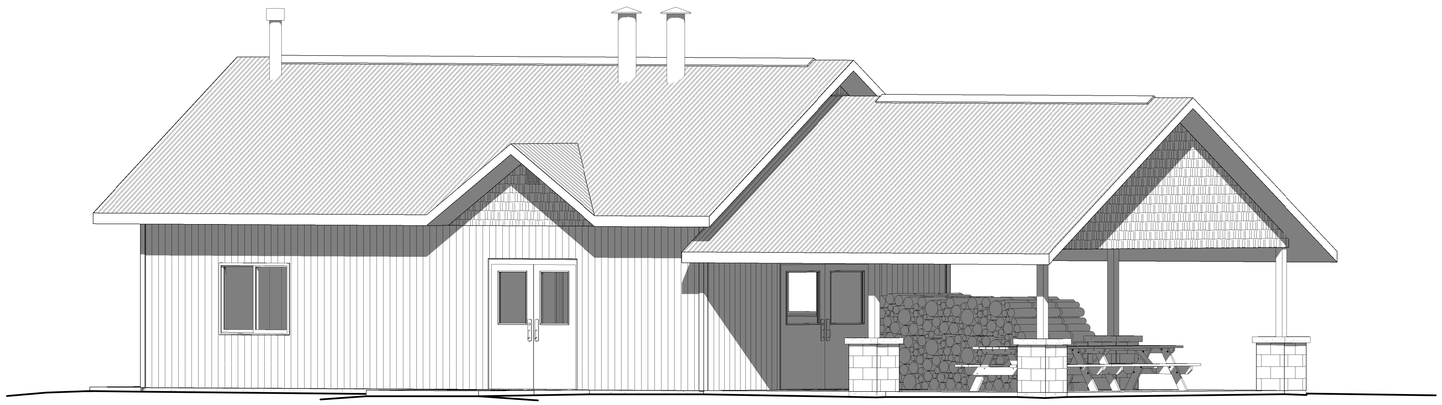
MICHIGAN TECHNOLOGICAL UNIVERSITY
LAKE LINDEN, MI

NARA FOREST EDUCATION CENTER



ISSUED FOR 100% DESIGN DOCUMENTS: APRIL 6, 2021

PREPARED BY:

IDI INTEGRATED DESIGNS, INC.
ARCHITECTURE
ENGINEERING
CONSULTING

MARQUETTE OFFICE:
1201 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4480
FAX: (906)228-7524

BRIGHTON OFFICE:
8571 W. GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48816
PHONE: (810)229-2701
FAX: (810)229-6767

IDI PROJECT NO. 19-903

ABBREVIATIONS

CIVIL

ABUT.	ABUTMENTS
AGG.BSE.CSE.	AGGREGATE BASE COURSE
ASPH.	ASPHALT
B TO B	BACK TO BACK OF CURB
B/C	BACK OF CURB
BIT.	BITUMINOUS
B.M.	BENCH MARK
BR.	BRIDGE
B.S.	BACKSLOPE
C	CENTERLINE
C.	CUT (PROFILE ONLY)
C.B.	CATCH BASIN
C–C	CENTER TO CENTER
CEN.	CENTER
C & G	CURB AND GUTTER
CIP	COMPACTED IN PLACE
C.I.P.	CAST IRON PIPE
C.M.P.	CORRUGATED METAL PIPE
C.O.	SANITARY SEWER CLEANOUT
CO.	COUNTY
COMB.	COMBINED
COMP.	COMPACTED
CONC.	CONCRETE
CONST.	CONSTRUCT
COR.	CORNER
CORR.	CORRUGATED
CR.	CREEK
C.S.P.	CORRUGATED STEEL PIPE
CULV.	CULVERT
CYD	CUBIC YARDS
D.	DEGREE OF CURVE
DEFL.	DEFLECTION
DEP.	DEPENDENT DITCH
DET.	DETAIL
D.I.P.	DUCTILE IRON PIPE
DR.	DRIVE
DWY.	DRIVEWAY
E.	EXTERNAL TO CURVE
E.G.	EARTHGRADE
EL.	ELEVATION
ELEC.	ELECTRIC
EMB.	EMBANKMENT
ENG.	ENGINEER
ENC.	ENCASED
EXIST.	EXISTING
EXC.	EXCAVATION
EXP.	EXPANSION
F.	FILL (PROFILE ONLY)
F.A.	FEDERAL AID
F.B.	FLAT BOTTOM
F/C	FACE CURB
F–F	FACE TO FACE OF CURB
FL.	FLOOR
F.L.	FLOW LINE
F.S.	FORE SLOPE
FT.	FOOT/FEET
FTG.	FOOTING
G.D.E.	GRADE
G.I.	GRADE INSPECTION
G.S.	GRADE SEPARATION
G.R.	GUARD RAIL
HDW.	HEADWALL
H.W.	HIGH WATER
HWY.	HIGHWAY
HYD.	HYDRANT
I.E.	INVERT ELEVATION
I.G.L.D.	INTERNATIONAL GREAT LAKES DATUM
I.L.	INLET
IN	INCH
IND.	INDEPENDENT DITCH
INSP.	INSPECTION (INSPECTOR)
INTER.	INTERSECTION
L.	LENGTH OF CURVE
LB.	POUND
LEV.CSE.	LEVEL COURSE
LFT	LINEAL FEET
L.M.	LOOSE MEASURE
L.W.	LOW WATER
MAINT.	MAINTENANCE
M.H.	MANHOLE
MON.	MONUMENT
N.G.V.D.	NATIONAL GEODETIC VERTICAL DATUM
N.W.	NORMAL WATER
O.H.	OVERHEAD
PAV'T.	PAVEMENT
P.C.	POINT OF CURVATURE
P.C.C.	POINT OF COMPOUND CURVATURE
P.I.	POINT OF INTERSECTION
P.L.	PROPERTY LINE
P.P.	POWER POLE
P.O.T.	POINT OF TANGENT
P.R.C.	POINT REVERSE CURVATURE
PROJ.	PROJECT
PROP.	PROPERTY
PROP.	PROPOSED
P.T.	POINT OF TANGENCY
P.V.C.	POINT VERTICAL CURVATURE
P.V.I.	POINT VERTICAL INTERSECTION
P.V.T.	POINT VERTICAL TANGENCY
R.B.	ROUND BOTTOM
R.C.P.	REINFORCED CONCRETE PIPE
RDY.	ROADWAY
R.E.C.P.	REINFORCE ELLIPTICAL CONCRETE PIPE
REINF.	REINFORCING OR REINFORCEMENT
ROW	RIGHT OF WAY
R.R.	RAILROAD
SALV.	SALVAGED
SAN.	SANITARY
SEC.	SECTION (LAND SURVEY)
SEW.	SEWER
S.G.	SUBGRADE
SHR.	SHRINKAGE
SHLD.	SHOULDER
SIG.	SIGNAL
SPEC.	SPECIAL
SPEC.	SPECIFICATIONS
SPEC.PROV.	SPECIAL PROVISIONS
SAN.	SANITARY SEWER
STD.SPEC.	STANDARD SPECIFICATIONS
ST.	STORM SEWER
SUB.	SUBBASE
SUPER ELEV.	SUPERELEVATION
SURF.	SURFACE
S.W.	SIDEWALK
T.	TANGENT
T/C	TOP CURB
T.CSE	TOP COURSE
T.L.	TRUNK LINE
TRANS.	TRANSMISSION
TWP.	TOWNSHIP
U.C.	UNDERCLEARANCE
U.G.	UNDERGROUND
UNIF.	UNIFORM
V.C.	VERTICAL CURVE
V.F.	VERTICAL FEET
VIT.	VITRIFIED
W.M.	WATER MAIN
W.S.	WATER SERVICE

ARCHITECTURAL

A.B.	ANCHOR BOLT
A/C	AIR CONDITIONING
ADD	ADDENDUM
ADH	ADHESIVE
ADJT	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AGG	AGGREGATE
AL	ALUMINUM
ALT	ALTERNATE
ANOD	ANODIZED
ARCH	ARCHITECTURAL
ASB	ASBESTOS
ASPH.	ASPHALT
AUTO	AUTOMATIC
AVE.	AVENUE
AV.	AVERAGE
BD	BOARD
BF	BOARD FEET
BIT	BITUMINOUS
BLDG.	BUILDING
BLK(G)	BLOCKING
BM	BEAM
BOT	BOTTOM
BRG	BEARING
BRK	BRICK
BRZ	BRONZE
BS	BOTH SIDES
BSMT	BASEMENT
BTWN	BETWEEN
BUR	BUILT UP ROOFING
BVL	BEVELED
BW	BOTH WAYS
CAB	CABINET
C.B.	CATCH BASIN
CEM	CEMENT
CER	CERAMIC
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CFT	CUBIC FEET
CHAM	CHAMFER
C.I.	CAST IRON
CIR	CIRCLE
CIRC	CIRCUMFERENCE
CJ	CONTROL JOINT
CLG	CEILING
CLR	CLEAR
CK(G)	CAULKING
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
C.O.	CLEANOUT
COL	COLUMN
COMB	COMBINATION
CONC.	CONCRETE
CONN.	CONNECTION
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
CONTR	CONTRACTOR
CORG	CORRUGATED
CORR	CORRIDOR
CRS	COURSE(S)
CPT	CARPET(ED)
CSMT	CASEMENT
CT	CERAMIC TILE
CTR	CENTER
CTSK	COUNTERSUNK SCREW
CYD	CUBIC YARD
DBL	DOUBLE
DEM	DEMOLISH
DEPT.	DEPARTMENT
DET.	DETAIL
D.F.	DRINKING FOUNTAIN
D.H.	DOUBLE HUNG
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DISP	DISPENSER
DIV.	DIVISION
DL	DEAD LOAD
D.O.	DOOR OPENING
DO	DITTO
DP	DAMPPROOFING
DR	DRIVE
DRWG	DRAWING
DT	DRAIN TILE
DW	DUMBWAITER
DWR	DRAWER
E	EAST
EA	EACH
E.C.	ELECTRICAL CONTRACTOR
E.F.	EACH FACE
E.J.	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMER	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
E.O.	ELECTRICAL OUTLET
EQ	EQUAL
EQUIP	EQUIPMENT
ESC	ESCALATOR
EST	ESTIMATE
E.W.	EACH WAY
EWC	ELECTRIC WATER COOLER
EXC	EXCAVATE
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EXPO	EXPOSED
EXS	EXISTING STRONG
EXT	EXTERIOR
F.A.	FIRE ALARM
F.B.	FACE BRICK
FBO	FINISHING BY OTHERS
F.D.	FLOOR DRAIN
F.E.	FIRE EXTINGUISHER
F.E.C.	FIRE EXTINGUISHER CABINET
F.F.L.	FINISHED FLOOR LINE
F.H.C.	FIRE HOSE CABINET
FOC	FACE OF CABINET
F.O.F.	FACE OF FINISH
FOM	FACE OF MASONRY
F.O.S.	FACE OF STUDS
FDN	FOUNDATION
FIN	FINISH
FLR	FLOOR
FLASH	FLASHING
FLUOR	FLUORESCENT
FP	FIREPROOF
FR	FRAME(D)(ING)
FS	FULL SIZE
FT	FOOT or FEET
FTG	FOOTING
FURR	FURR(ING)(ED)
FUT.	FUTURE
G	GUTTER
G.B.	GRAB BAR
G.C.	GENERAL CONTRACTOR
G.L.	GIRT LINE
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GL	GLASS
GLB	GLASS BLOCK
GND	GROUND
GR	GRADE
GST	GLAZED STRUCTURAL TILE
GVL	GRAVEL
GYP	GYPSUM
HB	HOSEBIB
HBD	HARDBOARD
H.C.	HOLLOW CORE
H.M.	HOLLOW METAL
HDR	HEADER
HDW	HARDWARE
HK	HOOK
HORIZ	HORIZONTAL
H.R.	HANDRAIL
HR	HOUR
HT	HEIGHT
HTG	HEATING
HVAC	HEATING,VENTILATION,A/C
HWD	HARDWOOD
HWH	HOT WATER HEATER
I.D.	INSIDE DIAMETER
IN	INCHES
INCL	INCLUDE
INSUL	INSULATION
INT	INTERIOR
INTM	INTERMEDIATE
INV	INVERT
JAN	JANITOR
JC	JANITOR'S CLOSET
JST	JOIST
JT	JOINT
KIT	KITCHEN
KO	KNOCKOUT
KPL	KICKPLATE
LAB	LABORATORY
LAD	LADDER
LAM	LAMINATE
LAV	LAVATORY
LB	LOG BOLT
lb	POUND
LBL	LABEL
LH	LEFT HAND
LIN	LINEAR
LKR	LOCKER
L.L.	LIVE LOAD
L.O.A.	LENGTH OVERALL
LP	LIGHT PROOF
LPT	LOW POINT
L.S.	LICENSED SURVEYOR
LT	LIGHT
LTG	LIGHTING
LTL	LINTEL
LVR	LOUVER
LW	LIGHTWEIGHT
LWC	LIGHTWEIGHT CONCRETE
MAS	MASONRY
MAT	MATERIAL
MAX	MAXIMUM
MBR	MEMBER
M.C.	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MED	MEDIUM
MED	MEDICINE
MEM	MEMBRANE
MET	METAL
MEZZ	MEZZANINE
MFG	MANUFACTURING
MFR	MANUFACTURER
M.H.	MANHOLE
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
M.O.	MASONRY OPENING
MOD	MODULAR
MOV	MOVABLE
MSRY	MASONRY
MTD	MOUNTED
MUL	MULLION
N	NORTH
NAT	NATURAL
N.I.C.	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NR	NOISE REDUCTION
NRC	NOISE REDUCTION COEFFICIENT
N.T.S.	NOT TO SCALE
O.A.	OVERALL
OBS	OBSCURE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
OFF	OFFICE
OH	OVERHEAD
OP	OPAQUE
OPG	OPENING
OPH	OPPOSITE HAND
OPP.	OPPOSITE
OPS	OPPOSITE SURFACE
PAR	PARALLEL
PART	PARTITION
PART BD.	PARTICLE BOARD
PB	PANIC BAR
PCC	PRECAST CONCRETE
pcf	POUNDS PER CUBIC FOOT
PCS	PIECES
PED	PEDESTAL
PERF	PERFORATE(D)
PERI	PERIMETER
PERM	PERMINATE
PERP	PERPENDICULAR
PFB	PREFABRICATE(D)
PFN	PREFINISHED
PG	PLATE GLASS
PK(G)	PARKING
P.L.	PROPERTY LINE
PL	PLATE
P.LAM.	PLASTIC LAMINATE
PLAS	PLASTER
PLF	POUNDS PER LINEAL FEET
PLYWD	PLYWOOD
PNL	PANEL
ONT	PAINT(ED)
PR	PAIR
PRF	PREFORMED
psf	POUNDS PER SQUARE FOOT
psi	POUNDS PER SQUARE INCH
PT	POINT
P.T.D.	PAPER TOWEL DISPENSER
P.T.R.	PAPER TOWEL RECEPTACLE
PVMT	PAVEMENT
PWR	POWER
Q.T.	QUARRY TILE
R	RISER
RAD	RADIUS
R.B.	RUBBER BASE
R.D.	ROOF DRAIN
REF	REFERENCE
REFR	REFRIGERATOR
REINF	REINFORCED
REQ'D	REQUIRED
RES	RESILIENT
RET	RETURN
REV	REVISION
RFH	ROOF HATCH
RFG	ROOFING
RH	RIGHT HAND
RM	ROOM
R.O.	ROUGH OPENING
R.O.W.	RIGHT OF WAY
R.R.	RAILROAD
RVS	REVERSE SIDE
S	SOUTH
S.C.	SOLID CORE
SCH	SCHEDULE
SCT	STRUCTURAL CLAY TILE
S.D.	STORM DRAIN
SECT.	SECTION
SH	SHELF
SHO	SHOR(ING)(ED)
SHT	SHEET
SHTH	SHEATHING
SHWR	SHOWER
SIM	SIMILAR
SNT	SEALANT
SP	SOUNDPROOF
SPEC	SPECIFICATION
SPKR	SPEAKER
SPRKLR	SPRINKLER
SQ	SQUARE
S.S.	STAINLESS STEEL
SSR	SERVICE SINK
STA	STATION
STD	STANDARD
STG	SEATING
STL	STEEL
STOR	STORAGE
STRUCT.	STRUCTURAL
SUSP	SUSPENDED
SYM	SYMMETRICAL
SYS	SYSTEM
T.B.	TOWEL BAR
T.CONC.	TOP OF CONCRETE
TEL	TELEPHONE
TER	TERRAZZO
T&G	TONGUE AND GROOVE
THK	THICK
THR	THRESHOLD
TOL	TOLERANCE
TPD	TOILET PAPER DISPENSER
TPTN	TOILET PARTITION
T.PVMT	TOP OF PAVEMENT
TR	TREAD
T.SLAB	TOP OF SLAB
T.V.	TELEVISION
T.WALL	TOP OF WALL
TYP	TYPICAL
U.B.C.	UNIFORM BUILDING CODE
U.L.	UNDERWRITERS LABORATORIES
UNF	UNFINISHED
U.N.O.	UNLESS NOTED OTHERWISE
UR	URINAL
V.A.T.	VINYL ASBESTOS TILE
V.B.	VINYL BASE
VERT.	VERTICAL
VEST.	VESTIBULE
VNR	VENEER
VT	VINYL TILE
W.	WEST
W/	WITH
W.C.	WATER CLOSET
WD.	WOOD
WD	WOOD BASE
WGT	WEIGHT
W.H.	WALL HUNG
WI	WROUGHT IRON
WIN	WINDOW
W.M.	WIRE MESH
W/O	WITHOUT
WP.	WATERPROOF
WPT	WORKING POINT
WSCT.	WAINSCOT
W.W.F.	WELDED WIRE FABRIC

STRUCTURAL

ARCH	ARCHITECTURAL
B/	BOTTOM OF
BIT	BITUMINOUS
BM	BEAM
BRDG	BRIDGING
BRG	BEARING
C.J.	CONTROL/CONSTRUCTION JOINT
CANT	CANTILEVER
℄	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT(S)
COL	COLUMN
CONC	CONC
CONN	CONNECTION
CONT	CONTINUOUS
COORD	COORDINATE
db	BAR DIAMETER
ø	DIAMETER
DCA	DRILLED IN CONCRETE ANCHOR
DEMO	DEMOLISH/DEMOLITION
DIA	DIAMETER
DL	DEAD LOAD
DWL	DOWEL
E.F.	EACH FACE
E.W.	EACH WAY
EA	EACH
EL	ELEVATION
ELEC	ELECTRICAL
EMBED	EMBEDDED
EQ	EQUAL
EXIST	EXISTING
FIN	FINISH
FLR	FLOOR
FND	FOUNDATION
FS	FAR SIDE
FTG	FOOTING
GA	GAGE
GALV	GALVANIZED
HK	HOOK
HORIZ	HORIZONTAL
I.R.	INSIDE RADIUS
INSUL	INSULATION
ISOL	ISOLATION
JG	JOIST GIRDER
JNT	JOINT
K	KIP(S) (1 KIP = 1000 lbs)
LL	LIVE LOAD
LLBB	LONG LEGS BACK TO BACK
LLH	LONG LEG(S) HORIZONTAL
LLV	LONG LEG(S) VERTICAL
LOCS	LOCATIONS
MAS	MASONRY
MECH	MECHANICAL
MTL	METAL
NIC	NOT IN CONTRACT
NS	NEAR SIDE
O.C.	ON CENTER
O.H.	OPPOSITE HAND
O.R.	OUTSIDE RADIUS
OPNG	OPENING
PC	PIECE
P	PLATE
PREFAB	PREFABRICATED
PSI	POUNDS PER SQUARE INCH
R	RADIUS
REBAR	REINFORCING BAR
REINF	REINFORCE(D) (ING)
REQ'D	REQUIRED
SCHED	SCHEDULE
SIM	SIMILAR
SLBB	SHORT LEGS BACK TO BACK
SP	SPACE(D)
STD	STANDARD
STRUCT	STRUCTURAL
T&B	TOP AND BOTTOM
T/	TOP OF
T/S	TOP OF STEEL
TS	TUBE STEEL
TYP	TYPICAL
U.N.	UNLESS NOTED
USGS	UNITED STATES GEOLOGICAL SURVEY
VERT	VERTICAL
W.P.	WORK POINT
W/	WITH
WWF	WELDED WIRE FABRIC

MECHANICAL

AFF	ABOVE FINISH FLOOR
AP	ACCESS PANEL
AV	AIR VENT
B.A.C.	BUILDING AUTOMATED CONTROLS
BC	BALANCING COCK
BD	BALANCING DAMPER
BT	BATHTUB
C.	COMMON
CO	CLEANOUT
CV	CONTROL VALVE
DF	DRINKING FOUNTAIN
DG	DOOR GRILLE
E.C.	ELECTRICAL CONTRACTOR
EAT	ENTERING AIR TEMPERATURE
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
FA	FRESH AIR
FHC	FIRE HOSE CABINET
G.C.	GENERAL CONTRACTOR
IE	INVERT ELEVATION
L	LAVATORY
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MB	MOP BASIN
M.C.	MECHANICAL CONTRACTOR
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
OTCS	OPEN TO CEILING SYSTEM
RA	RETURN AIR
RD	ROOF DRAIN
S	SINK
SA	SHOCK ABSORBER
SH	SHOWER
SS	SERVICE SINK
TCC	TEMP CONTROL CENTER
TP	TEMP & PRESSURE TEST POINT
U	URINAL
U.C. 1"	UNDERCUT DOOR 1"
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WF	WASH FOUNTAIN

ELECTRICAL

AC	ALTERNATING CURRENT
AFF	ABOVE FINISH FLOOR
AFFF	AQUEOUS FILM FORMING FOAM
AHU	AIR HANDLING UNIT
A/C	AMPS INTERRUPTING CAPACITY
AL	ALUMINUM
ALT	ALTERNATE
AMP, A	AMPERE
APPD	APPROVED
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL or ARCHITECT
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAUGE
BD or BRD	BOARD
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
C or COND.	CONDUIT
CCT	CIRCUIT
CCT BKR	CIRCUIT BREAKER
CLG	CEILING
CNTL	CONTROL
COMB	COMBINATION
CONN	CONNECTION
CONSTR	CONSTRUCTION
CORR	CORRIDOR
CPL or ~	CYCLES PER SECOND
DC	DIRECT CURRENT
DEG	DEGREE
DET	DETAIL
DEV	DEVICES
DF	DRINKING FOUNTAIN
DIA or	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
DIV	DIVISION
DWG	DRAWING
EF	EXHAUST FAN
ELEC	ELECTRIC or ELECTRICAL
EMER	EMERGENCY
ENCL	ENCLOSURE
EP	EXPLOSION PROOF
EQUIP	EQUIPMENT
EST	ESTIMATE
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EXIST	EXISTING
EXP	EXPOSED
EXPL	EXPLOSION
EXT	EXTERIOR
FC	FOOT CANDLE
FDN	FOUNDATION
DIX	FIXTURE
FL or FLR	FLOOR
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLUOR	FLUORESCENT
FP	FIRE PROTECTION
GA	GAGE or GAUGE
GFI	GROUND FAULT INTERRUPTER
GND or GRND	GROUND
GOVT	GOVERNMENT
HP	HORSE POWER
HPS	HIGH PRESSURE SODIUM
HT	HEIGHT
IC	INTERCOM
ID	INSIDE DIAMETER
IES	ILLUMINATING ENGINEERING SOCIETY
INCAN	INCANDESCENT
JB	JUNCTION BOX
JCT	JUNCTION
K	KEY
KV	KILOVOLTS
KVA	KILOVOLT AMPERES
KVAR	KILOVOLT AMPERES REACTIVE
KW	KILOWATT
L	LUMEN
LD	LOAD
LDG	LOADING
LT	LIGHT
LTG	LIGHTING
MCA	MINIMUM CIRCUIT AMPS
MCM	THOUSAND CIRCULAR MILLS
MECH	MECHANICAL
MET	METAL
MFG	MANUFACTURING
MFF	MANUFACTURE
MG	MOTOR GENERATOR
MG	METAL HALIDE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MO	MOTOR
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
MV	MERCURY VAPOR
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELEC MANUFACTURERS ASSOC
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NO	NUMBER
NO	NORMALLY OPEN
OD	OUTSIDE DIAMETER
OH	OVERHEAD
OPNG	OPENING
OPS	OPERATIONS
P	PUMP
P	POLE
PA	PUBLIC ADDRESS
PBS	PUSH BUTTON STATION
PC	PHOTOCELL
PH	PHASE
PNL	PANEL
P.P.M.	PARTS PER MILLION
PR	PAIR
PRELIM	PRELIMINARY
PROJ	PROJECT
PWR	POWER
R or RSR	RISER
RCVR	RECEIVER
RECP	RECEPTACLE
RECEPT	RECEPTACLE
REFR	REFRIGERATOR
REM	REMOVABLE
REV	REVISIONS
RGE	RANGE
RLA	RATED LOAD AMPS
RM	ROOM
R.P.M.	REVOLUTIONS PER MINUTE
SCH	SCHEDULE
SHT	SHEET
SPEC	SPECIFICATIONS
SPKR	SPEAKER
STD	STANDARD
SURF	SURFACE
SUSP	SUSPENDED
SW	SWITCH
SWBD	SWITCHBOARD
TC	TIMECLOCK
TEL	TELEPHONE
TEMP	TEMPERATURE
TEMP	TEMPORARY
TERM	TERMINAL
TG;L	TOGGLE
TRANSF	TRANSFORMER
TSTAT	THERMOSTAT
TV	TELEVISION
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
UON	UNLESS OTHERWISE NOTED
UT	UTILITY
UTIL CO	UTILITY COMPANY
V	VOLT
W	WIRE
W/	WITH
WHM	WATTHOUR METER
W/O	WITHOUT
WP	WEATHER PROOF
XFMR	TRANSFORMER

MECHANICAL SYMBOL LEGEND

- CONDENSATE OR EQUIPMENT DRAIN — D
- CONDENSER SUPPLY — CS
- CONDENSER RETURN — CR
- REFRIGERANT LIQUID — RL
- REFRIGERANT SUCTION — RS
- LOW PRESSURE STEAM SUPPLY
- LOW PRESSURE STEAM RETURN
- MEDIUM PRESSURE STEAM SUPPLY
- MEDIUM PRESSURE STEAM RETURN
- HIGH PRESSURE STEAM SUPPLY
- HIGH PRESSURE STEAM RETURN
- INDICATION OF FLOW DIRECTION
- INDICATES PITCH DOWN
- PIPE ANCHORS
- PIPE GUIDES
- STORM SEWER LINES
- SANITARY VENT — V
- COLD WATER
- HOT WATER
- HOT WATER CIRCULATING
- HOT WATER SUPPLY — HWS
- HOT WATER RETURN — HWR
- CHILLED WATER SUPPLY — CWS
- CHILLED WATER RETURN — CWR
- FIRE SPRINKLER LINE — F
- EXPANSION TANK LINE — XL
- GAS — G
- COMPRESSED AIR — CA
- SANITARY SEWER LINES
- BUTTERFLY VALVE
- GLOBE VALVE
- GATE VALVE
- BALL VALVE
- CHECK VALVE
- PLUG VALVE
- THERMOSTAT / TEMP. SENSOR
- HUMIDISTAT / HUMIDITY SENSOR
- 1–HR FIRE DAMPER
- 2–HR FIRE DAMPER
- PRESSURE GAGE
- THERMOMETER
- DOOR GRILLE — DG
- UNION
- PRESSURE REDUCING VALVE
- SAFETY RELIEF VALVE
- UNDERCUT DOOR 1" — UC 1"
- AUTOMATIC AIR VENT
- GRILL, REGISTER, DIFFUSER — SIZE / CFM
- PLUMBER RISER DIAGRAM — P
- RADIATION — TYPE / LIN. FT. ELEMENT
- MANUAL AIR VENT
- FLEXIBLE PIPE CONNECTOR
- HOSE END VALVE
- BALANCING COCK
- AUTOMATIC CONTROL VALVE
- 3–WAY CONTROL VALVE
- STRAINER W/BLOW–OFF VALVE
- WALL HYDRANT

GRAPHIC SYMBOLS

BUILDING SECTION/WALL SECTION

- 0 / A0.0 — INDICATES SECTION NUMBER; INDICATES NUMBER OF SHEET SECTION IS FOUND

DETAILS

- 0 / A0.0 — INDICATES DETAIL NUMBER; INDICATES NUMBER OF SHEET DETAIL IS FOUND

INTERIOR ELEVATION

- a, 0 / A0.0, b — NUMBER INDICATES ELEVATION & SHADING INDICATES INDICATES DIRECTION(S) OF VIEW; LETTER(S) DESIGNATE ELEV. WHERE MULTIPLE; INDICATES NUMBER OF SHEET ELEVATION IS FOUND

OTHER

- 0 — WALL TYPE
- 0 — REVISIONS
- NAME / 000 — ROOM NAME & NUMBER
- 00.0 — DOOR NUMBER
- a — WINDOW TYPE
- 0 — KEYNOTE

ELECTRICAL SYMBOL LEGEND

LIGHT FIXTURES – NUMBER INDICATES CIRCUIT, LOWER CASE LETTER INDICATES SWITCH LEG, UPPER CASE LETTER INDICATES FIXTURE TYPE, SEE FIXTURE SCHEDULE. DARKENED SYMBOL INDICATES NIGHT LIGHT.

- A/1 a/b — FLUORESCENT RECESSED FIXTURE
- DOWN LIGHT OR INDUSTRIAL AS SCHEDULED
- SURFACE, CHAIN SUSPENDED OR INDIRECT PENDANT MOUNTED FLUORESCENT FIXTURE AS SCHEDULED
- SURFACE MOUNTED SQUARE LIGHT
- EXTERIOR AREA LIGHT
- EXTERIOR POLE MOUNTED FIXTURE
- $ — LIGHT SWITCH – SINGLE POLE UNLESS NOTED OTHERWISE, LOWER CASE LETTER INDICATES SWITCH LEG
  - 3 – THREE WAY SWITCH
  - K – KEYED SWITCH
- EXIT LIGHT
- EMERGENCY BATTERY LIGHT
- F — FIRE ALARM PULL STATION, MOUNT 48" A.F.F. TO TOP
- DOOR HOLDER/CLOSER
- HORN/STROBE LIGHT MOUNT 80" A.F.F. TO BOTTOM
- STROBE LIGHT, MOUNT 80" A.F.F. TO BOTTOM
- SD — SMOKE DETECTOR (D – DUCT MTD. TYPE)
- F — SPRINKLER SYSTEM FLOW SWITCH
- 1 — MOTOR SYMBOL, NUMBER INDICATES HORSEPOWER, F – FRACTIONAL HORSEPOWER
- DISCONNECT SWITCH, SIZE AND TYPE AS NOTED
  - N.F. – NON FUSED
- MOTOR STARTER
- MSS — MANUAL MOTOR STARTER SWITCH WITH THERMAL OVERLOAD PROTECTION
- COMBINATION MOTOR STARTER/DISCONNECT DEVICE
- J — JUNCTION BOX (AS NOTED)
- SPECIAL PURPOSE RECEPTACLE, AS NOTED
- C — WALL MOUNTED CLOCK, AS SPECIFIED, MOUNT 8'–3" A.F.F. TO CENTER
- FLOOR MOUNTED RECEPTACLE OUTLET OR JUNCTION BOX AS NOTED.
- QUADRAPLEX RECEPTACLE
- DUPLEX RECEPTACLE
  - GFI – GROUND FAULT INTERRUPTER
  - WP – WEATHER PROOF COVER
- SIMPLEX RECEPTACLE
- COMMUNCIATION/DATA CABLE OUTLET.
- WIRELESS ACCESS POINT
- CCTV CAMERA
- I — INTERCOM STATION
- PANELBOARD; FLUSH MTD, SURFACE MTD
- CONDUIT NIPPLE (AS NOTED)
- SURFACE MOUNTED RACEWAY
- CONDUIT RUN CONCEALED IN WALLS OR ABOVE CEILING
- CONDUIT RUN BELOW FLOOR SLAB OR GRADE
- HOMERUN TO PANELBOARD — CONDUIT, NEUTRAL, PHASE WIRE(S), GROUND WIRE, PANELBOARD (RLP–1), CIRCUIT(S) (2,4,6)

GENERAL NOTES

1. DO NOT SCALE DRAWINGS; USE FIGURED DIMENSIONS ONLY. IF DIMENSIONS ARE IN QUESTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT BEFORE CONTINUING WITH CONSTRUCTION.
2. FIELD VERIFY: ALL DIMENSIONS AND CONDITIONS BEFORE PROCEEDING WITH WORK.
3. ENLARGED PLANS: WHERE ENLARGED OR PARTIAL PLANS ARE REFERENCED. DIMENSIONS, SPECIAL DETAILING, OR FINISH REQUIREMENTS ARE NOTED ON THE ENLARGED PLANS AND OMITTED ON THE SMALLER SCALE OR OVERALL PLANS.
4. EXPOSED WELDS: GRIND SMOOTH AND FIELD DRESS ALL WELDS TO REMAIN VISIBLE AND NOT CONCEALED BY OTHER FINISHES.
5. FIRE PROTECTION: FOR FIRE PROTECTION REQUIREMENTS OF STRUCTURAL FRAME AND ASSEMBLIES SEE U.L. ASSEMBLY RATING DESCRIPTION THIS SHEET OR DETAILS REFERENCED IN PLANS.
6. DOOR OPENINGS: REFERENCED IDENTIFICATION OF DOOR OPENINGS IS SCHEDULED BY THE CORRESPONDING ROOM NUMBER IN WHICH THE OPENING OCCURS OR GIVES ACCESS TO (DOOR SWING DIRECTION). IF MORE THAN ONE DOOR OCCURS IN A SPACE THE ADDITIONAL DOOR NUMBERS WILL BE FOLLOWED BY A SEQUENTIAL DECIMAL NUMBER.
7. WINDOW OPENINGS: REFERENCED IDENTIFICATION OF WINDOW OPENINGS IS SCHEDULED BY LOWER CASE LETTERS. SIMILAR WINDOWS ARE SCHEDULED BY THE SAME LETTER.
8. PARTITION STANDARD: IT IS INTENDED THAT THE FACE OF EVERY CONTINUOUS PARTITION BE FLUSH, WITHOUT OFFSETS, EVEN AT AN INTERMEDIATE CHANGE IN PARTITION THICKNESS. CHANGES IN PARTITION THICKNESS OCCUR ONLY AT INSIDE OR OUTSIDE CORNERS. THE FACES OF CORRIDOR WALLS MUST ALIGN WITHOUT OFFSETS (UNLESS GRAPHICALLY SHOWN OTHERWISE) ALONG THEIR ENTIRE LENGTH REGARDLESS OF INTERMEDIATE BREAKS OR INTERRUPTIONS. ALL ADJUSTMENTS DUE TO CHANGE IN PARTITION THICKNESS MUST OCCUR ON THE ADJOINING ROOM SIDE OF CORRIDOR PARTITIONS AT THE NEAREST INSIDE OR OUTSIDE CORNER.
9. ALL ELECTRICAL PANELS, FIRE EXTINGUISHER CABINETS, ETC., LOCATED IN RELATED PARTITIONS SHALL BE BACKED WITH GYPSUM BOARD AS REQUIRED TO RETAIN PARTITION RATING.
10. IN SPACES REQUIRING LEAD LINING, ALL WALL PENETRATIONS SHALL BE BACKED AND PROTECTED WITH LEAD SHIELDING TO MAINTAIN SHIELDING CONTINUITY.
11. INTERIOR DIMENSIONS ARE GENERALLY TO FACE OF GYPSUM BOARD AND TO CENTER LINE OF STEEL UNLESS SPECIFICALLY NOTED. ALL PUBLIC CORRIDOR DIMENSIONS ARE GIVEN IN CLEAR DIMENSIONS.
12. EXTEND ALL FIRE RATED PARTITIONS TIGHT TO DECK ABOVE AND FILL ALL VOIDS WITH SAFING MATERIALS OR GYPSUM BOARD MUDDING COMPOUND.
13. WHEN CONTRADICTIONS OCCUR BETWEEN PLANS AND SPECIFICATIONS CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT BEFORE CONTINUING WITH CONSTRUCTION.

* SOME GENERAL NOTES ABOVE MAY NOT BE APPLICABLE TO PROJECT HEREIN.

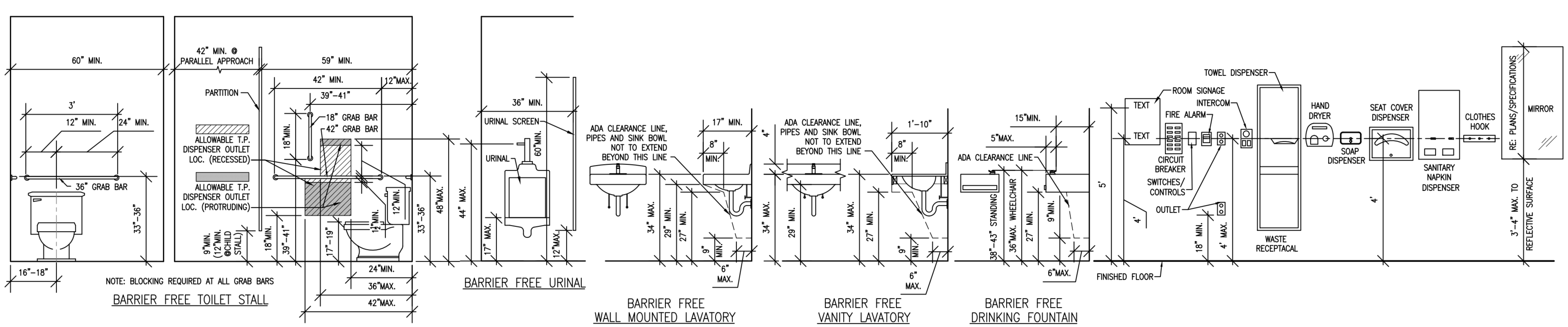
CODE SUMMARY

CODES			
X	2015 MICHIGAN BUILDING CODE		FIRE MARSHALL RULES
	STATE OF MICHIGAN BARRIER FREE ACCESS DESIGN RULES (2009 ICC/ANSI A117.1)		MICHIGAN DEPARTMENT OF LABOR CONSTRUCTION CODE COMMISION GENERAL RULES
	NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	X	2015 MICHIGAN MECHANICAL CODE
X	2015 MICHIGAN PLUMBING CODE		MICHIGAN UNIFORM ENERGY CODE
X	NATIONAL ELECTRICAL SAFETY CODE	X	2017 NATIONAL ELECTRIC CODE (NEC)
CODES FIRE RESISTIVE ANALYSIS			
	CLASSIFICATIONS:		CONSTRUCTION PROTECTION:
1	STORIES	0	INTERIOR NON-BEARING PARTITIONS
E	OCCUPANCY TYPE	0	STRUCTRAL FRAME
VB	CONSTRUCTION TYPE	0	EXTERIOR NON-BEARING WALLS
NONE	SPRINKLER SYSTEM	0	ROOF

DRAWING SHEET INDEX

A0.0	COVER
I1.0	INDEX SHEET
CIVIL	
C1.0	SITE PLAN
C2.0	SITE DETAILS
STRUCTURAL	
S0.1	STRUCTURAL NOTES AND TESTING
S1.0	FOUNDATION AND FRAMING PLAN
S2.0	DETAILS
ARCHITECTURAL	
A1.0	FLOOR AND REFLECTED CEILING PLANS
A2.0	WINDOW, DOOR & FINISH SCHEDULES
A3.0	ROOF PLAN
A4.0	ELEVATIONS
A5.0	BUILDING SECTIONS
A6.0	INTERIOR ELEVATIONS & DETAILS
MECHANICAL/PLUMBING	
MP1.0	MECHANICAL/PLUMBING PLANS
MP2.0	MECHANICAL/PLUMBING DETAILS & SCHEDULES
ELECTRICAL	
E1.0	ELECTRICAL PLANS

BARRIER FREE MOUNTING REQUIREMENTS (ICC A117.1-2009)



MARQUETTE OFFICE:
1021 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4480 FAX: (906)228-7524

BRIGHTON OFFICE:
8571 W. GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48816
PHONE: (810)229-2701 FAX: (810)229-6767

ARCHITECTURE
ENGINEERING
CONSULTING

IDI
INTEGRATED DESIGNS, INC.

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
B	100% DESIGN DOCS.	06.01.20
0	ISSUED FOR BIDS	04.06.21

	BY	DATE:
DESIGN	EC	04.27.20
DRAWN	EC	04.27.20
CHECKED	TH	05.06.20
APPROVED	TH	05.06.20

INDEX SHEET

COPYRIGHT © 2021 INTEGRATED DESIGNS INC.

I1.0

C:\Users\ecoursey.IDI\Documents\MTU Nara Forest Education Center_erik@intdesigns.com.rvt
3/29/2021 1:37:46 PM

SITE PLAN
SCALE: 1 INCH = 10 FEET

N

GRAPHIC SCALE: 1 inch = 10 feet
0 5 10 20 30

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

KEYNOTES

– SEE CURRENT MDOT SPECIFICATIONS FOR MATERIALS AND INSTALLATION REQUIREMENTS UNLESS OTHERWISE SPECIFIED –

1. PROPOSED 1 STORY BUILDING. SEE ARCHITECTURAL AND STRUCTURAL PLANS FOR MORE INFORMATION. BUILDING IS TO BE LOCATED PARALLEL TO THE EXISTING ROAD. REMOVE EXISTING VEGETATION, TOPSOIL AND UNDERLYING MATERIAL AS REQUIRED FOR NEW WORK. FINAL BUILDING LOCATION AND ELEVATION SHALL BE ESTABLISHED IN THE FIELD BY THE SITE CONTRACTOR AFTER DISCUSSION WITH THE OWNER AND THE ENGINEER. THE SITE SHALL BE GRADED AS NECESSARY TO SLOPE AWAY FROM THE BUILDING AT A 2% MAX SLOPE TO ENSURE THAT WATER DRAINS AWAY FROM THE BUILDING. SEE STRUCTURAL AND ARCHITECTURAL PLANS.
2. PROPOSED FUTURE BUILDING EXPANSION FOR INFORMATION ONLY. THE CONTRACTOR SHALL NOT CONSTRUCT ANY IMPROVEMENTS IN THIS AREA.
3. PROPOSED COVERED PORCH AND PATIO, BID ALTERNATE #1. SEE STRUCTURAL AND ARCHITECTURAL PLANS.
4. CONSTRUCT SUPPORTED SLAB FOR PROPOSED DOOR. SEE STRUCTURAL AND ARCHITECTURAL PLANS.
5. CONSTRUCT EIGHT (8) WOODEN POST BOLLARDS. SEE DETAIL SHEET.
6. INSTALL A SEPTIC ABSORPTION SYSTEM AND ASSOCIATED UNDERGROUND STORAGE TANKS AS REQUIRED BY THE WESTERN UPPER PENINSULA HEALTH DEPARTMENT. CONTACT HEALTH DEPARTMENT FOR ALL REQUIREMENTS AND OBTAIN PERMIT FOR CONSTRUCTION (INCLUDING PAYMENT OF ANY PERMIT FEES) PRIOR TO BEGINNING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DIGGING THE TEST HOLES REQUIRED BY THE HEALTH DEPARTMENT.
7. INSTALL ±34 LF OF 4 INCH SDR–26 SANITARY SEWER LATERAL WITH CLEANOUTS AS SHOWN (1 TOTAL). CONNECT PROPOSED SANITARY SEWER LATERAL TO PROPOSED SEPTIC SYSTEM PER REQUIREMENTS OF THE WESTERN UPPER PENINSULA HEALTH DEPARTMENT. SITE CONTRACTOR SHALL TERMINATE NEW SANITARY SEWER LATERAL 5 FEET OUTSIDE OF THE PROPOSED BUILDING WITH A CLEANOUT AS SHOWN. SEE DETAIL SHEET. COORDINATE WITH THE PLUMBING CONTRACTOR AND SEE PLUMBING PLANS FOR MORE INFORMATION.
8. INSTALL A NEW POTABLE DRINKING WATER WELL AND A 1 INCH TYPE 'K' COPPER WATER SERVICE LINE FROM THE PROPOSED WELL TO THE PROPOSED EXPANSION TANK. LOCATION OF WELL IS SHOWN FOR INFORMATION ONLY, WELL DRILLING CONTRACTOR SHALL DETERMINE THE FINAL LOCATION OF THE WELL, ENSURING THAT IT IS LOCATED OVER 50 FEET AWAY FROM THE PROPOSED SEPTIC SYSTEM AND ASSOCIATED SEWER PIPES. MINIMUM DEPTH OF BURY FOR WATER LINE SHALL BE 7 FEET. INSULATE LINE WITH 2 INCH POLYSTYRENE FOR ANY DEPTH ABOVE 7 FEET. CONTACT THE WESTERN UPPER PENINSULA HEALTH DEPARTMENT FOR ALL REQUIREMENTS AND OBTAIN PERMIT (INCLUDING PAYMENT OF ANY PERMIT FEES) FOR CONSTRUCTION PRIOR TO BEGINNING WORK. CONTRACTOR SHALL PERFORM ALL TESTS AND INSTALL WELL ACCORDING TO THE LATEST RULES AND REGULATIONS OF ALL GOVERNING AGENCIES. CONTRACTOR SHALL SUPPLY ALL MATERIALS AND EQUIPMENT NECESSARY TO PROVIDE A COMPLETE WELL SYSTEM INCLUDING REQUIRED PUMP. SITE CONTRACTOR SHALL TERMINATE NEW 1 INCH WATER LINE INSIDE BUILDING FOOTPRINT AND PROVIDE TWO (2) CURB STOPS AND PIPING AS SHOWN FOR WINTERIZING THE BUILDING, SEE DETAIL SHEET. SEE PLUMBING, MECHANICAL AND ELECTRICAL PLANS FOR MORE INFORMATION AND COORDINATE WITH PLUMBING, MECHANICAL AND ELECTRICAL CONTRACTORS.
9. PROPOSED GENERATOR AND ASSOCIATED PAD, BY OTHERS. SEE ELECTRICAL PLANS FOR MORE INFORMATION AND COORDINATE WITH THE ELECTRICAL CONTRACTOR.
10. PROPOSED 500 GAL PROPANE TANK, BY OTHERS. COORDINATE FINAL TANK LOCATION WITH THE PROPANE SUPPLY COMPANY.
11. PROPOSED BURIED PROPANE SUPPLY LINE. COORDINATE WITH MECHANICAL AND ELECTRICAL CONTRACTOR. SEE ELECTRICAL AND MECHANICAL PLANS FOR MORE INFORMATION.

ALL KEYNOTES ARE SPECIFIC TO THAT SHEET ONLY

PROPOSED CONCRETE

SURVEY INFORMATION

A SITE SURVEY WAS NOT CONDUCTED FOR THIS PROJECT. INFORMATION SHOWN ON THE PLANS ARE FOR INFORMATION ONLY AND WAS OBTAINED FROM AERIAL AND SITE PHOTOGRAPHS. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND ELEVATIONS BEFORE BEGINNING WORK.

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) STANDARD PLANS AND SPECIFICATIONS FOR CONSTRUCTION 2012 EDITION UNLESS SPECIFIED OTHERWISE IN PROJECT PLANS OR SPECIFICATIONS.
2. IF DIMENSIONS ARE IN QUESTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE OWNER/ENGINEER BEFORE PROCEEDING.
3. FIELD VERIFY ALL DIMENSIONS, QUANTITIES AND SITE CONDITIONS BEFORE PROCEEDING WITH WORK. A SITE SURVEY WAS NOT COMPLETED FOR THIS PROJECT.
4. A SOIL EROSION & SEDIMENT CONTROL (SESC) PERMIT IS NOT REQUIRED AT THIS LOCATION. HOWEVER THE CONTRACTOR SHALL BE IN FULL COMPLIANCE WITH PART 91 OF PUBLIC ACT 451 OF 1994 AS AMENDED AND THE ADMINISTRATIVE RULES. CONTRACTOR SHALL HAVE A DEQ CERTIFIED STORMWATER OPERATOR ASSIGNED TO THIS PROJECT.
5. SOIL EROSION MEASURES SHALL BE IN PLACE PRIOR TO ANY WORK ON SITE.
6. THE CONTRACTOR SHALL BE REQUIRED TO RESTORE ALL EXISTING TURF AREAS WHICH ARE DISTURBED BY CONSTRUCTION ACTIVITIES THROUGHOUT THE PROJECT OR AS SPECIFIED. TURF AREAS SHALL MATCH ADJACENT GRADES IN ADDITION TO GRADES SPECIFIED. TURF RESTORATION CONSISTS OF A SCREENED TOPSOIL SURFACE, 6 INCH, CHEMICAL FERTILIZER NUTRIENT, SEED MIXTURE CLASS A, STRAW MULCH BLANKETS AND MULCH ANCHORING. THE CONTRACTOR SHALL BE REQUIRED TO WATER TURF AREAS UNTIL THE FIRST CUTTING. AT THAT TIME THE OWNER SHALL TAKE RESPONSIBILITY FOR MAINTENANCE.
7. ALL REMOVAL ITEMS CALLED OUT SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS SPECIFIED OTHERWISE.
8. ALL KEYNOTES ON SITE SHEETS ARE "SPECIFIC" TO THAT SHEET ONLY.
9. THE CONTRACTOR SHALL ABIDE BY ALL LOCAL ORDINANCES.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING FOR THIS PROJECT AND PROTECTION OF, OR PLACING NEW, BENCHMARKS AND/OR CONTROL POINTS. THE ELECTRONIC ".DWG" FILE SHALL BE PROVIDED TO THE CONTRACTOR OR THEIR SURVEYOR FOR LAYOUT PURPOSES.
11. ANY PROPERTY IRONS DAMAGED OR REMOVED BY CONSTRUCTION SHALL BE REPLACE BY A SURVEYOR LICENSED IN THE STATE OF MICHIGAN AT NO COST TO THE OWNER.
12. CONTRACTOR SHALL COORDINATE RELATIVE WORK WITH THE BUILDING CONTRACTOR.

integrated designs inc.
ARCHITECTURE ENGINEERING CONSULTING
MARQUETTE OFFICE: 1021 W. BARAGA AVENUE MARQUETTE, MI 49855 PHONE: (906)228-4480 FAX: (906)228-7324
BRIGHTON OFFICE: 8511 W. GRAND RIVER AVE., SUITE 600 BRIGHTON, MI 48816 PHONE: (810)229-2701 FAX: (810)229-6767

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

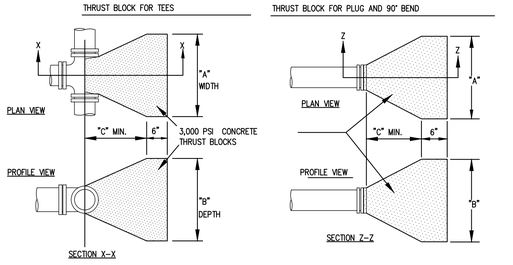
NO.	REVISIONS	DATE
A.	OWNER REVIEW	05.07.20
B.	100% DESIGN DOCS.	06.01.20
0	Issued for Bids	04.06.21
-	-	-
-	-	-

	BY	DATE
DESIGN	ADM	- -
DRAWN	ADM	- -
CHECKED	BLK	- -
APPROVED	ADM	- -

SITE PLAN

COPYRIGHT © 2001 INTEGRATED DESIGNS INC.

C1.0

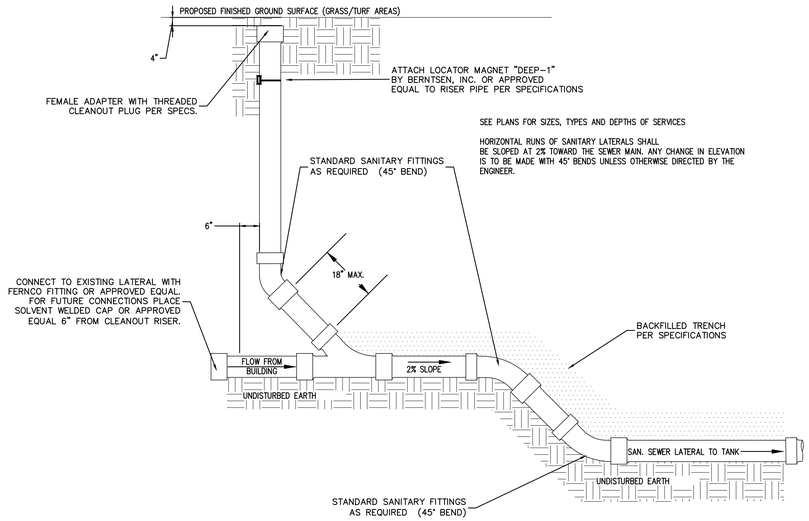


SCHEDULE FOR TEES AND/OR PLUGS

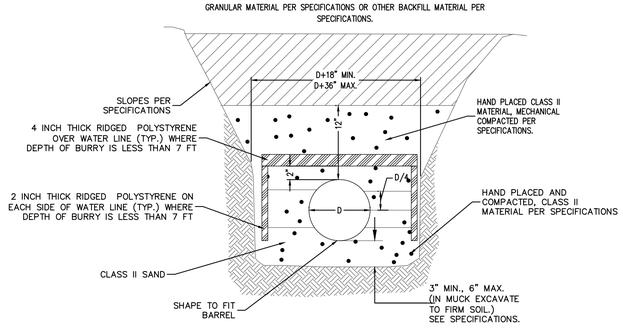
W.M. SIZE	MIN.THRUST BLOCK DIM.			BEARING SQ.FT.
	A (MIN.)	B (MIN.)	C (MIN.)	
6" OR LESS	1'6"	1'6"	12"	2.2
8"	2'3"	2'3"	1'3"	5.1
10"	2'6"	2'6"	1'6"	6.3
12"	3'0"	3'0"	1'9"	9.0
16"	4'0"	4'0"	2'10"	16.0

1. THE SHAPE OF THE BACK OF THE BLOCK MAY VARY AS LONG AS THE BEARING AREA IS NO LESS THAN THE AREA SHOWN IN THE TABLES AND THE POUR IS AGAINST FIRM UNDISTURBED EARTH.
2. JOINTS SHALL BE KEPT FREE OF CONCRETE AND A NON-ABRASIVE BARRIER APPROVED BY THE ENGINEER SHALL BE PLACED BETWEEN THE THRUST BLOCK AND ALL MECHANICAL JOINTS.
3. DIMENSIONS ARE BASED ON A SURGE PRESSURE OF 150 PSI AND SAFE BEARING LOADS OF 2 TONS PER SQ. FT. IN CLEAN DRY SAND

THRUST BLOCK DETAIL
NOT TO SCALE

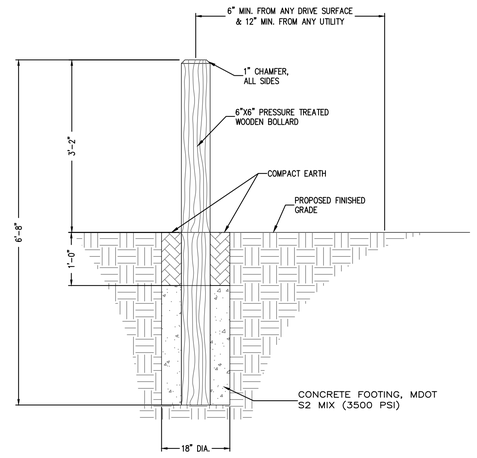


SANITARY/STORM SEWER LATERAL RISER DETAIL
NOT TO SCALE

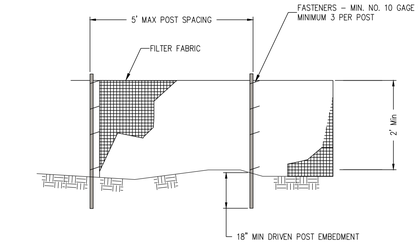


THE BACKFILL MATERIALS AND METHODS SHALL CONFORM WITH THE SPECIFICATIONS.

UTILITY TRENCH
NOT TO SCALE



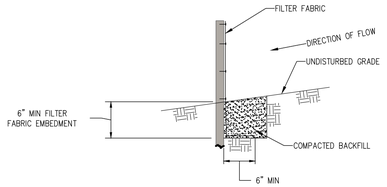
WOODEN BOLLARD DETAIL
NOT TO SCALE



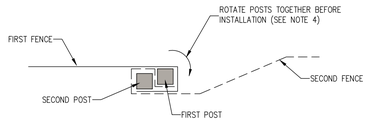
ELEVATION

NOTES:
1. TEMPORARY SILT FENCE SHALL BE INSTALLED PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED. FENCE SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.
2. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF MATERIAL SPECIFICATION 592 GEOTEXTILE TABLE 1 OR 2, CLASS L WITH EQUIVALENT OPENING SIZE OF AT LEAST 30 FOR NONWOVEN AND 50 FOR WOVEN.
3. FENCE POSTS SHALL BE EITHER WOOD POST WITH A MINIMU CROSS-SECTIONAL AREA OF 1.5" X 1.5" OR A STANDARD STEEL POST.
4. WHEN SPLICES ARE NECESSARY MAKE SPLICE AT POST ACCORDING TO SPLICE DETAIL. PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE. ROTATE BOTH POSTS TOGETHER AT LEAST 180 DEGREES TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL. CUT THE FABRIC NEAR THE BOTTOM OF THE POSTS TO ACCOMMODATE THE 6 INCH FLAP. THEN DRIVE BOTH POSTS AND BURY THE FLAP. COMPACT BACKFILL WELL.

DETAIL MODIFIED FROM NRCS-IL STANDARD DRAWING NRCS141P2_029360

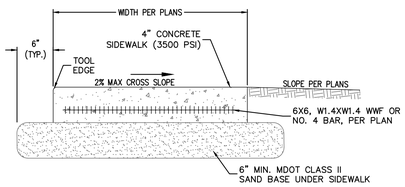


FABRIC ANCHOR DETAIL

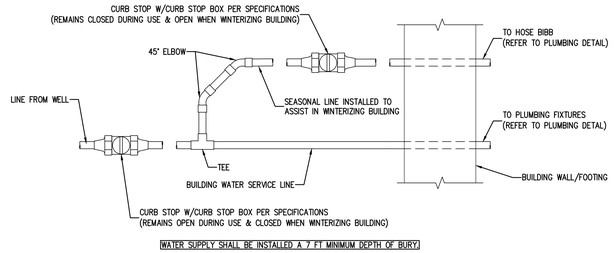


SPLICE DETAIL-PLAN VIEW

SILT FENCE INSTALLATION DETAILS
NO SCALE



CONCRETE SIDEWALK
NOT TO SCALE



WINTERIZING SEASONAL BUILDING WATER SUPPLY
NOT TO SCALE

MARQUETTE OFFICE:
1021 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4480 FAX: (906)228-7324

BRIGHTON OFFICE:
8511 W. GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48816
PHONE: (810)229-2701 FAX: (810)229-6767

integrated designs inc.
ARCHITECTURE ENGINEERING CONSULTING

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
B	100% DESIGN DOCS.	06.01.20
0	Issued for Bids	04.06.21
-	-	-
-	-	-

	BY	DATE
DESIGN	BLK	-
DRAWN	BLK	-
CHECKED	ADM	-
APPROVED	BLK	-

SITE DETAILS

COPYRIGHT © 2001 INTEGRATED DESIGNS INC.

C2.0

C:\Users\ecoursey.IDI\Documents\MTU Nara Forest Education Center_erik@intdesigns.com.rvt
3/29/2021 1:42:35 PM

SITE PREP NOTES

1. REMOVE ALL TOPSOIL, ORGANIC SOIL, PEAT AND OTHER UNSUITABLE MATERIALS WITHIN THE FOOTPRINT OF THE BUILDING ADDITIONS AND TO A LATERAL DISTANCE 5 FEET BEYOND THE FOOTPRINT OF THE ADDITIONS. ANY EXCAVATION BELOW FINISHED GRADE NECESSARY TO REMOVE UNSUITABLE SOIL SHALL EXTEND LATERALLY A DISTANCE EQUAL TO THE DEPTH OF THE EXCAVATION IN ALL DIRECTIONS.

2. CONTACT THE ARCHITECT & CONSTRUCTION MANAGER IMMEDIATELY WHEN QUESTIONABLE SOILS ARE ENCOUNTERED.

3. FOOTINGS ARE DESIGNED TO BEAR ON NATURAL MATERIALS OR ENGINEERED FILL PER NOTE 6 WITH AN ASSUMED ALLOWABLE BEARING CAPACITY OF 1500 PSF PER TABLE 1806.2 OF THE 2015 MICHIGAN BUILDING CODE(CONTRACTOR TO VERIFY BY QUALIFIED TESTING AGENCY IN THE FIELD). IF MATERIAL OF THIS CAPACITY IS NOT FOUND AT THE ELEVATIONS INDICATED, FOOTINGS SHALL BE LOWERED OR ENLARGED AT THE DIRECTION OF THE ARCHITECT.

4. THE FINAL 6" OF SOIL DIRECTLY BELOW FLOOR SLABS SHALL BE CLEAN GRANULAR FILL COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DENSITY AS DETERMINED BY MODIFIED PROCTOR.

5. PROOFROLL EXISTING FOOTING SUBGRADES TO IDENTIFY SOFT SPOTS. CUT OUT SOFT SPOTS AND RECOMPACT EXISTING SOIL OR REPLACE WITH ENGINEERED FILL PER NOTE 6.

6. A WELL GRADED, GRANULAR, ENGINEERED FILL SHALL BE USED TO REPLACE EXISTING SOILS WHICH HAVE BEEN REMOVED, AND TO ACHIEVE PROPER GRADE ELEVATIONS IN "FILL" SITUATIONS. ENGINEERED FILL SHALL NOT HAVE MORE THAN 7% BY WEIGHT PASSING THE NUMBER 200 SIEVE. PLACE FILL IN LIFTS NOT EXCEEDING 12" AND COMPACT TO 95% OF MODIFIED PROCTOR.

7. EXISTING INORGANIC SITE SOILS & FILL MAY BE USED AS ENGINEERED FILL IF IT MEETS THE GRADING REQUIREMENTS OF NOTE 6.

8. DO NOT UNDERMINE EXISTING FOUNDATIONS WHEN EXCAVATING ADJACENT TO THE EXISTING BUILDING. SHOULD IT BECOME NECESSARY TO EXCAVATE TO AN ELEVATION BELOW THE EXISTING FOOTINGS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND DESIGNING TEMPORARY SHORING OF THE EXISTING FOOTINGS, OR OTHER MEANS OF SAFEGUARDING THE EXISTING FOUNDATIONS.

CONCRETE NOTES

1. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60. ALL WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WITH MINIMUM LAPS OF 8".

2. PROVIDE CORNER BARS TO MATCH ALL HORIZONTAL REINFORCING IN WALLS AND FOOTINGS. ALL LAPS SHALL BE A MINIMUM OF 30 BAR DIAMETERS, U.N.O.

3. PROVIDE DOWELS BETWEEN ALL FOOTINGS, WALLS, AND PIERS TO MATCH SIZE AND SPACING OF VERTICAL REINFORCING. ALL LAPS SHALL BE A MINIMUM OF 30 BAR DIAMETERS, U.N.O.

4. ALL "CAST_IN" ANCHOR RODS FOR STRUCTURAL STEEL COLUMNS SHALL BE ASTM A307.

5. ALL FOUNDATION ANCHORS FOR WOOD CONSTRCUTION SHALL BE ASTM A307 STEEL, U.N.O. GALVANIZE TO G60 COATING PER ASTM A153 FOR EXTERIOR AND HIGH HUMIDITY LOCATIONS; GALVANIZE TO G185 COATING PER ASTM A153 FOR ITEMS IN CONTACT WITH PRESERVATIVE TREATED WOOD; PLAIN FINISH FOR ALL OTHER LOCATIONS.

6. ALL CONCRETE SHALL ATTAIN THE FOLLOWING 28 DAY COMPRESSIVE STRENGTHS:
   A. FOOTINGS, WALLS, PIERS........................3000 PSI
   B. SLABS ON GRADE OR METAL DECK......4000 PSI

7. PROVIDE AIR ENTRAINING FOR ALL CONCRETE EXCEPT INTERIOR SLABS AND INTERIOR FOOTINGS.

8. CONCRETE SHALL CONFORM TO THE FOLLOWING:
   A. ACI 301: SPECIFICATIONS FOR STRUCTURAL CONCRETE
   B. ACI 305: HOT WEATHER CONCRETING
   C. ACI 306: COLD WEATHER CONCRETING

9. NO FILL SHALL BE PLACED AGAINST CONCRETE WALLS UNTIL CONCRETE HAS REACHED 75% OF DESIGN STRENGTH OR UNTIL DIRECTED BY THE ARCHITECT.

10. DRILLED IN CONCRETE ANCHORS(DCA'S) SHALL BE AS FOLLOWS:
    A. HILTI HEAVY DUTY "KWIK BOLTS"
    B. RAMSET/REDHEAD "DYNABOLT SLEEVE"
    C. POWERS/RAWL "POWERBOLT"
    D. SIMPSON STRONG-TIE "WEDGE-ALL"
    E. APPROVED EQUAL
    PROVIDE STAINLESS STEEL OR GALVANIZED TO G185 COATING PER ASTM A153 FOR DCA'S IN CONTACT WITH PRESERVATIVE TREATED WOOD.

11. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4".

12. ELECTRICAL CONDUITS, PIPES, DRAINS, ETC. SHALL BE IN PLACE BEFORE CONCRETE IS PLACED.

13. FIBER REINFORCING FOR SLABS ON GRADE SHALL BE SYNTHETIC POLYPROPYLENE FIBERS ENGINEERED AND DESIGNED FOR USE IN CONCRETE SLABS, COMPLYING WITH ASTM C 1116, TYPE III, ½ TO 1-1/2 INCHES LONG.

14. REBAR SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT FOR APPROVAL PRIOR TO FABRICATION. ALL SHOP DRAWINGS SHALL BE PREPARED IN ACCORDANCE WITH THE LATEST EDITION OF THE ACI DETAILING MANUAL.

STRUCTURAL LOADS

1. DESIGN LOADS_IN ACCORDANCE WITH THE 2015 MICHIGAN BUILDING CODE & SEI/ASCE 7-10.

2. SNOW LOAD INFORMATION
   A. Pg=90 PSF
   B. Is=1.0(CATEGORY II)
   C. Ce=1.2(EXPOSURE B)
   D. Ct=1.1
   E. Pf=54 PSF=(90 PSF)(0.7)(1.0)(1.2)(1.1)
   F. ROOF DEAD LOAD=20 PSF
   G. ROOF SNOW LOAD=83 PSF UNIFORM
   ALSO SEE DRIFT LOAD AND UNBALANCED SNOW LOAD DIAGRAMS ON PLANS
   DESIGN STRUCTURAL ELEMENTS FOR SNOW LOAD CASE WHICH PRODUCES THE MAXIMUM FORCES IN THE MEMBER

3. WIND LOAD INFORMATION
   A. V_{ASD}=93 MPH
   B. Iw=1.0(CATEGORY II)
   C. EXPOSURE B
   D. GCpi=+0.18 & -0.18
   E. COMPONENTS & CLADDING DESIGN WIND PRESSURE=29 PSF
   F. MAIN WINDFORCE RESISTING SYSTEM DESIGN WIND PRESSURES
      a. WINDWARD WALL=17 PSF
      b. LEEWARD WALL= -10.5 PSF
      c. WINDWARD ROOF=-12.5 PSF
      d. LEEWARD ROOF= -6 PSF

4. MECHANICAL LOADS
   A. MECHANICAL HOOD.........................300 LB, COORD. & VERIFY W/ MECH. CONTRACTOR
   B. PLUMBING SHELF.............................1000 LB

WOOD NOTES

1. EXISTING STRUCTURAL INFORMATION, LOCATIONS AND ELEVATIONS ARE BASED ON RECORD DRAWINGS AND/OR FIELD OBSERVATIONS. THE CONTRACTOR SHALL FIELD VERIFY THIS INFORMATION PRIOR TO BEGINNING CONSTRUCTION.

2. PRE_ENGINEERED WOOD TRUSSES SHALL BE DESIGNED FOR THE FOLLOWING CRITERIA:
   A. DEAD LOADS-
      a. TOP CHORD................10 PSF
      b. BOTTOM CHORD......10 PSF
   B. LIVE LOADS-
      a. TOP CHORD................54 PSF-UNIFORM SNOW LOAD
      b. TOP CHORD.................UNBALANCED SNOW LOAD-SEE DIAGRAM(S) ON PLAN
      c. TOP CHORD................DRIFT(SNOW) OR SLIDING SNOW LOAD-SEE DIAGRAM(S) ON PLAN
      d. TOP CHORD................20 PSF-WIND LOAD
   C. DEFLECTION(LIVE LOAD)_SPAN/360

3. WHERE UNBALANCED SNOW LOADS, SLIDING SNOW LOADS OR DRIFT LOADS CREATE LARGER REACTIONS FOR THE PRIMARY ROOF TRUSSES THAN DOES THE UNIFORM SNOW LOAD, ANY GIRDER TRUSSES, OR OTHER FRAMING CARRYING PRIMARY TRUSSES, INCLUDING CONNECTION HARDWARE, SHALL BE DESIGNED BASED UPON THE LARGER REACTIONS

4. WOOD TRUSS SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT FOR APPROVAL PRIOR TO FABRICATION.
   A. TRUSS TO TRUSS CONNECTIONS SHALL BE DESIGNED BY THE TRUSS SUPPLIER AND SHALL BE CLEARLY SHOWN ON THE ERECTION PLANS.
   B. INCLUDED WITH THE SHOP DRAWING SUBMITTAL SHALL BE CUT SHEETS OF ANY TRUSS-TO-TRUSS CONNECTION HARDWARE, SHOWING DIMENSIONS AND LOAD CAPACITIES.
   C. SHOP DRAWINGS SHALL BE BEAR THE STAMP OF AN ENGINEER LICENSED IN THE STATE OF MICHIGAN.
   D. ERECTION PLANS WHICH CALL OUT TRUSS-TO-TRUSS CONNECTIONS & HARDWARE SHALL BE BEAR THE STAMP OF AN ENGINEER LICENSED IN THE STATE OF MICHIGAN.

5. LUMBER FOR JOISTS, RAFTERS, HEADERS AND BUILT UP BEAMS SHALL BE SPRUCE_PINE_FIR, #2 OR BETTER, OR APPROVED EQUAL, U.N.O.

6. LUMBER FOR SOLID SAWN POSTS SHALL BE SOUTHERN PINE, #2 OR BETTER, OR APPROVED EQUAL, U.N.O.

7. LUMBER FOR ALL OTHER APPLICATIONS SHALL BE SPRUCE_PINE_FIR, STUD GRADE OR APPROVED EQUAL, U.N.O.

8. MEMBERS DESIGNATED AS "LVL" SHALL BE LAMINATED VENEER LUMBER AS FOLLOWS:
   A. MICROLAM OR PARALLAM BY TRUS JOIST MacMILLAN
   B. GANG_LAM BY LOUISIANA_PACIFIC
   C. VERSA_LAM BY BOISE CASCADE
   D. APPROVED EQUAL

9. PLYWOOD/OSB WEB "I" JOISTS SHALL BE AS FOLLOWS:
   A. TJI BY TRUS JOIST MacMILLAN
   B. BCI BY BOISE CASCADE

10. BUILT UP MEMBERS MADE OF MULTIPLE PLIES OF NOMINAL 2" LUMBER OR "LVL" SHALL BE GLUED AND NAILED. ALL INDIVIDUAL PIECES OF NOMINAL 2" AND "LVL" MEMBERS SHALL BE FULL LENGTH. SPLICES OF PLIES ARE NOT PERMITTED.

11. BOLTS FOR WOOD TO WOOD AND WOOD TO STEEL CONNECTIONS SHALL BE ASTM A307.

12. ROOF AND WALL SHEATHING SHALL BE APA PERFORMANCE_RATED STRUCTURAL_USE PANELS, EITHER PLYWOOD OR NONVENEER PANELS, EXPOSURE 1 CLASSIFICATION.

13. ALL LUMBER AND SHEATHING SHALL HAVE A GRADE STAMP RECOGNIZED BY THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION OR THE AMERICAN PLYWOOD ASSOCIATION.

14. PRESERVATIVE TREATED LUMBER SHALL BE IN ACCORDANCE WITH AWPA STANDARD U1-07. WATERBORNE PRESERVATIVE SHALL HAVE THE FOLLOWING RETENTIONS, BASED ON THE USE OF COPPER AZOLE(CA-B) PRESERVATIVE:
    A. ABOVE GROUND, EXPOSED TO WEATHER...........0.10 lb/cu. ft.
    B. GROUND CONTACT...0.21 lb/cu. ft.
    C. PERMANENT WOOD FOUNDATIONS.......................0.31 lb/cu. ft.
    D. OTHER PRESERVATIVES MAY BE SUBSTITUTED, UPON WRITTEN APPROVAL BY THE ARCHITECT OF ACCEPTABLE DOCUMENTATION DEMONSTRATING EQUAL PERFORMANCE & QUALITY OF THE SUBSTITUTED PRESERVATIVE.

15. FIELD CUT OR DRILLED TREATED LUMBER SHALL BE FIELD TREATED BY LIBERALLY BRUSHING ON A SOLUTION OF COPPER NAPHTHENATE CONTAINING A MINIMUM OF 2% METALLIC COPPER IN SOLUTION IN ACCORDANCE WITH AWPA STANDARD M4.

16. ALL FASTENERS(FOUNDATION ANCHORS, NAILS, SCREWS, BOLTS, ETC.) IN CONTACT WITH PRESERVATIVE TREATED LUMBER SHALL BE GALVANIZED TO EQUIVALENT OF G185 COATING IN ACCORDANCE WITH ASTM A153. ALL CONNECTORS & OTHER HARDWARE MADE FROM SHEET STEEL IN CONTACT WITH PRESERVATIVE TREATED LUMBER SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A653, CLASS G185. ANY COMPONENTS MADE FROM STRUCTURAL STEEL IN CONTACT WITH PRESERVATIVE TREATED LUMBER SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

17. GLUED LAMINATED(GLULAM) TIMBER BEAMS SHALL CONFORM TO AITC COMBINATION SYMBOL 24F_V3 SP/SP, OR APPROVED EQUAL, AND SHALL CONFORM TO THE "ARCHITECTURAL" APPEARANCE GRADE OF AITC 110.

MARQUETTE OFFICE:
1201 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4480 FAX: (906)228-7524

BRIGHTON OFFICE:
8571 W. GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48816
PHONE: (810)229-2701 FAX: (810)229-6767

ARCHITECTURE
ENGINEERING
CONSULTING

IDI
INTEGRATED DESIGNS, INC.

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

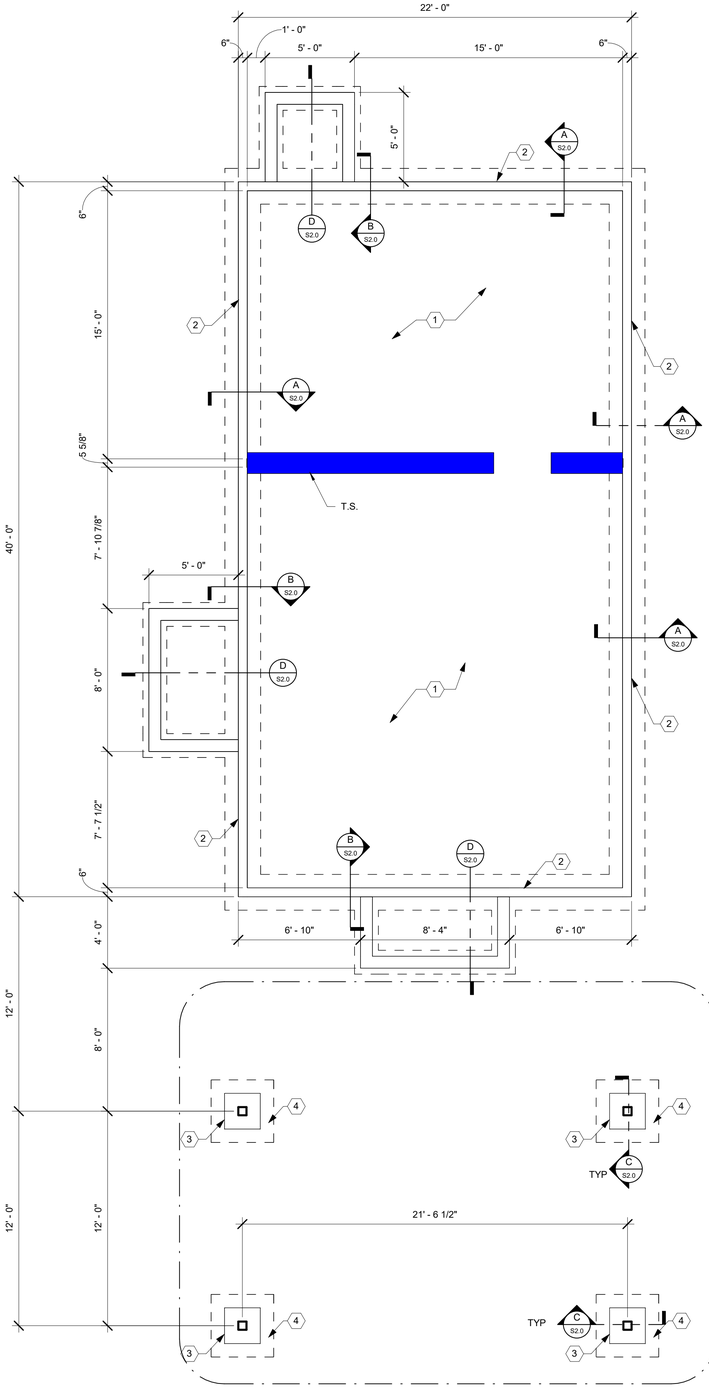
	BY	DATE:
DESIGN	NPC	05.05.20
DRAWN	NPC	05.05.20
CHECKED	PDN	
APPROVED	PDN	

NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
0	ISSUED FOR BIDS	04.06.21

STRUCTURAL NOTES AND TESTING

COPYRIGHT © 2019 INTEGRATED DESIGNS INC.

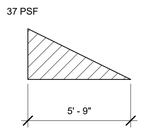
S0.1



FOUNDATION PLAN

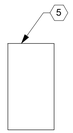
1/4" = 1'-0"

T/SLAB=100'-0" U.N.O.
T/FTG. = 96'-0" U.N.O.

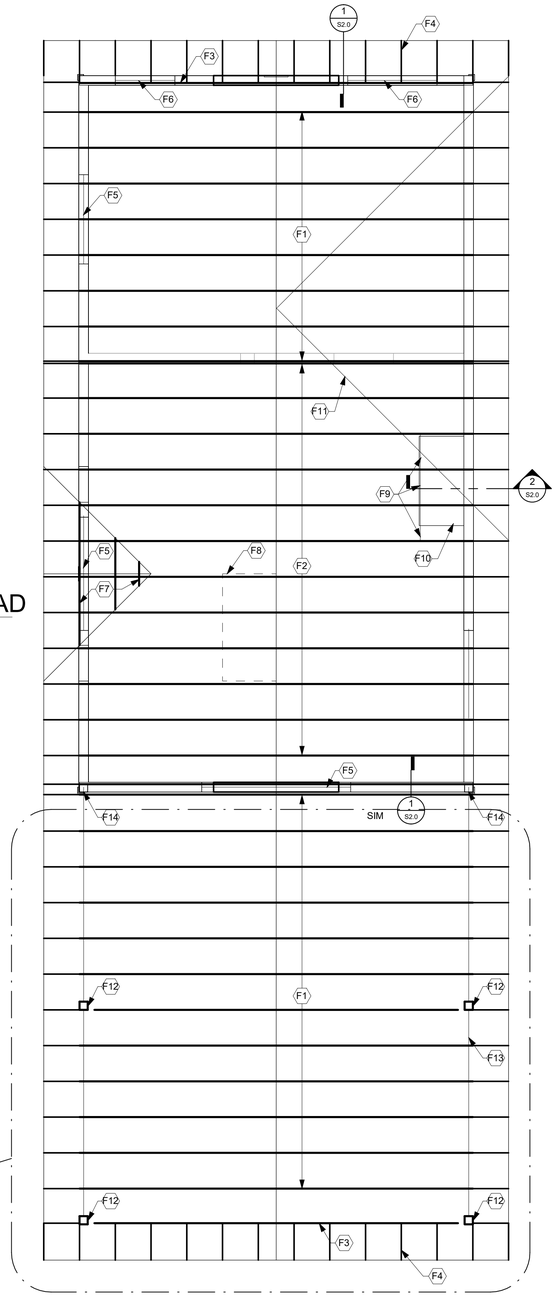


STEP TRUSS DRIFT LOAD

1/4" = 1'-0"



PORCH-
BID ALTERNATE #1



ROOF FRAMING PLAN

1/4" = 1'-0"

LOW ROOF TRUSS BRNG. = 108'-6"
HIGH ROOF TRUSS BRNG. = 110'-6"
HEADER ENDPOSTS TO BE (2) 2x6

FOUNDATION KEYNOTES

1. 4" CONCRETE SLAB W/ WWF, 6x6-W1.4xW1.4 IN TOP 1/3 OF SLAB OVER 6 MIL VAPOR BARRIER ON 6" COMPACTED FILL.
2. 6" REINFORCED CONCRETE FOUNDATION WALL W/ CONTINUOUS STRIP FOOTING, RE: DETAILS.
3. 2'-0"x2'-0" REINFORCED CONCRETE PIER, RE: DETAILS.
4. 3'-6"x3'-6"x12" REINFORCED CONCRETE SPREAD FOOTING, RE: DETAILS.
5. CONCRETE PAD FOR GENERATOR, RE: ELECTRICAL DWGS. EMBED EYE BOLTS FOR SECURING GENERATOR.

FRAMING KEYNOTES

F1. PRE-ENGINEERED WOOD GABLE TRUSSES AT 2'-0" O.C. W/ SIMPSON H1 HURRICANE TIE, OR APPROVED EQUAL.

F2. PRE-ENGINEERED WOOD SCISSOR TRUSSES AT 2'-0" O.C. W/ SIMPSON H1 HURRICANE TIES, OR APPROVED EQUAL.

F3. GABLE END TRUSS.

F4. OUTRIGGERS AT 2'-0" O.C.

F5. (2) 1 3/4"x7 1/4" MICROLAM LVL INSULATED BOX HEADER AT EXTERIOR WALL.

F6. (2) 2x8 SP-F NO.1/NO.2 INSULATED BOX HEADER AT EXTERIOR WALL.

F7. STEP TRUSSES AT 2'-0" O.C.

F8. MECHANICAL HOOD SUSPENDED FROM TRUSSES, COORDINATE WITH MECHANICAL CONTRACTOR AND STRUCTURAL LOADING FOR LOAD.

F9. 2x6 PLUMBING SHELF SUPPORTS BETWEEN TRUSSES.

F10. HANGING PLUMBING SUPPORT SHELF, RE: DETAIL.

F11. FUTURE ADDITION STEP TRUSSES, TAKE INTO FOR DESIGN OF GABLE TRUSSES.

F12. 6x6 SYP NO.1 TREATED COLUMN W/ SIMPSON PB66 POST BASE, OR APPROVED EQUAL.

F13. 1 3/4"x11 1/4" MICROLAM LVL BEAM W/ SIMPSON PC6Z POST CAP, OR APPROVED EQUAL.

F14. (3) 2x6 SP-F STUD GRADE END POST AT BEAM/WALL CONNECTION.

LEGEND

F.S.	FOOTING STEP
T/	"TOP OF"
EXIST.	EXISTING
F-X	FOOTING MARK
T.S.	THICKENED SLAB
TYP.	TYPICAL
L-X	LINTEL MARK
C.J.	CONTROL/CONSTRUCTION JOINT
SIM.	SIMILAR
T/S	TOP OF STEEL
F.V.	FIELD VERIFY
N.T.S.	NOT TO SCALE
U.N.O.	UNLESS NOTED OTHERWISE

INTEGRATED DESIGNS, INC.
ARCHITECTURE ENGINEERING CONSULTING
MARQUETTE OFFICE:
1201 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4466 FAX: (906)228-7524
BRIGHTON OFFICE:
8211 W. GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48116
PHONE: (810)225-5151 FAX: (810)225-5161

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
0	ISSUED FOR BIDS	04.06.21

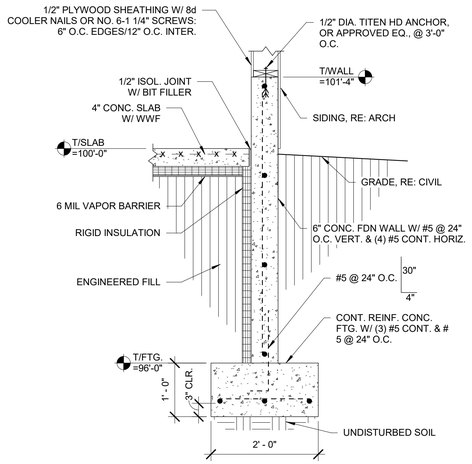
	BY	DATE:
DESIGN	NPC	05.05.20
DRAWN	NPC	05.05.20
CHECKED	PDN	
APPROVED	PDN	

FOUNDATION AND FRAMING PLAN

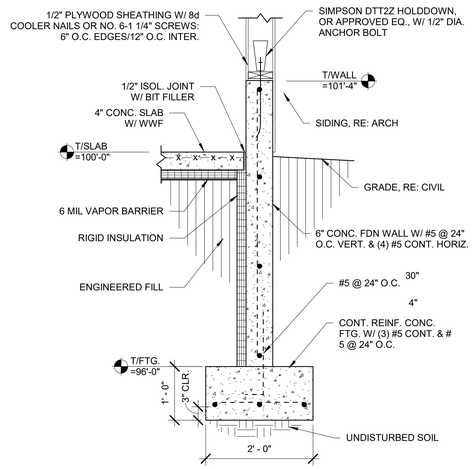
COPYRIGHT © 2019 INTEGRATED DESIGNS INC.

S1.0

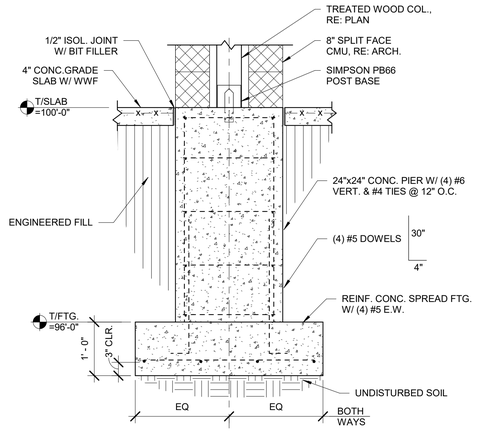
C:\Users\rcourey\3D\Documents\MTU Nara Forest Education Center_pdf@dbdesign.com.rvt
3/29/2021 1:45:37 PM



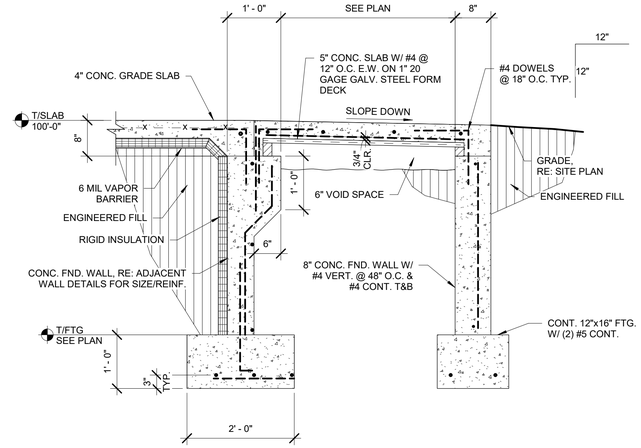
DETAIL A
3/4" = 1'-0" S1.0



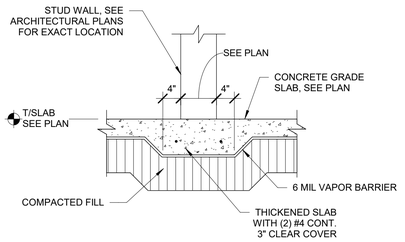
DETAIL B
3/4" = 1'-0" S1.0



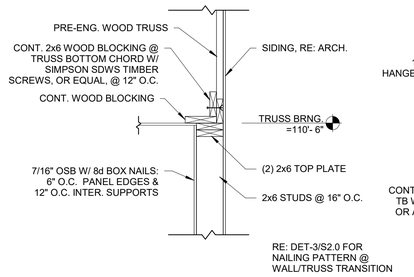
DETAIL C
3/4" = 1'-0" S1.0



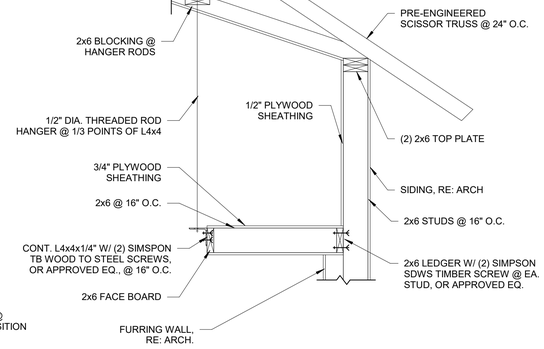
DETAIL D
3/4" = 1'-0" S1.0



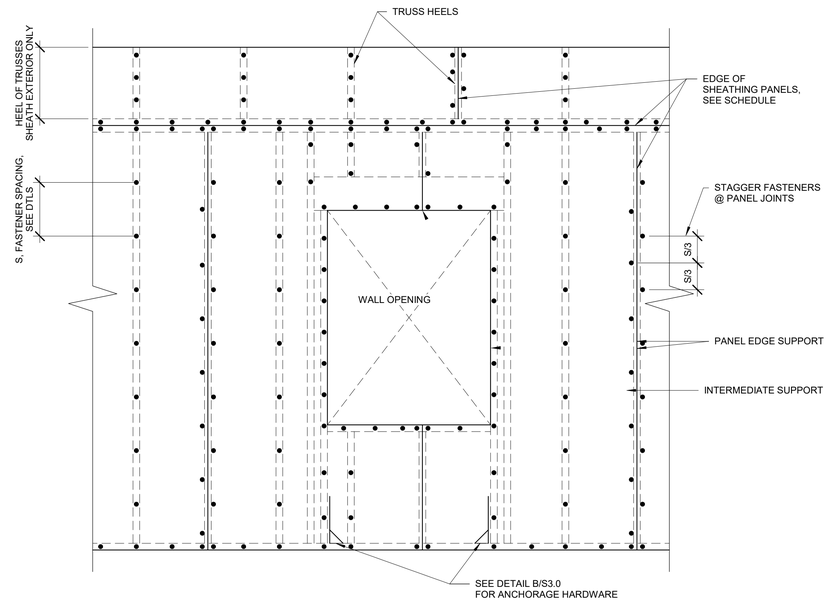
THICKENED SLAB
3/4" = 1'-0"



DETAIL 1
3/4" = 1'-0" S1.0



DETAIL 2
3/4" = 1'-0" A1.0



DETAIL 3
3/4" = 1'-0"

INTEGRATED DESIGNS, INC.
ARCHITECTURE ENGINEERING CONSULTING
MARQUETTE OFFICE: 1201 W. BARAGA AVENUE MARQUETTE, MI 49855 PHONE: (906)228-4466 FAX: (906)228-7524
BRIGHTON OFFICE: 8871 W. GRAND RIVER AVE., SUITE 600 BRIGHTON, MI 48116 PHONE: (810)225-5151 FAX: (810)225-5161

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
0	ISSUED FOR BIDS	04.06.21

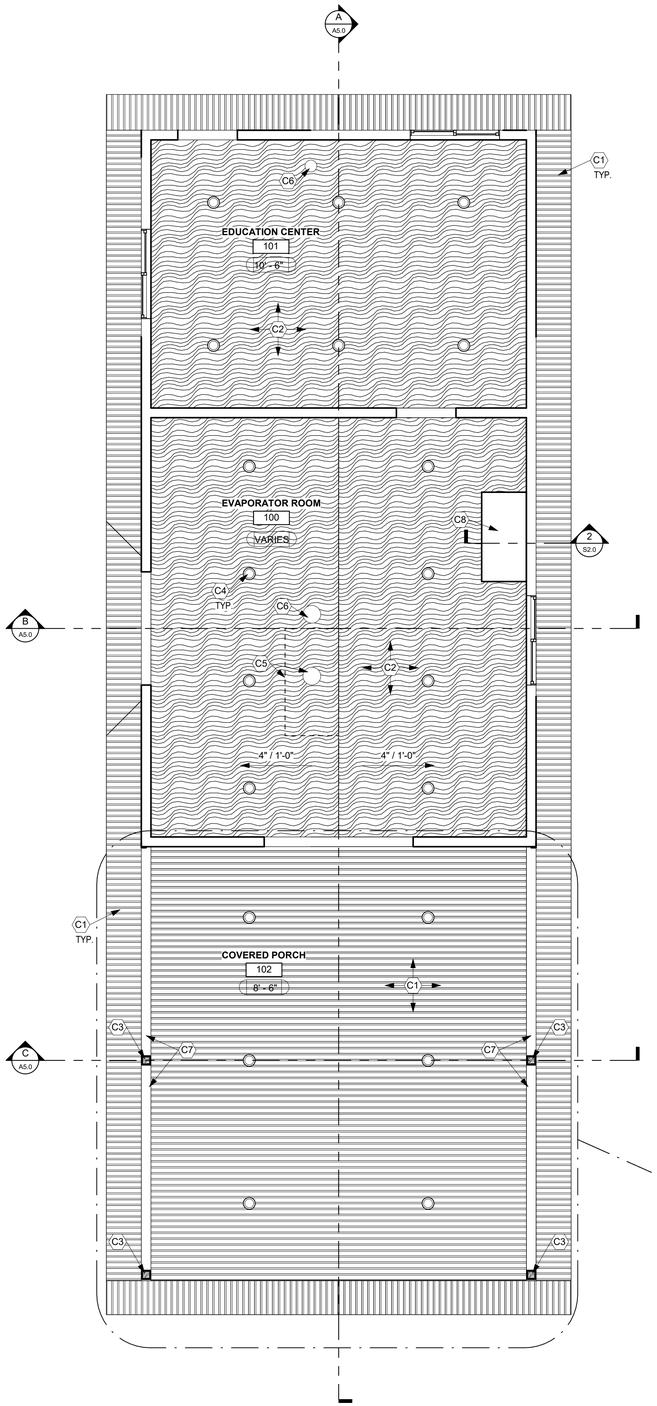
	BY	DATE:
DESIGN	NPC	05.05.20
DRAWN	NPC	05.05.20
CHECKED	PDN	
APPROVED	PDN	

DETAILS

COPYRIGHT © 2019 INTEGRATED DESIGNS INC.

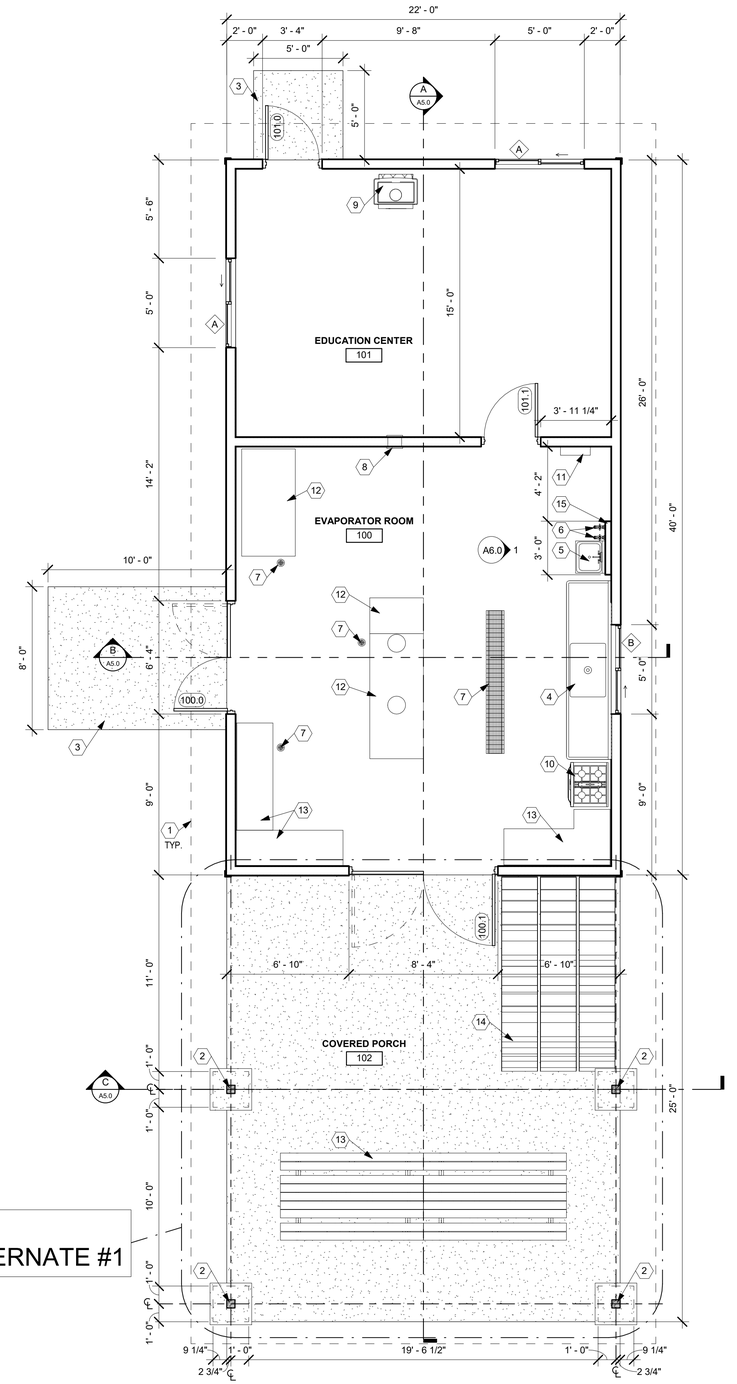
S2.0

C:\Users\ecooney.ID\Documents\MTU Nara Forest Education Center_ecd@idmidesigns.com.rvt
3/29/2021 1:42:36 PM



REFLECTED CEILING PLAN

1/4" = 1'-0"



MAIN LEVEL FLOOR PLAN

1/4" = 1'-0"

PORCH-
BID ALTERNATE #1

KEYNOTES

1. LINE OF CANOPY/OVERHANG ABOVE.
   RE: ROOF PLAN.
2. 6"x6" P.T. WOOD COLUMNS WITH SPLIT-FACE C.M.U. BASE.
   RE: BUILDING SECTIONS AND STRUCTURAL PLANS.
3. CONC. PAD.
4. S.S. SINGLE COMPARTMENT SINK. RE: PLUMBING PLANS.
5. HAND SINK. RE: PLUMBING PLANS.
6. HOT/COLD HOSE BIB CONNECTIONS. RE: PLUMBING PLANS.
7. FLOOR/TRENCH DRAIN. RE: PLUMBING PLANS.
8. IN WALL HEATER. RE: MECHANICAL PLANS.
9. WOOD STOVE BY OWNER.
10. GAS RANGE BY OWNER. RE: PLUMBING PLANS.
11. ELECTRICAL PANEL.
    RE: ELECTRICAL PLANS.
12. EVAPORATOR AND TANKS BY OWNER. 16" STEAM STACK, CHINESE HAT, AND 3'x6' HOOD BY CDL OF MICHIGAN, INSTALLED BY CONTRACTOR. SUSPEND HOOD BY CABLE TO TRUSSES ABOVE. CONTRACTOR TO PROVIDE AND INSTALL FLUE.
    RE: MECHANICAL PLANS.
13. LOOSE FURNITURE, WORK TABLES, SHELVING BY OWNER.
14. WOOD STORAGE.
15. PLUMBING CHASE- FURR OUT WALL WITH 1/2" PLYWOOD SHEATHING WITH 1x BATTEN ON SEAMS OVER 2"x6" WOOD STUD FRAMING @ 16" O.C. INSTALL F.R.P. FROM FIN. FLOOR TO 4'-0" A.F.F. ON 3 SIDES AND CAULK ALL EDGES.

CEILING KEYNOTES

C1. PREFINISHED METAL VENTED SOFFIT.

C2. 1/2" PLYWOOD SHEATHING WITH 1x4 BATTEN ON SEAMS.

C3. 6"x6" P.T. WOOD COLUMNS WITH SPLIT-FACE C.M.U. BASE.
RE: BUILDING SECTIONS AND STRUCTURAL PLANS.

C4. RECESSED CEILING LIGHT. RE: ELECTRICAL PLANS.

C5. 16" STEAM STACK, CHINESE HAT, AND 3'x6' HOOD BY CDL OF MICHIGAN, INSTALLED BY CONTRACTOR. SUSPEND HOOD BY CABLE TO TRUSSES ABOVE.

C6. EVAPORATOR/ WOOD STOVE FLUE. RE: MECHANICAL PLANS.

C7. LVL BEAM. WRAP IN PREFINISHED METAL FASCIA.
RE: STRUCT. PLANS.

C8. SHELF FOR PLUMBING EQUIPMENT.
RE: INTERIOR ELEVATIONS AND PLUMBING PLANS.

SYMBOL LEGEND

- PLYWOOD SHEATHING.
- VENTED ALUMINUM SOFFIT.
- RECESSED CAN LIGHT.
- 10'-0" CEILING HEIGHT.

GENERAL NOTES

1. WORK SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL CODES, LAWS, AND REGULATIONS.
2. ALL WORK SHALL MEET BARRIER FREE REQUIREMENTS (I.E. GRAB BARS, DOOR HARDWARE, CASEWORK HEIGHTS, ETC.)
3. REFER ALSO TO ELECTRICAL, MECHANICAL, STRUCTURAL, AND CIVIL DRAWINGS FOR ADDITIONAL SCOPE OF WORK.
4. REFER TO WALL SECTIONS AND BUILDING SECTIONS FOR WALL CONSTRUCTION, MATERIALS, HEIGHTS, ETC.
5. ALL DOOR FRAMES IN MASONRY ARE 8" FROM ADJACENT WALL, 4" FROM ADJACENT WALL AT WOOD FRAMING, UNLESS NOTED OTHERWISE.
6. INTERIOR/EXTERIOR DIMENSIONS ARE FROM WOOD STUD FRAMING.
7. ROOM NUMBERING SYSTEM USED IN THIS CONSTRUCTION DOCUMENT IS FOR ARCHITECTURAL PURPOSES. VERIFY ACTUAL ROOM NUMBERING/ LAYOUT AS REQUIRED.

DI ARCHITECTURE ENGINEERING CONSULTING
INTEGRATED DESIGNS, INC.

MARQUETTE OFFICE:
1021 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4485 FAX: (906)228-7524

BRIGHTON OFFICE:
8014 W. GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48816
PHONE: (810)229-3701 FAX: (810)229-6797

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
B	OWNER REVIEW	03.03.20
C	OWNER REVIEW	05.07.20
D	100% DESIGN DOCS.	06.01.20
0	ISSUED FOR BIDS	04.06.21

	BY	DATE:
DESIGN	TH	02.05.20
DRAWN	EC	02.05.20
CHECKED	TH	05.06.20
APPROVED	TH	05.06.20

FLOOR AND REFLECTED CEILING PLANS

COPYRIGHT © 2021 INTEGRATED DESIGNS INC.

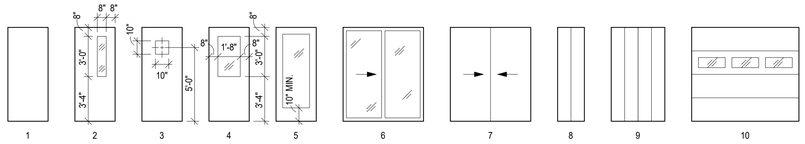
A1.0

C:\Users\ecourey.DI\Documents\MTU Nara Forest Education Center_ecat@integ-design.com.rvt
3/29/2021 1:39:55 PM

DOOR SCHEDULE

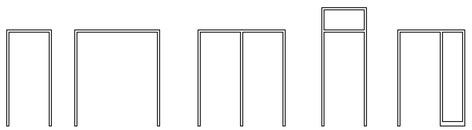
DOOR NUMBER	FRAME		DOOR			SIZE		HARDWARE SET	DETAIL REFERENCE				REMARKS
	MATERIAL	TYPE	MATERIAL	TYPE	FIRE RATING	WIDTH	HEIGHT		HEAD	JAMB	THRESHOLD	MULLION	
100.0	HM	2	STI	4		6' - 0"	7' - 0"	01	3/A6.0	3/A6.0	3/A6.0		1,2,4
100.1	HM	2	STI	4		8' - 0"	7' - 0"	01	3/A6.0	3/A6.0	3/A6.0		1,3,4
101.0	HM	1	STI	4		3' - 0"	7' - 0"	02	3/A6.0	3/A6.0	3/A6.0		1,4
101.1	HM	1	ST	4		3' - 0"	7' - 0"	03	4/A6.0	4/A6.0			1,4

DOOR TYPES



1 2 3 4 5 6 7 8 9 10

DOOR FRAMES

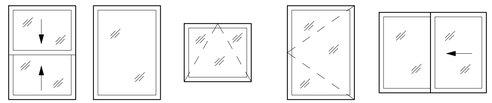


1 2 3 4 5

WINDOW SCHEDULE

WINDOW DESIG.	WINDOW			SIZE		DETAIL REFERENCE				REMARKS
	MATERIAL	TYPE	GLAZING	WIDTH	HEIGHT	HEAD	JAMB	SILL	MULLION	
A	FG	5	INS	5' - 0"	4' - 0"	5/A6.0	5/A6.0	5/A6.0		1,2
B	FG	5	INS	5' - 0"	3' - 0"	5/A6.0	5/A6.0	5/A6.0		1,2

WINDOW TYPES



1 (DOUBLE-HUNG) 2 (FIXED) 3 (AWNING) 4 (CASEMENT) 5 (SLIDER)

CODE TO DOOR & WINDOW SCHEDULES

RU	ROLL UP COILING DOOR
AL	ALUMINUM
SCPL	SOLID CORE DOOR, PLASTIC LAMINATE FACE
SCWV	SOLID CORE DOOR, WOOD VENEER FINISH
HM	HOLLOW METAL
FG	FIBERGLASS
OH	OVERHEAD STEEL SECTIONAL DOOR
HCV	HOLLOW CORE, WOOD VENEER FINISH
ST	STEEL
STI	STEEL INSULATED
SS	STAINLESS STEEL
IOH	INSULATED OVERHEAD SECTIONAL DOOR
WOH	WOOD OVERHEAD SECTIONAL DOOR
CLAD	ALUMINUM CLAD WOOD
WD	WOOD

PWG	1/4" POLISHED WIRE GLAZING
INS	INSULATED GLAZING
TCG	TEMPERED CLEAR GLAZING
SIG	SOLAR INSULATED GLAZING
SSG	SINGLE STRENGTH GLAZING
HSG	HEAT STRENGTHENED GLAZING
LSG	LAMINATED SAFETY GLAZING
PG	PATTERNED GLAZING
LG	LEXAN GLAZING
TG	TRIPLE GLAZING

GENERAL NOTES TO DOOR SCHEDULE

1. DOOR NUMBER: SEE FLOOR PLAN(S) FOR LOCATION OF DOORS.
2. FRAME: SEE CODE TO "DOOR/WINDOW SCHEDULE" FOR DEFINITION OF DESIGNATIONS IN MATERIAL COLUMN. SEE "DOOR FRAMES" FOR DESCRIPTION OF DESIGNATIONS IN FRAME TYPE COLUMN.
3. DOOR: SEE CODE TO "DOOR/WINDOW SCHEDULE" FOR DEFINITION OF DESIGNATIONS IN MATERIAL COLUMN. SEE "DOOR TYPES" FOR DESCRIPTION OF DESIGNATIONS IN DOOR TYPE COLUMN.
4. FIRE RATING: LABELING INDICATED IS PER NFPA 80. LABELS SHALL BE APPROVED AND PERMANENTLY AFFIXED.
5. SIZE: SIZE IS GIVEN AS WIDTH x HEIGHT.
6. HARDWARE SET: SEE HARDWARE SPECIFICATIONS FOR DESCRIPTIONS.
7. ALL INTERIOR AND EXTERIOR WINDOWS WITHIN 24" TO THE VERTICAL EDGE OF AN INTERIOR OR EXTERIOR DOOR MUST CONTAIN TEMPERED SAFETY GLASS.

GENERAL NOTES TO WDW. SCHEDULE

1. WINDOW DESIGNATION: SEE FLOOR PLAN(S) FOR LOCATION OF WINDOWS.
2. FRAME: SEE CODE TO "DOOR/WINDOW SCHEDULE" FOR DEFINITION OF DESIGNATIONS IN MATERIAL COLUMN. SEE "WINDOW TYPES" FOR DESCRIPTION OF DESIGNATIONS IN FRAME TYPE COLUMN.
3. WINDOW: SEE CODE TO "DOOR/WINDOW SCHEDULE" FOR DEFINITION OF DESIGNATIONS IN GLAZING COLUMN.
4. SIZE: SIZE IS GIVEN AS WIDTH x HEIGHT.
5. HARDWARE SET: SEE HARDWARE SPECIFICATIONS FOR DESCRIPTIONS.
6. ALL INTERIOR AND EXTERIOR WINDOWS WITHIN 24" TO THE VERTICAL EDGE OF AN INTERIOR OR EXTERIOR DOOR MUST CONTAIN TEMPERED SAFETY GLASS.

ROOM FINISH SCHEDULE

NUMBER	ROOM NAME	CEILING TYPE	FLOOR	BASE	WALLS TYPICAL	WALLS NORTH	WALLS EAST	WALLS SOUTH	WALLS WEST	SIGN TYPE	REMARKS
100	EVAPORATOR ROOM	WC-1	CONC-1		WW-1						1
101	EDUCATION CENTER	WC-2	CONC-1		WW-2						1
102	COVERED PORCH		CONC-1								

CODE TO ROOM FINISH SCHEDULES

--CEILING FINISHES--

ATC-1	2x2 LAY IN ACOUSTIC BOARD, REVEAL EDGE, IN PREFINISHED METAL 15/16" T GRID.
ATC-2	2x2 LAY IN ACOUSTIC BOARD, SQUARE EDGE, IN PREFINISHED METAL 15/16" T GRID.
ATC-3	2x2 LAY IN VINYL FACED GYPSUM BOARD, SQUARE EDGE, IN PREFINISHED 15/16" ALUMINUM T-GRID.
WC-1	1/2" PLYWOOD SHEATHING WITH 1x BATTEN ON SEAMS APPLIED TO BOTTOM CHORD OF TRUSSES. PNT-3.
WC-2	1/2" PLYWOOD SHEATHING WITH 1x BATTEN ON SEAMS APPLIED TO BOTTOM CHORD OF TRUSSES. PNT-2.

--CONCRETE FINISH--

CONC-1	CONCRETE STEEL TROWELED WITH HARDENER AND SEALANT.
CONC-2	CONCRETE PAINTED.

--RESILIENT PRODUCTS--

RB-1	4" RESILIENT BASE - COVED.
RB-2	4 1/2" RESILIENT BASE - COVED. (RENOVATION PROJECTS)
LVT-1	LUXURY VINYL TILE. (_" x _")
LVP-1	LUXURY VINYL PLANK. (_" x _")
RSF-1	RUBBER SPORTS FLOORING. (_" x _")
RS-1	RESILIENT SHEET FLOORING.

-- CARPET --

CPT-1	CARPET TILES. (_" x _")
CPT-2	CARPET PLANK. (_" x _")
CPT-3	CARPET, ROLLED GOODS.

-- TILE FINISH --

PFT-1	PORCELAIN FLOOR TILE. (_" x _")
PTB-1	PORCELAIN TILE BASE. (_" x _")

-- WALL COVERING --

WW-1	1/2" PLYWOOD SHEATHING WITH 1x BATTEN ON SEAMS. PNT-3.
WW-2	1/2" PLYWOOD SHEATHING WITH 1x BATTEN ON SEAMS, PNT-2.

-- PAINT FINISH --

PNT-1	PAINT - FLAT LATEX, CEILING WHITE.
PNT-2	PAINT - EGG SHELL LATEX.
PNT-3	PAINT - SEMI-GLOSS LATEX.
PNT-4	PAINT - ENAMEL, OIL-BASE, SEMI-GLOSS.
PNT-5	PAINT - DRYFALL, EXPOSED STRUCTURE.

-- WOOD FINISHES --

WB-1	1x WOOD BASE
HSF-1	HARDWOOD SPORTS FLOOR SYSTEM

REMARKS TO DOOR SCHEDULE

1. FIELD VERIFY DOOR OPENING BEFORE ORDERING.
2. (1) PR. 3'-0" DOORS.
3. (1) PR. 4'-0" DOORS.
4. ALL DOOR TRIM TO BE PAINTED PNT-3.

REMARKS TO FINISH SCHEDULE

1. PRIME AND PAINT (PNT-3) ALL EXPOSED INTERIOR VERTICAL MASONRY.

GENERAL NOTES TO FIN. SCHEDULE

1. ROOM: SEE FLOOR PLAN(S) FOR LOCATION OF ROOM NUMBERS AND NAMES.
2. CEILING TYPE, FLOOR, AND BASE: SEE "CODE TO ROOM FINISH SCHEDULE" FOR DEFINITION OF DESIGNATIONS.
3. WALLS: SEE "CODE TO ROOM FINISH SCHEDULE" FOR DEFINITION OF DESIGNATIONS IN TYPICAL, NORTH, SOUTH, EAST, AND WEST COLUMNS.
4. REMARKS: SEE "REMARKS TO FINISH SCHEDULE".
5. SIGN TYPE: SEE SPECIFICATIONS FOR SIGN TYPES. LOCATE SIGN INDICATED ON WALL OUTSIDE ROOM NEAR MAIN ROOM DOOR.

REMARKS TO WINDOW SCHEDULE

1. FIELD VERIFY WINDOW OPENING BEFORE ORDERING.
2. ALL WINDOW TRIM TO BE PAINTED PNT-3.

ARCHITECTURE ENGINEERING CONSULTING
INTEGRATED DESIGNS, INC.
MARQUETTE OFFICE: 1021 W. BARAGA AVENUE MARQUETTE, MI 49855 PHONE: (906)228-4465 FAX: (906)228-7524
BRIGHTON OFFICE: 501 W. GRAND RIVER AVE., SUITE 600 BRIGHTON, MI 48116 PHONE: (810)229-2101 FAX: (810)229-6787

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
B	100% DESIGN DOCS.	06.01.20
0	ISSUED FOR BIDS	04.06.21

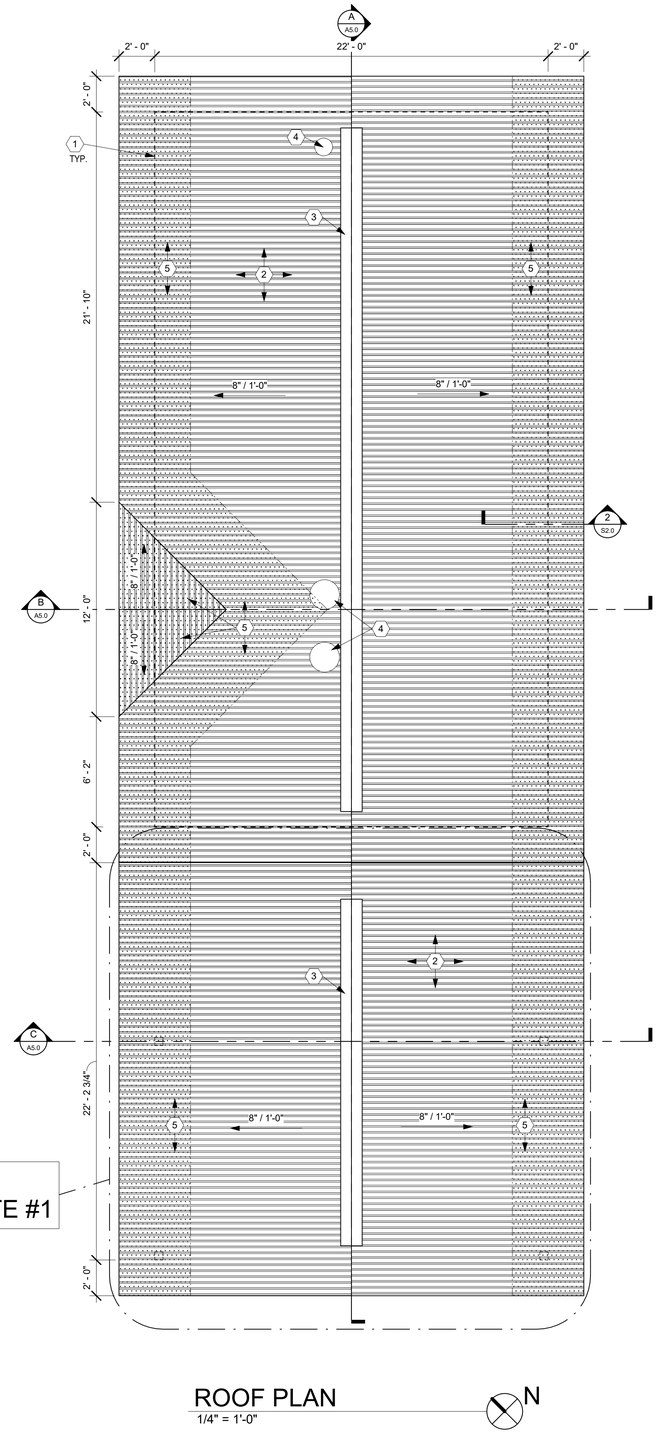
	BY	DATE:
DESIGN	EC	04.27.20
DRAWN	EC	04.27.20
CHECKED	TH	05.06.20
APPROVED	TH	05.06.20

WINDOW, DOOR & FINISH SCHEDULES

COPYRIGHT © 2021 INTEGRATED DESIGNS INC.

A2.0

C:\Users\ecoony.ID\Documents\MTU Nara Forest Education Center_ed@iddesigns.com.rvt
3/29/2021 1:39:58 PM



PORCH-
BID ALTERNATE #1

ROOF PLAN
1/4" = 1'-0"

N

KEYNOTES

1. LINE OF WALL BELOW.
2. METAL ROOFING PANELS OVER 15LB FELT OVER 5/8" O.S.B. RE: SPECIFICATIONS.
3. CONTINUOUS RIDGE VENT.
4. PROVIDE ROOF JACK AND CAULK AT STEAM PIPE AND FLUE PENETRATIONS.
5. 2 ROWS ICE AND WATER SHIELD AT ALL EAVE EDGES AND VALLEYS.

GENERAL NOTES

1. WORK SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL CODES, LAWS, AND REGULATIONS.
2. REFER ALSO TO ELECTRICAL, MECHANICAL, STRUCTURAL, AND CIVIL DRAWINGS FOR ADDITIONAL SCOPE OF WORK.
3. REFER TO WALL SECTIONS AND BUILDING SECTIONS FOR WALL CONSTRUCTION, MATERIALS, HEIGHTS, ETC.
4. ALL MECHANICAL ITEMS ARE SHOWN FOR GENERAL LAYOUT ONLY. RE: MECHANICAL DRAWINGS TO VERIFY EXACT SIZE AND LOCATION AND ANY ADDITIONAL SCOPE OF WORK NOT SHOWN ON THIS DRAWING.

INTEGRATED DESIGNS, INC.
ARCHITECTURE ENGINEERING CONSULTING
MARQUETTE OFFICE:
1201 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4485 FAX: (906)228-7524
BRIGHTON OFFICE:
501 W. GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48116
PHONE: (810)229-3701 FAX: (810)229-6797

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

	BY	DATE:
DESIGN	EC	04.30.20
DRAWN	EC	04.30.20
CHECKED	TH	05.06.20
APPROVED	TH	05.06.20

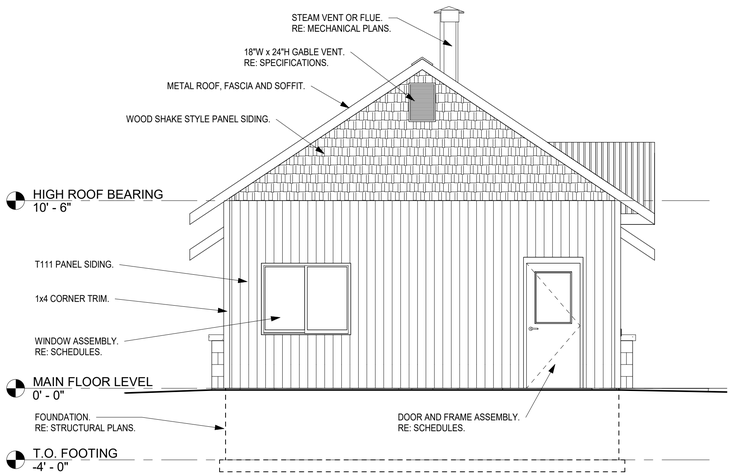
NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
B	100% DESIGN DOCS.	06.01.20
0	ISSUED FOR BIDS	04.06.21

ROOF PLAN

COPYRIGHT © 2021 INTEGRATED DESIGNS INC.

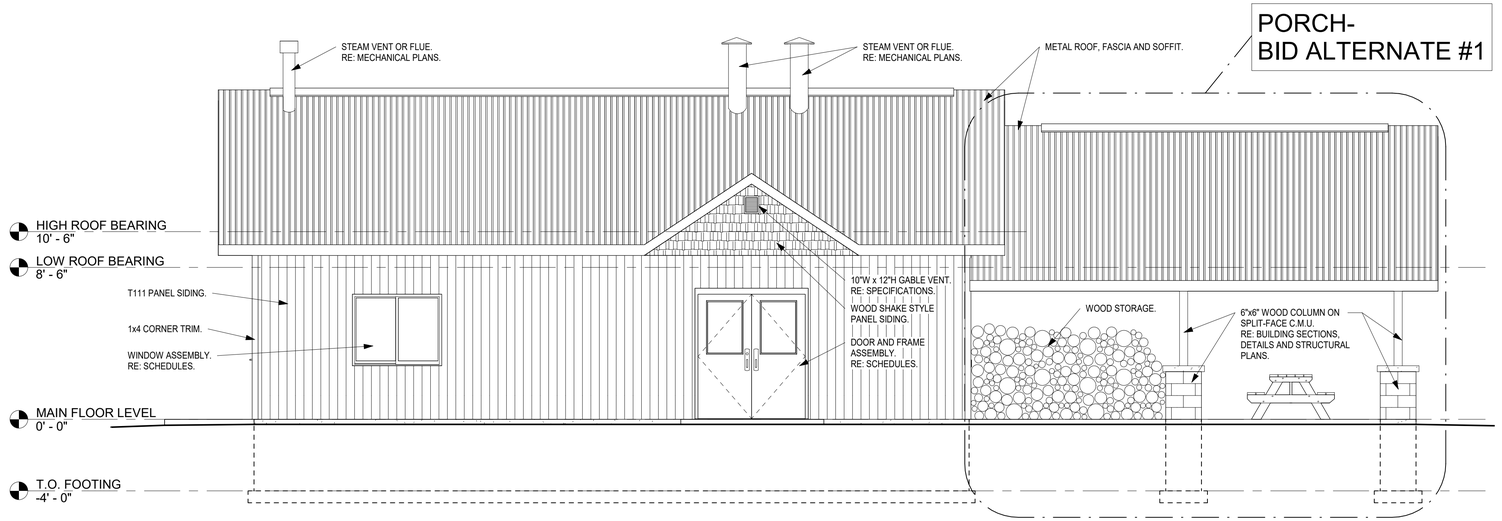
A3.0

C:\Users\ecourey\2D\Documents\MTU Nara Forest Education Center_edit@idesigns.com.rvt
3/29/2021 1:35:36 PM



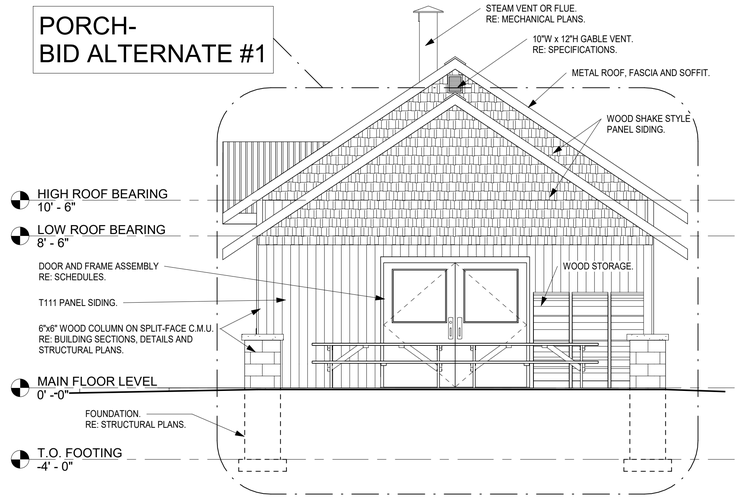
NORTHEAST ELEVATION

1/4" = 1'-0"



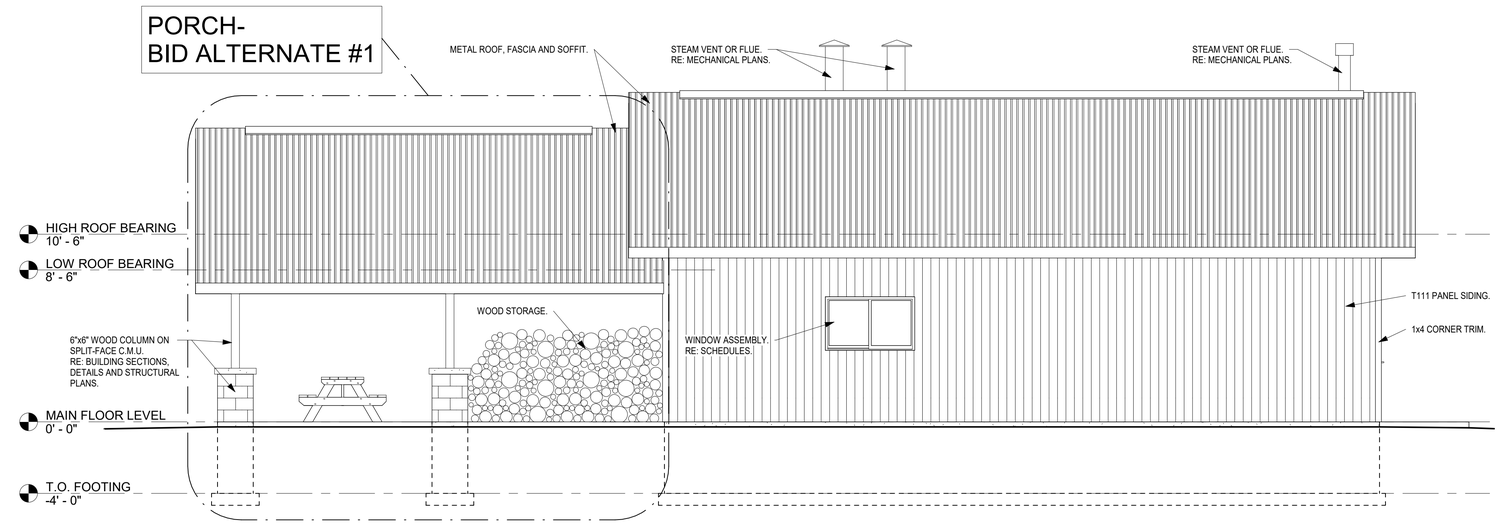
NORTHWEST ELEVATION

1/4" = 1'-0"



SOUTHWEST ELEVATION

1/4" = 1'-0"



SOUTHEAST ELEVATION

1/4" = 1'-0"

INTEGRATED DESIGNS, INC.
ARCHITECTURE ENGINEERING CONSULTING
MARQUETTE OFFICE:
1021 W. BANNAN AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4465 FAX: (906)228-7524
BRIGHTON OFFICE:
8074 W. GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48816 FAX: (810)229-6797
PHONE: (810)229-3701

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
B	OWNER REVIEW	03.03.20
C	OWNER REVIEW	05.07.20
D	100% DESIGN DOCS.	06.01.20
0	ISSUED FOR BIDS	04.06.21

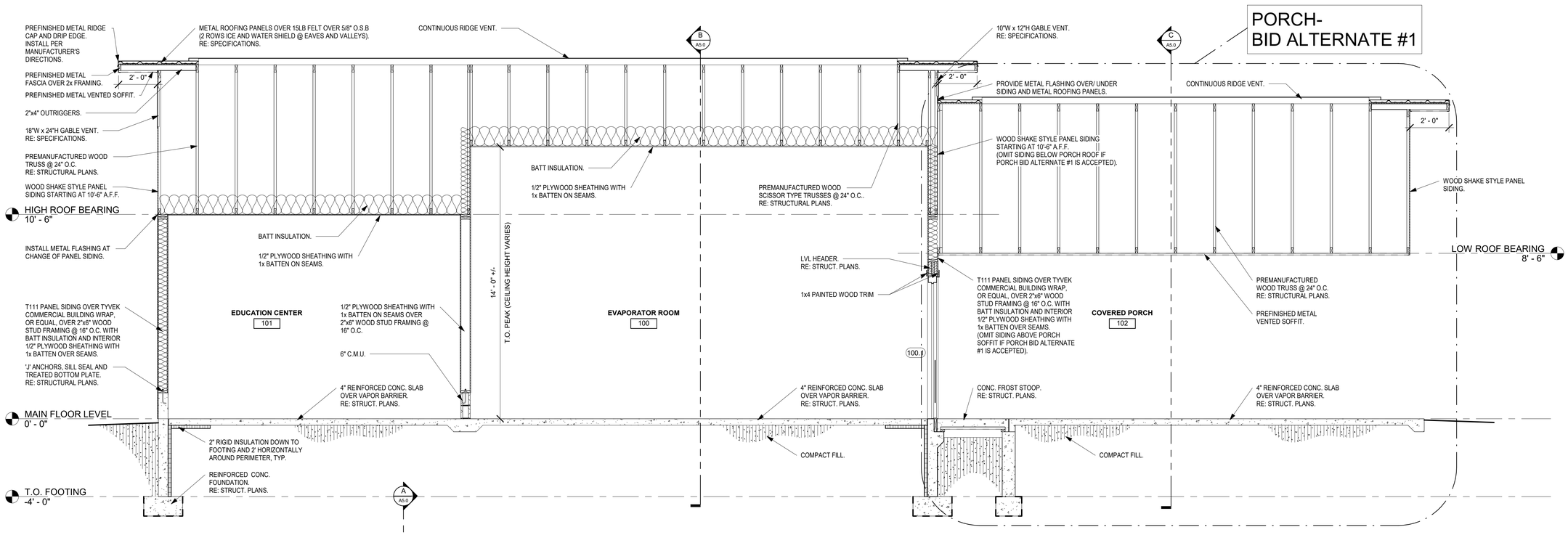
	BY	DATE:
DESIGN	TH	02.05.20
DRAWN	EC	02.05.20
CHECKED	TH	05.06.20
APPROVED	TH	05.06.20

ELEVATIONS

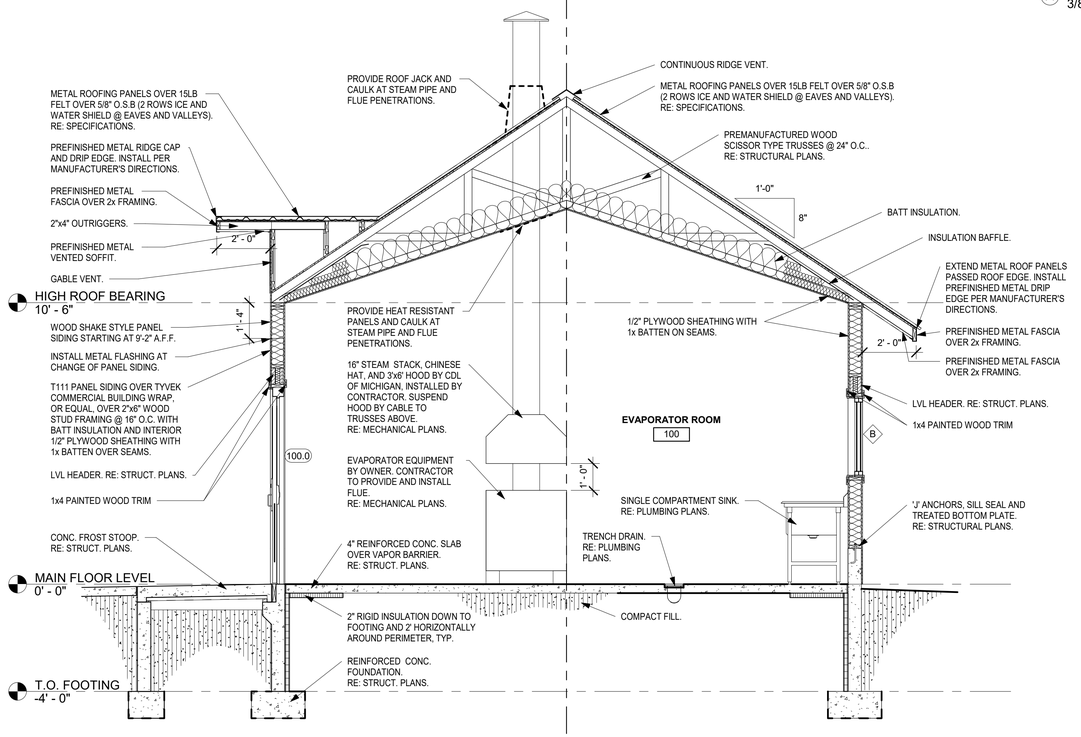
COPYRIGHT © 2021 INTEGRATED DESIGNS INC.

A4.0

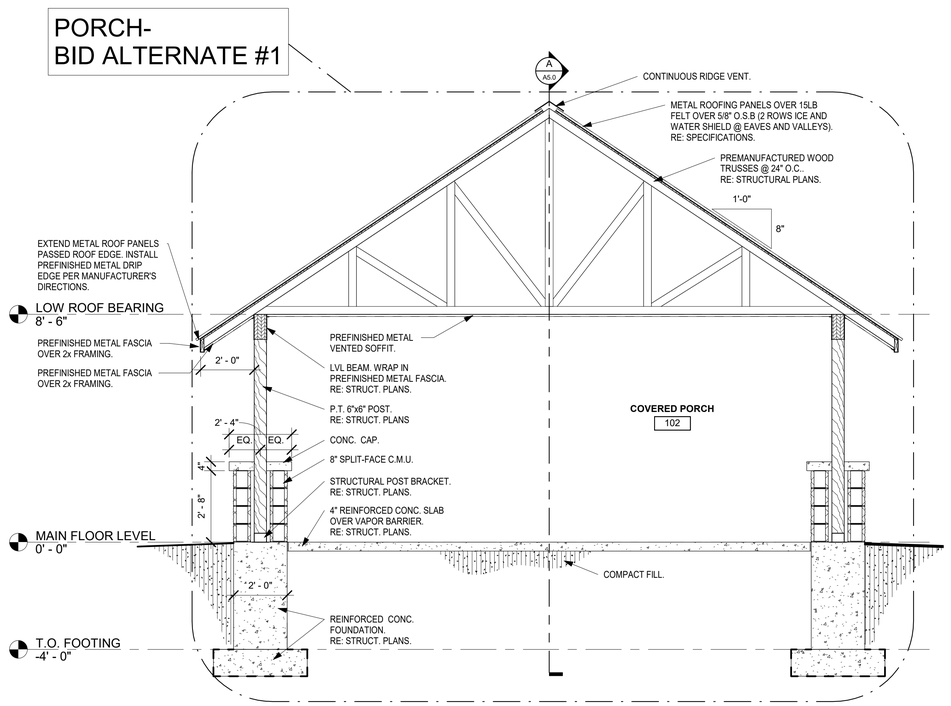
C:\Users\tcrumm\y.DVDocuments\MTU\Nara Forest Education Center_wall@idesigns.com.rvt
3/25/2021 1:46:00 PM



A BUILDING SECTION A
3/8" = 1'-0"



B BUILDING SECTION B
3/8" = 1'-0"



C BUILDING SECTION C
3/8" = 1'-0"

ARCHITECTURE ENGINEERING CONSULTING
INTEGRATED DESIGNS, INC.
MARQUETTE OFFICE: 1021 W. BARAGA AVENUE MARQUETTE, MI 49855 PHONE: (906)228-4485 FAX: (906)228-7524
BRIGHTON OFFICE: 501 W. GRAND RIVER AVE., SUITE 600 BRIGHTON, MI 48116 PHONE: (810)229-3701 FAX: (810)229-6797

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
B	100% DESIGN DOCS.	06.01.20
0	ISSUED FOR BIDS	04.06.21

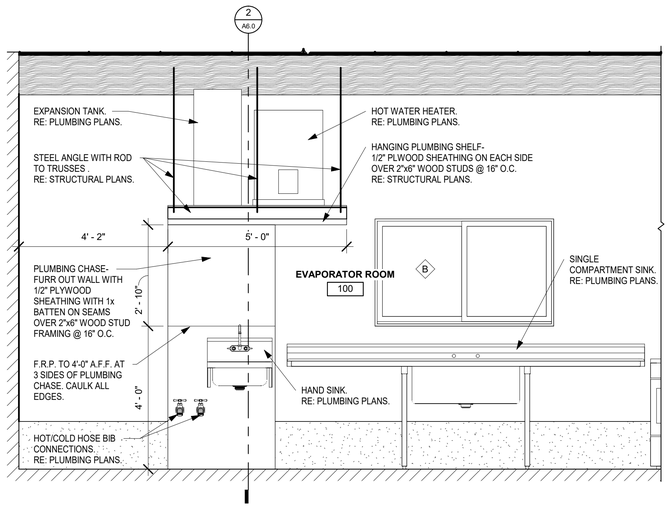
	BY	DATE:
DESIGN	EC	04.29.20
DRAWN	EC	04.29.20
CHECKED	TH	05.06.20
APPROVED	TH	05.06.20

BUILDING SECTIONS

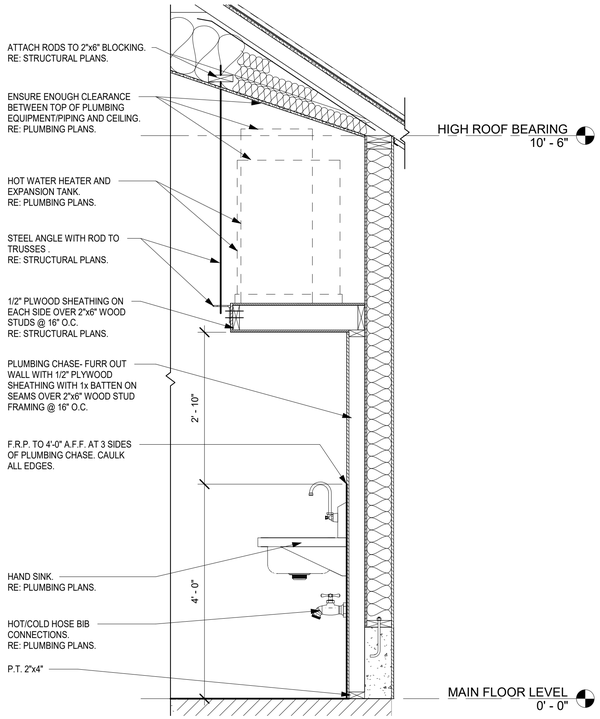
COPYRIGHT © 2021 INTEGRATED DESIGNS INC.

A5.0

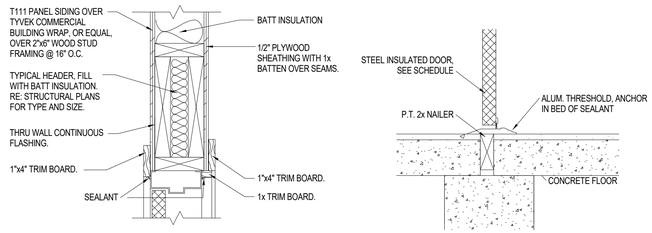
C:\Users\tonyvu.IDI\Documents\MTU Nara Forest Education Center_wtdj@idiadvgrp.com.rvt
3/29/2021 1:46:01 PM

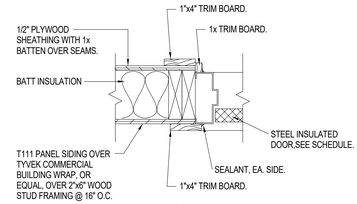


1 INTERIOR ELEVATION
1/2" = 1'-0"

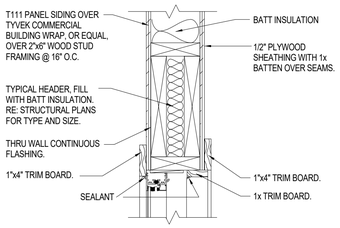


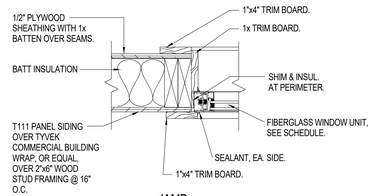
2 PLUMBING EQUIPMENT SHELF DETAIL
3/4" = 1'-0"

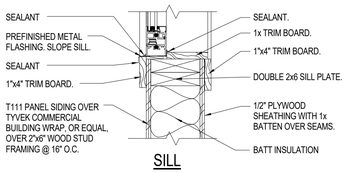




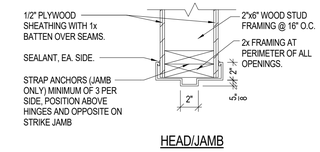
3 EXTERIOR DOOR DETAIL 1
1 1/2" = 1'-0"







5 WINDOW DETAIL
1 1/2" = 1'-0"



4 INTERIOR DOOR DETAIL 2
1 1/2" = 1'-0"

ARCHITECTURE
ENGINEERING
CONSULTING
INTEGRATED DESIGNS, INC.
MARQUETTE OFFICE:
1021 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4465 FAX: (906)228-7524
BRIGHTON OFFICE:
501 W. GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48116
PHONE: (810)229-2101 FAX: (810)229-6787

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
B	100% DESIGN DOCS.	06.01.20
0	ISSUED FOR BIDS	04.06.21

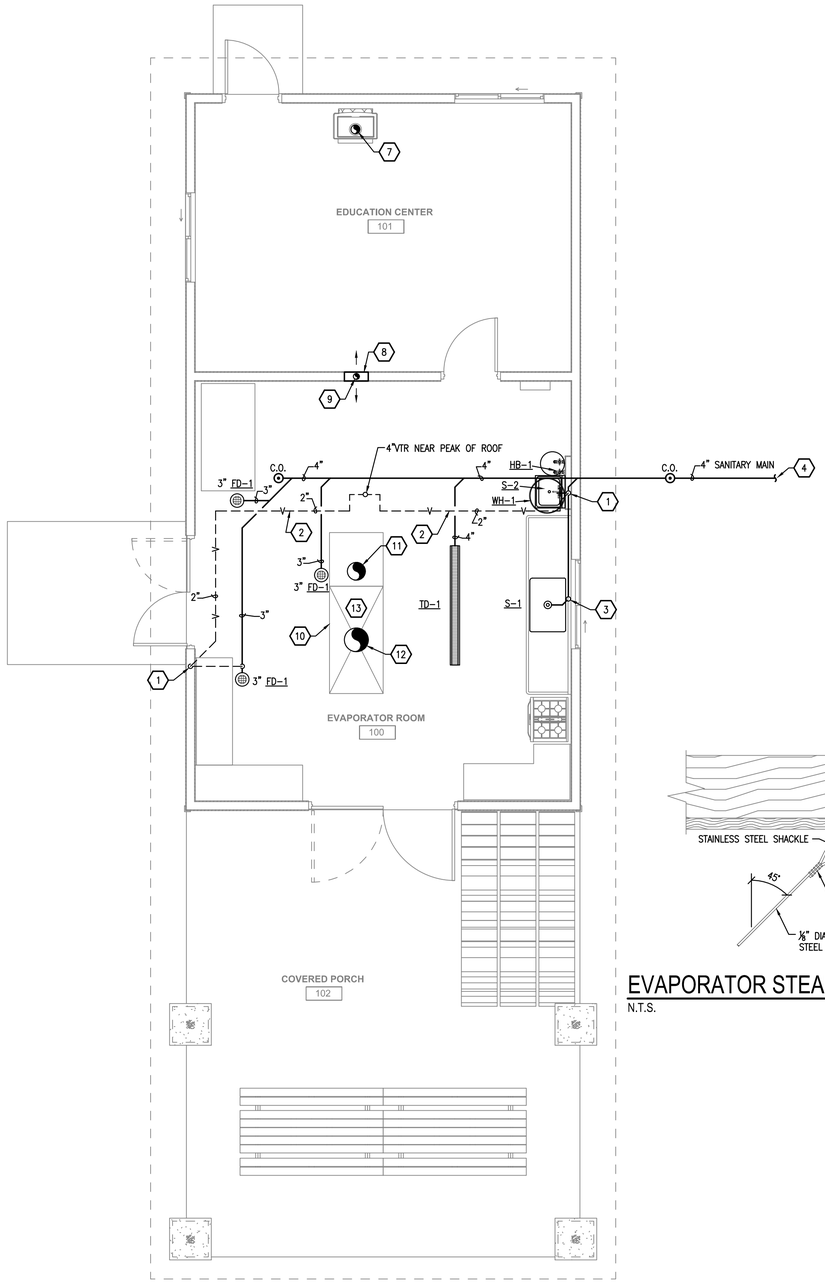
	BY	DATE:
DESIGN	EC	04.30.20
DRAWN	EC	04.30.20
CHECKED	TH	05.06.20
APPROVED	TH	05.06.20

INTERIOR ELEVATIONS & DETAILS

COPYRIGHT © 2021 INTEGRATED DESIGNS INC.

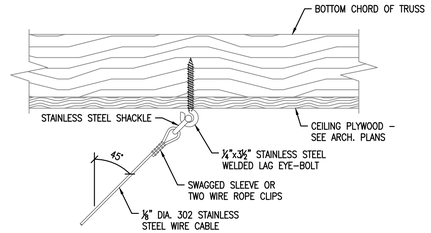
A6.0

C:\Users\teconey.ID\Documents\MTU Nara Forest Education Center_eal@intdesigns.com.rvt
3/29/2021 1:40:33 PM



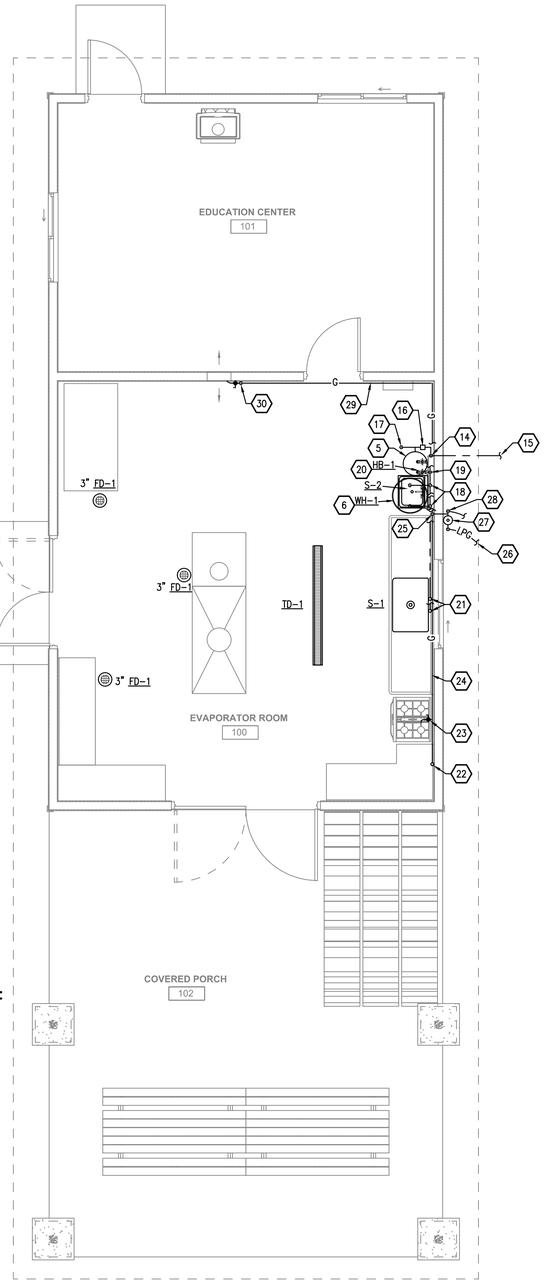
PLUMBING WASTE, VENT, AND MECHANICAL PLAN

SCALE: 1/4" = 1'-0"



EVAPORATOR STEAM HOOD SUSPENSION DETAIL

N.T.S.



PLUMBING DOMESTIC WATER AND PROPANE PIPING PLAN

SCALE: 1/4" = 1'-0"

KEYNOTES

1. 2" VENT UP IN WALL.
2. SLOPE VENT PIPE IN ATTIC WITH PITCH OF ROOF.
3. AIR ADMITTANCE VALVE UNDER COUNTER. INSTALL 2" WASTE DOWN TO BELOW SLAB.
4. REFER TO CIVIL PLAN FOR CONTINUATION OF 4" SANITARY.
5. AMTROL WELL-X-TROL MODEL WX-402-C, OR EQUAL, DIAPHRAGM TYPE EXPANSION TANK, ASME COMPLIANT, 16" DIA. x 39" TALL, 25-GALLON, SET ON SHELF APPROX. 42" DOWN FROM CEILING.
6. ELECTRIC WATER HEATER MOUNTED ON SHELF HIGH ON WALL – SHELF BY G.C. SET IN 24" DIAMETER CATCH PAN AND ROUTE ¾" PAN DRAIN DOWN IN FURRED WALL AND OUT AT FLOOR TOWARDS DRAIN.
7. 6"ø (F.V.) BLACK STOVE PIPE UP; INSTALL DOUBLE WALL AL29-4C FLUE UP THRU ATTIC AND ROOF. WOOD BURNING STOVE BY OWNER.
8. EMPIRE MODEL GWT50W GRAVITY VENT PROPANE GAS DUAL ROOM WALL FURNACE RATED AT 50 MBH; THERMOSTATICALLY CONTROLLED.
9. 4"ø (F.V.) TYPE 'B' GRAVITY FLUE VENT UP THRU ATTIC AND ROOF.
10. FURNISH AND INSTALL A CDL OF MICHIGAN 36"x72" STAINLESS STEEL EVAPORATOR HOOD (RMG SUGARBUSH 906-478-3038). SUSPEND HOOD APPROXIMATELY 76" ABOVE FLOOR BY 3/16" DIAMETER STAINLESS STEEL WIRE ROPE FROM FOUR HOOD ANCHOR POINTS AND CENTER OVER EVAPORATOR. SUPPORT HOOD SUSPENSION ROPE FROM BOTTOM CORD OF ROOF TRUSSES – SEE EVAPORATOR STEAM HOOD SUSPENSION DETAIL ON THIS SHEET.
11. 12"ø (F.V.) DOUBLE WALL AL29-4C WOOD BURNING CHIMNEY UP THRU ATTIC AND TERMINATE THROUGH ROOF WITH SPARK ARRESTOR FLUE CAP.
12. 16"ø DIAMETER SINGLE WALL STAINLESS STEEL EVAPORATOR STEAM HOOD GRAVITY EXHAUST DUCT UP THROUGH ROOF. TERMINATE EXHAUST A MINIMUM OF 36" ABOVE ROOF WITH CHINESE HAT. DUCT TO BE FURNISHED BY HOOD SUPPLIER.
13. INSTALL 1" TYPE 'M' COPPER HOOD CONDENSATE DRAIN DOWN TO FLOOR DRAIN AT HOOD. FIELD VERIFY LOCATION AND SIZE OF CONNECTION ON HOOD.
14. 1" COLD WATER UP IN CHASE TO PRESSURE TANK – SEE PIPING DETAIL ON SHEET MP2.0.
15. REFER TO CIVIL PLAN FOR CONTINUATION OF DOMESTIC WATER FROM WELL.
16. INSTALL 40-60 PSI WELL PRESSURE SWITCH AT WELL TANK ON SHELF.
17. 1" COLD WATER SUPPLY BACK TO CHASE AT WALL AND OVER TO WATER HEATER, SINKS, AND HOSE BIBB.
18. ¾" H & CW DOWN IN CHASE TO SINKS S-1 & S-2.
19. ¾" CW & HW (NOT SHOWN) DOWN IN CHASE TO HB-1.
20. INSTALL HOT AND COLD WATER HOSE BIBB AT APPROX. 24" A.F.F.
21. ½" H & CW UP THRU COUNTER TO SINK FAUCET.
22. INSTALL ½" GAS PIPE TO ABOVE COUNTER (APPROX. 42" A.F.F.) FOR BOTTLING PROCESS EQUIPMENT
23. CONNECT ½" GAS PIPE TO STOVE USING SHUT-OFF VALVE AND APPROVED FLEXIBLE APPLIANCE GAS HOSE.
24. ½" GAS PIPE ON WALL BELOW SINK COUNTER.
25. ROUTE TYPE 'K' COPPER OR BLACK IRON GAS PIPE UP ON WALL EXPOSED NEXT TO CHASE.
26. REFER TO CIVIL PLAN FOR CONTINUATION OF PROPANE.
27. GAS PRESSURE REGULATOR AND SERVICE TO BUILDING BY GAS CO.; 300 CFH CONNECTED GAS LOAD.
28. ½" GAS SERVICE APPROVED POLYPROPYLENE PROPANE GAS PIPE UNDERGROUND OVER TO GENERATOR LOCATION. REFER TO SITE PLAN FOR APPROXIMATE LOCATION AND DISTANCE.
29. ⅜" TYPE 'K' COPPER PROPANE GAS TUBING SUPPORTED HIGH ON WALL.
30. CONNECT PROPANE GAS TO WALL FURNACE WITH SHUT-OFF VALVE, UNION, AND DIRT LEG; AND PER FURNACE MANUFACTURER INSTRUCTIONS.

GENERAL NOTES

1. ALL VENTS AND FLUES THRU ROOF SHALL BE LOCATED JUST TO N.NW. SIDE OF ROOF PEAK.
2. VERIFY ALL VENT AND FLUE SIZES WITH ACTUAL EQUIPMENT FURNISHED BEFORE FABRICATING OR PURCHASING.

MARQUETTE OFFICE:
1021 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4480
FAX: (906)228-7324

BRIGHTON OFFICE:
8331 GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48816
PHONE: (810)229-2701
FAX: (810)229-4787

INTEGRATED DESIGNS INC.
ARCHITECTURE
ENGINEERING
CONSULTING

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

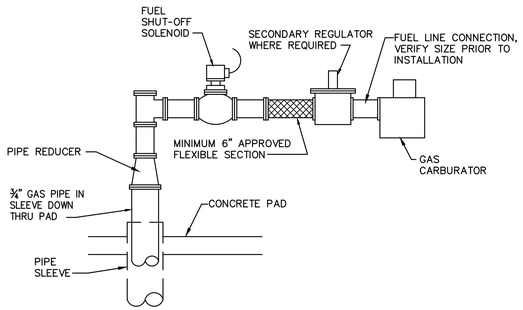
NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
B	100% DESIGN DOCS.	06.01.20
0	ISSUED FOR BIDS	04.06.21
---	---	---
---	---	---

	BY	DATE
DESIGN	SLB	03.03.20
DRAWN	AJD	03.03.20
CHECKED	SLB	04.30.20
APPROVED	SLB	04.30.20

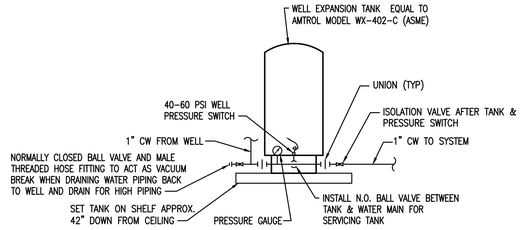
MECHANICAL / PLUMBING PLANS

COPYRIGHT © 2020 INTEGRATED DESIGNS INC.

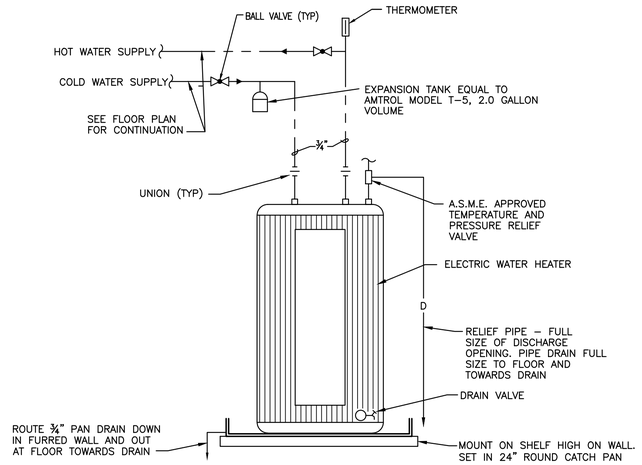
MP1.0



GENERATOR PROPANE GAS PIPING
N.T.S.

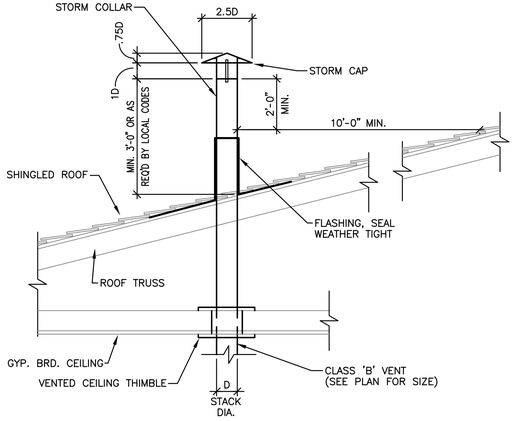


WELL EXPANSION TANK PIPING SCHEMATIC
N.T.S.

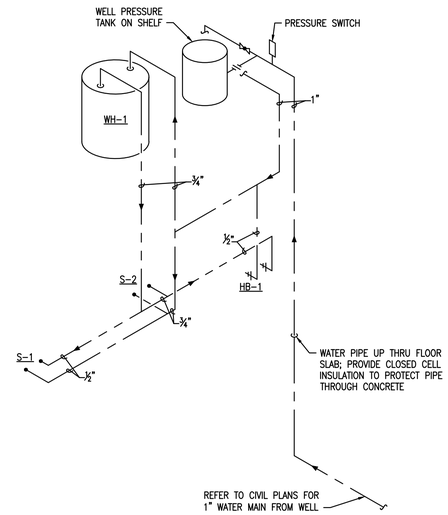


WATER HEATER PIPING SCHEMATIC
N.T.S.

NOTE: PROVIDE 6" FLUE UP THRU ROOF. FLASH AND SEAL PENETRATION WEATHER TIGHT. EXTEND MINIMUM 3'-0" ABOVE ROOF AND INSTALL STORM CAP.



FLUE THRU ROOF DETAIL
NOT TO SCALE



DOMESTIC WATER PIPING RISER DIAGRAM
N.T.S.

PLUMBING FIXTURE SCHEDULE

SYM	DESCRIPTION	W	V	HW	CW
S-1	SINGLE BOWL SINK – ELKAY PSRS33223 20 GAUGE TYPE 304 SELF-RIMMING STAINLESS STEEL SINK, 7¼" DEEP; ELKAY MODEL LKD2432BHC HI-ARC FAUCET WITH WRIST BLADE HANDLES, FLEXIBLE SUPPLIES AND STOPS, LK35 STRAINER.	1½"	1½"	½"	½"
S-2	WALL HUNG SINK – REGENCY MODEL 600HS12SP STAINLESS STEEL SINK, WALL CARRIER, AND DOUBLE HANDLE FAUCET, ANGLE SUPPLY STOPS, AND GRID DRAIN. PROVIDE K-7131-A OFFSET DRAIN & KNEE GUARDS ON ALL EXPOSED PIPING.	1¼"	1¼"	½"	½"
FD-1	FLOOR DRAIN – 'WADE' MODEL W-1100 CAST IRON FLOOR DRAIN WITH FLANGE, INTEGRAL CLAMPING COLLAR AND ADJUSTABLE 6"ø NICKEL BRASS STRAINER.	VARIES	1½"		
TD-1	TRENCH DRAIN – ZURN Z886 6¼" WIDE BY 80" LONG HDPE TRENCH DRAIN, WITH CLOSED END CAP, 4" NO-HUB END OUTLET AND (4) P6-HPP 20" LONG HEEL-PROOF POLYETHYLENE GRATES.	4"			
HB-1	HOSE BIBB – WOODFORD MODEL HCB67 HOT & COLD WALL HYDRANT WITH ASSE 1052 APPROVED HIGH FLOW DOUBLE CHECK BACKFLOW PREVENTER, CONCEALED TYPE, ¾" HOSE THREAD NOZZLE, BRASS CONSTRUCTION & CHROME FINISH COVER.			¾"	¾"
WH-1	WATER HEATER – RUDD 40-GALLON MODEL PESB40-2 ELECTRIC WATER HEATER; 23" DIA. x 32" TALL, 450 LBS TOTAL WEIGHT; (2) 2,500 WATT, 240 VOLT, 1-PHASE; INSULATION BLANKET.			¾"	¾"

MARQUETTE OFFICE:
1021 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-4480
FAX: (906)228-7324

BRIGHTON OFFICE:
8137 GRAND RIVER AVE., SUITE 600
BRIGHTON, MI 48816
PHONE: (810)229-2701
FAX: (810)229-4787

INTEGRATED DESIGNS INC.
ARCHITECTURE
ENGINEERING
CONSULTING

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
A	OWNER REVIEW	05.07.20
B	100% DESIGN DOCS.	06.01.20
0	ISSUED FOR BIDS	04.06.21
---	---	---
---	---	---

	BY	DATE
DESIGN	SLB	04.29.20
DRAWN	AJD	04.29.20
CHECKED	SLB	04.30.20
APPROVED	SLB	04.30.20

MECHANICAL / PLUMBING
DETAILS & SCHEDULES

COPYRIGHT © 2020 INTEGRATED DESIGNS INC.

MP2.0

PANELBOARD SCHEDULE
PANEL 'A'

50A, 120/240V, 1ø, 3W, MCB, SURF. MTD, 16 POLE

DESCRIPTION	CONN KVA	CCT BRKR AMP/POLES	CCT. NO.	CCT. NO.	CCT BRKR AMP/POLES	CONN KVA	DESCRIPTION
LIGHTING	.30	20/1	1A	2A	20/1	1.44	RECEP – EDUCATION CENTER, EXT.
WELL	1.15	30/2	3B	4B	20/1	.90	RECEP – EVAPORATOR ROOM, EXT.
WELL	1.15	–	5A	6A	30/2	2.50	WATER HEATER
SEPTIC TANK LEVEL MONITOR	.10	20/1	7B	8B	–	2.50	WATER HEATER
SPACE			9A	10A			SPACE
SPACE			11B	12B			SPACE
SPACE			13A	14A			SPACE
SPACE			15B	16B			SPACE

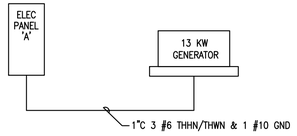
CONNECTED LOAD
PHASE A 5.39 KVA
PHASE B 4.65 KVA
TOTAL 10.04 KVA

10.04 KVA ⁄ [240 ⁄ 1000] = 41.83 A

LIGHTING FIXTURE SCHEDULE

TYPE	LED	DESCRIPTION	LAMP NO./TYPE	MANUFACTURER	VOLTS	NOTES
A	X	RECESSED DOWNLIGHT	LED	HALO #SDL612840WH	120	
B	X	AREA LIGHT	LED	LUMARK #LDWPGL4B120VPEBK	120	

NOTES TO LIGHTING FIXTURE SCHEDULE:

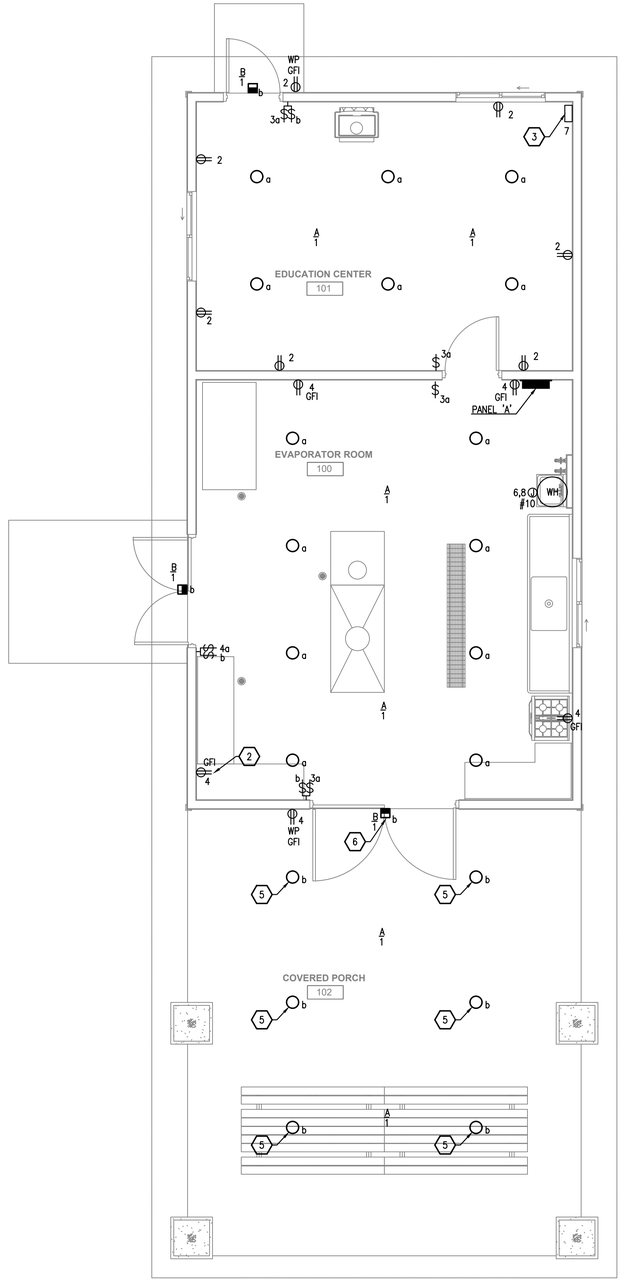


RISER DIAGRAM
N.T.S.

ELECTRICAL SYMBOL LEGEND

LIGHT FIXTURES – NUMBER INDICATES CIRCUIT, LOWER CASE LETTER INDICATES SWITCH LEG, UPPER CASE LETTER INDICATES FIXTURE TYPE, SEE FIXTURE SCHEDULE. DARKENED SYMBOL INDICATES NIGHT LIGHT.

- A/1 a/b — FLUORESCENT OR LED RECESSED FIXTURE
- DOWN LIGHT OR INDUSTRIAL AS SCHEDULED
- SURFACE, CHAIN SUSPENDED OR INDIRECT PENDANT MOUNTED FIXTURE AS SCHEDULED
- SURFACE MOUNTED SQUARE LIGHT
- EXTERIOR AREA LIGHT
- EXTERIOR POLE MOUNTED FIXTURE
- LIGHT SWITCH – SINGLE POLE UNLESS NOTED OTHERWISE, LOWER CASE LETTER INDICATES SWITCH LEG
  3 – THREE WAY SWITCH
  K – KEYED SWITCH
- EXIT LIGHT
- EMERGENCY BATTERY LIGHT
- FIRE ALARM PULL STATION, MOUNT 48" A.F.F. TO TOP
- DOOR HOLDER/CLOSER
- HORN/STROBE LIGHT MOUNT 80" A.F.F. TO BOTTOM
  C – CEILING MOUNTED
- STROBE LIGHT, MOUNT 80" A.F.F. TO BOTTOM
- SMOKE DETECTOR (D – DUCT MTD. TYPE)
- SPRINKLER SYSTEM FLOW SWITCH
- MOTOR SYMBOL, NUMBER INDICATES HORSEPOWER, F – FRACTIONAL HORSEPOWER
- DISCONNECT SWITCH, SIZE AND TYPE AS NOTED
  N.F. – NON FUSED
- MOTOR STARTER
- MSS — MANUAL MOTOR STARTER SWITCH WITH THERMAL OVERLOAD PROTECTION
- COMBINATION MOTOR STARTER/DISCONNECT DEVICE
- JUNCTION BOX (AS NOTED)
- SPECIAL PURPOSE RECEPTACLE, AS NOTED
- WALL MOUNTED CLOCK, AS SPECIFIED, MOUNT 84" A.F.F. TO CENTER
- FLOOR MOUNTED RECEPTACLE OUTLET OR JUNCTION BOX AS NOTED.
- QUADRAPLEX RECEPTACLE
- DUPLEX RECEPTACLE
  GFI – GROUND FAULT INTERRUPTER
  WP – WEATHER PROOF COVER
- SIMPLEX RECEPTACLE
- COMMUNCIATION/DATA CABLE OUTLET.
- WIRELESS ACCESS POINT
- INTERCOM STATION
- CCTV CAMERA
- INTERCOM STATION
- PANELBOARD; FLUSH MTD, SURFACE MTD
- CONDUIT NIPPLE (AS NOTED)
- SURFACE MOUNTED RACEWAY
- CONDUIT RUN CONCEALED IN WALLS OR ABOVE CEILING
- CONDUIT RUN BELOW FLOOR SLAB OR GRADE
- HOMERUN TO PANELBOARD
  CONDUIT
  NEUTRAL
  PHASE WIRE(S)
  GROUND WIRE
  PANELBOARD CIRCUIT(S)
  RLP–1 2,4,6



ELECTRICAL PLAN
SCALE: 1/4" = 1'-0"

N

KEYNOTES

1. PROVIDE #10 BRANCH CIRCUITRY TO WELL HEAD LOCATION. SEE SITE PLAN FOR PROPOSED LOCATION.
2. PROVIDE GFI RECEPTACLE, MOUNT AT 44" A.F.F. TO BOTTOM.
3. PROVIDE INDOOR HIGH WATER ALARM/LEVEL INDICATOR SYSTEM FOR SEPTIC HOLDING TANK EQUAL TO LIBERTY PUMPS #LAM-2-EYE WIRELESS ENABLED PUMP ALARM WITH TETHERED FLOAT LEVEL SENSOR. PROVIDE BRANCH CIRCUITRY AS INDICATED. SEE CIVIL SITE PLAN FOR HOLDING TANK LOCATION.
4. PROVIDE 13KW LP GAS GENERATOR EQUAL TO GENERAC GUARDIAN SERIES HSB W/ 16-CIR SW PANEL, 60A/2P MAIN CIRCUIT BREAKER, 2 WATT SOLAR PULSE BATTERY CHARGER, AND 4000 PSI CONCRETE PAD 54" X 31" X 4" FOR GENERATOR WITH EYEBOLT EMBEDDED FOR SECURING GENERATOR TO PAD. PROVIDE BREAKERS AS INDICATED IN PANELBOARD SCHEDULE ON THIS SHEET.
5. PROVIDE LIGHTING FIXTURE BID ALTERNATE #1.
6. OMIT LIGHTING LIGHTING FIXTURE BID ALTERNATE #1

MARQUETTE OFFICE:
1021 W. BARAGA AVENUE
MARQUETTE, MI 49855
PHONE: (906)228-7524
FAX: (906)228-7524

BRIGHTON OFFICE:
8371 W. GRAND RIVER AVE. SUITE 600
BRIGHTON, MICHIGAN
PHONE: (810)229-2791
FAX: (810)229-4787

DI ARCHITECTURE ENGINEERING CONSULTING
INTEGRATED DESIGNS INC.

MICHIGAN TECHNOLOGICAL UNIVERSITY
NARA FOREST EDUCATION CENTER
LAKE LINDEN, MI
PROJECT NO. 19-903

NO.	REVISIONS	DATE
A	OWNER REVIEW	03.03.20
B	OWNER REVIEW	05.07.20
0	100% DESIGN DOCS	06.01.20
1	ISSUED FOR BIDS	4.06.21
---	---	---
---	---	---

	BY	DATE
DESIGN	AJM	02.06.20
DRAWN	THH	02.06.20
CHECKED	AJM	06.01.20
APPROVED	AJM	06.01.20

ELECTRICAL PLANS

COPYRIGHT © 2017 INTEGRATED DESIGNS INC.

E1.0