Shower
4. Straight 48" at Shower
5. Straight 24" at Shower

2. BATHROOM ACCESSORIES
a. Basis of design Manufacturers or equal: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
b. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
i. Gatco Inc
ii. Basco, Inc.
iii. Bobrick Washroom Equipment, Inc.
iv. Franklin Brass by Liberty Hardware Manufacturing Corporation; a Masco company.
v. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
vi. Ginger; a Masco company.
vii. Seachrome Corporation.
viii. Tubular Specialties Manufacturing, Inc.
c. Toilet Tissue Dispenser:
i. Basis-of-Design Product: Gatco #4243
ii. Description: Single-roll dispenser
iii. Mounting: Surface mounted.
iv. Capacity: Designed for 4-1/2- or 5-inch- (114- or 127-mm-) diameter tissue rolls.
v. Material and Finish:
1. #4293 Satin Nickel
d. Shower Curtain Rod:
i. Basis-of-Design Product: Bobrick B-207
ii. Outside Diameter: 1 inch (25.4 mm).
iii. Mounting: Flanges with concealed fasteners.
iv. Rod Material and Finish: Stainless steel, No. 4 finish (satin)
v. Flange Material and Finish: Chrome Plated Plastic
e. Soap Dish at Shower / Tub (2 per residence):
i. Basis-of-Design Product: Bobrick B-4390
ii. Description: ADA Heavy Duty Soap Dispenser with Bar.
iii. Mounting: Recessed.
iv. Material and Finish: Stainless steel, No. 4 finish (satin).
f. Medicine Cabinet:
i. Basis-of-Design Product: Bobrick B-297.
ii. Mounting: Surface mounted.
iii. Size: 48 by 20 inches.
iv. Door: Framed mirror door concealing storage cabinet equipped with continuous hinge and spring-buffered, rod-type stop and magnetic door catch.
v. Shelves: Two Minimum.
vi. Material and Finish:
1. Cabinet: Steel with powder coated finish.
2. Mirror: No 1 quality 1/8" select float glass, electrolytically copper-plated.
3. Door: Heavy duty gauge steel with stainless steel channel frame.
4. Hinge: Steel piano hinge and equipped with magnetic latch.
5. Shelves: Heavy-gauge steel with white powder-coated finish. Roll-formed edges.
g. Robe Hook (1 per Master Bathroom – 1 per Kids Bathroom):
i. Basis-of-Design Product: Gatco
1. Description: Single-prong unit.
2. Material and Finish:
a. #4295 Satin Nickel
h. Towel Bar: (2 per Master Bathroom - 1 per Bathroom)
i. Basis-of-Design Product: Gatco
1. Description: .80-inch- round tube with end brackets
2. Mounting: Flanges with concealed fasteners.
3. Length: 24 inches (610 mm)
4. Material and Finish: Satin Nickel
a. #4290 Satin Nickel

2 FIRE EXTINGUISHERS

1. PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS
a. Fire Extinguishers: Type, size, and capacity for each mounting bracket indicated.
i. Basis of design Manufacturers or equal: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Amerex Corporation.
2. Ansul Incorporated; Tyco International Ltd.
3. Badger Fire Protection; a Kidde company.
4. Buckeye Fire Equipment Company.
5. Fire End & Croker Corporation.
6. J. L. Industries, Inc.; a division of Activar Construction Products Group.
7. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
8. Larsen's Manufacturing Company.
9. Moon-American.
10. Pem All Fire Extinguisher Corp.; a division of PEM Systems, Inc.
11. Potter Roemer LLC.
12. Pyro-Chem; Tyco Safety Products.
ii. Valves: Manufacturer's standard
iii. Handles and Levers: Manufacturer's standard
iv. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.
b. Multipurpose Dry-Chemical Type in Steel Container UL-rated 3-A:40-B:C, 5-lb (2.3-kg) nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.
c. MOUNTING BRACKETS
d. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or black baked-enamel finish.
i. Basis of design Manufacturers or equal: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Amerex Corporation.
2. Ansul Incorporated; Tyco International Ltd.
3. Badger Fire Protection; a Kidde company.
4. Buckeye Fire Equipment Company.
5. Fire End & Croker Corporation.
6. J. L. Industries, Inc.; a division of Activar Construction Products Group.
7. Larsen's Manufacturing Company.
8. Potter Roemer LLC.
e. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
i. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
1. Orientation: Vertical

3 POSTAL SPECIALTIES

1. MAILBOXES
a. GENERAL
i. Section Includes:
1. USPS-approved surface and post mounted mailboxes: Subject to compliance with requirements and approval by Owner provide USPS-approved mailboxes to be incorporated into the work.
b. ACTION SUBMITTALS
i. A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of postal specialty.
ii. Shop Drawings: For postal specialties. Include plans, elevations, sections, details, and attachments to other work.
1. Include layout of identification text.
2. Include setting drawings, templates, and installation instructions for anchor bolts and other anchorages installed as part of the work of other Sections.
iii. Samples for Initial Selection: For units with factory-applied color finishes.

4 SCREEN PORCH

1. SCREEN PORCH AND PATIO SYSTEMS
a. PVC Vinyl Fiber Reinforced Porch Screening and Framing Systems
b. MANUFACTURERS
i. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following Basis of design Manufacturer or equal:
1. Screen Tight, Inc, Screen Wall: www.screentight.com

DIVISION 11 - EQUIPMENT

1 RETRACTABLE STAIRS

1. RETRACTABLE STAIRS
a. GENERAL
i. Section Includes:
1. Preassembled, telescoping aluminum attic access stairs with aluminum treads.
ii. Related Sections:
1. Division 06 Section "Rough Carpentry Miscellaneous Rough Carpentry" for wood blocking for anchoring railings.
iii. PERFORMANCE REQUIREMENTS
1. Delegated Design: Design metal stairs, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
2. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
a. Load Capacity 375 lbs.
b. Ladder material – aluminum with non-marring, rubber bottom
c. Uniform and concentrated loads need not be assumed to act concurrently.
d. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
b. PRODUCTS
i. Basis-of-Design Productor or equal: Subject to compliance with requirements, provide **Werner Aluminum Attic Ladder AH2210** as indicated on Drawings or a comparable product by architect approved manufacturer.

DIVISION 12 - FURNISHINGS

1 HORIZONTAL LOUVER BLINDS

1. BLINDS WITHOUT SIDE GUIDES
a. GENERAL
i. Section Includes:
1. Horizontal slat louvers
b. PRODUCTS
i. BLINDS WITHOUT SIDE GUIDES
1. A. Description: Horizontal slat louvers hung from full-width headrail with full-width bottom rail.
2. Basis-of-Design Productor or equal: Subject to compliance with requirements, provide **Hunter Douglas Blinds** indicated on Drawings or a comparable product by architect approved manufacturer.
3. Manual Operation: Control of raising and lowering by cord with full range locking; blade angle adjustable by control wand.
4. Slat Support: Woven polypropylene cord, ladder configuration.
5. Head Rail: Pre-finished, formed aluminum box, with end caps; internally fitted with hardware, pulleys, and bearings for operation; same depth as width of slats.
6. Headrail Attachment: Wall brackets.
ii. FABRICATION
1. Determine sizes by field measurement.
2. Fabricate blinds to fit within openings with uniform edge clearance of 1/4" (6 mm).

2 RESIDENTIAL CASEWORK

1. CABINETS
a. GENERAL
i. Section includes:
1. Manufactured casework. Base and upper units.
2. Cabinet Hardware
ii. STANDARDS
1. Quality Standard: Provide cabinets that comply with KCMA A161.1.
b. PRODUCTS
i. CASEWORK
1. Basis of Design Product or equal: Subject to compliance with requirements, provide following products or comparable products to one of the following:
a. Smart Cabinets.
b. KraftMaid Cabinets
2. Face Style: Flush overlay; door and drawer faces cover cabinet fronts with only enough space
3. between faces for operating clearance.
4. Cabinet Style: Frameless.
5. Door and Drawer Fronts: Solid-wood stiles and rails, 3/4 inch (19 mm) thick, with 1/4-inch- (6.4-mm-) thick, veneer-faced plywood center panels.
6. Face Frames: 3/4-by-1-5/8-inch (19-by-41-mm) solid wood
7. Exposed Cabinet End Finish: Wood veneer.
8. Exposed Materials:
a. Exposed Cabinet End Finish: Wood veneer.
b. Wood Species: Manufacturer's standard domestic hardwood species.
i. a. Select materials for compatible color and grain. Do not use two adjacent exposed surfaces that are noticeably dissimilar in color, grain, figure, or natural character markings.
c. Finish: **Honey Maple.**
d. Solid Wood: Clear hardwood lumber of species indicated, free of defects.
e. Plywood: Hardwood plywood with face veneer of species indicated, with Grade A faces and Grade C backs of same species as faces.
f. Edge band exposed edges with [a minimum of 1/8-inch- (3-mm-) thick, veneer edging of same species as face veneer.
9. C. Semiexposed Materials: Unless otherwise indicated, provide the following:
a. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects. Same species as exposed surfaces.
b. Plywood: Hardwood plywood with Grade C faces and not less than Grade 3 backs of Same species as faces. Face veneers of same species as exposed surfaces.
c. Vinyl-Faced Particleboard: MDF with vinyl film adhesively bonded to particleboard.
i. a. Provide vinyl film on both sides of shelves, dividers, drawer bodies, and other components with two semi-exposed surfaces and on semi-exposed edges.
d. Colors, Textures, and Patterns: As selected by Architect from cabinet manufacturer's full range.
10. Concealed Materials: Solid wood or plywood, of any hardwood or softwood species, with no defects affecting strength or utility; particleboard; MDF; or hardboard.
c. CABINET HARDWARE
i. General: Manufacturer's standard units complying with BHMA A156.9, of type, size, style. Finish, unless specified otherwise, shall be selected by the Owner from the manufacturer's full range.
ii. Pulls: Surface-mounted decorative pulls
1. Basis of Design Product: Subject to compliance with requirements, provide following products or comparable products to one of the following:
a. Amerok:
i. Edge Pull 3" Cabinet Pull (Satin Nickel)
iii. Hinges: Concealed butt hinges.
iv. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05011 or Type B05091.

3 PLASTIC-LAMINATE-CLAD COUNTERTOPS

1. PLASTIC-LAMINATE COUNTERTOPS
a. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades indicated for construction, installation, and other requirements.
i. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.
b. Grade: Economy.
c. Decorative Laminate:
i. Basis of Design: **Wilsonart International** or approved equal
d. Colors, Patterns, and Finishes: Colors and textures selected by Owner from manufacturer's standard finishes.
i. Selected by Owner from manufacturer's full range of standard finishes
e. Edge Treatment: Same as laminate cladding on horizontal surfaces.
f. Core Material: Particleboard or medium-density fiberboard
g. Core Material at Sinks: Particleboard made with exterior glue or medium-density fiberboard made with exterior glue

DIVISION 33 - UTILITIES

1 STORM DRAIN UTILITIES

1. FOUNDATION DRAINAGE MAT
a. GENERAL
i. Includes
1. Dimpled, plastic foundation drainage board with integrated filter fabric
ii. Application
1. Applied to exterior side of waterproofed, concrete foundations.
b. PRODUCTS
i. Basis of Design: **JDRAIN 400/420** or approved equal
c. EXECUTION
i. Integrate filter fabric of the drainage board with the filter fabric of the french drain with manuf. Recommended spray adhesive

SEVEN GENERATIONS architectur +
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ELDERS HOUSING
BAY MILLS INDIAN COMMUNITY
Red Pine Lane, Bay Mills Township, MI 49715
100% Design Review

95% CONSTRUCTION DOCUMENTS
ISSUE DATE: 10/23/2020
REVISIONS

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER: 220046
SHEET TITLE SPECIFICATIONS
SHEET NO. G007

GENERAL NOTES

1. REFERENCED SPECIFICATIONS AND CODES

A. EGLE, MICHIGAN WATER QUALITY STANDARDS, LATEST VERSIONS.
B. MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, LATEST VERSION.
C. THE AMERICANS WITH DISABILITIES ACT, LATEST VERSIONS.
D. U.S. SOIL CONSERVATION SERVICE FIELD ENGINEERING HANDBOOK, LATEST VERSION..
E. ALL REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.
F. THE CITED STANDARD SPECIFICATIONS, CODES AND PERMITS, WITH THESE CONSTRUCTION PLANS AND DETAILS, ARE ALL TO BE CONSIDERED PART OF THE WORK. INCIDENTAL ITEMS OR ACCESSORIES NECESSARY TO COMPLETE THIS WORK MAY NOT BE SPECIFICALLY NOTED BUT ARE CONSIDERED A PART OF THESE IMPROVEMENTS.
G. IN CASE OF CONFLICT, THE MORE RESTRICTIVE PROVISION SHALL APPLY.

2. UTILITY LOCATIONS

A. TO THE BEST OF OUR KNOWLEDGE, EASEMENTS FOR THE EXISTING UTILITIES, BOTH PUBLIC AND PRIVATE, AND UTILITIES WITHIN PUBLIC RIGHTS–OF–WAY ARE SHOWN ON THE PLANS ACCORDING TO AVAILABLE RECORDS.
B. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM OR ESTABLISH THE EXISTENCE OF ALL EXISTING UTILITY FACILITIES AND THEIR EXACT LOCATIONS, AND TO SAFELY SCHEDULE ALL UTILITY RELOCATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING THE UTILITY COMPANIES LOCATE THEIR FACILITIES IN THE FIELD PRIOR TO CONSTRUCTION AND SHALL ALSO BE RESPONSIBLE FOR THE MAINTENANCE AND PRESERVATION OF THESE FACILITIES. THE ENGINEER DOES NOT WARRANT THE LOCATION OF ANY EXISTING UTILITIES SHOWN ON THE PLAN. THE CONTRACTOR SHALL CALL MISS DIG AT 811 OR 800–482–7171 AND THE AGENCY HAVING JURISDICTION OVER LOCAL WATER, SEWER AND ELECTRICAL SYSTEMS.
C. IF EXISTING UTILITY LINES OF ANY NATURE ARE ENCOUNTERED WHICH CONFLICT WITH LOCATIONS OF THE NEW CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.

3. UTILITY COORDINATION

A. OWNER SHALL OBTAIN EASEMENTS AND PERMITS NECESSARY TO FACILITATE CONSTRUCTION OF THE PROPOSED UTILITIES. THE CONTRACTOR SHALL FURNISH ALL REQUIRED BONDS AND EVIDENCE OF INSURANCE NECESSARY TO SECURE THESE PERMITS.
B. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE NATURE AND STATUS OF ALL UTILITY RELOCATION WORK PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO ENSURE THAT CONSTRUCTION OPERATIONS DO NOT INTERFERE WITH UTILITY FACILITIES AND RELOCATION WORK. THE SCHEDULE SHOULD REFLECT CONSTRUCTION SEQUENCING WHICH COORDINATES WITH ALL UTILITY RELOCATION WORK. THE CONTRACTOR SHALL BE REQUIRED TO ADJUST THE ORDER OF WORK FROM TIME TO TIME, TO COORDINATE SAME WITH UTILITY RELOCATION WORK, AND SHALL PREPARE REVISED SCHEDULE(S) IN COMPLIANCE THEREWITH AS DIRECTED BY THE OWNER.
C. THE OWNER, ENGINEER, ALL GOVERNING AGENCIES AND UTILITY COMPANIES SHALL BE NOTIFIED IN WRITING BY THE CONTRACTOR AT LEAST 48 HOURS PRIOR TO THE START OF ANY OPERATION REQUIRING COOPERATION WITH OTHERS.

4. COMMENCING CONSTRUCTION

A. PRIOR TO COMMENCEMENT OF CONSTRUCTION THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AFFECTING THE WORK WITH THE ACTUAL CONDITIONS AT THE JOB SITE. IF THERE ARE ANY DISCREPANCIES WITH WHAT IS SHOWN ON THE CONSTRUCTION PLANS, HE MUST IMMEDIATELY REPORT TO ENGINEER BEFORE DOING ANY WORK, OTHERWISE THE CONTRACTOR ASSUMES FULL RESPONSIBILITY. IN THE EVENT OF DISAGREEMENT BETWEEN THE CONSTRUCTION PLANS, SPECIFICATIONS AND/OR SPECIAL DETAILS, THE CONTRACTOR SHALL SECURE WRITTEN INSTRUCTION FROM THE ENGINEER PRIOR TO PROCEEDING WITH ANY PART OF THE WORK AFFECTED BY OMISSIONS OR DISCREPANCIES. FAILING TO SECURE SUCH INSTRUCTION, THE CONTRACTOR WILL BE CONSIDERED TO HAVE PROCEEDED AT HIS OWN RISK AND EXPENSE. IN THE EVENT OF ANY DOUBT OR QUESTIONS ARISING WITH RESPECT TO THE TRUE MEANING OF THE CONSTRUCTION PLANS OR SPECIFICATIONS, THE DECISION OF THE ENGINEER SHALL BE FINAL AND CONCLUSIVE.
B. THE CONTRACTOR SHALL NOTIFY AS NECESSARY, ALL TESTING AGENCIES AS CONTRACTED BY THE COUNTY, TOWNSHIP OR OWNER, SUFFICIENTLY IN ADVANCE OF CONSTRUCTION. ALL MATERIAL TESTING SHALL BE THE RESPONSIBILITY AND EXPENSE OF THE CONTRACTOR. ALL TESTING AGENCIES SHALL MEET THE APPROVAL OF THE OWNER. FAILURE OF CONTRACTOR TO ALLOW PROPER NOTIFICATION TIME WHICH RESULTS IN TESTING AGENCIES BEING UNABLE TO VISIT SITE WILL RESULT IN THE CONTRACTOR SUSPENDING OPERATIONS (PERTAINING TO TESTING) UNTIL TESTING OPERATIONS CAN BE COMPLETED. COST OF SUSPENSION OF WORK TO BE BORNE BY CONTRACTOR.
C. THE CONTRACTOR SHALL MAINTAIN PEDESTRIAN AND VEHICULAR ACCESS AT ALL TIMES. AT NO TIME SHALL ACCESS BE DENIED TO PROPERTIES SURROUNDING THE SITE.
D. THE CONTRACTOR SHALL PRESERVE ALL CONSTRUCTION STAKES UNTIL THEY ARE NO LONGER NEEDED. ANY STAKES DESTROYED OR DISTURBED BY THE CONTRACTOR PRIOR TO THEIR USE SHALL BE RESET BY THE DEVELOPER'S SURVEYOR AT CONTRACTOR'S COST.
E. ITEMS SPECIFIED FOR REMOVAL, INCLUDING BUT NOT LIMITED TO, PAVEMENT, SIDEWALK, CURB, CURB AND GUTTER, CULVERTS, ETC. SHALL BE LEGALLY DISPOSED OF OFF–SITE BY THE CONTRACTOR AT HIS OWN EXPENSE. THE CONTRACTOR IS RESPONSIBLE FOR ANY PERMIT REQUIRED FOR SUCH DISPOSAL.
F. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SAFETY ON THE JOB.
G. THE CONTRACTOR SHALL COLLECT AND REMOVE ALL CONSTRUCTION DEBRIS, EXCESS MATERIALS, TRASH, OIL AND GREASE RESIDUE, MACHINERY, TOOLS AND OTHER MISCELLANEOUS ITEMS WHICH WERE NOT PRESENT PRIOR TO PROJECT COMMENCEMENT AT NO ADDITIONAL EXPENSE TO THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ANY AND ALL PERMITS NECESSARY FOR THE HAULING AND DISPOSAL REQUIRED FOR CLEAN–UP AS DIRECTED BY THE ENGINEER OR OWNER.
H. ALL EXISTING UTILITIES OR IMPROVEMENTS, INCLUDING WALKS, CURBS, PAVEMENT AND PARKWAYS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE PROMPTLY RESTORED TO THEIR RESPECTIVE ORIGINAL CONDITION. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT UNLESS SPECIFICALLY NOTED ON THE PLANS.

5. GENERAL EXCAVATION/UTILITY NOTES

A. COST FOR SHORING AND BRACING, SHEET PILING, UPRIGHTS, STRINGERS, CROSS BRACES, ETC. SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE WORK. NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
B. THE CONTRACTOR SHALL: PREVENT SURFACE WATER AND SUBSURFACE OR GROUNDWATER FROM FLOWING INTO EXCAVATIONS; REMOVE WATER TO PREVENT SOFTENING OF FOUNDATION BOTTOMS, UNDERCUTTING FOOTINGS, AND SOIL CHANGES DETRIMENTAL TO STABILITY OF SUBGRADES AND FOUNDATIONS; PROVIDE AND MAINTAIN PUMPS, SUMPS, SUCTION AND DISCHARGE LINES AND OTHER DEWATERING SYSTEM COMPONENTS NECESSARY TO CONVEY WATER AWAY FROM EXCAVATIONS; CONVEY WATER REMOVED FROM EXCAVATIONS AND RAINWATER TO COLLECTING OR RUN–OFF AREAS ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION; PROVIDE AND MAINTAIN TEMPORARY DRAINAGE DITCHES AND OTHER DIVERSIONS OUTSIDE EXCAVATION LIMITS FOR EACH STRUCTURE. THE CONTRACTOR SHALL NOT USE TRENCH EXCAVATIONS AS TEMPORARY DRAINAGE DITCHES.
C. UNDERGROUND WORK SHALL INCLUDE TRENCHING, INSTALLATION OF PIPE, CASTINGS, STRUCTURES, BACKFILLING OF TRENCHES AND COMPACTION AND TESTING AS SHOWN ON THE CONSTRUCTION PLANS. FITTINGS AND ACCESSORIES NECESSARY TO COMPLETE THE WORK MAY NOT BE SPECIFIED, BUT SHALL BE CONSIDERED AS INCIDENTAL TO THE COST OF THE IMPROVEMENTS.
D. EXISTING DRAINAGE STRUCTURES AND SYSTEMS SHALL BE CLEANED OF DEBRIS AND PATCHED AS NECESSARY TO ASSURE INTEGRITY OF THE STRUCTURE, WHERE SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. DRAINAGE STRUCTURES AND SYSTEMS CONSTRUCTED AS PART OF THIS PROJECT SHALL BE MAINTAINED BY THE CONTRACTOR AT HIS EXPENSE. NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
E. IN THE EVENT THAT SOFT MATERIALS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE OWNER OR OWNER'S AGENT IMMEDIATELY.
F. THE CONTRACTOR SHALL INSTALL A 4" X 4" X 8' (NOMINAL) POST AT THE TERMINUS OF THE SANITARY AND WATER SERVICE, SANITARY AND STORM MANHOLES, CATCH BASINS, INLETS AND WATER VAULTS. THE POST SHALL EXTEND 4' ABOVE THE GROUND. THE TOP 12" OF THE POST SHALL BE PAINTED AS FOLLOWS: SANITARY – RED, WATERMAIN – BLUE, STORM – GREEN.
G. ALL TOP OF FRAMES FOR STORM AND SANITARY SEWERS AND VALVE COVERS ARE TO BE ADJUSTED TO MEET FINAL FINISHED GRADE. THIS ADJUSTMENT IS TO BE MADE BY THE SEWER AND WATER CONTRACTOR AND THE COST IS TO BE CONSIDERED INCIDENTAL. THESE ADJUSTMENTS TO FINISHED GRADE WILL NOT ALLEVIATE THE CONTRACTOR FROM ANY ADDITIONAL ADJUSTMENTS IF REQUIRED, BY THE LOCAL MUNICIPALITY HAVING JURISDICTION OVER THE WORK UPON FINAL INSPECTION OF THE PROJECT.
H. THE CONTRACTOR SHALL VERIFY THE SIZE AND INVERT ELEVATION OF ALL CONNECTIONS TO AVOID ANY CONFLICTS BEFORE STARTING WORK. NOTIFY OWNER OF ANY DISCREPANCIES.
I. NO UNDERGROUND WORK SHALL BE COVERED UNTIL IT HAS BEEN APPROVED BY THE AGENCY HAVING JURISDICTION. APPROVAL TO PROCEED MUST BE OBTAINED FROM THE COUNTY AND/OR CITY PRIOR TO INSTALLING PAVEMENT BASE, BINDER, SURFACE, AND PRIOR TO PLACING ANY CONCRETE AFTER FORMS HAVE BEEN SET.
J. AT THE CLOSE OF EACH WORKING DAY AND AT THE CONCLUSION OF CONSTRUCTION OPERATIONS, ALL DRAINAGE STRUCTURES AND FLOW LINES SHALL BE FREE FROM DIRT AND DEBRIS.

6. INDEMNIFICATION

A. HOLD HARMLESS: THE CONTRACTOR, AS A CONDITION OF THE CONTRACT, HEREBY AGREES TO ASSUME THE ENTIRE RESPONSIBILITY AND LIABILITY FOR, AND DEFENSE OF, AND TO PAY AND INDEMNIFY AND HOLD THE OWNER, THE ENGINEER, THE CITY, THEIR ENGINEERS, AGENTS AND EMPLOYEES HARMLESS FROM ALL CLAIMS FOR DAMAGES OR INJURY (OR DEATH RESULTING THEREFROM) TO ANY AND ALL PERSONS, INCLUDING EMPLOYEES OR AGENTS OR ANY PERSON OR FIRM WHO ENGAGES IN WORK UPON THE PROJECT, ARISING OUT OF THE CONDUCT OF THE CONTRACTOR ARISING OUT OF THE PERFORMANCE OF THIS AGREEMENT OR ANY WORK RELEVANT THERETO, OR ARISING OUT OF ANY FEDERAL, STATE OR LOCAL STATUTE, RULE, REGULATION OR ORDINANCE, INCLUDING BUT NOT LIMITED TO THE PROVISIONS OF THE OCCUPATIONAL SAFETY AND HEALTH STANDARDS ACT (OSHA).
B. ALL COSTS, FEES AND EXPENSES, INCLUDING, BY WAY OF EXAMPLE AND WITHOUT LIMITATION, REASONABLE ATTORNEY'S FEES, COURT COSTS, COURT REPORTER'S FEES, TRANSCRIPT COSTS, SUBPOENA FEES AND COSTS, WITNESS FEES, SERVICE COSTS, AND DOCUMENT REPRODUCTION COSTS INCURRED BY THE COUNTY OR CITY AS A RESULT OF ANY CLAIMS FOR DAMAGE OR INJURY AS ENUMERATED ABOVE SHALL BE PAID BY THE CONTRACTOR.
C. THE CONTRACTOR(S) SHALL NAME WBK ENGINEERING, LLC. (WBK), THE PROJECT OWNER, AND LOCAL MUNICIPALITY AS ADDITIONAL NAMED INSUREDS ON ALL LIABILITY INSURANCE POLICIES AND SHALL PROVIDE ALL PARTIES WITH CERTIFICATES OF INSURANCE PRIOR TO COMMENCEMENT OF ANY WORK.

EARTHWORK NOTES

1. GENERAL

A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE SOIL AND GROUNDWATER CONDITIONS AT THE SITE.
B. THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE DURING CONSTRUCTION, AND PREVENT STORMWATER FROM RUNNING OFFSITE AND INTO OR STANDING IN EXCAVATED AREAS.
C. SITE DEWATERING IS NOT EXPECTED. IF SITE DEWATERING IS REQUIRED PLANS SHALL BE SUBMITTED AND APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION. NO ADDITIONAL COMPENSATION SHALL BE MADE FOR DEWATERING DURING CONSTRUCTION.
D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF THE "SOIL EROSION AND SEDIMENTATION CONTROL MEASURES". THE INITIAL ESTABLISHMENT OF EROSION CONTROL PROCEDURES AND THE PLACEMENT OF EROSION CONTROL BARRIER FENCING, ETC. TO PROTECT ADJACENT PROPERTY, WETLANDS, ETC. SHALL OCCUR PRIOR TO ANY CONSTRUCTION ACTIVITIES.
E. PRIOR TO COMMENCEMENT OF GRADING ACTIVITIES, THE CONTRACTOR SHALL ERECT A "SNOW FENCE" AROUND ANY TREE DESIGNATED TO BE PRESERVED. SAID FENCE SHALL BE PLACED IN A CIRCLE CENTERED AROUND THE TREE, THE DIAMETER OF WHICH SHALL BE SUCH THAT THE ENTIRE DRIP ZONE (EXTENT OF FURTHEST EXTENDING BRANCHES) SHALL BE WITHIN THE FENCE LIMITS. THE EXISTING GRADE WITHIN THE FENCED AREA SHALL NOT BE DISTURBED.
F. EXCESS MATERIALS, IF NOT UTILIZED AS FILL SHALL BE COMPLETELY REMOVED FROM THE CONSTRUCTION SITE AND PROPERLY DISPOSED OF OFF–SITE BY THE CONTRACTOR AT A PREVIOUSLY APPROVED SITE.

2. SUB–GRADE PREPARATION

A. EARTHWORK FOR PROPOSED PAVEMENT SUBGRADE SHALL BE FINISHED TO WITHIN 0.1 FOOT, PLUS OR MINUS, OF PLAN ELEVATION. THE CONTRACTOR SHALL SATISFY HIMSELF THAT THE SUBGRADE HAS BEEN PROPERLY PREPARED AND THAT THE FINISH TOP SUBGRADE ELEVATION HAS BEEN GRADED WITHIN TOLERANCES ALLOWED IN THESE SPECIFICATIONS. UNLESS THE CONTRACTOR ADVISES THE ENGINEER IN WRITING PRIOR TO FINE GRADING FOR AGGREGATE BASE COURSE CONSTRUCTION, IT IS UNDERSTOOD THAT HE HAS APPROVED AND ACCEPTS THE RESPONSIBILITY FOR THE SUBGRADE.
B. PRIOR TO THE PLACEMENT OF THE CURB AND GUTTER AND AGGREGATE BASE COURSE, THE CONTRACTOR SHALL PROVIDE, AS A MINIMUM, A FULLY LOADED SIX–WHEEL TANDEM AXLE TRUCK FOR PROOF ROLLING THE PAVEMENT SUBGRADE PRIOR TO THE PLACEMENT OF THE CURB AND GUTTER AND AGGREGATE BASE MATERIAL. THE SUBGRADE MUST BE PROOF ROLLED AND INSPECTED FOR UNSUITABLE MATERIALS AND/OR EXCESSIVE MOVEMENT BY THE SOILS CONSULTANT AND IF REQUIRED, BY THE LOCAL MUNICIPALITY HAVING JURISDICTION OVER THE WORK. IF UNSUITABLE SUBGRADE IS ENCOUNTERED, IT SHALL BE CORRECTED. THIS MAY INCLUDE ONE OR MORE OF THE FOLLOWING METHODS:

1) SCARIFY DISC AND AERATE.
2) REMOVE AND REPLACE WITH GRANULAR MATERIAL.
3) USE OF GEOTEXTILE FABRIC. MAXIMUM DEFLECTION ALLOWED IN ISOLATED AREAS MAY BE 1/4" TO 1/2", IF NO DEFLECTION OCCURS OVER THE MAJORITY OF THE AREA.

STORM SEWER NOTES

1. STORM SEWER PIPE: ALL STORM SEWER AND CULVERT CLASS SHALL BE SELECTED ACCORDING TO TABLES 402–1 AND 401–1 RESPECTIVELY OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

2. BEDDING: BEDDING SHALL BE COMPLETED PER THE DETAIL FOR PIPE BEDDING SHOWN ON THE DETAIL SHEETS.

3. CONSTRUCTION: ALL STORM SEWERS ARE TO BE CONSTRUCTED USING A PIPE LASER INSTRUMENT TO MAINTAIN LINE AND GRADE. CONTRACTOR WILL PERFORM A SECONDARY CHECK USING AN EXTERIOR LEVEL EVERY 5 FULL PIPE LENGTHS OR AT INTERVAL APPROVED BY ENGINEER. CONTRACTOR WILL ACCOMMODATE INDEPENDENT ELEVATION CHECKS BY THE ENGINEER OR APPROVAL AGENCY.

4. COVER: THE CONTRACTOR SHALL MAINTAIN PIPE MANUFACTURER SPECIFIED COVER OVER SHALLOW PIPES AT ALL TIMES DURING CONSTRUCTION ACTIVITIES. AT NO POINT IN THE CONSTRUCTION SHALL COVER BE LESS THAN ONE (1') FOOT. THE CONTRACTOR SHALL MOUND OVER ANY PIPES WHICH HAVE LESS THAN (1') FEET OF COVER DURING CONSTRUCTION UNTIL THE AREA IS FINAL GRADED OR PAVED.

5. STRUCTURES: MANHOLES, CATCH BASINS AND INLETS SHALL CONFORM TO THE DETAILS SHOWN ON THE DETAIL SHEETS. THE FRAME, GRATE, AND/OR CLOSED LID SHALL BE CAST IRON OF THE STYLE SHOWN ON THE PLANS.

6. CLEANING: THE STORM SEWER SYSTEM SHALL BE THOROUGHLY CLEANED PRIOR TO FINAL INSPECTION AND TESTING.

WATERMAIN NOTES

1. WATER SERVICES: WATER LINES 2 INCHES IN DIAMETER OR LESS WILL BE CONSIDERED WATER SERVICES, LARGER LINES WILL BE CONSIDERED WATER MAIN. MINIMUM WATER SERVICE SIZE IS 1 INCH. WATER SERVICE LINES SHALL BE TYPE K COPPER. IF ALLOWED BY THE LOCAL MUNICIPALITY, SDR 9 MEETING REQUIREMENTS OF ASTM D3035, AWWA C901, AND ANSI/NSF STANDARD 14 PRESSURE RATED TO 200 PSI MAY BE USED.

2. VALVE BOXES AND CURB BOXES: VALVE BOXES AND CURB BOXES MUST BE MADE OF CAST IRON, CONFORMING TO THE REQUIREMENTS OF ASTM A 48 FOR CLASS 30B AND AASHTO M 306. EACH BOX MUST BE A SCREW TYPE AND CONSIST OF FIVE SECTIONS: BASE, CENTER, EXTENSION, TOP, AND COVER. THE COVER MUST BE MARKED "WATER". BOXES TO MEET LOCAL MUNICIPALITIES STANDARD TYPE. SET BOX FLUSH WITH FINISH GROUND IN LAWN AREAS, 2" ABOVE FINISH GROUND ELEVATION IN NON–LAWN AREAS, OR AT FINAL PAVEMENT ELEVATION.

3. CORPORATION STOPS AND CURB STOPS: CORPORATION STOPS AND CURB STOPS SHALL BE COMPRESSION FITTINGS MEETING REQUIREMENTS OF AWWA C800. PROVIDE STOPS OF ALL–BRASS CONSTRUCTION WITH THE END TYPES CONFORMING TO THE CONDITIONS ENCOUNTERED ON THE PROJECT, AS NECESSARY TO COMPLETE INSTALLATION. STOPS SHALL OPEN COUNTERCLOCKWISE. STOPS TO MEET REQUIREMENTS OF LOCAL MUNICIPALITY.

4. SERVICE SADDLE: PROVIDE SOLID STAINLESS STEEL SERVICE SADDLES WITH A SINGLE BOLT BAND. SERVICE SADDLES TO MEET REQUIREMENTS OF LOCAL MUNICIPALITY.

5. MAXIMUM DEFLECTION AT PIPE JOINTS SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURER'S CURRENT RECOMMENDATIONS AND AWWA SPECIFICATIONS.

6. BEDDING: REFER TO TRENCH DETAIL FOR WATER MAIN.

7. A MINIMUM DEPTH OF COVER OF 6'–0" SHALL BE MAINTAINED OVER THE WATER LINES. THE MAXIMUM COVER SHALL BE TEN (10') FEET.

8. WATER MAINS SHALL BE SEPARATED FROM SANITARY SEWERS AND STORM SEWERS IN ACCORDANCE WITH EGLE REQUIREMENTS MAINTAINING 18 INCHES OF VERTICAL SEPARATION AND 10 FOOT HORIZONTAL SEPARATION.

9. ALL WATER MAINS SHALL BE PRESSURE TESTED, FLUSHED AND DISINFECTED IN ACCORDANCE WITH AWWA C600 & C651. AT NO TIME IS THERE TO BE ANY VISIBLE LEAKAGE FROM THE MAIN.

10. COORDINATE WATER MAIN SHUTDOWN WITH LOCAL MUNICIPALITY 48 HOURS IN ADVANCE OF THE WORK.

SANITARY SEWER NOTES

1. GRAVITY SANITARY SEWER PIPE SHALL BE PVC (POLYVINYL CHLORIDE) PLASTIC PIPE CONFORMING TO ASTM D–3034 OR ASTM F679 WITH PUSH–ON JOINTS CONFORMING TO ASTM D–3212 AND A STANDARD DIMENSION RATIO (SDR) OF 26 EXCEPT WHERE NOTED.
2.
3. SANITARY SEWER PIPE FOR SEWERS HAVING A FINISHED BURIED DEPTH TO INVERT GREATER THAN 20' SHALL BE PVC (POLYVINYL CHLORIDE) PLASTIC PIPE CONFORMING TO DR–18 AWWA C–905 STANDARDS.

4. ALL SANITARY SEWER FITTINGS SHALL BE PVC SDR 26 HEAVY WALL UNLESS PIPE IS C905.

5. BEDDING: BEDDING SHALL BE COMPLETED PER THE TRENCH DETAILS CONTAINED ON THESE DRAWINGS

6. ALL TRENCHES BENEATH PROPOSED OR EXISTING UTILITIES, AND FOR A DISTANCE OF THREE (3') FEET ON EITHER SIDE OF SAME, AND/OR WHERE SHOWN ON THE PLANS, SHALL BE BACKFILLED PER THE TRENCH DETAIL SHOWING PIPE UNDER ROADWAY.

7. ALL SANITARY SEWERS ARE TO BE CONSTRUCTED USING AN INTRA–PIPE LASER INSTRUMENT TO MAINTAIN LINE AND GRADE.

8. ALL FLOOR DRAINS SHALL CONNECT TO THE SANITARY SEWER.

9. CONNECTIONS TO EXISTING SANITARY SEWER SYSTEM SHALL BE COORDINATED WITH THE LOCAL SEWER AUTHORITY.

10. WATER MAINS SHALL BE SEPARATED FROM SANITARY SEWERS AND STORM SEWERS IN ACCORDANCE WITH EGLE REQUIREMENTS MAINTAINING 18 INCHES OF VERTICAL SEPARATION AND 10 FOOT HORIZONTAL SEPARATION.
11.
12. CLEANING: ALL MANHOLES AND PIPES SHALL BE THOROUGHLY CLEANED OF DIRT AND DEBRIS, AND ALL VISIBLE LEAKAGE ELIMINATED, BEFORE FINAL INSPECTION AND ACCEPTANCE.

13. TESTING: DEFLECTION TESTING SHOWING A MAXIMUM DEFLECTION OF 5% AND LOW PRESSURE AIR LEAKAGE TESTING WILL BE REQUIRED.

14. TEST RESULTS: IF THE SANITARY SEWER INSTALLATION FAILS TO MEET THE TEST REQUIREMENTS SPECIFIED, THE CONTRACTOR SHALL DETERMINE THE CAUSE OR CAUSES OF THE DEFECT AND REPAIR, OR REPLACE ALL MATERIALS, AND WORKMANSHIP AS MAY BE NECESSARY TO COMPLY WITH THE TEST REQUIREMENTS.

SIGNING AND PAVEMENT MARKINGS

1. ALL SIGNING AND PAVEMENT MARKING SHALL BE IN ACCORDANCE WITH:
   1.1. THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD)
   1.2. MDOT TRAFFIC SIGN DESIGN, PLACEMENT, AND APPLICATION GUIDELINES
   1.3. THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION
2. SIGNS: SIGNS SHALL BE CONSTRUCTED OF 0.080 INCH THICK FLAT ALUMINUM PANELS WITH REFLECTORIZED LEGEND ON THE FACE. LEGEND SHALL BE IN ACCORDANCE WITH MMUTCD.

3. POSTS: SIGN POSTS SHALL BE A HEAVY DUTY STEEL "U" SHAPED CHANNEL OR SQUARE TUBULAR POST WEIGHING 3.0 POUNDS/FOOT.

4. SIGNS AND POSTS SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 810 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

5. PAVEMENT MARKINGS: ALL PAVEMENT MARKINGS IN THE ROADWAY LIMITS, SUCH AS STOP BAR LINES, CENTERLINES, CROSSWALKS AND DIRECTIONAL ARROWS SHALL BE REFLECTORIZED THERMOPLASTIC PER SECTION 811 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

6. PAVEMENT MARKINGS ON BIKE PATHS, PARKING LOT STALLS, AND SIMILAR "LOW WEAR" APPLICATION, SHALL BE PAINT IN ACCORDANCE TO SECTION 811 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

7. COLOR, WIDTH, STYLE, AND SIZE OF ALL MARKINGS SHALL BE IN ACCORDANCE WITH MMUTCD.

8. ADHERE TO MINIMUM MATERIAL PLACEMENT TEMPERATURE AND SEASONAL RESTRICTIONS AS SHOWN IN TABLE 811–2 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

UPDATED 10/20/2020 - REVISIONS

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

GENERAL NOTES AND SPECIFICATIONS

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	GN200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

CLIENT : **BAY MILLS HOUSING AUTHORITY**
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PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **GN1**
SHEET:
1 OF 23

PAVING NOTES

1. GENERAL

A. PAVING WORK INCLUDES FINAL SUBGRADE SHAPING, PREPARATION AND COMPACTION; PLACEMENT OF SUB–BASE AND/OR BASE COURSE MATERIALS; PLACEMENT OF BITUMINOUS MATERIAL PRIME COAT; BITUMINOUS BINDER AND SURFACE COURSES; FORMING, FINISHING AND CURING CONCRETE PAVEMENT, CURBS AND WALKS; AND FINAL CLEAN–UP AND ALL RELATED WORK.

B. COMPACTION REQUIREMENT: PRIOR TO PLACEMENT OF THE HOT–MIX ASPHALT BASE COURSE, THE CONTRACTOR SHALL PROVIDE, AS A MINIMUM, A TANDEM AXLE TRUCK LOADED TO A MINIMUM GROSS WEIGHT OF 40,000 LBS. PROOF ROLLING SHALL OPERATE AT WALKING SPEED (APPROXIMATELY 3–5 MPH). THE NUMBER OF PASSES IN PROOF ROLLING WILL BE AS DIRECTED BY THE ENGINEER. IF UNSUITABLE SUB–BASE IS ENCOUNTERED IT SHALL BE CORRECTED BY REMOVING AND REPLACING WITH GRANULAR MATERIAL AS SPECIFIED BY THE ENGINEER.

C. HOT–MIX ASPHALT SHALL BE PLACED ON A CLEAN DRY AGGREGATE BASE. THE AGGREGATE BASE SHALL BE PREPARED PER SECTION 302 OF THE MDOT 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION.

D. THE HMA SHALL BE DELIVERED AT A TEMPERATURE OF 250˚F TO 350˚F.

E. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE PROPER BARRICADING, WARNING DEVICES AND THE SAFE MANAGEMENT OF TRAFFIC WITHIN THE AREA OF CONSTRUCTION. ALL SUCH DEVICES AND THEIR INSTALLATION SHALL CONFORM TO THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

2. FLEXIBLE PAVEMENT

A. HOT MIX ASPHALT CONSTRUCTION SHALL CONFORM TO SECTION 501 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

B. ALL TRAFFIC SHALL BE KEPT OFF THE COMPLETED AGGREGATE BASE UNTIL THE HOT–MIX ASPHALT BASE COURSE IS PLACED. THE AGGREGATE BASE SHALL BE UNIFORMLY PRIME COATED AT A RATE OF 0.25 TO 0.50 GALLONS PER SQUARE YARD PRIOR TO PLACING THE HOT–MIX ASPHALT BINDER COURSE. PRIME COAT MATERIALS SHALL BE PER SECTION 904 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

C. UNLESS SPECIFIED ELSEWHERE, THE BINDER PG SHALL BE 58–28 FOR BASE COURSE AND 58–34 FOR THE WEARING COURSE OF ASPHALT.

D. PRIOR TO PLACEMENT OF THE HOT–MIX ASPHALT BINDER COURSE AND THE HOT–MIX ASPHALT SURFACE COURSE THE RESPECTIVE HOT–MIX ASPHALT PAVEMENT, SHALL BE CLEANED TO THE SATISFACTION OF THE ENGINEER, AND PRIME COATED. ALL DAMAGED AREAS IN THE BINDER, BASE OR CURB SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AND VILLAGE PRIOR TO PLACING THE HOT–MIX ASPHALT SURFACE COURSE. THE CONTRACTOR SHALL PROVIDE WHATEVER EQUIPMENT AND MANPOWER NECESSARY, INCLUDING THE USE OF POWER BROOMS IF REQUIRED BY THE ENGINEER, TO PREPARE THE PAVEMENT FOR APPLICATION OF THE HOT–MIX ASPHALT SURFACE COURSE. THE PRIME COAT SHALL BE UNIFORMLY APPLIED TO THE HOT–MIX ASPHALT BASE COURSE AND THE HOT–MIX ASPHALT BINDER COURSE AT A RATE OF 0.05 TO 0.15 GALLONS PER SQUARE YARD.

3. CONCRETE WORK

A. ALL EXTERIOR CONCRETE SHALL BE PORTLAND CEMENT CONCRETE CLASS AS DEFINED BELOW PER TABLE 601–2 OF THE MDOT 2020 STANDARD SPECIFICATION FOR CONSTRUCTION:
CONCRETE CURB AND GUTTER – MDOT CONCRETE GRADE P1 OR S2
CONCRETE SIDEWALK, RAMPS, AND STEPS – MDOT CONCRETE GRADE P1, P2, S2, OR S3
CONCRETE DRIVEWAYS – MDOT CONCRETE GRADE P1, P–NC, OR S2

B. EXTERIOR CONCRETE SHALL HAVE AIR ENTRAINMENT OF NOT LESS THAN FIVE (5%) OR MORE THAN EIGHT (8.5%) PERCENT. CONCRETE SHALL BE A MINIMUM OF SIX (6) BAG MIX AND SHALL DEVELOP A MINIMUM OF 3,500 PSI COMPRESSIVE STRENGTH AT FOURTEEN (14) DAYS. ALL CONCRETE SHALL BE BROOM FINISHED PERPENDICULAR TO THE DIRECTION OF TRAVEL.

C. CONCRETE CURB AND/OR COMBINATION CURB AND GUTTER SHALL BE OF THE TYPE SHOWN ON THE PLANS. THE CONTRACTOR IS CAUTIONED TO REFER TO THE CONSTRUCTION STANDARDS AND THE PAVEMENT CROSS–SECTION TO DETERMINE THE GUTTER FLAG THICKNESS AND THE AGGREGATE BASE COURSE THICKNESS BENEATH THE CURB AND GUTTER. 1" PREMOLDED FIBER EXPANSION JOINTS SHALL BE INSTALLED AT SIXTY (60) FOOT INTERVALS AND AT ALL PC'S, PT'S AND CURB RETURNS. TWO #4 REBARS SHALL BE CONTINUOUSLY INSTALLED ALONG ALL CURB AND GUTTER. ALTERNATE ENDS OF THE DOWEL BARS SHALL BE GREASED AND FITTED WITH CAPS. SAWED FORMED CONTRACTION JOINTS SHALL BE PROVIDED AT NO GREATER THAN FIFTEEN (15) FOOT INTERVALS AND 2" IN DEPTH, BETWEEN EXPANSION JOINTS AND AT ALL PC'S, PT'S AND CURB RETURNS. NO HONEY–COMBING OF THE CURB AND GUTTER WILL BE ACCEPTED.

D. CURBS SHALL BE DEPRESSED AT LOCATIONS WHERE PUBLIC WALKS/PEDESTRIAN PATHS INTERSECT CURB LINES, AT DRIVEWAY LOCATIONS, AND AT OTHER LOCATIONS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER FOR THE PURPOSE OF PROVIDING ACCESSIBILITY. (SEE CONSTRUCTION STANDARDS FOR DETAIL).

E. CONCRETE SIDEWALK SHALL HAVE JOINTS SCORED AT 5 FOOT INTERVALS AND 1/2" PREMOLDED FIBER EXPANSION JOINTS AT 50 FOOT INTERVALS, AND ADJACENT TO CONCRETE CURBS, DRIVEWAYS, FOUNDATIONS, ETC.

F. CONCRETE DRIVEWAY APRONS SHALL HAVE 6" X 6" NO. 6 WELDED WIRE MESH IN COMMERCIAL DRIVEWAYS. PROVIDE 1/2" PREMOLDED FIBER EXPANSION JOINT ADJACENT TO CURBS AND CONCRETE SIDEWALKS. PROVIDE SAWED OR FORMED CONTRACTION JOINT AT MID–POINT AND TEN (10) FOOT MAXIMUM.

G. CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTIONS 601, 602, 801, 802, 803, AND 804 OF THE 2020 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

UPDATED: 10/23/2020 - BDR/VRES

ANSI/AWWA C605–13

SEC. 10.3 HYDROSTATIC TESTING:

1. WARNING: HYDROSTATIC TESTING DESCRIBED IN THIS SECTION SHALL BE CONDUCTED WITH WATER OR OTHER ENVIRONMENTALLY SAFE, INCOMPRESSIBLE FLUIDS, BECAUSE OF THE INHERENT SAFETY HAZARD POTENTIAL ASSOCIATED WITH TESTING COMPONENTS AND SYSTEMS WITH COMPRESSED AIR OR OTHER COMPRESSED GASES.

1.1. GENERAL. THE CONSTRUCTOR SHALL PROVIDE MEASUREMENT GAUGES AND RECORDING DEVICES FOR THE TEST, INCLUDING PUMP, PIPE, CONNECTIONS, AND OTHER NECESSARY APPARATUS, UNLESS OTHERWISE SPECIFIED BY THE PURCHASER, AND SHALL PROVIDE THE NECESSARY ASSISTANCE TO CONDUCT THE TEST. BEFORE TESTING, THE CONSTRUCTOR SHALL PLACE SUFFICIENT BACKFILL TO PREVENT PIPE MOVEMENT. WHEN LOCAL CONDITIONS REQUIRE THAT THE TRENCHES BE BACKFILLED IMMEDIATELY AFTER THE PIPE HAS BEEN LAID, THE TESTING MAY BE CARRIED OUT AFTER BACKFILLING HAS BEEN COMPLETED BUT BEFORE PLACEMENT OF PERMANENT SURFACING. THE CONSTRUCTOR SHALL ENSURE THRUST–BLOCKING OR OTHER TYPES OF RESTRAINING SYSTEMS WILL PROVIDE ADEQUATE RESTRAINT BEFORE PRESSURIZING THE PIPELINE.

1.2. CROSS–CONNECTION CONTROL. WHEN EXISTING WATER MAINS ARE USED TO SUPPLY TEST WATER, THEY SHOULD BE PROTECTED FROM BACKFLOW CONTAMINATION BY TEMPORARILY INSTALLING A DOUBLE–CHECK–VALVE ASSEMBLY BETWEEN THE TEST AND SUPPLY MAIN OR BY OTHER MEANS APPROVED BY THE PURCHASER. BEFORE PRESSURE AND LEAKAGE TESTING, THE TEMPORARY BACKFLOW PROTECTION SHOULD BE REMOVED AND THE MAIN UNDER TEST ISOLATED FROM THE SUPPLY MAIN.

1.3. PROCEDURE. TESTS SHALL BE PERFORMED ONLY AFTER THE PIPELINE HAS BEEN PROPERLY FILLED, FLUSHED, AND PURGED OF AIR. THE SPECIFIED TEST PRESSURE SHALL BE APPLIED BY MEANS OF AN APPROVED PUMPING ASSEMBLY CONNECTED TO THE PIPE IN A MANNER SATISFACTORY TO THE PURCHASER. THE TEST PRESSURE SHALL NOT EXCEED THE DESIGN PRESSURE OF THE PIPE, FITTINGS, VALVES, OR THRUST RESTRAINTS. IF NECESSARY, THE TEST PRESSURE SHALL BE MAINTAINED BY ADDITIONAL PUMPING FOR THE SPECIFIED TIME. DURING TESTS, THE SYSTEM AND EXPOSED PIPE, FITTINGS, VALVES, AND HYDRANTS SHALL BE CAREFULLY EXAMINED FOR LEAKAGE. VISIBLE LEAKS SHALL BE STOPPED. DEFECTIVE ELEMENTS SHALL BE REPAIRED OR REMOVED AND REPLACED AND THE TEST REPEATED UNTIL THE TEST REQUIREMENTS HAVE BEEN MET.

1.4. TEST DURATION. THE DURATION OF THE HYDROSTATIC TEST SHALL BE 2 HR.

1.5. TEST PRESSURE. THE HYDROSTATIC TEST PRESSURE SHALL NOT BE LESS THAN 1.25 TIMES THE STATED ANTICIPATED MAXIMUM SUSTAINED WORKING PRESSURE OF THE PIPELINE MEASURED AT THE HIGHEST ELEVATION ALONG THE TEST SECTION AND NOT LESS THAT 1.5 TIMES THE STATED SUSTAINED WORKING PRESSURE AT THE LOWEST ELEVATION OF THE TEST SECTION. HOWEVER, IN NO CASE SHALL THE TEST PRESSURE EXCEED THE RATED WORKING PRESSURE FOR ANY JOINT, THRUST RESTRAINT, VALVE, FITTING, OR OTHER CONNECTED APPURTENANCE OF THE TEST SECTION.

1.6. TEST ALLOWANCE. THE TESTING ALLOWANCE SHALL BE DEFINED AS THE QUANTITY OF WATER THAT MUST BE SUPPLIED TO THE PIPE SECTION BEING TESTED TO MAINTAIN A PRESSURE WITHIN 5 PSI (34 kPa) OF THE SPECIFIED HYDROSTATIC TEST PRESSURE. NO INSTALLATION WILL BE ACCEPTED IF THE QUANTITY OF MAKEUP WATER IS GREATER THAN THAT DETERMINED BY THE FORMULA:

Table 4A Hydrostatic test makeup water allowances per 1,000 ft (50 joints) of PVC pipe, (US gal/hr)

Avg. Test Pressure		Nominal Pipe Diameter, in. (mm)												
psi	(kPa)	4	6	8	10	12	14	16	18	20	24	30	36	42	48
300	(2,070)	0.47	0.70	0.94	1.17	1.40	1.64	1.87	2.11	2.34	2.81	3.51	4.21	4.92	5.62
275	(1,900)	0.45	0.67	0.90	1.12	1.34	1.57	1.79	2.02	2.24	2.69	3.36	4.03	4.71	5.38
250	(1,720)	0.43	0.64	0.85	1.07	1.28	1.50	1.71	1.92	2.14	2.56	3.21	3.85	4.49	5.13
225	(1,550)	0.41	0.61	0.81	1.01	1.22	1.42	1.62	1.83	2.03	2.43	3.04	3.65	4.26	4.86
200	(1,380)	0.38	0.57	0.76	0.96	1.15	1.34	1.53	1.72	1.91	2.29	2.87	3.44	4.01	4.59
175	(1,210)	0.36	0.54	0.72	0.89	1.07	1.25	1.43	1.61	1.79	2.15	2.68	3.22	3.75	4.29
150	(1,030)	0.33	0.50	0.66	0.83	0.99	1.16	1.32	1.49	1.66	1.99	2.48	2.98	3.48	3.97
125	(860)	0.30	0.45	0.60	0.76	0.91	1.06	1.21	1.36	1.51	1.81	2.27	2.72	3.17	3.62
100	(690)	0.27	0.41	0.54	0.68	0.81	0.95	1.08	1.22	1.35	1.62	2.03	2.43	2.84	3.24
75	(520)	0.23	0.35	0.47	0.59	0.70	0.82	0.94	1.05	1.17	1.40	1.76	2.11	2.46	2.81
50	(340)	0.19	0.29	0.38	0.48	0.57	0.67	0.76	0.86	0.96	1.15	1.43	1.72	2.01	2.29

$$Q = \frac{LD\sqrt{P}}{148{,}000} \qquad \text{(Eq 1)}$$

Where:

Q = quantity of makeup water, in gallons per hour
L = length of pipe section being tested, in ft
D = nominal diameter of the pipe, in in.
P = average test pressure during the hydrostatic test, in pounds per square in. (gauge)

WATER MAIN SPECIFICATIONS:

PIPE LOCATION DEVICES

1. ALL BURIED PVC AND HDPE PIPING TO HAVE AN ELECTRICALLY CONDUCTIVE [14 GAUGE] TRACER WIRE WITH HDPE JACKET TO LOCATE THE PIPE FROM GRADE LEVEL. ALL GRADE LEVEL CONNECTION POINTS FOR THE PURPOSE OF LOCATING BURIED PIPE TO BE IDENTIFIED AND SUBMITTED TO THE MUNICIPALITY.
2. TRACER WIRE TO BE SECURED TO THE PVC OR HDPE PIPE AT [10 FT.] MAXIMUM INTERVALS.
3. TRACER WIRE INTERSECTIONS SHALL BE ELECTRICALLY ISOLATED FROM GROUND AND CONTINUITY PROVIDE PER MANUFACTURE'S RECOMMENDATION.
4. SUBSURFACE WATERPROOF CONNECTORS SPECIFICALLY DESIGNED FOR BURIED SERVICE TO BE USED.

HYDROSTATIC TESTING

1. GENERAL
THE CONTRACTOR SHALL PRETEST AND BE SATISFIED THAT ALL LINES ARE READY FOR TESTING BEFORE REQUESTING TEST INSPECTION. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT AND PERFORM ALL WORK REQUIRED IN CONNECTION WITH THE TESTS.
2. HYDROSTATIC TESTING
THE TEST SHALL CONFORM TO AWWA C–600 AND SECTION 823.03 T. OF THE 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION BY MDOT FOR ALL NEWLY LAID PIPE AND FITTINGS.

DISINFECTION OF THE SYSTEM

1. GENERAL
DISINFECTION SHALL BE BY CHLORINATION AND/OR OTHER METHODS AS APPROVED BY THE ENGINEER AFTER PRESSURE TESTING AND FLUSHING. THE DISINFECTION SHALL CONFORM TO THE CURRENT AWWA C–651 STANDARDS.
2. CHLORINATION
ALL NEW WATER LINES SHALL BE CHLORINATED. THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT, AND MATERIALS NECESSARY FOR EFFECTIVE CHLORINATION OF THE WATER MAINS.
3. MATERIALS
3.1. HIGH TEST CALCIUM HYPOCHLORITE (HTH, "PERCHLOREN", "MAXOCHLOR", "PITTCHLOR"). – POWDER AND WATER SHALL BE MIXED TO FORM A 1 PERCENT CHLORINE SOLUTION (10,000 PPM), PUMPING SOLUTION AT A CONSTANT RATE INTO THE WATER MAIN WHILE BLEEDING OFF THE WATER AT THE EXTREME END.
3.2. LIQUID CHLORINE. – LIQUID CHLORINE CONFORMING TO AWWA B–301 MAY BE APPLIED TO THE WATER MAIN MUCH THE SAME WAY AS THE HYPOCHLORITE SOLUTION LISTED ABOVE.
3.3. CHLORINE GAS. – CHLORINE GAS SHALL NOT BE USED.

4. METHOD OF CHLORINATION
THE CHLORINATION AGENT SHALL BE APPLIED AT THE BEGINNING OF THE SECTION ADJACENT TO THE FEEDER MAIN AND SHALL BE INJECTED THROUGH A CORPORATION COCK, HYDRANT OR OTHER CONNECTION, INSURING TREATMENT OF THE ENTIRE LINE. WATER SHALL BE FED SLOWLY INTO THE NEW LINES WITH CHLORINE APPLIED TO PRODUCE A DOSAGE OF 25 mg/L. MAINS PREVIOUSLY FILLED SHALL BE TREATED TO A CONCENTRATED DOSAGE AT INTERVALS ALONG THE LINE AND RETAINED FOR A PERIOD OF NOT LESS THAN 24 HOURS. A CHLORINE RESIDUAL OF NOT LESS THAN 10 mg/L SHALL BE PRODUCED IN ALL PARTS OF THE LINE. DURING CHLORINATION, ALL NEW VALVES AND ACCESSORIES SHALL BE OPERATED.

AFTER CHLORINATION, THE WATER SHALL BE FLUSHED FROM THE LINE AT ITS EXTREMITIES UNTIL ALL OF THE HEAVILY CHLORINATED WATER HAS BEEN REMOVED, LEAVING A RESIDUAL CHLORINE CONTENT NOT LESS THAN 10 mg/L.

AFTER THE APPLICABLE RETENTION PERIOD, HEAVILY CHLORINATED WATER SHALL NOT REMAIN IN PROLONGED CONTACT WITH THE PIPE. IN ORDER TO PREVENT DAMAGE TO THE PIPE LINING OR CORROSION DAMAGE TO THE PIPE ITSELF, THE HEAVILY CHLORINATED WATER SHALL BE FLUSHED FROM THE MAIN UNTIL CHLORINE MEASUREMENTS SHOW THAT THE CONCENTRATION IN THE MAIN IS NO HIGHER THAN THAT GENERALLY PREVAILING IN THE DISTRIBUTION SYSTEM OR IS ACCEPTABLE FOR DOMESTIC USE.

THE CHLORINE CONCENTRATIONS IN THE DISCHARGED CHLORINATION WATER SHALL NOT EXCEED THE LIMITS IMPOSED BY THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY AND OTHER REGULATORY AGENCIES. CHLORINE CONCENTRATIONS IN DISCHARGES THAT OCCUR OVER A PERIOD OF 160 MINUTES OR LESS SHALL NOT EXCEED 0.5 MILLIGRAMS PER LITER. CHLORINE CONCENTRATIONS IN DISCHARGES THAT OCCUR OVER A PERIOD LONGER THAN 160 MINUTES SHALL NOT EXCEED 0.038 MILLIGRAMS PER LITER.

THE ENVIRONMENT INTO WHICH THE CHLORINATED WATER IS TO BE DISCHARGED SHALL BE INSPECTED. IF THERE IS ANY POSSIBILITY THAT THE CHLORINATED DISCHARGE WILL CAUSE DAMAGE TO THE ENVIRONMENT, THEN A NEUTRALIZING CHEMICAL SHALL BE APPLIED TO THE WATER TO BE WASTED TO NEUTRALIZE THOROUGHLY THE CHLORINE RESIDUAL REMAINING IN THE WATER. WHERE NECESSARY, FEDERAL, STATE AND LOCAL REGULATORY AGENCIES SHALL BE CONTACTED TO DETERMINE SPECIAL PROVISIONS FOR THE DISPOSAL OF HEAVILY CHLORINATED WATER.

THE CONTRACTOR SHALL COLLECT WATER SAMPLES IN STERILE BOTTLES CONTAINING SODIUM THIOSULFATE FOR BACTERIOLOGICAL ANALYSIS EVERY 1,200 FEET. TWO SAMPLES SHALL BE TAKEN 24 HOURS APART FOR EACH SECTION OF LINE TESTED. IF BOTH SAMPLES SHOW SAFE RESULTS AND MEET THE SAFE DRINKING WATER STANDARDS, THE NEW PIPELINE MAY BE PLACED IN SERVICE. IF, HOWEVER, THE RESULTS ARE UNSAFE, A REPETITION OF THE CHLORINE TREATMENT IS NECESSARY. SAMPLES WILL NEVER BE TAKEN FROM HOSES OR FIRE HYDRANTS. A SUGGESTED SAMPLING TAP IS A CORPORATION COCK WITH A COPPER GOOSENECK ASSEMBLY. THE GOOSENECK ASSEMBLY MAY BE REMOVED AFTER USE. AT THE OPTION OF THE CITY, SAMPLES SHALL BE TAKEN DURING CHLORINATION.

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

GENERAL NOTES AND SPECIFICATIONS

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	
GN200153.DWG	

NO.	DATE	NATURE OF REVISION
1	10/23/21	95% CD

CLIENT : **BAY MILLS HOUSING AUTHORITY**
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WBK engineering

PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **GN2**
SHEET:
2 OF 23

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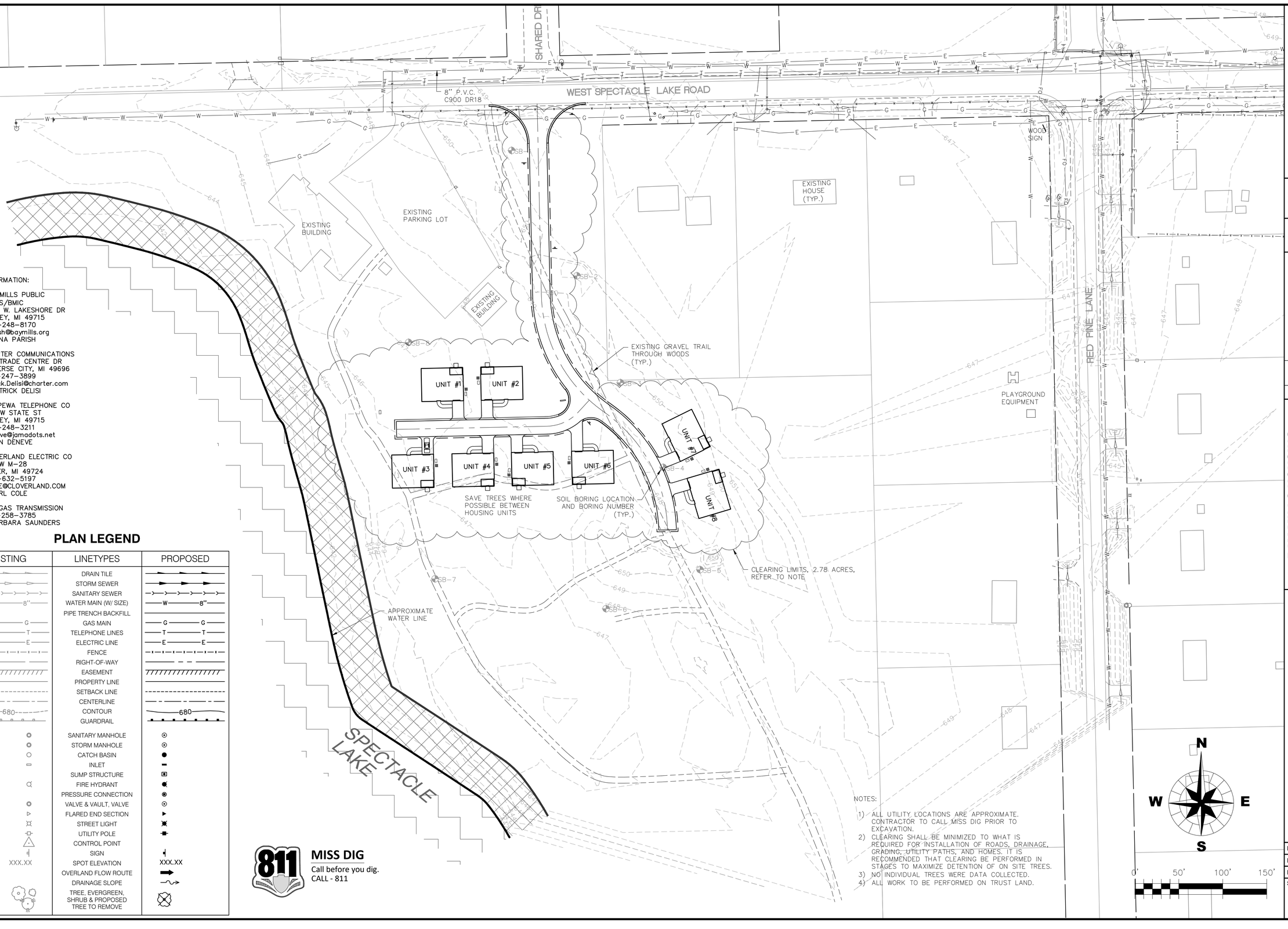
Contact: BARBARA SAUNDERS

PLAN LEGEND

EXISTING	LINETYPES	PROPOSED
	DRAIN TILE	
	STORM SEWER	
	SANITARY SEWER	
W 8"	WATER MAIN (W/ SIZE)	W 8"
	PIPE TRENCH BACKFILL	
G G	GAS MAIN	G G
T T	TELEPHONE LINES	T T
E E	ELECTRIC LINE	E E
	FENCE	
	RIGHT-OF-WAY	
	EASEMENT	
	PROPERTY LINE	
	SETBACK LINE	
	CENTERLINE	
680	CONTOUR	680
	GUARDRAIL	
	SANITARY MANHOLE	
	STORM MANHOLE	
	CATCH BASIN	
	INLET	
	SUMP STRUCTURE	
	FIRE HYDRANT	
	PRESSURE CONNECTION	
	VALVE & VAULT, VALVE	
	FLARED END SECTION	
	STREET LIGHT	
	UTILITY POLE	
	CONTROL POINT	
	SIGN	
XXX.XX	SPOT ELEVATION	XXX.XX
	OVERLAND FLOW ROUTE	
	DRAINAGE SLOPE	
	TREE, EVERGREEN, SHRUB & PROPOSED TREE TO REMOVE	



811 **MISS DIG**
Call before you dig.
CALL - 811

NOTES:

1) ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR TO CALL MISS DIG PRIOR TO EXCAVATION.
2) CLEARING SHALL BE MINIMIZED TO WHAT IS REQUIRED FOR INSTALLATION OF ROADS, DRAINAGE, GRADING, UTILITY PATHS, AND HOMES. IT IS RECOMMENDED THAT CLEARING BE PERFORMED IN STAGES TO MAXIMIZE DETENTION OF ON SITE TREES.
3) NO INDIVIDUAL TREES WERE DATA COLLECTED.
4) ALL WORK TO BE PERFORMED ON TRUST LAND.

N W E S

0' 50' 100' 150'

TITLE: **BAY MILLS ELDERS HOUSING DEVELOPMENT**

EXISTING CONDITIONS AND DEMOLITION PLAN

DSGN. JWC
DWN. TLB
CHKD. JWC
SCALE: AS NOTED
EC200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

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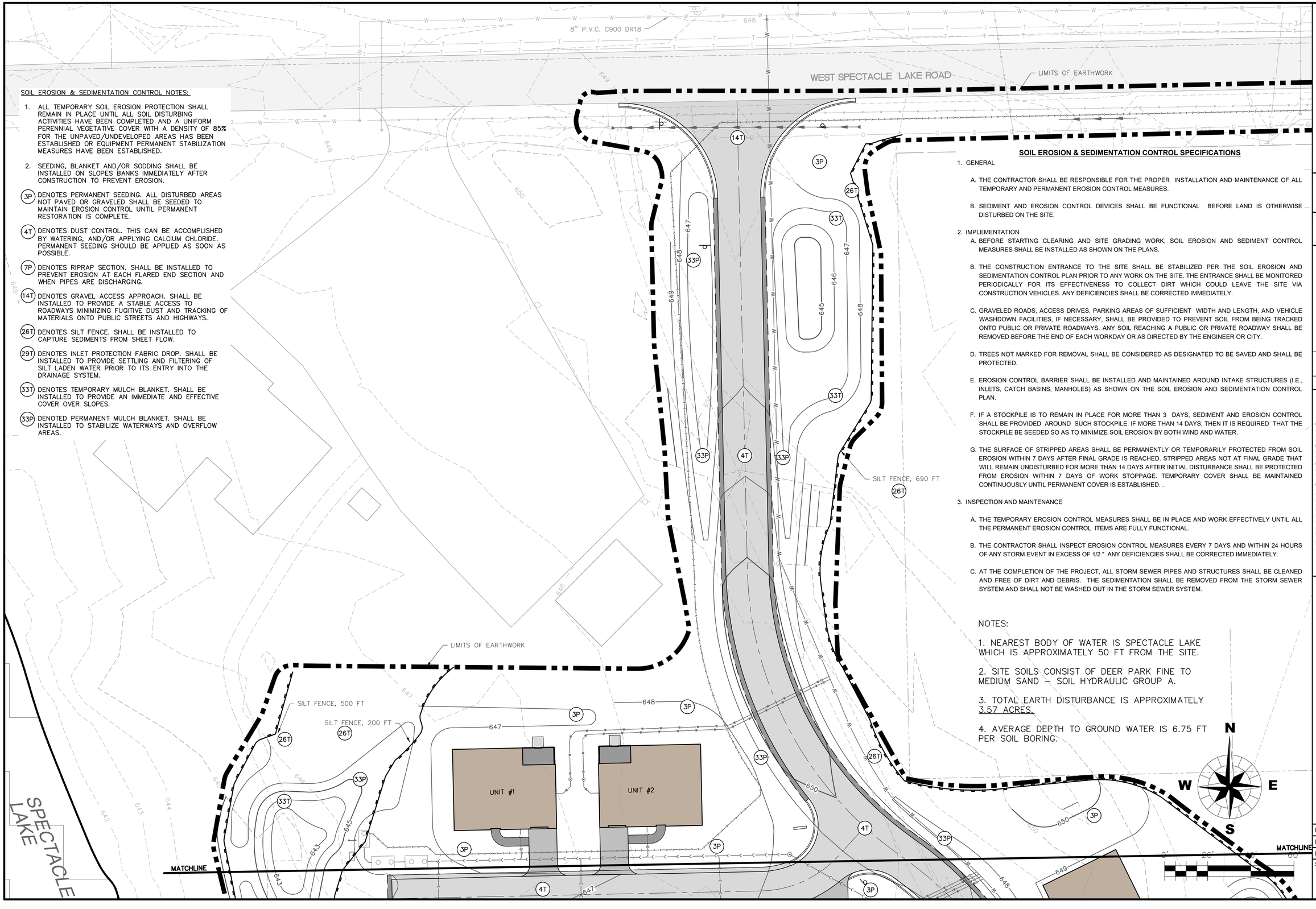
PROJECT NO. 200153
DATE: 09/14/2020
DRAWING NO. **EC1**
SHEET:
3 OF 23

UPDATED: 10/23/2020 - REVISIONS



SOIL EROSION & SEDIMENTATION CONTROL NOTES:

1. ALL TEMPORARY SOIL EROSION PROTECTION SHALL REMAIN IN PLACE UNTIL ALL SOIL DISTURBING ACTIVITIES HAVE BEEN COMPLETED AND A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 85% FOR THE UNPAVED/UNDEVELOPED AREAS HAS BEEN ESTABLISHED OR EQUIPMENT PERMANENT STABILIZATION MEASURES HAVE BEEN ESTABLISHED.
2. SEEDING, BLANKET AND/OR SODDING SHALL BE INSTALLED ON SLOPES BANKS IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION.

(3P) DENOTES PERMANENT SEEDING. ALL DISTURBED AREAS NOT PAVED OR GRAVELED SHALL BE SEEDED TO MAINTAIN EROSION CONTROL UNTIL PERMANENT RESTORATION IS COMPLETE.

(4T) DENOTES DUST CONTROL. THIS CAN BE ACCOMPLISHED BY WATERING, AND/OR APPLYING CALCIUM CHLORIDE. PERMANENT SEEDING SHOULD BE APPLIED AS SOON AS POSSIBLE.

(7P) DENOTES RIPRAP SECTION. SHALL BE INSTALLED TO PREVENT EROSION AT EACH FLARED END SECTION AND WHEN PIPES ARE DISCHARGING.

(14T) DENOTES GRAVEL ACCESS APPROACH. SHALL BE INSTALLED TO PROVIDE A STABLE ACCESS TO ROADWAYS MINIMIZING FUGITIVE DUST AND TRACKING OF MATERIALS ONTO PUBLIC STREETS AND HIGHWAYS.

(26T) DENOTES SILT FENCE. SHALL BE INSTALLED TO CAPTURE SEDIMENTS FROM SHEET FLOW.

(29T) DENOTES INLET PROTECTION FABRIC DROP. SHALL BE INSTALLED TO PROVIDE SETTLING AND FILTERING OF SILT LADEN WATER PRIOR TO ITS ENTRY INTO THE DRAINAGE SYSTEM.

(33T) DENOTES TEMPORARY MULCH BLANKET. SHALL BE INSTALLED TO PROVIDE AN IMMEDIATE AND EFFECTIVE COVER OVER SLOPES.

(33P) DENOTED PERMANENT MULCH BLANKET. SHALL BE INSTALLED TO STABILIZE WATERWAYS AND OVERFLOW AREAS.

SOIL EROSION & SEDIMENTATION CONTROL SPECIFICATIONS

1. GENERAL

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER INSTALLATION AND MAINTENANCE OF ALL TEMPORARY AND PERMANENT EROSION CONTROL MEASURES.

B. SEDIMENT AND EROSION CONTROL DEVICES SHALL BE FUNCTIONAL BEFORE LAND IS OTHERWISE DISTURBED ON THE SITE.

2. IMPLEMENTATION

A. BEFORE STARTING CLEARING AND SITE GRADING WORK, SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS.

B. THE CONSTRUCTION ENTRANCE TO THE SITE SHALL BE STABILIZED PER THE SOIL EROSION AND SEDIMENTATION CONTROL PLAN PRIOR TO ANY WORK ON THE SITE. THE ENTRANCE SHALL BE MONITORED PERIODICALLY FOR ITS EFFECTIVENESS TO COLLECT DIRT WHICH COULD LEAVE THE SITE VIA CONSTRUCTION VEHICLES. ANY DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY.

C. GRAVELED ROADS, ACCESS DRIVES, PARKING AREAS OF SUFFICIENT WIDTH AND LENGTH, AND VEHICLE WASHDOWN FACILITIES, IF NECESSARY, SHALL BE PROVIDED TO PREVENT SOIL FROM BEING TRACKED ONTO PUBLIC OR PRIVATE ROADWAYS. ANY SOIL REACHING A PUBLIC OR PRIVATE ROADWAY SHALL BE REMOVED BEFORE THE END OF EACH WORKDAY OR AS DIRECTED BY THE ENGINEER OR CITY.

D. TREES NOT MARKED FOR REMOVAL SHALL BE CONSIDERED AS DESIGNATED TO BE SAVED AND SHALL BE PROTECTED.

E. EROSION CONTROL BARRIER SHALL BE INSTALLED AND MAINTAINED AROUND INTAKE STRUCTURES (I.E., INLETS, CATCH BASINS, MANHOLES) AS SHOWN ON THE SOIL EROSION AND SEDIMENTATION CONTROL PLAN.

F. IF A STOCKPILE IS TO REMAIN IN PLACE FOR MORE THAN 3 DAYS, SEDIMENT AND EROSION CONTROL SHALL BE PROVIDED AROUND SUCH STOCKPILE. IF MORE THAN 14 DAYS, THEN IT IS REQUIRED THAT THE STOCKPILE BE SEEDED SO AS TO MINIMIZE SOIL EROSION BY BOTH WIND AND WATER.

G. THE SURFACE OF STRIPPED AREAS SHALL BE PERMANENTLY OR TEMPORARILY PROTECTED FROM SOIL EROSION WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED. STRIPPED AREAS NOT AT FINAL GRADE THAT WILL REMAIN UNDISTURBED FOR MORE THAN 14 DAYS AFTER INITIAL DISTURBANCE SHALL BE PROTECTED FROM EROSION WITHIN 7 DAYS OF WORK STOPPAGE. TEMPORARY COVER SHALL BE MAINTAINED CONTINUOUSLY UNTIL PERMANENT COVER IS ESTABLISHED. .

3. INSPECTION AND MAINTENANCE

A. THE TEMPORARY EROSION CONTROL MEASURES SHALL BE IN PLACE AND WORK EFFECTIVELY UNTIL ALL THE PERMANENT EROSION CONTROL ITEMS ARE FULLY FUNCTIONAL.

B. THE CONTRACTOR SHALL INSPECT EROSION CONTROL MEASURES EVERY 7 DAYS AND WITHIN 24 HOURS OF ANY STORM EVENT IN EXCESS OF 1/2 ". ANY DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY.

C. AT THE COMPLETION OF THE PROJECT, ALL STORM SEWER PIPES AND STRUCTURES SHALL BE CLEANED AND FREE OF DIRT AND DEBRIS. THE SEDIMENTATION SHALL BE REMOVED FROM THE STORM SEWER SYSTEM AND SHALL NOT BE WASHED OUT IN THE STORM SEWER SYSTEM.

NOTES:

1. NEAREST BODY OF WATER IS SPECTACLE LAKE WHICH IS APPROXIMATELY 50 FT FROM THE SITE.

2. SITE SOILS CONSIST OF DEER PARK FINE TO MEDIUM SAND – SOIL HYDRAULIC GROUP A.

3. TOTAL EARTH DISTURBANCE IS APPROXIMATELY 3.57 ACRES.

4. AVERAGE DEPTH TO GROUND WATER IS 6.75 FT PER SOIL BORING.

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**
SOIL EROSION SEDIMENTATION CONTROL PLAN

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	SE200153.DWG

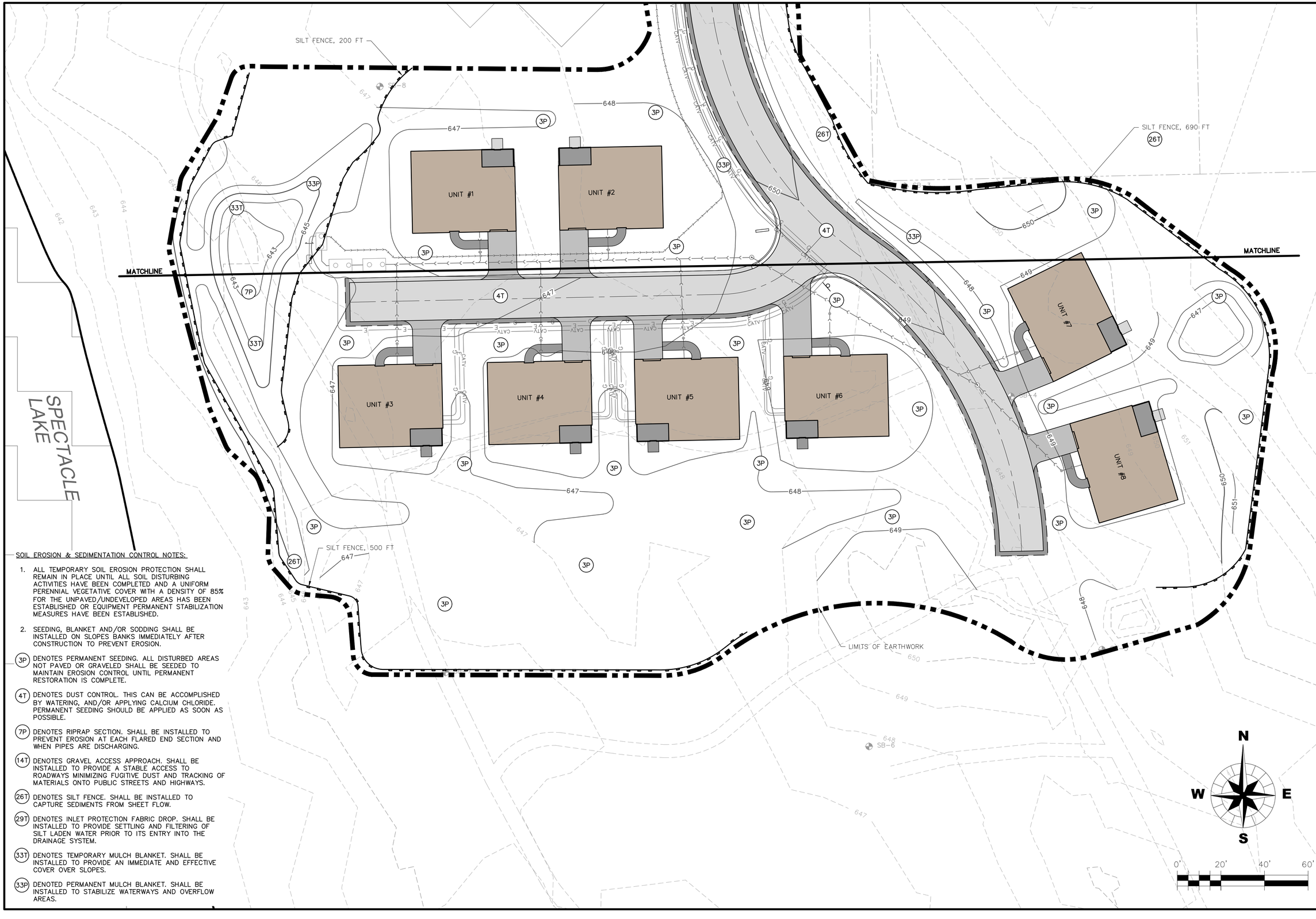
NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

CLIENT : **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

WBK ENGINEERING, LLC
68 EAST MICHIGAN AVENUE
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182
WBK engineering

PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **SE1**
SHEET:
4 OF 23

UPDATED: 10/23/2020 - BDEVRIES



SOIL EROSION & SEDIMENTATION CONTROL NOTES:

1. ALL TEMPORARY SOIL EROSION PROTECTION SHALL REMAIN IN PLACE UNTIL ALL SOIL DISTURBING ACTIVITIES HAVE BEEN COMPLETED AND A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 85% FOR THE UNPAVED/UNDEVELOPED AREAS HAS BEEN ESTABLISHED OR EQUIPMENT PERMANENT STABILIZATION MEASURES HAVE BEEN ESTABLISHED.
2. SEEDING, BLANKET AND/OR SODDING SHALL BE INSTALLED ON SLOPES BANKS IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION.

(3P) DENOTES PERMANENT SEEDING. ALL DISTURBED AREAS NOT PAVED OR GRAVELED SHALL BE SEEDED TO MAINTAIN EROSION CONTROL UNTIL PERMANENT RESTORATION IS COMPLETE.

(4T) DENOTES DUST CONTROL. THIS CAN BE ACCOMPLISHED BY WATERING, AND/OR APPLYING CALCIUM CHLORIDE. PERMANENT SEEDING SHOULD BE APPLIED AS SOON AS POSSIBLE.

(7P) DENOTES RIPRAP SECTION. SHALL BE INSTALLED TO PREVENT EROSION AT EACH FLARED END SECTION AND WHEN PIPES ARE DISCHARGING.

(14T) DENOTES GRAVEL ACCESS APPROACH. SHALL BE INSTALLED TO PROVIDE A STABLE ACCESS TO ROADWAYS MINIMIZING FUGITIVE DUST AND TRACKING OF MATERIALS ONTO PUBLIC STREETS AND HIGHWAYS.

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UPDATED: 10/23/2023 - BDEVRIES

TITLE: **BAY MILLS ELDERS HOUSING DEVELOPMENT**
SOIL EROSION SEDIMENTATION CONTROL PLAN

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE:	AS NOTED
	SE200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

CLIENT: **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

WBK ENGINEERING, LLC
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BATTLE CREEK, MICHIGAN 49017
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WBK engineering

PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **SE2**
SHEET:
5 OF 23

SIDE ROAD SIGN.
MMUTCD SIGN W2-2R.

550.00

SHARED DRIVE

C-4 CONCRETE CURB AND GUTTER, 73-FT.

C-4 CONCRETE CURB AND GUTTER, 73-FT.

WEST SPECTACLE LAKE ROAD

114'

500.00

SIDE ROAD SIGN.
MMUTCD SIGN W2-2L.

STREET NAME SIGN
MMUTCD SIGN D3-1.

R45'

2'

2'

R45'

STOP SIGN.
MMUTCD SIGN R1-1.

NO OUTLET SIGN.
MMUTCD SIGN W14-2.

24'

20'

2'

2'

172.35

ASPHALT ROADWAYS (TYP)

6.50 (TYP.)

STOP AHEAD SIGN.
MMUTCD SIGN W3-1

2 FT WIDE GRAVEL SHOULDER BOTH SIDES

R167'

C-4 CONCRETE CURB AND GUTTER, 35-FT.

ENTRY SIGN TO BE PROVIDED BY THE BAY MILLS INDIAN COMMUNITY.

50' LAKE PRESERVATION SETBACK

HMA DRIVEWAYS (TYP.)

UNIT #1

UNIT #2

2-FT WIDE HMA WING CURB, 184-FT

19'

YIELD SIGN.
MMUTCD SIGN R1-2.

C-4 CONCRETE CURB AND GUTTER, 51-FT.

R20'

R20'

8'

171.16

8'

R50'

UNIT #3

UNIT #4

UNIT #5

UNIT #6

UNIT #7

HMA DRIVEWAYS (TYP.)

UNIT #8

R167'

2 FT WIDE GRAVEL SHOULDER

2 FT WIDE GRAVEL SHOULDER

50.00

SPECTACLE LAKE

EXISTING PATH THROUGH WOODS (TYP.)

RED PINE LANE

NOTES:

SEE SHEET GM2 FOR LAYOUT OF UNITS

LEGEND (TOTAL SITE):

- ASPHALT PAVEMENT (SEE DETAILS) AREA = 2,027 SYD
- GRAVEL SHOULDER/DRIVE (SEE DETAILS) AREA= 232 SYD
- CONCRETE PAVEMENT (SEE DETAILS) AREA = 212 SYD
- LAKE PRESERVATION SETBACK AREA
- LAKE

PLAN LEGEND

EXISTING	LINETYPES	PROPOSED
	DRAIN TILE	
	STORM SEWER	
	SANITARY SEWER	
W 8"	WATER MAIN (W/ SIZE)	W 8"
	PIPE TRENCH BACKFILL	
G G	GAS MAIN	G G
T T	TELEPHONE LINES	T T
E E	ELECTRIC LINE	E E
	FENCE	
	RIGHT-OF-WAY	
	EASEMENT	
	PROPERTY LINE	
	SETBACK LINE	
	CENTERLINE	
680	CONTOUR	680
	GUARDRAIL	
	SANITARY MANHOLE	
	STORM MANHOLE	
	CATCH BASIN	
	INLET	
	SUMP STRUCTURE	
	FIRE HYDRANT	
	PRESSURE CONNECTION	
	VALVE & VAULT, VALVE	
	FLARED END SECTION	
	STREET LIGHT	
	UTILITY POLE	
	CONTROL POINT	
	SIGN	
XXX.XX	SPOT ELEVATION	XXX.XX
	OVERLAND FLOW ROUTE	
	DRAINAGE SLOPE	
	TREE, EVERGREEN, SHRUB & PROPOSED TREE TO REMOVE	

N

W E

S

0' 40' 80' 120'

TITLE: **BAY MILLS ELDERS HOUSING DEVELOPMENT**

GEOMETRIC PLAN

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	GM200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

CLIENT: **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

WBK ENGINEERING, LLC
68 EAST MICHIGAN AVENUE
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182

WBK engineering

PROJECT NO. 200153

DATE : 09/14/2020

DRAWING NO. **GM1**

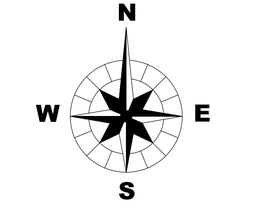
SHEET:

6 OF 23

UPDATED: 10/23/2020 - BCR/JWES

PLAN LEGEND

EXISTING	LINETYPES	PROPOSED
	DRAIN TILE	
	STORM SEWER	
	SANITARY SEWER	
W 8"	WATER MAIN (W/ SIZE)	W 8"
	PIPE TRENCH BACKFILL	
G G	GAS MAIN	G G
T T	TELEPHONE LINES	T T
E E	ELECTRIC LINE	E E
	FENCE	
	RIGHT-OF-WAY	
	EASEMENT	
	PROPERTY LINE	
	SETBACK LINE	
	CENTERLINE	
680	CONTOUR	680
	GUARDRAIL	
	SANITARY MANHOLE	
	STORM MANHOLE	
	CATCH BASIN	
	INLET	
	SUMP STRUCTURE	
	FIRE HYDRANT	
	PRESSURE CONNECTION	
	VALVE & VAULT, VALVE	
	FLARED END SECTION	
	STREET LIGHT	
	UTILITY POLE	
	CONTROL POINT	
	SIGN	
XXX.XX	SPOT ELEVATION	XXX.XX
	OVERLAND FLOW ROUTE	
	DRAINAGE SLOPE	
	TREE, EVERGREEN, SHRUB & PROPOSED TREE TO REMOVE	



0' 20' 40' 60'

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

GEOMETRIC PLAN

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE : AS NOTED	GM200153.DWG

NO.	DATE	NATURE OF REVISION
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PROJECT NO. 200153

DATE : 09/14/2020

DRAWING NO. **GM2**

SHEET:

7 OF 23

UPDATED: 10/23/2020 - REVISIONS

P.O.B.
H

256.72'
N89°26'18"W

600.00'

SHARED DRIVE

CONNECT TO EXISTING WATER MAIN, REFER TO SHEET PP4

WEST SPECTACLE LAKE ROAD

12" RCP FES

115 FT 12" CL IV RCP DRIVE CULVERT

12" RCP FES

UNDERGROUND ELEC., COMMUNICATIONS, & GAS BY PRIVATE UTILITIES.

4" SCH. 40 SANITARY SEWER FORCE MAIN FROM S.T.E.P. TO WEST SPECTACLE RD. REFER TO SHEETS PP1 TO PP2.

8" WATER MAIN, REFER TO SHEET PP4

1500 GALLON SEPTIC TANK WITH EFFLUENT FILTER

1500 GALLON SEPTIC TANK

CONTROL PANEL IN NEMA 4X ENCLOSURE

1000 GALLON SEPTIC/DOSING TANK WITH FILTERED EFFLUENT PUMP (TYP.)

UNDER-GROUND ELECTRIC TO PUMP AND CONTROLS (TYP.). WILL REQUIRE SEPARATE ELECTRIC METER.

UNIT #1
UNIT #2
UNIT #3
UNIT #4
UNIT #5
UNIT #6
UNIT #7
UNIT #8

WATER METER PIT FOR EACH UNIT. (SEE DETAILS)

4" GRAVITY SEWER LATERALS, REFER TO PP3

PRIVATE UTILITIES INTO BUILDINGS HERE (TYP). LAYOUT IS TYPICAL AND APPLIES TO ALL UNITS.

WOOD SIGN

PLAYGROUND EQUIPMENT

SPECTACLE LAKE

WATER SERVICE TABLE		
LOCATION	SIZE (IN)	LENGTH (FT)
UNIT 1	1 ½	157
UNIT 2	1 ½	152
UNIT 3	1 ½	265
UNIT 4	1 ½	197
UNIT 5	1 ¼	182
UNIT 6	1 ¼	121
UNIT 7	1 ¼	39
UNIT 8	1 ¼	35

NOTE:
ALL WATER SERVICE MATERIAL SHALL BE TYPE K COPPER PIPE OR SDR 9.

N
W
E
S

0' 40' 80' 120'

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

UTILITY PLAN

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	
UT200153.DWG	

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CLIENT : **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
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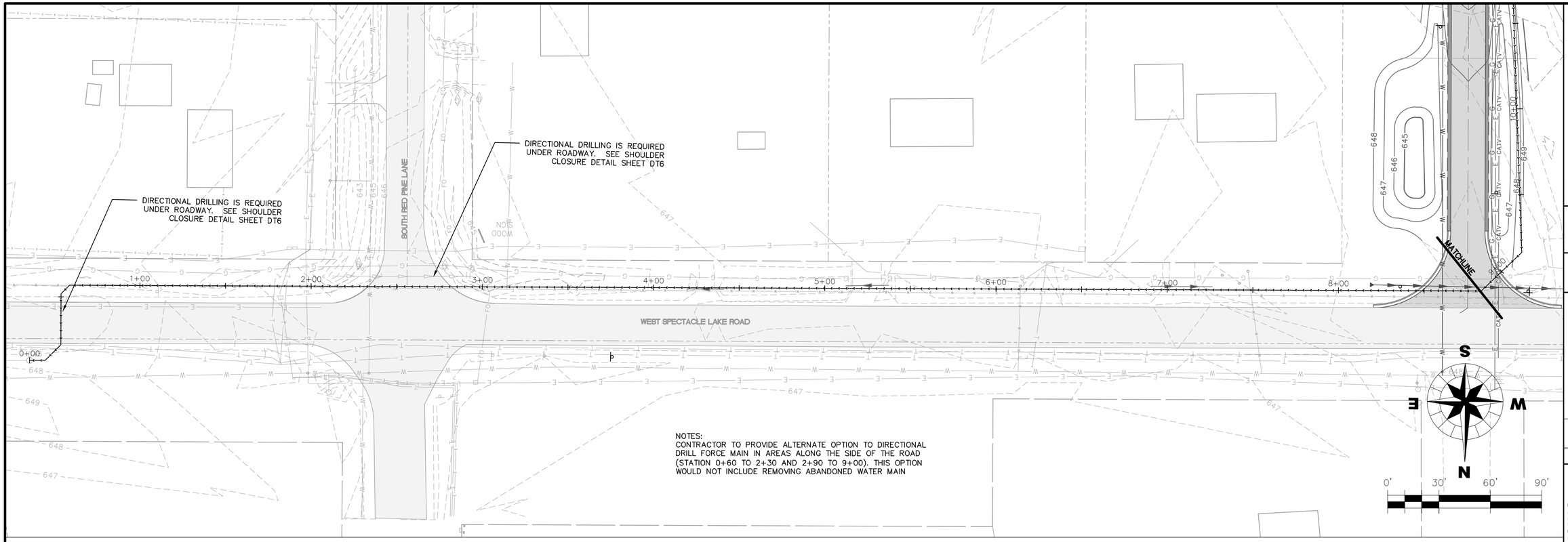
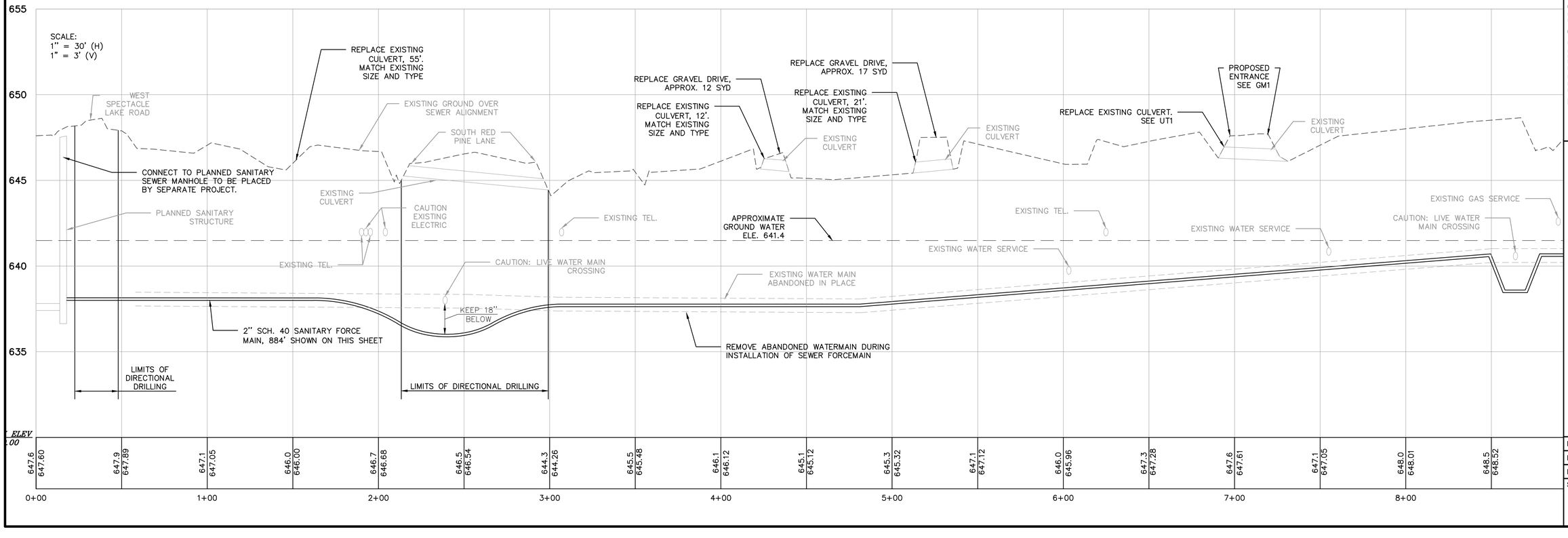
PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **UT1**
SHEET:
8 OF 23

UPDATED: 10/23/2020 - BDEVRIES





647.6	647.9	647.1	646.0
647.60	647.89	647.05	646.00
646.7	646.5	644.3	645.5
646.68	646.54	644.26	645.48
646.1	645.1	645.3	647.1
646.12	645.12	645.32	647.12
646.0	647.3	647.6	647.1
645.96	647.28	647.61	647.05
648.0	648.5		
648.01	648.52		

CLIENT : **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

PLAN AND PROFILE SANITARY SEWER

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	PP200153.DWG

NO.	DATE	NATURE OF REVISION
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WBK ENGINEERING, LLC
68 EAST MICHIGAN AVENUE
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182

WBK engineering

PROJECT NO. 200153
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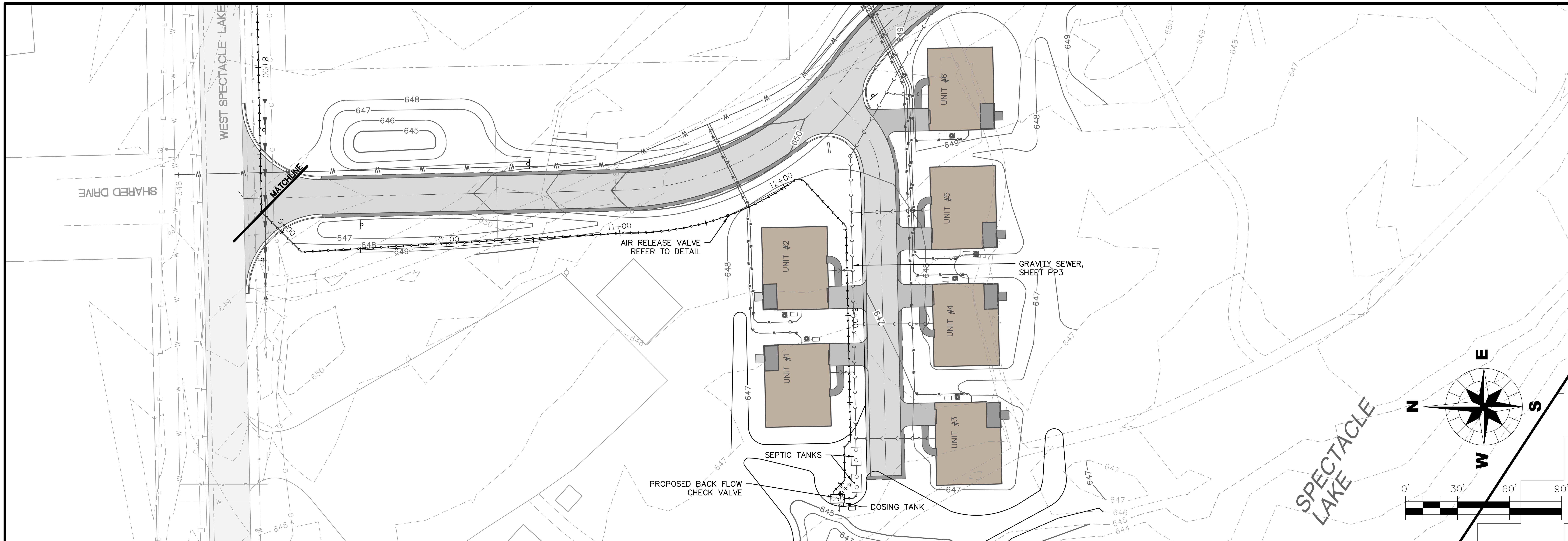
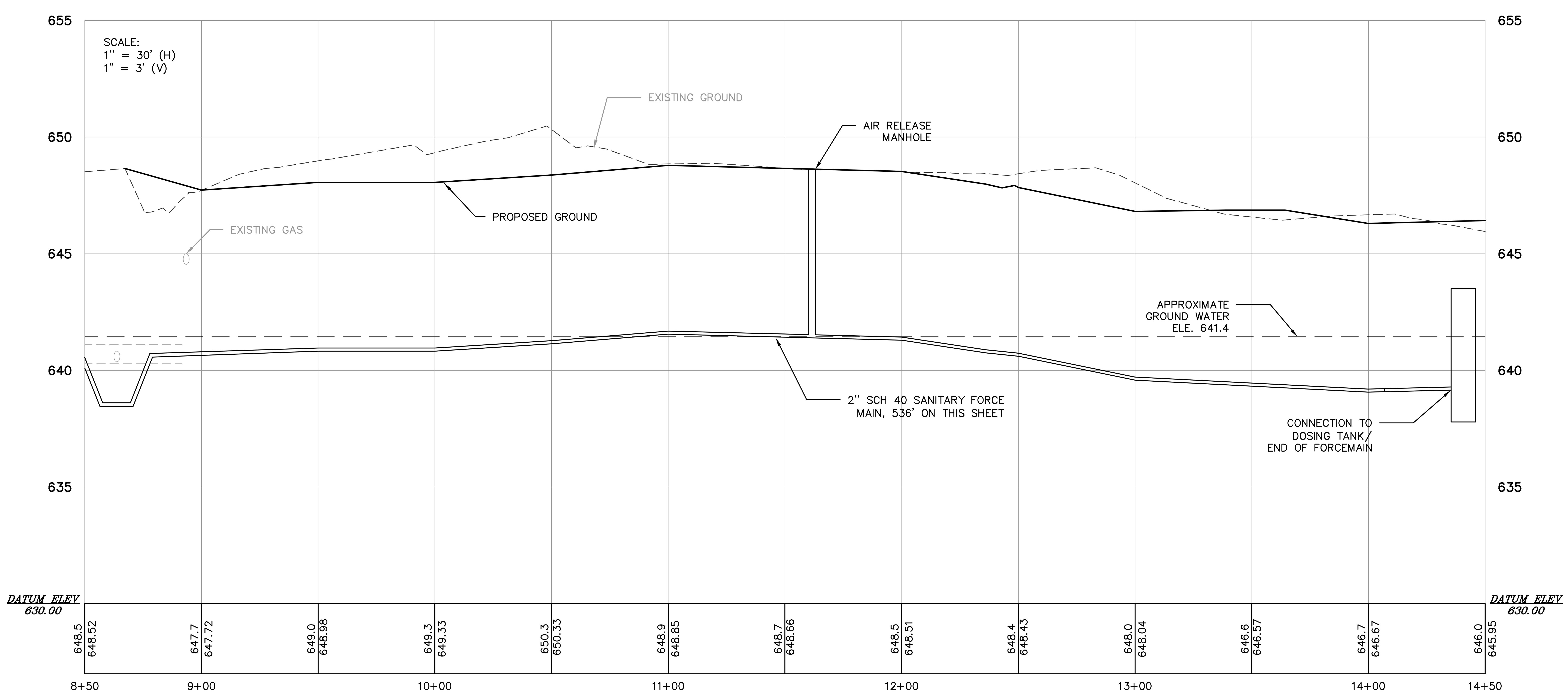
DRAWING NO. **PP1**
SHEET:
9 OF 23

UPDATED: 10/23/2020 - BDEVRIES





TITLE: **BAY MILLS ELDERS HOUSING DEVELOPMENT**

PLAN AND PROFILE SANITARY SEWER

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE : AS NOTED	

PP200153.DWG

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P: (269) 224-3182

WBK engineering

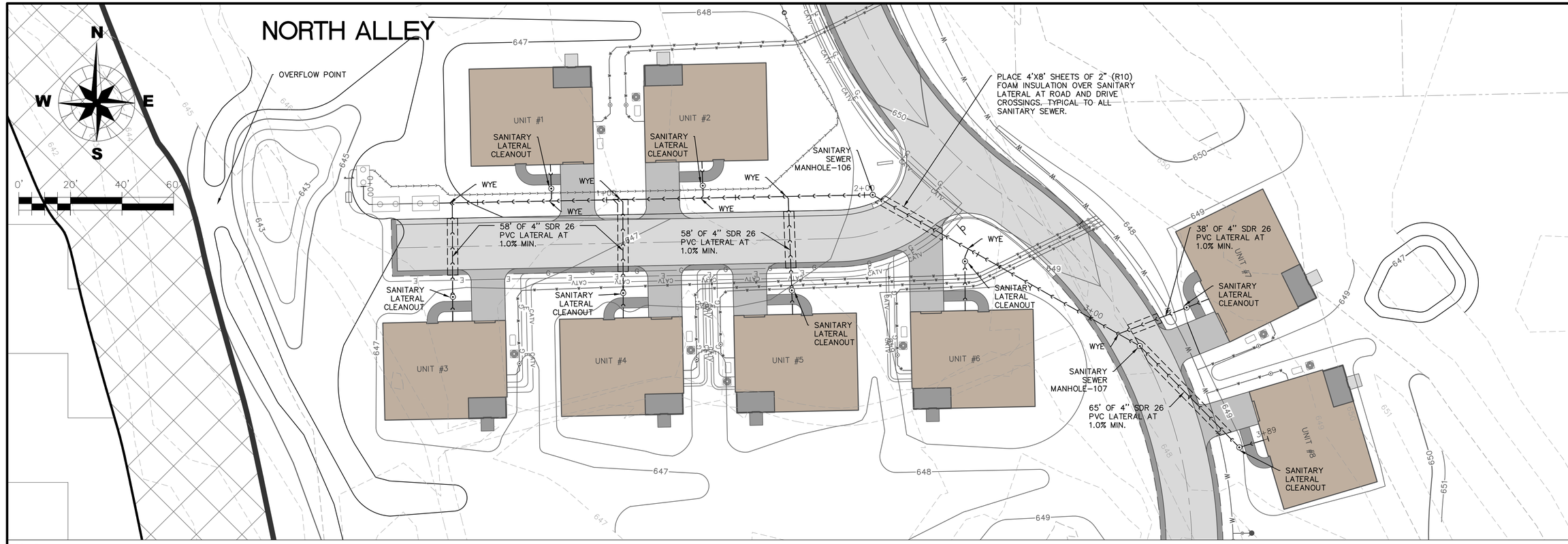
PROJECT NO. 200153

DATE: 09/14/2020

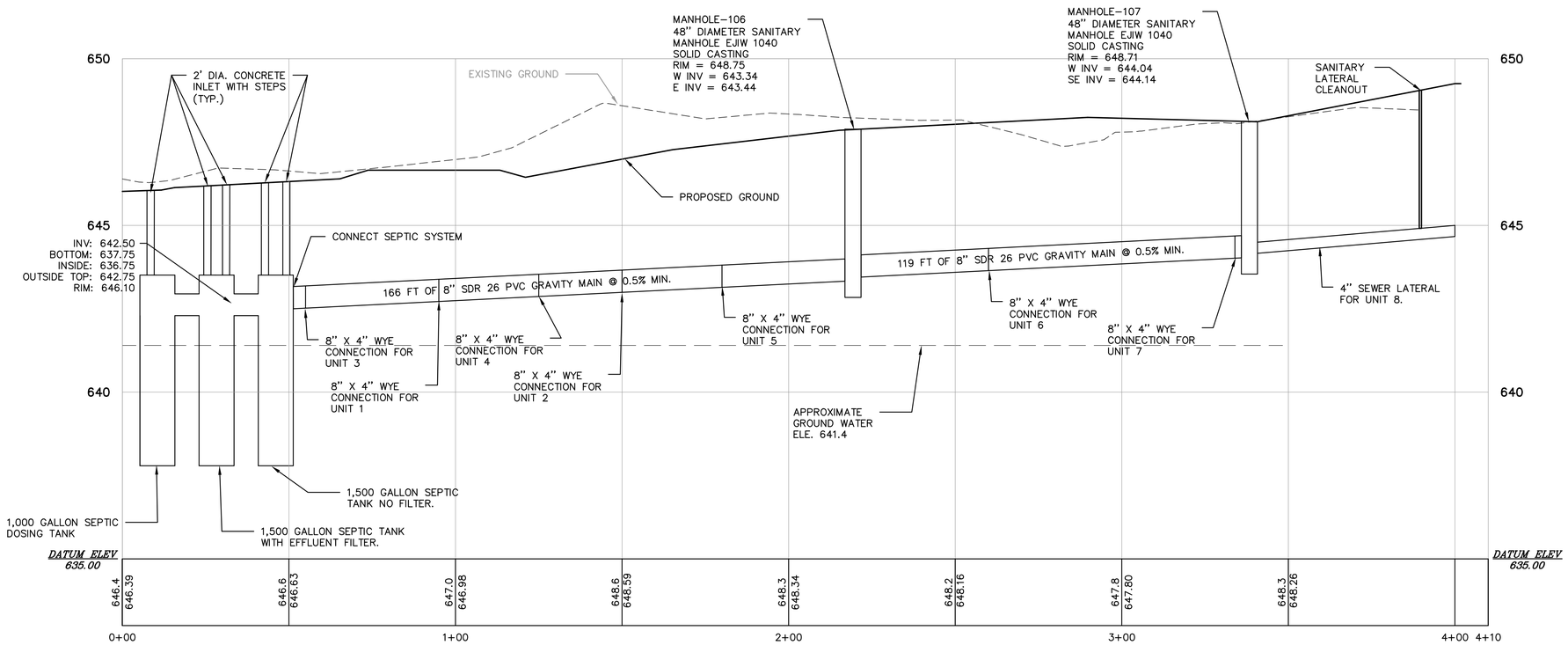
DRAWING NO. PP2

SHEET:

UPDATED: 10/23/2020 - BDEVRIES



SCALE:
1" = 20' (H)
1" = 2' (V)



CLIENT : **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

PLAN AND PROFILE SANITARY SEWER

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	PP200153.DWG

NO.	DATE	NATURE OF REVISION
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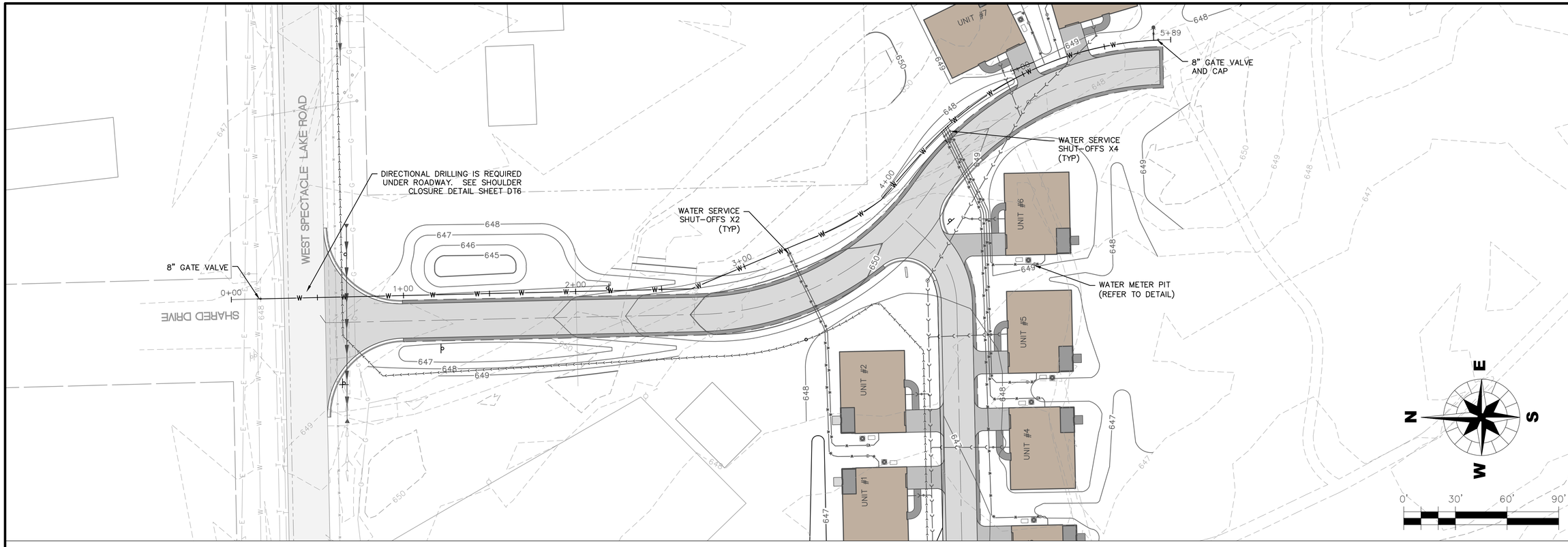
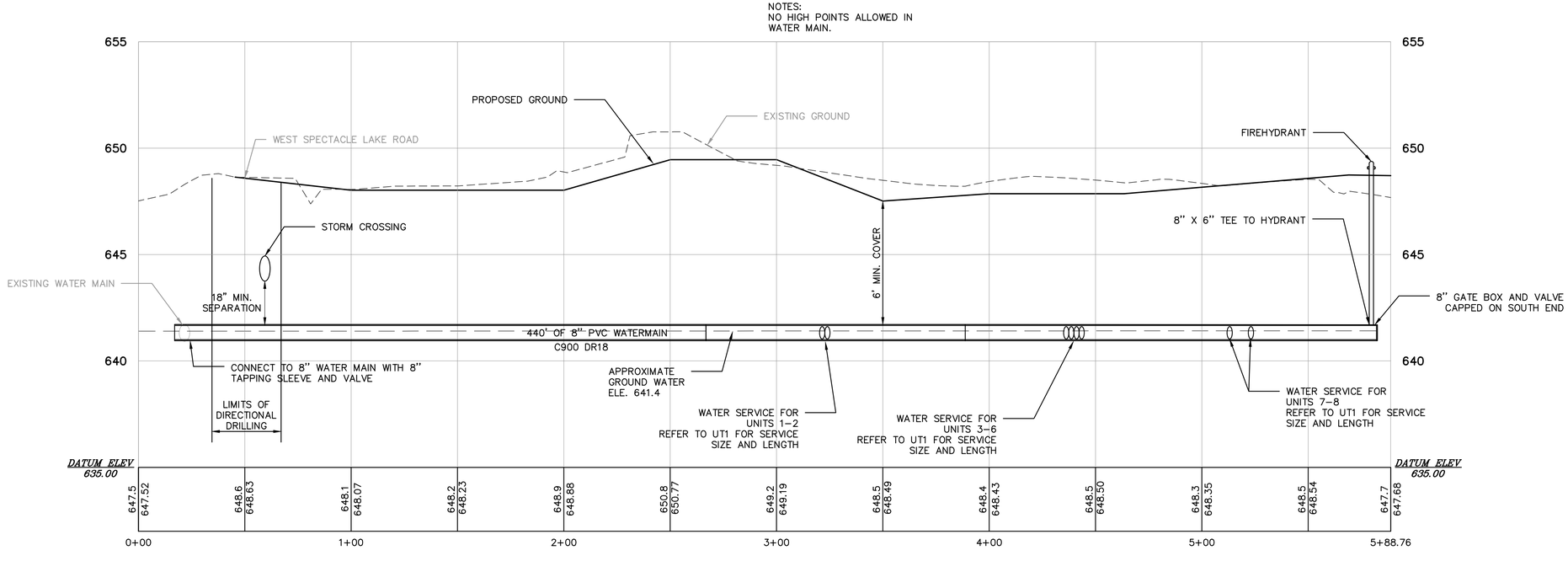
WBK ENGINEERING, LLC
68 EAST MICHIGAN AVENUE
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182

PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **PP3**
SHEET:
11 OF 23

UPDATED: 10/23/2020 - BDE/KRES



SCALE:
1" = 30' (H)
1" = 3' (V)



CLIENT: BAY MILLS HOUSING AUTHORITY
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

TITLE: BAY MILLS ELDERS HOUSING DEVELOPMENT

PLAN AND PROFILE WATER MAIN

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	PP200153.DWG

NO.	DATE:	NATURE OF REVISION
1	10/23	95% CD

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P: (269) 224-3182
WBK engineering

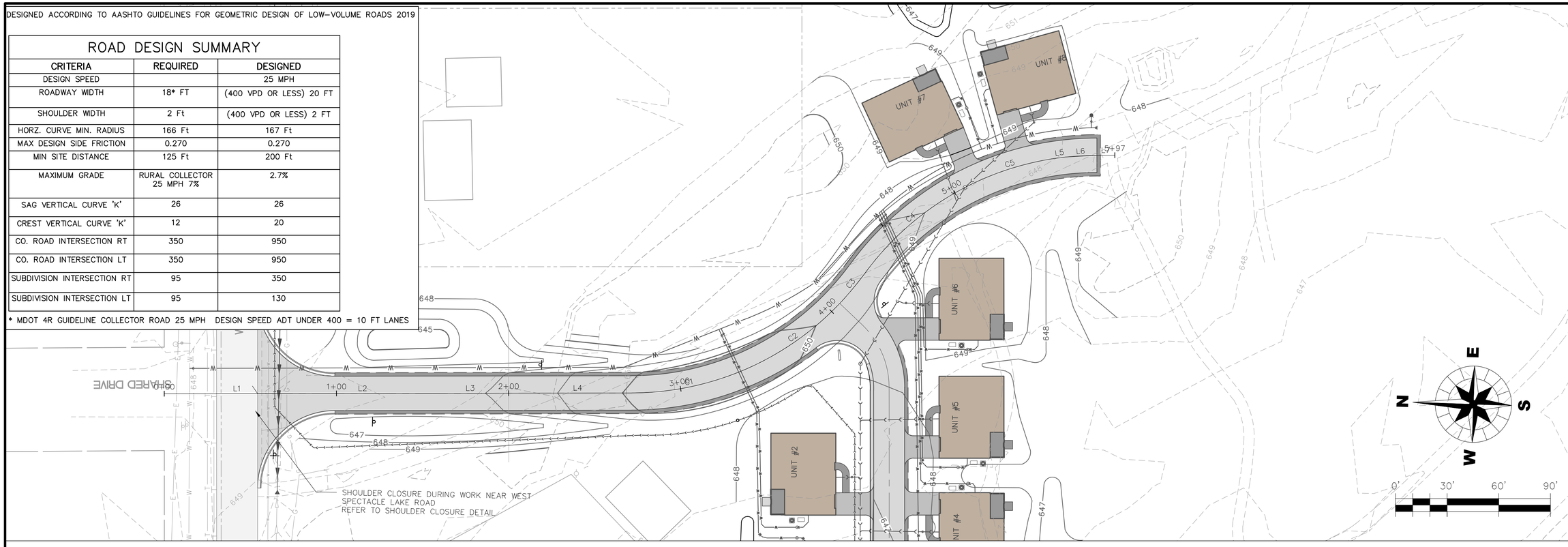
PROJECT NO. 200153
DATE: 09/14/2020
DRAWING NO. **PP4**
SHEET:
12 OF 23

DESIGNED ACCORDING TO AASHTO GUIDELINES FOR GEOMETRIC DESIGN OF LOW-VOLUME ROADS 2019

ROAD DESIGN SUMMARY

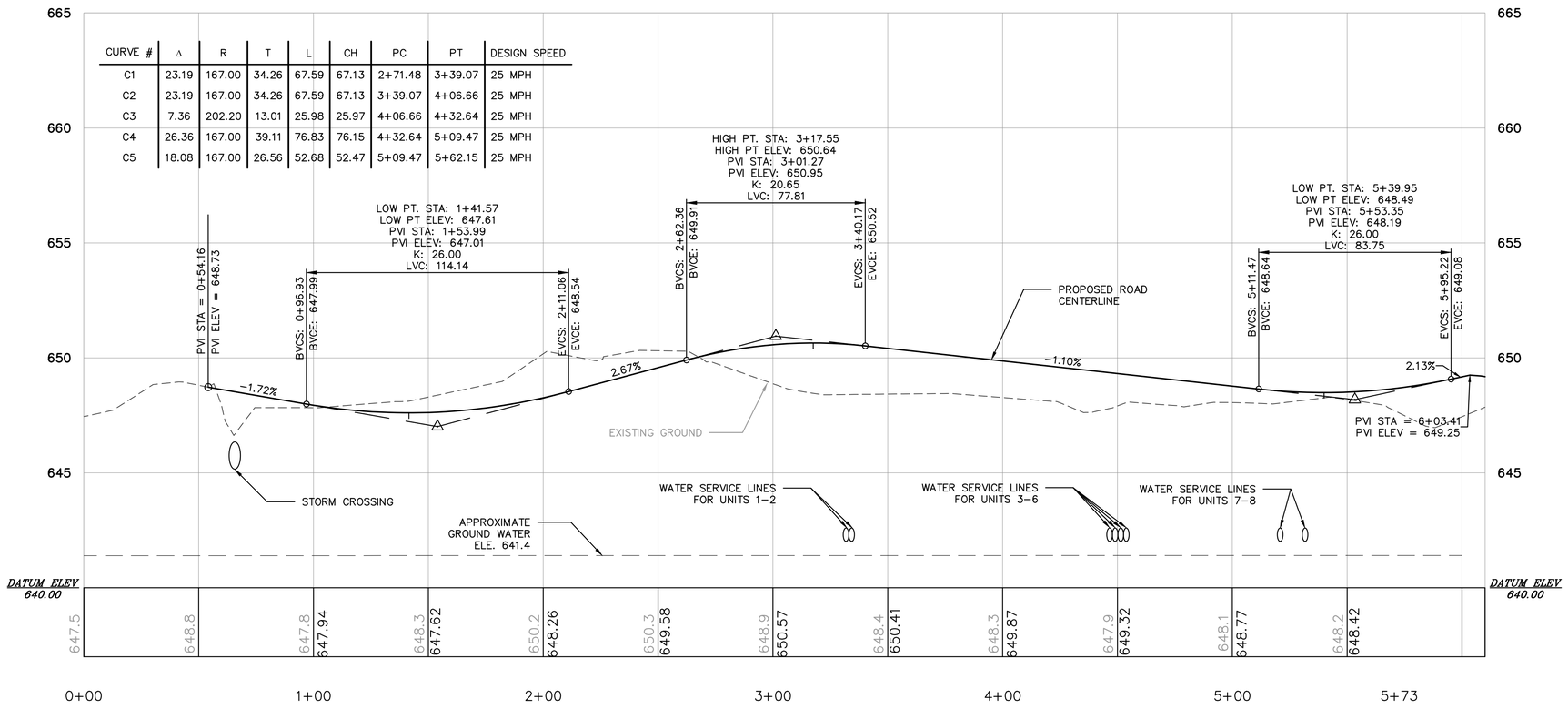
CRITERIA	REQUIRED	DESIGNED
DESIGN SPEED		25 MPH
ROADWAY WIDTH	18* FT	(400 VPD OR LESS) 20 FT
SHOULDER WIDTH	2 Ft	(400 VPD OR LESS) 2 FT
HORZ. CURVE MIN. RADIUS	166 Ft	167 Ft
MAX DESIGN SIDE FRICTION	0.270	0.270
MIN SITE DISTANCE	125 Ft	200 Ft
MAXIMUM GRADE	RURAL COLLECTOR 25 MPH 7%	2.7%
SAG VERTICAL CURVE 'K'	26	26
CREST VERTICAL CURVE 'K'	12	20
CO. ROAD INTERSECTION RT	350	950
CO. ROAD INTERSECTION LT	350	950
SUBDIVISION INTERSECTION RT	95	350
SUBDIVISION INTERSECTION LT	95	130

* MDOT 4R GUIDELINE COLLECTOR ROAD 25 MPH DESIGN SPEED ADT UNDER 400 = 10 FT LANES



SCALE:
1" = 30' (H)
1" = 3' (V)

CURVE #	Δ	R	T	L	CH	PC	PT	DESIGN SPEED
C1	23.19	167.00	34.26	67.59	67.13	2+71.48	3+39.07	25 MPH
C2	23.19	167.00	34.26	67.59	67.13	3+39.07	4+06.66	25 MPH
C3	7.36	202.20	13.01	25.98	25.97	4+06.66	4+32.64	25 MPH
C4	26.36	167.00	39.11	76.83	76.15	4+32.64	5+09.47	25 MPH
C5	18.08	167.00	26.56	52.68	52.47	5+09.47	5+62.15	25 MPH



CLIENT: BAY MILLS HOUSING AUTHORITY
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

WBK ENGINEERING, LLC
68 EAST MICHIGAN AVENUE
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182

TITLE: BAY MILLS ELDERS HOUSING DEVELOPMENT

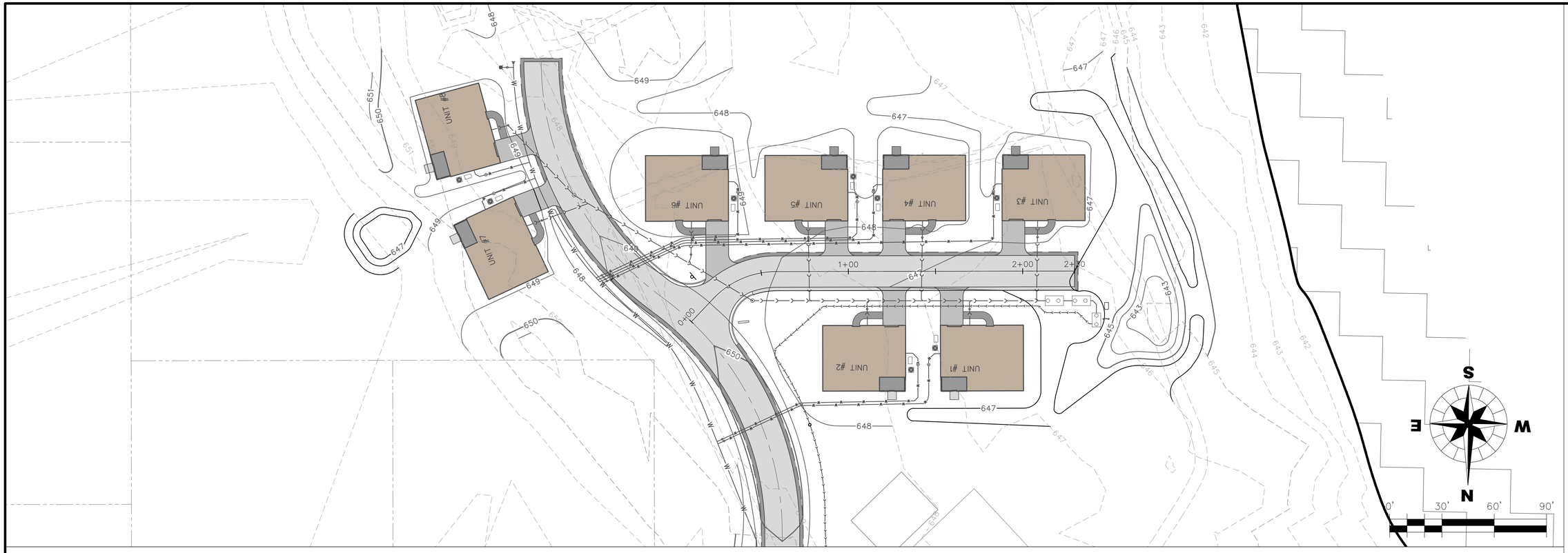
PLAN AND PROFILE MAIN ROAD

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	PP200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

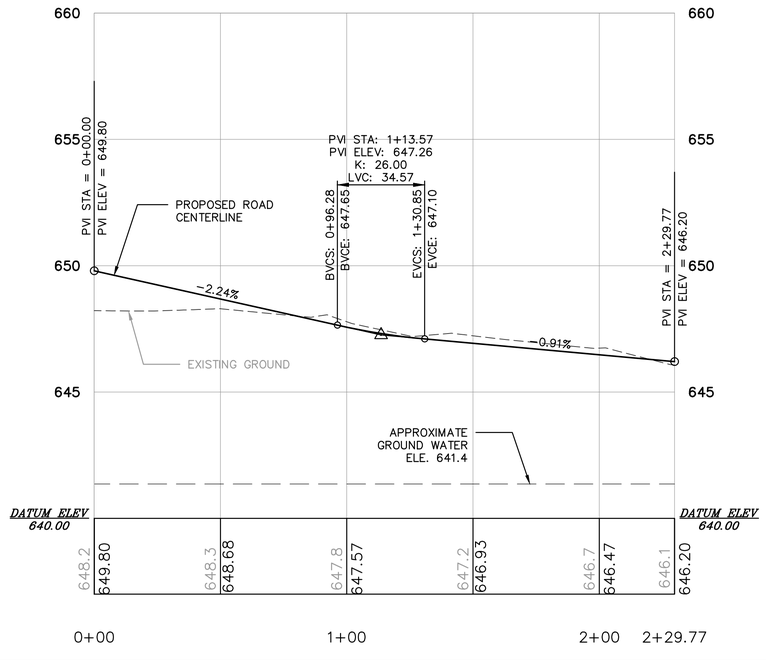
PROJECT NO. 200153
DATE: 09/14/2020
DRAWING NO. PP5
SHEET:
13 OF 23

UPDATED: 10/23/2020 - BDR/WEB



SCALE:
1" = 30' (H)
1" = 3' (V)

NORTH ALLEY



CLIENT: BAY MILLS HOUSING AUTHORITY
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

TITLE: BAY MILLS ELDERS HOUSING DEVELOPMENT

PLAN AND PROFILE ALLEYS

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	PP200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

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BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182

WBK engineering

PROJECT NO. 200153
DATE: 09/14/2020
DRAWING NO. **PP6**
SHEET:
14 OF 23

CHLINE

BASIN INFORMATION:

NORTHWEST BASIN:

TOP BASIN = 646.00
BOTTOM BASIN = 643.00
VOLUME = 6,186 CF
OVERFLOW POINT = 645.75

FF-647.50
UNIT #1

FF-648.00
UNIT #2

UNIT #3
FF-647.50

UNIT #4
FF-648.50

UNIT #5
FF-648.50

UNIT #6
FF-649.50

UNIT #7
FF-649.25

UNIT #8
FF-649.25

TRANSITION DUB DOWN 2-FT EDGES

TRANSITION DUB DOWN 2-FT EDGES

CONSTRUCT SMALL BERM TO DIVERT FLOW INTO BASIN.

LAKE ELEVATION AT TIME OF SURVEY = 642.10

SPECTACLE LAKE

NOTE:
CONTRACTOR TO PROTECT BASINS AREAS DURING CONSTRUCTION TO PREVENT OVER COMPACTION OF NATIVE SOILS WHICH COULD RESULT IN LOSS OF INFILTRATION CAPACITY. AFTER BASINS HAVE BEEN EXCAVATED, CONTRACTOR IS TO AVOID RUNNING EQUIPMENT THROUGH THE BASINS. AT THE DIRECTION OF THE ENGINEER OR THE LOCAL MUNICIPALITY THE CONTRACTOR MAY BE REQUIRED TO INSTALL TEMPORARY FENCING (SUCH AS SNOW FENCE) AROUND THE TOP PERIMETER OF THE BASIN TO FURTHER PROTECT THE AREA.

DO NOT STOCKPILE SOIL OR MATERIAL OVERTOP BASIN AREAS BEFORE THEY ARE EXCAVATED OR WITHIN BASIN AREA AFTER EXCAVATION.

CONTRACTOR TO INSTALL A MINIMUM OF 4 INCHES OF NEW MATERIAL IN THE BASIN BOTTOM. MATERIAL SHALL BE A MIX OF NEW TOPSOIL, MDOT CLASS II SAND, AND LEAF COMPOST. DO NOT USE SALVAGED TOPSOIL.

BASIN SIDES SHALL CONSIST OF TOPSOIL WHICH MAY BE NEW OR SALVAGED.

INSTALL A LOW VELOCITY EROSION CONTROL BLANKET (NORTH AMERICAN GREEN S75 OR EQUAL) ON ALL BASIN SIDE SLOPES 4:1 (H:V) AND SHALLOWER. SLOPES STEEPER THAN 4:1 AND AREAS OF CONCENTRATE FLOW SHALL HAVE A HIGH VELOCITY MULCH BLANKET (NORTH AMERICAN GREEN SC250) INSTALLED. INSTALL HIGH VELOCITY MULCH BLANKET AT BASIN WEIR OVERFLOW POINTS.

STORMWATER BASIN SUMPS SHALL BE CLEANED OUT TO THEIR DESIGN VOLUME AT THE COMPLETION OF CONSTRUCTION ACTIVITIES OR ONCE THE SITE IS ESTABLISHED.

CONTRACTOR SHALL TAKE CARE DURING CONSTRUCTION TO PREVENT THE MIGRATION OF SILT AND SEDIMENT INTO STORMWATER BASINS. IF A BASIN BECOMES INUNDATED WITH SEDIMENT AND SILT THE CONTRACTOR SHALL EXPEDIENTLY CLEAN THE BASIN TO ITS ORIGINAL DESIGN VOLUME.

LEGEND:

TOC = TOP OF CURB

RIM = STRUCTURE RIM

ME = MATCH EXISTING

INV = PIPE INVERT

FF = FINISHED FLOOR

+999.99 SPOT GRADE

SITE EARTHWORK NOTES:

SITE CUT – 1,980 CY
SITE FILL – 1,415 CY

NET – CUT 565 CY

CUT FACTOR OF 1.1 APPLIED

STORMWATER MANAGEMENT NOTES:

CONTRIBUTING IMPERVIOUS AREA = 30,116 SFT
CONTRIBUTING VOLUME (1"/AREA) = 2,510 CFT
ΔCN = +18 (WEIGHTED CHANGE OVER THE WHOLE SITE)
25-YEAR, 24-HOUR EVENT = 5,435 CFT
DESIGN BASIN VOLUME = 9,235 CFT > 5,435 CFT & 2,510 CFT

VOLUME OF DITCHES, LOW POCKETS AROUND BUILDINGS, AND IN PIPES ARE NOT COUNTED TOWARD DESIGN BASIN VOLUME SHOWN ABOVE.

N
W E
S

0' 20' 40' 60'

UPDATED: 10/23/2020 - BDE/VRES

TITLE: BAY MILLS ELDERS HOUSING DEVELOPMENT

GRADING AND DRAINAGE PLAN

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	GR200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

CLIENT: BAY MILLS HOUSING AUTHORITY
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
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68 EAST MICHIGAN AVENUE
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WBK engineering

PROJECT NO. 200153
DATE: 09/14/2020
DRAWING NO. GR1
SHEET:
15 OF 23

WEST SPECTACLE LAKE ROAD

ME=649.10

ME=648.74

ME=648.22

BASIN INFORMATION:

NORTHEAST BASIN:

TOP BASIN = 647.00
BOTTOM BASIN = 645.00
VOLUME = 3,049 CF
OVERFLOW POINT = 647.00

NOTE:

REFER TO SHEET PP5 FOR ADDITIONAL ROAD GRADES AND ROAD PLAN AND PROFILE SHEET.

MATCHLINE

MATCHLINE

BASIN INFORMATION:

NORTHWEST BASIN:

TOP BASIN = 646.00
BOTTOM BASIN = 643.00
VOLUME = 6,186 CF
OVERFLOW POINT = 645.75

FF-647.50
UNIT #1

FF-648.00
UNIT #2

TRANSITION DUB DOWN 2-FT EDGES

TRANSITION DUB DOWN 2-FT EDGES

LEGEND:

TOC = TOP OF CURB
RIM = STRUCTURE RIM
ME = MATCH EXISTING
INV = PIPE INVERT
FF = FINISHED FLOOR
+999.99 SPOT GRADE

N
W
E
S

0' 10' 20' 30'

UPDATED: 10/23/2020 - BDR/VRES

GRADING AND DRAINAGE PLAN

TITLE: BAY MILLS ELDERS HOUSING DEVELOPMENT

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	GR200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

CLIENT: BAY MILLS HOUSING AUTHORITY
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PROJECT NO. 200153
DATE: 09/14/2020
DRAWING NO. GR2
SHEET:
16OF23

C. Infiltration Basin Mix: Fresh, clean, and dry new seed, of mixed species as follows:		
Botanical Name	**Common Name**	**PLS Ounces/Acre**
Grasses		
Carex bebbii	Bebb's oval sedge	4
Carex vulpinoidea	Fox Sedge	4
Elymus canadensis	Canada Wild Rye	24
Juncus effusus	Soft Rush	0.5
Juncus tenuis	Path Rush	0.5
Panicum virgatum	Switchgrass	8
Sorghastrum nutans	Indian Grass	8
	Grasses oz per acre	49
Forbs		
Anemone cylindrica	Thimbleweed	0.5
Asclepias tuberosa	Butterfly Milkweed	2
Aster laevis	Smooth Blue Aster	1
Aster sagittifolius	Arrow-leaved Aster	2
Baptisia lactea	White Wild Indigo	2
Cassia fasciculata	Partridge Pea	4
Coreopsis lanceolata	Lance-leaf Coreopsis	8
Desmodium illinoense	Prairie Tick Trefoil	1
Echinacea purpurea	Purple Coneflower	8
Eryngium yuccifolium	Rattlesnake Master	2
Helianthus occidentalis	Western Sunflower	1
Kuhnia eupatorioides	False Boneset	1
Liatris cylindracea	Cylindrical Blazingstar	1
Lupinus perennis	Lupine	3
Monarda fistulosa	Wild Bergamot	4
Monarda punctata	Horsemint	1
Penstemon digitalis	Foxglove Beardtongue	3
Penstemon hirsutus	Hairy Beardtongue	1
Petalostemum purpureum	Purple Prairie Clover	4
Potentilla arguta	Prairie Cinquefoil	1
Ratibida pinnata	Yellow Coneflower	6
Rudbeckia hirta	Black-eyed Susan	4
Solidago rigida	Stiff Goldenrod	1.5
Solidago speciosa	Showy Goldenrod	1
Tradescantia ohiensis	Common Spiderwort	3
Verbena stricta	Hoary Vervain	4
Zizia aptera	Prairie Golden Alexander	1
	Forbs oz per acre	71
Annuals		
Coreopsis tinctoria	Plains Coreopsis	5
Cosmos bipinnatus 'Sensation'	Cosmos, Tall Mixed	100
Eschschoolzia californica 'Ballerina Mix'	California Poppy, Mixed	23
Gaillardia pulchella	Indian Blanket	23
Linum perenne	Blue Flax	23
Monarda citriodora	Lemon Mint	5
Salvia coccinea	Scarlet Sage	23
	Annuals oz per acre	**202**
	Total oz per acre	**251**

SEEDING LEGEND

POND SEEDING MIX – MEADOW MAINTAINED SEE TABLE "C", THIS SHEET FOR SEED MIX AREA = 365 S.Y.

SEEDING NOTE FOR ALL GRASS AREAS DISTURBED:
CONTRACTOR TO USE A SUN/SHADE SEED MIX.
SOW SEED AT A RATE OF 220 LB/ACRE

NORTHERN WHITE CEDAR
[THUJA OCCIDENTALIS]
2 EA

NORTHERN WHITE CEDAR
[THUJA OCCIDENTALIS]
5 EA

UNIT #1
UNIT #2
UNIT #3
UNIT #4
UNIT #5
UNIT #6
UNIT #7
UNIT #8

OPTIONAL:
NATURAL HARDWOOD MULCH 1 CYD
AT 5" THICK
PLANT WITH SUN/SHADE
TOLERANT NATIVE FLOWERS
ADD ONE DWARF TREE SUCH AS
WEEPING EASTERN REDBUD
[CERCIS CANADENSIS]
TYPICAL TO EACH GARDEN

SPECTACLE LAKE

N
W
E
S

0' 20' 40' 60'

UPDATED: 10/23/2020 - BDK/VRES

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

LANDSCAPING PLAN

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	LP200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

CLIENT : **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

WBK ENGINEERING, LLC
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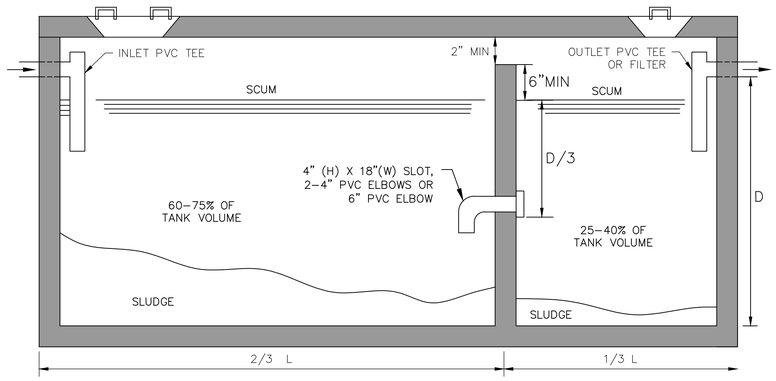
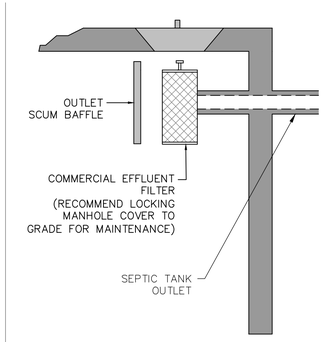
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182
WBK engineering

PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **LP1**
SHEET:
17 OF 23

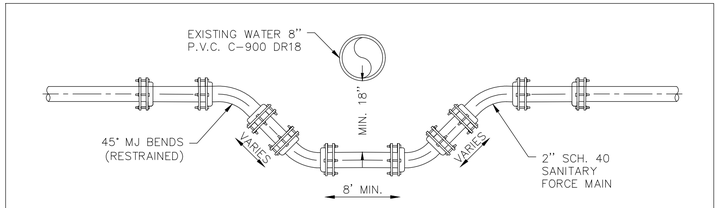




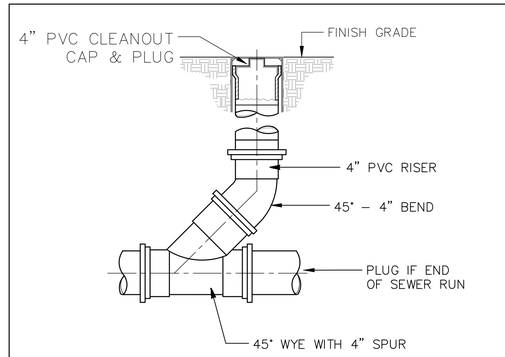
NOTES:

1. CONNECTIONS TO COMPARTMENTS SHALL BE LOCATED AT A DISTANCE BELOW THE LIQUID LEVEL EQUAL TO 1/3 THE DISTANCE (D) BETWEEN THE INVERT OF THE OUTLET AND THE BOTTOM OF THE TANK.
2. AT LEAST ONE ACCESS MANHOLE SHALL BE PROVIDED INTO EACH COMPARTMENT.
3. TANKS IN SERIES SHOULD BE CONNECTED BY A SINGLE PIPE WITH A MINIMUM DIAMETER OF FOUR (4) INCHES.
4. ALL TEES/ELBOWS IN THE TANK SHALL BE CONSTRUCTED FROM NATIONAL SANITATION FOUNDATION (NSF) SCHEDULE 40 POLYVINYL CHLORIDE (PVC) OR EQUIVALENT.
5. THE TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STANDARD C1227, SECTION 9.2 TESTING FOR LEAKAGE (9.2.1 VACUUM TESTING – SEAL THE EMPTY TANK AND APPLY A VACUUM TO 2 IN. OR 50 MM OF MERCURY. THE TANK IS APPROVED IF 90% OF A VACUUM IS HELD FOR 2 MINUTES. 9.2.2 WATER–PRESSURE TESTING – SEAL THE TANK, FILL WITH WATER, AND LET STAND FOR 24 HOURS. REFILL THE TANK. THE TANK IS APPROVED IF WATER LEVEL IS HELD FOR 1 HOUR.) IN THE EVENT THAT A TANK OR CHAMBER FAILS TESTING, REPAIRS OR REPLACEMENT SHALL BE REQUIRED TO THE EXTENT NECESSARY TO RESOLVE THE LEAKING CONDITION.
6. CONCRETE STRENGTH MUST BE 4000 LBS. PER SQ INCH AFTER 28 DAYS.
7. TANKS REINFORCED FOR STRENGTH AND TO FACILITATE HANDLING.
8. LIDS REINFORCED WITH ⅜" STEEL REINFORCING ROD ON 12" CENTERS IN EACH DIRECTION.

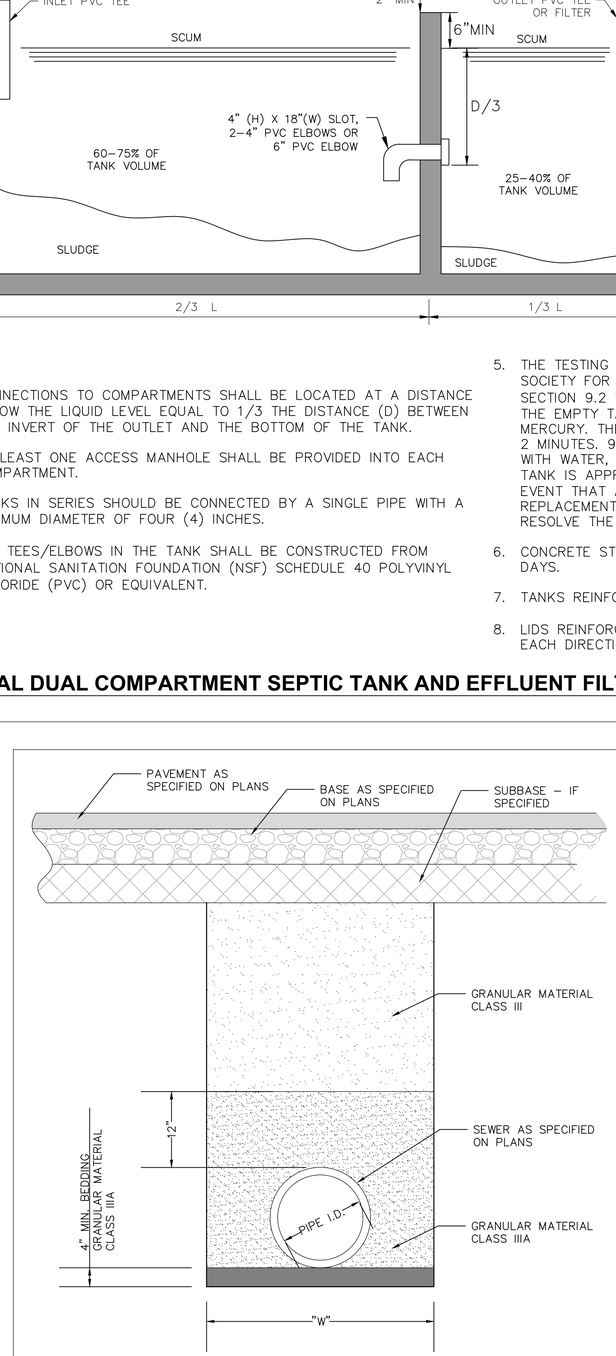
TYPICAL DUAL COMPARTMENT SEPTIC TANK AND EFFLUENT FILTER
N.T.S.



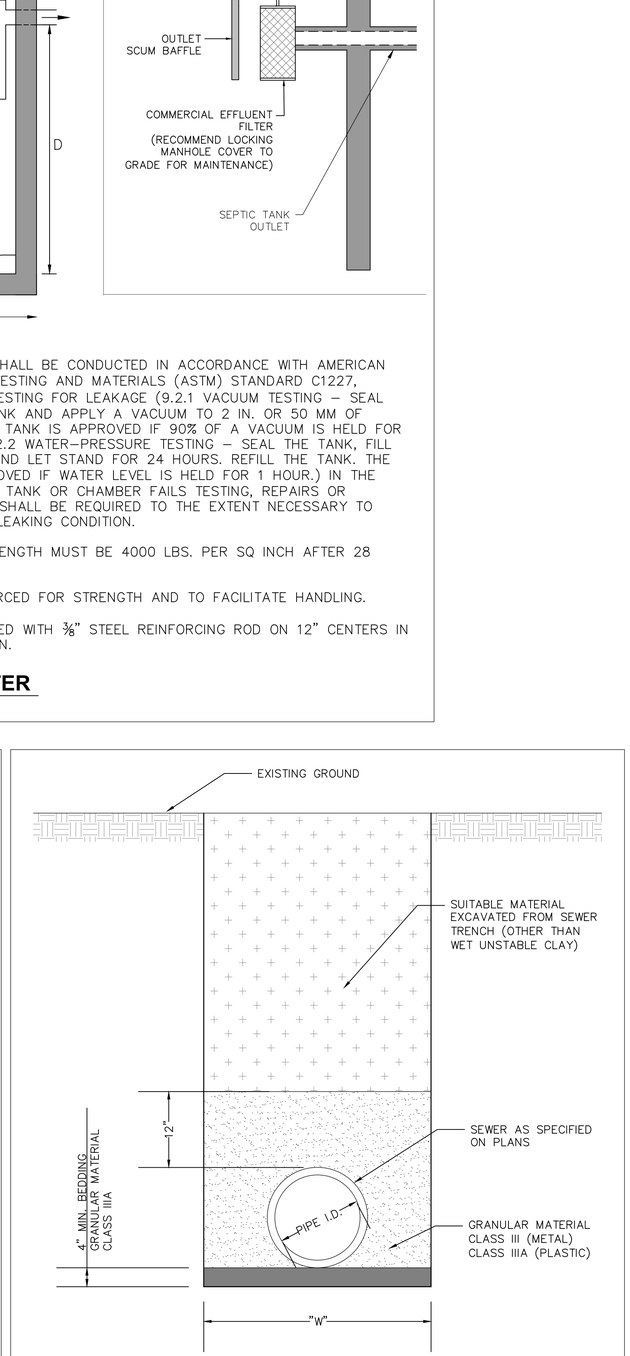
WATER MAIN RELOCATION DETAIL
N.T.S.



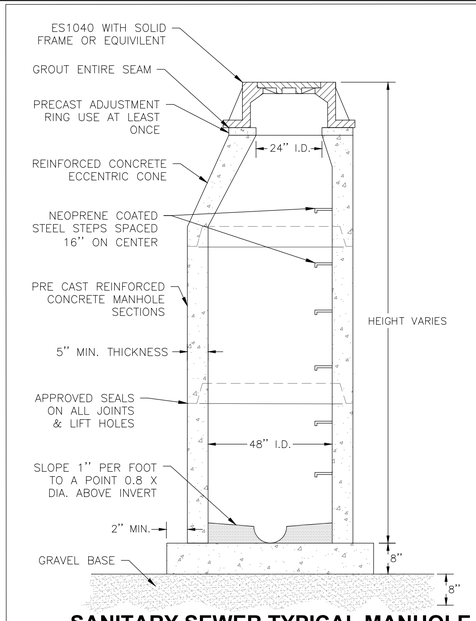
SANITARY SEWER SERVICE CLEANOUT
N.T.S.



SEWER UNDER PAVEMENT PLASTIC PIPE
N.T.S.



SEWER NOT UNDER PAVEMENT METAL AND PLASTIC PIPE
N.T.S.



SANITARY SEWER TYPICAL MANHOLE
PRECAST REINFORCED CONCRETE SHOWN

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

DETAILS

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	DT200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

CLIENT : **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

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WBK engineering

PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **DT1**
SHEET:
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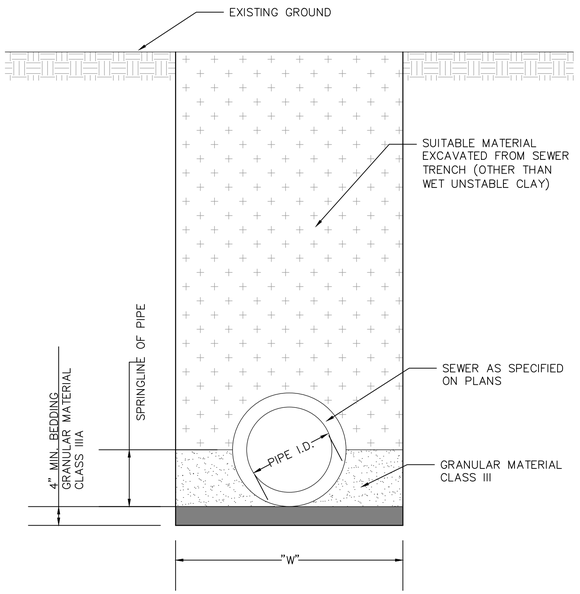
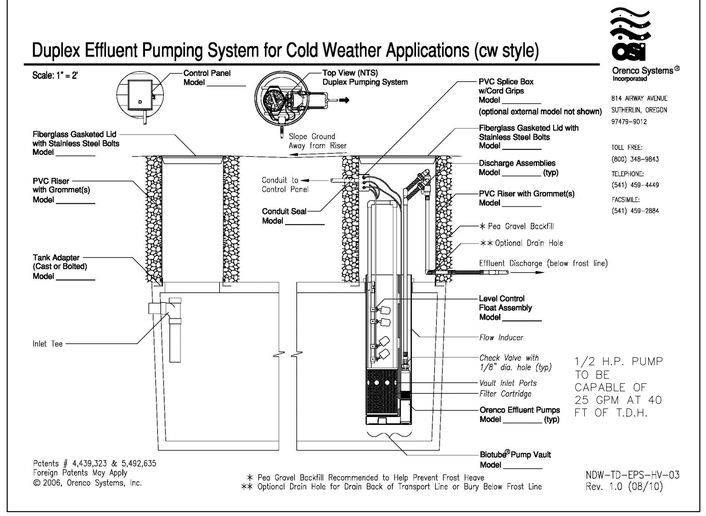


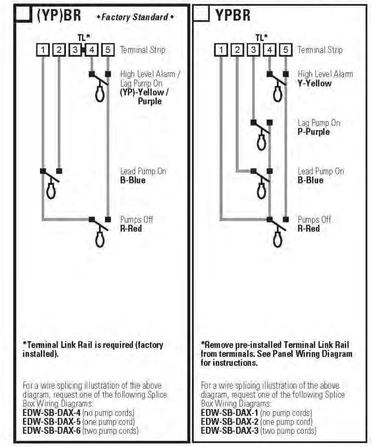
STORM NOT UNDER PAVEMENT
CONCRETE PIPE
N.T.S.



DOSING TANK

Float Arrangement Diagram

Check the appropriate box for the float function (color code) used in your system.



Float Types

Typical Orenco float model: A
Specs: contact - normally open differential - 2" min. power rating - signal
Possible substitutions: B,C,D

Typical Orenco float model: B
Specs: contact - normally open differential - 2" min. power rating - signal
Possible substitutions: C,D

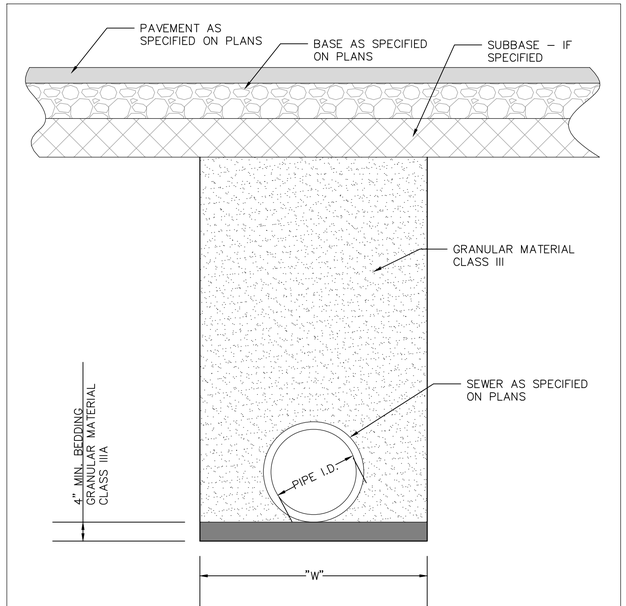
Typical Orenco float model: T
Specs: contact - normally closed differential - no minimum power rating - signal

Orenco Systems®
Incorporated
814 AIRWAY AVENUE
SUTHERLIN, OREGON
97479-9012
TELEPHONE:
(541) 459-4449
FACSIMILE:
(541) 459-2884

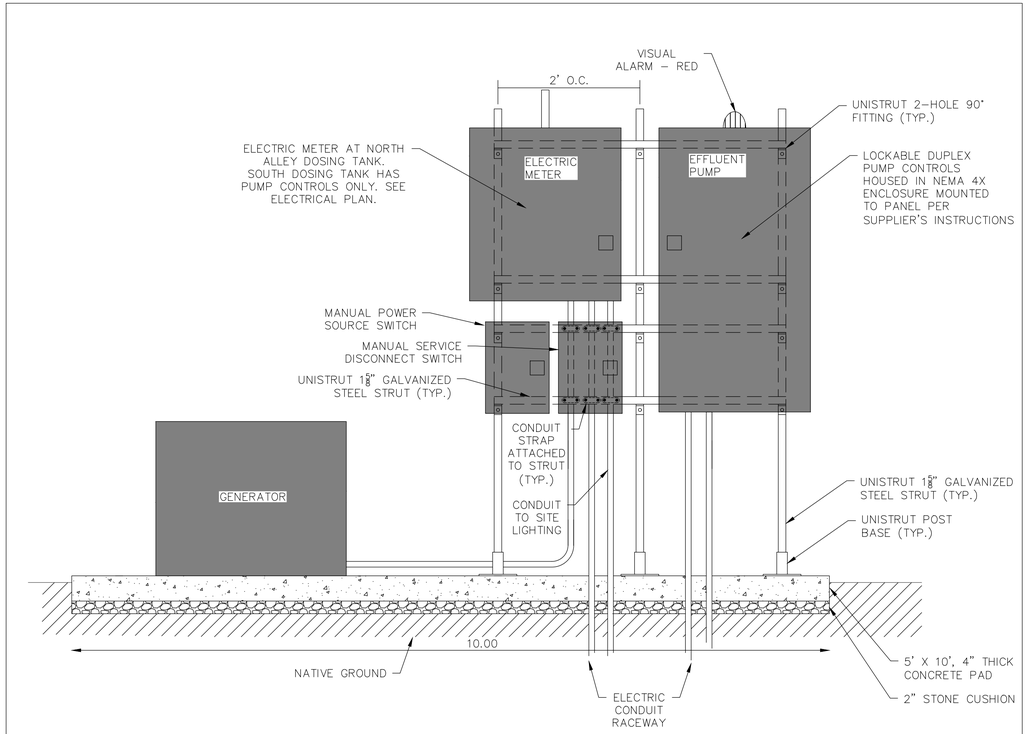
Control Panel Series
DAX

Drawing No.
EDW-FA-DAX-1

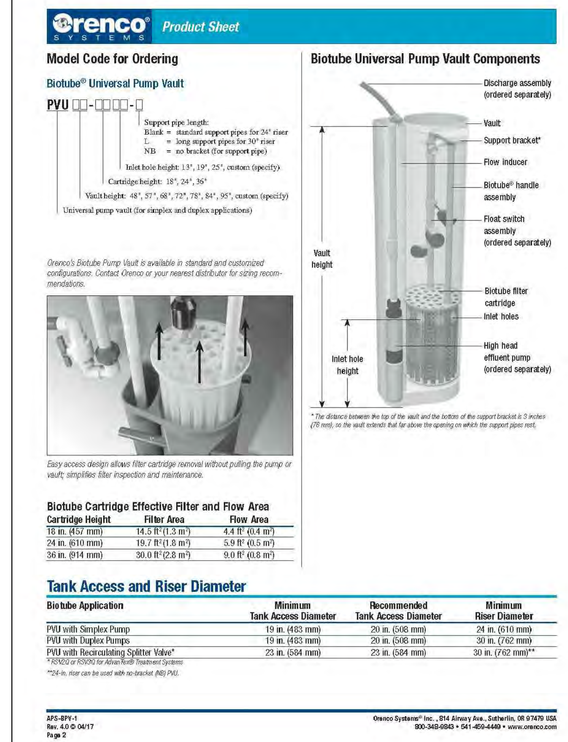
EDW-FA-DAX-1
Rev 2.2 ©03/15/11



STORM UNDER PAVEMENT
METAL AND CONCRETE PIPE
N.T.S.



PUMP PANEL REQUIREMENTS
N.T.S.



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PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **DT2**
SHEET:
19 OF 23

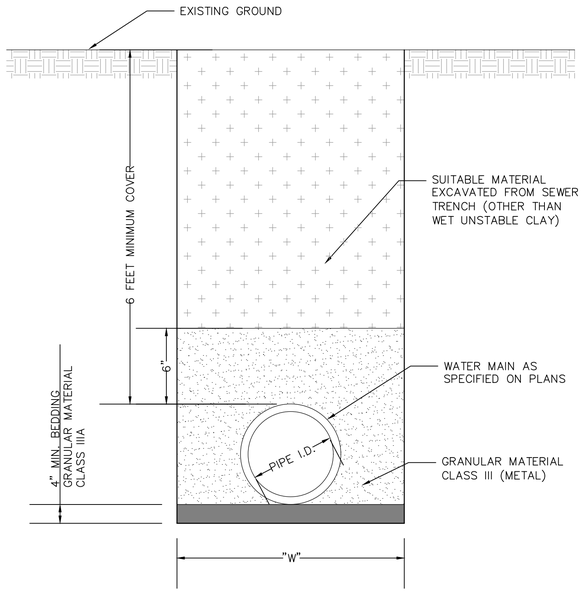
TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

DETAILS

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	DT200153.DWG

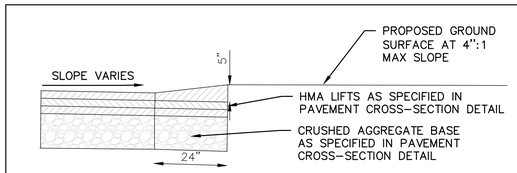
NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

UPDATED: 10/23/2020 - BCR/VRES



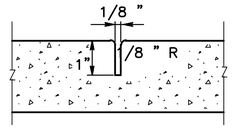
C-900 WATER MAIN NOT UNDER PAVEMENT

N.T.S.

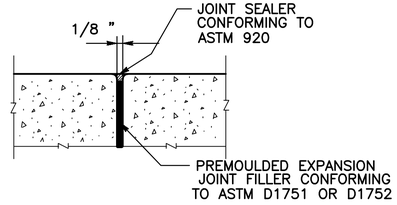


TYPICAL HMA WING CURB

N.T.S



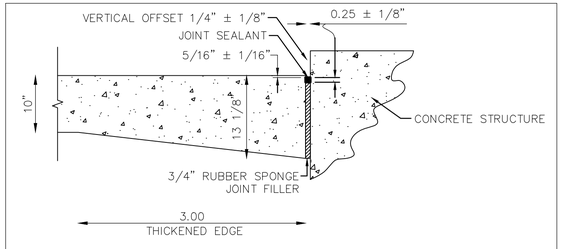
CONTRACTION JOINT



EXPANSION JOINT

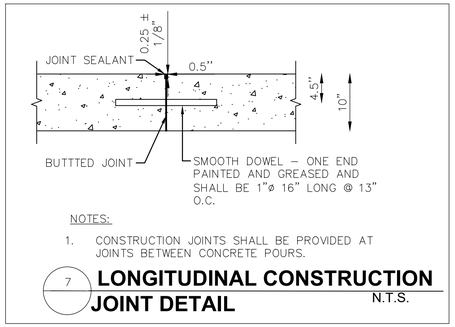
4 CS100 **TYPICAL CONCRETE JOINT DETAILS**

N.T.S.



10 **EXPANSION JOINT DETAIL**

N.T.S.

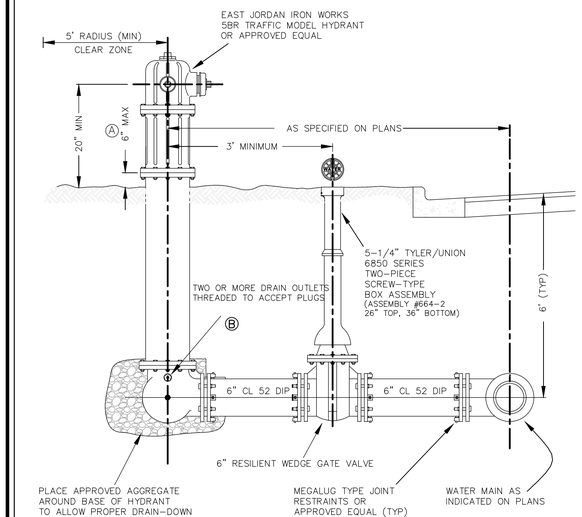


NOTES:

1. CONSTRUCTION JOINTS SHALL BE PROVIDED AT JOINTS BETWEEN CONCRETE POURS.

7 **LONGITUDINAL CONSTRUCTION JOINT DETAIL**

N.T.S.



NOTES:
ALL MATERIALS MUST MEET AWWA & NSF STANDARDS.

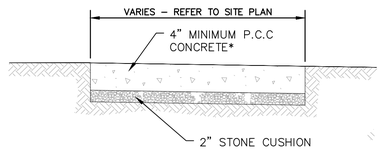
FIRE HYDRANT ASSEMBLY INCLUDES TEE, 6" RESILIENT WEDGE VALVE AND BOX, RESTRAINTS, AND UP TO 10'-6" OF CL 52, CEMENT LINED, DUCTILE IRON PIPE.

Ⓐ 6" D.I.P. VERTICAL EXTENSIONS SHALL BE INSTALLED AS NECESSARY TO MAINTAIN PROPER HYDRANT HEIGHT.

Ⓑ DRAIN PLUGS MUST BE REMOVED UNLESS OTHERWISE DIRECTED BY THE CITY.

TYPICAL HYDRANT AND VALVE DETAIL

N.T.S.

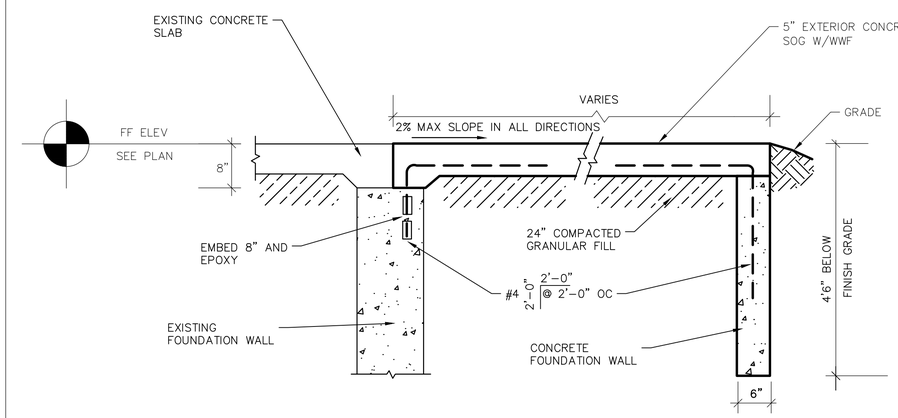


NOTES:

1. CONCRETE SHALL BE MDOT CLASS P1 OR P2.
2. MINIMUM SIDEWALK THICKNESS IN NON-TRAFFIC AREAS SHALL BE 4". FOR SIDEWALKS CROSSING DRIVES OR OTHER AREAS SUBJECT TO VEHICULAR TRAFFIC USE 6" THICKNESS.
3. CONTRACTION JOINTS SHALL BE CONSTRUCTED AT A SPACING OF 5'. *f* EXPANSION JOINT SHALL BE CONSTRUCTED AT A MAXIMUM SPACING OF 50'.
4. SUB-BASE COURSE SHALL BE MECHANICALLY COMPACTED.
5. ALL SIDEWALKS SHALL BE PROMPTLY BACKFILLED AND PROTECTED FROM DAMAGE
.
6. *USE 6" THICKNESS AS NOTED WHEN SIDEWALK IS WITHIN VEHICLE DRIVE PATHS.

CONCRETE SIDEWALK DETAIL

N.T.S.



FROST SLAB DETAIL

N.T.S.

UPDATED: 10/23/2020 - BDR/WBS

CLIENT **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

TITLE: **BAY MILLS ELDERS HOUSING DEVELOPMENT**

DETAILS

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	
DT200153.DWG	

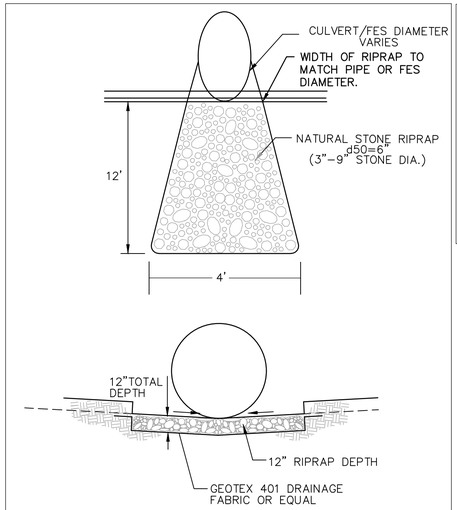
NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

WBK ENGINEERING, LLC
68 EAST MICHIGAN AVENUE
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182

WBK engineering

PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **DT4**
SHEET:

20 OF 23



RIP-RAP SECTION

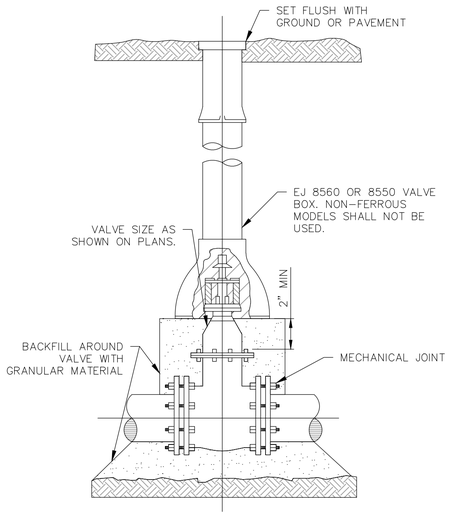
TAKEN FROM MDOT 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION TABLE 902-3

MATERIAL	SIEVE ANALYSIS TOTAL % PASSING									
	6 in	3 in	2 in	1 in	½ in	⅜ in	No.4	No.30	No.100	P-200
CLASS II	–	100	–	60-100	–	–	50-100	–	0-30	0-7
CLASS III	100	95-100	–	–	–	–	50-100	–	–	0-15
CLASS IIIA	–	–	–	–	–	100	50-100	–	0-30	0-15

BACKFILL MATERIAL DEFINATION

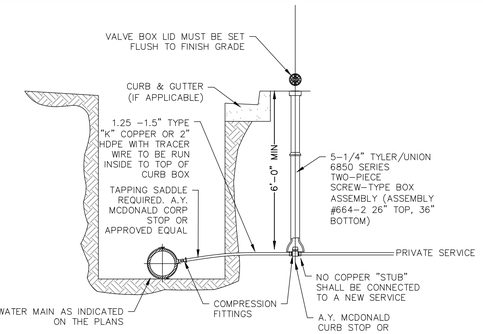
PIPE I.D. (INCHES)	"W" MIN. TRENCH WIDTH (FEET)	PIPE I.D. (INCHES)	"W" MIN. TRENCH WIDTH (FEET)
<18"	3.0'	60"	10.0'
24"	4.0'	66"	10.5'
30"	5.0'	72"	11.0'
36"	6.0'	78"	11.5'
42"	7.0'	84"	12.0'
48"	8.0'	90"	12.5'
54"	9.5'	96"	13.0

MINIMUM TRENCH WIDTH TABLE



TYPICAL VALVE BOX DETAIL

N.T.S.



TYPICAL WATER SERVICE

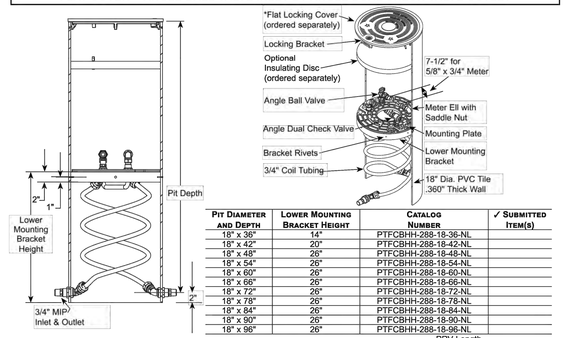
N.T.S.

SUBMITTAL INFORMATION

Tandem Coil Pitsetter - *(PTFCBHH-288-18-xx-NL style)*

3/4" MALE IRON PIPE THREAD INLET AND OUTLET - FOR 5/8" x 3/4" METER

FLAT COVER* - ANGLE BALL VALVE INLET BY ANGLE DUAL CHECK VALVE OUTLET



PIT DIAMETER AND DEPTH	LOWER MOUNTING BRACKET HEIGHT	CATALOG NUMBER	✓ SUBMITTED ITEM(S)
18" x 36"	14"	PTFCBHH-288-18-36-NL	
18" x 42"	20"	PTFCBHH-288-18-42-NL	
18" x 48"	26"	PTFCBHH-288-18-48-NL	
18" x 54"	26"	PTFCBHH-288-18-54-NL	
18" x 60"	26"	PTFCBHH-288-18-60-NL	
18" x 66"	26"	PTFCBHH-288-18-66-NL	
18" x 72"	26"	PTFCBHH-288-18-72-NL	
18" x 78"	26"	PTFCBHH-288-18-78-NL	
18" x 84"	26"	PTFCBHH-288-18-84-NL	
18" x 90"	26"	PTFCBHH-288-18-90-NL	
18" x 96"	26"	PTFCBHH-288-18-96-NL	
		PRV Length	

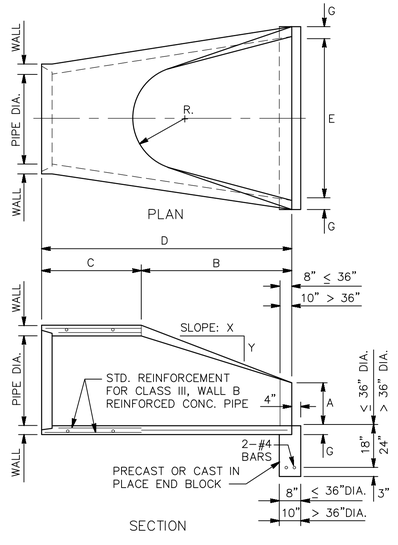
FEATURES

- All brass that comes in contact with potable water conforms to AWWA Standard C800 (ASTM B584, UNS C89833)
- The product has the letters "NL" cast into the main body for lead-free identification
- Brass components that do not come in contact with potable water conform to AWWA Standard C800 (ASTM B62 and ASTM B584, UNS C83600, 85-5-5-5)
- ASSE 1024 approved dual check valve
- Body is made from 18" PVC tile and is lightweight for easy installation
- 3/4" coil tubing allows meter to be raised for meter access and lowered below the frost line to prevent meter and service line freeze-ups in colder climates
- Inlet and outlet valves are secured to a slotted, adjustable mounting plate
- This tandem setting is designed with 7-1/2" spacing for the meter setting and a PRV range of 4-1/2"-5-3/4" to hold a water meter in series with a pressure regulator. Two regulator adapters (2-1/16" in length) shall be furnished on a 5/8" x 3/4" Tandem Coil Pitsetter to hold a pressure regulator. **Ford recommends to specify the PRV length when ordering to ensure proper spacing.**
- Upper and lower mounting brackets secure the position of the mounting plate
- Male iron pipe service line connections are clearly identified for quick and easy installation
- Coil Pits ship with a plastic idler to maintain meter spacing and alignment during transportation and installation
- *Flat cast iron locking cover, per ASTM A48, Class 25 (Part number: PPSC-18-L, ordered separately)
- Optional: Closed-cell polyethylene foam disc provides additional freezing protection (Part number: CCID-18, CCID-18-2, CCID-18-4, or CCID-18-6 ordered separately)

The Ford Meter Box Company considers the information in this submittal form to be correct at the time of publication. Item and option availability, including specifications, are subject to change without notice. Please verify that your product information is current.

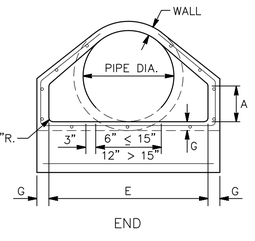
The Ford Meter Box Company, Inc.
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
www.fordmeterbox.com
01/05/17

Submitted By:



PIPE DIA.	WT. (lbs.)	WALL	A	B	C	D	E	G	R	SLOPE
12"	530	2"	4"	2'-0"	4'-09"	6'-09"	2'-0"	2"	9"	3:1
15"	740	2?"	6"	2'-3"	3'-10"	6'-1"	2'-6"	2?"	11"	3:1
18"	990	2?"	9"	2'-3"	3'-10"	6'-1"	3'-0"	2?"	12"	3:1
21"	1280	2?"	9"	2'-11"	3'-2"	6'-1"	3'-6"	2?"	13"	3:1
24"	1520	3"	9?"	3'-7?"	2'-6"	6'-1?"	4'-0"	3"	14"	3:1
27"	1930	3?"	10?"	4'-0"	2'-1?"	6'-1?"	4'-6"	3?"	14?"	3:1
30"	2190	3?"	1'-0"	4'-6"	1'-7?"	6'-1?"	5'-0"	3?"	15"	3:1
33"	3200	3?"	1'-1?"	4'-10?"	3'-3?"	8'-1?"	5'-6"	3?"	17?"	3:1
36"	4100	4"	1'-3"	5'-3"	2'-10?"	8'-1?"	6'-0"	4"	20"	3:1
42"	5380	4?"	1'-3"	5'-3"	2'-11"	8'-2"	6'-6"	4?"	22"	3:1
48"	6550	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	5"	22"	3:1
54"	8240	5?"	2'-3"	5'-5"	2'-11"	8'-4"	7'-6"	5?"	24"	4:1
60"	8730	6"	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"	*	2:1
66"	10710	6?"	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5?"	*	2:1
72"	12520	7"	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"	*	1.86:1
78"	14770	7?"	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6?"	*	1.82:1
84"	18160	8"	3'-0"	7'-6?"	1'-9"	9'-3?"	10'-0"	6?"	*	1.5:1

* RADIUS AS FURNISHED BY MANFACTURER

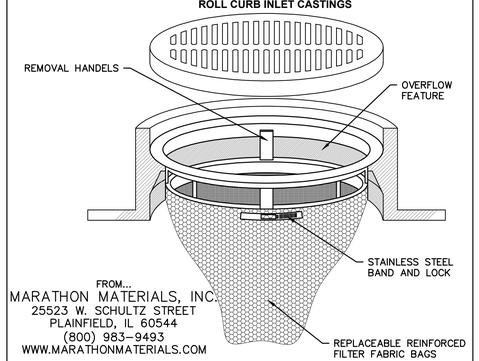


PRECAST REINFORCED CONCRETE FLARED END SECTION

N.T.S.

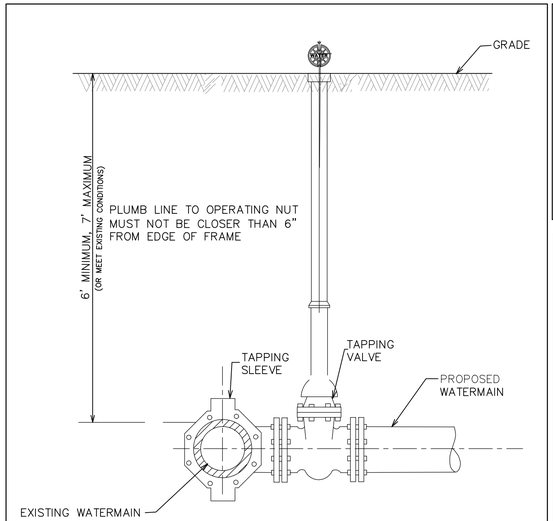
CATCH-ALL

INLET PROTECTOR
FOR ROUND, RECTANGULAR, BEEHIVE, OR ROLL CURB INLET CASTINGS



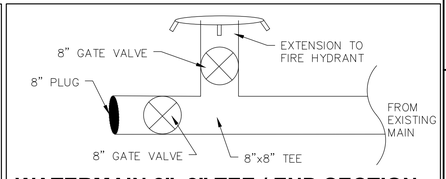
FROM:
MARATHON MATERIALS, INC.
25523 W. SCHULTZ STREET
PLAINFIELD, IL 60544
(800) 983-9493
WWW.MARATHONMATERIALS.COM

INSTALLED COMPLETELY BELOW GRADE



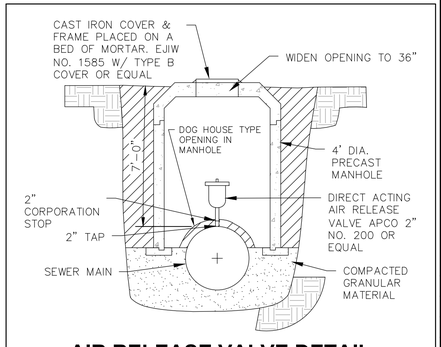
TYPICAL PRESSURE CONNECTION TAPPING SLEEVE AND VALVE

N.T.S.



WATERMAIN 8"x8" TEE / END SECTION

N.T.S.



AIR RELEASE VALVE DETAIL

CLIENT: **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

TITLE: **BAY MILLS ELDERS HOUSING DEVELOPMENT**

DETAILS

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	
DT200153.DWG	

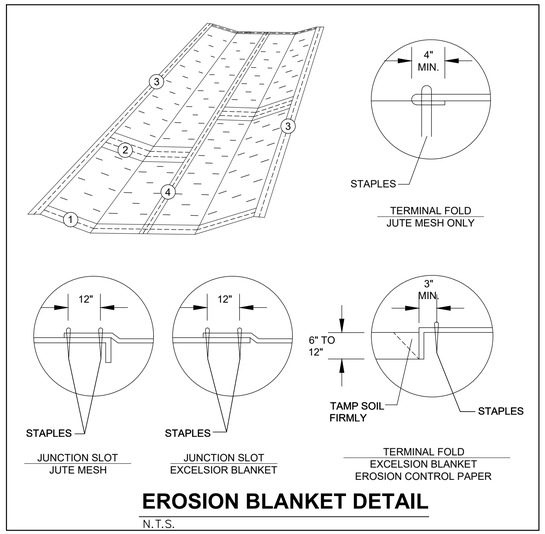
NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

WBK ENGINEERING, LLC
68 EAST MICHIGAN AVENUE
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182

WBK engineering

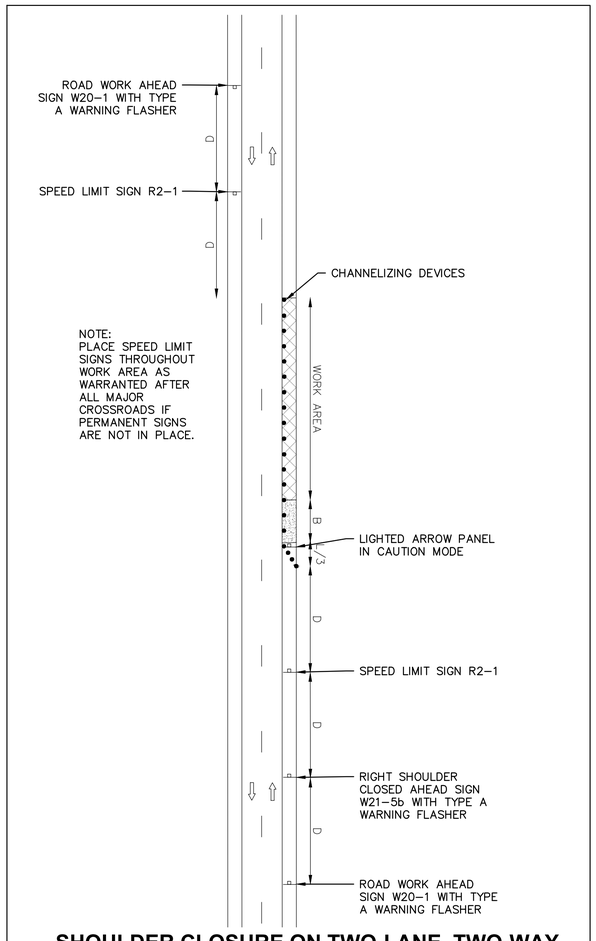
PROJECT NO. 200153
DATE: 09/14/2020
DRAWING NO. **DT3**
SHEET:
21 OF 23

UPDATED: 10/23/2020 - BIDS/WEB



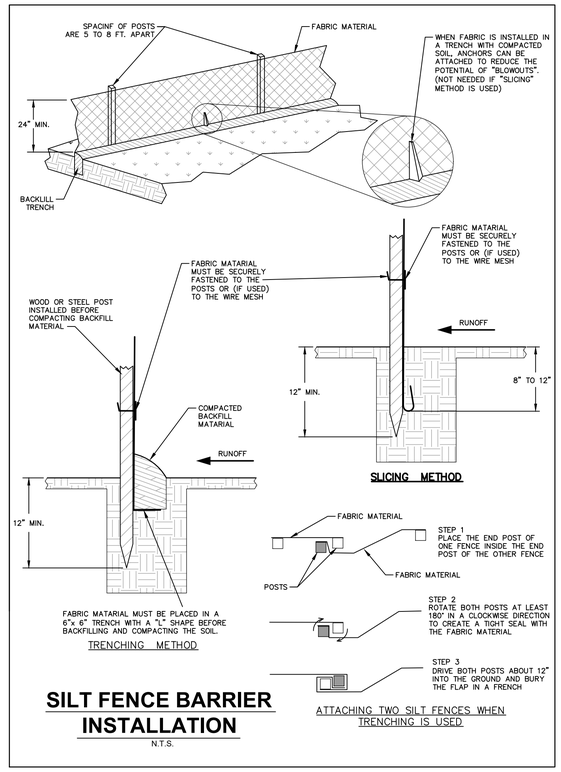
EROSION BLANKET DETAIL

N.T.S.



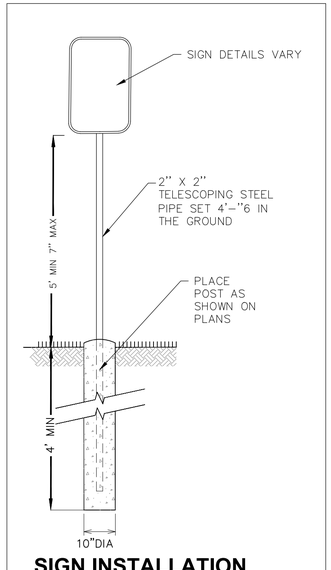
SHOULDER CLOSURE ON TWO-LANE, TWO-WAY ROADWAY WITH NO SPEED REDUCTION

N.T.S.



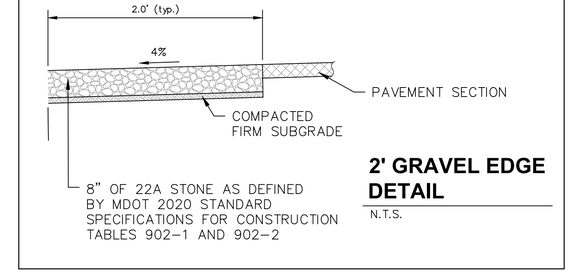
SILT FENCE BARRIER INSTALLATION

N.T.S.



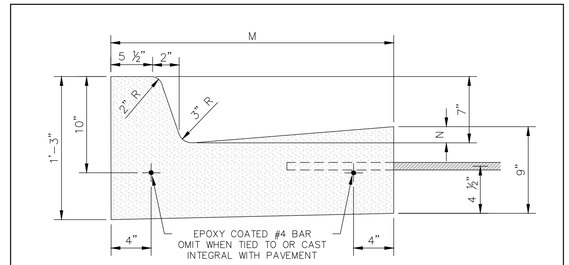
SIGN INSTALLATION

N.T.S.



2' GRAVEL EDGE DETAIL

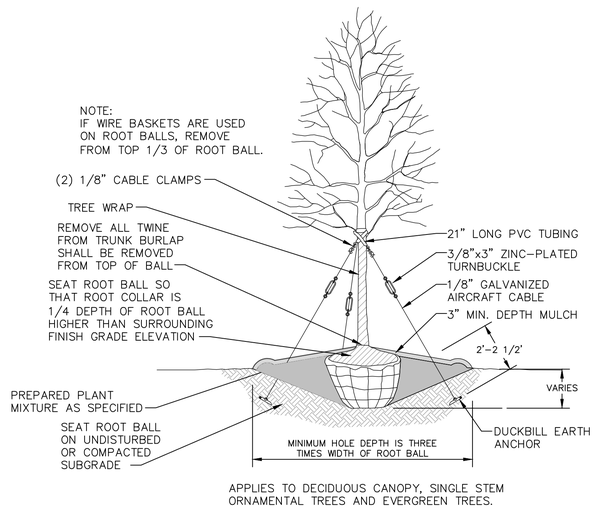
N.T.S.



DETAIL	DIMENSIONS		LANE TIES	CONCRETE CYD / LFT
	M	N		
C1	1' -6"	7/8 "	AS SHOWN	0.0506
C2	1' -6"	7/8 "	OMITTED	0.0506
C3	2' -0"	1 3/8 "	AS SHOWN	0.0632
C4	2' -0"	1 3/8"	OMITTED	0.0632
C5	2' -6"	1 7/8"	AS SHOWN	0.0757
C6	2' -6"	1 7/8"	OMITTED	0.0757

CONCRETE CURB DETAIL

N.T.S.



TREE PLANTING DETAIL

N.T.S.

UPDATED: 10/25/2020 - BDEVRIES

CLIENT : **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

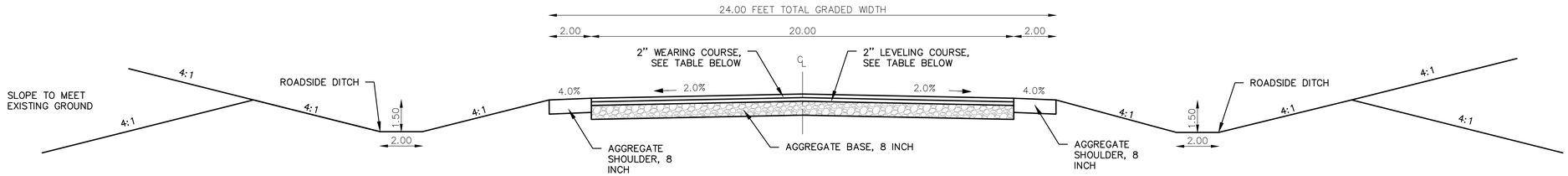
DETAILS

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: AS NOTED	DT200153.DWG

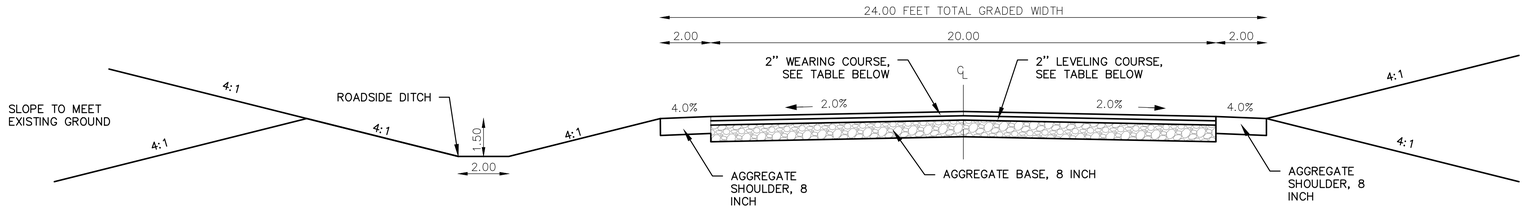
NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

WBK ENGINEERING, LLC
68 EAST MICHIGAN AVENUE
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182

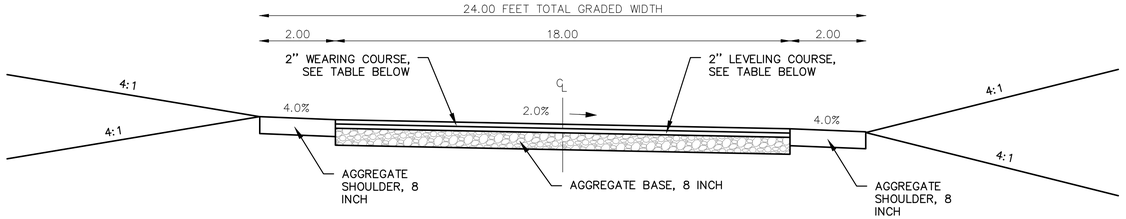
PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **DT5**
SHEET:
22 OF 23



PROPOSED SLOPE N/S ROAD WITH DITCH ON BOTH SIDES
SECTION APPLIES TO: STA 01+00 TO 03+75



PROPOSED SLOPE N/S ROAD WITH DITCH ON ONE SIDE
SECTION APPLIES TO: STA 03+75 TO 06+25



PROPOSED SLOPE NORTH BRANCH
SECTION APPLIES TO: STA 00+45 TO 01+25
STA 01+85 TO 02+30

ITEM	RATE LBS PER SYD	PERFORMANCE GRADE	REMARKS
HMA APPROACH (LVSP)	220	58-34	WEARING COURSE AWI=260
HMA APPROACH (LVSP)	220	58-28	LEVELING COURSE

** FOR INFORMATION ONLY

GENERAL NOTES:

FOR ALL SLOPE RESTORATION AREAS, SEED MIX SHALL BE 'THM' AS DEFINED IN SECTION 816 AND 917

APPLY TACK COAT TO ALL EXPOSED EDGES TO BE PAVED AGAINST.

TITLE : **BAY MILLS ELDERS HOUSING DEVELOPMENT**

DETAILS

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE: NOT TO SCALE	DT200153.DWG

NO.	DATE	NATURE OF REVISION
1	10/23	95% CD

CLIENT : **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

WBK ENGINEERING, LLC
68 EAST MICHIGAN AVENUE
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182

WBK engineering

PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **DT6**
SHEET:
23 OF 23

GENERAL NOTES - FLOOR PLAN

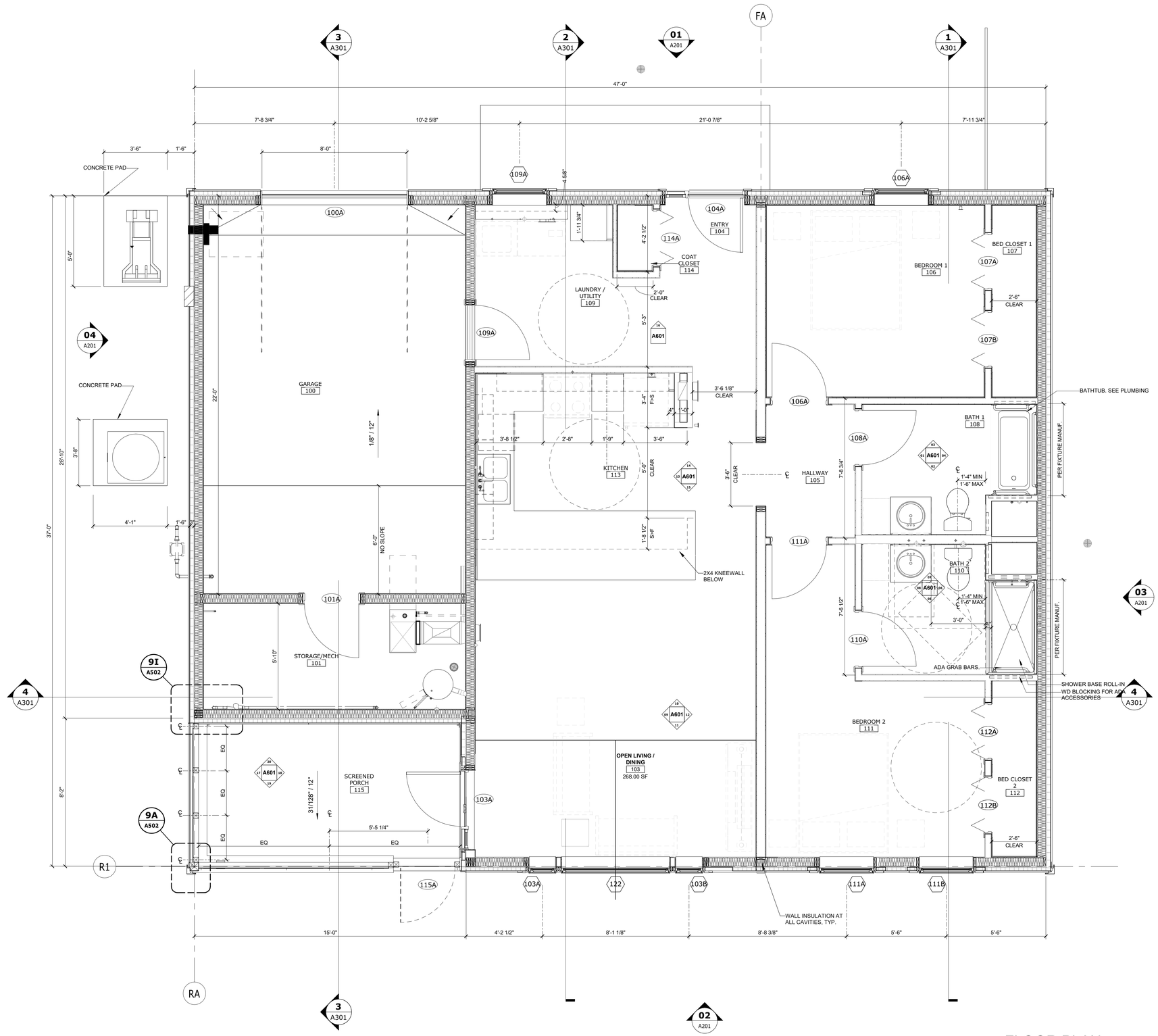
1. THE INFORMATION & DIMENSIONS SHOWN ON THIS PLAN ARE ALSO TO BE USED IN THE OPPOSITE AND/OR MIRRORED VERSIONS DEPENDING ON SITE PLAN ORIENTATION AS SHOWN ON CIVIL SHEETS.
2. OUTSIDE OF DOOR JAMB ROUGH OPENINGS TO BE 3" FROM WALL INTERSECTION UNLESS OTHERWISE INDICATED.
3. PROVIDE BLOCKING FOR KITCHEN, BATHROOM AND FUTURE ADA ACCESSORIES AS NEEDED.
4. DIMENSIONS ARE TO FACE OF STUD LAYER UNLESS OTHERWISE INDICATED.
5. FINISH FLOOR 0'-0" = SEA LEVEL DATUM PROVIDED PER CIVIL/SITE DRAWINGS. FINISH FLOOR ELEVATIONS SHOULD BE COORDINATED WITH CIVIL.
6. WHERE PLUMBING SUPPLY LINES EXIST IN EXTERIOR WALLS REPLACE BLOWN IN INSULATION WITHIN STUD CAVITY WITH RIGID FOAM FOR ADDITIONAL FREEZE PROTECTION SEE: PLUMBING FOR LOCATIONS
7. SLOPES ON ALL WALKING SURFACES SHALL NOT EXCEED ADA MAXIMUMS. SLOPE TO DRAIN AWAY FROM BUILDING TYP
8. GENERAL CONTRACTOR SHALL DOUBLE CHECK ADA REQUIREMENTS AND COORDINATE A MEETING WITH THE ARCHITECT/ENGINEER TO VERIFY SLOPES AND CROSS-SLOPES OF WALKING SURFACES AT THE HOUSE PERIMETER PRIOR TO POURING ANY SUCH PERIMETER WALKING SURFACES.

PROVIDED AND INSTALLED

ITEM IS OWNER PROVIDED

ITERATION SHOWN
1/16" = 1'-0" A101 ◀13H

MIRRORED ITERATION
1/16" = 1'-0" A101 ◀13D



FLOOR PLAN
3/8" = 1'-0" A101 ◀01

SEVEN GENERATIONS architectur +

600 E. Michigan Ave., Suite B
Kalamazoo, MI 49007
P: 269.927.0144
www.7GenAE.com

ELDERS HOUSING
BAY MILLS INDIAN COMMUNITY
Red Pine Lane, Bay Mills Township, MI 49715
100% Design Review

95% CONSTRUCTION DOCUMENTS

ISSUE DATE:
10/23/2020

REVISIONS

PRELIMINARY
NOT FOR CONSTRUCTION

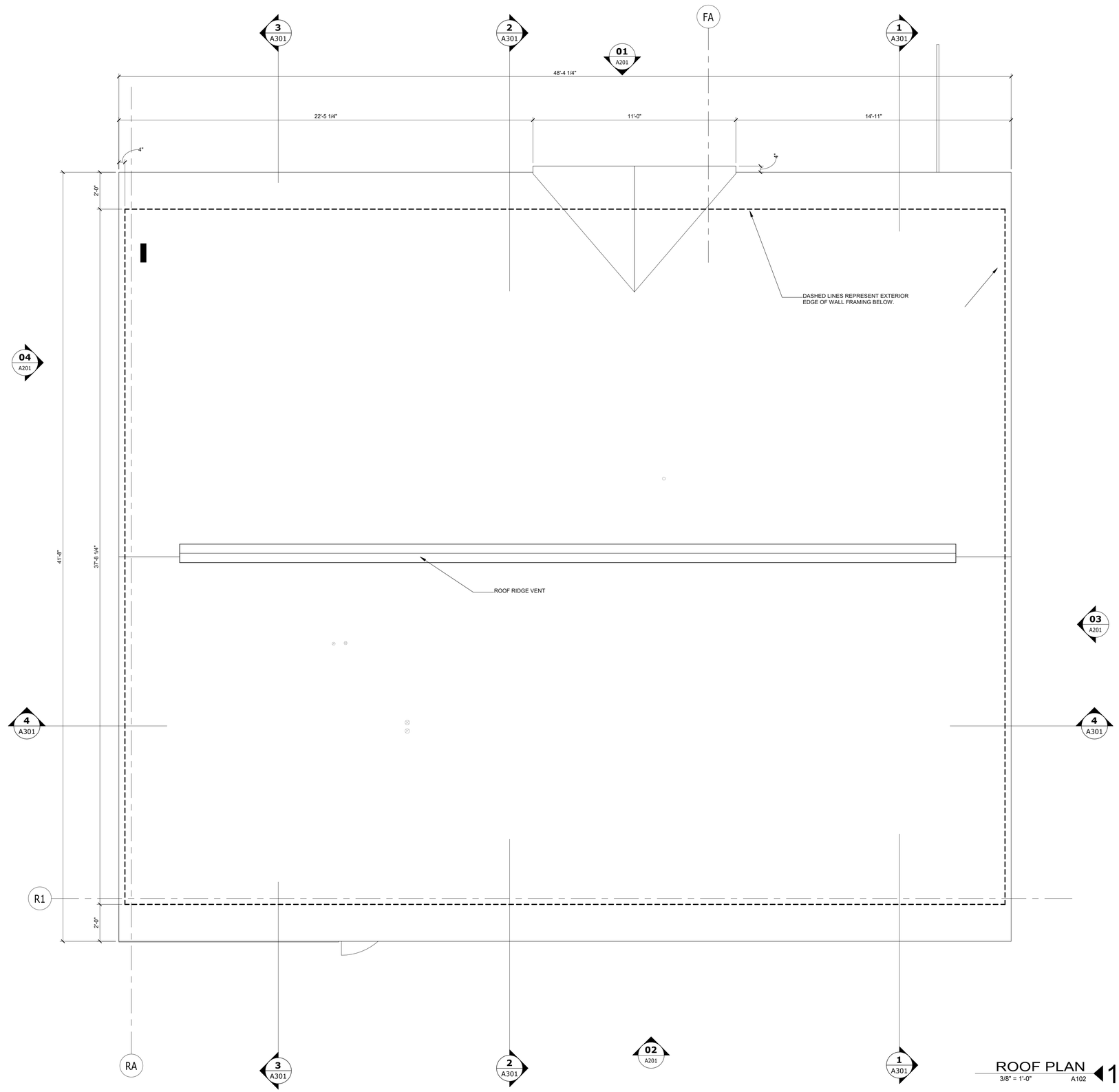
JOB NUMBER:
220046

SHEET TITLE
FLOOR PLAN

SHEET NO.
A101

GENERAL NOTES - ROOF PLAN

1. ALL WORK TO BE NEW UNLESS OTHERWISE INDICATED AS EXISTING.
2. DIMENSIONS ARE TO FACE OF STUD LAYER UNLESS OTHERWISE INDICATED.
3. PROVIDE ROOFING FELT AND ICE & WATER SHIELD PER SPECIFICATIONS.
4. PROVIDE WATERPROOFING MEMBRANE AND FLASHING PER SPECIFICATIONS.
5. FLASH ALL ROOF PENETRATIONS PER MANUF. REC. TYP.



ROOF PLAN 1A
3/8" = 1'-0" A102

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JOB NUMBER:
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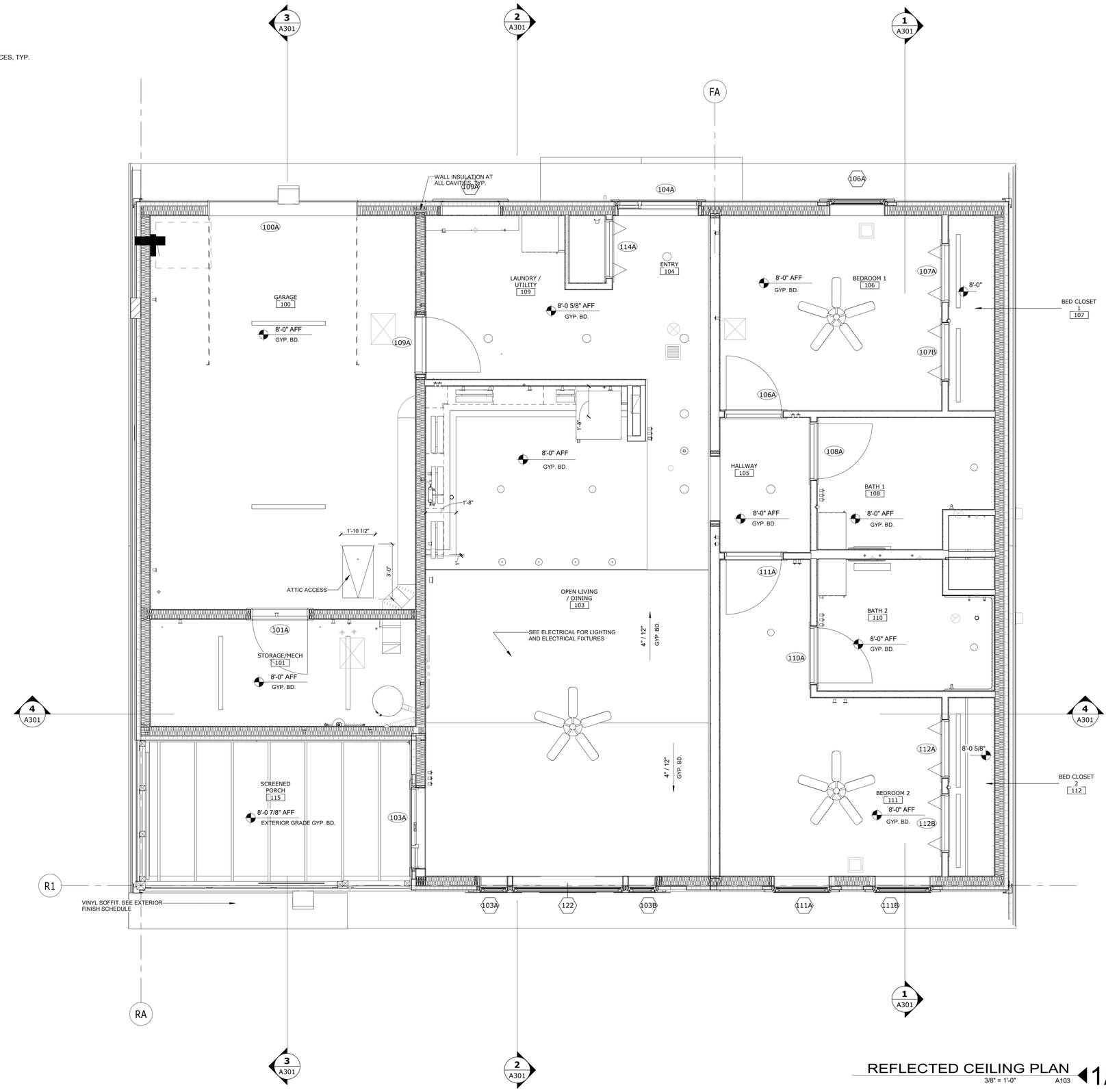
SHEET TITLE
ROOF PLAN

SHEET NO.

A102

GENERAL NOTES - RCP

1. DIMENSIONS ARE TO FACE OF STUD LAYER UNLESS OTHERWISE INDICATED.
2. ALL LIGHT FIXTURES, DIFFUSERS, GRILLES, ETC. SHALL BE CENTERED AND BALANCED WITHIN SPACES, TYP.



REFLECTED CEILING PLAN 1A
3/8" = 1'-0" A103

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SHEET TITLE
RCP

SHEET NO.

A103

GENERAL NOTES - FOUNDATIONS

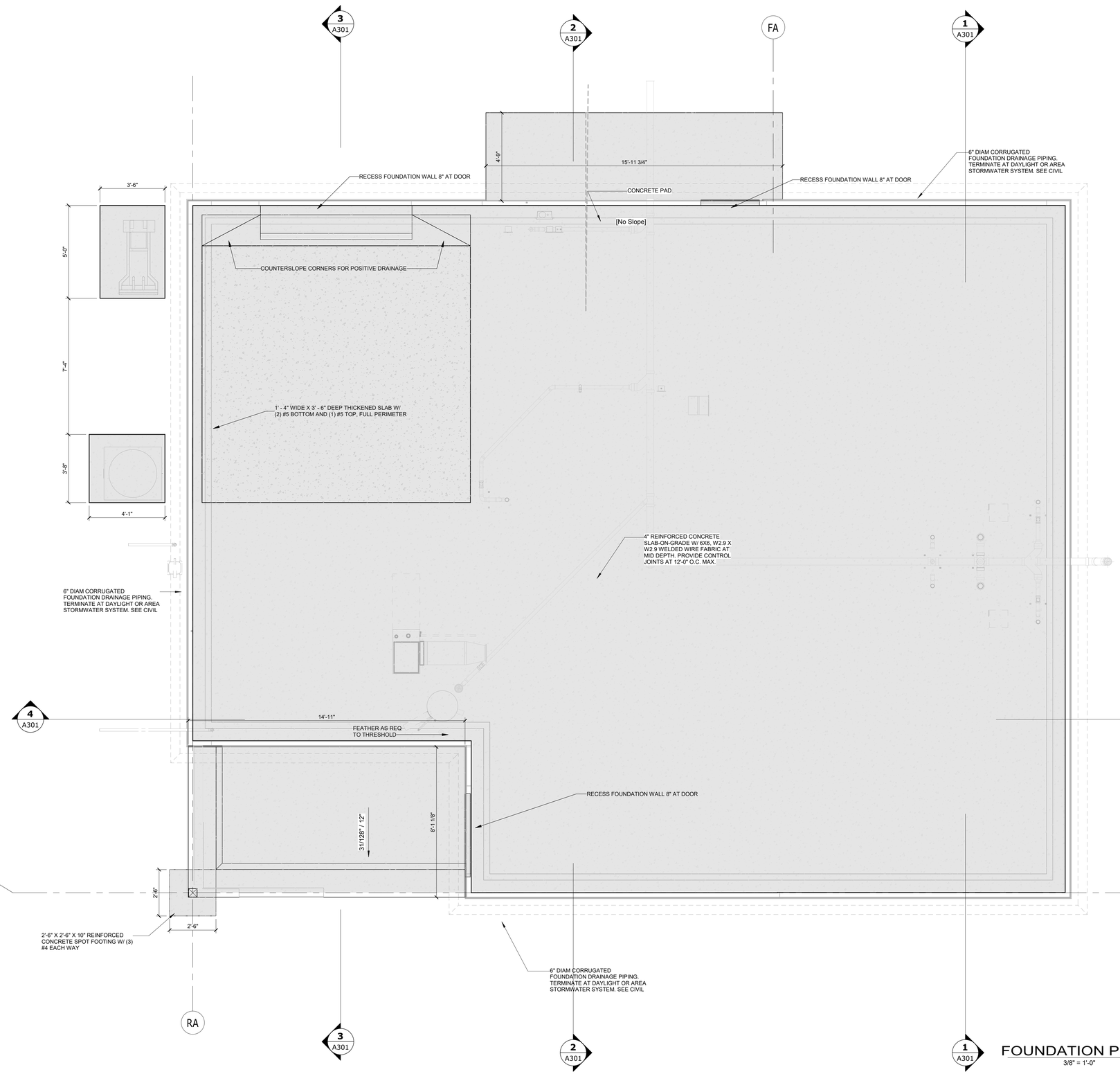
1. FOUNDATION DESIGNS, SUBGRADE PREPARATION NOTES, AND STRUCTURAL EARTH MOVING SPECIFICATION ARE BASED ON THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT #2020144001.02, BY: GOSLING CZUBAK ENGINEERING SCIENCES, INC. DATED: JUNE 11, 2020.
2. FOOTING DESIGNS ARE BASED ON A NET ALLOWABLE SOIL BEARING PRESSURE OF 2000 PSF. FOOTINGS SHALL BEAR IN FIRM TO STIFF RESIDUAL CLAY SOILS OR PROPERLY COMPACTED AND APPROVED LOWER PLASTICITY STRUCTURAL FILL AS NOTED IN THE GEOTECHNICAL REPORT.
3. CONTRACTOR AND TESTING LABORATORY REPRESENTATIVE SHALL READ THE GEOTECHNICAL REPORT AND BECOME THOROUGHLY FAMILIAR WITH SITE AND SUBGRADE INFORMATION GIVEN THEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT QUANTITIES OF CUT AND FILL FOR ESTIMATING AND CONSTRUCTION.
4. A QUALIFIED AND REGISTERED GEOTECHNICAL ENGINEER, LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED AND WORKING FOR THE TESTING LABORATORY, SHALL DETERMINE CONFORMANCE OF THE FOUNDATION BEARING STRATA WITH THE FOUNDATION DESIGN CRITERIA ABOVE, AND ALL OTHER CONTRACT DOCUMENTS. TESTING LABORATORY SHALL NOTIFY CONTRACTOR, ARCHITECT AND ENGINEER-OF-RECORD OF ANY CONDITIONS NOT IN ACCORDANCE WITH FOUNDATION DESIGN CRITERIA OR CONTRACT DOCUMENTS.
5. USE ONLY STRUCTURAL FILL MATERIAL AS NOTED IN THE STRUCTURAL EARTH MOVING SPECIFICATION FOR FILL BELOW BUILDING AND FIVE FEET BEYOND THE EDGES OF THE BUILDING.
6. EXTERIOR FOOTINGS SHALL BEAR AT OR BELOW MINIMUM BEARING DEPTH. MINIMUM BEARING DEPTH IS 42 INCHES BELOW ADJACENT FINISHED GRADE. THICKENED SLAB EDGE FOR STOOPS, CANOPIES, ETC. SHALL EXTEND 42 INCHES BELOW GRADE UNLESS NOTED OTHERWISE IN CONTRACT DOCUMENTS.
7. FOOTINGS SHALL BE POURED AGAINST UNDISTURBED SOIL, UNLESS NOTED OTHERWISE IN CONTRACT DOCUMENTS.
8. AVOID DAMAGE TO UNDERGROUND UTILITIES INCLUDING, BUT NOT LIMITED TO, WATER MAINS, SANITARY SEWERS AND BURIED CABLES WHICH MIGHT EXTEND ACROSS OR ADJOIN SITE.

GENERAL NOTES - FOUNDATION PLAN

1. REFERENCE ARCHITECTURAL PLANS FOR DIMENSIONS NOT SHOWN. COORDINATE SLAB ELEVATIONS AND SLOPES WITH ARCHITECTURAL PLANS.
2. REFERENCE MECHANICAL AND ARCHITECTURAL DRAWINGS FOR SIZE AND LOCATION OF SLAB PENETRATIONS.
3. VERIFY LOCATIONS OF ALL CAST-IN-PLACE ANCHORS WITH MECHANICAL AND ARCHITECTURAL DRAWINGS.
4. THICKEN SLAB AT FLOOR BOXES AND CONDUIT TO MAINTAIN A MINIMUM 4" SLAB THICKNESS.

GENERAL NOTES - CONCRETE

1. MINIMUM COMPRESSIVE STRENGTH (fc) AT THE END OF 28 DAYS SHALL BE AS FOLLOWS:
   A. FOOTINGS - 3,000 PSI
   B. SLABS-ON-GRADE - 4,000 PSI
   C. SIDEWALKS - 3,500 PSI
2. WATER/CEMENT RATIO
   A. FOOTINGS: 0.52 MAX
   B. SLAB-ON-GRADE: 0.44
   C. SIDEWALKS: 0.44
3. EXTERIOR CONCRETE AND CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL BE AIR-ENTRAINED. REFER TO CAST-IN-PLACE CONCRETE SPECIFICATION FOR AIR CONTENT OF 6% +/-1.5%.
4. MATERIALS OR ADMIXTURES SHALL NOT CONTAIN ANY CALCIUM CHLORIDE.
5. REINFORCING STEEL SHALL MEET THE FOLLOWING:
   A. DEFORMED BARS - ASTM A615, GRADE 60
   B. WELDABLE DEFORMED BARS - ASTM A706, GRADE 60
   C. WELDED WIRE FABRIC - ASTM A185
6. WHERE DOWELS ARE INDICATED BUT NOT SIZED, PROVIDE DOWELS THAT MATCH SIZE AND LOCATION OF MAIN REINFORCING STEEL AND LAP SPLICE WITH THE MAIN REINFORCING STEEL. REINFORCING BARS SHALL BE SPLICED AS NOTED IN THE REINFORCING LAP SCHEDULE.
7. REFER TO ACI 318 LATEST EDITION FOR CONCRETE COVER, ACI 315 LATEST EDITION FOR DETAILING PRACTICES AND FABRICATION, AND ACI 301 LATEST EDITION FOR STANDARD PRACTICE FOR MIXING AND PLACING CONCRETE.
8. "C.J." INDICATES SAW CUT CONTRACTION JOINT OR DOWELED CONSTRUCTION JOINT IN SLAB-ON-GRADE. REFERENCE CAST-IN-PLACE CONCRETE SPECIFICATION FOR ACCEPTED SAW CUT METHODS. SLAB POURS SHALL BE SEPARATED BY A DOWELED CONSTRUCTION JOINT. CONTRACTION/CONSTRUCTION JOINTS SHALL BE LOCATED AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER-OF-RECORD.
9. PROVIDE CORNER BARS THAT MATCH AND LAP CONTINUOUS REINFORCEMENT SIZE AND QUANTITY AT INTERSECTIONS AND CORNERS OF WALLS AND FOUNDATIONS.
10. PROVIDE #3 Z-BAR SPACERS AT 24 INCHES ON CENTER EACH WAY FOR CONCRETE WALLS HAVING REINFORCING STEEL IN BOTH FACES.
11. ANCHORS INSTALLED IN HARDENED CONCRETE SHALL ONLY BE USED WHERE SPECIFIED ON THE CONTRACT DRAWING. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER-OF-RECORD PRIOR TO INSTALLING POST-INSTALLED ANCHORS IN PLACE OF MISSING OR MISPLACED CAST-IN-PLACE ANCHORS. CARE SHALL BE TAKEN IN PLACING POST-INSTALLED ANCHORS TO AVOID CONFLICTS WITH EXISTING REINFORCING. HOLES SHALL BE DRILLED, DRY AND CLEANED AND ANCHORS INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED WRITTEN INSTRUCTIONS AND APPLICABLE ESR REPORT. REFERENCE DETAILS FOR ANCHOR SIZE AND EMBEDMENT. SUBSTITUTION REQUESTS FOR PRODUCTS OTHER THAN THOSE SPECIFIED ON THE CONTRACT DRAWINGS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER-OF-RECORD ALONG WITH CALCULATIONS THAT ARE SIGNED AND SEALED BY THE PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION AND LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED.



FOUNDATION PLAN 3/8" = 1'-0" A104 01

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JOB NUMBER: 220046

SHEET TITLE: FOUNDATION PLAN

SHEET NO.: A104

GENERAL NOTES - STRUCTURAL

FRAMING

1. FRAME WALLS WITH SINGLE 2X6 STUDS @ 24" O.C. UNLESS OTHERWISE INDICATED ON FRAMING PLANS OR ELVATIONS.
2. ONE (1) KING STUD AND ONE (1) JACK STUD PER TYPICAL FRAMED OPENING
3. INSTALL ALL RAFTERS, HEADERS AND BEAMS "CROWN UP".
4. MOISTURE CONTENT OF ALL WOOD MEMBERS SHALL NOT EXCEED 19%.
5. ALL JOISTS SHALL HAVE DIAGONAL BRIDGING OR FULL DEPTH BLOCKING AT 8'-0" ON CENTER MAXIMUM ALONG THE SPAN AND AT SUPPORTING BEAMS OR WALLS. COORDINATE WITH ROOF PENETRATIONS
6. CUTTING, BORING OR NOTCHING OF FRAMING MEMBERS, IF REQUIRED, SHALL CONFORM TO THE LIMITATIONS PRESCRIBED BY THE INTERNATIONAL BUILDING CODE AND MAY BE DISALLOWED FOR SOME FRAMING MEMBERS BY THE ENGINEER-OF-RECORD.
7. FOR NAILED BUILT-UP COLUMNS, NAIL TOGETHER MULTIPLE STUD MEMBERS MADE OF (2) 2X MEMBERS TOGETHER WITH (1) ROW OF 10d x 3 INCH COMMON WIRE NAILS AT 6 INCHES ON CENTER, STAGGER NAILING EACH SIDE OF STUD GROUP. NAIL TOGETHER MULTIPLE STUD MEMBERS OF (3) 2X WITH ONE ROW OF 30d x 4 1/2 INCH COMMON WIRE NAILS AT 8 INCHES ON CENTER, STAGGER NAILING EACH SIDE OF STUD GROUP. SPLICES IN MULTIPLE "BUILT-UP" COLUMNS MEMBERS ARE NOT PERMITTED. FOR BUILT-UP COLUMNS NOT SHEATHED ON TWO SIDES, PROVIDE SOLID BLOCKING AT MID-HEIGHT TO ADJACENT STUDS.
8. FASTEN ALL PLYS OF ALL BUILT UP STUD COLUMNS AND BEAMS IN ACCORDANCE WITH THE REQUIREMENTS OF THE INTERNATIONAL RESIDENTIAL BUILDING CODE AND THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION.
9. ALL LVL HEADERS AND BEAMS TO REMAIN WRAPPED IN MOISTURE PROTECTION COVER UNTIL PERMANENT MOISTURE PROTECTION IS IN PLACE.
10. ALL LUMBER IN CONTACT WITH SLAB ON GRADE OR MASONRY TO BE PRESERVATIVE TREATED SYP NO. 2 OR WHERE SPECIFIED, WESTERN RED CEDAR

02 A106 **TRUSS PROFILE**

TRUSSES

1. TRUSSES SHALL BE DESIGNED BY AN ENGINEER LICENSED IN THE STATE OF MICHIGAN.
2. DESIGN TRUSSES FOR A TOP CHORD SNOW LOAD OF 49PSF, LIVE LOAD OF 20 PSF, DEAD LOAD OF 10PLF, BOTTOM CHORD 7PSF.
3. TRUSS MANUF. TO INCLUDE AN ADDITIONAL 5 PSF TOP CHORD DEAD LOAD ACCOMODATE FUTURE ROOF MOUNTED PHOTOVOLTAIC COLLECTORS.
4. TRUSS MANUF. TO INCLUDE ADDITIONAL ROOF AND FLOOR LOADS PER TRUSS PROFILES AND FRAMING PLANS

05 A106 **TRUSS PROFILE**

SHEATHING

1. ALL EXTERIOR WALL SHEATHING SHALL BE EITHER APA RATED PLYWOOD C-D WITH EXTERIOR GLUE (EXPOSURE 1) OR ORIENTED STRAND BOARD (OSB) WITH EXTERIOR GLUE (EXPOSURE 1), AND SHALL BEAR THE STAMP OF AN APPROVED TESTING AGENCY.
2. ALL ROOF SHEATHING SHALL BE APA RATED EXPOSURE 1 SHEATHING WITH A MINIMUM THICKNESS OF 5/8 INCH, DOC PS-1 OR PS-2, WITH A SPAN RATING OF AT LEAST 32/16 NAILED WITH 8d GALVANIZED COMMON NAILS AT 6" O.C. AT PANEL EDGES AND 12 INCHES ON CENTER AT INTERMEDIATE SUPPORTS. 8d NAILS SHALL HAVE A MINIMUM 0.131 INCH DIAMETER AND 1 3/8 INCH MINIMUM PENETRATION INTO SUPPORTING FRAMING.

CONNECTIONS

1. TRUSSE WALL PLATE - USE SIMPSON H2.5T TIES TYP. OR EQUILIVANT ON TRUSS TO WALL CONNECTIONS
2. WOOD POST TO COLUMN - USE SIMPSON ECCLLQ666SDS OR EQUIVILANT AT COLUMN TO CEDAR BEAM CONNECTIONS TYP.
3. PROVIDE SIMPSON STRONG-TIE CONNECTORS OR EQUIVALENT FOR WOOD FRAMING CONNECTING TO SUPPORTING MEMBERS. USE STRONG-TIE CONNECTORS AND NAILS OF APPROPRIATE SIZE AND CAPACITY FOR THE SUPPORTED MEMBER AND INSTALL ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
4. REFER TO THE STATE ADOPTED BUILDING CODE FOR MINIMUM FASTENING CRITERIA. ALL NAILS TO BE COMMON WIRE SIZE.
5. ALL LUMBER IN CONTACT WITH SLAB ON GRADE TO BE PRESERVATIVE TREATED SYP NO. 2 OR WHERE SPECIFIED, WESTERN RED CEDAR

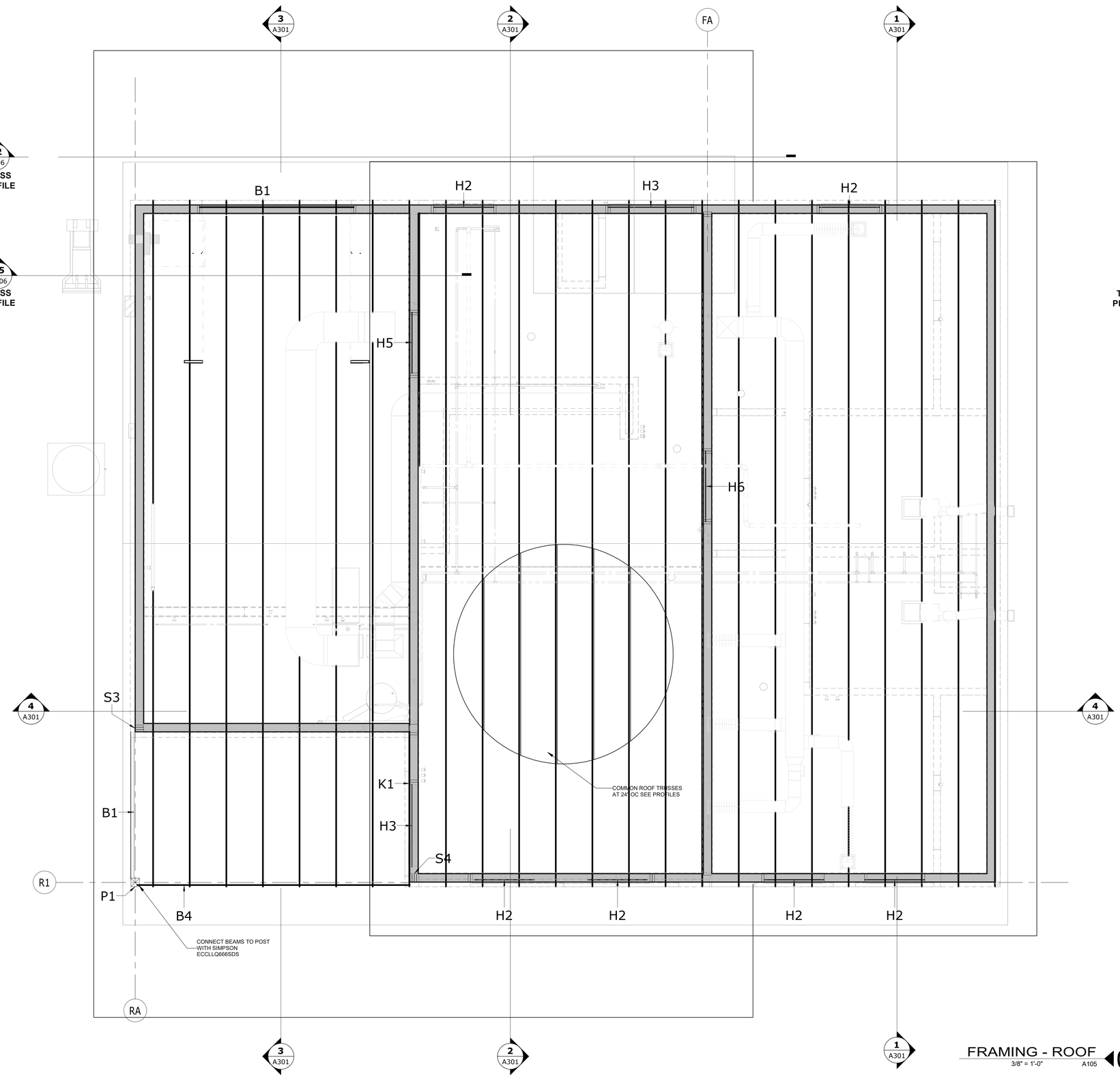
LOAD-BEARING WALLS / BEAMS

FRAMING SCHEDULE

TYPE ID	NAME	SIZE	Comments
	WESTERN RED CEDAR BOARD		
B1	LVL GIRDER	1 3/4 x 11 7/8" (X2)	
B4	LVL GIRDER	1 3/4 x 11 7/8" (X3)	
FJ1	WOOD I-JOIST FLOOR JOIST	TJI 210 - 12" @ 24" OC	
H2	INSULATED HEADER	2" X 8" (X2)	
H3	INSULATED HEADER	2" X 12" (X2)	
H5	BOX HEADER	2" X 8" (X2)	
H6	BOX HEADER	2" X 10" (X2)	
L2	DIMENSIONAL WOOD LEDGER	2" X 12"	
X1	GARAGE TRACK SUPPORTS	VARIES	

COLUMN SCHEDULE

TYPE ID	NAME	SIZE
P1	WESTERN RED CEDAR POST	6" X 6"
S3	STUD COLUMNS	2" X 6" (X3)
S4	STUD COLUMNS	2" X 6" (X4)



TRUSS PROFILE

FRAMING - ROOF 01
3/8" = 1'-0" A105

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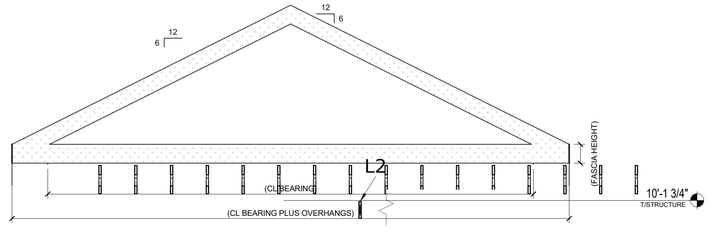
SHEET TITLE
FRAMING PLAN - ROOF

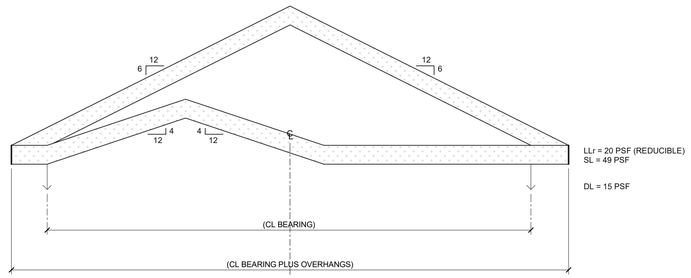
SHEET NO.
A105

GENERAL NOTES - TRUSSES

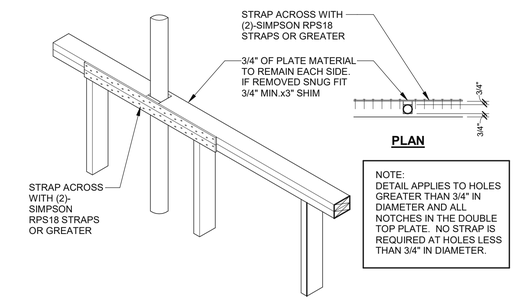
1. DESIGN TRUSSES FOR THE DEAD, LIVE AND SNOW LOADS INDICATED ON THIS SHEET.
2. DESIGN TEMPORARY AND PERMANENT BRACING FOR TRUSSES AS REQUIRED TO MAINTAIN THEM IN POSITION AND PLUMB AND TO PROVIDE EXTERNAL AND INTERNAL STABILITY.
3. DESIGN AND INSTALL INSULATION NAILER BLOCKING PER TRUSS DRAWINGS
4. DO NOT ALTER TRUSSES WITHOUT WRITTEN PERMISSION FROM TRUSS DESIGNER



TRUSS PROFILE T2
1/4" = 1'-0" A106 05



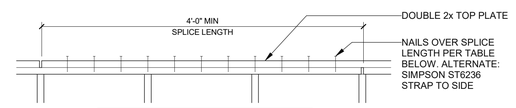
TRUSS PROFILE T1
1/4" = 1'-0" A106 02



PLAN

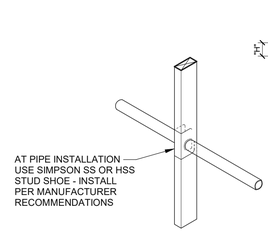
NOTE:
DETAIL APPLIES TO HOLES GREATER THAN 3/4" IN DIAMETER AND ALL NOTCHES IN THE DOUBLE TOP PLATE. NO STRAP IS REQUIRED AT HOLES LESS THAN 3/4" IN DIAMETER.

DETAIL - CONTINUOUS TOP PLATE
3/4" = 1'-0" A106 07



LENGTH OF WALL (BETWEEN CORNERS)	NAILS ALONG SPLICE LENGTH
OVER 30'-0"	(20)-16d
OVER 20'-0"	(12)-16d
OVER 10'-0"	(8)-16d
LESS THAN 10'-0"	(6)-16d

DETAIL - TOP SPLICE
3/4" = 1'-0" A106 04

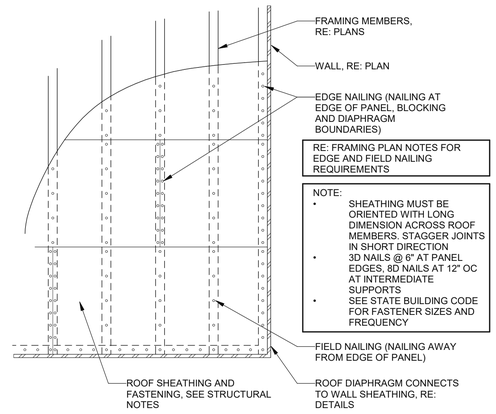


CUT SECTION

SIMPSON STUD SHOE	H	D
		2x6 STUD
SS	2 1/2"	3 1/2"
HSS	3"	4 1/4"

NOTES:
1. CUTTING OF STUDS PERMITTED ONLY WITHIN END 1/4 OF LENGTH. DO NOT CUT STUDS WITHIN MIDDLE 1/2 OF LENGTH.
2. CUT DIMENSIONS SHALL NOT EXCEED MAXIMUM VALUES SHOWN IN TABLE.
3. USE SS1.5 AT SINGLE 2x STUD. USE SS3 AT DOUBLE 2x STUD.
4. USE HSS2 AT SINGLE 2x STUD. USE HSS2-2 AT DOUBLE 2x STUD. USE HSS2-3 AT TRIPLE 2x STUD.

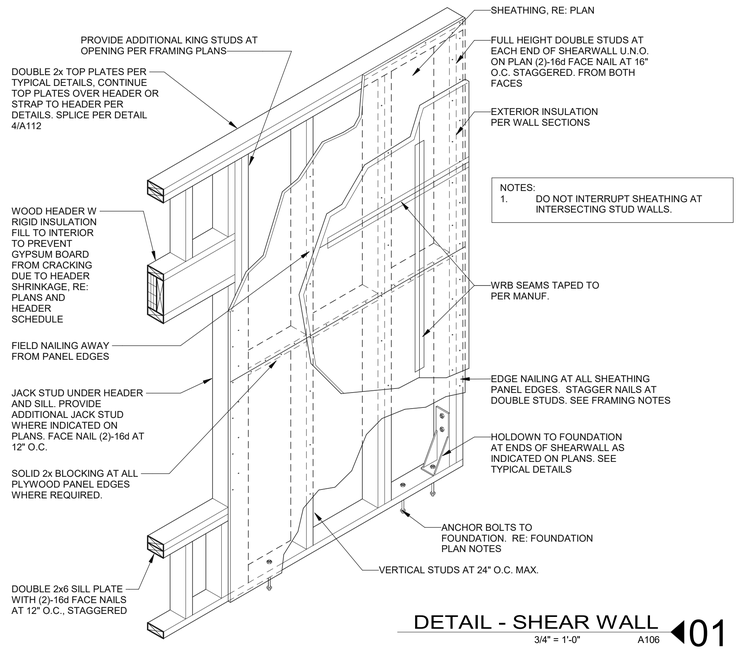
DETAIL - STUD NOTCH
3/4" = 1'-0" A106 06



RE: FRAMING PLAN NOTES FOR EDGE AND FIELD NAILING REQUIREMENTS

NOTE:
- SHEATHING MUST BE ORIENTED WITH LONG DIMENSION ACROSS ROOF MEMBERS. STAGGER JOINTS IN SHORT DIRECTION
- 3D NAILS @ 6" AT PANEL EDGES, 8D NAILS AT 12" OC AT INTERMEDIATE SUPPORTS
- SEE STATE BUILDING CODE FOR FASTENER SIZES AND FREQUENCY

DETAIL - SHEATHING ATTACH
3/4" = 1'-0" A106 03



NOTES:
1. DO NOT INTERRUPT SHEATHING AT INTERSECTING STUD WALLS.

DETAIL - SHEAR WALL
3/4" = 1'-0" A106 01

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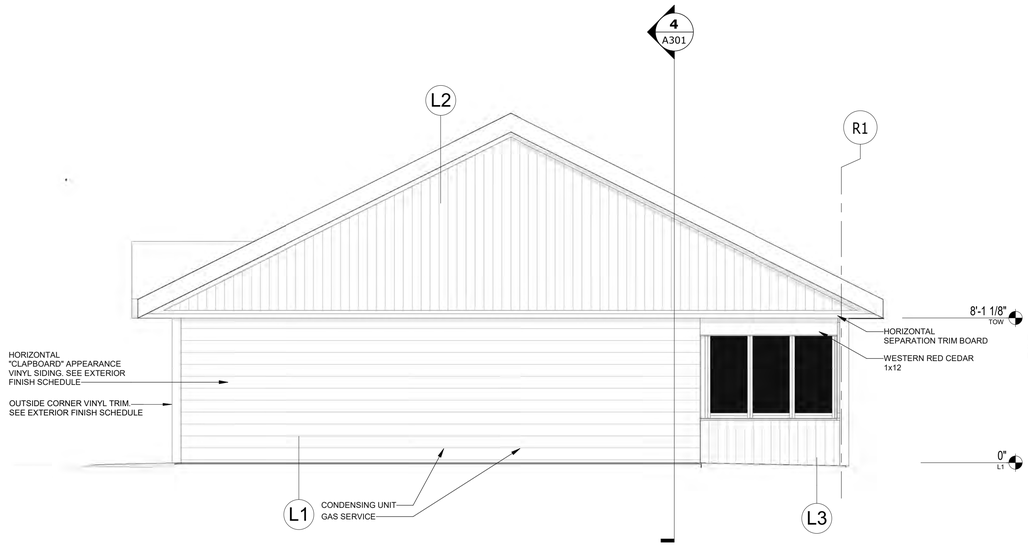
SHEET TITLE
FRAMING DETAILS & TRUSS PROFILES

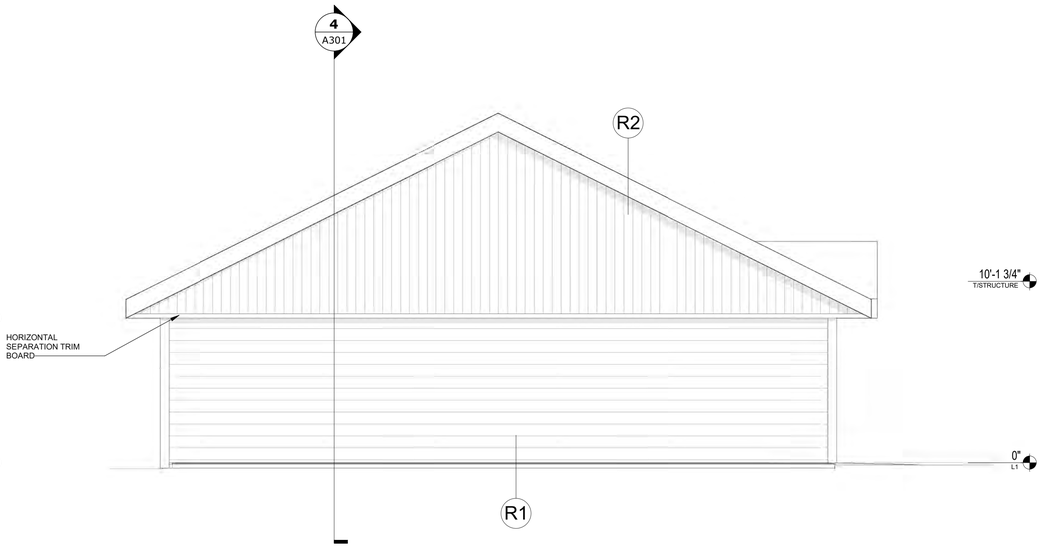
SHEET NO.
A106

CLADDING SCHEDULE

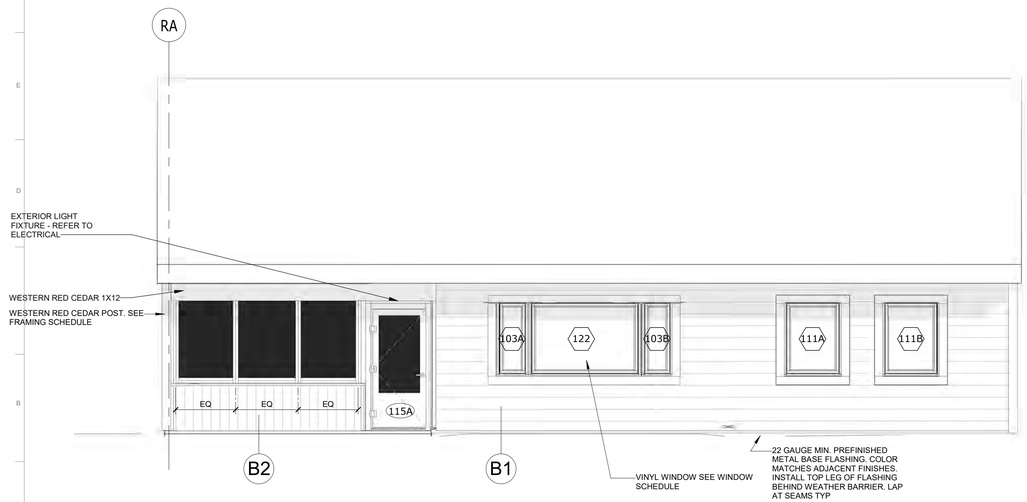
EXTERIOR FINISH ZONE CODE	MATERIAL	STYLE
B1	VINYL SIDING	DOUBLE DUTCH
B2	1x6 T&G WESTERN RED CEDAR	BOARD AND BATTEN
F1	VINYL SIDING	DOUBLE DUTCH
L1	VINYL SIDING	DOUBLE DUTCH
L2	SHAKE VINYL SIDING	BOARD AND BATTEN
L3	1x6 T&G WESTERN RED CEDAR	BOARD AND BATTEN
R1	VINYL SIDING	DOUBLE DUTCH
R2	SHAKE VINYL SIDING	BOARD AND BATTEN



LEFT ELEVATION 1/4" = 1'-0" A201 04



RIGHT ELEVATION 1/4" = 1'-0" A201 03



REAR ELEVATION 1/4" = 1'-0" A201 02

FRONT ELEVATION 1/4" = 1'-0" A201 01

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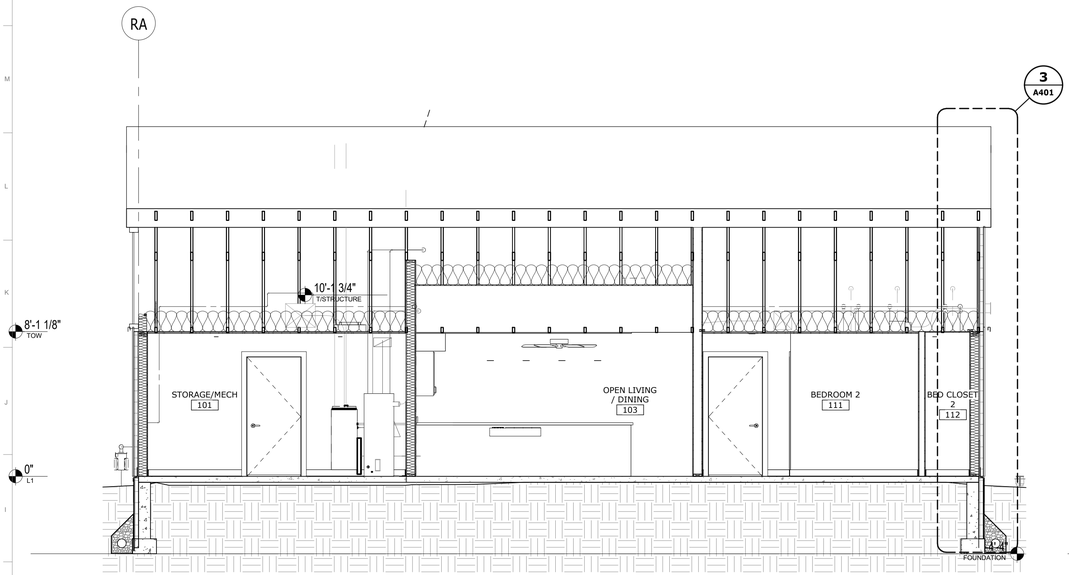
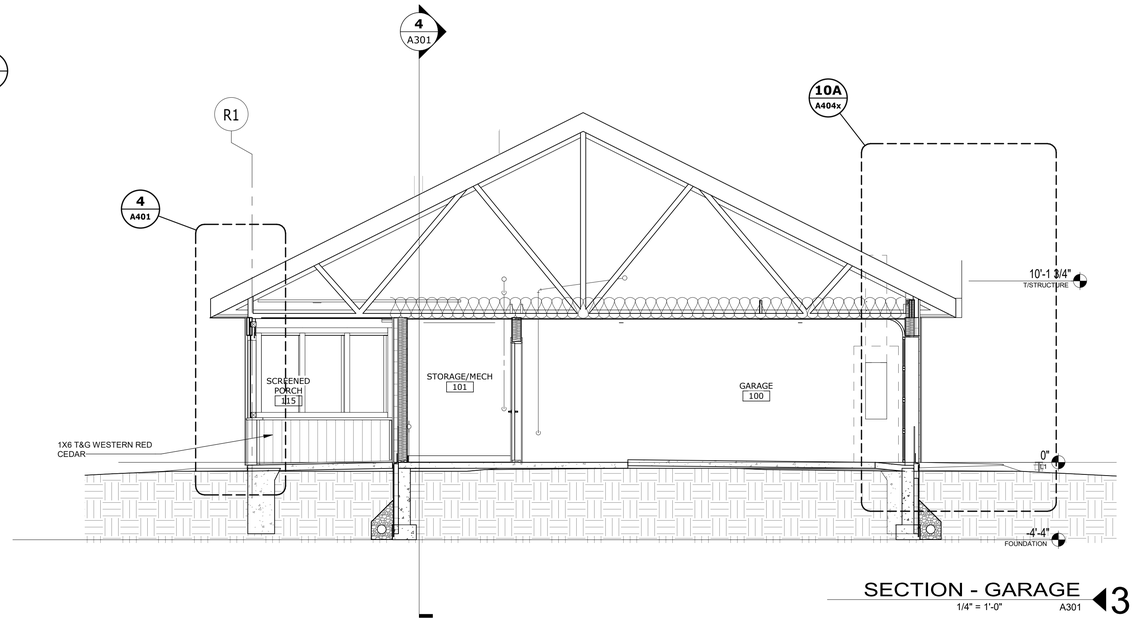


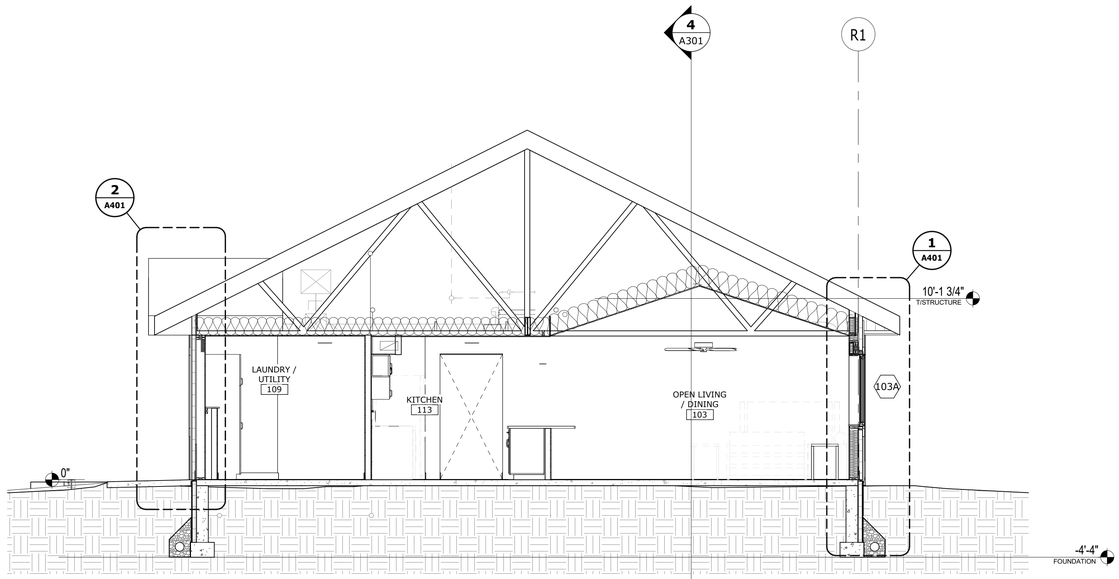
LONGITUDINAL SECTION - LEFT TO RIGHT 4

1/4" = 1'-0" A301



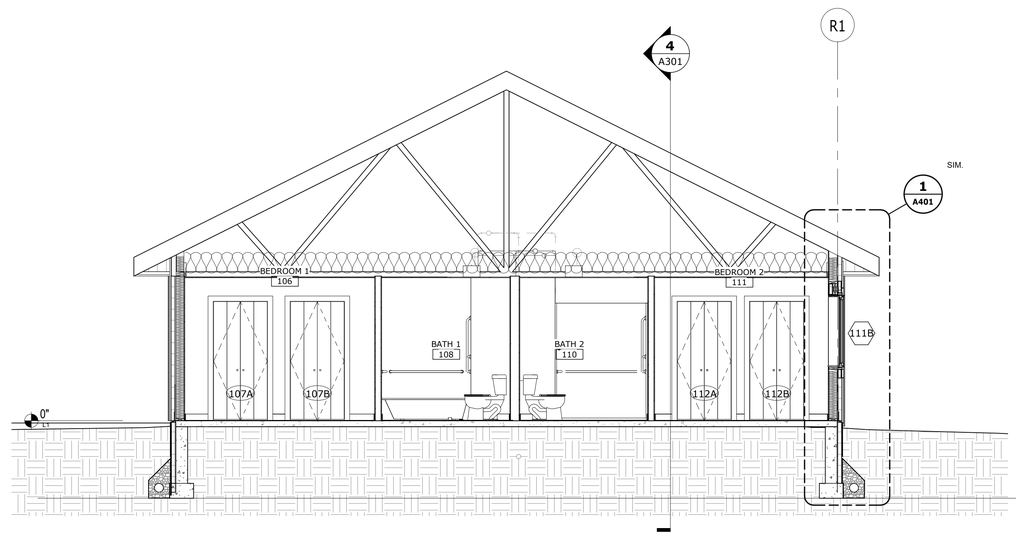
SECTION - GARAGE 3

1/4" = 1'-0" A301



SECTION - N-S @ LIVING ROOM 2

1/4" = 1'-0" A301



SECTION - NORTH-SOUTH @ BEDROOMS 1

1/4" = 1'-0" A301

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100% Design Review

95% CONSTRUCTION DOCUMENTS

ISSUE DATE:
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REVISIONS

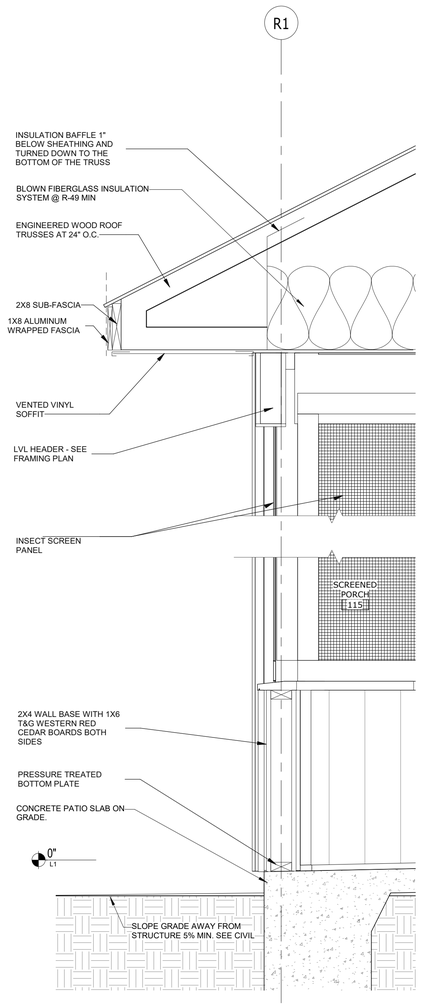
PRELIMINARY
NOT FOR CONSTRUCTION

JOB NUMBER:
220046

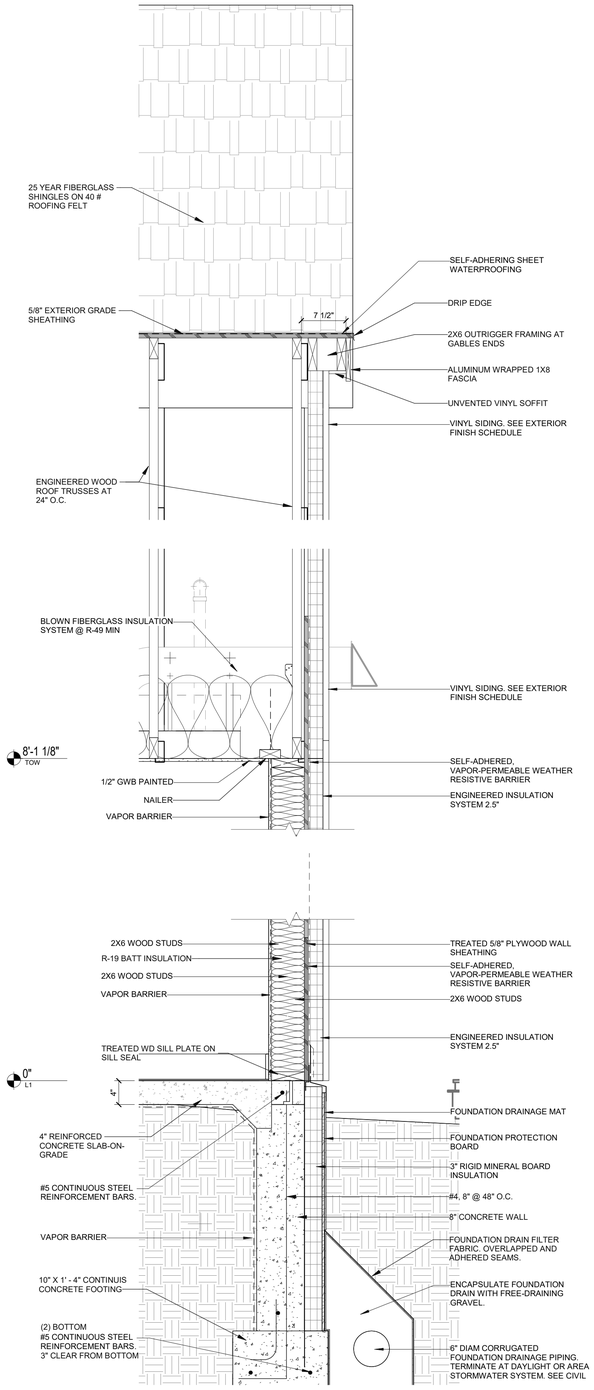
SHEET TITLE
BUILDING SECTIONS

SHEET NO.

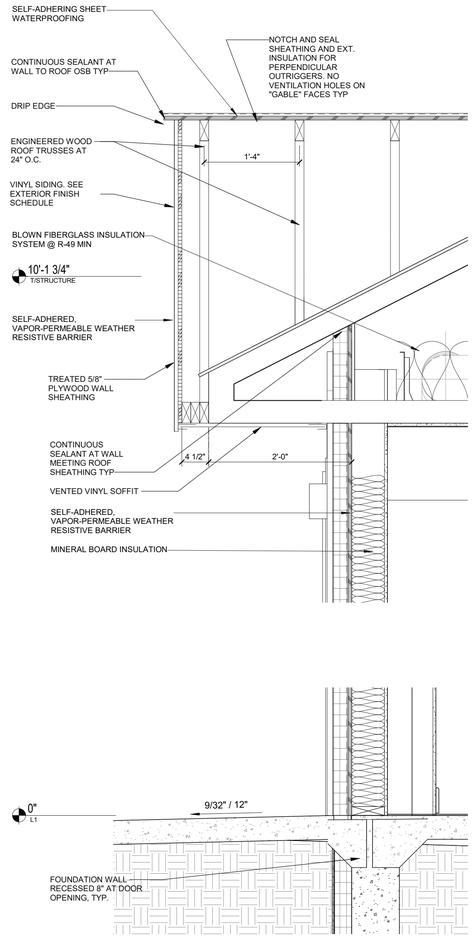
A301



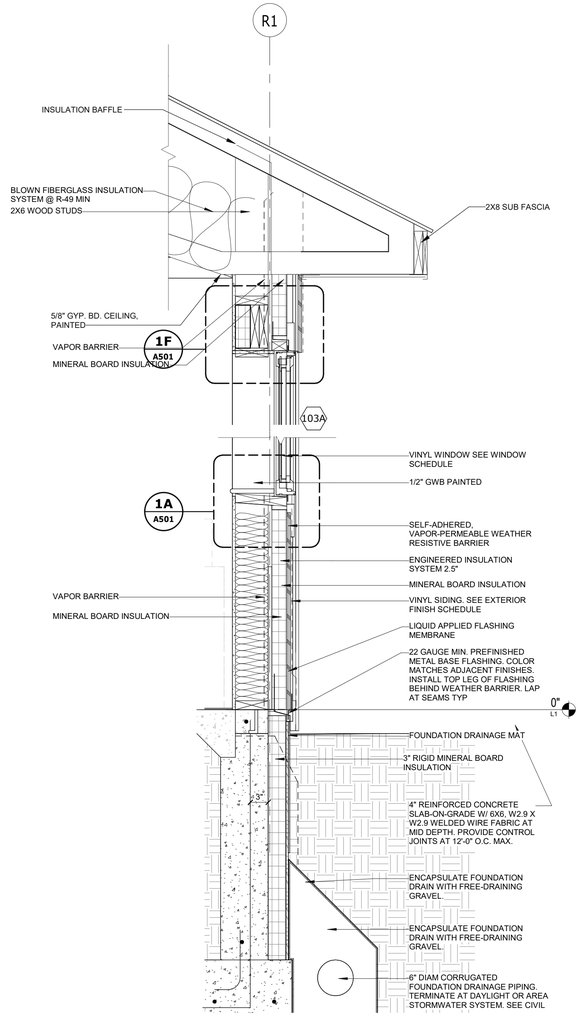
WALL SECTION - PORCH 4
1" = 1'-0" A401



WALL SECTION - ROOF GABLE 3
1" = 1'-0" A401



WALL SECTION - FRONT DOOR 2
1" = 1'-0" A401



WALL SECTION - LIVING/DINING 1
1" = 1'-0" A401

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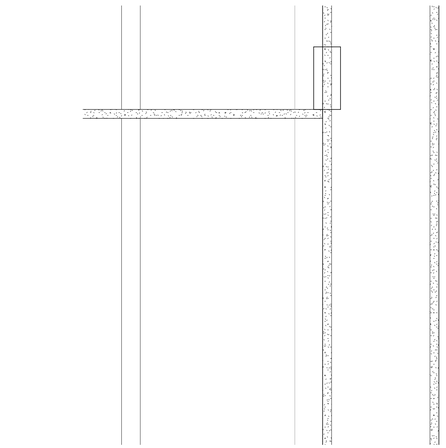
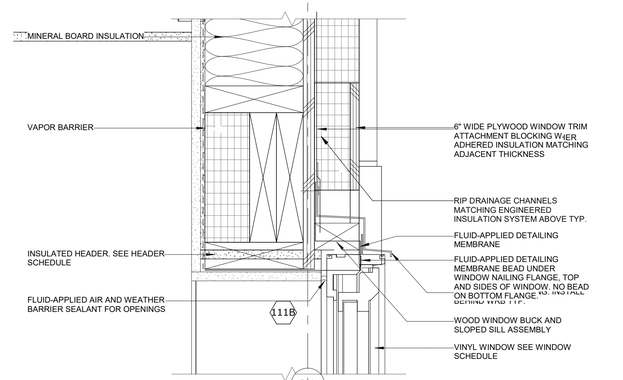
SHEET TITLE
WALL SECTIONS

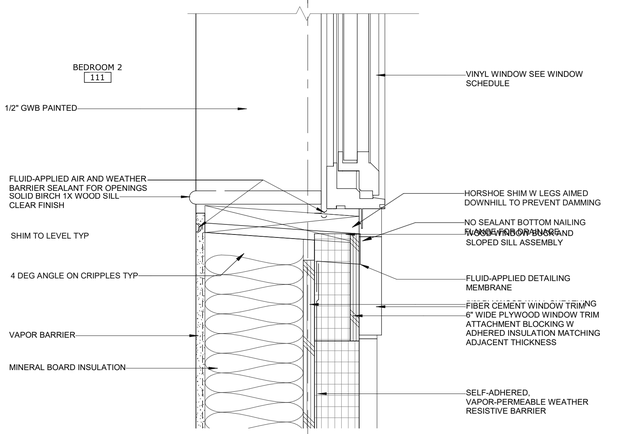
SHEET NO.
A401



DETAIL - DOOR HEAD 1K
3" = 1'-0" A501



DETAIL - WINDOW HEAD TYP 1F
3" = 1'-0" A501



DETAIL - WINDOW SILL TYP 1A
3" = 1'-0" A501

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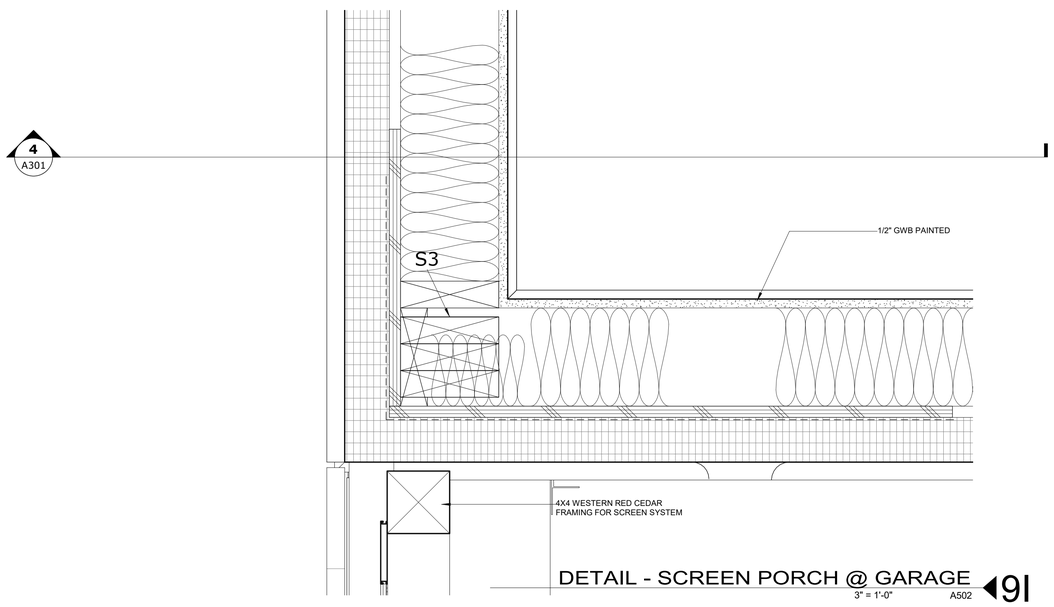
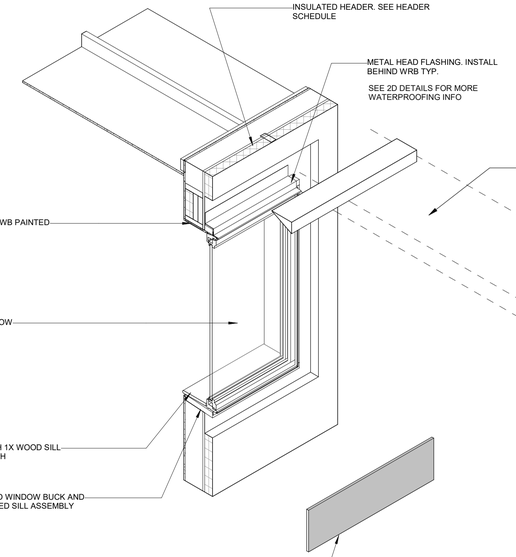
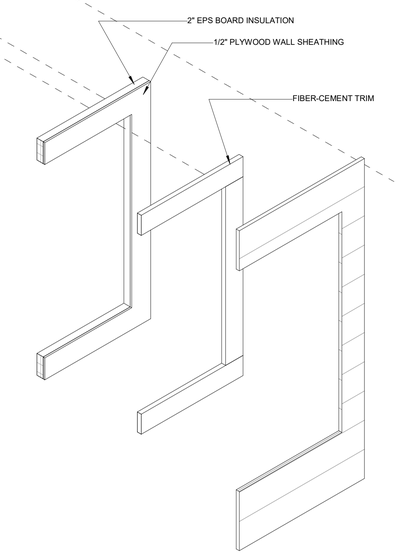
SHEET TITLE
DETAILS

SHEET NO.
A501



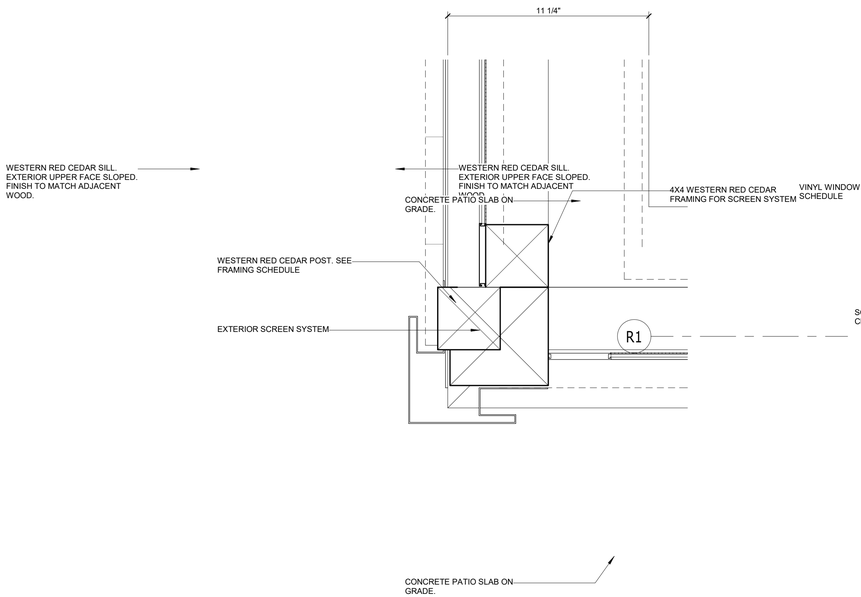
DETAIL - SCREEN PORCH @ GARAGE 9I
3" = 1'-0" A502





DETAIL 3D - WINDOW & EXTERIOR 1A
A502

MOVE TO a501



DETAIL - SCREEN PORCH CORNER 9A
3" = 1'-0" A502

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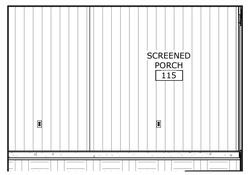
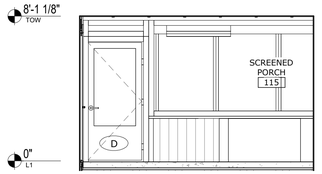
SHEET TITLE
DETAILS

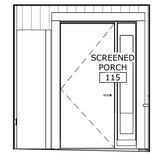
SHEET NO.
A502



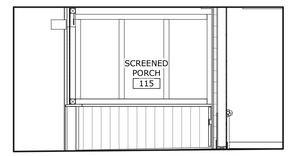
SCREEN PORCH FRONT 20
1/4" = 1'-0" A601



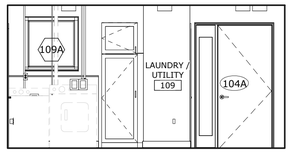
SCREEN PORCH REAR 19
1/4" = 1'-0" A601



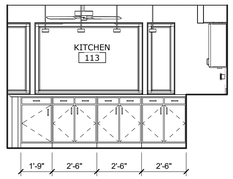
SCREEN PORCH INNER 18
1/4" = 1'-0" A601



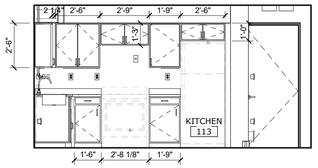
SCREEN PORCH OUTER 17
1/4" = 1'-0" A601



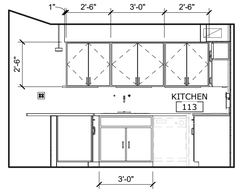
LAUNDRY FRONT 16
1/4" = 1'-0" A601



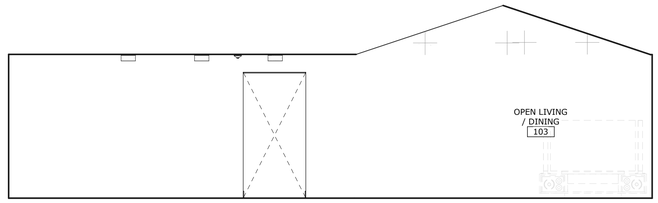
KITCHEN REAR 15
1/4" = 1'-0" A601



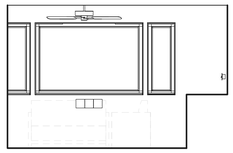
KITCHEN FRONT 14
1/4" = 1'-0" A601



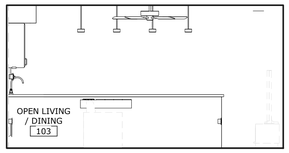
KITCHEN OUTER 13
1/4" = 1'-0" A601



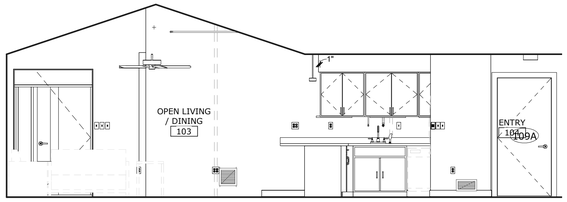
LIVING RIGHT 12
1/4" = 1'-0" A601



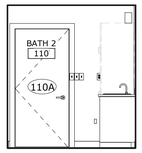
LIVING REAR 11
1/4" = 1'-0" A601



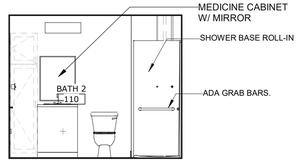
LIVING FRONT 10
1/4" = 1'-0" A601



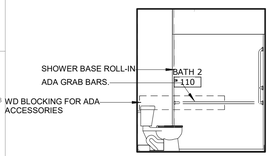
LIVING LEFT 09
1/4" = 1'-0" A601



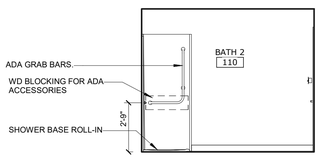
BATH 2 INNER 08
1/4" = 1'-0" A601



BATH 2 FRONT 07
1/4" = 1'-0" A601



BATH 2 OUTER 06
1/4" = 1'-0" A601



BATH 2 REAR 05
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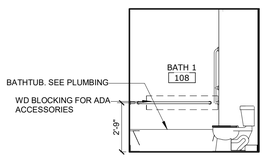
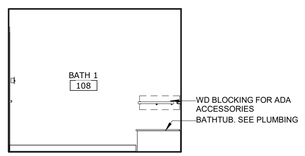
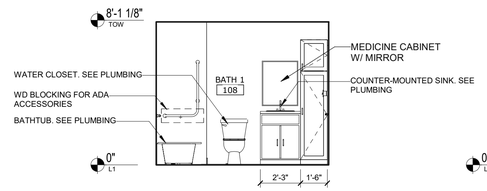


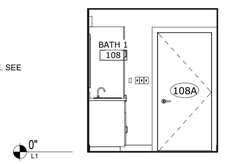
BATH 1 OUTER 04
1/4" = 1'-0" A601



BATH 1 FRONT 03
1/4" = 1'-0" A601



BATH 1 REAR 02
1/4" = 1'-0" A601



BATH 1 INNER 01
1/4" = 1'-0" A601

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SHEET TITLE
INTERIOR ELEVATIONS

SHEET NO.
A601

GENERAL NOTES - FINISHES

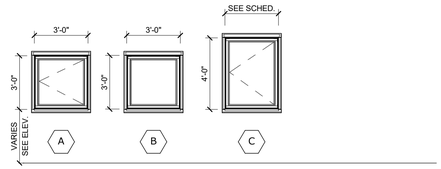
1. THE INFORMATION & DIMENSIONS SHOWN ON THIS PLAN ARE ALSO TO BE USED IN THE OPPOSITE AND/OR MIRRORED VERSIONS DEPENDING ON SITE PLAN ORIENTATION AS SHOWN ON CIVIL SHEETS.
2. DIMENSIONS ARE TO FACE OF STUD LAYER UNLESS OTHERWISE INDICATED.
3. FINISH FLOOR 0'-0" = SEA LEVEL DATUM PROVIDED PER CIVIL/SIT DRAWINGS. ELEVATION FINISH FLOOR ELEVATIONS SHOULD BE COORDINATED WITH CIVIL.
4. POLISHED CONCRETE COEFFICIENT OF FRICTION: GREATER THAN 0.60 DRY, GREATER THAN 0.60 WET WHEN TESTED IN ACCORDANCE WITH ASTM C1028.
5. SLOPES ON ALL WALKING SURFACES SHALL NOT EXCEED ADA MAXIMUMS. SLOPE TO DRAIN AWAY FROM BUILDING TYP.
6. GENERAL CONTRACTOR SHALL DOUBLE CHECK ADA REQUIREMENTS AND COORDINATE A MEETING WITH THE ARCHITECT/ENGINEER TO DOUBLE CHECK SLOPES AND CROSS-SLOPES OF WALKING SURFACES AT THE HOUSE PERIMETER PRIOR TO POURING ANY SUCH PERIMETER WALKING SURFACES.

ROOM FINISH SCHEDULE

ROOM		FINISHES			
NUMBER	NAME	FLOOR	CEILING	WALLS	BASE AND TRIM
L1					
100	GARAGE	FINISHED CONCRETE	PT-2	PT-1	WD BASE, PT-3
101	STORAGE/MECH	FINISHED CONCRETE	PT-2	PT-1	WD BASE, PT-3
103	OPEN LIVING / DINING	CPT-1	PT-2	PT-1	WD BASE, PT-3
104	ENTRY	CT-1	PT-2	PT-1	PORCELAIN TILE COVE
105	HALLWAY	LVT-1	PT-2	PT-1	WD BASE, PT-3
106	BEDROOM 1	CPT-1	PT-2	PT-1	WD BASE, PT-3
107	BED CLOSET 1	CPT-1	PT-2	PT-1	WD BASE, PT-3
108	BATH 1	CT-1	PT-2	PT-1	PORCELAIN TILE COVE
109	LAUNDRY / UTILITY	LVT-1	PT-2	PT-1	WD BASE, PT-3
110	BATH 2	CT-1	PT-2	PT-1	PORCELAIN TILE COVE
111	BEDROOM 2	CPT-1	PT-2	PT-1	WD BASE, PT-3
112	BED CLOSET 2	CPT-1	PT-2	PT-1	WD BASE, PT-3
113	KITCHEN	LVT-1	PT-2	PT-1	WD BASE, PT-3
114	COAT CLOSET	CT-1	PT-2	PT-1	PORCELAIN TILE COVE
115	SCREENED PORCH	FINISHED CONCRETE	PT-2	PT-1	WD BASE, PT-3

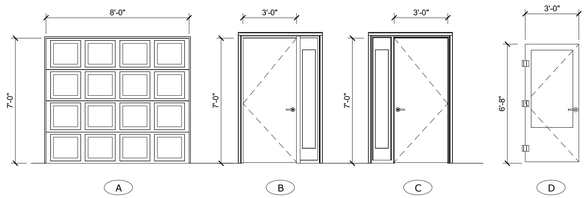
WINDOW SCHEDULE

MARK	TYPE	NAME	ROOM NAME	FRAME				COMMENTS
				WIDTH	HEIGHT	MATERIAL	FINISH	
103A	C	VINYL CASEMENT OPERABLE	OPEN LIVING / DINING	1'-6"	4'-0"	VINYL	VINYL	EGRESS, LOW-E, BUG SCREEN
103B	C	VINYL CASEMENT OPERABLE	OPEN LIVING / DINING	1'-6"	4'-0"	VINYL	VINYL	EGRESS, LOW-E, BUG SCREEN
106A	C	VINYL CASEMENT OPERABLE	BEDROOM 1	3'-0"	4'-0"	VINYL	VINYL	EGRESS, LOW-E, BUG SCREEN
109A	A	VINYL CASEMENT OPERABLE	LAUNDRY / UTILITY	3'-0"	3'-0"	VINYL	VINYL	LOW-E, BUG SCREEN
111A	C	VINYL CASEMENT OPERABLE	BEDROOM 2	3'-0"	4'-0"	VINYL	VINYL	EGRESS, LOW-E, BUG SCREEN
111B	C	VINYL CASEMENT OPERABLE	BEDROOM 2	3'-0"	4'-0"	VINYL	VINYL	EGRESS, LOW-E, BUG SCREEN
122	D	VINYL PICTURE FIXED	OPEN LIVING / DINING	6'-0"	4'-0"	VINYL	VINYL	EGRESS, LOW-E, BUG SCREEN

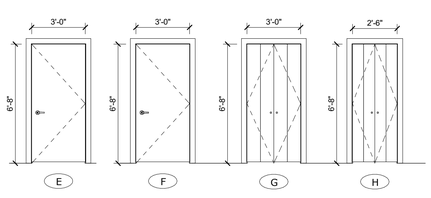


WINDOW TYPES 04
1/4" = 1'-0" A701

FLOOR FINISH PLAN 03
1/4" = 1'-0" A701



EXT DOOR TYPES 02
1/4" = 1'-0" A701



INTERIOR DOORS 01
1/4" = 1'-0" A701

GENERAL NOTES - OPENINGS

1. ALL OPERABLE EXTERIOR WINDOWS SHALL HAVE REMOVEABLE INSECT SCREENS
2. DIMENSIONS ARE TO FRAME SIZE AND FINAL DIMENSIONS ARE TO BE ADJUSTED FOR SHIM SPACE, AND FIELD VERIFIED PRIOR TO FABRICATION
3. SEE HARDWARE SCHEDULE IN SPECIFICATIONS FOR SPECIFIC HARDWARE INFORMATION
4. SEE SPECIFICATIONS FOR GLAZING
5. FOR ACCESSIBLE CLEARANCES, SEE FLOOR PLANS
6. COORDINATE ALL RECOMMENDED UNDERCUTTING OR OTHER AIR-FLOW MEASURES RELATED TO DOORS PER THE MECHANICAL SPECIFICATIONS PRIOR TO FABRICATION AND INSTALLATION.
7. ALL DOORS AND WINDOWS MUST MEET ENERGY STAR U-FACTOR AND OTHER STANDARDS BASED ON GEOGRAPHIC LOCATION OF THE PROJECT

DOOR SCHEDULE

DOOR								FRAME				
MARK	TYPE	NAME	ROOM NAME	SIZE WIDTH	SIZE HEIGHT	SIZE THICKNESS	MATERIAL	FINISH	MATERIAL	FINISH	DESCRIPTION	HARDWARE	LOCKSET FUNCTION	COMMENTS
100A	A	INSULATED GARAGE DOOR	GARAGE	8'-0"	7'-0"	1 1/2"	STL	PTD	STL	PTD	OVERHEAD SECTIONAL GARAGE DOOR			
103A	C	INSULATED METAL, OUTSWING ENTRY DOOR W 12" SIDELITE	OPEN LIVING/DINING	3'-0"	7'-0"	1 3/4"	STL	PTD	COMP	PT-3	EXTERIOR, INSULATED DOOR	HW-1	KEYED ENTRY	ADA THRESHOLD
104A	B	INSULATED METAL, INSWING ENTRY DOOR W 12" SIDELITE	ENTRY	3'-0"	7'-0"	1 3/4"	STL	PTD	COMP	PT-3	EXTERIOR, INSULATED DOOR	HW-1	KEYED ENTRY	ADA THRESHOLD
106A	F	WOOD INTERIOR SINGLE	BEDROOM 1	3'-0"	6'-8"	1 3/8"	WD	PT-3	WD	PT-3	INTERIOR, WOOD DOOR	HW-2	PRIVACY	
107A	G	WOOD INTERIOR BIFOLD DOUBLE	BED CLOSET 1	3'-0"	6'-8"	1 3/8"	WD	PT-3	WD	PT-3	INTERIOR, WOOD DOOR	HW-4	BIFOLD	
107B	G	WOOD INTERIOR BIFOLD DOUBLE	BED CLOSET 1	3'-0"	6'-8"	1 3/8"	WD	PT-3	WD	PT-3	INTERIOR, WOOD DOOR	HW-4	BIFOLD	
108A	F	WOOD INTERIOR SINGLE	BATH 1	3'-0"	6'-8"	1 3/8"	WD	PT-3	WD	PT-3	INTERIOR, WOOD DOOR	HW-2	PRIVACY	3/4" UNDERCUT
109A	E	WOOD SOLID INTERIOR SINGLE	GARAGE TO LAUNDRY	3'-0"	6'-8"	1 3/8"	WD	PT-3	WD	PT-3	INTERIOR, WOOD DOOR	HW-1	KEYED ENTRY	ADA THRESHOLD
110A	F	WOOD INTERIOR SINGLE	BATH 2	3'-0"	6'-8"	1 3/8"	WD	PT-3	WD	PT-3	INTERIOR, WOOD DOOR	HW-2	PRIVACY	3/4" UNDERCUT
111A	F	WOOD INTERIOR SINGLE	BEDROOM 2	3'-0"	6'-8"	1 3/8"	WD	PT-3	WD	PT-3	INTERIOR, WOOD DOOR	HW-2	PRIVACY	
112A	G	WOOD INTERIOR BIFOLD DOUBLE	BED CLOSET 2	3'-0"	6'-8"	1 3/8"	WD	PT-3	WD	PT-3	INTERIOR, WOOD DOOR	HW-4	BIFOLD	
112B	G	WOOD INTERIOR BIFOLD DOUBLE	BED CLOSET 2	3'-0"	6'-8"	1 3/8"	WD	PT-3	WD	PT-3	INTERIOR, WOOD DOOR	HW-4	BIFOLD	
114A	G	WOOD INTERIOR BIFOLD DOUBLE	COAT CLOSET	3'-0"	6'-8"	1 3/8"	WD	PT-3	WD	PT-3	INTERIOR, WOOD DOOR	HW-4	BIFOLD	
115A	D	WOOD SCREEN PORCH DOOR W SCREEN	SCREENED PORCH	3'-5"	6'-8 17/32"	1"	VINYL	VINYL	VINYL	VINYL	EXTERIOR, VINYL SCREEN DOOR			HARDWARE BY MANUFACTURER

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REVISIONS

PRELIMINARY
NOT FOR CONSTRUCTION

JOB NUMBER:
220046

SHEET TITLE
SCHEDULES - OPENINGS AND FINISH

SHEET NO.
A701

MECHANICAL SHEET LIST

GENERAL SYMBOLS

- REVISION NUMBER - SHOWN ON PLANS
- POINT WHERE NEW CONNECTS TO EXISTING
- NUMBER OF DETAIL ON SHEET / NUMBER OF SHEET WHERE DETAIL APPEARS
- KEYNOTE
- CONTINUATION SYMBOL
- Room 1 — ROOM NAME AND NUMBER
- ITEM TO BE DEMOLISHED
- AREA NOT IN CONTRACT
- 2" — PIPE SIZE TAG (DIAMETER)
- ABOVE GROUND PIPING
- 1/8" / 12" SLOPE — PIPE SLOPE TAG
- BELOW GROUND PIPING
- INVERT: -105' - 1" — PIPE INVERT ELEVATION TAG
- (E) — EXISTING PIPE TAG
- PIPING BEING DEMOLISHED

EQUIPMENT ABBREVIATIONS

AC	AIR CONDITIONING UNIT	ET	EXPANSION TANK
ACCU	AIR COOLING CONDENSING UNIT	EWH	ELECTRIC WATER HEATER
AHU	AIR HANDLING UNIT	FCU	FAN COIL UNIT
AS	AIR SEPARATOR	FP	FIRE PUMP
B	BOILER	GI	GREASE INTERCEPTOR
CH	CHILLER	GRV	GRAVITY ROOF VENTILATOR
CT	COOLING TOWER	HWP	HEATING WATER PUMP
CUH	CABINET UNIT HEATER	HRU	HEAT RECOVERY UNIT
CHWP	CHILLED WATER PUMP	PRV	POWER ROOF VENTILATOR
DBP	DOMESTIC WATER BOOSTER PUMP	RE	RETURN/EXHAUST FAN
DC	DUCT MOUNTED COIL	RTU	ROOFTOP UNIT
DCP	DOMESTIC WATER CIRCULATING PUMP	SP	SUMP PUMP
EF	EXHAUST FAN	UH	UNIT HEATER
EDC	ELECTRIC DUCT COIL	WH	WATER HEATER

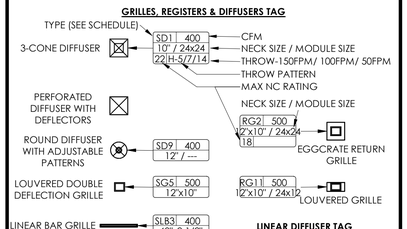
ABBREVIATIONS

Ø	ROUND	LVR	LOUVER
ABV	ABOVE	LWT	LEAVING WATER TEMPERATURE
AC	AIR CONDITIONING		
AD	AREA DRAIN	M/A	MIXED AIR
ADD	ADDENDUM	MAX	MAXIMUM
AFF	ABOVE FINISHED FLOOR	MBH	ONE THOUSAND BTU PER HOUR
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MCF	ONE THOUSAND CUBIC FEET
ALT	ALTERNATE	MD	MOTORIZED DAMPER
AP	ACCESS PANEL	MECH	MECHANICAL
ARCH	ARCHITECT/ARCHITECTURAL	MFR	MANUFACTURER
BFF	BELOW FINISHED FLOOR	MIN	MINIMUM
BLW	BELOW	MISC	MISCELLANEOUS
BTU	BRITISH THERMAL UNITS	MTR	MOTOR
BTUH	BRITISH THERMAL UNITS PER HOUR	MU/A	MAKE-UP/AIR
		NC	NOISE CRITERIA
CAP	CAPACITY	NC	NORMALLY CLOSED
CB	CATCH BASIN	NIC	NOT IN CONTRACT
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
CLG	CEILING	NO	NORMALLY OPEN
CO	CLEAN OUT	NTS	NOT TO SCALE
CW	COLD WATER	O	OXYGEN
D	DEGREE	O/A	OUTSIDE AIR
DB	DRY BULB	ORD	OVERFLOW ROOF DRAIN
DIA	DIAMETER	PD	PRESSURE DROP
DN	DOWN	PIV	POST INDICATOR VALVE
DW	DISTILLED WATER	PLBG	PLUMBING
EA	EACH	PRESS	PRESSURE
EAT	ENTERING AIR TEMPERATURE	PRV	PRESSURE REDUCING VALVE
ELEC	ELECTRICAL	PSI	POUNDS PER SQUARE INCH
EQUIP	EQUIPMENT	PSIG	POUNDS PER SQUARE INCH GAUGE
EWC	ELECTRIC WATER COOLER	PWR	POWER
EWT	ENTERING WATER TEMPERATURE	R	DUCT RISER
E/A	EXHAUST AIR	R/A	RETURN AIR
EXIST	EXISTING	RCP	RADIANT CEILING PANEL
F	DEGREES FAHRENHEIT	RD	ROOF DRAIN
FCO	FLOOR CLEAN OUT	REC	RECESSED
FD	FLOOR DRAIN	RED	REDUCER
FDC	FIRE DEPARTMENT CONNECTION	RH	RELATIVE HUMIDITY
FL	FLOOR	RL/A	RELIEF AIR
FO	FUEL OIL	RM	ROOM
FOV	FUEL OIL VENT	RPM	REVOLUTIONS PER MINUTE
FOR	FUEL OIL RETURN	RW	RAIN WATER
FOS	FUEL OIL SUPPLY	SF	SQUARE FOOT
FPM	FEET PER MINUTE	S/A	SUPPLY AIR
FS	FLOOR SINK	SAN	SANITARY
FT	FOOT/FEET	SF	SQUARE FOOT
FTR	FIN TUBE RADIATION	SD	SMOKE DAMPER
GAL	GALLON	SM	SURFACE MOUNT
GF	GAS-FIRED	SP	STANDPIPE
GC	GENERAL CONTRACTOR	SP	STATIC PRESSURE
GPM	GALLONS PER MINUTE	STM	STEAM
GW	GREASE WASTE	T	THERMOSTAT
HB	HOSE BIB	TD	TEMPERATURE DROP
HP	HORSE POWER	TDR	TRENCH DRAIN
HTG	HEATING	TEMP	TEMPERATURE
HTR	HEATER	TYP	TYPICAL
HW	HOT WATER	UG	UNDERGROUND
HYD	HYDRANT	VAC	VACUUM
ID	INDIRECT	V	VENT
IN	INCH	VAV	VARIABLE AIR VOLUME
INV	INVERT	VENT	VENTILATION
LB	POUND	VTR	VENT THROUGH ROOF
LB/HR	POUNDS PER HOUR	W	WASTE
LAT	LEAVING AIR TEMPERATURE	WB	WET BULB
LP	LOW PRESSURE	WCO	WALL CLEAN OUT
LPG	LIQUEFIED PETROLEUM GAS	WH	WALL HYDRANT

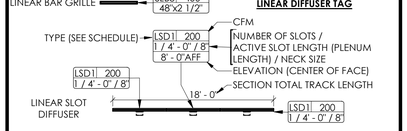
HVAC SYMBOLS

- 18"x12" — SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
- 18"/12" — OVAL DUCT SIZE TAG (WIDTH / HEIGHT)
- 18"Ø — ROUND DUCT SIZE TAG (DIAMETER)
- (E) — EXISTING DUCT TAG
- DUCT BEING DEMOLISHED
- 18"x18" S/A — SUPPLY AIR
- 18"x18" S-O/A — CONDITIONED OUTSIDE AIR
- 18"x18" O/A — OUTSIDE AIR
- 18"x18" R/A — RETURN AIR
- 18"x18" T/A — TRANSFER AIR
- 18"x18" E/A — EXHAUST AIR
- 18"x18" L/A — RELIEF AIR
- 18"x18" GE/A — GREASE EXHAUST AIR
- 18"x18" CE/A — CONDENSATE EXHAUST AIR
- 18"x18" SE/A — SMOKE EXHAUST AIR
- 6"Ø FLUE — EXHAUST GAS FLUE
- 6"Ø C/A — COMBUSTION AIR
- DROP — RECTANGULAR SUPPLY/OUTSIDE AIR DUCT RISE
- DROP — ROUND SUPPLY/OUTSIDE AIR DUCT RISE
- DROP — RECTANGULAR RETURN/TRANSFER AIR DUCT RISE
- DROP — ROUND RETURN/TRANSFER AIR DUCT RISE
- DROP — RECTANGULAR EXHAUST/RELIEF AIR DUCT RISE
- DROP — ROUND EXHAUST/RELIEF AIR DUCT RISE

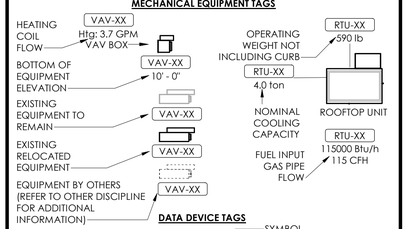
GRILLES, REGISTERS & DIFFUSERS TAG



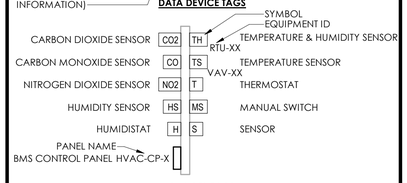
LINEAR DIFFUSER TAG



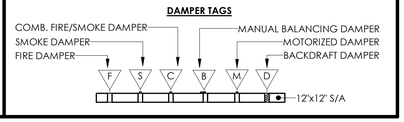
MECHANICAL EQUIPMENT TAGS



DATA DEVICE TAGS



DAMPER TAGS



* NOTE *
ALL GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET. THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

PROJECT GENERAL NOTES

A. COORDINATE INSTALLATION OF PIPING, DUCTWORK, CONDUIT, LIGHTS, CABLE TRAY, STRUCTURE, AND EQUIPMENT TO PREVENT CONFLICTS.

B. FINAL PRODUCT SHALL BE A COMPLETE AND FUNCTIONING SYSTEM, AND SHALL CONFORM TO ALL REQUIREMENTS OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING BUT NOT LIMITED TO THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL MECHANICAL CODE.

C. LOCATE DUCTWORK, PIPING AND MECHANICAL EQUIPMENT AWAY FROM THE SPACE ABOVE ELECTRICAL PANELS. TRANSFORMERS AND OTHER ELECTRICAL EQUIPMENT.

D. PENETRATIONS OF RATED ASSEMBLIES SHALL BE FIRE STOPPED. FIRE STOPPING SHALL BE AN APPROVED MATERIAL AS PRESCRIBED IN CSFM STANDARD 43-1 AND SHALL BE U.L. LISTED.

E. PROVIDE SLEEVES AND/OR OPENINGS TO RUN PIPES AND DUCTS THROUGH FOUNDATIONS, FLOORS, WALLS, AND ROOF.

F. MAINTAIN CLEAR ACCESS TO SERVICE EQUIPMENT AND OTHER ACCESSORIES REQUIRING SERVICE. VISUAL INSPECTION OR HAND OPERATION. WHERE INDICATED OR REQUIRED, PROVIDE ACCESS PANELS OF THE TYPE SELECTED TO SUIT MATERIALS IN WHICH INSTALLED.

G. ADJUST PIPING AND DUCTWORK SIZES TO PROPERLY CONNECT TO MECHANICAL EQUIPMENT.

H. REFER TO HVAC SERIES DRAWINGS FOR GAS AND A.C. CONDENSATE DRAIN PIPING.

I. PIPE SIZES SHOWN SHALL BE CONTINUED IN THE DIRECTION OF FLOW UNTIL ANOTHER SIZE IS SHOWN.

J. FOR DETAILS, EQUIPMENT CONNECTIONS, AND PIPE SIZES NOT SHOWN ON THE SEGMENTS, REFER TO DETAILS, SCHEDULES, AND SPECIFICATIONS.

K. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE RESPECTIVE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS, AT A LEVEL OF QUALITY AND WORKMANSHIP CONSISTENT WITH THE SPECIFICATIONS.

L. LOCATIONS OF PIPING, DUCTWORK AND EQUIPMENT AS INDICATED ON THE DRAWING, ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD. WORK SHALL BE COORDINATED WITH ALL OTHER TRADES TO AVOID INTERFERENCE IN THE FIELD.

M. INSTALL EXPOSED PIPING AND DUCTWORK AS HIGH AS PRACTICAL IN ROOMS WITHOUT CEILINGS.

N. THE CONTRACTOR'S WORK SCHEDULE SHALL BE SUBMITTED TO AND APPROVED BY THE OWNER.

O. PRIOR TO STARTING WORK, SUBMIT SHOP DRAWINGS FOR ALL MECHANICAL EQUIPMENT, PLUMBING FIXTURES, AND DIFFUSERS.

P. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND SHALL ARRANGE FOR ALL INSPECTIONS AS REQUIRED.

Q. PROVIDE ONE YEAR WARRANTY FOR ALL WORKMANSHIP AND MATERIALS AFTER THE DATE OF FINAL ACCEPTANCE.

HVAC GENERAL NOTES

A. CONTRACTOR SHALL LOCATE THERMOSTATS AND TEMPERATURE SENSORS AT 5'-0" AFF, A MINIMUM OF 8" FROM LIGHT SWITCH.

B. REFER TO HVAC DRAWINGS FOR THERMOSTAT AND TEMPERATURE SENSOR LOCATIONS.

C. CONDENSATE DRAINS SHALL BE SUPPLIED FOR ALL COOLING EQUIPMENT. CONTRACTOR SHALL ENSURE PROPER INSTALLATION AND DRAINAGE AS REQUIRED BY FEDERAL, STATE, AND LOCAL CODES. CONDENSATE PIPING SHALL BE TYPE "L" COPPER.

D. ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK SHALL BE RATED FOR PRESSURE CLASS OF 2" W.G. UNLESS NOTED OTHERWISE.

E. COORDINATE THE EXACT LOCATION OF ALL CEILING DIFFUSERS, REGISTERS, AND GRILLES WITH NEW AND EXISTING LIGHTING.

F. PROVIDE DIFFUSERS AND REGISTERS WITH 4-WAY BLOW PATTERN UNLESS OTHERWISE NOTED.

G. PROVIDE A 4" HOUSEKEEPING PAD FOR EACH PIECE OF MECHANICAL EQUIPMENT. COORDINATE SIZES WITH MECHANICAL EQUIPMENT SELECTED.

H. THIS CONTRACTOR SHALL BE REQUIRED TO REPLACE FILTERS ON HVAC EQUIPMENT AFTER ALL DUST PRODUCING CONSTRUCTION HAS BEEN COMPLETED AND PRIOR TO THE FINAL PUNCH.

I. IN HIGH-HUMIDITY AREAS, INCLUDING SHOWER ROOMS, ALL DUCTWORK SHALL BE CONSTRUCTED OF ALUMINUM.

Mechanical Symbols List

SCALE: 1/8" = 1'-0"

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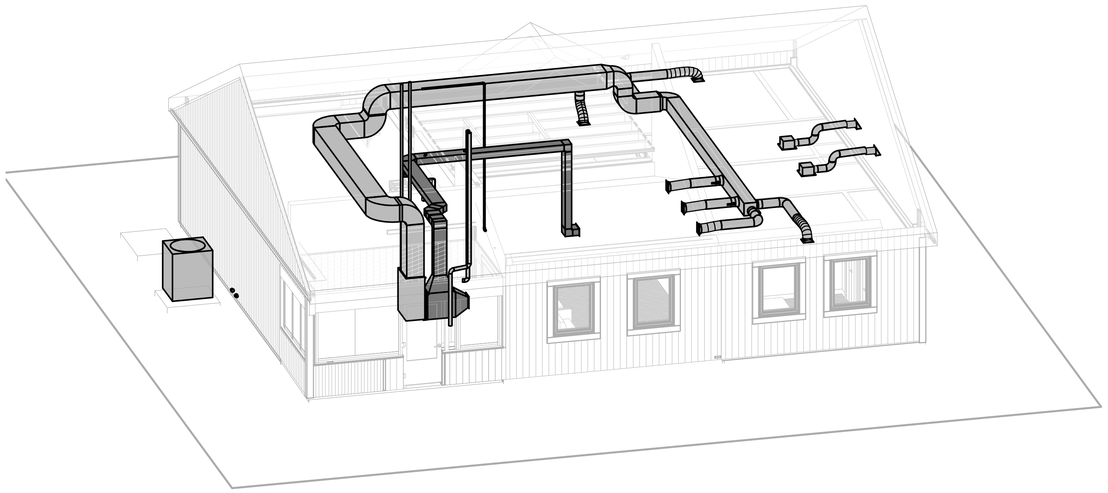
REVISIONS

JOB NUMBER:
220046

SHEET TITLE
MECHANICAL INFORMATION & SYMBOL LEGEND

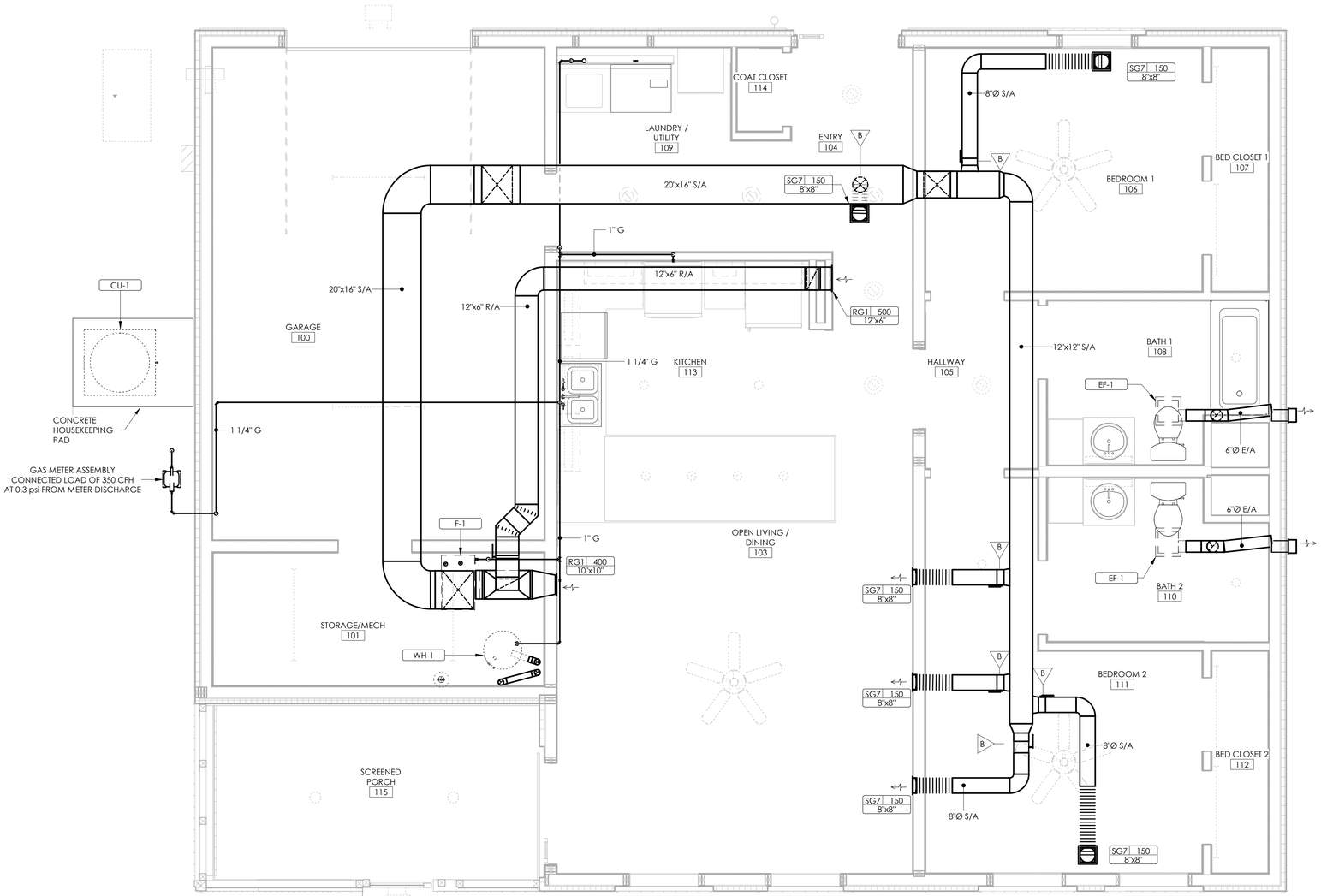
SHEET NO.
M001



GENERAL MECHANICAL NOTES

A	CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A COMPLETE AND WORKING SYSTEM.
B	INSTALL, SUPPORT, & BRACE NEW DUCTWORK AND ACCESSORIES PER SMACNA GUIDELINES.
C	DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS. CONTRACTOR SHALL MAKE ALLOWANCE FOR ANY INTERIOR LINING, INSULATION, ETC.
D	ALL NEW DUCT ELBOWS SHALL BE RADIUS TYPE, WHERE NECESSARY, CONTRACTOR MAY SUBSTITUTE MITERED ELBOWS WITH TURNING VANES.
E	PROVIDE FLAT BLADE MANUAL VOLUME DAMPERS AT ALL TERMINAL DUCT BRANCHES AND AS INDICATED.
F	INSTALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
G	ALL PRIMARY CONDENSATE DRAIN PIPING SHALL BE INSULATED TO A MINIMUM THICKNESS OF 1/2" AND SHALL INCLUDE A VAPOR RETARDANT OUTSIDE THE INSULATION. SEAL ALL JOINTS AND PENETRATIONS.
H	COORDINATE ALL EXTERIOR PENETRATIONS INCLUDING ROOF PENETRATIONS WITH OTHER TRADES TO PROVIDE A COMPLETE AND FULLY WEATHER-PROOF INSTALLATION.

KEYNOTES



NORTH

MECHANICAL PLAN

SCALE: 3/8" = 1'-0"

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JOB NUMBER:
220046

SHEET TITLE
MECHANICAL FLOOR PLAN

SHEET NO.

M101

GAS-FIRED FURNACE SCHEDULE

ID	LOCATION NAME	LOCATION NO.	MANUFACTURER	MODEL NO.	TYPE	ARRANGEMENT	SUPPLY AIRFLOW	OUTSIDE AIRFLOW	DCV MIN AIRFLOW	FAN ESP	FAN DRIVE TYPE	FAN MOTOR QTY	FAN MOTOR POWER	FAN MOTOR RPM	FAN MOTOR ECM	COOLING COIL TYPE	COOLING COIL NOMINAL CAP	COOLING COIL AIRSIDE EAT(db)	COOLING COIL AIRSIDE EAT(wb)	COOLING COIL AIRSIDE LAT(db)	COOLING COIL AIRSIDE LAT(wb)	GAS-FIRED HEAT EXCHANGER GAS BURNER INPUT	GAS BURNER CAP	GAS BURNER STAGES	GAS BURNER FUEL TYPE	GAS BURNER FUEL PRESS AVAIL	GAS-FIRED HEAT EXCHANGER AIRSIDE EAT(db)	GAS-FIRED HEAT EXCHANGER AIRSIDE LAT(db)	AFUE	FILTER EFF	UNIT WEIGHT	FLA	MCA	MOCP	VOLT	PH	INTERLOCK ID	REMARKS
F-1			TRANE	TUX1B080A9H31B	CONDENSING	UPFLOW	900 CFM	0 CFM	0 CFM	0.00 in-wg	DIRECT	1	0.50 hp	1075	Yes	A-COIL	0.0 ton	-459.7 °F	-459.7 °F	55.0 °F	54.0 °F	80000 Btu/h	73680 Btu/h	2	NG	2.0 psi	55.0 °F	130.8 °F	92%	MERV-12	148 lb	10.0 A	12.3 A	15.0 A	120 V	1		

SPLIT SYSTEM CONDENSING UNIT SCHEDULE

ID	DESCRIPTION	LOCATION NAME	LOCATION NO.	MANUFACTURER	MODEL NO.	TYPE	COMPRESSOR CAP	COMPRESSOR TYPE	REFRIGERANT TYPE	REFRIGERANT CHARGE	MOTOR QTY	MOTOR RLA	LOW AMBIENT KIT	DESIGN PIPE LENGTH	SUMMER AMBIENT DBT	WINTER AMBIENT DBT	SEER	EER	SEACOAST PROT	SOUND PRESS LEVEL	UNIT WEIGHT	MCA	MOCP	VOLT	PH	INTERLOCK ID	REMARKS
CU-1	CONDENSING UNIT	ROOF	-	TRANE	4TTR7024A1000B		0 ton			0 lb	1	13.0 A	Yes		-459.7 °F	-459.7 °F	0	0		0	240 lb	17.0 A	20.0 A	240 V	1		

EXHAUST FAN SCHEDULE

ID	LOCATION NAME	LOCATION NO.	MANUFACTURER	MODEL NO.	TYPE	ARRANGEMENT	FAN AIRFLOW DESIGN	FAN AIRFLOW MIN	FAN VELOCITY INLET	FAN VELOCITY OUTLET	FAN PRESS ESP	FAN RPM	FAN WHEEL TYPE	FAN WHEEL DIA	FAN CLASS	FAN DRIVE TYPE	FAN MOTOR QTY	FAN MOTOR POWER	FAN MOTOR RPM	FAN MOTOR ECM	SOUND PRESS LEVEL (dBA)	UNIT WEIGHT	FLA	MCA	MOCP	VOLT	PH	INTERLOCK ID	REMARKS
EF-1			GREENHECK	SP-110-VG	CEILING	ROUND OUTLET	100 CFM	0 CFM	0 FPM	0 FPM	0.00 in-wg	0	FC	8"		DIRECT	1	0.01 hp	940	Yes	0	12 lb	0.2 A	0.3 A	15.0 A	120 V	1		

GRILLES, REGISTERS AND DIFFUSERS SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	QTY	SYSTEM	FACE SIZE	NECK SIZE	NECK WIDTH	NECK HEIGHT	BLADE DESIGN THICKNESS	BLADE DESIGN SPACING	BLADE DESIGN DEFLECTION ANGLE SINGLE	BLADE DESIGN DEFLECTION ANGLE DOUBLE	BLADE DESIGN ORIENTATION	INSTALLATION BORDER TYPE	OPTIONS DAMPER DESCRIPTION	OPTIONS FILTER DESCRIPTION	OPTIONS EQUALIZING GRID	OPTIONS HEAVY DUTY FRAME	SPECIFICATION	NOTES
RG1	LOUVERED GRILLE	TITUS	350RL	1	R/A			10"	10"	1/8"	3/4"	35.0°		LONG	TYPE 1 (SURFACE)	---		No			
RG1	LOUVERED GRILLE	TITUS	350RL	1	R/A			12"	6"	1/8"	3/4"	35.0°		LONG	TYPE 1 (SURFACE)	---		No			
SG7	LOUVERED DOUBLE DEFLECTION GRILLE	TITUS	300RL	6	S/A			8"	8"	1/8"	3/4"	0.0°	0.0°	DOUBLE-LON G	TYPE 1 (SURFACE)	---		No			

DIVISION 23 MECHANICAL SPECIFICATIONS

HVAC:

1. The HVAC system shall be designed and sized by the Mechanical Contractor and conform to the requirements of this section and ASHRAE standards. The Contractor shall provide and install a complete and operational system.
2. The heating/air conditioning shall be provided by high efficiency heat pump with a minimum SEER rating of 14. The equipment shall be manufacture by Carrier or approved in advance by the Owner.
3. All ductwork shall be constructed with 24 gauge galvanized steel. All metal duct joints shall be sealed with mastic or heat resistant fiberglass tape & mechanical fasteners.
4. All ductwork shall be fabricated and installed in accordance with SMACNA recommendations for lon velocity ducMork.
5. All ductwork (including ductwork installed in ventilation systems) located in unconditioned spaces shall be insulated with minimum R4-R8 insulation with integral Class 1 vapor retarding barrier. Seams in the insulation shall be sealed with foil tape.
6. All supply and return ducts emanating from the air handler shall be acoustically lined with 0.5" lining up to a distance of 15' from the unit. Provide flexible connections at the air handling unit for supply & return ducts.
7. No flexible duct run shall be longer than 5'-0".
8. Hot water heater, furnace hood and dryer shall be vented via T.B.D.
9. One condensers shall be located at each end of the townhome units.
10. Provide to the Owner all manufacturers' data supplied with the equipment including all manuals and warranties.
11. Provide and install all miscellaneous ductwork for bathroom exhaust fans and kitchen exhaust fans.
12. The air handling unit (AHU) shall be Carrier. No other manufacturers will be accepted. Filter shall have a static pressure gauge to indicate when the filter should be changed.

FURNACES:

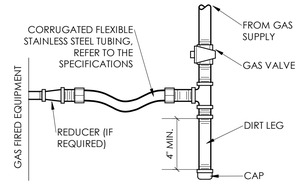
Performance Requirements

a. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
b. ASHRAE Compliance:
   1. Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup".
   2. Minimum Efficiency: Comply with ASHRAE/ IESNA 90.1

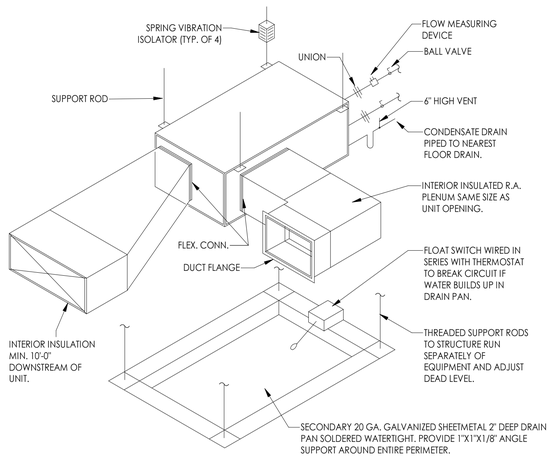
1. Gas-Fired Furnaces, Condensing
   a. *Basis-of-Design Product:* Carrier, Condensing Gas Furnace.
   b. Comply with AGA 721.47 and NFPA 54, and bear AGA label.
      1. Type of Gas: Natural
      2. Fan Motor: Multispeed.
         ii. Heat Exchanger: Stamped and welded; aluminized steel primary surfaces; polyethylene-coated steel secondary surface.
         1. Burner Controls: Solid state; control gas valve and ignition.
         2. Automatic Controls: Solid-state board to delay fan start and shutdown.
         3. Configuration: Upflow.
         4. Efficiency: Minimum of 93%.
         5. Heating Capacity: T.B.D. BTU.
         6. Accessories: Combination combustion-air intake and vent and ventilation-air heat exchanger.
            c. Capacities and Characteristics:
               1. Fan: Airflow in CFM; T.B.D.
               2. Fan Motor: Number of Speeds; variable.

ACCESSORIES

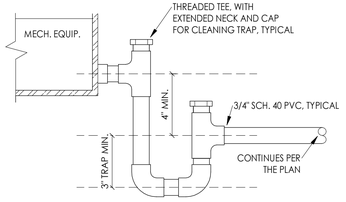
1. Controls: Include components required for operation of furnaces and auxiliary equipment in all seasons.
   a. Thermostat: *Basis-of-Design Product:* T.B.D.
1. Filters: 5 inch thick, disposable, fiberglass type.
2. Humidifiers
   a. Minimum capacity rating indicated according to ARI 610, "Central System Humidifiers for Residential Applications."
   b. Fan-powered, wetted-pad, continuous-drain type with water-flow control orifice and 24-V ac motor, arranged for mounting on duct or plenum.
   c. Comply with applicable requirements in ASHRAE 62.1
4. Refrigeration Components
   a. Evaporator Coil: Comply with ARI 210/ 240. Match size with furnace. Match remote condensing unit. Include condensate drain pan with drain outlet.
   b. Evaporator Coil Enclosure: As required to suit furnace and cooling cool. Steel cabinet with access panel and flanges for integral mounting at or on furnace cabinet.
   c. Refrigerant Line Kits: Annealed-copper suction and liquid line factor cleaned, dried pressurized, and sealed; with insulated suction line and appropriate fittings at ends.
5. Controls
   a. Thermostat: 24-V ac, two-stage, heating-cooling, wall-mounted unit with fan on/ auto selector and heat anticipator.
   b. Humidistat: Adjustable, wall mounted.



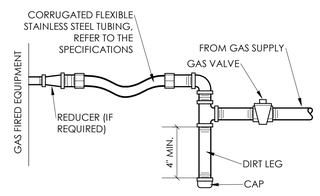
5 M.500 GAS PIPING CONNECTION DETAIL
SCALE: NTS



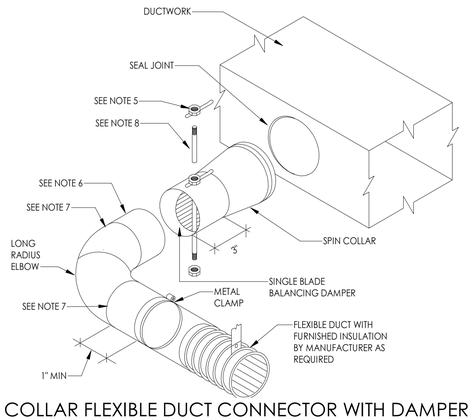
3 M.500 AIR-CONDITIONER / DRAIN PAN DETAIL
SCALE: NTS



6 M.500 CONDENSATE DRAIN TRAP
SCALE: NTS

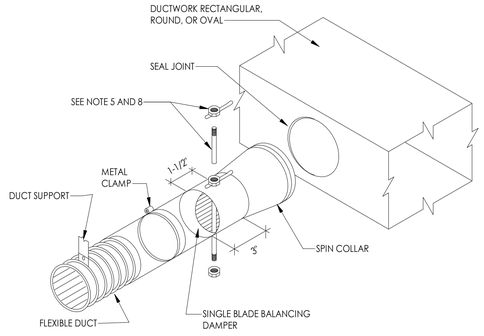


4 M.500 GAS PIPING CONNECTION DETAIL
SCALE: NTS



NOTES:
1. SUPPORT DUCTWORK AS REQUIRED.
2. BAND FLEX TO COLLAR 1/2" MINIMUM FROM OUTBOARD END OF COLLAR.
3. INSTALL SPIN COLLAR DAMPER IN OPEN POSITION; FINAL ADJUSTMENT BY TAB CONTRACTOR.
4. PULL FLEXIBLE DUCT INSULATION UP TO END OF SPIN COLLAR AT EDGE OF RECTANGULAR DUCTWORK; SEAL VAPOR BARRIER WITH GREY TAPE TO PREVENT MOISTURE MIGRATION.
5. PROVIDE EXTENSION RODS TO ACCOMMODATE INSULATION. PULL TO EDGE OF DUCTWORK AS REQUIRED AND SEAL TO EFFECT VAPOR BARRIER.
6. POP RIVET OR SHEET METAL SCREWS, MINIMUM 3 EACH AT 120 INTERVALS. CONNECTING STOVEPIPE TO COLLAR. ENSURE RIVETS OR SCREWS DO NOT INTERFERE WITH DAMPER.
7. TAPE AND SEAL ALL JOINTS TO PREVENT LEAKAGE.
8. INSTALL LOCKING QUADRANT AND HANDLE ON BOTTOM OF DUCT FOR EASY SERVICE (SHOWN ON TOP FOR EASE OF ILLUSTRATION ONLY).

2 M.500 SPIN COLLAR FLEXIBLE DUCT CONNECTOR WITH DAMPER AND WITH LONG RADIUS ELBOW
SCALE: NTS



NOTES:
1. SUPPORT DUCTWORK AS REQUIRED.
2. BAND FLEX TO COLLAR 1/2" MINIMUM FROM OUTBOARD END OF COLLAR.
3. INSTALL SPIN COLLAR DAMPER IN OPEN POSITION; FINAL ADJUSTMENT BY TAB CONTRACTOR.
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7. TAPE AND SEAL ALL JOINTS TO PREVENT LEAKAGE.
8. INSTALL LOCKING QUADRANT AND HANDLE ON BOTTOM OF DUCT FOR EASY SERVICE (SHOWN ON TOP FOR EASE OF ILLUSTRATION ONLY).

1 M.500 SPIN COLLAR FLEXIBLE DUCT CONNECTOR WITH DAMPER
SCALE: NTS

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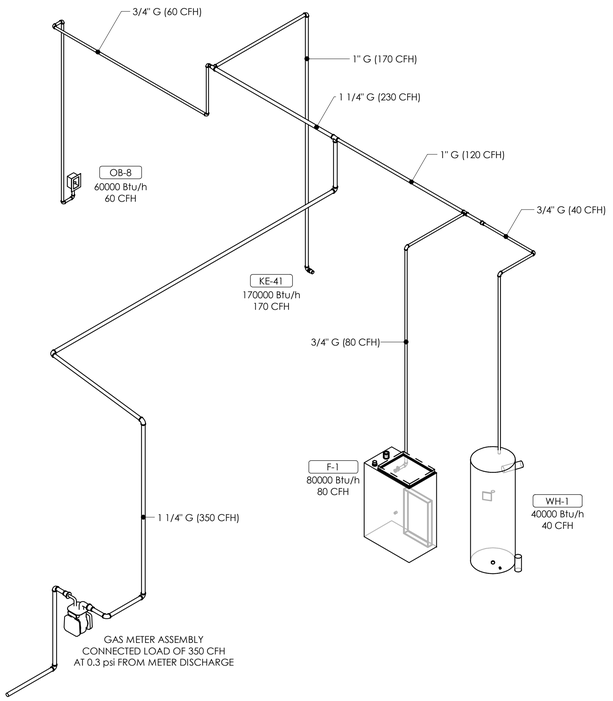
JOB NUMBER:
220046

SHEET TITLE
MECHANICAL DETAILS, SCHEDULES AND SPECIFICATONS

SHEET NO.
M500

FUEL LOADS SUMMARY

ID	DESCRIPTION	LOCATION		FUEL INPUT			EFF	OUTPUT CAPACITY		FUEL PROPERTIES		
		NAME	NO	MAX	STAGES	MIN		MAX	MIN	TYPE	PRESS AVAIL	PIPE FLOW (CFH)
	RANGE W/ CONVECTION OVEN			170000 Btu/h	0		0	0 Btu/h		NG	2.0 psi	170
F-1	FURNACE			80000 Btu/h	2	40000 Btu/h	0.921	73680 Btu/h	36840 Btu/h	NG	2.0 psi	80
OB-8	DRYER GAS BOX			60000 Btu/h				0 Btu/h		NG	2.0 psi	60
WH-1	WATER HEATER	STORAGE/MECH	101	40000 Btu/h	2	20000 Btu/h	0.95	38000 Btu/h	19000 Btu/h	NG	2.0 psi	40
Grand total: 4								111680 Btu/h				



1 / M520 GAS RISER DIAGRAM
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JOB NUMBER:
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SHEET TITLE
GAS RISER DIAGRAM

SHEET NO.
M520

PLUMBING SHEET LIST

GENERAL SYMBOLS

- REVISION NUMBER - SHOWN ON PLANS
- POINT WHERE NEW CONNECTS TO EXISTING
- NUMBER OF DETAIL ON SHEET / NUMBER OF SHEET WHERE DETAIL APPEARS
- KEYNOTE
- CONTINUATION SYMBOL
- Room 4 — ROOM NAME AND NUMBER
- ITEM TO BE DEMOLISHED
- AREA NOT IN CONTRACT
- 2" — PIPE SIZE TAG (DIAMETER)
- ABOVE GROUND PIPING
- 1/8" / 12" SLOPE — PIPE SLOPE TAG
- BELOW GROUND PIPING
- INVERT: -105' - 1" — PIPE INVERT ELEVATION TAG
- (E) — EXISTING PIPE TAG
- PIPING BEING DEMOLISHED

ABBREVIATIONS

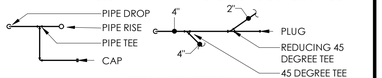
Ø	ROUND
ABV	ABOVE
AC	AIR CONDITIONING
AD	AREA DRAIN
ADD	ADDENDUM
AFF	ABOVE FINISHED FLOOR
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
ALT	ALTERNATE
AP	ACCESS PANEL
ARCH	ARCHITECT/ARCHITECTURAL
BFF	BELOW FINISHED FLOOR
BLW	BELOW
BTU	BRITISH THERMAL UNITS
BTUH	BRITISH THERMAL UNITS PER HOUR
CAP	CAPACITY
CB	CATCH BASIN
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CO	CLEAN OUT
CW	COLD WATER
D	DEGREE
DB	DRY BULB
DIA	DIAMETER
DN	DOWN
DW	DISTILLED WATER
EA	EACH
EAT	ENTERING AIR TEMPERATURE
ELEC	ELECTRICAL
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
E/A	EXHAUST AIR
EXIST	EXISTING
F	DEGREES FAHRENHEIT
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FL	FLOOR
FO	FUEL OIL
FOV	FUEL OIL VENT
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FPM	FEET PER MINUTE
FS	FLOOR SINK
FT	FOOT/FEET
FTR	FIN TUBE RADIATION
GAL	GALLON
GF	GAS-FIRED
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
GW	GREASE WASTE
HB	HOSE BIB
HP	HORSE POWER
HTG	HEATING
HTR	HEATER
HW	HOT WATER
HYD	HYDRANT
ID	INDIRECT
IN	INCH
INV	INVERT
LB	POUND
LB/HR	POUNDS PER HOUR
LAT	LEAVING AIR TEMPERATURE
LP	LOW PRESSURE
LPG	LIQUEFIED PETROLEUM GAS
LVR	LOUVER
LWT	LEAVING WATER TEMPERATURE
M/A	MIXED AIR
MAX	MAXIMUM
MBH	ONE THOUSAND BTU PER HOUR
MCF	ONE THOUSAND CUBIC FEET
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MTR	MOTOR
MU/A	MAKE-UP/AIR
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NUMBER
NO	NORMALLY OPEN
NTS	NOT TO SCALE
O	OXYGEN
O/A	OUTSIDE AIR
ORD	OVERFLOW ROOF DRAIN
PD	PRESSURE DROP
PIV	POST INDICATOR VALVE
PLBG	PLUMBING
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PWR	POWER
R	DUCT RISER
R/A	RETURN AIR
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
REC	RECESSED
RED	REDUCER
RH	RELATIVE HUMIDITY
RL/A	RELIEF AIR
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RW	RAIN WATER
SF	SQUARE FOOT
S/A	SUPPLY AIR
SAN	SANITARY
SF	SQUARE FOOT
SD	SMOKE DAMPER
SM	SURFACE MOUNT
SP	STANDPIPE
SP	STATIC PRESSURE
STM	STEAM
T	THERMOSTAT
TD	TEMPERATURE DROP
TDR	TRENCH DRAIN
TEMP	TEMPERATURE
TYP	TYPICAL
UG	UNDERGROUND
VAC	VACUUM
V	VENT
VAV	VARIABLE AIR VOLUME
VENT	VENTILATION
VTR	VENT THROUGH ROOF
W	WASTE
WB	WET BULB
WCO	WALL CLEAN OUT
WH	WALL HYDRANT

EQUIPMENT ABBREVIATIONS

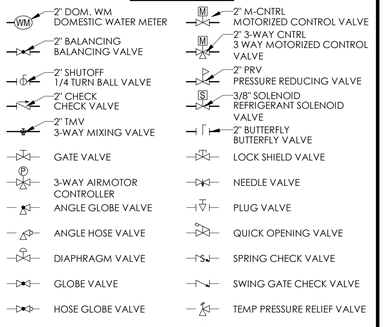
AC	AIR CONDITIONING UNIT
ACCU	AIR COOLING CONDENSING UNIT
AHU	AIR HANDLING UNIT
AS	AIR SEPARATOR
B	BOILER
CH	CHILLER
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
CHWP	CHILLED WATER PUMP
DBP	DOMESTIC WATER BOOSTER PUMP
DC	DUCT MOUNTED COIL
DCP	DOMESTIC WATER CIRCULATING PUMP
EF	EXHAUST FAN
EDC	ELECTRIC DUCT COIL
ET	EXPANSION TANK
EWH	ELECTRIC WATER HEATER
FCU	FAN COIL UNIT
FP	FIRE PUMP
GI	GREASE INTERCEPTOR
GRV	GRAVITY ROOF VENTILATOR
HWP	HEATING WATER PUMP
HRU	HEAT RECOVERY UNIT
PRV	POWER ROOF VENTILATOR
RE	RETURN/EXHAUST FAN
RTU	ROOFTOP UNIT
SP	SUMP PUMP
UH	UNIT HEATER
WH	WATER HEATER

PLUMBING AND PIPING SYMBOLS

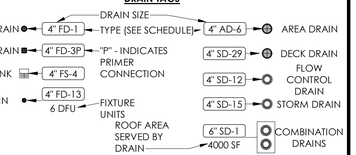
- CHWR — CHILLED WATER RETURN
- CHWS — CHILLED WATER SUPPLY
- CD — CONDENSATE DRAINAGE
- CWR — CONDENSER WATER RETURN
- CWS — CONDENSER WATER SUPPLY
- GWR — GEOTHERMAL WATER RETURN
- GWS — GEOTHERMAL WATER SUPPLY
- HWR — HEATING WATER RETURN
- HWS — HEATING WATER SUPPLY
- G — NATURAL GAS
- PG — PROPANE GAS
- REF-L — REFRIGERANT-LIQUID
- REF-S — REFRIGERANT-SUCTION
- REF-HG — REFRIGERANT-HOT GAS
- STM — STEAM
- CDR — CONDENSATE RETURN
- CWV — COMBINATION WASTE & VENT
- CA — COMPRESSED AIR
- CW — DOMESTIC COLD WATER
- H-CW — HARD COLD WATER
- S-CW — SOFT COLD WATER
- F-CW — FILTERED COLD WATER
- RO — REVERSE OSMOSIS WATER
- HW — HOT WATER
- HW 140° — HOT WATER 140°
- HW-R — HOT WATER RECIRCULATION
- HW-R 140° — HOT WATER RECIRCULATION 140°
- GV — GREASE VENT
- GW — GREASE WASTE
- IW — INDIRECT WASTE
- OV — OIL VENT
- OW — OIL WASTE
- PD — PUMP DISCHARGE
- V — SANITARY VENT
- SS — SANITARY SEWER
- SHWR — SOLAR HOT WATER RETURN
- SHWS — SOLAR HOT WATER SUPPLY
- SD — STORM DRAINAGE
- OSD — OVERFLOW STORM DRAINAGE



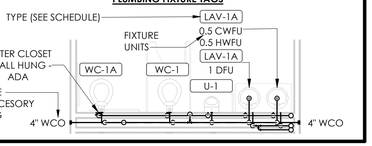
PIPE ACCESSORY TAGS



DRAIN TAGS



PLUMBING FIXTURE TAGS



* NOTE *
ALL GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET. THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

PROJECT GENERAL NOTES

A. COORDINATE INSTALLATION OF PIPING, DUCTWORK, CONDUIT, LIGHTS, CABLE TRAY, STRUCTURE, AND EQUIPMENT TO PREVENT CONFLICTS.

B. FINAL PRODUCT SHALL BE A COMPLETE AND FUNCTIONING SYSTEM, AND SHALL CONFORM TO ALL REQUIREMENTS OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING BUT NOT LIMITED TO THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL MECHANICAL CODE.

C. LOCATE DUCTWORK, PIPING AND MECHANICAL EQUIPMENT AWAY FROM THE SPACE ABOVE ELECTRICAL PANELS, TRANSFORMERS AND OTHER ELECTRICAL EQUIPMENT.

D. PENETRATIONS OF RATED ASSEMBLIES SHALL BE FIRE STOPPED. FIRE STOPPING SHALL BE AN APPROVED MATERIAL AS PRESCRIBED IN CSFM STANDARD 43-1 AND SHALL BE U.L. LISTED.

E. PROVIDE SLEEVES AND/OR OPENINGS TO RUN PIPES AND DUCTS THROUGH FOUNDATIONS, FLOORS, WALLS, AND ROOF.

F. MAINTAIN CLEAR ACCESS TO SERVICE EQUIPMENT AND OTHER ACCESSORIES REQUIRING SERVICE, VISUAL INSPECTION OR HAND OPERATION. WHERE INDICATED OR REQUIRED, PROVIDE ACCESS PANELS OF THE TYPE SELECTED TO SUIT MATERIALS IN WHICH INSTALLED.

G. ADJUST PIPING AND DUCTWORK SIZES TO PROPERLY CONNECT TO MECHANICAL EQUIPMENT.

H. REFER TO HVAC SERIES DRAWINGS FOR GAS AND A.C. CONDENSATE DRAIN PIPING.

I. PIPE SIZES SHOWN SHALL BE CONTINUED IN THE DIRECTION OF FLOW UNTIL ANOTHER SIZE IS SHOWN.

J. FOR DETAILS, EQUIPMENT CONNECTIONS, AND PIPE SIZES NOT SHOWN ON THE SEGMENTS, REFER TO DETAILS, SCHEDULES, AND SPECIFICATIONS.

K. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE RESPECTIVE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS, AT A LEVEL OF QUALITY AND WORKMANSHIP CONSISTENT WITH THE SPECIFICATIONS.

L. LOCATIONS OF PIPING, DUCTWORK AND EQUIPMENT AS INDICATED ON THE DRAWING, ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD. WORK SHALL BE COORDINATED WITH ALL OTHER TRADES TO AVOID INTERFERENCE IN THE FIELD.

M. INSTALL EXPOSED PIPING AND DUCTWORK AS HIGH AS PRACTICAL IN ROOMS WITHOUT CEILINGS.

N. THE CONTRACTOR'S WORK SCHEDULE SHALL BE SUBMITTED TO AND APPROVED BY THE OWNER.

O. PRIOR TO STARTING WORK, SUBMIT SHOP DRAWINGS FOR ALL MECHANICAL EQUIPMENT, PLUMBING FIXTURES, AND DIFFUSERS.

P. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND SHALL ARRANGE FOR ALL INSPECTIONS AS REQUIRED.

Q. PROVIDE ONE YEAR WARRANTY FOR ALL WORKMANSHIP AND MATERIALS AFTER THE DATE OF FINAL ACCEPTANCE.

PLUMBING GENERAL NOTES

A. PITCH UNDERFLOOR SANITARY WASTE PIPING 3" DIAMETER OR GREATER AT 1/8" PER FOOT, AND PITCH SANITARY WASTE PIPING LESS THAN 3" DIAMETER AT 1/4" PER FOOT, UNLESS NOTED OTHERWISE.

B. FIELD VERIFY LOCATION AND INVERTS OF SITE UTILITIES PRIOR TO INSTALLATION.

C. ROUTE DOMESTIC WATER, SANITARY SEWER, AND STORM SEWER SERVICES TO SITE UTILITIES 5'-0" FROM BUILDING UNLESS NOTED OTHERWISE. REFER TO CIVIL PLANS.

D. WASTE AND VENT PIPING BELOW FLOOR AND THROUGH FLOOR SHALL BE 2' MINIMUM.

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SHEET TITLE
PLUMBING GENERAL INFORMATION & SYMBOL LEGEND

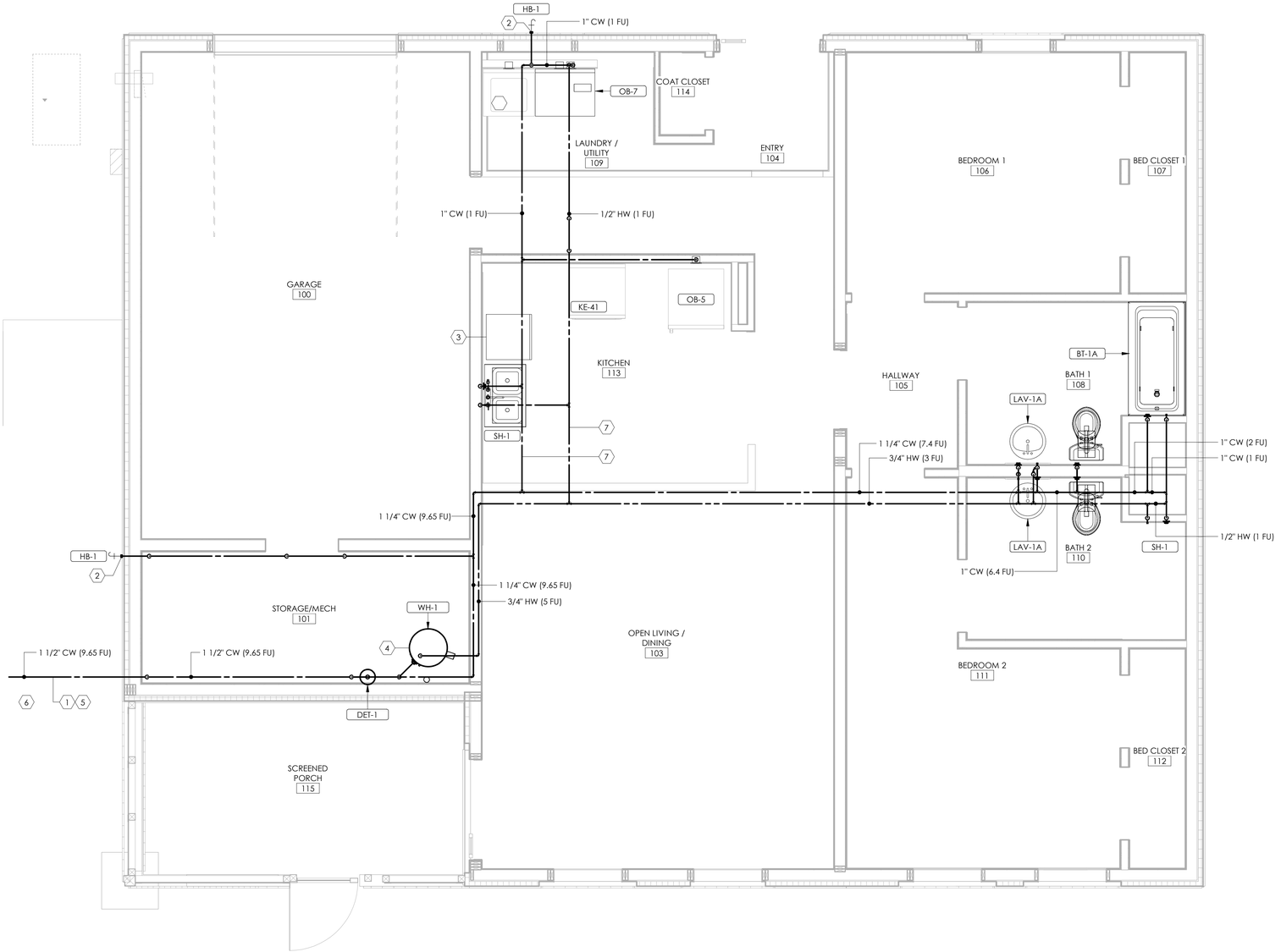
SHEET NO.
P001

PLUMBING GENERAL SHEET NOTES

A	THIS PLAN IS DIAGRAMMATIC IN NATURE AND SHALL NOT BE SCALED TO DETERMINE THE LOCATION OR DIMENSION OF THE WORK. CONTRACTOR SHALL VERIFY EXACT LOCATION OF PIPING AND PENETRATIONS.
B	ALL CONDENSATE DRAIN PIPE SHALL BE RUN AT 1% GRADE.
C	MAINTAIN MINIMUM 10'-0" SEPARATION BETWEEN FLUE AND PLUMBING VENT OUTLETS AND ANY FRESH AIR INTAKE. COORDINATE WITH HVAC CONTRACTOR.
D	PROVIDE ALL FLOOR DRAINS WITH TRAP GUARD DEVICES (ASSE 1072 COMPLIANT).
E	SEE RISER DIAGRAMS FOR PIPE SIZING.

KEYNOTES

1	ROUTE 1 1/2" CW LINE BELOW SLAB INTO MECHANICAL ROOM AND ROUTE THRU WATER METER.
2	CONTRACTOR TO INSTALL FREEZE PROOF HOSE BIBB PER MANUFACTURER'S REQUIREMENTS.
3	PROVIDE CW/HW LINE HOOKUPS FOR DISHWASHER PER MANUFACTURER'S REQUIREMENTS.
4	INSTALL WH-1 PER MANUFACTURER'S REQUIREMENTS.
5	CW LINE SHALL BE ROUTED BELOW FROST LINE.
6	SEE CIVIL PLANS FOR WATERLINE CONNECTION.
7	ROUTE HW AND CW ABOVE CEILING (TYPICAL).



1 / P101 PLUMBING PLAN - DOMESTIC WATER

SCALE: 3/8" = 1'-0"

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SHEET TITLE
DOMESTIC WATER FLOOR PLAN

SHEET NO.

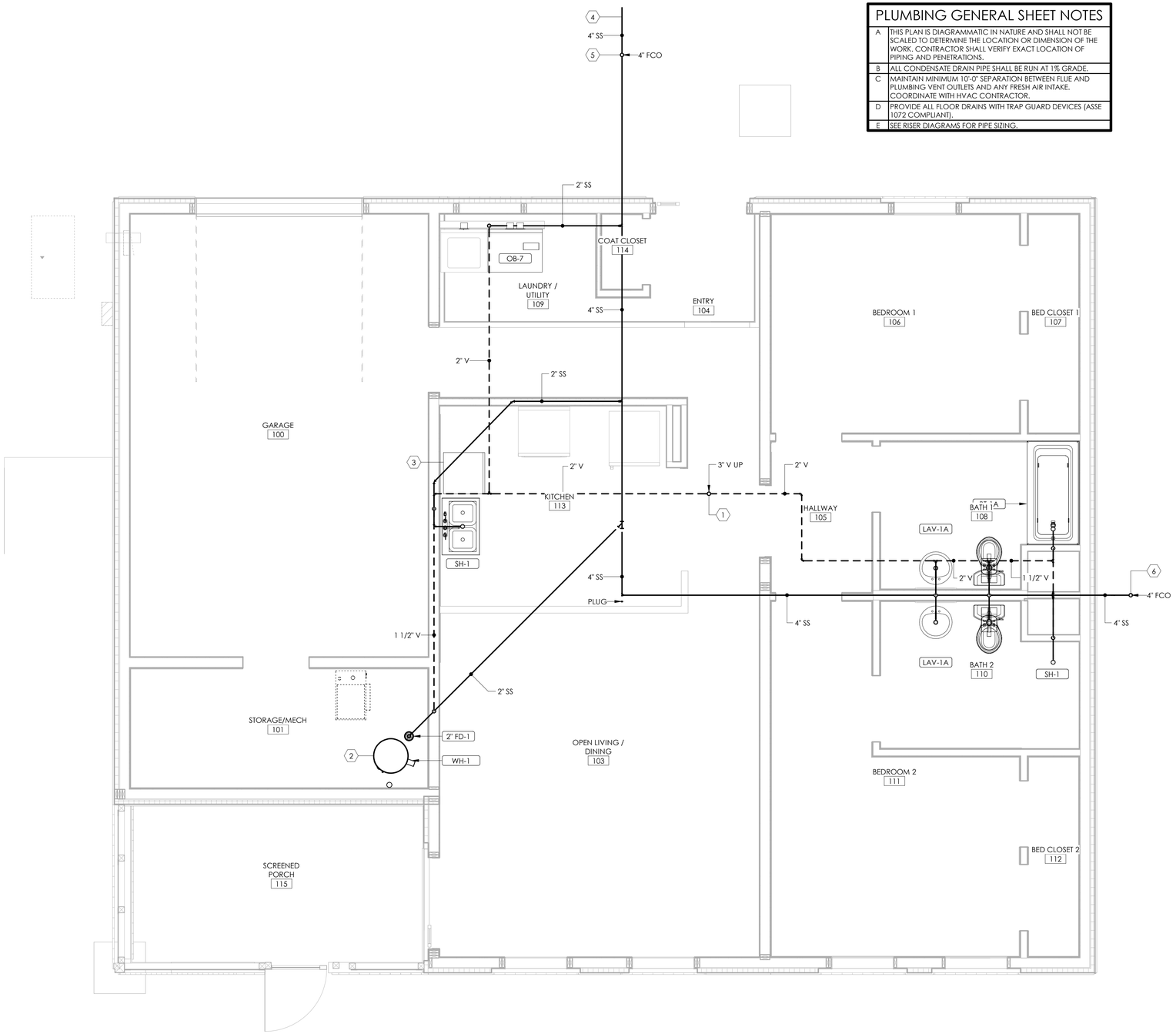
P101

KEYNOTES

1	SANITARY VENT THRU ROOF.
2	CONTRACTOR TO PROVIDE DRAIN PIPING FROM WATER HEATER DRAIN VALVE TO INDIRECT CONNECTION AT FLOOR DRAIN.
3	CONTRACTOR TO CONNECT DISHWASHER DRAIN LINE TO KITCHEN SINK DRAIN LINE.
4	SEE CIVIL PLANS FOR SANITARY SEWER CONNECTION.
5	INSTALL CLEANOUT IN LANDSCAPING AREA.
6	INSTALL CLEANOUT OUTSIDE OF BUILDING.

PLUMBING GENERAL SHEET NOTES

A	THIS PLAN IS DIAGRAMMATIC IN NATURE AND SHALL NOT BE SCALED TO DETERMINE THE LOCATION OR DIMENSION OF THE WORK. CONTRACTOR SHALL VERIFY EXACT LOCATION OF PIPING AND PENETRATIONS.
B	ALL CONDENSATE DRAIN PIPE SHALL BE RUN AT 1% GRADE.
C	MAINTAIN MINIMUM 10'-0" SEPARATION BETWEEN FLUE AND PLUMBING VENT OUTLETS AND ANY FRESH AIR INTAKE. COORDINATE WITH HVAC CONTRACTOR.
D	PROVIDE ALL FLOOR DRAINS WITH TRAP GUARD DEVICES (ASSE 1072 COMPLIANT).
E	SEE RISER DIAGRAMS FOR PIPE SIZING.



1 P121 PLUMBING PLAN - SANITARY AND VENT

SCALE: 3/8" = 1'-0"

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SHEET TITLE
SANITARY AND VENT FLOOR PLAN

SHEET NO.

P121

GAS-FIRED WATER HEATER SCHEDULE

ID	LOCATION NAME	LOCATION NO.	TYPE	GAS-FIRED HEAT EXCHANGER: GAS BURNER INPUT	GAS BURNER CAP	GAS BURNER EFF	GAS BURNER STAGES	GAS BURNER FUEL TYPE	GAS BURNER FUEL PRESS AVAIL	WATERSIDE FLOW DESIGN	WATERSIDE FLOW MIN @ MIN FIRE	WATERSIDE STORAGE RECOVERY	WATERSIDE STORAGE VOL	MAX TEMP RISE	THERMAL EFF	ASME	UNIT WEIGHT	FLA	MCA	MOCP	VOLT	PH	REMARKS
WH-1	STORAGE/MECH	101	CONDENSING	40000 Btu/h	38000 Btu/h	95.0%	2	NG	2.0 psi			0 gal/h	40.0 gal	90 °F	95%		135 lb	0.0 A	7.3 A	15.0 A	120 V	1	PROVIDE ASSE 1017 COMPLIANT MIXING VALVE: POWERS SERIES LFSH OR EQUAL.

DOMESTIC EXPANSION TANK SCHEDULE

ID	LOCATION NAME	LOCATION NO.	MANUFACTURER	MODEL NO.	SYSTEM	TYPE	ARRANGEMENT	VOL	MAX ACCEPTANCE FACTOR	ACCEPT. VOL	PRESS RELIEF	PRECHARGE PRESS	UNIT DIMENSIONS DIAMETER	UNIT DIMENSIONS HEIGHT	ASME	UNIT WEIGHT	REMARKS
DET-1	STORAGE/MECH	101	AMTROL	ST-5C	DOM. WATER	FIXED DIAPHRAM	INLINE	2.0 gal	0.45	0.9 gal	100 psi	55 psi	8"	14"	Yes	27 lb	

PLUMBING FIXTURE SCHEDULE

ID	DESCRIPTION	FINISH	FLOW FIXTURE WATER FLOW	WASTE ROUGH-IN PIPE SIZE	VENT PIPE SIZE	COLD WATER ROUGH-IN PIPE SIZE	HOT WATER ROUGH-IN PIPE SIZE	SPECIFICATION	REMARKS
BT-1A	BATHTUB - ADA	WHITE	1.0 GPM	2"	1 1/2"	1/2"	1/2"	TUB/SHOWER SYSTEM, ASSE 1016 COMPLIANT TYPE "T/P" THERMOSTATIC/PRESSURE BALANCING COMBINATION MIXING VALVE WITH ADJUSTABLE STOP SCREW TO LIMIT HANDLE TURN. PROVIDE MANUFACTURER'S FLOW RATE RESTRICTOR ON SHOWERHEAD. INSTALL ALL FIXTURES AND ACCESSORIES PER ADA REQUIREMENTS.	
HB-1	HOSE BIBB		2.5 GPM			1/2"		INTERIOR HOSE BIBB WITH VACUUM BREAKER, 3/4" HOSE THREAD OUTLET, LOCK SHIELD CAP, AND REMOVABLE 'TEE' HANDLE. PROVIDE SHUTOFF VALVE IN COLD WATER SUPPLY AHEAD OF HOSE BIBB.	
LAV-1A	LAVATORY - WALL HUNG - ADA	WHITE	0.5 GPM	2"	1 1/2"	1/2"	1/2"	WALL HUNG LAVATORY WITH BACKSPLASH, FAUCET HOLES ON 4" CENTERS, DECK-MOUNTED FAUCET WITH SENSOR, WATER TURBINE POWER WITH VANDAL RESISTANT SPRAY, EXTERNAL ASSE 1070 COMPLIANT THERMOSTATIC MIXING VALVE, GRID DRAIN, LOOSE KEY ANGLE STOPS AND SUPPLIES, INSULATE WATER AND WASTE WITH ADA INSULATION KIT. MOUNT AT ADA COMPLIANT HEIGHT.	
OB-5	REFRIGERATOR OUTLET BOX	WHITE	0.5 GPM			1/2"		FULLY RECESSED FIRE RATED REFRIGERATOR SUPPLY BOX WITH COVER. PROVIDE 1/4 TURN BALL VALVES AND WATER HAMMER ARRESTORS IN BOX.	
OB-7	WASHING MACHINE OUTLET BOX	WHITE	0.5 GPM	2"	2"	1/2"	1/2"	FULLY RECESSED FIRE RATED WASHING MACHINE SUPPLY BOX WITH COVER. PROVIDE 1/4 TURN BALL VALVES AND WATER HAMMER ARRESTORS IN BOX. PROVIDE A 2" TRAPPED STANDPIPE IN CONCEALED WALL SPACE.	
OB-8	DRYER GAS BOX	WHITE	0.0 GPM					FULLY RECESSED FIRE RATED GAS VALVE BOX WITH COVER. PROVIDE 1/4 TURN BALL VALVE. PROVIDE A GAS REGULATOR ASSEMBLY AND DRIP LEG IN CONCEALED WALL SPACE.	
SH-1	SHOWER STALL		1.0 GPM	2"	1 1/2"	1/2"	1/2"	THE INDIVIDUAL SHOWER STALL IS SPECIFIED IN ANOTHER DIVISION. PROVIDE A SHOWER DRAIN AS SPECIFIED IN "SOIL, WASTE, AND VENT PIPING SYSTEMS." SHOWER SYSTEM WITH ASSE 1016 COMPLIANT TYPE "T/P" THERMOSTATIC/PRESSURE BALANCING COMBINATION MIXING VALVE WITH ADJUSTABLE STOP SCREW TO LIMIT HANDLE TURN. PROVIDE MANUFACTURER'S FLOW RATE RESTRICTOR ON SHOWERHEAD.	
WC-3A	WATER CLOSET - FLOOR - TANK TYPE - ADA	WHITE		3"	2"	1/2"		ELONGATED FLOOR MOUNTED TANK TYPE WATER CLOSET, WITH CHURCH 295CT ELONGATED OPEN FRONT SEAT. PROVIDE A 1/4" BRASS BALL VALVE AT WALL CONNECTION. INSTALL AT ADA COMPLIANT HEIGHT.	

FLOOR DRAIN SCHEDULE

ID	DESCRIPTION	MATERIAL DESCRIPTION: DRAIN BODY	MATERIAL DESCRIPTION: STRAINER	PRIMER CONNECTION	WASTE PIPE SIZE	VENT PIPE SIZE	SPECIFICATION	REMARKS
FD-1	FLOOR DRAIN	EPOXY COATED CAST IRON	NICKEL BRONZE	No	2"	2"	EPOXY COATED CAST IRON FLOOR DRAIN WITH ANCHOR FLANGE, REVERSIBLE CLAMPING COLLAR WITH PRIMARY & SECONDARY WEEPHOLES, ADJUSTABLE ROUND HEEL PROOF NICKEL BRONZE STRAINER, AND NO HUB OUTLET.	

DIVISION 22 PLUMBING SPECIFICATIONS

PLUMBING:

1. WORK UNDER THIS SECTION SHALL COMPLY WITH LOCAL GOVERNING REGULATIONS, CODES AND ORDINANCES.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL PLUMBING AND FIXTURES AS REQUIRED.
3. SOIL, WASTE AND VENT PIPING SHALL BE SCHEDULE 40 PVC PIPING.
4. HOT AND COLD WATER DISTRIBUTION IN BUILDING SHALL BE BY COPPER PIPE. ALL HOT WATER SUPPLY LINES TO BE INSULATED.
5. OUTSIDE UNDERGROUND WATER PIPING SHALL BE SCHEDULE 40 PVC, AS APPROVED BY THE LOCAL PLUMBING INSPECTION DEPARTMENT.
6. COORDINATE AS NECESSARY WITH OTHER TRADES TO ENSURE PROPER AND ADEQUATE PROVISION IN THE WORK OF THOSE TRADES FOR INTERFACE WITH THE WORK OF THIS SECTION.
7. PLUMBING CONTRACTOR SHALL PREPARE ANY ADDITIONAL PLUMBING DIAGRAMS AND / OR DRAWINGS AS REQUIRED TO OBTAIN NECESSAG PLUMBING PERMIT(S).
8. ALL WATER PIPING SHALL BE NON-BARRIER PEX TUBING WITH BRASS FITTINGS AND MANIFOLDS PER ASTM F877.

PLUMBING FIXTURE SCHEDULE:

WATER CLOSET:
ZURN MODEL Z5555-K, COMFORT HEIGHT ELONGATED 1.6 GPF TANK, WITH A CLOSED FRONT, STAINLESS STEEL CHECK HINGE TOILET SEAT.

LAVATORY:
ZURN MODEL Z5120, 19" ROUND SELF-RIMMING, VITREOUS CHINA, COUNTERTOP LAVATORY WITH 4" FAUCET HOLES.

LAVATORY FAUCET:
ZURN MODEL Z7440-XL, SINGLE HANDLE CENTERSET, 5" INTEGRAL SPOUT, CERAMIC DISC CARTRIDGE AND TEMPERATURE LIMIT STOP, 1.5 GPM AERATOR AND SEPARATE USER PROTECTION THERMOSTATIC MIXING VALVE.

TUB/SHOWER:
AKER MODEL GB-60, ONE-PIECE ACRYLX SOAKER TUB.

TUB/SHOWER FAUCET:
ZURN MODEL Z7302-SS-MT, SINGLE HANDLE PRESSURE BALANCE, CHROME PLATED METAL TRIM AND HANDLE, 2.5 GPM CHROME PLATED SHOWER HEAD, CHROME PLATED DIVERTER TUB SPOUT.

SHOWER:
MAAX MODEL BFS-60F, ADA COMPLIANT RECTANGULAR SHOWER WITH AN L-SHAPED FOLD-UP SEAT, GRAB BARS, STAINLESS STEEL CURTAIN ROD WITH GROMMETS, SOLID BRASS DRAIN WITH A STAINLESS STEEL GRID.

SHOWER FAUCET:
ZURN MODEL Z7301-SS-MT, SINGLE HANDLE PRESSURE BALANCE, CHROME PLATED METAL TRIM AND HANDLE, 2.5 GPM CHROME PLATED SHOWER HEAD.

ROLL-IN SHOWER:
TILE REDI MODEL 3772CBF-PVC, BARRIER-FREE ROLL-IN ADA SHOWER PAN.

ROLL-IN SHOWER FAUCET:
ZURN MODEL Z7300-SS-MT-HW6, SINGLE HANDLE PRESSURE BALANCE, CHROME PLATED METAL TRIM AND HANDLE, 2.5 GPM, 60" METAL HOSE, 24" CHROME METAL MOUNTING BAR, VACUUM BREAKER, CHROME SUPPLY ELBOW AND FLANGE.

KITCHEN SINK:
ELKAY/DAYTON MODEL DDW5023322, 7" DOUBLE BOWL DROP-IN SINK, 22 GAUGE 3000 SATIN FINISHED STAINLESS STEEL, CENTER DRAINS

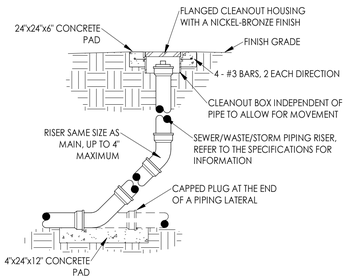
KITCHEN SINK FAUCET:
DELTA MODEL 21996LF, 8" CENTER, 8" LONG HIGH SPOUT, METAL LEVER HANDLES WITH ¼ TURN STOPS, 1.8 GPM FLOW, MATCHING SPRAY ATTACHMENT.

LAUNDRY:
IPS CORP./GUY GRAY MODEL B200, GALVANIZED METAL CENTER DRAIN WASHING MACHINE OUTLET BOX, 2" DRAIN, ½" SWEAT SUPPLY CONNECTIONS.

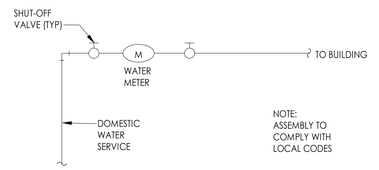
WATER HEATER:
BRADFORD WHITE MODEL M-1-TW-40S6FBN, RESIDENTIAL GAS-FIRED POWER VENT ENERGY SAVER.

WALL HYDRANT:
ZURN MODEL Z1344, EXPOSED NON-FREEZE WALL HYDRANT, CHROME FINISHED BRASS, VACUUM BREAKER.

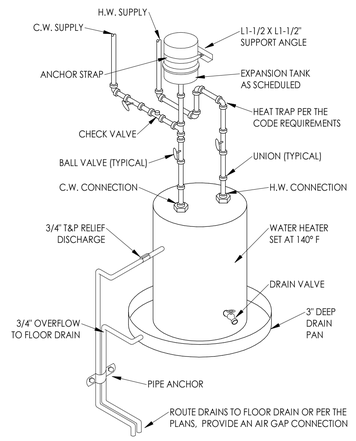
FLOOR DRAIN:
ZURN MODEL EZ-PV2, PVC BODY, 2" BOTTOM OUTLET, ROUND LIGHT DUTY NICKEL BRONZE STRAINER WITH ROUGH-IN COVER.



3 P500 CLEAN OUT AND PLUGGED RISER
SCALE: NTS



2 P500 WATER SERVICE PIPING DETAIL
SCALE: NTS



1 P500 WATER HEATER DETAIL
SCALE: NTS

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ISSUE DATE:
10-23-2020

REVISIONS

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220046

SHEET TITLE
PLUMBING DETAILS, SCHEDULES AND SPECIFICATONS

SHEET NO.
P500

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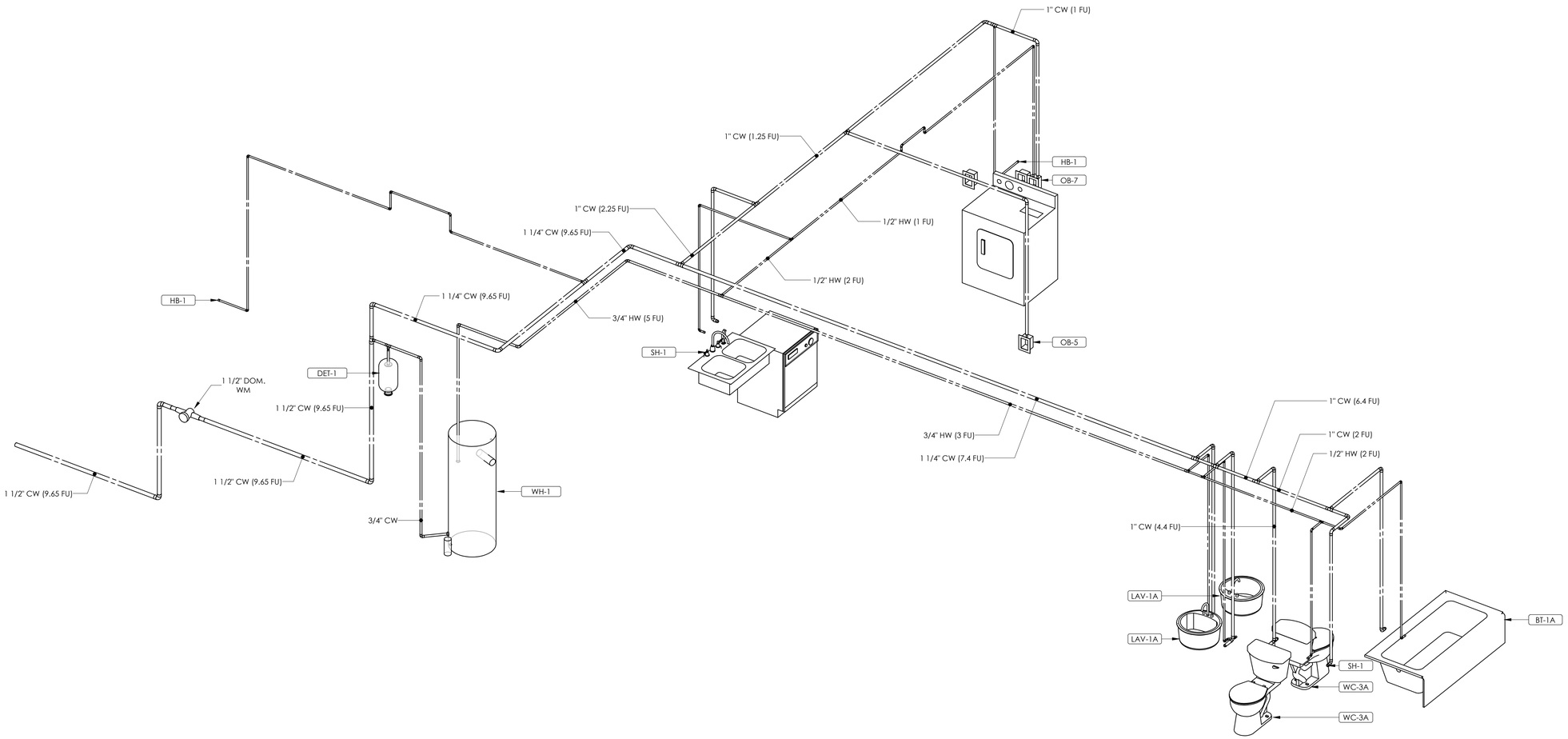
KEYNOTES

PLUMBING GENERAL SHEET NOTES

A	THIS PLAN IS DIAGRAMMATIC IN NATURE AND SHALL NOT BE SCALED TO DETERMINE THE LOCATION OR DIMENSION OF THE WORK. CONTRACTOR SHALL VERIFY EXACT LOCATION OF PIPING AND PENETRATIONS.
B	ALL CONDENSATE DRAIN PIPE SHALL BE RUN AT 1% GRADE.
C	MAINTAIN MINIMUM 10'-0" SEPARATION BETWEEN FLUE AND PLUMBING VENT OUTLETS AND ANY FRESH AIR INTAKE. COORDINATE WITH HVAC CONTRACTOR.
D	PROVIDE ALL FLOOR DRAINS WITH TRAP GUARD DEVICES (ASSE 1072 COMPLIANT).
E	SEE RISER DIAGRAMS FOR PIPE SIZING.



DOMESTIC WATER RISER DIAGRAM
SCALE:

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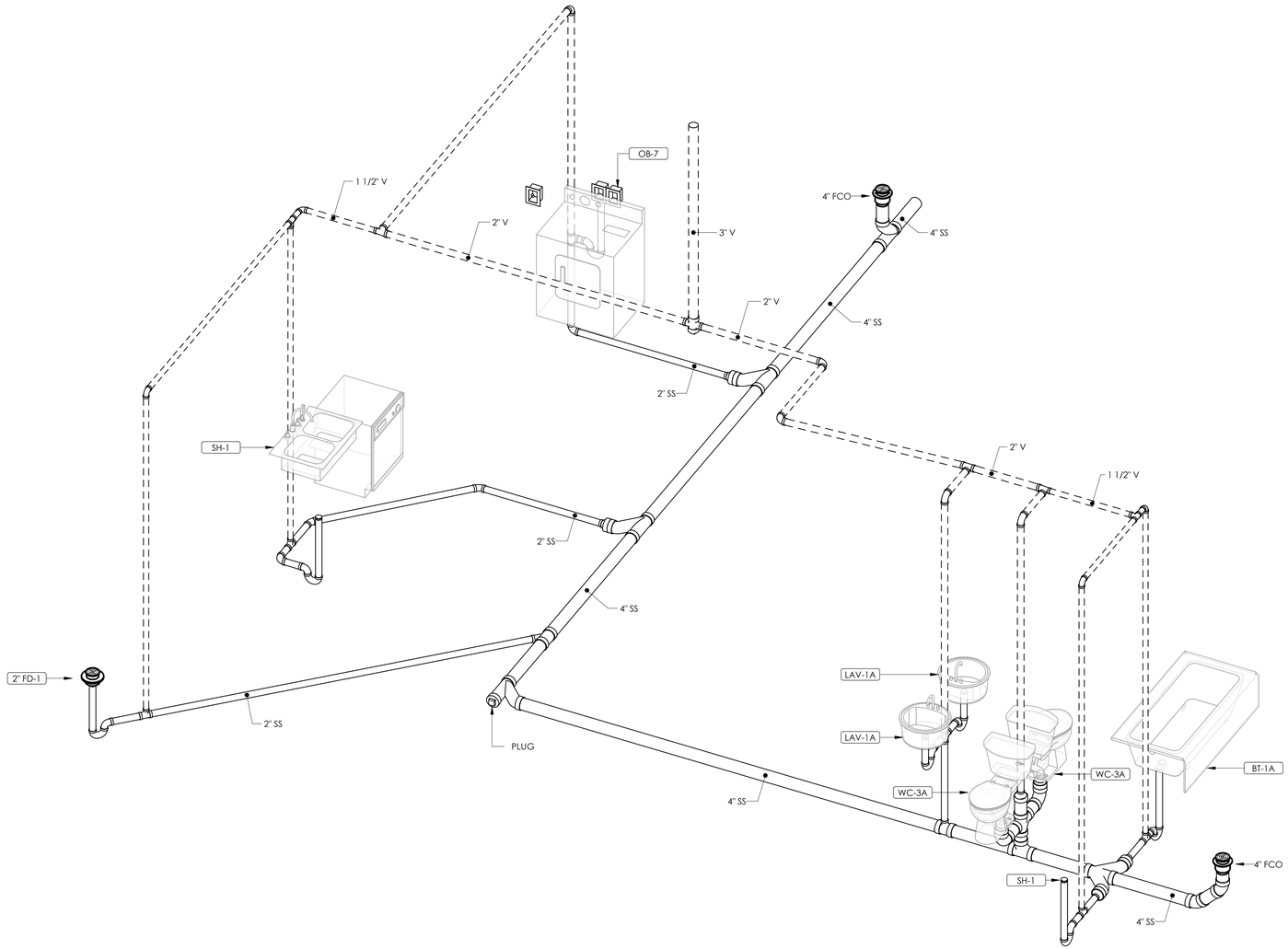

WASTE & VENT RISER DIAGRAM

SCALE:

KEYNOTES

PLUMBING GENERAL SHEET NOTES

A	THIS PLAN IS DIAGRAMMATIC IN NATURE AND SHALL NOT BE SCALED TO DETERMINE THE LOCATION OR DIMENSION OF THE WORK. CONTRACTOR SHALL VERIFY EXACT LOCATION OF PIPING AND PENETRATIONS.
B	ALL CONDENSATE DRAIN PIPE SHALL BE RUN AT 1% GRADE.
C	MAINTAIN MINIMUM 10'-0" SEPARATION BETWEEN FLUE AND PLUMBING VENT OUTLETS AND ANY FRESH AIR INTAKE. COORDINATE WITH HVAC CONTRACTOR.
D	PROVIDE ALL FLOOR DRAINS WITH TRAP GUARD DEVICES (ASSE 1072 COMPLIANT).
E	SEE RISER DIAGRAMS FOR PIPE SIZING.

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SHEET TITLE
WASTE & VENT RISER DIAGRAMS

SHEET NO.

P521

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION
	LIGHTING FIXTURES, TYPICAL. RECTANGULAR FILLED CIRCLES INDICATE RECESSED, OPEN CIRCLES INDICATE SURFACE DIAGONAL LINE INDICATES LENSED OUTER DOTS INDICATE SUSPENDED
	LIGHTING FIXTURES, TYPICAL, ROUND CENTER DOT INDICATES PENDANT DIAGONAL LINE INDICATES LENSED CHEVRON INDICATES WALL WASH
	WALL-MOUNTED FIXTURES, TYPICAL
	STRIP FIXTURE
	DIRECTIONAL LIGHT, TRACK, FLOOD
	LINEAR LIGHT, TAPE LIGHT
	DIAGONAL HATCH INDICATES LIGHT ON A CRITICAL CIRCUIT
	SOLID HATCH INDICATES LIGHT ON AN EMERGENCY OR LIFE SAFETY CIRCUIT
S	SINGLE POLE SWITCH
S3	3-WAY SWITCH
S4	4-WAY SWITCH
SK	KEYED SWITCH
SP	SWITCH W/PILOT
SD	DIMMER SWITCH
SOS	OCCUPANCY SENSOR W/ MANUAL SWITCH
ST	TIMER SWITCH
STD	TIME DELAY SWITCH
STC	TIME CONTROL SWITCH

SYMBOL	DESCRIPTION
	SINGLE RECEPT.
	DUPLEX RECEPT.
48"	(DESIGNATES SPECIFIC MOUNT HT) DUPLEX RECEPT.
GFI	GFI DUPLEX RECEPT. (FEED THROUGH)
GFI WP	GFI WEATHERPROOF RECEPT.
AC GFI	DUPLEX RECEPTACLE
	SPLIT DUPLEX RECEPT.
	DUPLEX ISOLATED GROUND RECEPT.
	DUPLEX RECEPT. ON EMERG. CIRCUIT
FD	FLOOR DUPLEX RECEPT.
CLNG	CEILING DUPLEX RECEPT.
	FOURPLEX RECEPT.
	FOURPLEX RECEPT. ON EMERG. CIRCUIT
4PRS	FOURPLEX RECEPTACLE
240	240V RECEPTACLE
	RECEPT. ON CORD REEL
	SPECIAL RECEPT.
J	JUNCTION BOX
FJ	FLOOR JUNCTION BOX
J CLNG	CEILING JUNCTION BOX
PS - D2	MULTIOUTLET ASSEMBLY
	COMB. MOTOR STARTER (FUSED)
	SAFETY DISC. SW. (NON-FUSED)
	SAFETY DISC. SW. (FUSED)
R	RELAY
	PUSH BUTTON
T	THERMOSTAT
H	HUMIDISTAT
T1	TRANSFORMER

SYMBOL	DESCRIPTION
	TELEPHONE OUTLET
	FLOOR TELEPHONE OUTLET
1V2D	VOICE/DATA OUTLET # OF VOICE AND # OF DATA OUTLETS. EXAMPLE 1V2D = 1 VOICE, 2 DATA
	FLOOR DATA OUTLET
M	MICROPHONE OUTLET
CLNG	CEILING DATA OUTLET
	CATV OUTLET
TV	TV OUTLET
V	VOLUME CONTROL
	DOOR BELL
	DOOR BUZZER
	DOOR CHIME
	DOOR CHIME
D	DOOR SIGNAL
	AUTO DOOR PUSH PAD
ES	ELECTRIC STRIKE
ML	MAGNETIC LOCK
CL	COMBINATION LOCK
DC	DOOR CONTACT
CR	CARD READER
	SECURITY KEYPAD
MD	MOTION DETECTOR

ELECTRICAL SYMBOL NOTES

ELEC-1 2,4 — SPECIAL CONNECTIONS. THE EQUIPMENT IS INDICATED BY A NUMBER IN A CIRCLE. SEE THE MOTOR AND EQUIPMENT SCHEDULE FOR THE LOAD DESCRIPTION AND TYPE OF CONNECTION. THE CIRCUIT DESIGNATION IS INDICATED BY NUMBER(S) ADJACENT TO THE SYMBOL. EXAMPLE: EQUIPMENT NO. ELEC-1; 1 PHASE CONNECTION TO CIRCUITS 2, 4.

PANELBOARDS. PANELBOARD DOORS MAY BE SHOWN TO INDICATE OPENING SIDE OF RECESSED PANELBOARDS. SEE PANELBOARD IDENTIFICATION FOR DESIGNATION CODES.

FLOOR CLEARANCE AREA

CONDUIT IN CEILING, FLOOR OR WALL AS REQUIRED BY FIELD CONDITIONS

CONDUIT IN FLOOR

#12 — CONDUIT SHOWN WITHOUT SLASH MARKS SHALL CONTAIN 1 # 12 CONDUCTOR PER PHASE, NEUTRAL, AND GROUND IN 1/2" CONDUIT UNLESS SPECIFIC EQUIPMENT REQUIRES A DIFFERENT SIZE.

#10 — CONDUIT SHOWN SHALL CONTAIN 1 # 10 CONDUCTOR PER PHASE IN ELECTRICAL CODE SIZED MINIMUM CONDUIT UNLESS A CONDUCTOR AND CONDUIT SIZE IS SHOWN ADJACENT.

P4N-102 1, 3, 5 — HOME RUN TO BRANCH CIRCUIT PANELBOARD. THE PANELBOARD DESIGNATION IS SHOWN ADJACENT TO THE HOME RUN ARROW AS A NUMERATOR AND THE CIRCUIT DESIGNATION IS SHOWN AS THE DENOMINATOR. CIRCUIT BREAKER SIZES (AMPS/NUMBER OF POLES) ARE SHOWN IN THE PANELBOARD SCHEDULE WITH THE CORRESPONDING PANELBOARD AND CIRCUIT DESIGNATION. EXAMPLE: HOME RUN TO PANELBOARD P4N-102; CIRCUITS 1, 3, 5.

REVISION NUMBER - SHOWN ON PLANS

- NUMBER OF DETAIL ON SHEET
--- NUMBER OF SHEET WHERE DETAIL APPEARS

1 — KEYED NOTE (SEE SCHEDULE)

Room 6 — ROOM NAME AND NUMBER

PANELBOARD IDENTIFICATION

P4N-102

1. EQUIPMENT DESIGNATION:
L = LIGHTING
P = POWER
D = DISTRIBUTION
S = SWITCHBOARD
M = MOTOR CONTROL CENTER
R = RELAY PANEL

2. VOLTAGE DESIGNATION:
1 = 120/240V - 1PH
2 = 240V - 3PH
3 = 208Y/120V - 3PH
4 = 480Y/277V - 3PH
5 = 120/208 - 1PH
6 = SPECIAL

3. SYSTEM DESIGNATION:
N = NORMAL
E = EMERGENCY
C = POWER CONDITIONED
U = UNINTERRUPTIBLE POWER SOURCE

5. PANEL NO. DESIGNATION:
01 = PANELBOARD #1
02 = PANELBOARD #2
03 = PANELBOARD #3
ETC.

4. FLOOR DESIGNATION:
B = BASEMENT
G = GROUND
1 = FIRST FLOOR
2 = SECOND FLOOR
ETC.

ELECTRICAL ABBREVIATIONS LIST

1P	1 POLE (2P, 3P, 4P, ETC.)	MCB	MAIN CIRCUIT BREAKER
A	AMPERE	MDC	MAIN DISTRIBUTION CENTER
AC	ABOVE COUNTER	MDP	MAIN DISTRIBUTION PANEL
AFF	ABOVE FINISHED FLOOR	MFR	MANUFACTURER
AFG	ABOVE FINISHED GRADE	MFS	MAIN FUSED DISCONNECT SW
AFI	ARC FAULT CIRCUIT INTERRUPTER	MIN	MINIMUM
AL	ALUMINUM	MISC	MISCELLANEOUS
ALT	ALTERNATE	MLO	MAIN LUGS ONLY
AMP	AMPERE	MOA	MULTIOUTLET ASSEMBLY
AMPL	AMPLIFIER	MSBD	MAIN SWITCHBOARD
ANNUN	ANNUNCIATOR	MT	MOUNT
APPROX	APPROXIMATELY	MT.C	EMPTY CONDUIT
ARCH	ARCHITECT, ARCHITECTURAL	MTS	MANUAL TRANSFER SWITCH
AS	AMP SWITCH	N.C.	NORMALLY CLOSED
AT	AMP TRIP	NEC	NATIONAL ELECTRICAL CODE
ATS	AUTOMATIC TRANSFER SWITCH	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
AUTO	AUTOMATIC		
AUX	AUXILIARY		
AV	AUDIO VISUAL	NFDS	NON-FUSED SAFETY DISCONNECT SWITCH
AWG	AMERICAN WIRE GAUGE	NIC	NOT IN CONTRACT
BATT	BATTERY	NL	NIGHT LIGHT
BD	BOARD	N.O.	NORMALLY OPEN
BLDG	BUILDING	NPF	NORMAL POWER FACTOR
BMS	BUILDING MANAGEMENT SYSTEM	NTS	NOT TO SCALE
C	CONDUIT	OH	OVERHEAD
CAB	CABINET	OL	OVERLOADS
CAT	CATALOG	PA	PUBLIC ADDRESS
CATV	CABLE TELEVISION	PB	PULL BOX OR PUSHBUTTON
CB	CIRCUIT BREAKER	PE	PNEUMATIC ELECTRIC
CKT	CIRCUIT	PED	PEDESTAL
CLG	CEILING	PF	POWER FACTOR
COMB	COMBINATION	PH	PHASE
CMPR	COMPRESSOR	PIV	POST INDICATING VALVE
CONN	CONNECTION	PNL	PANEL
CONST	CONSTRUCTION	PP	POWER POLE
CONT	CONTINUATION OR CONTINUOUS	PR	PAIR
CONTR	CONTRACTOR	PRI	PRIMARY
CONV	CONVECTOR	PROJ	PROJECTION
CP	CIRCULATING PUMP	PRV	POWER ROOF VENTILATOR
CT	CURRENT TRANSFORMER	PT	POTENTIAL TRANSFORMER
CTR	CENTER	PVC	POLYVINYL CHLORIDE (CONDUIT)
CU	COPPER	PWR	POWER
DCP	DOMESTIC WATER CIRCULATING PUMP	QUAN	QUANTITY
DEPT	DEPARTMENT	RCPT	RECEPTACLE
DET	DETAIL	REQD	REQUIRED
DIA	DIAMETER	RM	ROOM
DISC	DISCONNECT	RSC	RIGID STEEL CONDUIT
DIST	DISTRIBUTION	RTU	ROOF TOP UNIT
DN	DOWN	SC	SURFACE CONDUIT
DPR	DAMPER	SEC	SECONDARY
DS	SAFETY DISCONNECT SWITCH	SHT	SHEET
DT	DOUBLE THROW	SIM	SIMILAR
DWG	DRAWING	S/N	SOLID NEUTRAL
EC	ELECTRICAL CONTRACTOR	SPEC	SPECIFICATION
ELEC	ELECTRIC, ELECTRICAL	SP	SPARE
ELU	EMERGENCY LIGHTING UNIT	SR	SURFACE RACEWAY
EM	EMERGENCY	SS	STAINLESS STEEL
EMS	ENERGY MANAGEMENT SYSTEM	SSW	SELECTOR SWITCH
EMT	ELECTRICAL METALLIC TUBING	S/S	STOP/START PUSHBUTTONS
EP	ELECTRIC PNEUMATIC	STA	STATION
EQUIP	EQUIPMENT	STD	STANDARD
EWC	ELECTRIC WATER COOLER	SURF	SURFACE MOUNTED
EXIST	EXISTING	SW	SWITCH
EXH	EXHAUST	SWBD	SWITCHBOARD
EXP	EXPLOSION PROOF	SYM	SYMMETRICAL
FCU	FAN COIL UNIT	SYS	SYSTEM
FIXT	FIXTURE	TEL	TELEPHONE
FLR	FLOOR	TEL/DAT	TELEPHONE/DATA
FLUOR	FLUORESCENT	TERM	TERMINAL
FU	FUSE	TL	TWIST LOCK
FUDS	FUSED SAFETY DISCONNECT SWITCH	TR	TAMPER RESISTANT
		T-STAT	THERMOSTAT
GA	GAUGE	TTC	TELEPHONE TERMINAL CABINET
GAL	GALLON	TV	TELEVISION
GALV	GALVANIZED	TVTC	TELEVISION TERMINAL CABINET
GC	GENERAL CONTRACTOR	TYP	TYPICAL
GEN	GENERATOR	UC	UNDER COUNTER
GFI	GROUND FAULT CIRCUIT INTERRUPTER	UE	UNDERGROUND ELECTRICAL
GFP	GROUND FAULT PROTECTOR	UG	UNDERGROUND
GND	GROUND	UH	UNIT HEATER
GRS	GALVANIZED RIGID STEEL (CONDUIT)	UT	UNDERGROUND TELEPHONE
GYP BD	GYPSUM BOARD	UTIL	UTILITY
HOA	HANDS-OFF-AUTOMATIC SWITCH	UV	ULTRAVIOLET
HORIZ	HORIZONTAL	V	VOLT
HP	HORSEPOWER	VA	VOLT-AMPERES
HPF	HIGH POWER FACTOR	VDT	VIDEO DISPLAY TERMINAL
HT	HEIGHT	VERT	VERTICAL
HTG	HEATING	VFD	VARIABLE FREQUENCY DRIVE
HTR	HEATER	VOL	VOLUME
HV	HIGH VOLTAGE	W	WATT
HVAC	HEATING, VENTILATING AND AIR CONDITIONING	W/	WITH
		WG	WIRE GUARD
IC	INTERRUPTING CAPACITY	WH	WATER HEATER
IG	ISOLATED GROUND	W/O	WITHOUT
IMC	INTERMEDIATE METAL CONDUIT	WP	WEATHERPROOF
INCAND	INCANDESCENT	XFMR	TRANSFORMER
IR	INFRARED	XFR	TRANSFER
I/W	INTERLOCK WITH		
J-BOX	JUNCTION BOX		
KV	KILOVOLT		
KVA	KILOVOLT-AMPERE	∠	ANGLE
KVAR	KILOVOLT-AMPERE REACTIVE	@	AT
KW	KILOWATT	▲	DELTA
KWH	KILOWATT HOUR	'	FEET
LOC	LOCATE OR LOCATION	"	INCHES
LT	LIGHT	#	NUMBER
LTG	LIGHTING	Ø	PHASE
LTNG	LIGHTNING	C	CENTER LINE
LV	LOW VOLTAGE	P	PLATE
MAX	MAXIMUM		
M/C	MOMENTARY CONTACT		
MC	MECHANICAL CONTRACTOR		

* NOTE *
ALL GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET. THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

DIVISION 26 ELECTRICAL NOTES

GENERAL
1. WORK UNDER THIS DIVISION SHALL COMPLY WITH LOCAL GOVERNING REGULATIONS, CODES AND ORDINANCES AS WELL AS THE NATIONAL ELECTRIC CODE. PROVIDE ONLY MATERIALS THAT ARE NEW AND OF THE TYPE AND QUALITY REQUIRED. WHERE UNDERWRITERS' LABORATORIES, INC. HAS ESTABLISHED STANDARDS FOR SUCH MATERIALS, PROVIDE ONLY MATERIALS BEARING THE UL LABEL. SEE DRAWING E1 FOR ELECTRICAL LAYOUT.
2. COORDINATE AS NECESSARY WITH OTHER TRADES TO ASSURE PROPER AND ADEQUATE PROVISION IN THE WORK OF THOSE TRADES FOR INTERFACE WITH THE WORK OF THIS SECTION.

WALL SWITCHES
1. SWITCHES FOR LOCAL CONTROL OF LIGHTING SHALL BE OF HEAVY DUTY, FLUSH, HANDLE OPERATED TUMBLER TYPE OF UL'S AC RATING FOR TYPE "C" LAMP LOADS. THE SWITCHES SHALL BE RATED AT NOT LESS THAN 15 AMPERES AT 120 VOLTS AND SHALL BE SINGLE POLE, 3 WAY OR 4 WAY AS INDICATED.
2. ALL SWITCHES, UNLESS OTHERWISE INDICATED OR DIRECTED BY THE OWNER, SHALL BE WHITE.
3. DIMMER SWITCHES WHERE INDICATED SHALL BE TOGGLE TYPE WITH SMALL SLIDE DIMMER, LUTRON ADRIADNI / TOGGLER IN THE COLOR BONE OR EQUAL.

RECEPTACLES
1. WALL RECEPTACLES FOR CONVENIENCE OUTLETS SHALL BE OF THE DUPLEX SLOT WITH GROUND, SELF ALIGNING TYPE AND RATED AT NOT LESS THAN 15 AMPERES AT 120V
2. WEATHERPROOF OUTLETS SHALL HAVE DUPLEX ALUMINUM COVER IN-USE AS SPECIFIED ABOVE.

DEVICE PLATES
1. PLATES FOR SWITCHES AND RECEPTACLES SHALL BE WHITE COLORED PLASTIC, BEVELED EDGES AND SMOOTH SURFACE.

WIRING
1. All CONDUCTORS TO BE COPPER NM CABLE OR AS REQUIRED BY CODE.

EXHAUST FANS
1. PROVIDE AND INSTALL SEPARATE EXHAUST FAN AND LIGHT IN EACH BATHROOM, SWITCHED SEPARATELY.

GROUND FAULT PROTECTION
1. ALL KITCHEN, BATH, GARAGE AND ALL OUTSIDE WEATHERPROOF RECEPTACLES ARE TO BE GROUND FAULT PROTECTED AND INSTALLED IN ACCORDANCE WITH NEC REQUIREMENTS.

ARC FAULT PROTECTION
1. LIVING AREA BRARSCH CIRCUITS SHALL BE ARC FAULT PROTECTED AND INSTALLED IN ACCORDANCE WITH NEC REQUIREMENTS.

TELEPHONE, DATA, CATV, AUDIO
1. PROVIDE AND INSTALL WIRING FOR PHONE, CABLE TV, AND HIGH SPEED INTERNET WIRING. CONTRACTOR TO VERIFY DESIRED LOCATIONS OF COMMUNICATION OUTLETS WITH A&E PRIOR TO INSTALLATION.

SMOKE DETECTORS
1. PROVIDE AS REQUIRED BY CODE.
2. BASIS OF DESIGN PRODUCT: FIRST ALERT BRK, AC POWERED SMOKE/CO ALARMS. MODEL NO. SC9L 20B WITH BATTERY BACK UP AND SILENCE.

DOOR CHIMES
1. BASIS OF DESIGN PRODUCT: NUTONE, DECORATIVE WIRED DOOR CHIME.
2. MODEL NO. LA11WH.

ELECTRICAL SHEET LIST

PROJECT GENERAL NOTES

A — COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND DETAILS. ARCHITECTURAL ELEVATIONS AND DETAILS TAKE PRECEDENCE OVER LOCATIONS SHOWN ON ELECTRICAL DRAWINGS.

B — PROVIDE CABLE AS REQUIRED TO ACHIEVE CIRCUITING SHOWN. SIZE CONDUCTORS PER NEC AMPACITY AND WIRE FILL CRITERIA. PROVIDE DEDICATED NEUTRAL AND GROUND CONDUCTORS FOR CIRCUITING UNLESS NOTED OTHERWISE. INCREASE BRANCH CIRCUIT AND/OR FEEDER CONDUCTORS INCLUDING EQUIPMENT GROUNDING CONDUCTORS PROPORTIONALLY FOR NO MORE THAN 3% VOLTAGE DROP ON BRANCH CIRCUITS AND 2% ON FEEDERS PER ENERGY CODE.

C — IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO COORDINATE INSTALLATION OF ELECTRICAL SYSTEMS AND THOSE REQUIRING ELECTRICAL CONNECTIONS TO MAINTAIN NEC REQUIRED CLEARANCES, INCLUDED BY NOT LIMITED TO AREAS ABOVE ACCESSIBLE CEILINGS.

D — COORDINATE WITH OTHER TRADES FOR PROPER INSTALLATION OF EQUIPMENT. CONSULT THE DRAWINGS OF OTHER TRADES OR CRAFTS TO AVOID CONFLICTS WITH EQUIPMENT, ETC. CONFLICTS SHALL BE RESOLVED PRIOR TO ROUGH-IN AND AT NO ADDITIONAL COST TO THE OWNER.

E — LEAVE THE SITE CLEAN AND READY FOR OCCUPANCY. REMOVE DIRT, DEBRIS, EMPTY CARTONS, TOOLS, SCRAPS AND MISCELLANEOUS SPARE EQUIPMENT AND MATERIALS USED IN THIS DIVISION OF THE WORK DURING CONSTRUCTION. COMPONENTS SHALL BE FREE OF DUST, GRIT AND FOREIGN MATERIALS AND LEFT AS NEW BEFORE FINAL ACCEPTANCE OF WORK.

F — THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

G — PERFORM WORK TO COMPLY WITH THE STANDARD PRACTICES FOR GOOD WORKMANSHIP PUBLISHED BY NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA). COMPLY WITH THE LATEST ENFORCED EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), LOCAL CODES, AMENDMENTS, AND ORDINANCES.

H — FIELD COORDINATE FINAL MECHANICAL AND EQUIPMENT LOCATIONS ALONG WITH CONNECTION REQUIREMENTS AND CONTROL WIRING PRIOR TO ROUGH-IN. ADJUST CORRESPONDING CIRCUIT BREAKER RATINGS AND BRANCH CIRCUITING ACCORDINGLY.

I — ELECTRICAL WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF A LICENSED MASTER ELECTRICIAN. PROCURE PERMITS AND LICENSES AND PAY FEES ASSOCIATED WITH THIS WORK.

J — MATERIALS FURNISHED FOR THIS PROJECT SHALL BE NEW, FREE OF DEFECTS, AND LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY UNO.

K — PROVIDE COMPLETE OPERATION & MAINTENANCE MANUAL INCLUDING APPROVED SUBMITTAL DRAWINGS, WARRANTY INFORMATION FOR PRODUCT SUPPLIED,AND MANUFACTURES OPERATION AND MAINTENANCE INSTRUCTIONS.

L — CONDUIT AND WIRE SHALL NOT BE INSTALLED BELOW FLOOR SLAB UNLESS INDICATED ON PLAN BY DASHED CONDUIT.

M — CONTRACTOR SHALL BE RESPONSIBLE FOR WIRING ELECTRICAL ITEMS SHOWN ON DRAWINGS EXCEPT FOR ITEMS LISTED IN NOTE 'R' BELOW.

N — TV OUTLETS, VOLUME CONTROLSS, TELEPHONE OUTLETS, AND DATA OUTLETS SHALL CONSIST OF A BACK BOX WITH CONDUIT STUBBED ABOVE THE ACCESSIBLE CEILING, SEE STUB UP DETAIL.VERIFY SIZE OF BACK BOX REQUIRED WITH DEVICE TO BE INSTALLED. LOCATE BACK BOXES 6" FROM ADJACENT POWER RECEPTACLE INTENDED FOR COMPUTER USE.

O — FURNISH AND INSTALL CONDUIT FROM BACK BOXES FOR THE FOLLOWING DEVICES INTO THE ACCESSIBLE CEILING SPACE IN THE CORRIDOR, UNLESS NOTED OTHERWISE:
- 1/2"C TV OUTLETS
- 1/2"C VOLUME CONTROLS
- 1/2"C DOOR SECURITY DEVICES (CARD READERS, DOOR STRIKES ETC..
- 1/2"C NURSE CALL DOME LIGHTS
- 3/4"C NURSE CALL DEVICES
- 3/4"C TELEPHONE OUTLETS
- 3/4"C INFORMATION OUTLETS
- 3/4"C FIRE ALARM DEVICES

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10-23-2020

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JOB NUMBER:
220046

SHEET TITLE
ELECTRICAL GENERAL INFORMATION & SYMBOL LEGEND

SHEET NO.
E001

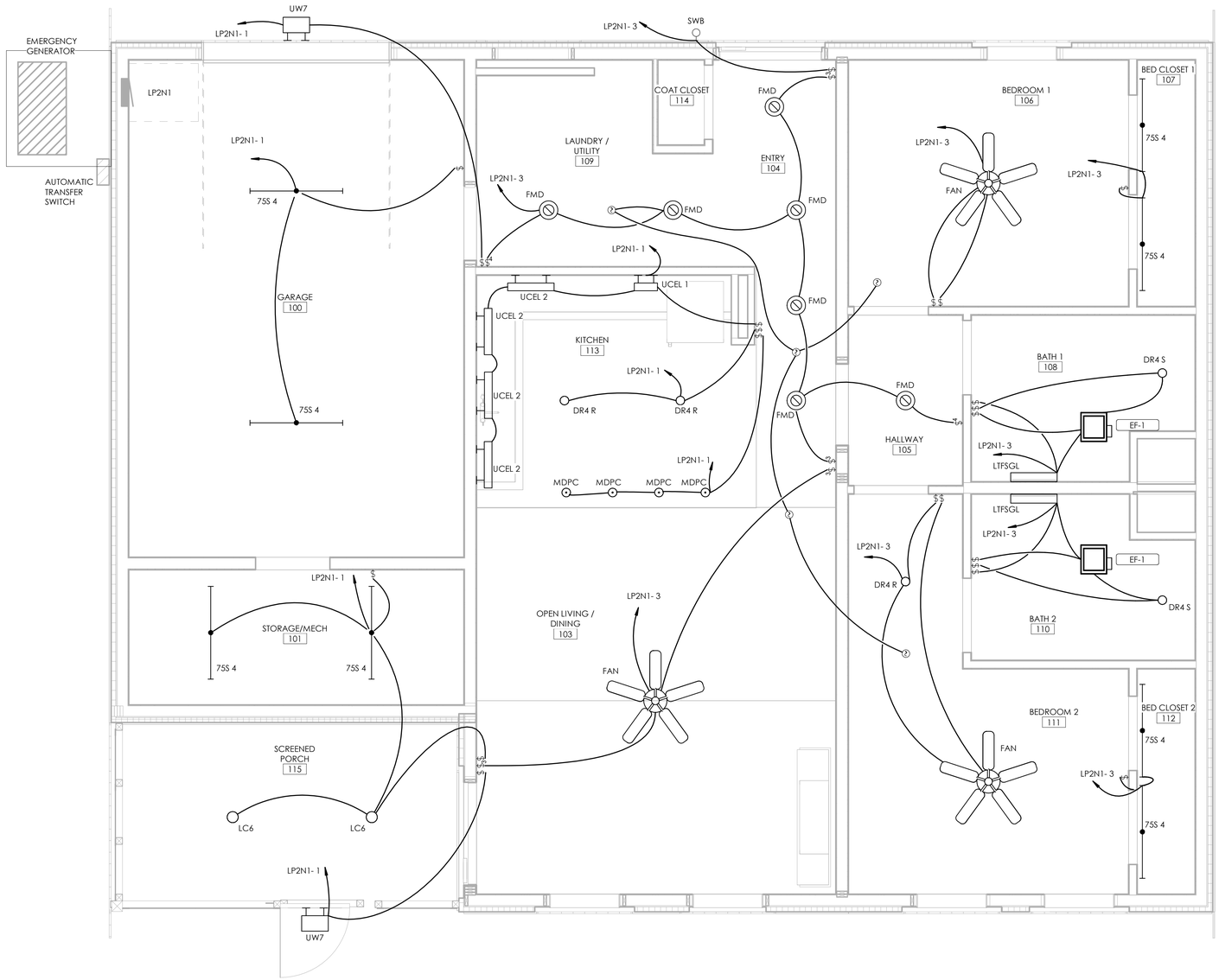
LIGHTING GENERAL NOTES

A ALL MOUNTING HEIGHTS FOR LIGHTING FIXTURES ARE TO THE BOTTOM OF THE FIXTURES UNLESS INDICATED OTHERWISE.

B SEE ARCHITECTURAL EXTERIOR ELEVATIONS FOR MOUNTING HEIGHTS OF EXTERIOR LIGHTING FIXTURES.

C WIRE COUNTS FOR CIRCUIT CONDUCTORS ARE NOT SHOWN. PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUIT AND SWITCHING CONNECTIONS SHOWN.

D MODIFICATIONS TO NUMBER OF CONDUCTORS IN HOME RUNS IN ADDITION TO CIRCUITS INDICATED ON THIS DRAWING ARE PROHIBITED.



1 E100 LIGHTING PLAN

SCALE: 3/8" = 1'-0"

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SHEET TITLE
LIGHTING PLAN

SHEET NO.

E100

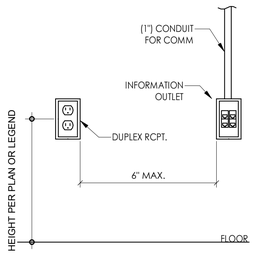
POWER GENERAL NOTES

A WHERE CONNECTED TO A 20A. BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.

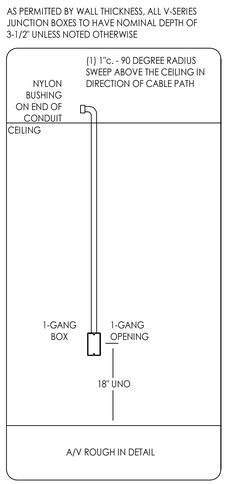
B PROVIDE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED AND GRADE MOUNTED ELECTRICAL EQUIPMENT. MINIMUM REQUIREMENTS: 4" HIGH, 4% AIR ENTRAINED, POLYFIBER REINFORCED CONCRETE. 4" WIDER AND 4" LONGER THAN EQUIPMENT TO BE PLACED ON IT, MINIMUM

C PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUITING AND SWITCHING SHOWN.

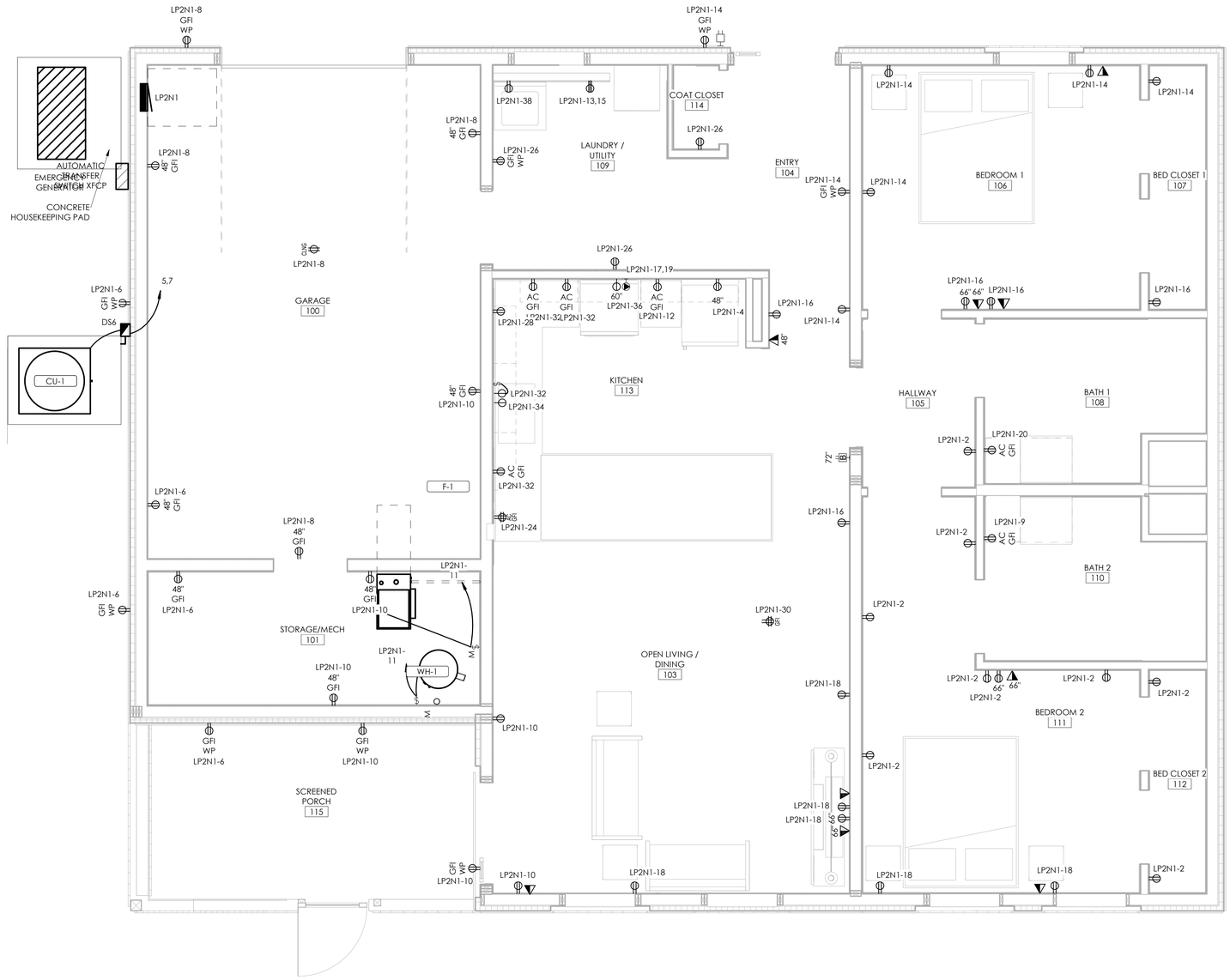
D CIRCUIT NUMBERS AT DEVICES CORRESPOND TO PANELBOARD BREAKERS (SEE PANELBOARD SCHEDULE). BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE CIRCUIT BREAKER RATING, UNLESS INDICATED OTHERWISE ON THE ELECTRICAL EQUIPMENT SCHEDULE.



3 E200 TYPICAL OUTLET INSTALLATION DETAIL
SCALE: NTS



2 E200 A/V ROUGH IN DETAIL
SCALE: NTS



1 E200 POWER PLAN
SCALE: 3/8" = 1'-0"

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SHEET TITLE
POWER LEVEL 1 PLAN

SHEET NO.
E200

DISCONNECT SWITCH SCHEDULE

TYPE	MANUFACTURER	SERVES	SWITCH INFORMATION				FUSE INFORMATION		REMARKS
			VOLTAGE	DUTY	AMP RATING	POLES	AMPERAGE	TYPE	
DS6	SQUARE D	CONDENSING UNIT CU-1	240 V	GENERAL	30.0 A	2	-	-	-

SINGLE LINE GENERAL SHEET NOTES

A	OVERCURRENT DEVICES OF ENTIRE DISTRIBUTION SYSTEM SHALL MEET STATED FAULT CURRENT VALUES WITH FULLY RATED EQUIPMENT.
B	ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
C	GROUNDING ELECTRODE CONDUCTORS SIZES ARE NOT INDICATED ON THE SINGLE LINE DIAGRAM ARE. REFER TO THE GROUNDING RISER DIAGRAM FOR CONNECTIONS AND CONDUCTOR SIZES.

Branch Panel: LP2N1

Location: GARAGE 100
Supply From: BUS CONNECTION, 120 V/240...
Mounting: RECESSED
Enclosure: NEMA 1

Volts: 120/240
Phases: 1
Wires: 3

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MLO
Mains Rating: 200.0 A
MCB Rating: 200.0 A

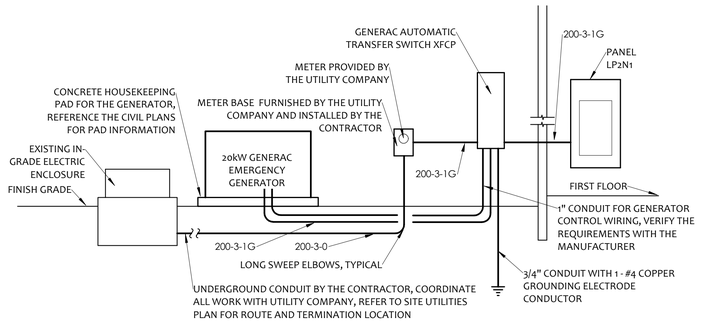
Notes: Optional Dwelling Unit Calculations

CKT	Circuit Description	Trip	Poles	A		B		Poles	Trip	Circuit Description	CKT
1	LTG.- GARAGE/STORAGE/KITCHEN/LIVING	20.0 A	1	287 VA	1620 VA			1	20.0 A	RECEPT.- MASTER BEDROOM	2
3	LTG.- LAUNDRY/BEDROOMS/BATHROOMS	20.0 A	1			1336 VA	180 VA	1	20.0 A	RECEPT.- KITCHEN 1	4
5	CONDENSING UNIT	20.0 A	2	1649 VA	900 VA			1	20.0 A	RECEPT.- CONDENSING UNIT	6
7						1649 VA	900 VA	1	20.0 A	RECEPT.- GARAGE	8
9	RECEPT.- BATHROOM	20.0 A	1	180 VA	1260 VA			1	20.0 A	RECEPT.- STORAGE/ SCREEN PORCH	10
11	WATER HEATER	20.0 A	1			1200 VA	180 VA	1	20.0 A	RECEPT.- KITCHEN 2	12
13	RECEPT.- DRYER	30.0 A	2	2500 VA	1260 VA			1	20.0 A	RECEPT.- BEDROOM	14
15						2500 VA	905 VA	1	20.0 A	RECEPT.- HALLWAY	16
17	RECEPT.- RANGE	50.0 A	2	3750 VA	1080 VA			1	20.0 A	RECEPT.- LIVINGROOM/ MASTER BEDROOM	18
19						3750 VA	180 VA	1	20.0 A	RECEPT.- BATHROOM	20
21											22
23							180 VA	1	20.0 A	RECEPT.- KITCHEN 3	24
25					540 VA			1	20.0 A	RECEPT.- COAT CLOSET/ EXTERIOR	26
27							180 VA	1	20.0 A	RECEPT.- LAUNDRY	28
29					180 VA			1	20.0 A	RECEPT.- KITCHEN 4	30
31							720 VA	1	20.0 A	RECEPT.- KITCHEN 5	32
33					180 VA			1	20.0 A	RECEPT.- DISPOSAL/ DISHWASHER	34
35							180 VA	1	20.0 A	RECEPT.- MICROWAVE	36
37					180 VA			1	20.0 A	RECEPT.- WASHER	38
39											40
41											42
		Total Load:		15566 VA		14040 VA					
		Total Amps:		129.7 A		117.0 A					

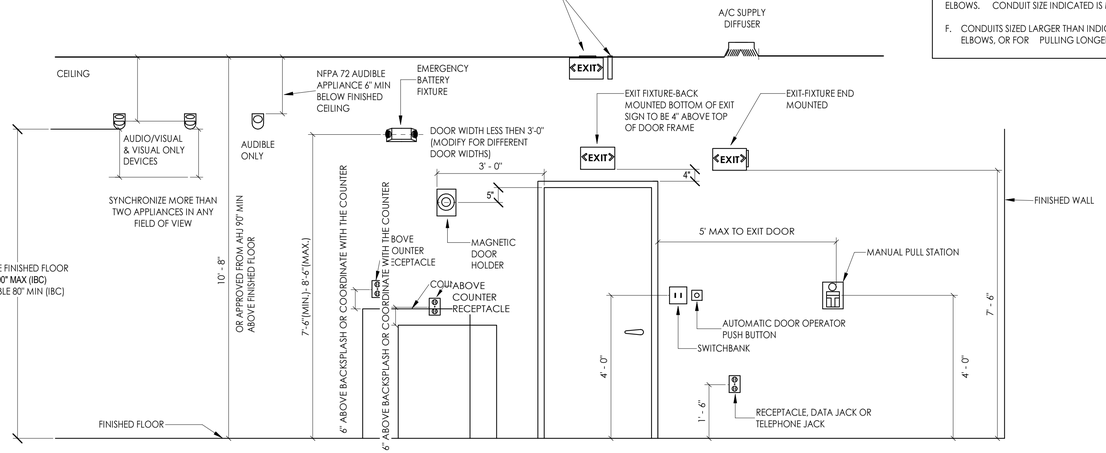
Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Other	0 VA	0.00%	0 VA		
Power	5 VA	100.00%	5 VA		
RCPT	720 VA	100.00%	720 VA	**Total Est. Demand:**	27370 VA
FA	0 VA	0.00%	0 VA		
LITES	1576 VA	125.00%	1969 VA	**Total KVA Load:**	16948 VA
SPEC	7500 VA	100.00%	7500 VA		
MN	4546 VA	100.00%	4546 VA		
R	15260 VA	82.77%	12630 VA	**Total Amp Load:**	74.4 A

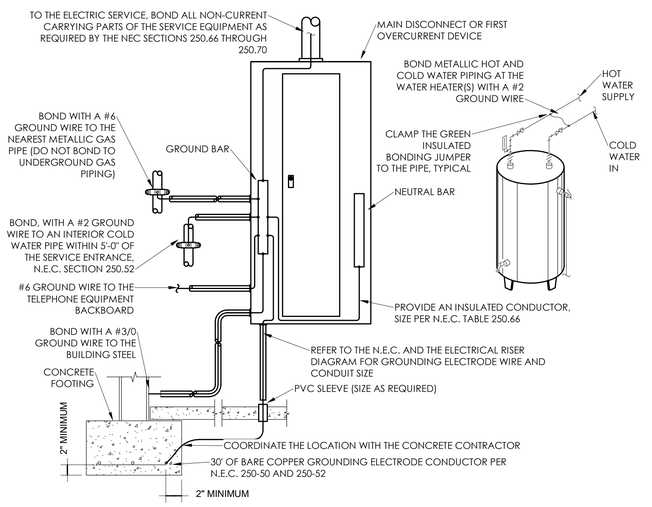
Notes:



2 E500 ELECTRICAL RISER DIAGRAM
SCALE: NTS



1 E500 TYPICAL MOUNTING HEIGHTS
SCALE: NTS



3 E500 SERVICE GROUND DETAIL
SCALE: NTS

CONDUIT AND WIRE SCHEDULE

FEEDER TYPE	COPPER CONDUCTORS		CONDUIT SIZE			
	Ø & N	GND	2Ø+N+GND	3Ø+GND	3Ø+N+GND	3Ø+2N+2GND
20	#12	#12	16 (1/2")	16 (1/2")	16 (1/2")	21 (3/4")
30	#10	#10	16 (1/2")	16 (1/2")	21 (3/4")	21 (3/4")
40	#8	#10	21 (3/4")	21 (3/4")	27 (1")	27 (1")
55	#6	#10	27 (1")	27 (1")	27 (1")	27 (1")
70	#4	#8	35 (1 1/4")	35 (1 1/4")	35 (1 1/4")	35 (1 1/4")
85	#3	#8	35 (1 1/4")	35 (1 1/4")	35 (1 1/4")	41 (1 1/2")
95	#2	#8	35 (1 1/4")	35 (1 1/4")	41 (1 1/2")	41 (1 1/2")
110	#1	#6	41 (1 1/2")	41 (1 1/2")	41 (1 1/2")	53 (2")
150	#1/0	#6	41 (1 1/2")	41 (1 1/2")	53 (2")	53 (2")
175	#2/0	#6	53 (2")	53 (2")	53 (2")	63 (2 1/2")
200	#3/0	#6	53 (2")	53 (2")	53 (2")	63 (2 1/2")
230	#4/0	#4	53 (2")	53 (2")	63 (2 1/2")	63 (2 1/2")
255	250 kCM	#4	63 (2 1/2")	63 (2 1/2")	63 (2 1/2")	78 (3")
285	300 kCM	#4	63 (2 1/2")	78 (3")	78 (3")	78 (3")
310	350 kCM	#3	78 (3")	78 (3")	78 (3")	91 (3 1/2")
335	400 kCM	#3	78 (3")	78 (3")	78 (3")	91 (3 1/2")
380	500 kCM	#3	78 (3")	78 (3")	91 (3 1/2")	103 (4")
510	(2) 250 kCM	(2) #1	(2) 63 (2 1/2")	(2) 63 (2 1/2")	(2) 78 (3")	(2) 78 (3")
EQ	EQUIPMENT FEEDER - REFER TO ELECTRICAL EQUIPMENT SCHEDULE					

200 - 4 - 1G FEEDER DESIGNATION

GROUND CONDUCTORS:
(0) - NO GROUND
(1G) - EQUIPMENT GND OR ISOLATED GND
(2G) - EQUIPMENT GND AND ISOLATED GND
SYSTEM DESCRIPTION:
(3) - 1Ø, 3W OR 3Ø, 3W
(4) - 3Ø, 4W
(5) - 3Ø, 5W (2 NEUTRALS)
CONDUCTOR AMPACITY:
(SEE FEEDER SCHEDULE)

GENERAL NOTES:

A. THE ABOVE FEEDER SCHEDULE IS A SCHEDULE OF TYPICAL FEEDERS AND SOME SIZES MAY NOT BE UTILIZED.

B. ALL CONDUCTOR AMPACITIES ARE BASED ON TABLE 310-15(b)(16) OF THE NEC FOR COPPER CONDUCTOR TYPE THW/THWN.

C. FEEDER SIZES SHOWN ON THE RISER DIAGRAM INDICATE FEEDER AMPACITIES AND DO NOT NECESSARILY CORRESPOND TO CIRCUIT BREAKER AMPACITIES. CERTAIN FEEDERS MAY BE SIZED FOR THE DERATION FACTORS REQUIRED BY CODE AND/OR ARE OVERSIZED FOR VOLTAGE DROP.

D. WHERE MULTIPLE CONDUITS AND CONDUCTORS ARE INDICATED FOR A SINGLE FEEDER, EACH CONDUIT SHALL CONTAIN 1 PARALLEL PHASE, NEUTRAL, AND GROUND CONDUCTORS INDICATED.

E. CONDUIT ABOVE GRADE INDOORS SHALL BE EMT. CONDUIT ABOVE GRADE OUTDOORS SHALL BE GALVANIZED IMC OR RMC. CONDUIT BELOW GRADE SHALL BE PVC WITH GALVANIZED RMC ELBOWS. CONDUIT SIZE INDICATED IS MINIMUM SIZE REGARDLESS OF CONDUIT TYPE.

F. CONDUITS SIZED LARGER THAN INDICATED SHALL BE PERMITTED FOR RUNS WITH UP TO (4) 90° ELBOWS, OR FOR PULLING LONGER RUNS.

LIGHTING FIXTURE SCHEDULE

TYPE	CONSTRUCTION			LIGHT SOURCE					ELECTRICAL			PRODUCT		NOTE
	DESCRIPTION	LENS/LOUVER	MOUNTING	LAMP	LUMENS DOWN	LUMENS UP	CCT	CRI	BALLAST/DRIVER	VOLT	WATTS	MANUFACTURER	Model	
7S5 4	4' STRIP CEILING	DIFFUSE ACRYLIC	CEILING SURFACE	LED	3000 lm	0 lm	4000 K	80	LED DRIVER	120 V	20 W	WILLIAMS	7S5 4 L30/840 DIM UNIV	MOUNTING AS REQUIRED
DR4 R	4" DOWNLIGHT	--	RECESSED	LED	1500 lm	0 lm	4000 K	80	LED DRIVER	120 V	14 W	WILLIAMS	4DR-TL-L15/835-DIM1-UNV-LW-OF-SG-MWT-N-F1	--
DR4 S	4" SHOWER RATED DOWNLIGHT	--	RECESSED	LED	1000 lm	0 lm	4000 K	80	LED DRIVER	120 V	9 W	WILLIAMS	4DR-TL-L10/835-DIM1-UNV-SW-OF-CS-MWT-N-F1	--
FAN	CEILING FAN	--	CEILING SUSPENDED	LED	1000 lm	0 lm	4000 K	90	--	120 V	300 W	--	OWNER SELECTED CONTRACTOR INSTALLED	--
FMD	10" LED DECOR ROUND	GLASS DIFFUSER	SURFACE	LED	980 lm	0 lm	4000 K	80	LED DRIVER	120 V	20 W	LITHONIA	FMDECL 10 14840 BN	--
LC6	6" DOWNLIGHT RECESSED	--	RECESSED	LED	1000 lm	0 lm	4000 K	80	LED DRIVER	120 V	9 W	WILLIAMS	LC6 L30C/835 ALUM CS M PM DIM UNIV	--
LTFSGL	SURFACE MOUNTED VANITY FIXTURE	--	WALL	LED	1260 lm	0 lm	2700 K	90	LED DRIVER	120 V	8 W	LITHONIA	LTFSGL4 LED 27K 90CRI BN	
MDPC	DECORATIVE PENDANT	--	SUSPENDED	LED	1000 lm	0 lm	3500 K	80	LED DRIVER	120 V	10 W	LITHONIA	MDPC-BNP-DMCN-BNP	--
SWB	DECORATIVE SCONCE	DIFFUSE ACRYLIC	SURFACE WALL	LED	720 lm	0 lm	3000 K	80	LED DRIVER	120 V	11 W	LITHONIA	SWBLED	USE DLSD15 WALL SCONCE DIFFUSER
UCEL 1	1' STRIP UNDERCABINET	ACRYLIC WHITE	UNDERCABINET	LED	388 lm	0 lm	3000 K	80	LED DRIVER	120 V	6 W	LITHONIA	UCEL-12IN-30K-90CRI-WH	--
UCEL 2	2' STRIP UNDERCABINET	ACRYLIC WHITE	UNDERCABINET	LED	742 lm	0 lm	3000 K	80	LED DRIVER	120 V	10 W	LITHONIA	UCEL-24IN-30K-90CRI-WH	--
UW7	EXTERIOR WALL LIGHTS	--	WALL	LED	2138 lm	0 lm	3000 K	70	LED DRIVER	120 V	24 W	GOOD EARTH LIGHTING	551097-BP2-02LFO-G	--

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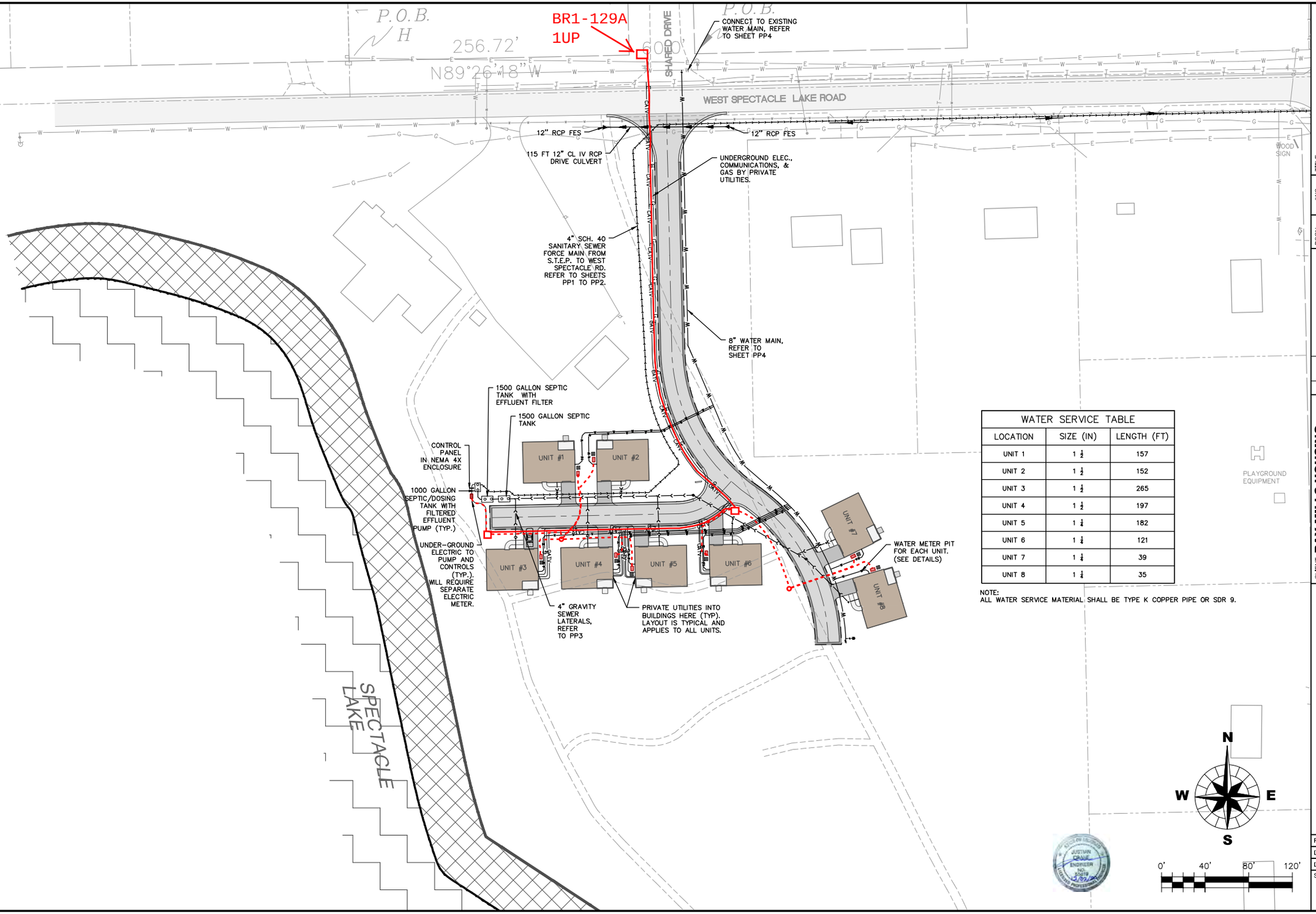
SHEET TITLE
ELECTRICAL DETAILS

SHEET NO.
E500

Attachment 3

Electrical utility schematic for the existing 8ea houses for informational purposes



WATER SERVICE TABLE		
LOCATION	SIZE (IN)	LENGTH (FT)
UNIT 1	1 ½	157
UNIT 2	1 ½	152
UNIT 3	1 ½	265
UNIT 4	1 ½	197
UNIT 5	1 ¼	182
UNIT 6	1 ¼	121
UNIT 7	1 ¼	39
UNIT 8	1 ¼	35

NOTE:
ALL WATER SERVICE MATERIAL SHALL BE TYPE K COPPER PIPE OR SDR 9.

TITLE: **BAY MILLS ELDERS HOUSING DEVELOPMENT**

UTILITY PLAN

DSGN.	JWC
DWN.	TLB
CHKD.	JWC
SCALE : AS NOTED	
UT200153.DWG	

NO.	DATE	NATURE OF REVISION
2	12/03	100% CD
1	10/23	95% CD

CLIENT: **BAY MILLS HOUSING AUTHORITY**
12140 WEST LAKESHORE DRIVE
BRIMLEY, MI 49715
906-248-3241

WBK ENGINEERING, LLC
68 EAST MICHIGAN AVENUE
BATTLE CREEK, MICHIGAN 49017
P: (269) 224-3182

WBK engineering

PROJECT NO. 200153
DATE : 09/14/2020
DRAWING NO. **UT1**
SHEET:
8 OF 23

Attachment 4

Geotechnical Report for the project site

Report of Geotechnical Exploration

Proposed Elder Housing Development

W. Spectacle Lake Road

Brimley, Michigan

Prepared for:

Bay Mills Indian Community

12140 W. Lakeshore Dr., Brimley, Michigan

June 11, 2020

Prepared by:
Gosling Czubak Engineering Sciences, Inc.
1280 Business Park Drive
Traverse City, Michigan
(231) 946-9191
www.goslingczubak.com

GCES Project # 2020144001.02

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TABLE OF CONTENTS

p:\2020144002.00\docs\geotechnical exploration report - bmic elder housing.docx

ATTACHMENTS

1.0 PURPOSE

The purpose of this study was to evaluate subsurface conditions at the site and develop geotechnical design criteria regarding foundations for the Proposed Elder Housing Development at W. Spectacle Lake Road near Brimley, Michigan. Gosling Czubak's scope of services included the drilling of eight soil borings with standard penetration testing and preparation of this geotechnical report. Mr. Eric Burtt, PE of Bay Mills Indian Community (BMIC) authorized the work and served as Gosling Czubak's Client contact.

2.0 PROJECT DESCRIPTION

The project involves the construction of eight, new single-family homes. This site is located on the south side of W. Spectacle Lake Road, west of S. Red Pine Lane within Section 24, Town 47 North, Range 03 West, Bay Mills Township, Chippewa County, Michigan. A site location map is included in Attachment 1.

We understand the structures will be stick built onsite, single-story, slab-on-grade with no basement and reinforced concrete foundations. The project will also include other items of work such as street development, pedestrian facilities, drainage, driveways, water and sewer installation, and landscaping. This office should be contacted to review the following foundation recommendations if the project details change.

3.0 SITE CONDITIONS

The property is currently a vacant undeveloped, wooded area contained within Tribal trust lands (BMIC reservation property). The proposed construction areas feature generally flat topography. The surrounding area consists single-family residential properties or undeveloped land.

3.1 Environmental Site Conditions

An environmental site review was not part of this evaluation. Any Due Care Plans completed for this site as they relate to worker health and safety should be made available for contractor review.

Furthermore, compliance with local Health Department and EGLE requirements is the responsibility of others, and is not part of this geotechnical exploration report.

4.0 FIELD EXPLORATION

The field exploration consisted of eight soil borings (SB-1 through SB-8) to depths of 20 feet below grade using our ATV-mounted hollow stem auger rig. The boring locations are shown on the boring location sketch, included as Attachment 2 of this report.

4.1 General Considerations

The observations, conclusions, and recommendations contained in this report pertain to these soil borings as they relate to the project described. The recommendations in this report should not be used if this project is altered or the structure locations changed, or if the structural information is incorrect. The borehole logs and other testing information provided for this project are intended for use with the complete report. The logs and other testing results should not be separated from the report.

The soil boring locations are shown on the Soil Boring Location Sketch included in Attachment 2 of this report. The drawing in Attachment 2 is intended to show the approximate borehole locations with respect to proposed buildings and other site features and may not include all existing or proposed site elements. The drawing(s) included in this report should not be used for site design, or to determine locations of utilities, building elements, or other proposed or existing features of the site.

5.0 EVALUATION METHODS

Soil borings and limited laboratory soil testing was completed to evaluate geotechnical conditions for this project.

5.1 Soil Borings

Soil borings were used to gather subsurface soil information. The soil borings were completed with conventional hollow stem auger drilling procedures. Soil samples were obtained at regular intervals throughout the borings by performing standard penetration tests through the center of the hollow augers. The standard penetration test (ASTM D-1586) consists of driving a two-inch outside diameter split

barrel sampler into the soil with a 140-pound hammer falling 30 inches. The sampler is driven 18 inches, with the hammer blows recorded for each six-inch increment. The number of blows for the second and third increments are summed and referred to as the standard penetration resistance (N).

Soils were removed from the sampler and described on boring logs; driving resistance values and strata depths were also recorded. Field soil classifications were made using procedures similar to ASTM, D-2488. Representative soil samples were preserved in glass jars for future reference and laboratory testing as required. Soil samples were reviewed in the laboratory and final boring logs were prepared. Unless otherwise directed, soil samples will be stored for 90 days prior to disposal.

Borings drilled at the time of the field exploration were backfilled and additional soil placed over the borings proper. Due to the impracticality of compacting soils into deep borings, subsidence of loose backfill may occur, partially reopening the borings. It is not within the scope of this exploration to maintain the borings during settlement of the loose backfill. It is the Owner's responsibility to ensure that a hazard to property, person, or animals is not presented by the borings after completion. Following demobilization of the drilling crew, the borings are the property and sole responsibility of the Owner.

5.2 Laboratory Testing

The laboratory testing program consisted of visual soil classification on recovered samples in general accordance with ASTM standards. Representative soil samples were returned to Gosling Czubak's soil laboratory where limited laboratory testing on select soils may be conducted to aid in identifying and describing the physical characteristics of the soils and to assist in defining the site soil stratigraphy.

6.0 SUBSURFACE CONDITIONS

Onsite borings indicate that subsurface soil conditions are mostly consistent across the area of the site explored by our soil borings. Soil boring logs are included in Attachment 3. Ground surface elevations at the boring locations were not available, as no site topographic information was provided or available. The following sections describe the soil and groundwater conditions encountered.

6.1 Soil Borings

The soil borings indicate approximately four to 10 inches of sandy topsoil exists at the surface. Below surficial topsoil, native sandy soils were found to the total depth of the borings, 20 feet below existing grade. The sandy soils were generally more coarse containing gravel and occasional cobble in the upper 10 feet. Relative density of the granular (sandy) soils ranged from very loose to dense. In particular, very loose or loose soils were found at soil boring locations SB-4, SB-5, SB-6, SB-7 and SB-8.

The native granular soils encountered have good strength and settlement properties and are generally considered suitable for building foundation support, provided proper densification can be achieved.

6.2 Groundwater

Groundwater was encountered under unconfined, or water table condition at each soil boring and ranged in depth between four feet (at SB-8) and 9.5 feet (at SB-1). It should be noted that groundwater depths will vary with time, season, lake levels, and natural climate variations.

6.3 Laboratory Testing Results

The laboratory testing program consisted of visual soil classification on recovered samples to aid in identifying and describing the physical characteristics of the soils and to assist in defining the site soil stratigraphy.

6.4 General Considerations

The borehole logs depict the subsurface data obtained (see Attachment 3). This information is representative of each location only; it should be understood that the soil conditions may vary between the test locations. In addition, the boreholes reflect soil and groundwater conditions at the time they were performed. The soil information was obtained for preliminary use for the project described. This information should not be used for determining earthwork quantities, construction estimating, or other purposes.

7.0 CONCLUSIONS AND RECOMMENDATIONS

This report is intended to present the geotechnical evaluation findings and construction recommendations for the proposed new foundation and other construction features.

7.1 Geotechnical

Generally, the soil borings indicate the subsurface soils encountered to the total depth of the borings are suitable for foundation support. The following sections include foundation and site preparation options to provide building support.

All site grading work should be completed in the construction area prior to preparation of the building pads. Although not anticipated, if remnants of any previous construction such as underground tanks, foundations, fill, utilities, or other items are encountered, they should be completely removed and replaced with engineered fill.

7.1.1 Site Preparation for Conventional Shallow Foundations

All existing topsoil, stumps and large roots in the construction area should be completely removed to the depth it occurs. The sandy foundation subgrade soil at the location of the proposed homes must be thoroughly compacted to improve its load carrying capability. All foundation subgrade beneath the footings should be evaluated and tested by Gosling Czubak personnel prior to concrete placement.

The footings may be established directly on the properly prepared and compacted subgrade and designed in a conventional manner. Footings may be sized using a soil contact pressure of up to 2,000 pounds per square foot. These recommendations are conditioned upon a representative of Gosling Czubak observing the subgrade prior to construction. A minimum footing depth of 3.5 feet for frost protection, width of 24 inches for the column footings and 18 inches for the wall footings should be maintained. Backfill should meet the requirements given in Section 8.0 Site Preparation, or be approved by Gosling Czubak.

Foundation settlements less than one inch are anticipated when footings are loaded to the recommended soil contact pressures described above and placed on properly prepared surfaces, using the compaction

equipment described. Differential settlements of ½-inch may result between structural elements depending on spacing, relative footing loads, and structural rigidity of the buildings.

7.1.2 Recommendations for Floor Slab Subgrade Preparation

It is recommended that all existing pavement materials and otherwise unsuitable soil be removed to the extent it occurs. The resulting subgrade soils should be inspected at that level to determine their suitability. A minimum of 24 inches of well-compacted granular soil should be present below the floor slab. Engineered fill should be properly placed as needed to return low areas to plan grade to help provide a suitable subgrade for the proposed floor slab.

7.1.3 Recommendations for Pavement Area Preparation

Any new parking or driveway subgrade areas should be prepared using the following guidelines. All vegetation, topsoil, or unsuitable materials should be removed from the proposed pavement areas. Clean sand fill should be placed and properly compacted to return the areas to the intended grade. After subgrade preparation has been completed under the observation of a Gosling Czubak representative, the parking areas may be constructed in a conventional manner using a gravel subbase beneath the asphalt pavement layers.

7.1.4 Groundwater

Groundwater was encountered at all boring locations and the depth to water ranged from four to 9.5 feet. It should be noted that water levels and patterns will vary with time, season, and variations in precipitation.

Planned utility locations and depths were not available at the time of this report. However, it is anticipated that dewatering will likely be necessary for the proposed water and sewer construction on site. Dewatering may also be needed for proper compaction of very loose or loose soils below conventional foundations, depending on final building locations and grading plans. The Contractor must be prepared to handle any precipitation runoff during construction, and water must not be allowed to collect within any excavations. Perimeter drains, if used should be placed in the lower foundation areas to control water collecting outside any below-grade walls. The walls should be backfilled with well graded granular material and compacted as outlined in the Site Preparation Section of this report. Any

drains should be connected to a positive gravity outlet at multiple locations to remove water from the building area.

7.1.5 Site Grading

It is important that the site grading plan be properly designed for controlled surface drainage. The foundation drainage system should be segregated from the surface drainage anticipated on site. In other words, the site should be designed to shed surface water in a way that will not add to the water finding its way to the drainage system of the buildings. In order to help achieve this, the area around the structure should be graded so that surface water will flow away from the structures.

8.0 SITE PREPARATION

It is recommended that any earthwork operations which take place on the site follow the standard procedures outlined below:

- If encountered, remove all topsoil and organic or unstable soils, roots, stumps, old footings, septic tanks, drain fields and any other unsuitable materials from the foundation areas, and construction limits including areas to be paved.
- Compact the backfill soils using a suitable compactor and method as described in Section 7.0 *Conclusions and Recommendations*. If unsuitable soils are encountered, they should be removed as required and suitable backfill should be replaced and compacted as specified below.
- Backfill should meet MDOT Class II specifications or otherwise as specified in Section 7.0 *Conclusions and Recommendations*.
- Fill should be spread in shallow lifts, six inches to eight inches maximum, and compacted to 95 percent of the modified proctor value (ASTM D-1557).
- For these recommendations to be valid, earthwork should be done under the observation of a qualified engineer or technician and density tests performed to determine if each lift is sufficiently compacted.
- If earthwork activities occur during periods of freezing weather, fill must not be placed on frozen ground, and fill with frozen conglomerations of soil must not be used.

- In general, the construction Contractor is responsible for safety during all activities on the site during construction. The Contractor is obligated to observe all applicable regulations and codes regarding site safety, including the codes pertaining to open cuts and trenches in soils during excavation, site improvement activities, and foundation construction.

9.0 LIMITATIONS

This report was prepared using generally accepted geotechnical engineering practices. Recommendations were developed based on the information gained from the soil borings performed, and the other information reviewed. No other warranty, expressed or implied, regarding the recommendations and conclusions provided in this report is offered.

Changes to the project should also be brought to the attention of this office prior to construction so that they can be reviewed to see that they are consistent with the recommendations presented in this report.

Readers of this report are encouraged to also review the advice included in Attachment 4, "Important Information about This Geotechnical-Engineering Report."

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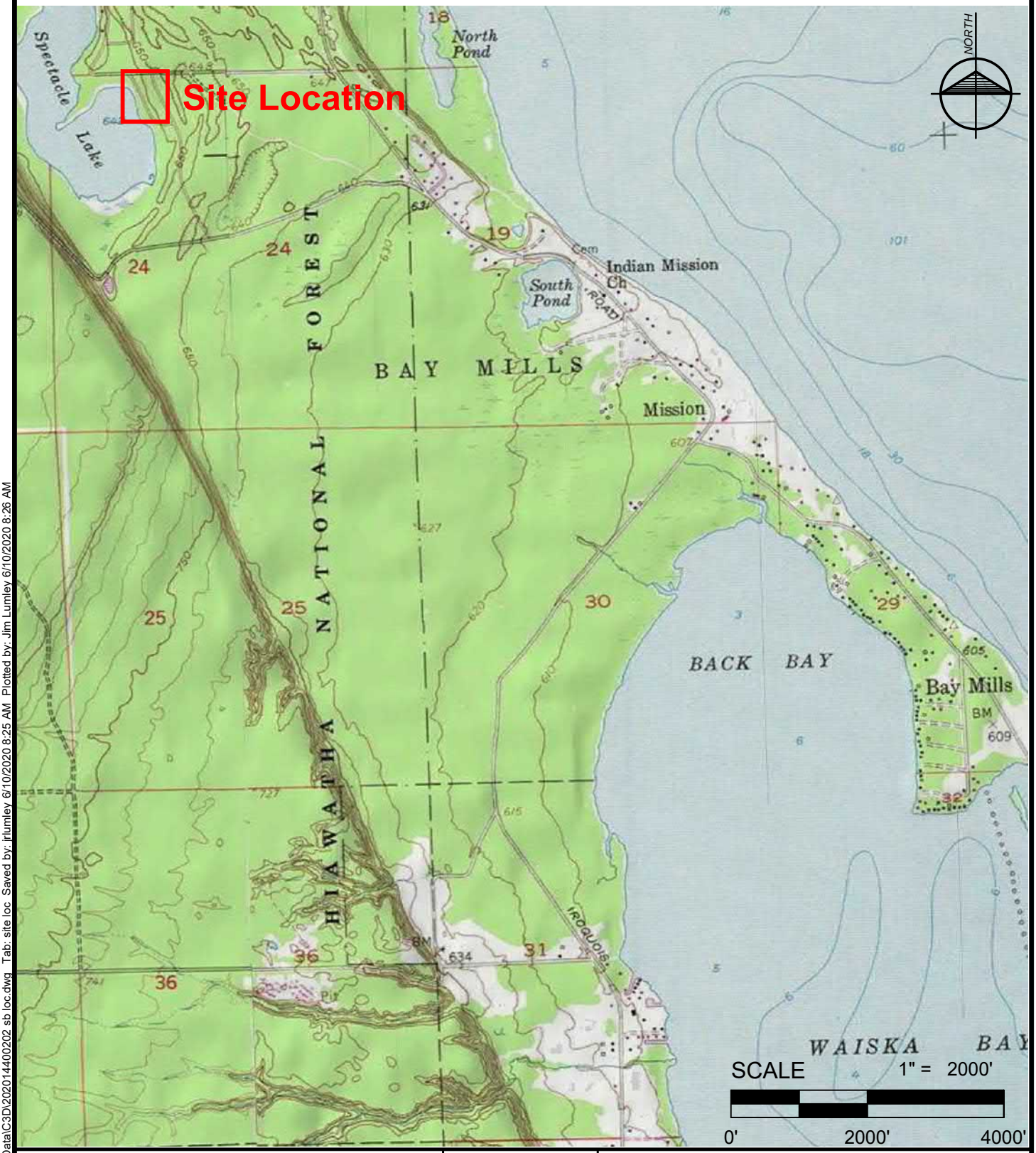
Attachment 1

Site Location Map

Site Location Map



Sheet 1 of 2

Elder Housing Geotechnical Evaluation
Bay Mills Indian Community
PART OF SECTION 24, T 47 N, R 03 W,
BAY MILLS TOWNSHIP,
CHIPPEWA COUNTY, MICHIGAN

Job #:	2020144002.02
Date:	06/10/2020
Scale:	1" = 2000'
Drawn:	jrl
Chk'd.:	ARB
Rev.:	

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Attachment 2

Soil Boring Location Sketch

Soil Boring Location Sketch

THIS SKETCH IS INTENDED TO SHOW THE APPROXIMATE BORING LOCATIONS WITH RESPECT TO BUILDINGS AND OTHER SITE FEATURES. THE SOIL BORING LOCATION SKETCH SHOULD NOT BE USED TO DETERMINE LOCATIONS OF UTILITIES, BUILDING ELEMENTS, TOPOGRAPHY, OR OTHER PROPOSED OR EXISTING FEATURES OF THE SITE. THIS SITE SKETCH IS FROM GOOGLE AERIAL IMAGERY. THE SOIL BORING LOCATIONS AND THIS SITE WERE NOT SURVEYED BY GCES.

Sheet 2 of 2

Elder Housing Geotechnical Evaluation
Bay Mills Indian Community
PART OF SECTION 24, T 47 N, R 03 W,
BAY MILLS TOWNSHIP,
CHIPPEWA COUNTY, MICHIGAN

Job #:	2020144002.02
Date:	06/10/2020
Scale:	1" = 150'
Drawn:	jrl
Chk'd.:	ARB
Rev.:	

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Attachment 3

Boring Logs

Gosling Czubak engineering sciences, inc.

Key to Gosling Czubak Boring Logs and Well Construction Diagrams

SOIL CLASSIFICATION INFORMATION

SOIL DESCRIPTIONS

Example: **Silty fine SAND (SM) - trace clay - occasional clay seams - dense - brown/gray below 40 feet - wet**
(1 - 2 - 3 - 4 - 5 - 6 - 7- 8 - 9 - 10)

1a FOR COARSE GRAINED PRIMARY MATERIAL: Secondary Material of 15 to 50%, if applicable. (eg. Silty, Clayey)
1b FOR FINE GRAINED PRIMARY MATERIAL: Secondary Material of 30 to 50%, if applicable (eg. Gravelly, Sandy)

2 PRIMARY MATERIAL (in CAPs)- SILT, SAND, GRAVEL, or CLAY
Note: fine, medium and/or coarse grained SAND
fine and/or coarse grained GRAVEL

3 (USCS) Unified Soil Classification System (USCS) symbol(s) is presented at the end of the soil description (in parentheses) based on ASTM gradation and plasticity testing. See attached USCS chart.

4 Additional Materials (with percentage descriptors as below)

Fine Grained Material	Coarse-Grained Material
15 to 30% - "some" or "with"	5 to 15% - "little"
5 to 15% - "little"	< 5% - "trace" or "few"
< 5% - "trace" or "few"	

5 Description of sorting or grading. For example, "well-sorted, or "poorly graded."

6 Occurrences (with frequency descriptors as below) - cobbles, boulders, bricks, layers, seams, etc.
Greater than one per 12-inches = "frequent"
One per 12-inches = "occasional"

Note: Seams = < 1-inch in thickness
Layers = > 1-inch in thickness

7 Angularity and mineral composition, if warranted

8 Odor or Sheen, if applicable

9 Soil Strength Description (Relative Density for gravel, sand and silt, or Consistency for clay)

10 Color

11 Moisture - "dry" or "wet" or "moist"
"dry" = absence of apparent moisture
"moist" = damp but not saturated
"wet" = saturated

Particle Sizes	
Boulders	- > 12-in
Cobbles	- 12 to 3 in
Course gravel	- 3 to 3/4 in
Fine gravel	- 3/4 to 0.187-in
Coarse sand	- 4.75 to 2.0-mm
Medium sand	- 2.0 to 0.425-mm
Fine sand	- 0.425 to 0.075-mm
Clay/Silt	- < 0.075-mm

Relative Density	SPT N-Value
"very loose"	W.O.H. to 4
"loose"	5 to 10
"medium dense"	11 to 30
"dense"	31 to 50
"very dense"	over 50

Consistency	SPT N-Value	Ppen, tsf
"very soft"	WOH to 2	0 - 0.125
"soft"	2 to 4	0.125 - 0.25
"medium stiff"	4 to 8	0.25 - 0.5
"stiff"	8 to 15	0.5 - 1.0
"very stiff"	15 to 30	1.0 - 2.0
"hard"	over 30	2.0 - 4.0

NOTES AND GENERAL INFORMATION

1. Drilling and sampling activities are indicative of subsurface conditions only at locations where data are taken, and when data are taken. Conditions at locations not evaluated may differ from professional interpretation.

2. Environmental boring logs present soil and groundwater data collected for resource development, depositional environment, groundwater flow and/or contaminant transport analyses and may not for be suited for geotechnical or structural engineering use unless otherwise arranged.

3. Stratigraphic Contacts: Solid line denotes a sudden, observed soil transition.
Dashed line denotes a gradual or gradational soil transition.
Dotted line denotes an inferred transition, therefore the type and specific location of the transition is unknown / approximated.

3. Common abbreviations: WOH = Weight of (SPT) Hammer DHH = Down Hole Hammer HA = Hand Auger
DR = Drove Rock (During SPT) NR = No Recovery
Ppen = Pocket Penetrometer (unconfined compressive strength in tons per square foot)

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UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

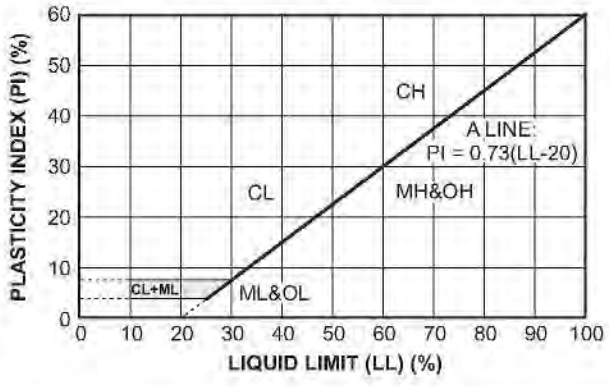
LABORATORY CLASSIFICATION CRITERIA

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 P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. 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 ..... Borderline cases requiring dual symbols

PLASTICITY CHART



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engineering sciences, inc.

Engineers Surveyors
Landscape Architecture
Environmental and Drilling Services
1280 Business Park Dr., Traverse City, Michigan 49686
(231) 946-9191

PROJECT: Elder Housing Project 2020
PROJECT NO.: 2020144002
PROJECT LOCATION: 12747 W Spectacle Lake Rd, Brimley MI
CLIENT: Bay Mills Indian Community
DRILLING COMPANY: Gosling Czubak **RIG:** CME-55LC
DRILLER: M. Allen **LOGGED BY:** R. Farve

LOG OF BORING: SB-1

GROUND ELEVATION: N.A. **DATE:** 6/4/2020
DRILLING LOCATION: See attached Soil Boring Location Sketch
DRILLING METHOD: 3.74-in (ID) Hollow Stem Auger
BOREHOLE DIAMETER (IN): +/- 8 **TOTAL DEPTH (FT):** 20
STATIC WATER LEVEL: ▽ 9.5 **CAVING DEPTH:** C 9.5

Elevation (feet)	Graphic	Soil Description (See Boring Log Key)	Depth (feet)	Sample Type	Sample No.	Recovery (in)	Blow Counts	Notes	Pocket Penetrometer (tsf)	% < #200	TEST RESULTS
		Four inches of Sandy TOPSOIL - dark brown	0								Plastic Limit ⊢⊣ Liquid Limit; Water Content - × %; SPT RESULT - ▲ N Value; 10 20 30 40 50
		0.33									
		Fine to medium SAND (SP) - trace silt - dark reddish brown - moist			SS1	18	4 5 7				12
		1.33									
		Fine to coarse SAND (SP) - trace fine gravel - medium dense - brown - moist	5		SS2	18	4 6 8				14
					SS3	14	4 14 22				36
		7									
		Fine to medium SAND (GP-SP) - little fine gravel - occasional coarse gravel and cobble - dense - brown - moist			SS4	18	7 7 8				15
		9.5 ▽	10								
		Fine SAND (SP) - trace silt and fine gravel - medium dense - brown - wet			SS5	18	9 12 16				28
		15	15								
		Silty fine SAND (SM) - medium dense - brown - wet			SS6	18	5 7 6				13
		Boring terminated at 20 ft.	20								

Borehole was backfilled with augered soil cuttings.

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engineering sciences, inc.

Engineers Surveyors
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PROJECT: Elder Housing Project 2020
PROJECT NO.: 2020144002
PROJECT LOCATION: 12747 W Spectacle Lake Rd, Brimley MI
CLIENT: Bay Mills Indian Community
DRILLING COMPANY: Gosling Czubak **RIG:** CME-55LC
DRILLER: M. Allen **LOGGED BY:** R. Farve

LOG OF BORING: SB-2

GROUND ELEVATION: N.A. **DATE:** 6/4/2020
DRILLING LOCATION: See attached Soil Boring Location Sketch
DRILLING METHOD: 3.74-in (ID) Hollow Stem Auger
BOREHOLE DIAMETER (IN): +/- 8 **TOTAL DEPTH (FT):** 20
STATIC WATER LEVEL: ▽ 9 **CAVING DEPTH:** ▽ 9

Elevation (feet)	Graphic	Soil Description (See Boring Log Key)	Depth (feet)	Sample Type	Sample No.	Recovery (in)	Blow Counts	Notes	Pocket Penetrometer (tsf)	% < #200
		Six inches of Sandy TOPSOIL - dark brown	0							
		0.5 Fine to medium SAND (SP) - little silt - trace fine gravel - dark reddish brown - moist			SS1	18	5 6 7			
		1.5 Fine to medium SAND (SP) - trace fine gravel - medium dense - brown - moist			SS2	18	5 7 9			
		4 Fine to coarse SAND (SP) - medium dense - brown - moist	5		SS3	18	7 17 24			
		7 Gravelly fine to medium SAND (GP) - trace silt - occasional coarse gravel and cobble - dense - brown - moist/wet below 9 ft			SS4	6	29 15 16	On Rock		
		11 Silty fine SAND (SM) - trace fine gravel - medium dense - brown - wet	10							
			15		SS5	18	7 9 10			
			20		SS6	18	4 6 7			
		Boring terminated at 20 ft.								

TEST RESULTS
Plastic Limit ⊢⊣ Liquid Limit
Water Content - × %
SPT RESULT - ▲ N Value
10 20 30 40 50
13 16 41 31 19 13

Borehole was backfilled with augered soil cuttings.

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Gosling Czubak
engineering sciences, inc.

Engineers Surveyors
Landscape Architecture
Environmental and Drilling Services
1280 Business Park Dr., Traverse City, Michigan 49686
(231) 946-9191

PROJECT: Elder Housing Project 2020
PROJECT NO.: 2020144002
PROJECT LOCATION: 12747 W Spectacle Lake Rd, Brimley MI
CLIENT: Bay Mills Indian Community
DRILLING COMPANY: Gosling Czubak **RIG:** CME-55LC
DRILLER: M. Allen **LOGGED BY:** R. Farve

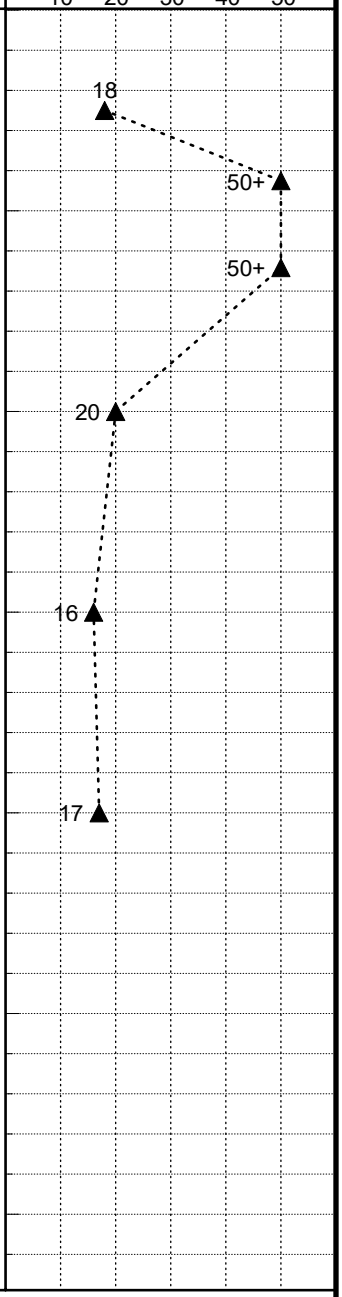
LOG OF BORING: SB-3

GROUND ELEVATION: N.A. **DATE:** 6/4/2020
DRILLING LOCATION: See attached Soil Boring Location Sketch
DRILLING METHOD: 3.74-in (ID) Hollow Stem Auger
BOREHOLE DIAMETER (IN): +/- 8 **TOTAL DEPTH (FT):** 20
STATIC WATER LEVEL: ▽ 7 **CAVING DEPTH:** ℄ 6.5

Elevation (feet)	Graphic	Soil Description (See Boring Log Key)	Depth (feet)	Sample Type	Sample No.	Recovery (in)	Blow Counts	Notes	Pocket Penetrometer (tsf)	% < #200
		10 inches of Sandy TOPSOIL - dark brown	0							
		0.83' Fine to medium SAND (SP) - little silt - trace fine gravel medium dense - dark reddish brown - moist			SS1	18	7 9 9			
		4' Fine to medium SAND (GP-SP) - little fine gravel - frequent cobble - dense - brown - moist	5		SS2	9	8 50/3"	On Rock		
		7' Fine to medium SAND (SP-SM) - little silt - medium dense - brown - wet			SS3	4	50/5"	On Rock		
			10		SS4	18	7 9 11			
			15		SS5	18	5 7 9			
			20		SS6	12	9 8 9			
		Boring terminated at 20 ft.								

TEST RESULTS

Plastic Limit ⊢⊣ Liquid Limit
Water Content - × %
SPT RESULT - ▲ N Value



Borehole was backfilled with augered soil cuttings.

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

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PROJECT: Elder Housing Project 2020
PROJECT NO.: 2020144002
PROJECT LOCATION: 12747 W Spectacle Lake Rd, Brimley MI
CLIENT: Bay Mills Indian Community
DRILLING COMPANY: Gosling Czubak **RIG:** CME-55LC
DRILLER: M. Allen **LOGGED BY:** R. Farve

LOG OF BORING: SB-4

GROUND ELEVATION: N.A. **DATE:** 6/4/2020
DRILLING LOCATION: See attached Soil Boring Location Sketch
DRILLING METHOD: 3.74-in (ID) Hollow Stem Auger
BOREHOLE DIAMETER (IN): +/- 8 **TOTAL DEPTH (FT):** 20
STATIC WATER LEVEL: ▽ 7 **CAVING DEPTH:** ▽ 7

Elevation (feet)	Graphic	Soil Description (See Boring Log Key)	Depth (feet)	Sample Type	Sample No.	Recovery (in)	Blow Counts	Notes	Pocket Penetrometer (tsf)	% < #200	TEST RESULTS
		Four inches of Sandy TOPSOIL - dark brown	0								Plastic Limit ⊢⊣ Liquid Limit; Water Content - × %; SPT RESULT - ▲ N Value; 10 20 30 40 50
		0.33 Fine to medium SAND (SP) - little silt - trace fine gravel very loose - dark reddish brown - moist			SS1	18	3 2 2				4
		3 Gravelly fine to medium SAND (SP) - trace silt - dense - brown - moist			SS2	6	32 50/2"	On Rock			50+
		7 ▽ Fine to medium SAND (SP-SM) - little silt - trace fine gravel - medium dense - brown - moist	5		SS3	8	23 21 11				32
					SS4	12	10 9 7				16
		13 Fine to coarse SAND (SP) - trace silt and fine gravel - loose - brown/grey - wet	10		SS5	12	2 3 5				8
		17 Silty fine SAND (SM) - loose - brown - wet	15		SS6	18	3 3 4				7
		Boring terminated at 20 ft.	20								

Borehole was backfilled with augered soil cuttings.

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PROJECT: Elder Housing Project 2020
PROJECT NO.: 2020144002
PROJECT LOCATION: 12747 W Spectacle Lake Rd, Brimley MI
CLIENT: Bay Mills Indian Community
DRILLING COMPANY: Gosling Czubak **RIG:** CME-55LC
DRILLER: M. Allen **LOGGED BY:** R. Farve

LOG OF BORING: SB-5

GROUND ELEVATION: N.A. **DATE:** 6/3/2020
DRILLING LOCATION: See attached Soil Boring Location Sketch
DRILLING METHOD: 3.74-in (ID) Hollow Stem Auger
BOREHOLE DIAMETER (IN): +/- 8 **TOTAL DEPTH (FT):** 20
STATIC WATER LEVEL: ▽ 5 **CAVING DEPTH:** ▽ 5.5

Elevation (feet)	Graphic	Soil Description (See Boring Log Key)	Depth (feet)	Sample Type	Sample No.	Recovery (in)	Blow Counts	Notes	Pocket Penetrometer (tsf)	% < #200
		Six inches of Sandy TOPSOIL - dark brown	0							
		Fine to medium SAND (SP) - little silt and fine gravel - medium dense - reddish brown - moist	0.5		SS1	16	7 13 15			
		Gravelly fine to medium SAND (GP) - trace silt - occasional coarse gravel - medium dense - brown - moist, wet below 6.5 ft	3		SS2	10	18 16 9			
			5		SS3	18	5 8 11			
		Gravelly fine to medium SAND (GM-SM) - little silt - medium dense to loose - reddish brown - moist	8		SS4	18	22 18 13			
			10							
			15		SS5	6	12 4 4	On Rock		
		Fine SAND (SP-SM) - little silt - very loose - brown/grey - wet	19		SS6	16	7 2 2			
		Boring terminated at 20 ft.	20							

TEST RESULTS

Plastic Limit ⊢⊣ Liquid Limit
Water Content - × %
SPT RESULT - ▲ N Value

10 20 30 40 50

28
25
19
31
8
4

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PROJECT: Elder Housing Project 2020
PROJECT NO.: 2020144002
PROJECT LOCATION: 12747 W Spectacle Lake Rd, Brimley MI
CLIENT: Bay Mills Indian Community
DRILLING COMPANY: Gosling Czubak **RIG:** CME-55LC
DRILLER: M. Allen **LOGGED BY:** R. Farve

LOG OF BORING: SB-6

GROUND ELEVATION: N.A. **DATE:** 6/3/2020
DRILLING LOCATION: See attached Soil Boring Location Sketch
DRILLING METHOD: 3.74-in (ID) Hollow Stem Auger
BOREHOLE DIAMETER (IN): +/- 8 **TOTAL DEPTH (FT):** 20
STATIC WATER LEVEL: ▽ 7 **CAVING DEPTH:** ℄ 5

Elevation (feet)	Graphic	Soil Description (See Boring Log Key)	Depth (feet)	Sample Type	Sample No.	Recovery (in)	Blow Counts	Notes	Pocket Penetrometer (tsf)	% < #200
		Eight inches of Sandy TOPSOIL - dark brown	0							
		0.67								
		Fine to medium SAND (SP) - little silt - trace fine gravel loose - reddish brown - moist			SS1	18	4 3 3			
		3								
		Sandy fine GRAVEL (GP) - trace silt - occasional coarse gravel and cobble - dense - brown - moist			SS2	8	25 29 36	On Rock		
			5							
		6.5			SS3	10	7 4 3			
		Fine to coarse SAND (GP-SP) - little gravel - trace silt loose to very loose - brown - moist/wet below 7 ft			SS4	18	1 1 2			
			10							
					SS5	18	7 4 3			
			15							
		16								
		Gravelly fine to coarse SAND (GP) - trace silt - medium dense - brown - wet			SS6	14	19 7 6			
			20							
		Boring terminated at 20 ft.								

TEST RESULTS
Plastic Limit ⊢⊣ Liquid Limit
Water Content - × %
SPT RESULT - ▲ N Value
10 20 30 40 50
6
65
7
3
7
13

Borehole was backfilled with augered soil cuttings.

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

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Environmental and Drilling Services
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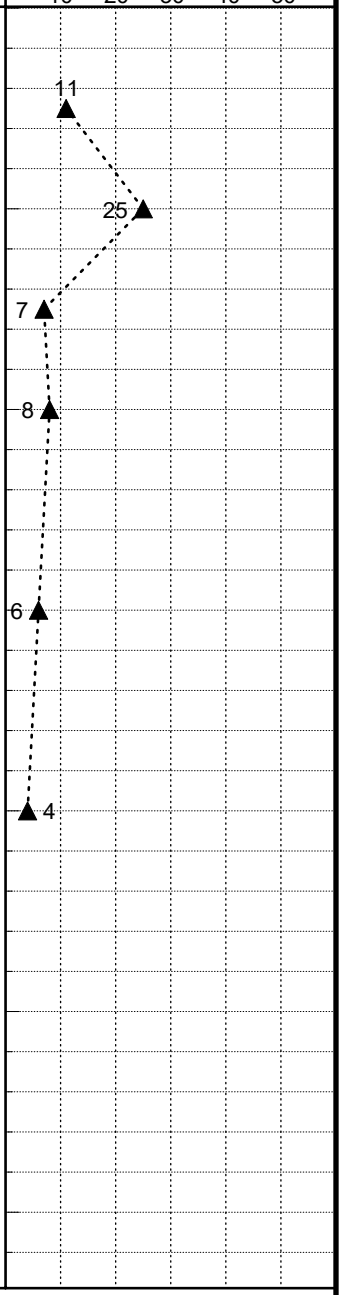
PROJECT: Elder Housing Project 2020
PROJECT NO.: 2020144002
PROJECT LOCATION: 12747 W Spectacle Lake Rd, Brimley MI
CLIENT: Bay Mills Indian Community
DRILLING COMPANY: Gosling Czubak **RIG:** CME-55LC
DRILLER: M. Allen **LOGGED BY:** R. Farve

LOG OF BORING: SB-7

GROUND ELEVATION: N.A. **DATE:** 6/3/2020
DRILLING LOCATION: See attached Soil Boring Location Sketch
DRILLING METHOD: 3.74-in (ID) Hollow Stem Auger
BOREHOLE DIAMETER (IN): +/- 8 **TOTAL DEPTH (FT):** 20
STATIC WATER LEVEL: ▽ 6.5 **CAVING DEPTH:** ℄ 6

Elevation (feet)	Graphic	Soil Description (See Boring Log Key)	Depth (feet)	Sample Type	Sample No.	Recovery (in)	Blow Counts	Notes	Pocket Penetrometer (tsf)	% < #200
		Six inches of Sandy TOPSOIL - dark brown	0							
		Fine to coarse SAND (SP) - trace fine gravel and silt - medium dense - brown - moist	0.5		SS1	18	4 5 6			
					SS2	18	6 11 14			
		Fine to coarse SAND (GP-SP) - little fine gravel - trace silt - loose - brown - moist/wet below 6.5 ft	5		SS3	12	2 2 5			
		Fine to medium SAND (SP) - trace gravel - loose - brown - wet	7		SS4	12	3 4 4			
			10		SS5	16	2 3 3			
			15		SS6	18	5 2 2			
		Boring terminated at 20 ft.	20							

TEST RESULTS
Plastic Limit ⊢⊣ Liquid Limit
Water Content - × %
SPT RESULT - ▲ N Value
10 20 30 40 50



Borehole was backfilled with augered soil cuttings.

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CLIENT: Bay Mills Indian Community
DRILLING COMPANY: Gosling Czubak **RIG:** CME-55LC
DRILLER: M. Allen **LOGGED BY:** R. Farve

LOG OF BORING: SB-8

GROUND ELEVATION: N.A. **DATE:** 6/3/2020
DRILLING LOCATION: See attached Soil Boring Location Sketch
DRILLING METHOD: 3.74-in (ID) Hollow Stem Auger
BOREHOLE DIAMETER (IN): +/- 8 **TOTAL DEPTH (FT):** 20
STATIC WATER LEVEL: ▽ 4 **CAVING DEPTH:** ▽ 4.5

Elevation (feet)	Graphic	Soil Description (See Boring Log Key)	Depth (feet)	Sample Type	Sample No.	Recovery (in)	Blow Counts	Notes	Pocket Penetrometer (tsf)	% < #200	TEST RESULTS
		Four inches of Sandy TOPSOIL - dark brown	0								Plastic Limit ⊢⊣ Liquid Limit; Water Content - × %; SPT RESULT - ▲ N Value; 10 20 30 40 50
		0.33 Fine to medium SAND (GP-SP) - little fine gravel - trace silt - dense - brown - moist			SS1	6	10 23 23	On Rock			
					SS2	8	10 23 17				
			5								
		6.5 Gravelly fine to coarse SAND (GP) - trace silt - medium dense - brown - moist/wet below 6.5 ft			SS3	10	17 21 19				
					SS4	12	4 5 6				
			10								
		13 Fine to medium SAND (SP) - little fine gravel - trace silt - loose - brown - wet			SS5	16	4 3 4				
			15								
					SS6	16	7 4 4				
			20								
		Boring terminated at 20 ft.									

Borehole was backfilled with augered soil cuttings.

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Attachment 4

Important Information about This Geotechnical-Engineering Report

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 exposure to problems associated with subsurface conditions at project sites and development of them 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 herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation

everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed

and imes

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences 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.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

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

- for a different client;
- for a different project or purpose;
- 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, the reliability of a geotechnical-engineering report can be 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 you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site 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.

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

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement 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 through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are

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 judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed 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 continuing 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 available 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-phase observations.

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 information 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. 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. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. 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 provide 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 obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with

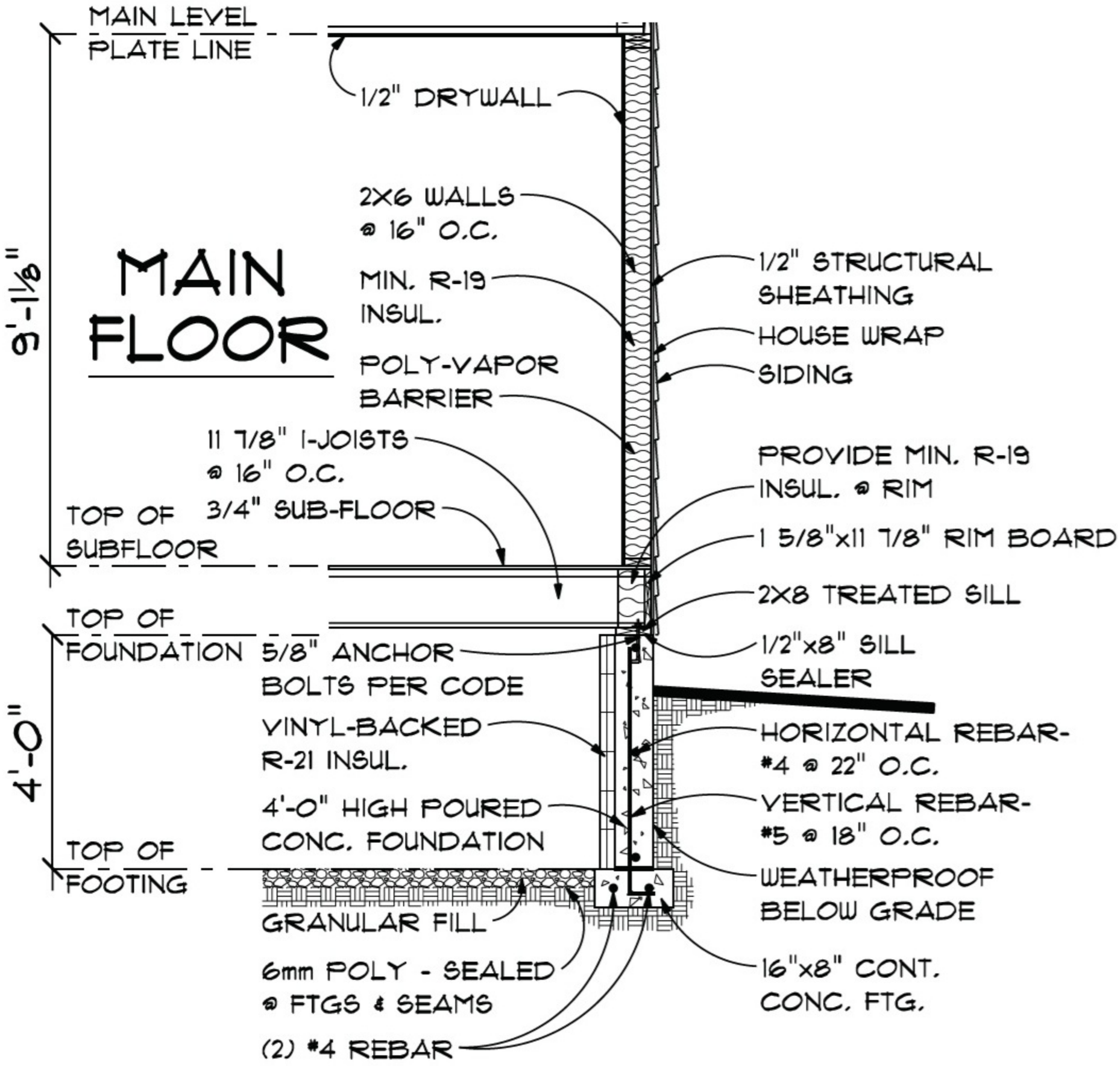
While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the 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

Attachment 5

Typical Crawlspace Cross Section



TYP. CRAWL SPACE WALL SECTION

SCALE: 1/4" = 1'-0"

Attachment 6

BMIC Prevailing Wage Rate Schedule

2024 through 2025
BMIC Prevailing Wage Rate Schedule

Position Match	Rates	Fringes	Rate No Benefits
Carpenter Helper	$ 17.23	$ 3.50	$ 20.73
Carpenter Apprentice	$ 18.30	$ 3.50	$ 21.80
Carpenter	$ 22.34	$ 3.50	$ 25.84
Lead Carpenter	$ 23.37	$ 3.50	$ 26.87
Master Plumber	$ 28.81	$ 3.50	$ 32.31
Plumber	$ 22.62	$ 3.50	$ 26.12
Tilesetter	$ 22.99	$ 3.50	$ 26.49
Carpet Installer	$ 22.42	$ 3.50	$ 25.92
Flooring Installer	$ 18.25	$ 3.50	$ 21.75
HVAC Installer	$ 22.51	$ 3.50	$ 26.01
Insulation Installer	$ 18.88	$ 3.50	$ 22.38
Bricklayer	$ 22.62	$ 3.50	$ 26.12
Cement Mason	$ 22.31	$ 3.50	$ 25.81
Laborer	$ 17.64	$ 3.50	$ 21.14
Laborer/Snowplow Driver	$ 22.19	$ 3.50	$ 25.69
Roofer	$ 17.82	$ 3.50	$ 21.32
Heavy Equipment Repairer	$ 22.82	$ 3.50	$ 26.32
Lead Operator	$ 24.36	$ 3.50	$ 27.86
Operator	$ 22.86	$ 3.50	$ 26.36
Lead Painter	$ 20.36	$ 3.50	$ 23.86
Painter	$ 18.03	$ 3.50	$ 21.53
Electrician	$ 28.77	$ 3.50	$ 32.27
Foreman	$ 28.86	$ 3.50	$ 32.36