

LITTLE TRAVERSE BAY BANDS OF ODAWA INDIANS PLANS FOR

MTIGWAAKIIS HOUSING COMPLEX WELL HOUSE AND WATER MAIN

UTILITIES & MUNICIPALITIES

CHARTER COMMUNICATIONS 2255 M-119 PETOSKEY, MICHIGAN 49770 CONTACT: STEVE THINEL PHONE: 231.631.5725

DTE ENERGY 1250 MICHCON LANE KALKASKA, MICHIGAN 49646 CONTACT: MATT LOGAN PHONE: 231.492.7479

GREAT LAKES ENERGY 1323 BOYNE AVE. BOYNE CITY, MICHIGAN 49712 CONTACT: JOE McHUGH PHONE: 231.487.1372

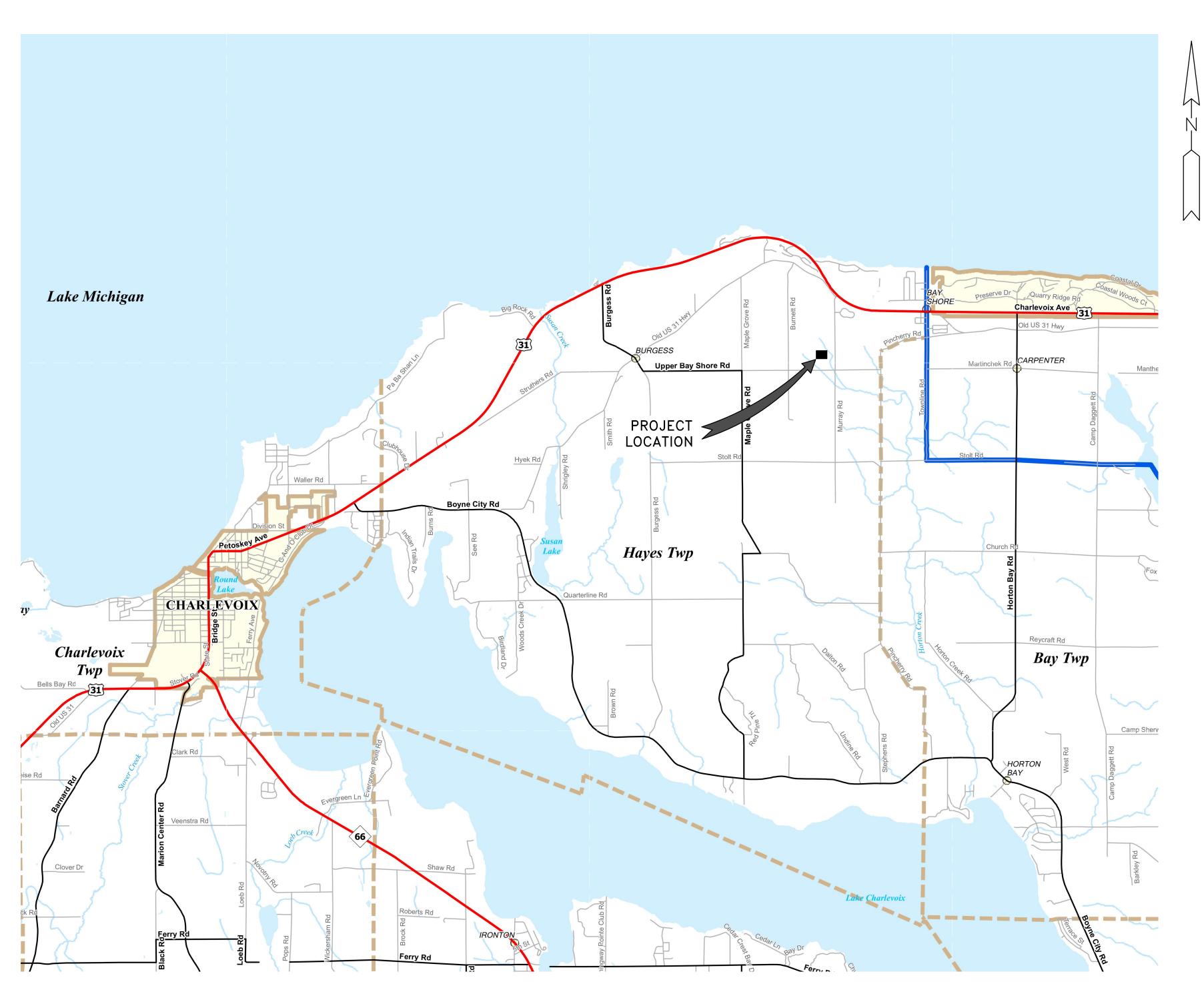
CHARTER COMMUNICATIONS 2255 M-119 PETOSKEY, MICHIGAN 49770 CONTACT: STEVE THINEL PHONE: 231.631.5725

514 MITCHELL PETOSKEY, MI 49770 CONTACT: JEFF COLLARD PHONE: 231.348.8010

LITTLE TRAVERSE BAY BAYS OF ODAWA INDIANS - PLANNING DEPARTMENT 7500 ODAWA CIRCLE HARBOR SPRINGS, MICHIGAN 49740 CONTACT: AMANDA SWISS PHONE: 231.242.1508

GENERAL NOTES

1.) EXISTING TOPOGRAPHIC SURVEY OF THE MTIGWAAKIIS HOUSING COMPLEX SITE COMPLETED ON SEPTEMBER 20, 2019.









REGISTRATION NO: 6201063674

VICINITY MAP

NO SCALE

C0.0 LEGEND AND CONSTRUCTION NOTES WELL HOUSE EXISTING CONDITIONS SITE PLAN AND CONSTRUCTION ACCESS ROUTE PLAN PROPOSED OVERALL SITE PLAN WELL HOUSE REMOVALS AND SESC SITE PLAN C3.0 PROPOSED WELL HOUSE SITE PLAN SITE DETAILS C3.1 WATER MAIN UTILITY PLAN C4.0 WATER MAIN PROFILES C4.1 UTILITY DETAILS C4.2 WELL HOUSE ELEVATIONS S1.0 S2.0 WELL HOUSE DETAILS AND SECTIONS ELECTRICAL TITLE SHEET ELECTRICAL PLANS ELECTRICAL DETAILS AND SPECIFICATIONS MECHANICAL TITLE SHEET

SHEET INDEX

PROJECT DESCRIPTION: CONSTRUCTION OF NEW 20-FT X 22-FT WELL HOUSE INCLUDING CONCRETE FOUNDATION, BUILDING STRUCTURE, INTERIOR PIPING, VALVES, METERS, TANKS, CONTROLS, MECHANICAL, ELECTRICAL, AND PLUMBING, DEVELOPMENT OF PRODUCTION WELL, WATER MAIN, WATER SERVICES, DEMOLITION OF EXISTING WELL HOUSE, SESC MEASURES, HMA AND CONCRETE REMOVAL AND REPLACEMENT, SITE RESTORATION, AND ALL OTHER MISCELLANEOUS

ODW2022.02G

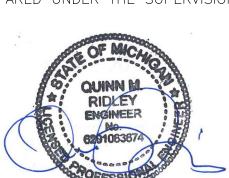
MECHANICAL PLAN AND DETAILS

HOUSING COMPLEX CHARLEVOIX COUNTY

GENERAL SHEETS

TITLE SHEET

SHEET NO.



1. ALL EXISTING GAS MAINS, WATER MAINS, TELEPHONE DUCTS AND OTHER UTILITIES, WHERE SHOWN ON THE PLANS OR NOT, SHALL BE SUPPORTED BY THE CONTRACTOR IN ACCORDANCE

WITH THE REQUIREMENTS OF THE OWNERS OF THE UTILITIES. 2. LOCATION OF EXISTING WATER MAIN AND WATER PIPING IS APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION, RESOLVING ANY CONFLICTS, AND THEIR PROTECTION DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER. MISS DIG SHALL BE CONTACTED PRIOR TO ALL DEMOLITION AND CONSTRUCTION. ALL DISTURBED AREAS SHALL BE TOPSOILED, SEEDED, FERTILIZED AND MULCHED IN ACCORDANCE WITH THE RESTORATION DETAIL AND SECTION 32-9219 OF THE SPECIFICATIONS

4. MAXIMUM DENSITIES ARE BASED ON MICHIGAN CONE DETERMINATION. 5. THE CONTRACTOR SHALL OBTAIN AND CONFORM TO THE REQUIREMENTS OF THE SOIL EROSION AND SEDIMENTATION CONTROL PERMIT, PART 91 OF ACT 451 AS OUTLINED IN SECTION 02200 GENERAL EARTHWORK OF THE SPECIFICATIONS.

6. EXISTING WATER MAIN MUST REMAIN IN SERVICE DURING THE ENTIRE CONSTRUCTION PERIOD EXCEPT WHERE NOTED IN THE PLANS. 7. ALL ELEVATIONS SHOWN ARE IN FEET.

8. SURVEY DATA FOLLOWS: HORIZONTAL DATUM — NAD 83 STATE PLANE COORDINATE, MICHIGAN CENTRAL ZONE. VERTICAL DATUM- NAVD 88.

GENERAL STRUCTURAL NOTES

1. THE GENERAL STRUCTURAL NOTES ARE INTENDED TO AUGMENT THE DRAWINGS. AND SPECIFICATIONS. SHOULD CONFLICTS OCCUR BETWEEN THE DRAWINGS AND/OR THE GENERAL STRUCTURAL NOTES, THE STRICTEST PROVISION SHALL GOVERN 2. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED, SELF SUPPORTING, STABLE STRUCTURE UNLESS OTHERWISE INDICATED. THEY DO NOT INDICATE THE

MEANS OR METHOD OF CONSTRUCTION. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND CONSTRUCTION SEQUENCE AND PROVIDE ALL MEASURES NECESSARY TO ENSURE THE STABILITY AND SAFETY OF THE STRUCTURE AND ITS COMPONENTS THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, SHORING FOR CONSTRUCTION EQUIPMENT, SHORING FOR THE BUILDING, FORMS, SCAFFOLDING, PLANKING, SAFETY NETS, SUPPORT AND BRACING FOR CRANES AND GIN POLES, ETC.

3. THE GOVERNING BUILDING CODE IS MICHIGAN BUILDING CODE (MBC) 2015. 4. SHOP DRAWINGS PREPARED BY SUPPLIERS, SUBCONTRACTORS, ETC. SHALL BE REVIEWED BY THE ENGINEER FOR CONFORMANCE WITH DESIGN INTENT ONLY.

5. CONTRACTOR IS RESPONSIBLE TO VERIFY ALL RELEVANT DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATIONS AGAINST APPROVED MANUFACTURERS CERTIFIED EQUIPMENT DRAWINGS 6. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND ELEVATIONS SHOWN ON THE PLANS AND FOR COORDINATING ALL DIMENSIONS AND ELEVATIONS SHOWN ON THE DRAWINGS. IF DISCREPANCIES IN THE DIMENSIONS OCCUR, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO BRING THE DISCREPANCY TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

CAST IN PLACE CONCRETE NOTES

1. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST ACI 318 AND ACI 301 SPECIFICATIONS.

CONCRETE SHALL BE A MINIMUM OF F'C = 3,500 psi AT 28 DAYS. 3. ALL REBAR SHALL BE HIGH STRENGTH NEW BILLET STEEL CONFORMING TO ASTM A615 GRADE 60. ALL DETAILS AND ACCESSORIES SHALL CONFORM TO THE LATEST ACI 315 STANDARD DETAILING MANUAL

5. ALL WELD PLATES AND MISCELLANEOUS STEEL SHALL BE Fy = 36 ksi. 6. WELDED CONNECTIONS SHALL CONFORM TO THE AWS STRUCTURAL WELDING CODE AND USE 60 ksi ELECTRODES.

7. REINFORCEMENT PROTECTION SHALL BE AS FOLLOWS U.O.N. CONCRETE POURED AGAINST EARTH

ALL OTHER CONCRETE 8. ALL EMBEDDED ITEMS SHALL BE PLACED IN THE FORMWORK PRIOR TO PLACING CONCRETE. DRILLING AND GROUTING IS ACCEPTABLE SUBJECT TO ENGINEER APPROVAL 9. ALL BOLTS, NUTS, WASHERS, PLATES, AND ANCHOR BOLTS IN DIRECT OR INTERMITTENT CONTACT WITH WATER SHALL BE HOT DIPPED GALVANIZED PER LATEST ASTM STANDARDS. 10. ALL SLABS ON GRADE SHALL BE PLACED OVER A MINIMUM OF 12" OF COMPACTED SAND

FILL. PROVIDE A VAPOR BARRIER AS CALLED FOR ON THE PLANS AND PITCH ALL SLABS TO DRAIN WHERE INDICATED WITHOUT REDUCING THE THICKNESS OF THE SLAB. 11. FIELD WELDING OF REINFORCEMENT IS NOT PERMITTED WITHOUT WRITTEN CONSENT OF THE

ENGINEER. 12. FIELD BEND BARS COLD. DO NOT FIELD BEND BARS WITH HEAT OR BARS PARTIALLY EMBEDDED IN CONCRETE. 13. ALL EXTERIOR CONCRETE INCLUDING WALLS SHALL BE AIR-ENTRAINED.

WOOD FRAMING NOTES

1. ALL FRAMING LUMBER SHALL BE SPF #2 OR BETTER, LUMBER LABELED PT SHALL BE SPF #2 OR BETTER.

2. STEEL PLATES OR FASTENERS IN CONTACT WITH PRESSURE TREATED LUMBER AND PROTECTED WITHIN THE BUILDING ENVELOPE (ADEQUATELY SHIELDED FROM DIRECT CONTACT WITH MOISTURE) SHALL BE STAINLESS STEEL OR GALVANIZED TO G60 PER ASTM A 924 REQUIREMENTS. STEEL PLATES OR FASTENERS IN CONTACT WITH PRESSURE TREATED LUMBER LOCATED OUTSIDE OF THE BUILDING ENVELOPE OR EXPOSED TO MOISTURE SHALL BE STAINLESS STEEL OR GALVANIZED TO G90 PER ASTM A 924. 3. CONTRACTOR SHALL NOT MIX GALVANIZED AND STAINLESS STEEL. ANY METAL PARTS IN CONTACT

WITH OTHER METAL PARTS SHALL BE OF A SIMILAR MATERIAL

WOOD TRUSS NOTES

1. CONTRACTOR SHALL PROVIDE AND INSTALL METAL-PLATE CONNECTED WOOD TRUSSES DESIGNED TO SUPPORT THE LOADS INDICATED ON THE PLANS. TRUSSES SHALL HAVE A MAXIMUM DEFLECTION

OF L/360 AND SHALL BE SPACED AT 2'-0" O.C. MAX. 2. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SEALED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF MICHIGAN. SHOP DRAWINGS FOR EACH TRUSS SHALL SHOW SIZE, SPECIES AND STRESS GRADES OF ALL LUMBER, METAL PLATE TYPE, ORIENTATION AND SIZES, BEARING AND UPLIFT REQUIREMENTS. ALL LOAD CASES INVESTIGATED AND MAXIMUM STRESSES IN EACH MEMBER SHALL ALSO BE INCLUDED. 3. TRUSS MANUFACTURER SHALL DESIGN TRUSSES FOR WIND LOADS PER SECTION OF SEI/ASCE

7-016 AND 7-22. 4. WOOD TRUSS FABRICATION SHALL COMPLY WITH TPI 1-95, "NATIONAL DESIGN STANDARD FOR METAL PLATE CONNECTED WOOD TRUSS CONSTRUCTION" AND TPI DSB-89, "RECOMMENDED DESIGN SPECIFICATION FOR TEMPORARY BRACING OF METAL PLATE CONNECTED WOOD TRUSSES". 5. METAL PLATE CONNECTORS SHALL COMPLY WITH TPI 1, HOT-DIP GALVANIZED STEEL SHEET:

ASTM A653/A653 M, G60 COATING DESIGNATION; DESIGNATION SS, GRADE 33, AND NOT LESS THAN 0.036 IN. THICK. 6. PROVIDE DIMENSIONAL LUMBER OF ANY SPECIES FOR TRUSS CHORD AND WEB MEMBERS, CAPABLE OF SUPPORTING THE REQUIRED LOADS WITHOUT EXCEEDING ALLOWABLE DESIGN VALUES ACCORDING TO AFPA'S "NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION" AND ITS

"SUPPLEMENT" CONTRACTOR SHALL INSTALL SIMPSON STRONG-TIE HURRICANE TIE-DOWNS (OR EQUAL) AT ALL BEARING LOCATIONS OF ALL TRUSSES AS FOLLOWS (U.O.N.)

> SINGLE PLY 0' TO 25' SPAN SINGLE PLY 26' TO 40' SPAN (2) H3 SINGLE PLY 41' TO 60' SPAN GIRDER TRUSSES AS CALLED OUT ON PLANS

8. TRUSS MANUFACTURER SHALL DESIGN TRUSS BEARINGS FOR 425 PSI ALLOWABLE BEARING PRESSURE. TRUSS MANUFACTURER SHALL ATTACH HEEL BLOCKS OR PROVIDE BEARING ENHANCERS AS NECESSARY TO ACHIEVE THIS REQUIREMENT.

9. TRUSSES SHALL BE HANDLED AND INSTALLED PER WTCA AND TPI REQUIREMENTS. INSTALL AND FASTEN PERMANENT BRACING DURING TRUSS ERECTION AND BEFORE LOADS ARE APPLIED. 10. ANCHOR ENDS OF PERMANENT BRACING WHERE TERMINATING AT WALLS OR BEAMS. IN ADDITION TO ANY LATERAL BRACING WHICH IS REQUIRED BY THE TRUSS MANUFACTURER/SUPPLIER, THE CONTRACTOR SHALL PROVIDE AND INSTALL PERMANENT DIAGONAL STABILITY BRACING FOR ALL COMPRESSION WEBS AND PRIMARY TOP CHORDS OF PIGGY BACK TRUSSES OR OTHER MEMBERS WHICH REQUIRE BRACING TO REDUCE THEIR BUCKING LENGTH. THIS BRACING SHALL CONSIST OF 2X4's ATTACHED TO EACH WEB MEMBER WITH NOT LESS THEN 2 - 16d NAILS. BRACING SHALL EXTEND ON A 45 DEGREE DIAGONAL FROM THE TOP TO BOTTOM OF THE WEBS. FOR EACH BRACED MEMBER, DIAGONALS SHALL BE INSTALLED IN CHEVRON PAIRS WITH ONE PAIR OF DIAGONALS AT EACH END OF THE SERIES OF TRUSSES AND NOT MORE THAN 20 FEET BETWEEN PAIRS.

BUILDING LOADS LIVE LOADS Section 1603.1. **IOCCUPANCY OR USE** UNIFORM CONCENTRATED (LBS.) UTILITY AND MISCELLANEOUS 150 | 3,000 MECHANICAL ROOM ROOF SNOW LOADS Section 1603.1.3 LOAD TYPE UNIFORM (PSF) GROUND SNOW LOAD, Pg 60 50.8 . FLAT ROOF SNOW LOAD, Pf 50.8 5. SLOPED ROOF SNOW LOAD, Ps 0/70.2 UNBALANCED SNOW LOADS N/A SNOW DRIFT LOADS (VALLEY LOADS) SNOW LOAD FACTORS **VALUE** 1.0 SNOW EXPOSURE FACTOR, Ce . SNOW LOAD IMPORTANCE FACTOR, Is . THERMAL FACTOR, Ct 1.1 1.0 . SLOPED ROOF FACTOR, FLAT ROOF WIND LOADS Section 1603.1.4 VALUE LOAD OR VARIABLE 90 MPH BASIC WIND SPEED (3-SECOND GUST) 1.15 . WIND IMPORTANCE FACTOR, IW WIND EXPOSURE CATEGORY -12.3<u> 1. MAIN WIND FORCE RESISTING SYSTEM (MAX ROOF UPLIFT, PSF)</u> 17.9 5. MAIN WIND FORCE RESISTING SYSTEM (MAX WALL, PSF) |+11.5,-15.3|6. COMPONENTS & CLADDING DESIGN PRESSURE (ZONE 1, PSF) +11.5, -26.7'. COMPONENTS & CLADDING DESIGN PRESSURE (ZONE 2, PSF) +11.5,-39.4 <u> 8. COMPONENTS & CLADDING DESIGN PRESSURE (ZONE 3, PSF)</u> $|+1\overline{6.8},-18.2|$ 9. COMPONENTS & CLADDING DESIGN PRESSURE (ZONE 4, PSF) +16.8, -22.410. COMPONENTS & CLADDING DESIGN PRESSURE (ZONE 5, PSF) 11. INTERNAL PRESSURE COEFFICIENT ±0.18 EARTHQUAKE DESIGN DATA Section 1603.1.5 LOAD OR VARIABLE VALUE SEISMIC USE GROUP 0.04g . SPECTRAL RESPONSE ACCELERATION, Ss 3. SPECTRAL RESPONSE COEFFICIENT 0.04g 4. SITE CLASS . SEISMIC DESIGN CATEGORY BASIC SEISMIC-FORCE-RESISTING SYSTEM USED: WOOD/STEEL FRAMES. S. SEISMIC IMPORTANCE FACTOR $l_{E} = 1.0$. MINIMUM LATERAL FORCE ANALYSIS PROCEDURE, SECTION 1616.4 SPECIAL INSPECTIONS REQUIRED Section 17 SOIL BEARING STRENGTH Section 1802.6 ALLOWABLE SOIL BEARING PRESSURE OF 2,000 PSF BASED ON PRESUMPTIVE ALLOWABLE BEARING CAPACITY OF SANDY SOILS. CONTRACTOR TO VERIFY PRIOR TO FORMING FOOTING. APPLICABLE CODE IS MBC 2015. LOADS ARE BASED ON SECTION 16 OF MBC 2015 UNLESS OTHERWISE NOTED.

MASONRY WALL NOTES

ALL MASONRY SHALL BE F'm = 1,500 psi.

ALL GROUT SHALL BE F'c = 3,000 psi. MORTAR FOR ALL BEARING AND EXTERIOR WALLS SHALL BE TYPE M.

PROVIDE AN 8" BOND BEAM W/(2) #5's, GROUTED SOLID AT THE TOP OF ALL WALLS. PROVIDE (1) #5 VERTICAL REBAR, GROUTED SOLID AT 48" C/C AT ALL WALLS. PROVIDE 9 GAGE LADDER OR TRUSS BED REINFORCEMENT EVERY 3rd COURSE ON ALL BLOCK WALLS. 6 . ALL WALL CORNERS & INTERSECTIONS SHALL BE FULL DEPTH INTERLOCKING JOINTS WITH CONTINUOUS CORNER AND INTERSECTION BED REINFORCEMENT.

GROUTING OF MASONRY WALLS SHALL BE CONFORM TO RECOMMENDED PROCEDURE FOR LOW LIFT GROUTING OR HIGH LIFT GROUTING AS OUTLINED IN THE NCMA-TEK NOTE 3-2, "GROUTING CONCRETE MASONRY WALLS".

BACKFILLING NOTES

DO NOT PLACE BACKFILL AGAINST FOUNDATION WALLS UNTIL WALLS HAVE FULLY CURED. AFTER EXCAVATING FOR ALL EARTH-SUPPORTED FLOOR SLABS. THE EXPOSED NATURAL SOIL SHALL BE COMPACTED TO 95% MAX DENSITY PRIOR TO PLACING FILL. 3. ALL EXCAVATED AREAS AROUND STRUCTURES SHALL BE BACKFILLED WITH GRANULAR MATERIAL FREE OF ORGANIC MATTER, SILT AND/OR CLAY. ALL FILL SLOPES SHALL BE PLACED IN 12" LAYERS AND COMPACTED TO 95% MAX DENSITY AS DETERMINED BE THE MICHIGAN CONE

PIPING NOTES

METHOD.

PIPE SUPPORTS, PEDESTALS, BASE ELBOWS AND TEES AND PIPE HANGERS SHALL BE PROVIDED AND INSTALLED AS REQUIRED BY THE ENGINEER IN ACCORDANCE WITH THE FOLLOWING:

PIPE SIZE (INCHES)	MAXIMUM DISTANCE (FEET) BETWEEN SUPPORTS	IN MINIMUM DIAMETE OF HANGER ROD (INCHES)
1/2 THRU 2	6	3/8
2 1/4 THRU 4	4 8	3/8 3/8
4 1/4 THRU		7/8

2. PVC PIPE, FIBERGLASS PIPE, RUBBER HOSE, TUBING, ETC., SHALL BE SUPPORTED ALONG THE ENTIRE LENGTH BY MEANS OF A STEEL CHANNEL OR ANGLE IRON ANCHORED TO THE FLOOR, WALL OR CEILING WITH SUPPORTS PER ABOVE 3. PIPING SYSTEMS SHALL BE SUPPORTED BY HANGERS, GUIDES, ANCHORS AND SWAY BRACING

OR BY RESTING ON STRUCTURAL BRACKETS OR RACKS. WELDING TO STRUCTURAL STEEL MEMBERS SHALL NOT BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE ENGINEER. VALVES SHALL BE SUPPORTED TO KEEP UNDUE STRAIN OFF OF PIPING AND ADJACENT EQUIPMENT. EQUIPMENT REQUIRING PERIODIC MAINTENANCE SHALL BE SUPPORTED TO ALLOW EASY REMOVAL WITH A MINIMUM OF TEMPORARY SUPPORTING.

4. HANGER RODS SHALL BE CONNECTED TO BEAM CLAMPS OR CONCRETE INSERTS. CLAMPS OR INSERTS SHALL BE UL APPROVED. "C" CLAMPS WILL NOT BE PERMITTED. EXPANSION ANCHORS MAY BE USED UPON WRITTEN APPROVAL BY THE ENGINEER. HOLES FOR EXPANSION ANCHORS SHALL BE MADE BY ROTARY DRILLING ONLY. HAMMERING DEVICES WILL NOT BE PERMITTED. 5. ANCHORS, GUIDES AND SWAY BRACES SHALL BE PROVIDED TO ALLOW FOR FORCES ON THE PIPING SYSTEM. SLEEVES SHALL BE PROVIDED ON ALL PIPES SUBJECT TO MOVEMENT. SLEEVES SHALL BE NO LESS THAN FOUR INCHES WIDE OR HAVE A WIDTH EQUAL TO 1/3 THE DIAMETER OF THE PIPE, WHICHEVER IS LARGER.

6. VERTICAL PIPING SHALL BE SUPPORTED AT EACH FLOOR OR GRATING LEVEL WITH APPROVED RISER CLAMPS EXCEPT WHERE PROHIBITED BY PIPING FLEXIBILITY REQUIREMENTS. LATERAL MOVEMENT OF EXPOSED VERTICAL PIPING AT BUILDING WALLS SHALL BE RESTRAINED BY ANCHOR DEVICES ATTACHED TO WALLS EXCEPT WHERE PROHIBITED BY PIPING FLEXIBILITY REQUIREMENTS. PROVIDE RETAINING STRAPS WHEN CLAMPS ARE USED.

WATER MAIN SPECIFICATIONS

I. WATER MAIN PIPE SHALL BE AS SPECIFIED ON THE PLANS: 1.1. FLEXIBLE POLYVINYL CHLORIDE BELL AND SPIGOT TYPE PRESSURE PIPE AND COUPLINGS, SIZE

4 INCHES AND LARGER, SHALL CONFORM TO AWWA C900, PRESSURE CLASS 235, DR 18 UNLESS OTHERWISE INDICATED IN THE PLANS OR SPECIFICATIONS. WATER MAIN JOINTS SHALL BE:

2.1. JOINTS FOR PVC PIPE SHALL BE PUSH-ON OR MECHANICAL ELASTOMERIC GASKET TYPE. CONFORMING TO ASTM D3139. 3. FITTINGS SHALL BE:

3.1. FITTINGS AND PLUGS FOR PVC PIPE, UNLESS SPECIFIED OTHERWISE, SHALL BE DUCTILE IRON. 4. GASKETS SHALL BE: 4.1. PVC PIPE GASKETS SHALL BE ELASTOMERIC SEAL TYPE CONFORMING TO ASTM F477.

5. WHERE THE PLANS OR SPECIFICATIONS CALL FOR RESTRAINED JOINTS THEY SHALL BE PER THE FOLLOWING: 5.1 RESTRAINED JOINTS FOR PVC WATER MAIN PIPE SHALL BE DESIGNED FOR A WORKING PRESSURE OF 200 PSI (1.4 MPA). WHERE THE RESTRAINED

PORTION OF THE PIPE IS CONNECTED TO FITTINGS, RESTRAINT SHALL BE PROVIDED ACROSS THE JOINT BY A CLAMPING RING AND ANCHORED TO THE FITTING WITH T-HEAD BOLTS OR STAINLESS STEEL RODS. SERRATIONS ON THE INSIDE SURFACE TO PROVIDE POSITIVE RESTRAINT ON THE OUTSIDE

5.2 RESTRAINING DEVICES FOR PVC WATER MAIN PIPE SHALL INCORPORATE CLAMPING RINGS WITH SURFACE OF THE PIPE AND SHALL PROVIDE FULL SUPPORT AROUND THE CIRCUMFERENCE OF THE PIPE TO MAINTAIN ROUNDNESS. VALVES, OPERATION, ACCESSORIES, AND SPECIFIC NOTES ARE SPECIFIED ON THE DRAWINGS.

VALVE MATERIALS AND WORKMANSHIP SHALL CONFORM TO APPLICABLE ANSI, ASTM, AND AWWA STANDARDS. VALVE BODIES SHALL HAVE AN ARROW TO INDICATE DIRECTION OF TURNING TO OPEN. 6.1. GATE VALVES 4-INCHES IN DIAMETER OR LARGER SHALL BE IRON-BODY, BRONZE MOUNTED, INSIDE-SCREW, HAND-OPERATED RESILIENT SEAT, AND SHALL BE EQUIPPED WITH RUBBER O-RING SEALS AT THE TOP OF THE STEMS UNLESS OTHERWISE SHOWN ON THE PLANS.

VALVES SHALL CONFORM TO THE REQUIREMENTS OF AWWA SPECIFICATION C500, EXCEPT AS SUCH SPECIFICATIONS ARE HEREIN MODIFIED. GATE VALVES SHALL BE DESIGNED FOR MINIMUM WORKING PRESSURE OF 200 PSI. VALVE BOXES SHALL BE 3-PIECE, 5-1/4-INCH DIAMETER, SCREW TYPE, GRAY IRON CASTINGS CONSISTING OF BASE SECTION, BOTTOM SECTION, AND TOP SECTION WITH LID CONFORMING TO

ASTM A48, CLASS 20. OVERALL LENGTH SHALL BE ADJUSTABLE TO MEET GRADE. TRACER WIRE IS TO BE INSTALLED ALONG WITH PVC WATER MAINS. TRACER WIRE IS TO BE CONTINUOUS FROM END TO END AND TERMINATE AT EACH STRUCTURE IN SUCH A WAY AND WITH A SUFFICIENT LENGTH OF WIRE TO ALLOW FOR EASY CONNECTION TO UTILITY TRACING EQUIPMENT. WIRE SHALL BE CONTINUITY TESTED AFTER INSTALLATION. ANY WIRE WHICH FAILS THE CONTINUITY TEST SHALL BE REPLACED. ALL TRACER WIRE SHALL BE COPPER CLAD STEEL WIRE WITH 30 MIL HIGH DENSITY POLYETHYLENE INSULATION. CONCENTRIC COPPER CLADDING METALLURGICALLY BONDED TO A STEEL CORE THROUGH A CONTINUOUS SOLID CLADDING PROCESS.

WATER SYSTEM CONSTRUCTION NOTES

1. PROVIDE 6' COVER ON ALL WATER MAINS OUTSIDE OF BUILDING. 2. CONTRACTOR IS TO VERIFY WHERE THE EXISTING WELL LINES ARE LOCATED AND ADJUST THE

LENGTH OF THE PROPOSED WATER MAIN EXTENSION ACCORDINGLY. 3. ALL UNDERGROUND PIPING SHALL BE AS SPECIFIED IN SECTION 33 1100 OF THE SPECIFICATIONS. ALL INTERIOR WELL HOUSE PIPING SHALL BE AS SPECIFIED IN SECTIONS 40 0513 OF THE SPECIFICATIONS.

4. WATER MAIN FITTINGS, GATE VALVES AND BOXES SHALL BE AS SPECIFIED IN SECTIONS 33 1100, 40 0513 OF THE SPECIFICATIONS.

5. LOCATION AND DEPTH OF EXISTING WATER MAINS SHALL BE VERIFIED PRIOR TO PLACING AND CONNECTING WATER MAIN. THE CONTRACTOR SHALL SUBMIT PROPOSED METHODS AND MATERIALS TO BE USED FOR EACH CONNECTION TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION. 6. PROPOSED WATER SYSTEM SHALL BE INSTALLED, TESTED, DISINFECTED, FLUSHED AND BACTERIA TESTED ACCORDING TO THE SPECIFICATIONS. CONTRACTOR SHALL PROVIDE ALL REQUIRED TEMPORARY FLUSH-OUT CONNECTIONS AND TESTING CORPORATIONS AND OBTAIN ENGINEER'S APPROVAL OF SAME PRIOR TO INSTALLATION.

7. ALL WATER SYSTEM CONSTRUCTION SHALL CONFORM TO THE SPECIFICATIONS IN THE CONTRACT DOCUMENTS.

8. CLASS III BEDDING, AS DETAILED ON SHEET C4.3, SHALL BE USED ON ALL WATER MAIN. 9. VALVE BOXES SHALL BE SET TO FINISH GRADE.

10. ALL VALVES SHALL CONFORM TO THE TYPE INDICATED IN THE SPECIFICATIONS. 11. ALL FITTINGS SHALL BE RESTRAINED WITH A MECHANICAL JOINT. THE MECHANICAL JOINT SHALL BE A MEGALUG BY EBBA IRON, INC. OR APPROVED EQUAL

12. ALL FLEXIBLE PIPES SHALL BE INSTALLED WITH PIPE BEDDING IN ACCORDANCE WITH THE DETAILS INCLUDED IN THESE PLANS OR PIPE MANUFACTURES RECOMMENDATIONS. 13. ALL WATER MAIN THAT RUNS OUTSIDE OF PAVED, GRAVEL OR CONCRETE SURFACES SHALL BE BACKFILLED IN MAX 12" LIFTS WITH SUITABLE NATIVE MATERIAL COMPACTED TO A MINIMUM 95% OF THE MAXIMUM DRY DENSITY DETERMINED BY MODIFIED PROCTOR TEST.

14. PLACE GRANULAR MATERIAL BACKFILL WITHIN 3 FEET OF ALL STRUCTURES, INCLUDING VALVE BOXES, ETC. 15. MATERIALS:

GRANULAR MATERIAL – MDOT CLASS II SAND

OPEN GRADED AGGREGATE - MDOT 6A OR AASHTO #57

DENSE GRADED AGGREGATE - MDOT 22AA CRUSHED LIMESTONE

VARIABLE FREQUENCY DRIVE (VFD) NOTES

1. VFD SHALL BE PROGRAMMED TO OPERATE WELL #1 AS THE PRIMARY WELL. WELL #1 SHALL BE ABLE TO OPERATED UNDER HAND/OFF/AUTO CONDITIONS. WELL #1 WILL NOT ALTERNATE WITH ANY OTHER PUMPS.

2. VFDS SHALL BE PROGRAMMED TO OPERATE WELLS #2A AND #2B AS SECONDARY WELLS. WELLS #2A AND #2B SHALL EACH BE ABLE TO BE OPERATED UNDER HAND/OFF/AUTO CONDITIONS. WELLS #2A AND #2B SHALL BE CAPABLE OF ALTERNATING BETWEEN ONE ANOTHER

	<u>EXISTING</u>	<u>PROPOSED</u>
LINE WORK	,,,,,,,,,	,,,,,,,,
BUILDING CHAIN LINK FENCE		
GRAVEL		, , ,
PROPERTY LINE	-	
RAILROAD TRACK CENTERLINE RIGHT OF WAY		
SECTION LINE		
SILT FENCE	-	_//_//
O BE DEMOLISHED OP OF BANK	· X·X·X·X·X·X·X·X·X·X·X·X·X·X·X·X·X·X·X	lalala lalala lalala
JTILITY/DRAINAGE EASEMENT	-	
WALL		
WOOD FENCE REMOVAL	· X·X·X·X·X·X·X·X·X·X·X·X·X·X·X·X·	-0-0-0-0-
WATER (ROMECTIO)	<u>EXISTING</u>	<u>PROPOSED</u>
WATER (DOMESTIC)		
WATER WELL/MANHOLE BLOW-OFF VALVE	\Diamond	Ø 5
FIRE HYDRANT	Q	•
GATE VALVE & BOX	\otimes	•
VALVE SHUT OFF VALVE	⊠ WSO	*
DOMESTIC WATER		wso
MONUMENTS		
RON (FOUND) RON (SET)	● ° _{IR}	
BENCH MARK	ŬR вм [†]	
GOVERNMENT CORNER	•	
MONUMENT BOX	● B0X	
MONUMENT NAIL & TAG	○ N&T	
PINCH IRON	N&T PI+	
PK NAIL	oРК 7	
RAILROAD SPIKE RIGHT—OF—WAY MARKER	⁷ RS	
SPIKE	R/W SPK	
USGS MONUMENT	USGS	
OVERHEAD UTILITIES		
GUY WIRE ANCHOR	O _{GA}	O _{GA}
GUY POLE	o _{GP}	, O _{GP}
LAMP POLE METAL LIGHT POLE) M) (
POWER & LIGHT POLE	Ø	Œ
POWER & TELEPHONE POLE TELE, CTV, PWR & LIGHT POLE	® Xtcp	Ø ∑(TCP
TELE, CTV, & POWER POLE	O _{TCP}	Ø _{TCP}
TELE, & CTV POLE	Ø	Ø
TELE, CTV, & LIGHT POLE TELE,. & LIGHT POLE	Ø Ø) (A)
TELE, POWER, & LIGHT POLE	M M	
UTILITY POLE	Ø 	Ø
OVERHEAD CABLE TV & TELEPHO OVERHEAD ELECTRIC & CABLE TV		
OVERHEAD ELECTRIC, CABLE TV		
AND TELEPHONE		
<u>TELEPHONE</u>		
TELEPHONE POLE	Ø	Ø
TELEPHONE MANHOLE TELEPHONE PEDESTAL	(T) (TP)	① IP
OVERHEAD TELEPHONE	TT	
UNDERGROUND TELEPHONE	———UT———UT———	
TOPOGRAPHIC FEATURES		
FLAG POLE	O _{FP}	
FOUNTAIN	→ POV	
MAIL BOX POST (ROUND)	BoxP	
POST (SQUARE)	P	
RAILROAD SIGNAL	*	
SIGN POST TRAFFIC SIGNAL	o _s	
UNDERGROUND MARKER	<u>»</u> м	
		
<u>PATTERNS</u>	र के किस के किस के किस के किस की	jjing of al
CONCRETE	4 44 4	AA A A A
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F	লৈ পিল্লানু ক্রিক্রের ক্রিক্রের স্ক্রের স্ক্রের স্কর্মনার সাহিত্য করে। সামার ক্রির্কিন স্কর্মনার স্কর্মনার স্ক	3045575

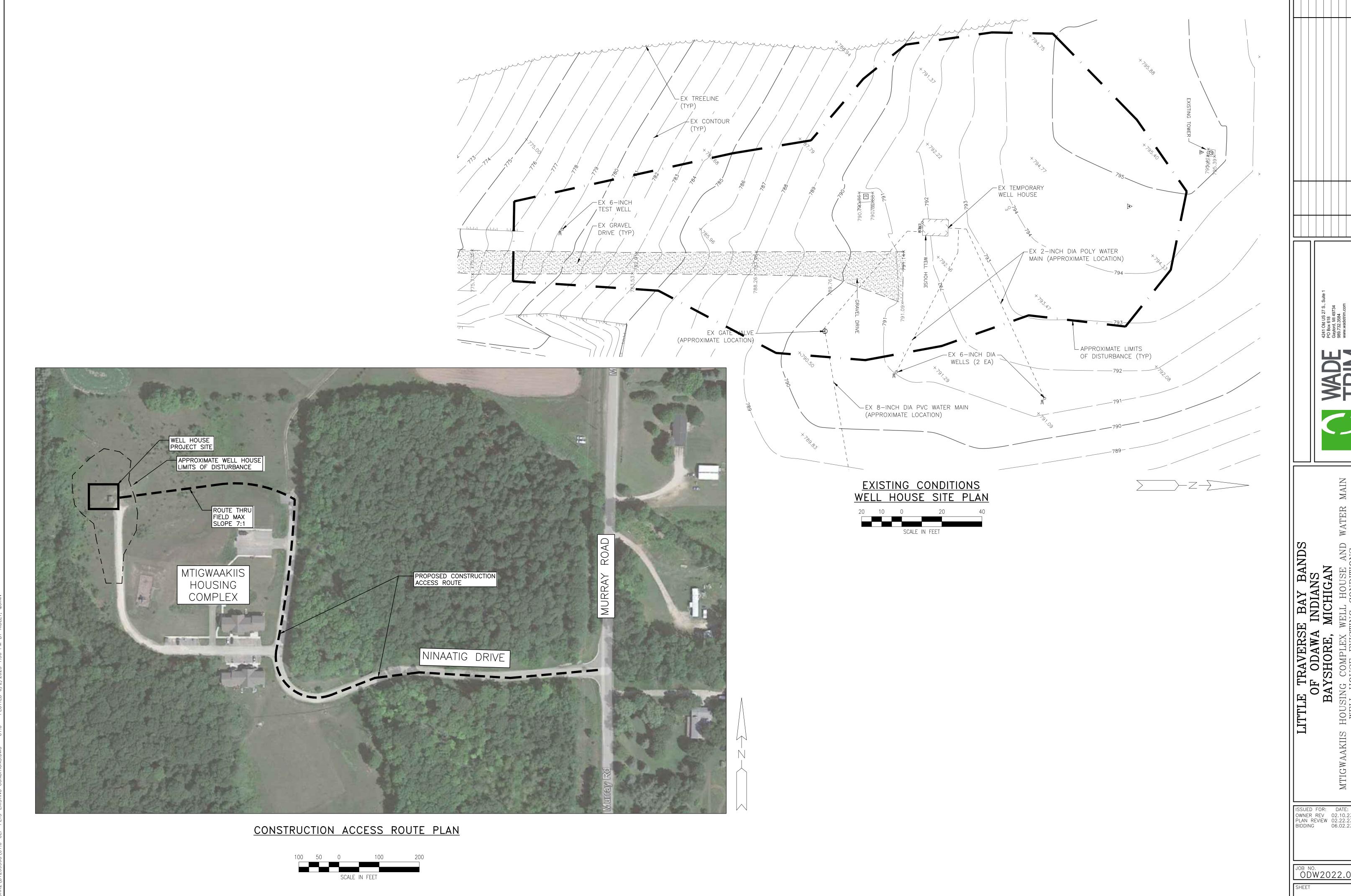
4241 Old US 2 PO Box 618 Gaylord, MI 48 989.732.3584



BAND IS AN E BAY E INDIAN; MICHIGA HOU

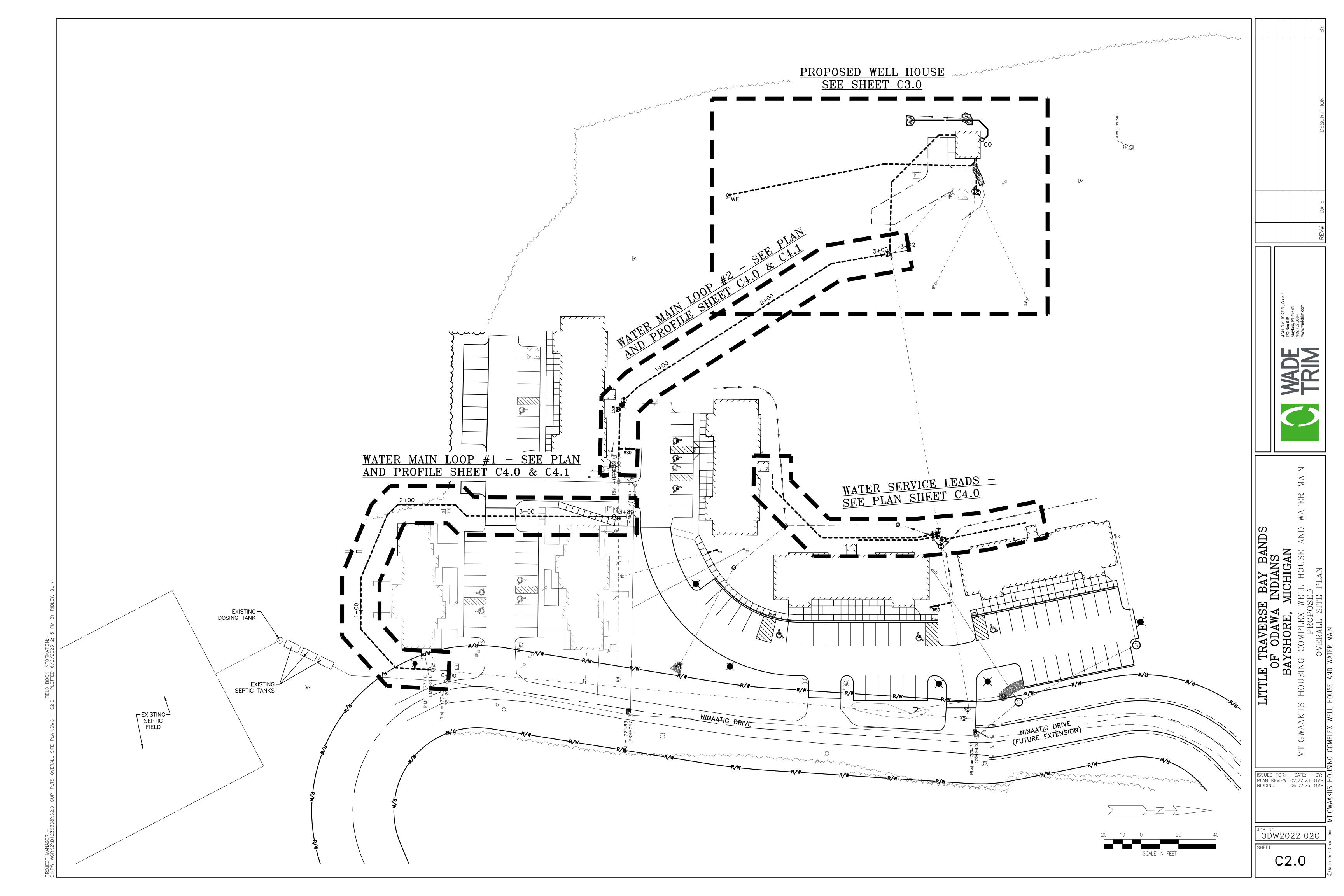
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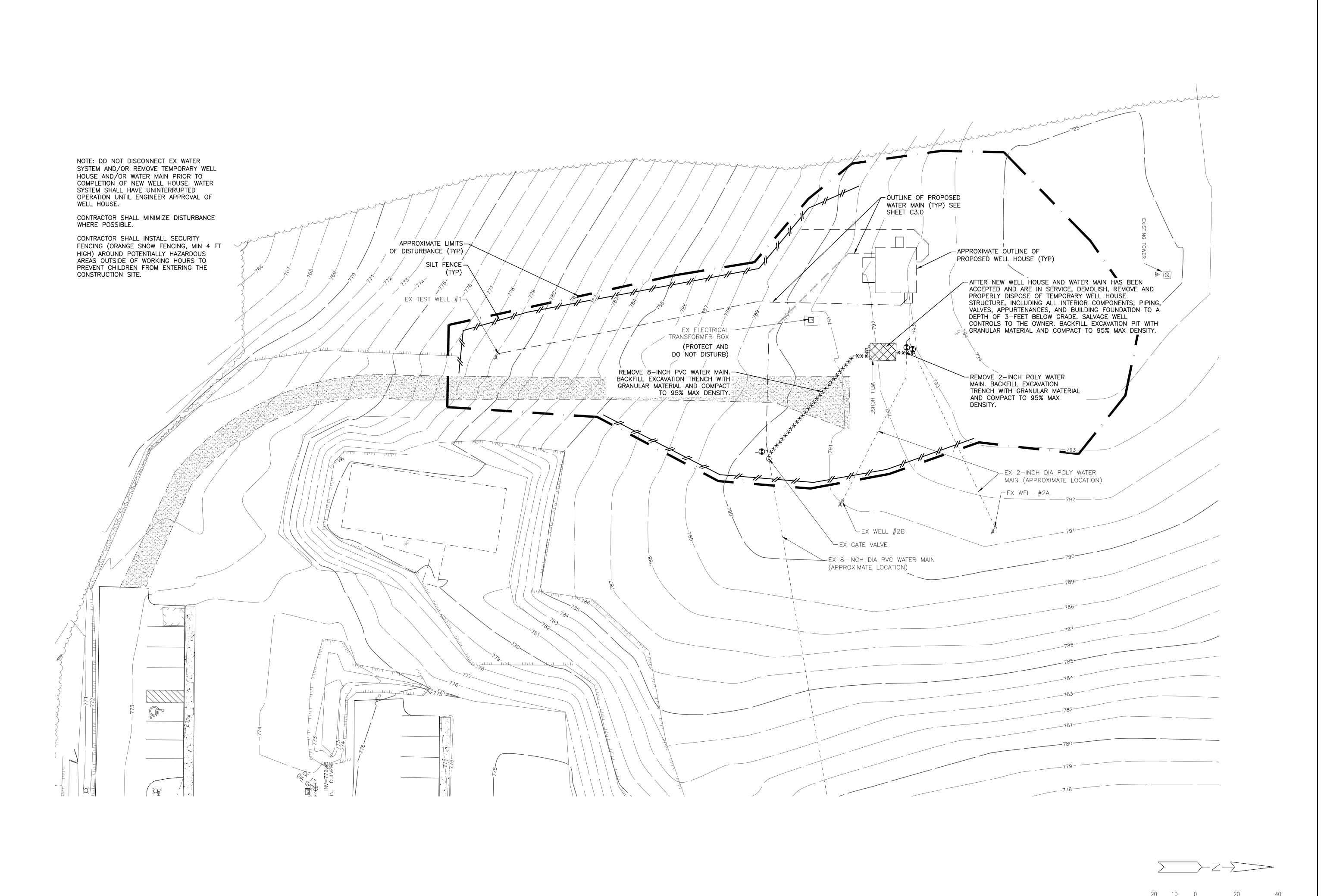
MTIGW SUED FOR: DATE: OWNER REV 02.10.23 QMR PLAN REVIEW 02.22.23 QMR IDDING 06.02.23 QMR



WATER

ISSUED FOR: DATE: BY:
OWNER REV 02.10.23 QMR
PLAN REVIEW 02.22.23 QMR
BIDDING 06.02.23 QMR





SCALE IN FEET

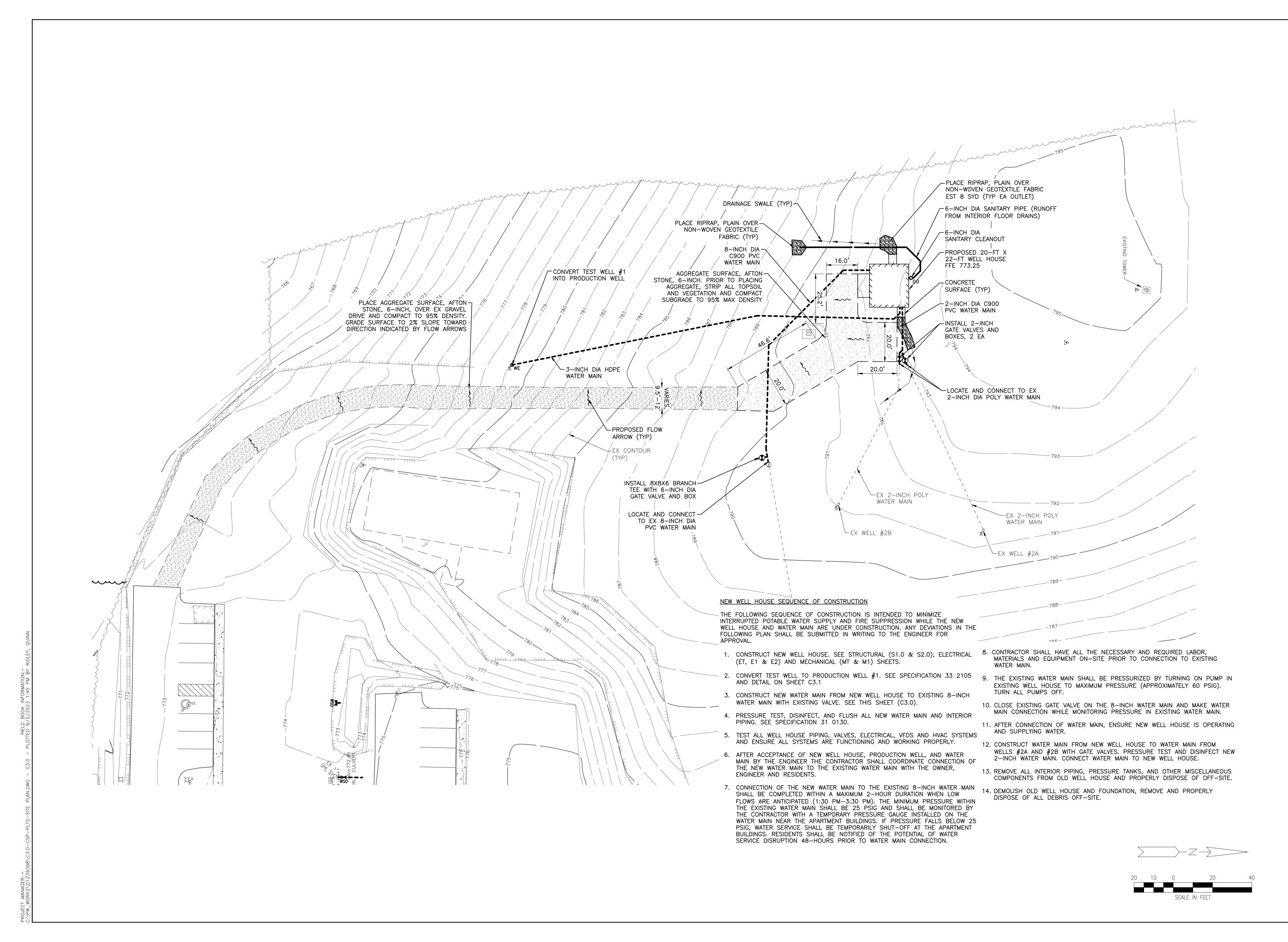
LITTLE TRAVERSE OF ODAWA II BAYSHORE, M

4241 Old US 27 . PO Box 618 Gaylord, MI 497? 989.732.3584 www.wadetrim.co

ISSUED FOR: DATE: BY:
OWNER REV 02.10.23 QMR
PLAN REVIEW 02.22.23 QMR
BIDDING 06.02.23 QMR

ODW2022.02G

C2.1



REV# DATE DESCRIPTION

4241 Old US 27 S., Suite 1 PO Box 618 Gaylord, MI 49734 989.732.3584 www.wadetrim.com



ASE BAY BANDS

WA INDIANS

E, MICHIGAN

EX WELL HOUSE AND WATER MAIN

WELL HOUSE

ITTLE TRAVERSE BAY BAI
OF ODAWA INDIANS
BAYSHORE, MICHIGAN
HOUSING COMPLEX WELL HOUSE
PROPOSED WELL HOUSE

ISSUED FOR: DATE: BY: OWNER REV 02.10.23 QMR PLAN REVIEW 02.22.23 QMR BIDDING 06.02.23 QMR

JOB NO. ODW2022.02G

C3.0

_6" OF AFTON STONE

98% MAX. DENSITY

LEX GRAVEL ROADWAY

NOT TO SCALE

AGGREGATE COMPACTED TO

LITTLE TRAVERSE
OF ODAWA II
BAYSHORE, M.
IS HOUSING COMPLEX WE
SITE
DETAILS
L HOUSE AND WATER MAIN

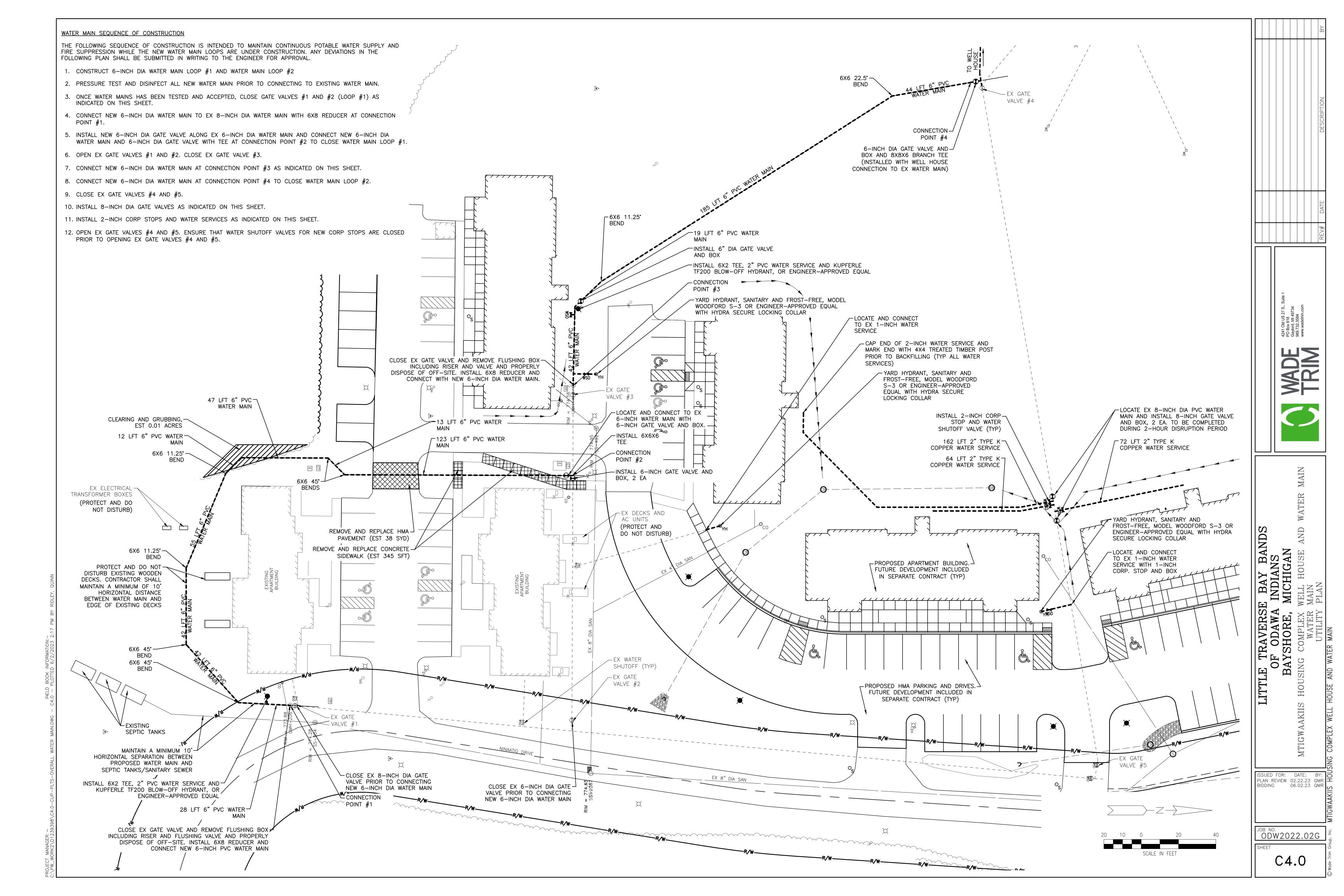
4241 Old US 27 PO Box 618 Gaylord, MI 497: 989.732.3584 www.wadetrim.c

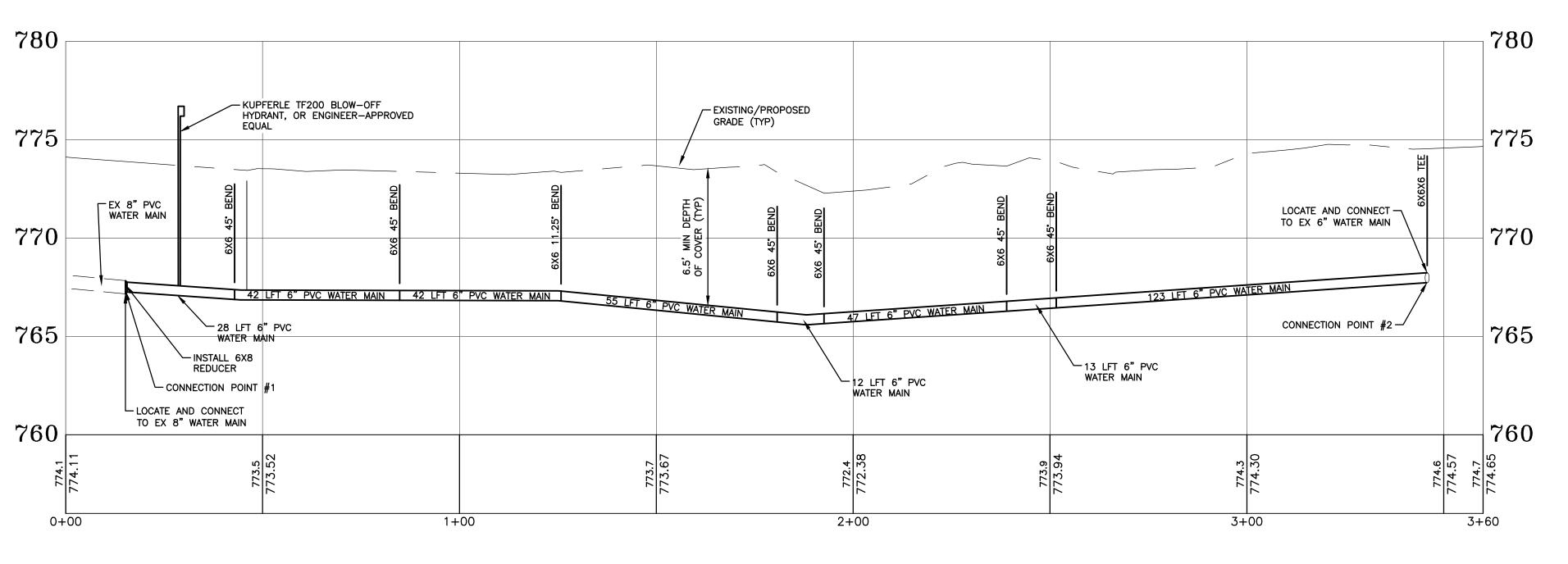
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OWNER REV 02.10.23 QMR
PLAN REVIEW 02.22.23 QMR
BIDDING 06.02.23 QMR

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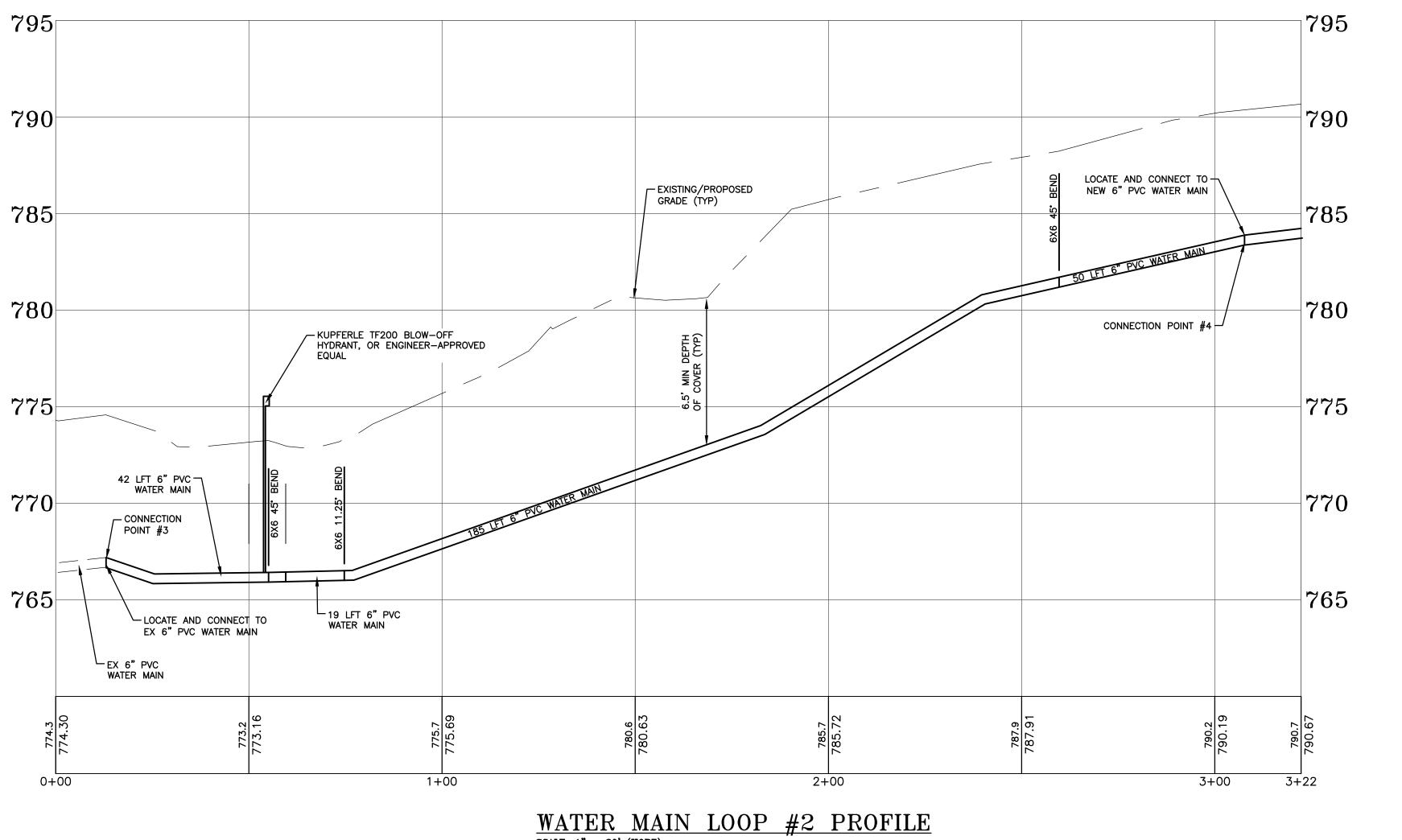
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C3.1





WATER MAIN LOOP #1 PROFILE SCALE: 1" = 20' (HORZ) 1" = 4' (VERT)



WATER MAIN LOOP #2 PROFILE

SCALE: 1" = 20' (HORZ)
1" = 4' (VERT)

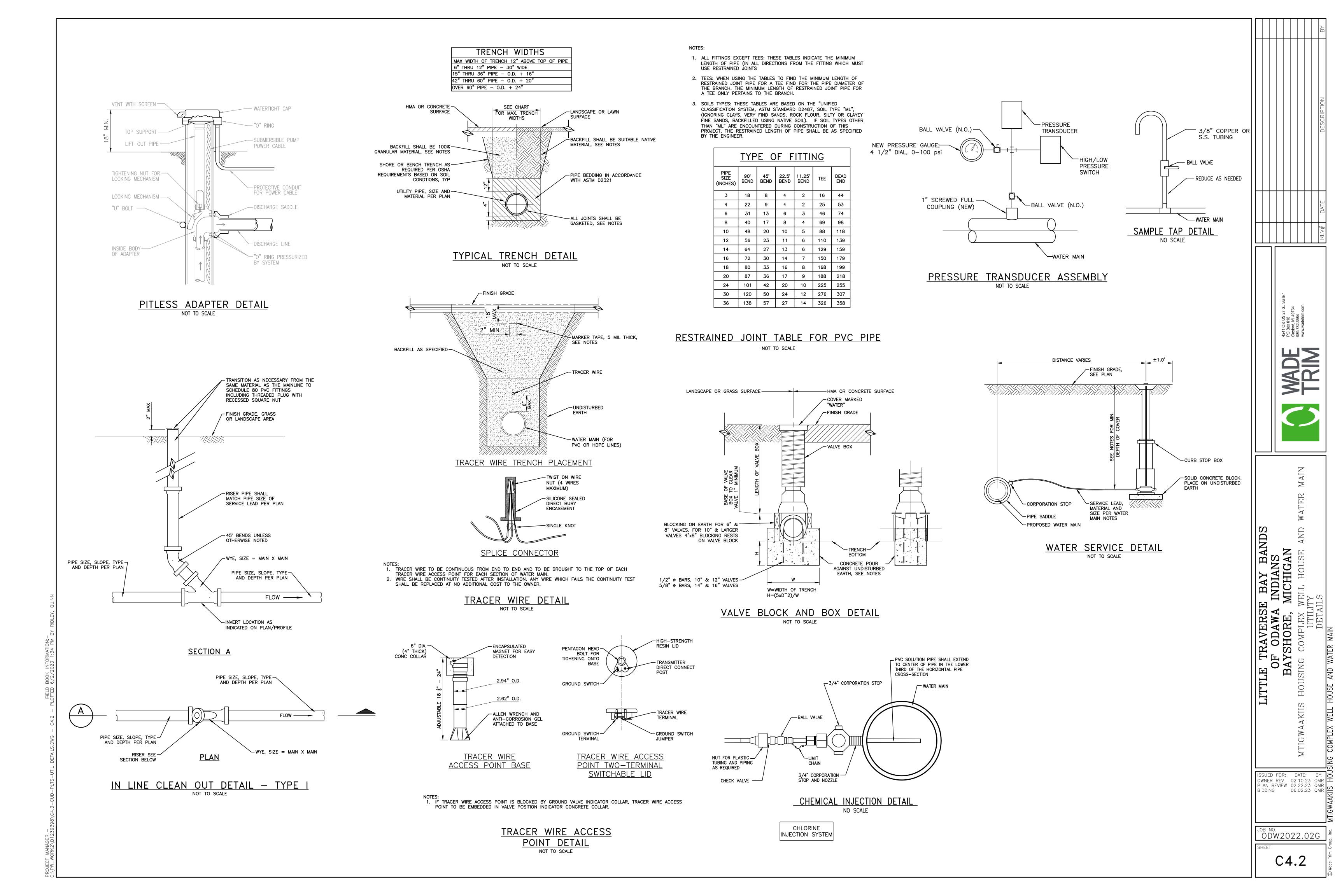
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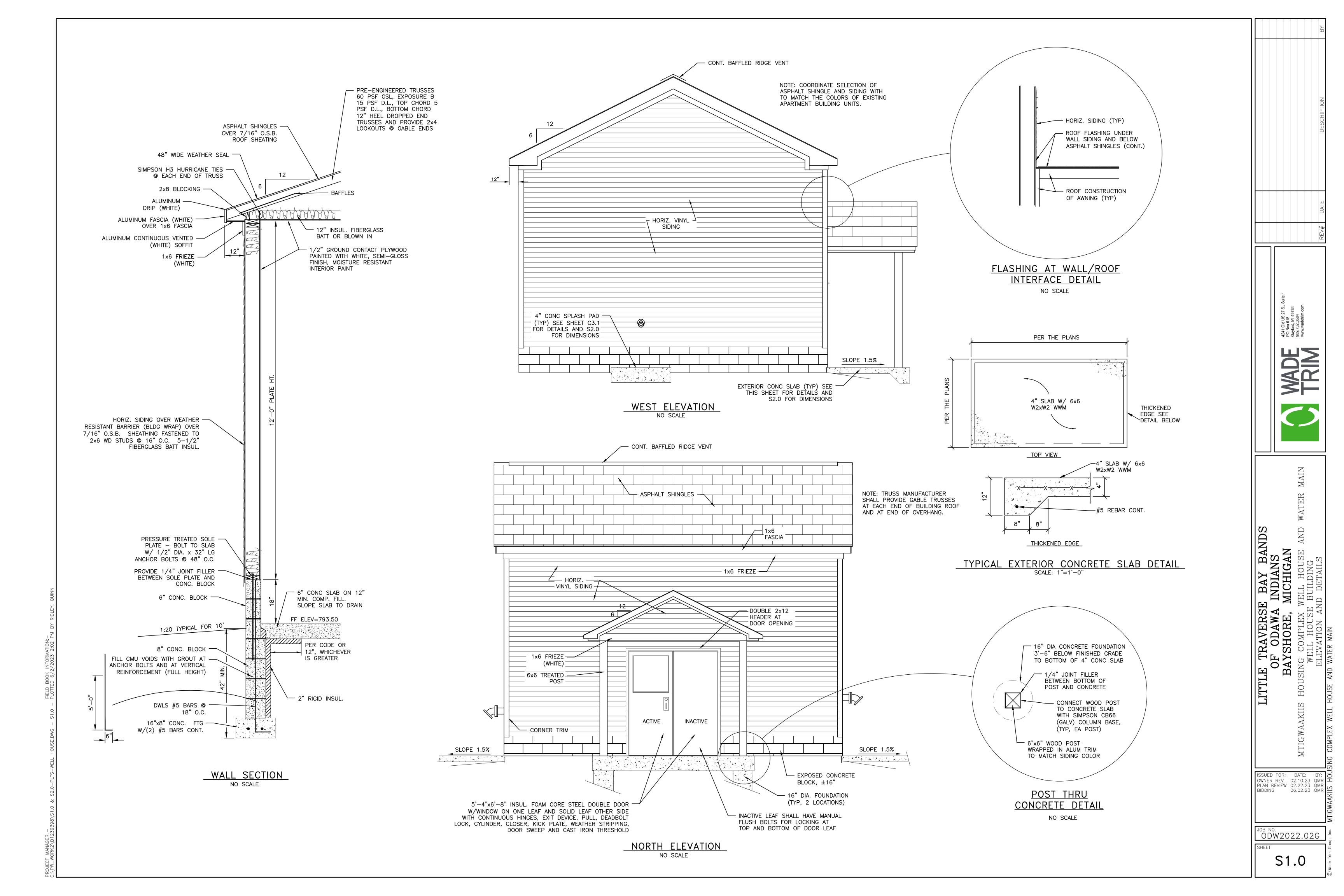
ISSUED FOR: DATE: BY: PLAN REVIEW 02.22.23 QMR BIDDING 06.02.23 QMR

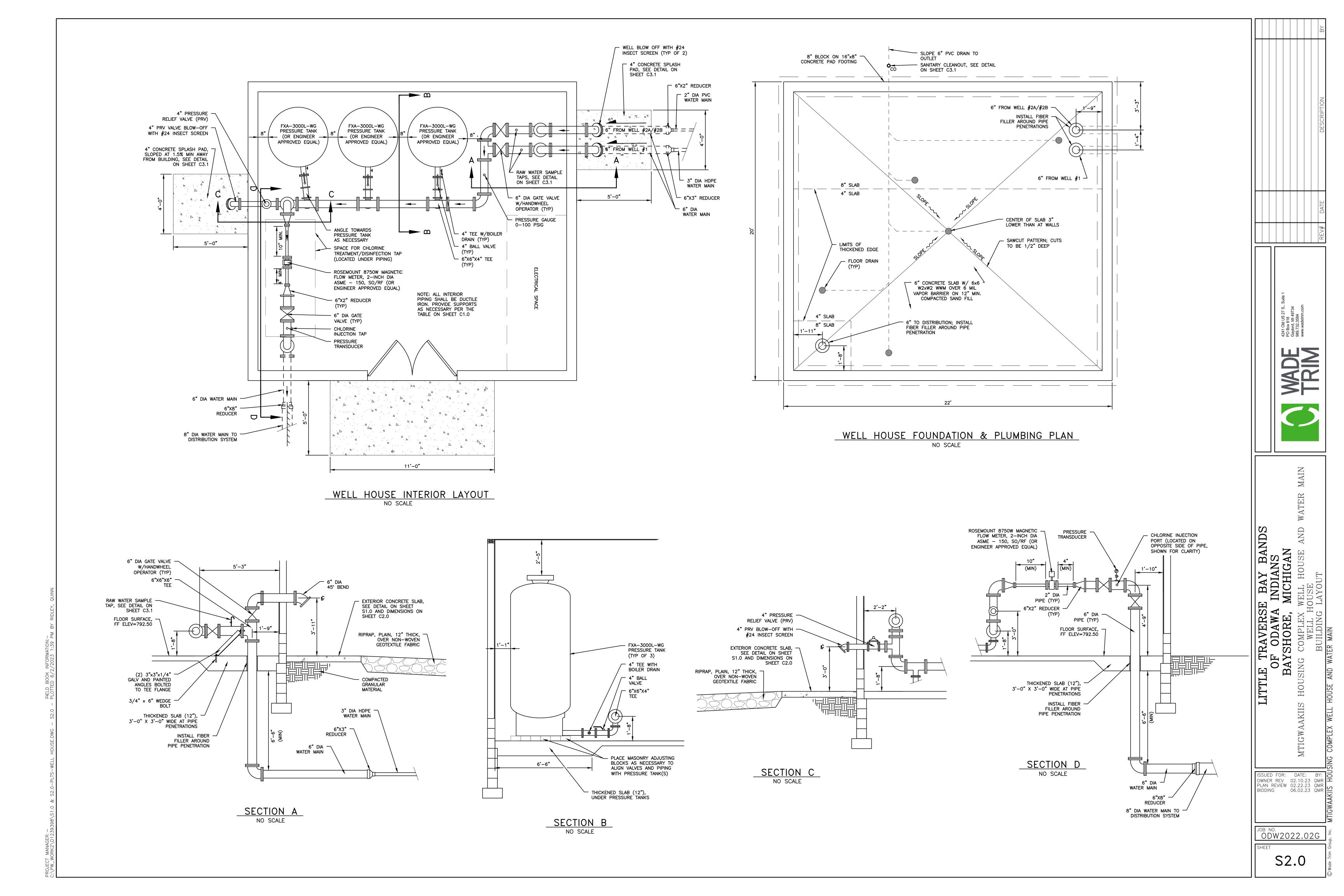
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4241 Old US 27 § PO Box 618 Gaylord, MI 4973 989.732.3584 www.wadefrim ~~

C4.1







THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT, LIGHTING, WIRING AND RELATED ITEMS. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL MATERIALS (I.E. CONDUIT, WIRE, PULL BOXES, FIXTURES, ETC.) REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM. IF ANY INTERFERENCES, VIOLATIONS, OR OMISSIONS APPEAR TO DEPART FROM THE DESIGN INTENT OF THE BID DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO ENTERING INTO A CONTRACT WITH THE OWNER.

COORDINATION: CONTRACTOR SHALL COORDINATE HIS WORK WITH THE WORK OF ALL OTHER TRADES IN ORDER TO AVOID INTERFERENCES. COORDINATE EXACT FIXTURE LOCATIONS WITH ARCHITECTURAL PLANS (REFLECTED CEILING PLANS, BUILDING ELEVATIONS, ETC). VERIFY REQUIREMENTS OF ALL MECHANICAL/PLUMBING/ARCHITECTURAL EQUIPMENT WITH SHOP DRAWING SUBMITTALS PRIOR TO INSTALLATION. NOTIFY THE ENGINEER OF ANY CONFLICTS BETWEEN SHOP DRAWINGS AND PLANS. COORDINATE LOCATIONS AND MOUNTING HEIGHTS OF ALL DEVICES WITH LOCATIONS/HEIGHTS OF COUNTERTOPS, SINKS, FURNITURE, CABINETS, ETC. WITH ARCHITECTURAL ELEVATIONS AND OTHER TRADES. CONTRACTOR SHALL COORDINATE REQUIREMENTS FOR WELL CONTROLS WITH WELL CONTRACTOR (I.E. SEQUENCE OF OPERATION, ALARMS, ETC.). CONTRACTOR SHALL EXAMINE THE DRAWINGS OF OTHER TRADES AND VERIFY THE CONDITIONS GOVERNING THE WORK ON THE JOB SITE. ARRANGE WORK ACCORDINGLY, PROVIDING SUCH CONDUIT, WIRING, ETC. AS MAY BE REQUIRED TO MEET SUCH CONDITIONS. WHERE INTERFERENCES OCCUR, THE CONTRACTOR SHALL, PRIOR TO INSTALLATION OF THE WORK, CONSULT WITH THE ARCHITECT/ENGINEER AS TO THE EXACT LOCATION AND LEVEL OF HIS WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ARRANGEMENT OF HIS WORK.

CONTRACTOR SHALL PROVIDE ALL NECESSARY ANGLE/BRACKETS OR SUPPLEMENTARY STEEL AS REQUIRED FOR ADEQUATE SUPPORT OF ALL LIGHTS, PANELS, WIRING, ETC. SECURE APPROVAL FROM THE ARCHITECT, IN WRITING, PRIOR TO WELDING OR BOLTING TO STEEL FRAMING OR ANCHORING TO CONCRETE STRUCTURE.

CONTRACTOR SHALL GUARANTEE ALL OF THE WORK FURNISHED UNDER HIS CONTRACT TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE YEAR AFTER OWNER ACCEPTANCE. THE CONTRACTOR SHALL FIX/REPAIR ANY DEFECTS WITH IN THIS PERIOD AT NO EXPENSE TO THE OWNER. THE CONTRACTOR SHALL SUBMIT TO THE OWNER ALL WARRANTIES FOR EQUIPMENT INSTALLED.

ALL CONSTRUCTION WORK AND MATERIALS SHALL BE COMPLETED IN ACCORDANCE WITH THE THEN CURRENT RULES SET FORTH IN LOCAL, STATE, AND FEDERAL CODES AND REGULATIONS. CONSTRUCTION AND MATERIALS SHALL COMPLY WITH CURRENT AMERICAN DISABILITIES ACT (ADA) REQUIREMENTS. CONTRACTOR SHALL PREPARE AND ISSUE ANY PLAN REVIEW APPLICATIONS/SUBMITTALS THAT MAY BE REQUIRED BY THE GOVERNING AUTHORITIES. CONTRACTOR SHALL COORDINATE INSPECTIONS WITH ALL CODE OFFICIALS HAVING AUTHORITY ON THE PROJECT (I.E. STATE FIRE MARSHALL, LOCAL INSPECTOR, ETC.). WHERE THE DESIGN DOCUMENTS INDICATE MATERIALS OR CONSTRUCTION IN EXCESS OF CODE REQUIREMENTS, THE DESIGN DOCUMENTS SHALL GOVERN. IN THE EVENT THAT THE PLANS AND SPECIFICATIONS CONFLICT WITH ANY RULES, REGULATIONS, OR CODES APPLYING, SAID RULES, REGULATIONS AND CODES SHALL GOVERN.

UNLESS OTHERWISE INDICATED, ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, PLAN REVIEWS, APPROVALS AND FEES FOR THE WORK SHALL BE SECURED AND PAID FOR BY THE CONTRACTOR. AT THE COMPLETION OF THE WORK, THE CONTRACTOR SHALL FURNISH THE OWNER WITH ALL CERTIFICATES OF FINAL INSPECTIONS AND APPROVALS.

THE CONTRACTOR SHALL COORDINATE ALL UTILITIES (POWER, PHONE, CABLE, ETC.) WITH UTILITY COMPANIES. ALL RULES OF LOCAL UTILITY COMPANIES SHALL BE COMPLIED WITH. THE CONTRACTOR SHALL CHECK WITH EACH UTILITY COMPANY SUPPLYING SERVICE TO THE INSTALLATION AND DETERMINE COSTS INCLUDED FOR, BUT NOT LIMITED TO, ALL METER BASES, TRANSFORMER PADS, ETC. WHICH WILL BE REQUIRED. THE CONTRACTOR SHALL COORDINATE ALL UTILITIES (POWER, PHONE, CABLE, ETC.) WITH OWNER/UTILITY FOR NEW/MODIFIED SERVICE.

SUBSTITUTION ITEMS REQUIRING PRIOR APPROVAL:

ALL ITEMS THAT THE CONTRACTOR PROPOSES TO USE IN HIS WORK THAT ARE NOT SPECIFICALLY NAMED IN THE DOCUMENTS MUST BE SUBMITTED FOR REVIEW. SUCH ITEMS MUST BE SUBMITTED IN DUPLICATE TO THE ARCHITECT/ENGINEER FOR APPROVAL A MINIMUM OF 10 DAYS PRIOR TO BID OPENING.

IF AN APPROVED MANUFACTURER IS OTHER THAN THE MANUFACTURER USED AS THE BASIS OF DESIGN, THE EQUIPMENT OR PRODUCT PROVIDED SHALL BE EQUAL IN QUALITY. DURABILITY, APPEARANCE, CAPACITY, AND EFFICIENCY THROUGH ALL RANGES OF OPERATION, SHALL CONFORM TO THE ARRANGEMENTS AND SPACE LIMITATIONS OF THE EQUIPMENT SHOWN ON THE DOCUMENTS, SHALL BE COMPATIBLE WITH THE OTHER COMPONENTS OF THE SYSTEM AND SHALL COMPLY WITH REQUIREMENTS FOR PRIOR APPROVAL. ALL COSTS TO MAKE THESE ITEMS COMPLY WITH THESE REQUIREMENTS INCLUDING, BUT NOT LIMITED TO, WIRING, CONDUIT, MECHANICAL, AND BUILDING ALTERATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND BE INCLUDED IN THE ORIGINAL BID.

OPERATION AND MAINTENANCE MANUALS:

PROVIDE TWO (2) COMPLETE OPERATION AND MAINTENANCE (O&M) MANUALS COVERING ALL ELECTRICAL EQUIPMENT HEREIN SPECIFIED. O&M MANUALS SHALL INCLUDE SHOP DRAWINGS, OPERATION/MAINTENANCE INSTRUCTIONS, AND SPARE PART LISTS. O&M MANUALS SHALL BE PROVIDED FOR ENGINEER REVIEW AND APPROVAL WHEN CONSTRUCTION IS 75% COMPLETE.

SHOP DRAWINGS SUBMITTALS: SUBMIT FOR REVIEW AND APPROVAL, WITHIN 30 DAYS AFTER NOTICE TO PROCEED, DIGITAL .PDF COPIES OF SHOP DRAWINGS FOR ALL ITEMS LISTED BELOW. WHERE ITEMS ARE REFERRED TO BY SYMBOLIC DESIGNATION ON THE DRAWINGS AND SPECIFICATIONS, ALL SUBMITTALS SHALL BEAR THE SAME DESIGNATION.

PANELBOARDS WIRING DEVICES

LIGHT FIXTURES DISCONNECT SWITCHES

BEFORE FINAL INSPECTION THE CONTRACTOR SHALL INSTRUCT OWNER'S DESIGNATED PERSONNEL IN OPERATION, ADJUSTMENT AND MAINTENANCE OF ELECTRICAL EQUIPMENT AND SYSTEMS AT AGREED UPON TIMES. FOR EQUIPMENT REQUIRING SEASONAL OPERATION, PERFORM INSTRUCTIONS FOR OTHER SEASONS WITHIN SIX MONTHS. USE OPERATION AND MAINTENANCE MANUALS AS BASIS FOR INSTRUCTION. REVIEW CONTENTS OF MANUAL WITH PERSONNEL IN DETAIL TO EXPLAIN ALL ASPECTS OF OPERATION AND MAINTENANCE.

RECORD DRAWINGS: CONTRACTOR SHALL SUBMIT RECORD DRAWINGS WHICH HAVE BEEN NEATLY MARKED TO REPRESENT AS-BUILT CONDITIONS FOR ALL NEW WORK.

APPROVAL OF ARCHITECT AND/OR ENGINEER FOR SAME INCLUDING LOADS, LOCATIONS, AND METHODS OF ATTACHMENT.

DEMOLITION WORK: ALL DEMOLITION OF EXISTING EQUIPMENT AND MATERIALS SHALL BE DONE BY THE CONTRACTOR UNLESS OTHERWISE INDICATED. INCLUDE ALL ITEMS SUCH AS, BUT NOT LIMITED TO, EXISTING WIRING, PANELBOARDS, CONDUIT, LIGHT FIXTURES, WIRING DEVICES, ETC. AND EQUIPMENT WHERE SUCH ITEMS ARE NOT REQUIRED FOR THE PROPER OPERATION OF THE MODIFIED SYSTEM. IN GENERAL, DEMOLITION WORK IS INDICATED ON THE DRAWINGS. HOWEVER, THE CONTRACTOR SHALL VISIT THE JOB SITE TO DETERMINE THE FULL EXTENT OF THE WORK. UNLESS SPECIFICALLY NOTED TO THE CONTRARY, REMOVED MATERIALS SHALL NOT BE REUSED IN THE WORK. ITEMS ON WHICH THE OWNER WAIVES OWNERSHIP SHALL BECOME THE PROPERTY OF THE CONTRACTOR, WHO SHALL REMOVE AND LEGALLY DISPOSE OF SAME, AWAY FROM THE PREMISES.

CUTTING, CORING, AND PATCHING:

CIRCUIT (AMPS)

15

20

30

ALL CUTTING, CORING, AND PATCHING WORK REQUIRED FOR ELECTRICAL INSTALLATIONS SHALL BE PERFORMED BY THE CONTRACTOR THROUGH APPROVED QUALIFIED SUB-CONTRACTORS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER RESTORATION OF ALL EXISTING SURFACES REQUIRING PATCHING, PAINTING, AND/OR OTHER REPAIRS REQUIRED. PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND/OR STRUCTURAL ENGINEER MUST BE OBTAINED PRIOR TO ANY CUTTING OF ANY BUILDING STRUCTURAL

EQUIPMENT FOUNDATIONS AND SUPPORTS: PROVIDE CONCRETE HOUSEKEEPING PADS FOR FLOOR MOUNTED EQUIPMENT THROUGH APPROVED. QUALIFIED SUBCONTRACTORS. CONCRETE HOUSEKEEPING PADS SHALL BE POURED BEFORE EQUIPMENT IS INSTALLED, WITH ANCHOR BOLTS AND SLEEVES TO FIT MACHINE BASE. CONTRACTOR SHALL INCLUDE FULL COST OF CONCRETE HOUSEKEEPING FOR EQUIPMENT SUSPENDED FORM CEILING OR WALLS, FURNISH AND INSTALL ALL INSERTS, RODS, STRUCTURAL STEEL FRAMES, BRACKETS AND PLATFORMS REQUIRED. OBTAIN

PROVIDE AND INSTALL SCHEDULE 40 BLACK STEEL PIPE SLEEVES, CUT TO LENGTH, WHEREVER CONDUITS PASS THROUGH ABOVE GRADE WALLS AND FLOORS. PROVIDE AND INSTALL GALVANIZED STEEL PIPE SLEEVES, CUT TO LENGTH, WHEREVER CONDUITS PASS THROUGH BELOW GRADE FOUNDATION WALLS AND SLAB ON GRADE FLOORS. SLEEVES SHALL TERMINATE FLUSH WITH WALLS IN FINISHED AREAS. ALL SLEEVES THROUGH THE FLOOR ARE TO EXTEND TWO (2) INCHES ABOVE FINISH FLOOR.

SEAL THE SPACE AROUND CONDUITS IN SLEEVES AND AROUND ELECTRICAL OPENINGS THROUGH WALLS, FLOORS, ROOFS, AND CEILINGS. ANY ELECTRICAL SYSTEMS PENETRATING THROUGH FIRE-RATED ASSEMBLIES SHALL BE FIRE AND DRAFT STOPPED WITH NON-COMBUSTABLE MATERIALS PER APPLICABLE BUILDING CODE REQUIREMENTS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE ASSEMBLY LOCATIONS, TYPES, AND RATINGS.

150

#8

#6

#4

< 300 | < 500

#4

#2

#3

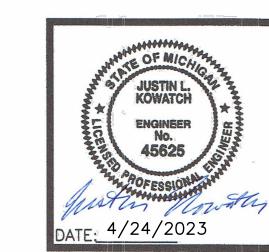
ELECTRIC	CAL ABBREVIATION LIST
ABBREVIATION	DESCRIPTION
A AFF AFG AIC	AMPS ABOVE FINISHED FLOOR ABOVE FINISHED GRADE AMPS INTERRUPTING CAPACITY
BKR	BREAKER
C CB CKT COORD CP	CONDUIT CIRCUIT BREAKER CIRCUIT COORDINATE CIRCULATION PUMP
DISC DP DWG	DISCONNECT DISTRIBUTION PANEL DRAWING
(E) EBH EBU E.C. EF EML EMT EUH EWH	EXISTING ELECTRIC BASEBOARD HEATER EMERGENCY BATTERY UNIT ELECTRICAL CONTRACTOR EXHAUST FAN EMERGENCY LIGHT ELECTRICAL METALLIC TUBING ELECTRIC UNIT HEATER ELECTRIC WALL HEATER
(F) F.A. F.S. FC FLA FU	FUTURE FIRE ALARM SUBCONTRACTOR FIRE SUPPRESSION SUBCONTRACTOR FAN COIL FULL LOAD AMPS FUSE
GFI GRD GRS	GROUND FAULT INTERRUPTER GROUND GALVANIZED RIGID STEEL
HOA HP HZ	HAND-OFF-AUTO HORSEPOWER HERTZ
IG	ISOLATED GROUND
JB	JUNCTION BOX
KVA KW KWH	KILO VOLT-AMPERES KILOWATT KILOWATT-HOURS
LC LP	LIGHTING CONTROLLER LIGHTING PANEL
M.C. MCA MCB MDP MFS MLO MTD MTR MTS	MECHANICAL CONTRACTOR MINIMUM CIRCUIT AMPS MAIN CIRCUIT BREAKER MAIN DISTRIBUTION PANEL MAX FUSE SIZE MAIN LUGS ONLY MOUNTED MOTOR MANUAL TRANSFER SWITCH
NC N.E.C. NF NIC NL NO NTS	NORMALLY CLOSED NATIONAL ELECTRIC CODE NON-FUSIBLE NOT IN CONTRACT NIGHT LIGHT NORMALLY OPEN NOT TO SCALE
P-A PB P.C. PRI	PANEL "A" PUSHBUTTON STATION PLUMBING CONTRACTOR PRIOR TO ROUGH-IN
(R) RECEPT	RELOCATED RECEPTACLE
SPEC S.D. SW SWGR	SPECIFICATION STAINLESS STEEL SWITCH SWITCHGEAR
TYP	TYPICAL
UH UON U/G	UNIT HEATER UNLESS OTHERWISE NOTED UNDERGROUND (BELOW GRADE)
V VFD VSD	VOLTS VARIABLE FREQUENCY DRIVE VARIABLE SPEED DRIVE
W WP	WATTS WEATHERPROOF

TRANSFORMER

ELECTRICAL SYMBOL LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
FA	FIXTURE TYPE	<i>/</i>	SINGLE PHASE MOTOR
⊢	PENDANT OR SURFACE MOUNTED LIGHT FIXTURE	/@/	THREE PHASE MOTOR
	PENDANT OR SURFACE MOUNTED EMERGENCY LIGHT FIXTURE	⊠¬	COMBINATION MOTOR STARTER WITH DISCONNECT SWITCH
⊢ •	WALL MOUNTED LIGHT FIXTURE	VSD ⊠	VARIABLE SPEED DRIVE COMBINATION MOTOR STARTER WITH DISCONNECT SWITCH
\(\rightarrow \)	CEILING MOUNTED LIGHTING FIXTURE		NON-FUSABLE DISCONNECT SWITCH
$\vdash \boxtimes$	OUTDOOR WALL MOUNTED LIGHTING FIXTURE	aw ⊠h	FUSIBLE DISCONNECT SWITCH HORSE POWER RATED SWITCH
4	EMERGENCY LIGHTING UNIT	•	PUSH BUTTON STATION JUNCTION BOX
&	EXIT_LIGHTING FIXTURE WITH EMERGENCY EGRESS	•	HARD WIRE POWER CONNECTION
<u> </u>	LIGHTING AND BATTERY		HARD WIRE CONNECTION AT FLOOR BOX
$ \sqrt{} $	REMOTE EMERGENCY EXIT DISCHARGE LIGHT	<u> </u>	CONDUIT UP
S	SINGLE POLE TOGGLE SWITCH	C	CONDUIT DOWN
S ₂ S ₃	TWO POLE TOGGLE SWITCH 3-WAY TOGGLE SWITCH	\triangleleft	COMBINATION TELE/DATA OUTLET — ROUGH—IN ONLY, NO CABLE DROP
T	T-STAT (BY OTHERS) ROUGHED IN BY E.C. @ 52" AFF WITH CONDUIT PATHWAY TO EQUIPMENT CONTROLS CONNECTION - COORD. WITH	4	COMBINATION TELE/DATA OUTLET MOUNTED 6" ABOVE COUNTERTOP — ROUGH—IN ONLY NO CABLE DROPS
	MECHANICAL TRADES	XXXXX	TELECOMMUNICATIONS BACKBOARD
	CIRCUIT BREAKER	Ф	DUPLEX RECEPTACLE
\	AUTOMATIC OR MANUAL TRANSFER SWITCH	ф _{48"}	DUPLEX RECEPTACLE MOUNTED AT 48" ABOVE FLOOR (UNLESS NOTED OTHERWISE) — SIMILAR FOR ISOLATED GROUND, EMERGENCY AND GFI
÷	GROUND	и	RECEPTACLES
EG	ENGINE GENERATOR	8	QUAD RECEPTACLE
(CR)	CONTROL RELAY	ф	DUPLEX RECEPTACLE - GROUND FAULT
\bigcirc	TWIST TIMER	111	INTERRUPTER
A-3	CIRCUIT HOMERUN TO PANEL "A" CIRCUIT #3	#	DUPLEX RECEPTACLE — GROUND FAULT INTERRUPTER — MOUNTED 6" ABOVE COUNTERTOP OR AS REQUIRED TO ACCOMMODATE COUNTERS —
	LIGHTING PANEL (LP = $<240V$)		REFER TO ARCHITECTURAL ELEVATIONS
	POWER PANEL (PP = >480V) DISTRIBUTION PANEL	Ф _{WP}	DUPLEX RECEPTACLE — GROUND FAULT INTERRUPTER — WEATHERPROOF COVER
T	TRANSFORMER	Ф _{DF}	DUPLEX RECEPTACLE — GROUND FAULT INTERRUPTER — DEAD—FRONT COVER
(M) (CT)	UTILITY METER UTILITY CT CABINET	•	DUPLEX RECEPTACLE EMERGENCY POWER
<u> </u>	S.E S. S.B.IIE.	igorplus	SPECIAL RECEPTACLE - NEMA CONFIGURATION AS NOTED

- **GENERAL ELECTRICAL POWER & LIGHTING NOTES:** 1. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MATERIALS (I.E. CONDUIT, WIRE, PULL BOXES, FIXTURES, ETC.) REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM.
- 2. ALL ELECTRICAL SYSTEMS SHALL BE PROVIDED/INSTALLED TO MEET APPLICABLE BUILDING CODES: MICHIGAN BUILDING CODE, MICHIGAN ELECTRICAL CODE, N.E.C., LIFE SAFETY CODE NFPA 101, MICHIGAN ENERGY CODE, ETC.
- 3. VERIFY REQUIREMENTS OF ALL MECHANICAL/PLUMBING/ARCHITECTURAL EQUIPMENT WITH SHOP DRAWING SUBMITTALS PRIOR TO INSTALLATION. NOTIFY THE ENGINEER OF ANY CONFLICTS BETWEEN SHOP DRAWINGS AND PLANS.
- 4. COORDINATE THE INSTALLATION OF ALL ELECTRICAL WORK WITH ALL OTHER TRADES. CONTRACTOR SHALL VERIFY ALL MECHANICAL AND ELECTRICAL CLEARANCES PRIOR TO FABRICATION OF ANY NEW WORK. ELECTRICAL EQUIPMENT, WIRING, ETC. SHALL NOT INTERFERE WITH MECHANICAL EQUIPMENT CLEARANCE SPACES.
- 5. UNLESS OTHERWISE NOTED. EACH SUBCONTRACTOR SHALL BE RESPONSIBLE FOR SEALING ALL NEW PENETRATIONS THROUGH ALL WALLS WITH FIRE CAULK IN ACCORDANCE WITH CURRENT BUILDING CODE REQUIREMENTS.
- 6. UNLESS OTHERWISE NOTED, EACH SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING, CORING, PATCHING ASSOCIATED WITH THEIR WORK. CUTTING, CORING, PATCHING WORK SHALL BE PERFORMED BY A QUALIFIED CONTRACTOR AND MATCH EXISTING OR NEW FINISHES.
- 7. ALL NIGHT LIGHTS, EMERGENCY LIGHTS, AND EXIT LIGHTS SHALL BE CIRCUITED TO UNSWITCHED/HOT LEG OF THE GENERAL LIGHTING CIRCUIT OF THE AREA SERVED BY THE NIGHT/EMERGENCY/EXIT LIGHTS.



PREPARED UNDER THE SUPERVISION OF: JUSTIN L. KOWATCH, P.E. MICHIGAN PE NO. 45625

STANDARD MOUNTING HEIGHTS

CONVENIENCE AND SPECIAL PURPOSE RECEPTACLE OUTLETS, TELE/DATA AND COMMUNICATIONS OUTLETS. NOT OTHERWISE SPECIFIED:

• 18" AFF TO THE MIDDLE OF BOX

• 16" AFF TO BOTTOM OF BOX IN CMU WALLS

LIGHT SWITCHES, MOTOR CONTROL DEVICES, AND FIRE ALARM PULL STATIONS, NOT OTHERWISE SPECIFIED: • 48" AFF TO THE MIDDLE OF BOX

48" AFF TO THE TOP OF BOX IN CMU WALLS

T-STATS, TEMP. SENSORS, CO2 SENSORS, NOT OTHERWISE SPECIFIED:

• 48" AFF TO THE MIDDLE OF BOX 48" AFF TO THE TOP OF BOX IN CMU WALLS

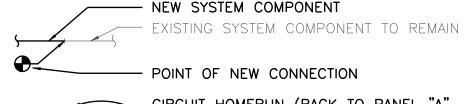
GFI RECEPTACLES IN TOILET ROOMS AND JANITOR CLOSETS, NOT OTHERWISE SPECIFIED: • 48" AFF TO TOP OF BOX.

LIGHTING AND RECEPTACLE BRANCH CIRCUIT PANELBOARDS AND

LIGHTING CONTROLLERS: • 6'-6" AFF TO TOP OF ENCLOSURE.

METHODS OF NOTATION

LIGHT FIXTURE DESIGNATION (I.E. FIXTURE TYPE "FA" - SEE FIXTURE SCHEDULE) CONSTRUCTION KEYED NOTE NUMBER



- POINT OF NEW CONNECTION

CIRCUIT HOMERUN (BACK TO PANEL "A" -REFER TO PANEL SCHEDULE)

ELECTRICAL DRAWING INDEX

ET ELECTRICAL TITLE SHEET

E1 ELECTRICAL PLANS

E2 ELECTRICAL DETAILS & SPECIFICATIONS

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7

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4241 Old US; PO Box 618 Gaylord, MI 4989.732.3584

LAN REVIEW 2/22/23

_AN REVIEW2 4/7/23

E BAY BAN INDIANS MICHIGAN

|S = A|

TRAVERS F ODAWAY YSHORE,

DI BAN

ODW2022.02G

4/24/23 JLK <u>\</u>

1. REFER TO SPECIFICATIONS FOR WIRE TYPE. 2. SCHEDULE IS BASED UPON A MAX 3% VOLTAGE DROP ON 208-240V/10

3. FOR LENGTHS BETWEEN TABLED VALUES - USE LONGER LENGTH.

BRANCH CIRCUIT WIRE SIZE/LENGTH SCHEDULE

MAX BRANCH MAX CIRCUIT LENGTH (FEET) TO LAST CONNECTION IN THE CIRCUIT

#10

#6

125

#10

#8

#6

75

#10

#10

#8

#10

#10

#8

#1/0

CIRCUIT (AMPS)

15

20

30

REFER TO SPECIFICATIONS FOR WIRE TYPE. 2. SCHEDULE IS BASED UPON A MAX 3% VOLTAGE DROP ON

75

#10

#8

#12

#8

BRANCH CIRCUIT WIRE SIZE/LENGTH SCHEDULE

MAX BRANCH MAX CIRCUIT LENGTH (FEET) TO LAST CONNECTION IN THE CIRCUIT

#8

#6

#4

150

#6

#6

#4

#4

#3

100

#10

#8

#6

115-120V/1ø CIRCUITS. 3. FOR LENGTHS BETWEEN TABLED VALUES - USE LONGER LENGTH.

PANEL:	W	200 MCB	BUSSING SIZE:	225A	FED FROM :	UTILITY
# OF POLES:	42	VOLTS: <u>120-208/3P/4W</u>	NEUTRAL BUS:	225A	MOUNTING:	SURFACE
PHASE:	3	GROUND BUS: YES	TVSS:	NO	AIC RMS AMPS:	65,000
HERTZ:	60	ISOLATED GROUND: NO	-	THIS IS A NEW	SERVICE PANEL	
LOCATION:	NEW WELLHO	USE	REMARKS:	FOR WELLHOU	SE LOADS	
			-			
CIRCUIT	BREAKER	DESCRIPTION		А	В	С
1	20	LIGHTING		200		
3	20	DEDICATED RECEPT. FOR DEHUMIDIFIER (5.	A @ 115V)		750	
5	20	EXH FAN & INTAKE DAMPER (1,000W / 6.5A @) 120V)			1000
7	20	ELEC UNIT HEATER EUH-1 (5 KW @ 208V/3P)		1800		
9	-	-			1800	
11	-	-				1800
13	20	RECEPTS		540		
15	20	RECEPTS			720	
17	20	FLOW TRANSMITTER				50
19	20	CONTROLS		250		
21	20	TRANSFER SWITCH STRIP HEATER			500	
23	20	SPARE				0
25	20	SPARE		0		
27	20	SPARE			0	
29						0
31				0		
33					0	
35						0
37				0		
39					0	
41						0
2	175	NEW WELL PUMP CONTROLLER - FEEDING (3) WELLS:	0		
4	-	-			0	
6	-	-				0
8		(E) WELL PUMP #2A (5?HP @ 208-240V/3P - C	ONFIRM)	2670		
10		20 FLA = 8 KW	,		2670	
12		-				2670
14		(E) WELL PUMP #2A (5?HP @ 208-240V/3P - C	ONFIRM)	2670		
16		20 FLA = 8 KW	,		2670	
18		-				2670
20		NEW WELL PUMP #1 (10 HP @ 208-240V/3P - 0	CONFIRM)	4500		
22		35 FLA = 13 KW	,		4500	
24		-				4500
				0		
26		1			0	
			I			
26						0
26 28 30				0		
26 28				0	0	0
26 28 30 32 34				0	0	
26 28 30 32 34 36					0	0
26 28 30 32 34 36 38				0		
26 28 30 32 34 36					0	

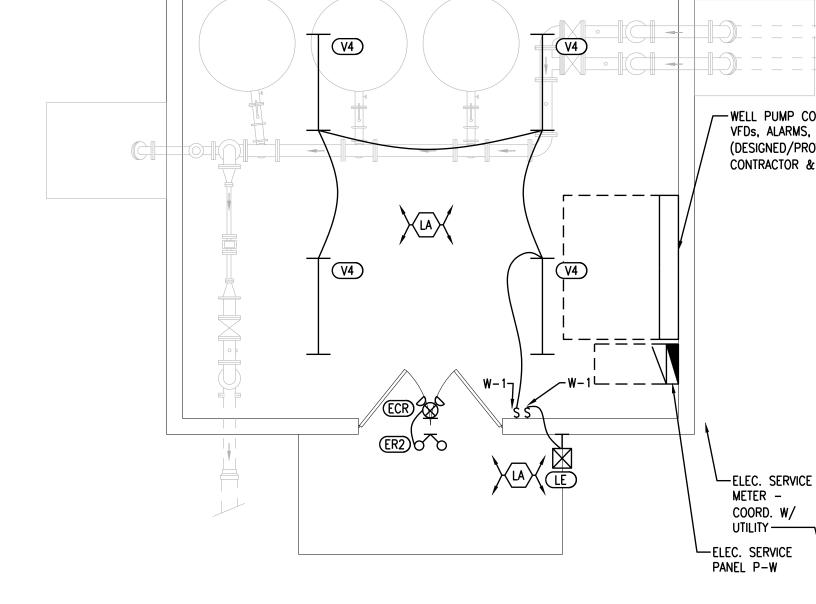
KEYED ELECTRICAL POWER CONSTRUCTION NOTES: COORDINATE LOCATION AND MOUNTING HEIGHT OF ALL

- ELECTRICAL DEVICES AND AUXILLARY ELECTRICAL DEVICES (I.E. TELECOM, SECURITY, ETC.) WITH OWNER/OWNER'S REP PRIOR TO ROUGH-IN. E.C. SHALL COORDINATE EXACT LOCATION OF ELECTRICAL DEVICES, ETC. WITH M.C./P.C. AS REQUIRED TO ACCOMMODATE LAYOUT OF EQUIPMENT, PIPING, LIGHT FIXTURES, ETC...
- PROVIDE 24"X24" PLYWOOD BACKBOARD FOR PHONE SERVICE BLOCK. PROVIDE NEW 1"C FROM BACKBOARD TO NEAREST UTILITY POLE FOR PHONE SERVICE (COORDINATE WITH UTILITY). WIRE TO ALARM DIALER LOCATED IN PUMP CONTROL PANEL, COORD. WITH WELL CONTROLS
- PROVIDE DEDICATED RECEPTACLE (5 AMPS @ 115V) FOR DEHUMIDIFIER (BY OTHERS).
- PROVIDE/INSTALL LOAD REACTOR/FILTER (IN NEMA 3R ENCLOSURE) AT WELL PUMP.

EXISTING WELL PUMP WP-#2B (5 HP @ 208-240V/3ø - FIELD VERIFY & CONFIRM) - REFER TO SITE PLANS FOR LOCATION (APPROX. 130 FEET WIRE-RUN SOUTHEAST OF WELL HOUSE) NEW FEEDER (REFER TO 1-LINE) BACK TO WELL PUMP CONTROL PANE	EXISTING WELL PUMP WP-#2A (5 HP @ 208-240V/3Ø - FIELD VERIFY & CONFIRM) - REFER TO SITE PLANS FOR LOCATION (APPROX. 140 FEET WIRE-RUN NORTHEAST OF WELL HOUSE) NEW FEEDER (REFER TO 1-LINE) BACK TO WELL PUMP CONTROL PANEL
DACK TO WELL FOMP CONTROL FAINE	INTAKE DAMPER D-1 (FRACT @ 120V)——
FLOW TRANSMITTER W-13 WELL PRESSURE SENSOR BY WELL CONTRACTOR W-5 NEW WELL PUMP WP-#1 (10 HP @ 208-230V/3ø, COORD/CONFIRM WITH WELL TRADES) - REFER TO SITE PLANS FOR LOCATION (APPROX. 210 FEET WIRE-RUN SOUTH OF WELL HOUSE)	W-15 W-17 W-17 W-17 W-17 W-18 W-19 W-19

KEYED ELECTRICAL LIGHTING CONSTRUCTION NOTES:

COORDINATE LOCATION AND MOUNTING HEIGHT OF ALL LIGHTING AND CONTROL/SWITCHING WITH OWNER/OWNER'S REP PRIOR TO ROUGH-IN. E.C. SHALL COORDINATE EXACT LOCATION OF LIGHT FIXTURES, ETC. WITH M.C./P.C. AS REQUIRED TO ACCOMMODATE LAYOUT OF EQUIPMENT,

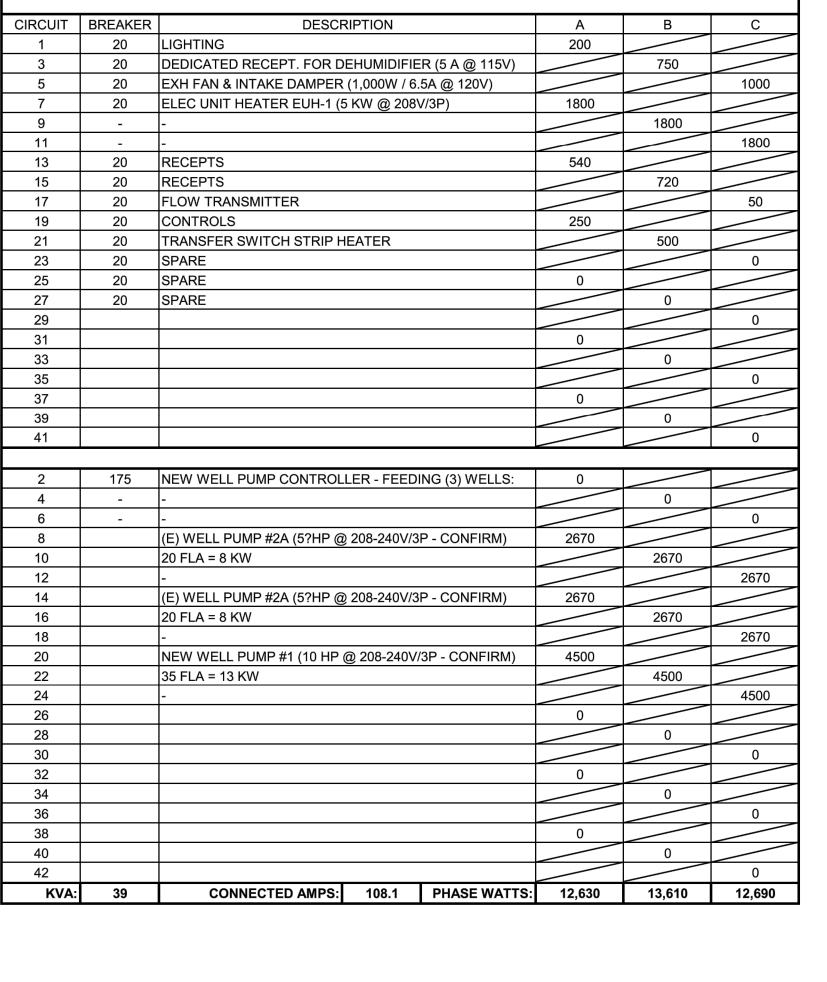


ELECTRICAL LIGHTING PLAN N SCALE: 1/4" = 1'-0"

E BAY BANDS INDIANS MICHIGAN LITTLE TRAVERSE
OF ODAWA II
BAYSHORE, M
MTIGWAAKIIS WEI BIDDING

SSUED FOR: DATE: BY: ☐ PLAN REVIEW 2/22/23 JLK PLAN REVIEW 2/22/23 JLK PLAN REVIEW2 4/7/23 JLK SIDDING 4/24/23 JLK

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LIGHTING FIXTURE SCHEDULE VOLTS/WATTS TYPE DESCRIPTION MANUFACTURERS REMARKS 19.75"Wx7.5"Hx2.25"D EXIT/EMERGENCY LIGHT COMBINATION WITH HIGH POWER BATTERY FOR EMERGENCY ARROWS AND FACES SHALL BE AS INDICATED ON DRAWINGS.

120V / 2.2W PROVIDE MOUNTING HARDWARE AS REMOTE CAPACITY: LED EXIT LIGHT, POLYCARBONATE (2) LED EM HOUSING WITH WHITE FACE PLATE, EMERGENCY LIGHTING
HIGH POWER COMBO FIXTURE WITH: TWO LED HEADS (100 MODEL# LPXC25R3 (RED FACE) HEADS & LED EXIT LUMENS EACH); SEALED MAINTENANCE FREE NICKEL CADMIUM BATTERY; AUTOMATIC CHARGER AND TRANSFER 2. ENGINEER APPROVED EQUAL REQUIRED FOR SINGLE OR DOUBLE LAMPS SIDE AS REQUIRED BY CODE. CIRCUIT; DUAL 120/277 VOLT AC/EM OPERATION; 3 REMOTE WATTS. WIRE TO BATTERY IN HIGH POWER CAPACITY EXIT SIGN OR EMERGENCY . SURE-LITES "SEL" SERIES 8.5"Wx6"H REMOTE OUTDOOR EMERGENCY LIGHTING UNIT: (2)-3.6V/0.78W LED EM HEADS ER2 WALL/CEILING MOUNTED WEATHERPROOF FIXTURE WITH TWO LED HEADS. #SRP25DWH 4.8V / 2.5W BATTERY LOCATED INSIDE BUILDING. 2. ENGINEER APPROVED EQUAL PROVIDE OPTIONAL WIREGUARD (WG9) WHERE NOTED ON DRAWINGS. 3.5"Wx5.75"Lx6.75"H LED WALL PACK FIXTURE; FULL
CUTOFF; UNIVERSAL VOLTAGE; 1–10V DIMMING; DIE-CAST
MODEL#: XTOR2B-PC1 VERIFY FINISH, LOCATION, & MOUNTING HEIGHT WITH OWNER/OWNER'S REP PRIOR TO 2,135 LUMENS 120V / 18W 2. ENGINEER APPROVED EQUAL ALUMINUM HOUSING; INTEGRAL PHOTOCELL 5,000 K TEMP ROUGH-IN . METALUX "VAPORTITE LED" SERIES 47.25" LONG x 6" WIDE x 4" HIGH INDUSTRIAL VAPORTITE LED LENSED STRIPLIGHT FIXTURE; ACRYLIC LENS; UNIVERSAL VOLTAGE; 0-10V DIMMING; SURFACE 5,405 LUMENS 120-277V / VERIFY MOUNTING & REQUIRED HARDWARE (SURFACE/SUSPENDED) MODEL#: 4VT3-LD5-5-G-UNV-L850-CD1 HARDWARE (SURFACE/SUSPENDED) 2. ENGINEER/OWNER APPROVED MOUNT OR PENDANT HUNG (CONFIRM HANGING 5,000 K TEMP ACCESSORIES)

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/-- WELL PUMP CONTROL PANEL W/ VFDs, ALARMS, ETC. (DESIGNED/PROVIDED BY WELL CONTRACTOR & WIRED BY E.C.)

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ALL ELECTRICAL EQUIPMENT AND MATERIALS SHALL BE NEW, CONFORM TO LATEST APPROVED STANDARDS OF I.E.E.E., ANSI, AND BEAR THE "UL" LABEL OR LISTING. ALL EQUIPMENT SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.

SECTION 260519 LOW-VOLTAGE CABLES (600 V AND LESS):

BRANCH CIRCUITS EQUAL, OR LESS THAN, 4/0 AWG SHALL BE COPPER, 600 VOLT INSULATION, MINIMUM SIZE #10 AWG (EXCEPT FOR RECEPTACLE CIRCUITS MAY BE MIN. #12 AWG), AND BE TYPE "THWN" RATED 75 DEGREES C, ROUTED IN CONDUIT, OR AC/MC CABLE. FEEDERS LARGER THAN #4/0 AND SECONDARY SERVICE CONDUCTORS SHALL BE COPPER, 600 VOLT INSULATION, AND BE TYPE "XHHW" RATED 90 DEGREES C, ROUTED IN

ALL FEEDERS AND BRANCH CIRCUITS SHALL BE SIZED FOR MAXIMUM OF 2% VOLTAGE DROP ALL CONDUCTORS SHALL BE COPPER AND ROUTED IN CONDUIT.

SECTION 260526 GROUNDING & BONDING: FURNISH AND INSTALL A COMPLETE GROUNDING SYSTEM IN ACCORDANCE WITH N.E.C. AND LOCAL CODES AND ORDINANCES

THE NEUTRAL BUS AT THE MAIN SERVICE PANEL/SWITCHES SHALL BE CONNECTED TO A GROUNDING ELECTRODE SYSTEM. THE GROUNDING ELECTRODE SYSTEM SHALL BE IN COMPLIANCE WITH THE N.E.C. AND SHALL INCLUDE TWO OR COMBINATION OF THE FOLLOWING: A) METAL UNDERGROUND COLD WATER SERVICE PIPE (WHERE AVAILABLE)

B) A 3/0 BARE COPPER CONDUCTOR ENCASED BY AT LEAST 2 INCHES OF CONCRETE, LOCATED WITHIN AND NEAR THE BOTTOM OF THE CONCRETE FOUNDATION OR FOOTING THAT IS IN DIRECT CONTACT WITH THE EARTH.

C) AN EFFECTIVE GROUNDING MAT. D) THE METAL FRAME OF THE BUILDING, WHERE EFFECTIVELY GROUNDED.

E) ANY ADDITIONAL ELECTRODES REQUIRED BY LOCAL CODES AND ORDINANCES.

GROUNDING PATH FROM CIRCUITS, EQUIPMENT, CONDUCTOR ENCLOSURES, ETC. SHALL BE PERMANENT AND CONTINUOUS AND SHALL HAVE A RESISTANCE TO GROUND OF LESS

ALL CABINETS, MOTOR FRAMES, MOTOR STARTERS, CONDUIT SYSTEMS, PANELBOARDS, TRANSFORMERS, ETC. SHALL BE THOROUGHLY GROUNDED IN ACCORDANCE WITH THE N.E.C SECTIONS 250-23(A), 250-81, 250-83, AND TABLES 250-94, AND 250-95.

ALL NEW METAL RE-BAR WITHIN NEW BUILDING FOUNDATIONS SHALL BE EFFECTIVELY GROUNDED PER CODE.

SECTION 260529 HANGERS AND SUPPORTS:

CONTRACTOR SHALL PROVIDE ALL NECESSARY ANGLE/BRACKETS OR SUPPLEMENTARY STEEL AS REQUIRED FOR ADEQUATE SUPPORT OF ALL LIGHTS, PANELS, WIRING, ETC. SECURE APPROVAL FROM THE ARCHITECT, IN WRITING, PRIOR TO WELDING OR BOLTING TO THE BUILDING STRUCTURE.

SECTION 260534 CONDUIT: EXTERIOR UNDERGROUND INSTALLATIONS – USE THINWALL SCH. 40 PVC, OR THICKWALL SCH. 80 PVC.

OUTDOOR LOCATIONS ABOVE GRADE - USE GALVANIZED RIGID STEEL (GRS), OR THICKWALL SCH. 80 PVC.

BURIED UNDER CONCRETE SLAB - USE GALVANIZED RIGID STEEL (GRS), OR THICKWALL SCH. 80 PVC. BURIED INSIDE CONCRETE SLAB - USE GALVANIZED RIGID STEEL (GRS).

WHERE CONCEALED - USE ELECTRICAL METALLIC TUBING (EMT).

WHERE EXPOSED - USE ELECTRICAL METALLIC TUBING (EMT), OR GALVANIZED RIGID STEEL (GRS). NOTE: USE GALVANIZED RIGID STEEL (GRS) CONDUIT WHERE EXPOSED/SUBJECT TO DAMAGE IN MECHANICAL ROOMS UP TO 10 FEET ABOVE FINISHED FLOOR.

EQUIPMENT CONNECTIONS (I.E. TRANSFORMERS, MOTORS, ETC.) - USE LIQUIDTIGHT FLEXIBLE CONDUIT. NOTE: USE GALVANIZED RIGID STEEL (GRS) CONDUIT WHERE EXPOSED/SUBJECT TO DAMAGE IN MECHANICAL ROOMS UP TO 10 FEET ABOVE FINISHED FLOOR.

LIGHT FIXTURES - USE MC CABLE FROM J-BOX (MAX. LENGTH 6').

WIRING DEVICES - USE MC CABLE FOR DROPS WHERE CONCEALED WITHIN WALLS. DO NOT USE MC CABLE FOR HOMERUNS. NOTE: USE ELECTRICAL METALLIC TUBING (EMT), OR GALVANIZED RIGID STEEL (GRS) CONDUIT WHERE EXPOSED.

CONTROL WIRING - ELECTRICAL METALLIC TUBING (EMT).

NOTE: ALL CIRCUITS FOR POWER, LIGHTING, CONTROLS, ETC. SHALL BE IN CONDUIT AS SPECIFIED. ALL CIRCUITS SHALL BE CONCEALED IN WALLS, INCLUDING (E) WALLS.

SECTION 260553 ELECTRICAL IDENTIFICATION:

INSTALL 1/2" HIGH ENGRAVED PHENOLIC NAMEPLATES/LABELS ON ALL ELECTRICAL EQUIPMENT AND LOADS (PLASTIC TAPE IS NOT ACCEPTABLE). LABEL AS FOLLOWS: DISCONNECTS (EQUIPMENT SERVED, CIRCUIT #, VOLTAGE/PHASE), JUNCTION BOXES (SOURCE, DESTINATION, VOLTAGE/PHASE), PANELBOARDS (DESTINATION, VOLTAGE/PHASE). LABELS SHALL MATCH NOMENCLATURE ON PLANS.

PROVIDE TYPEWRITTEN PANEL SCHEDULES INDICATING LOADS. EXISTING PANEL SCHEDULES SHALL BE UPDATED TO INDICATE CHANGES.

INSTALL UNDERGROUND WARNING TAPE FOR ALL UNDERGROUND CONDUITS.

SECTION 262416 PANELBOARDS:

LIGHTING & APPLIANCE PANELBOARDS - SHALL BE NEMA PB1, CIRCUIT BREAKER TYPE, WITH COPPER BUS, COPPER GROUND BUS, COPPER NEUTRAL BUS, SUPPORTS, ETC.; PANELBOARD A.I.C. INTERRUPTING RATING SHALL BE COORDINATED WITH THE LOCAL UTILITY (MINIMUM 22,000 A.I.C.); MOLDED CASE THERMAL MAGNETIC TRIP CIRCUIT BREAKERS, "BOLT-ON" TYPE. WITH MINIMUM INTERRUPTING CAPACITY OF 10,000 A.I.C.; ALL LIGHTING CIRCUIT BREAKERS SHALL BE RATED FOR SWITCH DUTY; LOCK-ON DEVICES SHALL BE PROVIDED FOR ALL BRANCH CIRCUITS SUPPLYING EXIT LIGHTING, UN-SWITCHED NIGHT LIGHTING, EMERGENCY LIGHTING, AND FIRE ALARM. SERVICE ENTRANCE PANELBOARDS SHALL BE LABELED "SUITABLE FOR USE AS SERVICE EQUIPMENT."

SQUARE D TYPE "NQ" OR EQUAL BY GE, SIEMENS. LOAD CENTERS ARE NOT ACCEPTABLE FOR USE AS LIGHTING AND APPLIANCE PANELBOARDS.

SECTION 262726 WIRING DEVICES:

WALL SWITCHES SHALL BE NEMA WD1, SPEC. GRADE, 20A, 120/277 RATED. SINGLE POLE, DOUBLE POLE, 3-WAY, ETC. AS INDICATED. COORDINATE COLOR WITH ARCHITECT. EQUAL BY HUBBELL, LEVITON, ARROW-HART, P&S.

RECEPTACLES SHALL BE NEMA WD1, SPEC. GRADE, GROUNDED TYPE, 20A, 120V RATED. COORDINATE COLOR WITH ARCHITECT. EQUAL BY HUBBELL, LEVITON, ARROW-HART, OR P&S. NOTE: ALL RECEPTACLES IN RESIDENTIAL USES (I.E. APARTMENTS, HOTELS, HOUSING, ETC.) SHALL BE TAMPER RESISTANT (TR) RATED, RESIDENTIAL GRADE. ALL RECEPTACLES IN COMMERCIAL BUILDINGS/AREAS OF THE BUILDING WITH CHILDREN USE (I.E. SCHOOLS/CLASSROOMS, DAYCARE FACILITIES, ETC.) SHALL BE TAMPER RESISTANT (TR) RATED, COMMERCIAL GRADE.

GFCI RECEPTACLES SHALL MEET UL STANDARDS. EQUAL BY HUBBELL, LEVITON, ARROW-HART, P&S.

WALL PLATES FOR DEVICES SHALL BE TYPE 302 STAINLESS STEEL. HUBBELL TYPE "S" OR AS SELECTED BY OWNER/ARCHITECT.

COORDINATE LOCATIONS AND MOUNTING HEIGHTS OF ALL OUTLETS WITH LOCATIONS/HEIGHTS OF COUNTERTOPS, SINKS, FURNITURE, CABINETS, ETC. WITH ARCHITECTURAL ELEVATIONS AND OTHER TRADES.

SECTION 262813 FUSES:
FUSES 0 TO 600 AMP SHALL BE CURRENT LIMITING DUAL-ELEMENT TYPE, WITH SEPARATE ELEMENTS FOR OVERLOADS AND SHORT CIRCUITS, 200,000 A.I.C. RMS SYMMETRICAL, UL LISTED AND CLASSIFIED RK1 (TIME DELAY) TYPE, VOLTAGE RATING SUITABLE FOR SERVICE. FUSES 601-6,000 AMP SHALL BE CURRENT LIMITING TIME DELAY TYPE, 200,000 A.I.C RMS SYMMETRICAL, UL LISTED AND CLASSIFIED L TYPE. PROVIDE FUSE PULLER AND 3 EXTRA FUSES OF EACH SIZE. BUSSMAN OR EQUAL BY GE, FERRAZ

SECTION 262818 ENCLOSED SWITCHES:
DISCONNECT SWITCHES SHALL BE 250V OR 600V, FUSED OR NON-FUSED AS INDICATED, HEAVY DUTY TYPE. DISCONNECT SWITCHES SERVING MOTOR LOADS SHALL BE

NEMA 1 ENCLOSURE FOR INTERIOR DRY LOCATIONS. NEMA 4X OR 3R FOR EXTERIOR LOCATIONS.

EQUAL BY SQUARE D, GE, SIEMENS.

MANUAL MOTOR STARTERS - SHALL BE NEMA ICS 2, AC GENERAL PURPOSE, CLASS A, FULL VOLTAGE CONTROLLER WITH OVERLOAD ELEMENT, PILOT LIGHT, NO AUX CONTACTS, TOGGLE OPERATOR.

1-PHASE MOTOR STARTING SWITCHES - SHALL BE NEMA ICS 2, AC GENERAL PURPOSE, CLASS A, FULL VOLTAGE CONTROLLER, WITH THERMAL OVERLOADS, PILOT LIGHT, TOGGLE OPERATOR. SQUARE D 2510 OR EQUAL.

3-PASE COMBINATION STARTER/DISCONNECTS - SHALL BE NEMA ICS 2, AC GENERAL PURPOSE CLASS A MAGNETIC CONTROLLER FOR INDUCTION MOTORS RATED IN HORSEPOWER, MECHANICALLY HELD, CONTROL POWER TRANSFORMER WITH 120V COIL VOLTAGE, OVERLOAD RELAYS, 2 FIELD CONVERTIBLE CONTACTS, RED AND GREEN INDICATING LIGHTS, HAND/OFF/AUTO SELECTOR SWITCH. SQUARE D CLASS 8536 OR EQUAL.

NEMA 1 ENCLOSURE FOR INTERIOR LOCATIONS. NEMA 4X FOR EXTERIOR LOCATIONS.

EQUAL BY SQUARE D, GE, SIEMENS.

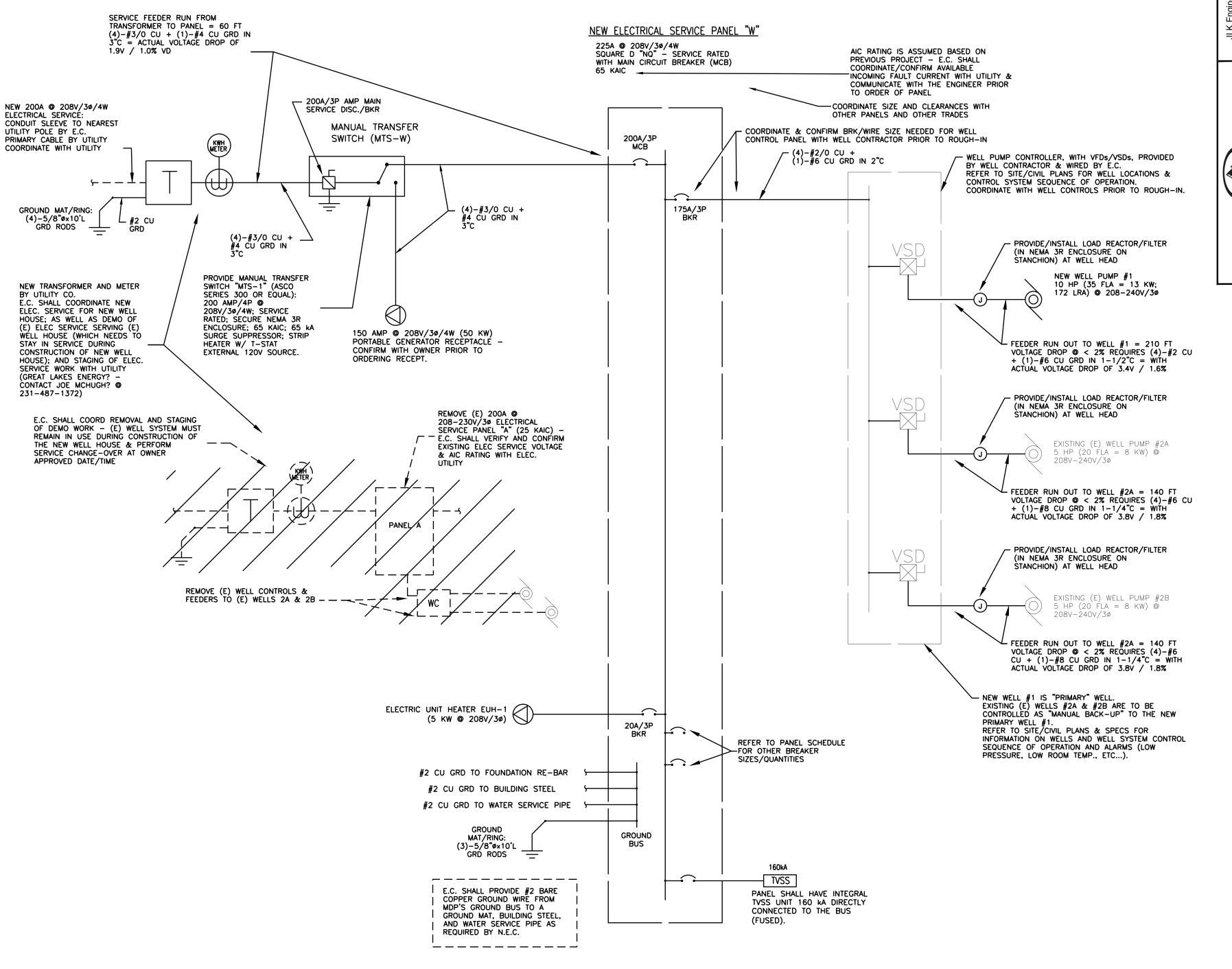
MEET THE LOCAL ENERGY CODE.

SECTION 265000 LIGHTING: FURNISH AND INSTALL LIGHT FIXTURES AND LAMPS AS INDICATED IN SCHEDULE.

OUTDOOR LIGHTING AND/OR BUILDING SIGNS SHALL BE BOTH PHOTOCELL AND TIME SWITCHED CONTROLLED. LIGHTING FIXTURE LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL COORDINATE THE EXACT LOCATIONS WITH THE ARCHITECTURAL REFLECTED CEILING PLAN, AND

OTHER TRADES (MECHANICAL, FIRE PROTECTION, ETC.) ALL NIGHT LIGHTS, EMERGENCY LIGHTS, AND EXIT LIGHTS SHALL BE CIRCUITED TO UNSWITCHED/HOT LEG OF THE GENERAL LIGHTING CIRCUIT OF THE AREA SERVED BY THE NIGHT/EMERCENCY/EXIT LIGHTS.

SUPPORT FIXTURES INDEPENDENT OF THE CEILING GRID. ALL LIGHTING SYSTEMS AND CONTROLS SHALL BE PROVIDED/INSTALLED TO MEET APPLICABLE CODES: LOCAL BUILDING CODE, ELECTRICAL CODE, N.E.C., LIFE SAFETY CODE CONTRACTOR SHALL DESIGN/PROVIDE/INSTALL LIGHTING CONTROLS (I.E. OCCUPANCY SENSORS, LIGHTING RELAY CONTROL PANELS, OVERRIDE SWITCHES, ETC.) AS REQUIRED TO



ELECTRICAL SERVICE ONE LINE DIAGRAM

ELECTRICAL SERVICE LOAD CALCULATIONS:

NEW WELL #1: 13 KW (35 FLA) FOR NEW 10 HP @ 208-240V/3ø (COORDINATE/CONFIRM WITH WELL CONTRACTOR PRIOR TO ROUGH-IN).

EXISTING (E) WELL #2A: 8 KW (20 FLA) FOR EXISTING 5 HP @ 208-240V/3ø (COORDINATE/CONFIRM WITH WELL CONTRACTOR PRIOR TO ROUGH-IN). WELL #2A WILL BE BACKUP TO NEW WELL #1.

EXISTING (E) WELL #2B: 8 KW (20 FLA) FOR EXISTING 5 HP @ 208-240V/3ø (COORDINATE/CONFIRM WITH WELL CONTRACTOR PRIOR TO ROUGH-IN). WELL #2B WILL BE BACKUP TO NEW WELL #1.

PANEL "W" LOADS = 10 KW (HVAC, LIGHTS, RECEPTS, ETC.)

NEW LOADS SUB-TOTAL = 40 KW = $40,000 \text{ W}/208V-3\phi$ = $112A \times 1.25$ = 138A ---> 200 AMP SERVICE

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PROVIDE ALL ITEMS, ARTICLES, MATERIALS, OPERATIONS OR METHODS LISTED, MENTIONED OR SCHEDULED IN DESIGN DOCUMENTS AND/OR HEREIN, INCLUDING ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS NECESSARY AND REQUIRED FOR THEIR COMPLETION. ALL DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING THE GENERAL CONDITIONS, SUPPLEMENTARY GENERAL CONDITIONS, AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO WORK OF ALL DIVISION 15/22/23 SECTIONS. THE ITEMS IN THIS SECTION ARE NOT INTENDED TO SUPERSEDE, BUT ARE SUPPLEMENTARY TO, THE REQUIREMENTS SET FORTH IN OTHER DIVISIONS OF

THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT, PIPING, DUCTWORK AND RELATED ITEMS. THEY SHALL BE FOLLOWED AS CLOSELY AS ELEMENTS OF THE CONSTRUCTION WILL PERMIT. THE CONTRACTOR SHALL VISIT THE SITE, EXAMINE AND VERIFY THE CONDITIONS UNDER WHICH THE WORK MUST BE CONDUCTED PRIOR TO SUBMITTING A PROPOSAL, IF ANY INTERFERENCES, VIOLATIONS, OR OMISSIONS APPEAR TO DEPART FROM THE DESIGN INTENT OF THE BID DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO ENTERING INTO A CONTRACT WITH THE OWNER. CONTRACTOR'S SHALL VERIFY ALL DIMENSIONS AND SHALL BE FAMILIAR WITH THE EXISTING CONDITIONS PRIOR TO STARTING THEIR

CONTRACTOR SHALL COORDINATE HIS WORK WITH THE WORK OF ALL OTHER TRADES IN ORDER TO AVOID INTERFERENCES. EXAMINE THE DRAWINGS OF OTHER TRADES AND VERIFY THE CONDITIONS GOVERNING THE WORK ON THE JOB SITE. ARRANGE WORK ACCORDINGLY, PROVIDING SUCH DUCTWORK, PIPING, ETC. AS MAY BE REQUIRED TO MEET SUCH CONDITIONS. WHERE INTERFERENCES OCCUR, THE CONTRACTOR SHALL, PRIOR TO INSTALLATION OF THE WORK, CONSULT WITH THE ARCHITECT/ENGINEER AS TO THE EXACT LOCATION AND LEVEL OF HIS WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ARRANGEMENT OF HIS WORK.

PROVIDE ALL NECESSARY ANGLE/BRACKETS OR SUPPLEMENTARY STEEL AS REQUIRED FOR ADEQUATE SUPPORT OF ALL PIPING, DUCTWORK, SPECIALTIES, AND EQUIPMENT. SUPPORT PIPING SYSTEMS SECURELY WHILE ALLOWING FOR PIPE AND BUILDING EXPANSION/CONTRACTION. PROVIDE COPPER PLATED HANGERS FOR COPPER PIPING. USE ADJUSTABLE CLEVIS HANGERS OR ADJUSTABLE STEEL BAND HANGERS. MAXIMUM SPACING SHALL BE 5' FOR 1/2" PIPING, 7' FOR 3/4" TO 1-1/4" PIPING, 8' FOR 1-1/2" OR LARGER PIPING. FURNISH MECHANICAL EQUIPMENT SUPPORTS AS DETAILED OR AS REQUIRED TO ADEQUATELY CARRY THE

GUARANTEE OF WORK: CONTRACTOR SHALL GUARANTEE ALL OF THE WORK FURNISHED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE YEAR AFTER OWNER ACCEPTANCE. THE CONTRACTOR SHALL FIX/REPAIR ANY DEFECTS WITHIN THIS PERIOD AT NO EXPENSE TO THE OWNER. THE CONTRACTOR SHALL SUBMIT TO THE OWNER ALL WARRANTIES FOR EQUIPMENT INSTALLED.

CODES AND REGULATIONS:

ALL CONSTRUCTION WORK AND MATERIALS SHALL BE COMPLETED IN ACCORDANCE WITH THE THEN CURRENT RULES SET FORTH IN LOCAL, STATE, AND FEDERAL CODES AND REGULATIONS. CONSTRUCTION AND MATERIALS SHALL COMPLY WITH CURRENT AMERICAN DISABILITIES ACT (ADA) REQUIREMENTS. CONTRACTOR SHALL PREPARE AND ISSUE ANY PLAN REVIEW APPLICATIONS/SUBMITTALS THAT MAY BE REQUIRED BY THE GOVERNING AUTHORITIES. CONTRACTOR SHALL COORDINATE INSPECTIONS WITH ALL CODE OFFICIALS HAVING AUTHORITY ON THE PROJECT (E.G. STATE FIRE MARSHALL, LOCAL BUILDING AUTHORITY, ETC.). WHERE THE DESIGN DOCUMENTS INDICATE MATERIALS OR CONSTRUCTION IN EXCESS OF CODE REQUIREMENTS, THE DESIGN DOCUMENTS SHALL GOVERN. IN THE EVENT THAT THE PLANS AND SPECIFICATIONS CONFLICT WITH ANY RULES, REGULATIONS, OR CODES APPLYING, SAID RULES, REGULATIONS AND CODES SHALL GOVERN.

PERMITS, FEES, ETC.: UNLESS OTHERWISE INDICATED, ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, PLAN REVIEWS, APPROVALS AND FEES FOR THE WORK SHALL BE SECURED AND PAID FOR BY THE CONTRACTOR. AT THE COMPLETION OF THE WORK, THE CONTRACTOR SHALL FURNISH THE OWNER WITH ALL CERTIFICATES OF FINAL INSPECTIONS AND APPROVALS.

RULES OF LOCAL UTILITY COMPANIES SHALL BE COMPLIED WITH. THE CONTRACTOR SHALL CHECK WITH EACH UTILITY COMPANY SUPPLYING SERVICE TO THE INSTALLATION AND DETERMINE DEVICES INCLUDED, BUT NOT LIMITED TO, ALL VALVES, METER BOXES AND METERS WHICH WILL BE REQUIRED. THE OWNER SHALL PAY FOR ANY DIRECT UTILITY COSTS.

SUBSTITUTION ITEMS REQUIRING PRIOR APPROVAL:

ALL ITEMS THAT THE CONTRACTOR PROPOSES TO USE IN HIS WORK THAT ARE NOT SPECIFICALLY NAMED IN THE DOCUMENTS MUST BE SUBMITTED FOR REVIEW. SUCH ITEMS MUST BE SUBMITTED IN DUPLICATE TO THE ARCHITECT/ENGINEER FOR APPROVAL A MINIMUM OF 7 DAYS PRIOR TO BID OPENING.

MANUFACTURER'S AND EQUIPMENT:

IF AN APPROVED MANUFACTURER IS OTHER THAN THE MANUFACTURER USED AS THE BASIS OF DESIGN, THE EQUIPMENT OR PRODUCT PROVIDED SHALL BE EQUAL IN QUALITY, DURABILITY, APPEARANCE, CAPACITY, AND EFFICIENCY THROUGH ALL RANGES OF OPERATION, SHALL CONFORM TO THE ARRANGEMENTS AND SPACE LIMITATIONS OF THE EQUIPMENT SHOWN ON THE DOCUMENTS, SHALL BE COMPATIBLE WITH THE OTHER COMPONENTS OF THE SYSTEM AND SHALL COMPLY WITH REQUIREMENTS FOR PRIOR APPROVAL. ALL COSTS TO MAKE THESE ITEMS COMPLY WITH THESE REQUIREMENTS INCLUDING, BUT NOT LIMITED TO, PIPING, SHEET METAL. ELECTRICAL, AND BUILDING ALTERATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND BE INCLUDED IN THE ORIGINAL BID. ALL EQUIPMENT SHALL BE FURNISHED COMPLETE WITH ALL ACCESSORIES NORMALLY SUPPLIED WITH THE CATALOG ITEMS LISTED AND ALL OTHER ACCESSORIES NECESSARY FOR A COMPLETE AND SATISFACTORY OPERATING SYSTEM. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND SHALL BE STANDARD PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF PLUMBING, HEATING. VENTILATING AND AIR CONDITIONING EQUIPMENT AND SHALL BE THE MANUFACTURER'S LATEST DESIGN.

PROVIDE OPERATION AND MAINTENANCE (O&M) MANUALS, IN BOTH .PDF FORMAT AND ONE (1) HARD PRINT COPY, COVERING ALL MECHANICAL AND PLUMBING EQUIPMENT HEREIN SPECIFIED. O&M MANUALS SHALL INCLUDE SHOP DRAWINGS, OPERATION/MAINTENANCE INSTRUCTIONS, AND SPARE PART LISTS. O&M MANUALS SHALL BE PROVIDED FOR ENGINEER REVIEW AND APPROVAL WHEN CONSTRUCTION IS 75% COMPLETE.

SHOP DRAWING SUBMITTALS:

SUBMIT FOR REVIEW AND APPROVAL, WITHIN 30 DAYS AFTER NOTICE TO PROCEED, DIGITAL COPIES (IN .PDF FORMAT) OF SHOP DRAWINGS FOR ALL ITEMS LISTED BELOW. WHERE ITEMS ARE REFERRED TO BY SYMBOLIC DESIGNATION ON THE DRAWINGS AND BY SPECIFICATION SECTION #, ALL SUBMITTALS SHALL BEAR THE SAME DESIGNATION.

PLUMBING FIXTURES PLUMBING EQUIPMENT AND SPECIALTIES

LOUVER/DAMPER UNIT HEATER

OWNER TRAINING:

BEFORE FINAL INSPECTION THE CONTRACTOR SHALL INSTRUCT OWNER'S DESIGNATED PERSONNEL IN OPERATION, ADJUSTMENT AND MAINTENANCE OF MECHANICAL EQUIPMENT AND SYSTEMS AT AGREED UPON TIMES. FOR EQUIPMENT REQUIRING SEASONAL OPERATION, PERFORM INSTRUCTIONS FOR OTHER SEASONS WITHIN SIX MONTHS. USE OPERATION AND MAINTENANCE MANUALS AS BASIS FOR INSTRUCTION. REVIEW CONTENTS OF MANUAL WITH PERSONNEL IN DETAIL TO EXPLAIN ALL ASPECTS OF OPERATION AND MAINTENANCE.

CONTRACTOR SHALL SUBMIT RECORD DRAWINGS WHICH HAVE BEEN NEATLY MARKED TO REPRESENT AS-BUILT CONDITIONS FOR ALL

PROVIDE AND INSTALL SCHEDULE 40 BLACK STEEL PIPE SLEEVES, CUT TO LENGTH, WHEREVER PIPES PASS THROUGH ABOVE GRADE WALLS AND FLOORS. PROVIDE AND INSTALL GALVANIZED STEEL PIPE SLEEVES, CUT TO LENGTH, WHEREVER PIPES PASS THROUGH BELOW GRADE FOUNDATION WALLS AND SLAB ON GRADE FLOORS. SLEEVES SHALL TERMINATE FLUSH WITH WALLS IN FINISHED AREAS. ALL SLEEVES THROUGH THE FLOOR ARE TO EXTEND TWO (2) INCHES ABOVE FINISH FLOOR.

SEAL THE SPACE AROUND PIPES IN SLEEVES AND AROUND DUCT OPENINGS THROUGH WALLS, FLOORS, ROOFS, AND CEILINGS. ANY MECHANICAL SYSTEMS PENETRATING THROUGH FIRE-RATED ASSEMBLIES SHALL BE FIRE AND DRAFT STOPPED WITH NON-COMBUSTIBLE MATERIALS PER APPLICABLE BUILDING CODE REQUIREMENTS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE ASSEMBLY LOCATIONS,

CUTTING, CORING, AND PATCHING: ALL CUTTING, CORING, AND PATCHING WORK REQUIRED FOR MECHANICAL AND PLUMBING INSTALLATIONS SHALL BE PERFORMED BY THE CONTRACTOR THROUGH APPROVED QUALIFIED SUB-CONTRACTORS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER RESTORATION OF ALL EXISTING SURFACES REQUIRING PATCHING, PAINTING, AND/OR OTHER REPAIRS REQUIRED. PRIOR WRITTEN APPROVAL FROM THE ARCHITECT/STRUCTURAL ENGINEER MUST BE OBTAINED PRIOR TO ANY CUTTING OF ANY BUILDING STRUCTURAL

MECHANICAL & PLUMBING SYMBOL LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	PIPE ELBOW UP	\ \ \ \	RECTANGULAR TAKE-OFF (SINGLE LINE)
	PIPE ELBOW OP PIPE ELBOW DOWN	بر <u>ب</u>	
	DIRECTION OF FLOW	<u>الي</u>	RECTANGULAR TAKE-OFF (DOUBLE LINE)
———— ————	UNION		
	CONCENTRIC REDUCER	, }	ROUND TAKE-OFF (SINGLE LINE)
$\phantom{aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa$	ECCENTRIC REDUCER		ROUND TAKE-OFF (DOUBLE LINE)
	PIPE CAP OR PLUG	, U ,	NOONO TAKE OF (BOODEE EINE)
	CIRCULATING PUMP		SPIN-IN FITTING (WITH VOLUME DAMPER)
—————————————————————————————————————	ISOLATION VALVE	٠, ١	
——————————————————————————————————————	GLOBE VALVE	<u> </u>	RECTANGULAR ELBOW (WITH TURNING VANES)
——N——	BALL VALVE CHECK VALVE (SWING)	\$	DADUG DESTANGULAD ELDON
	CHECK VALVE (SWING) CHECK VALVE (SPRING)		RADIUS RECTANGULAR ELBOW
——√F———	PLUG VALVE		
	COMBO BALANCE VALVE/FLOW MEASURING DEVICE		RADIUS ROUND ELBOW
	STRAINER (Y-TYPE)		RECTANGULAR ELBOW UP
**	STRAINER (BLOW OFF TYPE)	7 10	NECTANGULAR ELBOW OF
	TRAP (PLAN VIEW)		ROUND ELBOW UP
O	FLOOR DRAIN (PLAN VIEW)		
	FLOOR DRAIN (ELEVATION)		DUCT UP (SINGLE LINE)
——————————————————————————————————————	FUNNEL FLOOR DRAIN (PLAN VIEW)	———	
0	FUNNEL FLOOR DRAIN (ELEVATION)	المراح	RECTANGULAR ELBOW DOWN
——————————————————————————————————————	CLEAN OUT (IN FLOOR)		ROUND ELBOW DOWN
C0 BFP	CLEAN OUT (IN LINE) BACKFLOW PREVENTER		NOONE ELECTIVE COMM
<u>⊎</u> — нв	HOSE BIBB		DUCT DOWN (SINGLE LINE)
— ₩ H	WALL HYDRANT		
A	PRESSURE RELIEF VALVE		CONCENTRIC TRANSITION (DOUBLE LINE)
—————————————————————————————————————	PRESSURE REDUCING VALVE	(~ (001/05/17/10 TD11/05/101/ (01/101/5 1/1/15)
₽	PRESSURE AND TEMPERATURE RELIEF VALVE	}_ }	CONCENTRIC TRANSITION (SINGLE LINE)
· ×	PRESSURE REGULATING VALVE	\$	ECCENTRIC TRANSITION (DOUBLE LINE)
_	PRESSURE AND TEMPERATURE TEST PLUG		
<u>&</u>	PRESSURE GAUGE AND COCK	├─ └	ECCENTRIC TRANSITION (SINGLE LINE)
Ф		\bowtie	CROSS SECTION OF SUPPLY AIR DUCT
I MV	THERMOMETER	_	
<u> </u>	MANUAL AIR VENT		CROSS SECTION OF EXHAUST OR RETURN AIR DUCT
T	THERMOSTAT		FLEXIBLE CONNECTION (DUCT)
cw	DOMESTIC COLD WATER PIPING		(555.)
——— нw ———	DOMESTIC HOT WATER PIPING		RETURN OR EXHAUST CEILING GRILLE
HWR	DOMESTIC HOT WATER RETURN PIPING		
SAN	SANITARY WASTE PIPING	ाई।	TRANSFER GRILLE
ST	STORM SEWER PIPING		VOLUME DAMPER (MANUALLY ADJUSTABLE)
	SANITARY VENT PIPING GAS PIPING (NATURAL GAS OR PROPANE)		FOLUME DAMEEN (MANAGALLE ADSUSTABLE)
NPCW	NON POTABLE COLD WATER	— - —M	MOTORIZED DAMPER
		_	

		PLUMBING	SPECIA	ALTIE	S SCHE	DULE
MARK	MANUFACTURER SERIES NUMBER	D	ESCRIPTION			ACCESSORIES, FEATURES, AND NOTES
			FLOOR	DRAINS	5	
		CONSTRUCTION	GRATE	Ξ	SIZE	
FD-1	ZURN #Z-415B	ASME A112.21.1M; LACQUERED CAST IRON TWO PIECE BODY	ADJUSTAI ROUNE NICKEL-BR STRAINER (TYPE E	O, RONZE (ZURN	LINE SIZE SHOWN ON PLANS (MINIMUM 3")	DOUBLE DRAINAGE FLANGE, WEEP HOLES, REVERSIBLE CLAMPING COLLAR, TRAP PRIMER CONNECTION, AND ADJUSTABLE ROUND NICKEL-BRONZE STRAINER. USE CLAMPING COLLAR ON FLOORS ABOVE GRADE. THIS IS A STANDARD FLOOR DRAIN USE IN TOILET ROOMS, JANITOR'S CLOSETS, SHOWERS, ETC.
			INTERIOR	HOSE E	BIBS	
		DESCRIPTION		INLET	OUTLET	
HB-1	WOODFORD "MODEL 40HT" OR EQUAL	ANTI-SIPHON WALL FAI INTEGRAL MOUNTING REPLACEABLE HEXAGO CHROME PLATED WHERE WITH HANDWHEEL, IN VACUUM BREAKER IN CO WITH HASSE10011, HA	FLANGE, NAL DISC, E EXPOSED NTEGRAL DNFORMANCE	3/4"	3/4" MALE HOSE THREAD	NON-FREEZING AREAS.

ATION LIST

BREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
AFF APD	ABOVE FINISHED FLOOR AIR PRESSURE DROP	SA SAG	SUPPLY AIR SUPPLY AIR GRILLE OR REGISTER SANITARY WASTE
BFP BHP BTU	BACKFLOW PREVENTER BRAKE HORSEPOWER BRITISH THERMAL UNIT	SAN SP SqFt ST	STATIC PRESSURE SQUARE FOOT/SQUARE FEET STORM WATER
BTUH	BRITISH THERMAL UNITS PER HOUR CAPACITY	TSP TYP	TOTAL STATIC PRESSURE TYPICAL
CFH CFM CI CO COND CONT	CUBIC FEET PER HOUR CUBIC FEET PER MINUTE CAST IRON CLEAN OUT CONDENSATE CONTINUATION OR CONTINUED	U/G UH UL UON	UNDERGROUND (BELOW GRADE) UNIT HEATER UNDERWRITERS LABORATORY UNLESS OTHERWISE NOTED
CONTR COORD CW	CONTRACTOR COORDINATE DOMESTIC COLD WATER	V VD VFD	VENT VOLUME DAMPER VARIABLE FREQUENCY DRIVE
DB DEG DN	DRY BULB TEMPERATURE DEGREES DOWN	VS VSD VTR	VENT STACK VARIABLE SPEED DRIVE VENT THRU ROOF
DW&V (E) EA EAT E.C. EDB EF EG ELEC ELEV ESP EUH EWT EXH	EXISTING EXHAUST AIR ENTERING AIR TEMPERATURE ELECTRICAL CONTRACTOR ENTERING DRY BULB TEMPERATURE EXHAUST FAN EXHAUST GRILLE OR REGISTER ELECTRICAL ELEVATION EXTERNAL STATIC PRESSURE ELECTRIC UNIT HEATER ENTERING WATER TEMPERATURE EXHAUST	W WB WCO WG WH W&V	WASTE WET BULB TEMPERATURE WALL CLEAN OUT WATER GAUGE WALL HYDRANT WASTE & VENT
F (F) FA FD	FIRE PROTECTION FUTURE FRESH AIR FLOOR DRAIN		1. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL SCOPE OF WORK. CONTRACTOR SHALL P
FFD FLA FLR FPM	FUNNEL FLOOR DRAIN FULL LOAD AMPS FLOOR FEET PER MINUTE		MECHANICAL/PLUMBING SYSTEMS AND RELATED EQU COMPLETE AND INCLUDE ALL NECESSARY OFFSETS, AND OTHER COMPONENTS REQUIRED DUE TO INTERISPACE CONSTRAINTS, ETC.
FS F.S. FT	FLOOR SINK FIRE SUPPRESSION SUBCONTRACTOR FEET GAS (NATURAL GAS/PROPANE)		2. MECHANICAL SYSTEMS SHALL BE INSTALLED PER MIC MECHANICAL CODE, MICHIGAN PLUMBING CODE, INTE FUEL GAS CODE, APPLICABLE NFPA BUILDING CODES 90A, ETC.), AND APPLICABLE BUILDING CODES (E.G.
GPH GPM GUH	GALLONS PER HOUR GALLONS PER MINUTE GAS UNIT HEATER		BUILDING CODE, ETC.). 3. PLUMBING SYSTEMS SHALL BE INSTALLED PER MICH PLUMBING CODE, INTERNATIONAL FUEL GAS CODE, MECHANICAL CODE, AND APPLICABLE BUILDING CODE
HB HP HR	HOSE BIB HORSEPOWER HOUR		MICHIGAN BUILDING CODES, NFPA CODES, ETC.). 4. COORDINATE THE INSTALLATION OF MECHANICAL AND
HTG HW HWR	HEATING DOMESTIC HOT WATER DOMESTIC HOT WATER RETURN		WORK WITH ALL OTHER TRADES. CONTRACTOR SHA ALL MECHANICAL, PLUMBING AND ELECTRICAL CLEAR PRIOR TO FABRICATION OF ANY NEW WORK. DUCTV PIPING, ETC. SHALL NOT BE LOCATED DIRECTLY OVE
I.E. IN INL ISP	INVERT ELEVATION INCHES INLET INTERNAL STATIC PRESSURE		ELECTRICAL EQUIPMENT AND PANELS, OR INTERFERE ELECTRICAL/MECHANICAL EQUIPMENT CLEARANCE SP.
iW KW	INDIRECT WASTE KILOWATT		5. VERIFY REQUIREMENTS OF ALL EQUIPMENT WITH SHE SUBMITTALS PRIOR TO INSTALLATION. NOTIFY THE E ANY CONFLICTS BETWEEN SHOP DRAWINGS AND PLA
LAT LWT	LEAVING AIR TEMPERATURE LEAVING WATER TEMPERATURE		6. ALL FIXTURES / EQUIPMENT SHALL BE PROVIDED WISOLATION/STOP VALVES, INSTALLED IN ACCESSIBLE
MAX MBH M.C. MCA MECH MFR MIN MISC	MAXIMUM THOUSAND BRITISH THERMAL UNITS PER HOU MECHANICAL CONTRACTOR MINIMUM CIRCUIT AMPS MECHANICAL MANUFACTURER MINIMUM MISCELLANEOUS	R	7. COORDINATE ALL FLOOR, WALL, AND ROOF PENETRA EQUIPMENT PADS, LOUVERS, ETC. WITH ARCHITECTURAL/STRUCTURAL TRADES PRIOR TO ROUUNLESS NOTED OTHERWISE, EACH SUBCONTRACTOR RESPONSIBLE FOR ALL CUTTING, CORING, PATCHING WITH THEIR WORK. CUTTING, CORING, PATCHING WE PERFORMED BY A QUALIFIED SUB-CONTRACTOR EXISTING OR NEW FINISHES.
NC NIC NO NOM NPCW	NORMALLY CLOSED NOT IN CONTRACT NORMALLY OPEN NOMINAL NON POTABLE WATER		
OA OD	OUTSIDE AIR OUTSIDE DIAMETER		
P.C. PD PRI	PLUMBING CONTRACTOR PRESSURE DROP PRIOR TO ROUGH-IN		

PRIOR TO ROUGH-IN

RETURN AIR

RELATIVE HUMIDITY

PRESSURE REDUCING VALVE

REVOLUTIONS PER MINUTE

POUNDS PER SQUARE INCH (ABSOLUTE)

POUNDS PER SQUARE INCH (GAUGE)

45625

PREPARED UNDER THE SUPERVISION OF: JUSTIN L. KOWATCH, P.E. MICHIGAN PE NO. 45625

DATE: 4/24/2023

RETURN AIR GRILLE OR REGISTER

REDUCED PRESSURE ZONE BFP

PRI PRV

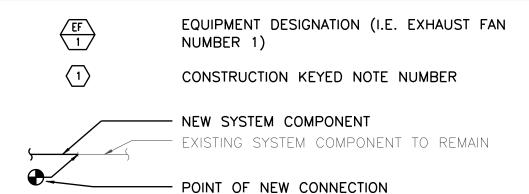
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- DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE RAL SCOPE OF WORK. CONTRACTOR SHALL PROVIDE HANICAL/PLUMBING SYSTEMS AND RELATED EQUIPMENT PLETE AND INCLUDE ALL NECESSARY OFFSETS, FITTINGS, OTHER COMPONENTS REQUIRED DUE TO INTERFERENCES, CONSTRAINTS, ETC.
- HANICAL SYSTEMS SHALL BE INSTALLED PER MICHIGAN HANICAL CODE, MICHIGAN PLUMBING CODE, INTERNATIONAL GAS CODE, APPLICABLE NFPA BUILDING CODES (E.G. 101, ETC.), AND APPLICABLE BUILDING CODES (E.G. MICHIGAN ING CODE, ETC.).
- IBING SYSTEMS SHALL BE INSTALLED PER MICHIGAN IBING CODE, INTERNATIONAL FUEL GAS CODE, MICHIGAN HANICAL CODE, AND APPLICABLE BUILDING CODES (E.G. IGAN BUILDING CODES, NFPA CODES, ETC.).
- RDINATE THE INSTALLATION OF MECHANICAL AND PLUMBING WITH ALL OTHER TRADES. CONTRACTOR SHALL VERIFY MECHANICAL, PLUMBING AND ELECTRICAL CLEARANCES TO FABRICATION OF ANY NEW WORK. DUCTWORK. G, ETC. SHALL NOT BE LOCATED DIRECTLY OVER FRICAL EQUIPMENT AND PANELS, OR INTERFERE WITH FRICAL/MECHANICAL EQUIPMENT CLEARANCE SPACES.
- FY REQUIREMENTS OF ALL EQUIPMENT WITH SHOP DRAWING MITTALS PRIOR TO INSTALLATION. NOTIFY THE ENGINEER OF CONFLICTS BETWEEN SHOP DRAWINGS AND PLANS.
- FIXTURES / EQUIPMENT SHALL BE PROVIDED WITH TION/STOP VALVES, INSTALLED IN ACCESSIBLE LOCATIONS.
- DINATE ALL FLOOR, WALL, AND ROOF PENETRATIONS, PMENT PADS, LOUVERS, ETC. WITH HITECTURAL/STRUCTURAL TRADES PRIOR TO ROUGH-IN. SS NOTED OTHERWISE, EACH SUBCONTRACTOR SHALL BE ONSIBLE FOR ALL CUTTING, CORING, PATCHING ASSOCIATED THEIR WORK. CUTTING, CORING, PATCHING WORK SHALL ERFORMED BY A QUALIFIED SUB-CONTRACTOR AND MATCH TING OR NEW FINISHES.

METHODS OF NOTATION



MECHANICAL DRAWING INDEX

MT MECHANICAL& PLUMBING TITLE SHEET

M1 MECHANICAL & PLUMBING PLAN

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SECTION 220719 - PIPING INSULATION

PRODUCT REQUIREMENTS: SURFACE BURNING CHARACTERISTICS: FLAME SPREAD/SMOKE DEVELOPED INDEX OF 25/50, MAXIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM E 84, NFPA 255, OR UL 723. WHERE INSULATION AND COVERING IS SPECIFIED OR REQUIRED TO INCLUDE A VAPOR BARRIER. IT IS CRITICAL THAT THE INTEGRITY OF THE VAPOR BARRIER IS CONTINUOUSLY MAINTAINED. FASTENERS OR OTHER SECURING DEVICES THAT MAY UNINTENTIONALLY PENETRATE, OR DAMAGE, THE VAPOR BARRIER ARE PROHIBITED. WHERE FASTENERS MUST PENETRATE THE VAPOR BARRIER, THE VAPOR BARRIER SHALL BE REPAIRED.

FIBERGLASS PIPE INSULATION:

MANUFACTURERS: KNAUF, OWENS/CORNING, CERTAINTEED, JOHNS MANVILLE

INSULATION SHALL BE ASTM C547: RIGID MOLDED, NONCOMBUSTIBLE: "K" VALUE: ASTM C117 0.24 AT 75 DEGREES F: MINIMUM SERVICE TEMPERATURE: -20 DEGREES F; MAXIMUM SERVICE TEMPERATURE: 850 DEGREES F; MAXIMUM MOISTURE ABSORPTION: 0.2 VAPOR BARRIER JACKET SHALL BE WHITE KRAFT PAPER REINFORCED (ASJ) WITH GLASS FIBER YARN AND BONDED TO ALUMINIZED

FILM; MOISTURE VAPOR TRANSMISSION: ASTM E96 0.02 PERM-INCHES; SECURE WITH SELF SEALING LONGITUDINAL LAP AND BUTT TIE WIRE: 0.048 INCH STAINLESS STEEL WITH TWISTED ENDS ON MAX 12 INCH CENTERS.

INDOOR VAPOR BARRIER FINISH: VINYL EMULSION TYPE ACRYLIC, COMPATIBLE WITH INSULATION, WHITE COLOR.

FLEXIBLE ELASTOMERIC CELLULAR INSULATION (CELLULAR FOAM):

MANUFACTURERS: ARMACELL, ARMSTRONG MODEL "AP ARMAFLEX". RUBATEX CORP. INSULATION: PREFORMED FLEXIBLE ELASTOMERIC CELLULAR RUBBER INSULATION COMPLYING WITH ASTM C 5.34 GRADE 3: USE MOLDED TUBULAR MATERIAL WHEREVER POSSIBLE. INSULATION SHALL NOT BE USED ON STAINLESS STEEL. K VALUE: ASTM C177 OR C518; 0.27 AT 75 DEGREES F. MINIMUM SERVICE TEMPERATURE: -40 DEGREES F. MAXIMUM SERVICE TEMPERATURE: 220 DEGREES F. MAXIMUM SERVICE ABSORPTION: ASTM D1056; 1.0 PERCENT (PIPE) BY VOLUME, 1.0 PERCENT (SHEET) BY VOLUME. MAXIMUM VAPOR TRANSMISSION: ASTM E96; 0.20 PERM INCHES. CONNECTION: WATERPROOF VAPOR BARRIER ADHÉSIVE. ELASTOMERIC FOAM ADHESIVE: AIR DRIED, CONTACT ADHESIVE, COMPATIBLE WITH INSULATION.

MANUFACTURERS: JOHNS MANVILLE, KNAUF, CERTAIN TEED, CEEL-CO.

PVC PLASTIC JACKET: ONE PIECE MOLDED TYPE, OFF-WHITE COLOR; MINIMUM SERVICE TEMPERATURE: -40 DEGREES F; MAXIMUM SERVICE TEMPERATURE: 150 DEGREES F; MOISTURE VAPOR TRANSMISSION: ASTM E96, 0.002 PERM-INCHES; THICKNESS: 10 MIL; CONNECTIONS: PRESSURE SENSITIVE COLOR MATCHING VINYL TAPE.

EXPOSED PIPING LESS THAN 10 FEET ABOVE FINISHED FLOOR: LOCATE INSULATION AND COVER SEAMS IN LEAST VISIBLE LOCATIONS. INSTALL PVC JACKETS AND FITTING COVERS.

GLASS FIBER INSULATED PIPES CONVEYING FLUIDS BELOW AMBIENT TEMPERATURE: PROVIDE VAPOR BARRIER JACKETS, FACTORY-APPLIED OR FIELD-APPLIED. SECURE WITH SELF-SEALING LONGITUDINAL LAPS AND BUTT STRIPS WITH PRESSURE SENSITIVE ADHESIVE. SECURE WITH OUTWARD CLINCH EXPANDING STAPLES AND VAPOR BARRIER MASTIC. VAPOR BARRIER SHALL INSULATE FITTINGS, JOINTS, AND VALVES WITH MOLDED INSULATION OF LIKE MATERIAL AND THICKNESS AS ADJACENT PIPE. FINISH WITH GLASS CLOTH AND VAPOR BARRIER ADHESIVE OR PVC FITTING COVERS.

PROVIDE CALCIUM SILICATE INSERTS WHERE PIPES PASS THROUGH WALLS, SLEEVES, PIPE HANGERS/ROLLERS, AND OTHER PIPE INSULATE ENTIRE SYSTEM INCLUDING FITTINGS, VALVES, UNIONS, FLANGES, STRAINERS, ETC.. BEVEL AND SEAL ENDS OF INSULATION. PROVIDE REMOVABLE INSULATION ACCESS SECTIONS TO PERMIT ACCESS AND REMOVAL OF UNIONS, FLANGES, AND STRAINER

GLASS FIBER INSULATED PIPES CONVEYING FLUIDS ABOVE AMBIENT TEMPERATURE: PROVIDE STANDARD JACKETS, WITH VAPOR BARRIER, FACTORY-APPLIED OR FIELD-APPLIED. SECURE WITH SELF-SEALING

LONGITUDINAL LAPS AND BUTT STRIPS WITH PRESSURE SENSITIVE ADHESIVE. SECURE WITH OUTWARD CLINCH EXPANDING STAPLES. INSULATE FITTINGS, JOINTS, AND VALVES WITH INSULATION OF LIKE MATERIAL AND THICKNESS AS ADJOINING PIPE. FINISH WITH GLASS CLOTH AND ADHESIVE OR PVC FITTING COVERS. FINISH WITH TAPE AND WHITE PAINTABLE VAPOR BARRIER JACKET.

PROVIDE CALCIUM SILICATE INSERTS WHERE PIPES PASS THROUGH WALLS, SLEEVES, PIPE HANGERS/ROLLERS, AND OTHER PIPE INSULATE ENTIRE SYSTEM INCLUDING FITTINGS, VALVES, UNIONS, FLANGES, STRAINERS, FLEXIBLE CONNECTIONS, PUMP BODIES, AND EXPANSION JOINTS. BEVEL AND SEAL ENDS OF INSULATION.

GALVANIZED STEEL BETWEEN PIPE HANGERS OR PIPE HANGER ROLLS AND INSERTS. ALL PIPING, ALL SIZES, SHALL HAVE SHIELDS INSTALLED BETWEEN THE PIPE HANGERS AND INSULATION OR INSERTS.

CONTINUE INSULATION THROUGH WALLS, SLEEVES, PIPE HANGERS/ROLLERS, AND OTHER PIPE PENETRATIONS. INSTALL STEEL SLEEVES AT ALL WALL AND FLOOR PENETRATIONS. FINISH AT SUPPORTS, PROTRUSIONS, AND INTERRUPTIONS.

ENDS OF INSULATION SHALL BE SEALED OFF. SPRAY PAINT IS NOT ACCEPTABLE. THERE SHALL BE NO EXPOSED ENDS.

DOMESTIC HOT WATER SUPPLY, DOMESTIC HOT WATER RE-CIRCULATION:

PIPE SIZE RANGE: 1-1/4" AND SMALLER = 1" THICK PIPE SIZE RANGE: 1-1/2" AND LARGER = 1-1/2" THICK DOMESTIC COLD WATER SUPPLY:

PIPE SIZE RANGE: 1-1/4" AND SMALLER = 0.5" THICK

PIPE SIZE RANGE: 1-1/2" AND LARGER = 1" THICK SECTION 221005 - PLUMBING PIPING

SANITARY SEWER (SAN. V) PIPING, BURIED WITHIN 5 FEET OF BUILDING:

CAST IRON PIPE: CISPI 301, HUBLESS WITH CAST IRON FITTINGS AND CISPI 310 JOINTS (NEOPRENE GASKET WITH STAINLESS STEEL CLAMP AND SHIELDS) PVC PIPE: ASTM D2665 OR ASTM D 3024, PVC JOINTS SOLVENT WELDED WITH ASTM D 2564 SOLVENT CEMENT ALL PIPES PASSING UNDER FOOTINGS SHALL BE CISPI 301, SERVICE WEIGHT, HUBLESS, CAST IRON PIPE WITH

NEOPRENE GASKETS AND STAINLESS STEEL CLAMP-AND-SHIELD GASKETS. SANITARY SEWER (SAN, V) PIPING, ABOVE GRADE:

CAST IRON PIPE: CISPI 301, HUBLESS WITH CAST IRON FITTINGS AND CISPI 310 JOINTS (NEOPRENE GASKET WITH STAINLESS STEEL CLAMP AND SHIELDS) PVC PIPE: ASTM D2665 OR ASTM D 3024, PVC JOINTS SOLVENT WELDED WITH ASTM D 2564 SOLVENT CEMENT - WHERE

DOMESTIC COLD WATER (CW) PIPING, BURIED WITHIN 5 FEET OF BUILDING: COPPER TUBING: TYPE K, ASTM B88, SEAMLESS AND JOINTLESS SOFT COPPER TUBING MAY BE USED FOR SIZES 2 INCHES AND LESS. NO SOLDER JOINTS SHALL BE PERMITTED BELOW GRADE.

DOMESTIC HOT WATER (HW), COLD WATER (CW), DOMESTIC HOT WATER RECIRC. (HWR) PIPING, ABOVE GRADE: COPPER TUBING: ASTM B88, TYPE L (B), HARD DRAWN FOR SIZES 4 INCH AND SMALLER. EXCEPTION: ALL DOMESTIC HOT WATER PIPING SHALL BE COPPER. FITTINGS: ASME B16.18, CAST COPPER ALLOY, OR ASME B16.22, WROUGHT COPPER AND BRONZE. JOINTS: ASTM B32, SOLDER, GRADE 95TA. SOLDER CONTAINING LEAD WILL NOT BE PERMITTED. PEX TUBING: PEX TUBING MAY BE USED FOR CW/HW/HWR BRANCHES 1-1/2" OR LESS. NOTE THAT PIPE SIZES ON PLANS ARE NOMINAL COPPER TUBING SIZES - - - > PEX TUBING I.D. MUST BE AT LEAST SAME DIAMETER AS NOMINAL COPPER TUBING SIZE

GAS (NATURAL OR PROPANE) PIPING (G), ABOVE GRADE: STEEL PIPE: ASTM A53, SCHEDULE 40 BLACK. FITTINGS: ASTM A234, WROUGHT STEEL WELDING TYPE, OR ASME B16.3 MALLEABLE IRON. JOINTS: NFPA 54, THREADED OR WELDED TO ASME B31.1. CORRUGATED STAINLESS STEEL TUBING (CSST), ALLOWED FOR INTERIOR RUN-OUTS < 1": ASTM 240, STAINLESS STEEL WITH A

PROVIDE TRANSITIONS FOR JOINING TWO DIFFERENT TYPES OF PIPE MATERIALS SUCH AS CAST IRON, STEEL, COPPER, OR PLASTIC. FABRICATE TRANSITIONS WITH BUSHINGS CAPABLE OF RESISTING NORMAL MOISTURE CORROSION.

INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT. ESTABLISH ELEVATIONS OF BURIED PIPING OUTSIDE THE BUILDING TO ENSURE NOT LESS THAN 4' OF COVER. INSTALL CONCRETE THRUST BLOCKS AT ELBOWS OF UNDERGROUND DOMESTIC WATER SERVICE PIPING. INSTALL WATER PIPING TO ASME B31.9.

EACH FIXTURE, OR GROUP OF PLUMBING FIXTURES, SHALL HAVE ISOLATION VALVES PROVIDED. ALL COLD WATER AND HOT WATER RUN-OUTS FROM PIPING MAINS TO FIXTURES SHALL HAVE ISOLATION VALVES INSTALLED NEAR THE MAIN TAKE-OFF, WHETHER SHOWN ON THE PLANS OR NOT.

PROVIDE DIELECTRIC CONNECTIONS AT JOINING OF DISSIMILAR METALS. SLOPE AND INSTALL PIPING TO DRAIN AT LOW POINTS. INSTALL SLEEVES AT WALL AND FLOOR PENETRATIONS. PROVIDE SEAL TO ACHIEVE APPROPRIATE FIRE SEPARATION WHERE REQUIRED. PROVIDE UNIONS OR FLANGES TO PERMIT REMOVAL OF EQUIPMENT, CONTROL VALVES, ETC. FROM THE PIPING SYSTEM FOR MAINTENANCE/REPLACEMENT. MAKE FINAL CONNECTIONS TO EQUIPMENT WITH UNIONS OR FLANGES LOCATED BETWEEN EQUIPMENT

PROVIDE ACCESS PANELS TO VALVES AND FITTINGS NOT EXPOSED. MINIMUM UNDERGROUND SANITARY PIPING SIZE SHALL BE 3".

MINIMUM WALL THICKNESS OF 0.010". SYSTEM SHALL COMPLY WITH ANSI LC-1.

PLUMBING VENTS THROUGH THE ROOF SHALL BE LOCATED AT LEAST 10'-0" AWAY FROM OUTDOOR AIR INTAKE LOCATIONS. ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING SHALL HAVE CODE REQUIRED CLEARANCES PROVIDED. ALL FIXTURES/EQUIPMENT SHALL BE PROVIDED WITH ISOLATION VALVES. ALL VALVES SHALL BE INSTALLED IN ACCESSIBLE

TEST BACKFLOW PREVENTION AT CONNECTIONS BETWEEN POTABLE WATER AND NONPOTABLE WATER FOR PROPER FUNCTIONING UNDER CONDITIONS NORMAL TO APPLICATION. PROVIDE OWNER WITH ONE (1) COPY OF BACKFLOW PREVENTION TEST REPORT ON POTARI F WATER PIPING SYSTEM

TEST DRAINAGE PIPING SYSTEMS IN ACCORDANCE WITH THEIR RESPECTIVE AND APPLICABLE GOVERNING CODES. TEST DRAINAGE AND WASTE PIPING HYDRAULICALLY BY FILLING SYSTEM TO ITS HIGHEST POINT OR, WHICHEVER IS GREATER, AT A STATIC HEAD OF 10 FEET. LEAKAGE AT ANY JOINT SHALL BE SUFFICIENT CAUSE FOR REJECTION AND REMAKING OF JOINT. PRESSURE TEST COLD WATER (CW) AND HOT WATER (HW) PIPING, PRIOR TO INSULATION, WITH WATER AT 225 PSIG. PERMISSIBLE PRESSURE DROP SHALL BE 0 PSIG DROP IN 2 HOURS.

MECHANICAL & PLUMBING SPECIFICATIONS

SECTION 221006 - PLUMBING SPECIALTIES

DRAIN MANUFACTURERS: JR SMITH, ZURN, WADE, MIFAB.

FLOOR DRAINS:

FLOOR DRAIN (FD-1): ASME A112.21.1M; LACQUERED CAST IRON TWO PIECE BODY WITH DOUBLE DRAINAGE FLANGE, WEEP HOLES, REVERSIBLE CLAMPING COLLAR, TRAP PRIMER CONNECTION, AND ADJUSTABLE ROUND NICKEL-BRONZE STRAINER. LACQUERED FINISH IS STANDARD. USE CLAMPING COLLAR ON FLOORS ABOVE GRADE.

THIS IS A STANDARD FLOOR DRAIN USED IN TOILET ROOMS, JANITOR'S CLOSETS, SHOWERS, ETC. PRODUCT: ZURN MODEL Z-415 (WITH TYPE B-STRAINER) OR EQUAL.

MANUFACTURERS: JR SMITH, ZURN, WADE, MIFAB.

AT EXTERIOR SURFACED AREAS: ROUND CAST NICKEL BRONZE ACCESS FRAME AND NON-SKID COVER. AT EXTERIOR UNSURFACED AREAS: LINE TYPE WITH LACQUERED CAST IRON BODY AND ROUND EPOXY COATED GASKETED COVER. AT INTERIOR FINISHED FLOOR AREAS ON GRADE: SMITH MODEL 4025-F CAST IRON BODY WITH ROUND, HEAVY DUTY, SCORIATED POLISHED-BRONZE FLUSH COVER. COVER SHALL BE ADJUSTABLE TO FINISHED FLOOR AFTER CONCRETE HAS SET. AT INTERIOR FINISHED WALL AREAS ON GRADE: LINE TYPE WITH CAST IRON BODY AND ROUND EPOXY COATED GASKET COVER AND ROUND STAINLESS STEEL ACCESS COVER WITH MACHINE SCREW INSTALLED FLUSH WITH THE WALL.

MANUFACTURERS: WOODWARD, J.R. SMITH, WATTS, ZURN, WADE, MIFAB.

INTERIOR HOSE BIBBS (HB-1): UT, CHROME PLATED WHERE EXPOSED WITH HANDWHEEL, INTEGRAL VACUUM BREAKER IN CONFORMANCE WITH ASSE 1011. HALF TURN HANDLE. 3/4" INLET. PRODUCT: WOODFORD MODEL 40HT. INTERIOR MIXING TYPE HOSE BIBBS (HB-2): BRONZE OR BRASS, WALL MOUNTED, DOUBLE SERVICE FAUCET WITH 3/4 INCH HOSE THREAD SPOUT, INTEGRAL STOPS, CHROME PLATED WHERE EXPOSED WITH HANDWHEELS, AND VACUUM BREAKER IN CONFORMANCE WITH ASSE 1011. PRODUCT: WOODFORD MODEL 22CC OR EQUAL.

BACKFLOW PREVENTERS:

QUALITY ASSURANCE

MANUFACTURERS: CONBRACO, ZURN, WATTS, MIFAB ASSE 1013: BRONZE BODY WITH BRONZE INTERNAL PARTS AND STAINLESS STEEL SPRINGS; TWO INDEPENDENTLY OPERATING, SPRING LOADED CHECK VALVES; DIAPHRAGM TYPE DIFFERENTIAL PRESSURE RELIEF VALVE LOCATED BETWEEN CHECK VALVES; THIRD CHECK VALVE THAT OPENS UNDER BACK PRESSURE IN CASE OF DIAPHRAGM FAILURE; NON-THREADED VENT OUTLET; ASSEMBLED WITH TWO GATE VALVES, STRAINER, AND FOUR TEST COCKS. OPTIONS/ACCESSORIES: EPOXY COATED WYE TYPE STRAINER (FLANGED ENDS), OS&Y PRODUCT: ZURN-WILKENS MODEL 375A OR EQUAL

FLOOR DRAIN TRAP SIZE SHALL MATCH THE OUTLET SIZE OF THE DRAIN AND THE SIZE SHOWN ON THE PLANS. FLOOR DRAINS SUBJECT TO LOSS BY EVAPORATION (E.G. STORAGE ROOMS, MECHANICAL ROOMS, BATHROOMS, ETC.) SHALL BE PROTECTED BY A TRAP SEAL PROTECTOR.

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING

THE TEST AND BALANCE CONTRACTOR SHALL SUBMIT TEST REPORTS ON AABC MN-1 FORMS, FORMS PREPARED FOLLOWING ASHRAE STD. 111, OR NEBB FORMS. INCLUDE THE FOLLOWING ON THE TITLE PAGE OF EACH REPORT: NAME OF TESTING, ADJUSTING, AND BALANCE AGENCY; ADDRESS OF TESTING, ADJUSTING, AND BALANCE AGENCY; TELEPHONE OF TESTING, ADJUSTING, AND BALANCE AGENCY; PROJECT NAME: PROJECT LOCATION: PROJECT ENGINEER: PROJECT DATE.

PERFORM TOTAL SYSTEM BALANCING IN ACCORDANCE WITH AABC MN-1, ASHRAE STD. 111, OR NEBB PROCEDURAL STANDARDS FOR TESTING, BALANCING, AND ADJUSTING OF ENVIRONMENTAL SYSTEMS. TAB AGENCY QUALIFICATIONS: COMPANY SPECIALIZING IN THE TESTING, ADJUSTING, AND BALANCING OF SYSTEMS SPECIFIED IN THIS section with minimum 5 years documented experience. Tab agency shall be a member of the the associated air balance COUNCIL (AABC), OR SHALL BE A CERTIFIED MEMBER OF THE STATE CHAPTER OF THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB), OR NATIONAL BALANCING COUNCIL (NBC), AND SHALL SUBMIT ADEQUATE DOCUMENTATION AS TO ITS COMPETENCE.

PRE-APPROVED TESTING CONTRACTORS: 1. INTEGRITY TEST & BALANCE: 4408 WEATHERBY LANE, TRAVERSE CITY, MI 49684, (231-929-0904) - CONTACT KEVIN HEIKKILA. 2. HI-TECH TEST & BALANCE: FREELAND, MI (989-695-5498). 3. CONTROLS SOLUTIONS INC TEST & BALANCE: BYRON CENTER, MI (616-5247-9422); ALPENA, MI (989-379-2404).

INSTILLATION TOLERANCES: AIR HANDLING SYSTEMS: ADJUST TO WITHIN PLUS OR MINUS 5 PERCENT OF DESIGN FOR SUPPLY SYSTEMS AND PLUS OR MINUS 10 PERCENT OF DESIGN FOR RETURN AND EXHAUST SYSTEMS. AIR OUTLETS AND INLETS: ADJUST TOTAL TO WITHIN PLUS 10 PERCENT AND MINUS 5 PERCENT OF DESIGN TO SPACE. ADJUST OUTLETS AND INLETS IN SPACE TO WITHIN PLUS OR MINUS 10 PERCENT OF DESIGN.

AIR SYSTEM PROCEDURE: ADJUST AIR HANDLING AND DISTRIBUTION SYSTEMS TO PROVIDE REQUIRED OR DESIGN SUPPLY, RETURN, AND EXHAUST AIR QUANTITIES. MAKE AIR QUANTITY MEASUREMENTS IN DUCTS BY PILOT TUBE TRAVERSE OF ENTIRE CROSS SECTIONAL AREA OF DUCT. MEASURE AIR QUANTITIES AT AIR INLETS AND OUTLETS. adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise. USE VOLUME CONTROL DEVICES TO REGULATE AIR QUANTITIES ONLY TO EXTEND THAT ADJUSTMENTS DO NOT CREATE ORIECTIONABLE AIR MOTION OR SOUND LEVELS. EFFECT VOLUME CONTROL BY DUCT INTERNAL DEVICES SUCH AS DAMPERS AND SPLITTERS.

vary total system air quantities by adjustment of fan speeds. Provide drive Changes Required. Vary branch air

ADJUST OUTSIDE AIR DAMPERS, RETURN AIR DAMPERS, AND EXHAUST DAMPERS FOR DESIGN CONDITIONS.

SECTION 230923 - TEMPERATURE CONTROLS QUALITY ASSURANCE: THE CONTRACTOR SHALL FURNISH, OR SUBCONTRACT A QUALIFIED TEMPERATURE CONTROLS CONTRACTOR TO

TEST, ADJUST, AND BALANCE THE FOLLOWING ITEMS: FANS.

FURNISH, ALL CONTROLS EQUIPMENT, WIRING, LABOR REQUIRED FOR PROVIDING FULLY FUNCTIONAL TEMPERATURE CONTROL SYSTEMS. FURNISH AND INSTALL ALL SWITCHES, CONTROL VALVES/DAMPERS, THERMOSTATS, SENSORS, TIMERS, CONTROL CABINETS, AND OR ANY OTHER EQUIPMENT REQUIRED FOR CONTROL OF MECHANICAL EQUIPMENT/SYSTEMS.

ALL LOW VOLTAGE CONTROL WIRING SHALL BE INSTALLED BY THE TEMPERATURE CONTROLS CONTRACT AND SHALL BE INSTALLED PER DIVISION 16/26 ELECTRICAL REQUIREMENTS (E.G. ALL WIRING IN CONDUIT, METAL BOXES, ETC.).

DUCT SIZES SHOWN ON DRAWINGS ARE INSIDE CLEAR DIMENSIONS. FOR LINED DUCTS, MAINTAIN SIZES INSIDE LINING LOW PRESSURE DUCTWORK: UP TO 2 INCHES WG AND VELOCITIES LESS THAN 1,500 FPM. CONSTRUCT FOR 2 INCH WG POSITIVE AND NEGATIVE OR POSITIVE STATIC PRESSURES.

MATERIALS:

ALL DUCTWORK SHALL BE NON-COMBUSTIBLE AND/OR CONFORM TO REQUIREMENTS FOR CLASS 1 AIR DUCT MATERIALS, OR UL 181. GALVANIZED STEEL DUCTS: ASTM A 653/A 653/M GALVANIZED STEEL SHEET, FORMING STEEL (FS) DESIGNATION, WITH G90/Z275 ZINC COATING. GASKETS: CHLOROPRENE ELASTOMER, 40 DUROMETER, 1/8 INCH THICK, FULL FACE, ONE PIECE VULCANIZED OR DOVETAIL AT JOINTS. ALL REINFORCEMENT FOR DUCTS HAVING A SIDE DIMENSION 48" OR LESS SHALL BE EXTERNAL. INTERNAL REINFORCEMENT SHALL BE ACCEPTABLE ONLY FOR DUCTS HAVING A SIDE DIMENSION GREATER THAN 48 INCHES. REINFORCEMENT SHALL BE PROVIDED

STEEL DUCTS - GALVANIZED ROUND AND FLAT OVAL SPIRAL: GALVANIZED SHEET STEEL DUCT AND FITTINGS, LOCK FORMING QUALITY PER ASTM A527. COATING DESIGNATION G-90, FACTORY FABRICATED, LOCK SEAM OR WELDED DESIGN IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS OR SMACNA INDUSTRIAL DUCT CONSTRUCTION STANDARDS AS REQUIRED BASED ON PRESSURE CLASS. FLAT OVAL AND ROUND FITTINGS SHALL BE FACTORY FABRICATED WELDED DESIGN. USE OF FIELD FABRICATED FITTINGS (WELDED DESIGN) SHALL ONLY BE PERMITTED WHEN FACTORY FABRICATED FITTINGS ARE UNAVAILABLE. MANUFACTURERS: FOREMOST MFG. CO., SEMCO, LAPINE METAL PRODUCTS, UNITED-MCGILL

ELASTOMER CAULK, UL LISTED AND PER NFPA 90A.

SEALANT: UL LISTED AND PER NFPA 90A, NON-HARDENING, WATER RESISTANT, FIRE RESISTIVE, COMPATIBLE WITH MATING MATERIALS; LIQUID USED ALONE OR WITH TAPE, OR HEAVY MASTIC FOR USE ON ALL SEAL CLASS B JOINTS AND ALL CLASS A JOINTS FOR FLAT OVAL, RECTANGULAR, AND ROUND STEEL DUCTWORK. NOTE: USE PVC "DUCT SEALER" ON PVC COATED DUCTWORK PER MFR. RECOMMENDATIONS.

WELDED REINFORCEMENT AND SUPPORTS SHALL BE STRUCTURAL STEEL BLACK IRON PAINTED WITH ZINC RICH PAINT. SCREWED TYPE AND SUPPORTS SHALL BE STRUCTURAL STEEL PER ASTM A36; MILL GALVANIZED STEEL PER ASTM A123. FABRICATED SHEET STEEL PER ASTM A527, COATING DESIGNATION G-90. FLANGES IN CONTACT WITH THE AIRSTREAM SHALL BE OF THE SAME MATERIAL AS THE DUCTWORK.

BOLTS AND FASTENERS FOR GALVANIZED STEEL DUCT WORK SHALL BE CARBON STEEL, ZINC COATED PER ASTM A153. HANGER ROD: ASTM A 36/A 36M; STEEL, GALVANIZED; THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUSLY THREADED.

FABRICATION - LOW PRESSURE DUCTWORK (+/-2 INCH W.G. STATIC PRESSURE CLASS):

FABRICATE AND SUPPORT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, AND AS INDICATED. PROVIDE DUCT MATERIAL, GAGES. REINFORCING. AND SEALING FOR OPERATING PRESSURES INDICATED. WHERE DUCTS ARE CONNECTED TO EXTERIOR WALL LOUVERS AND DUCT OUTLET IS SMALLER THAN LOUVER FRAME, PROVIDE BLANK-OUT PANELS SEALING LOUVER AREA AROUND DUCT. USE SAME MATERIAL AS DUCT, PAINTED BLACK ON EXTERIOR SIDE; SEAL TO LOUVER FRAME AND DUCT.

DUCTWORK APPLICATION SCHEDULE:

SUPPLY AIR - GENERAL: GALVANIZED STEEL; +2 INCHES WG.

GENERAL EXHAUST - TOILET ROOMS, STORAGE, AND JANITOR'S CLOSETS: GALVANIZED STEEL; -2 INCHES WG.

OUTSIDE AIR INTAKE - GENERAL: GALVANIZED STEEL; -2 INCHES WG.

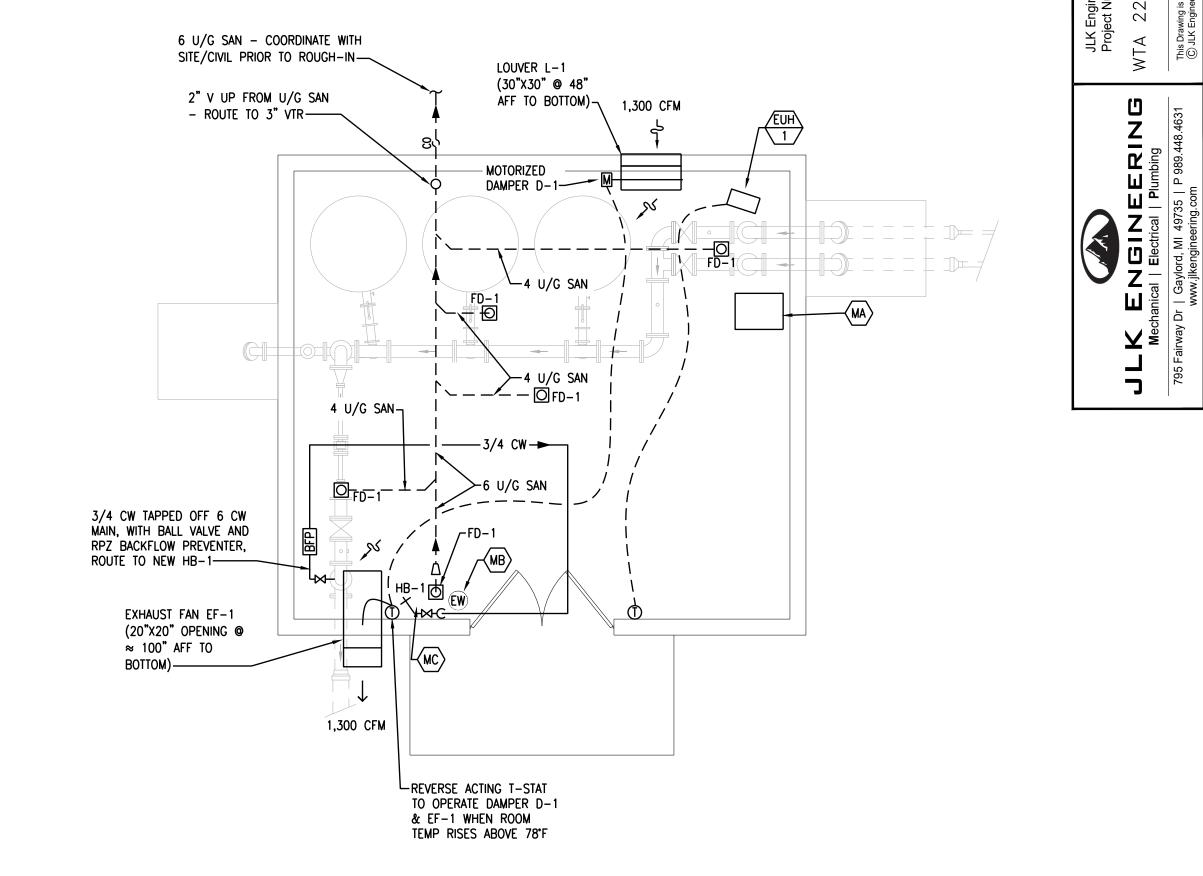
INSTALLATION: DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS. FOR LINED DUCTS, MAINTAIN SIZES INSIDE LINING. INSTALL AND SEAL METAL AND FLEXIBLE DUCTS IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND

KEYED MECHANICAL CONSTRUCTION NOTES:

INDUSTRIAL DEHUMIDIFIER - DAYTON #55HE55: 50 PT PER DAY; BUCKET COLLECTION / CONTINUOUS DRAIN; AUTO-RESTART; MODES: DEFROST/LONG DEFROST/NORMAL/SHUT-DOWN/STARTUP; AUTO DEFROST; 20' DRAIN HOSE; 755W / 5 AMP @ 115V, 10'L CORD

WALL MOUNTED PORTABLE EMERGENCY EYEWASH STATION (BY OTHERS). PROVIDE FLOOR DRAIN NEARBY FOR DRAINING VIA AIR GAP.

3/4" CW TO HOSE BIB @ 36" AFF.





	EXHAUST FAN SCHEDULE													
UNIT I.D.	UNIT I.D. TYPE	AIRFLOW CFM I	E.S.P.	RPM	MOTOR			ELECTRICAL		CURB	WEIGHT	MODEL NO.	REMARKS	
	2		IN. W.G.		BHP	HP	RPM	DRIVE	VOLTS	PHASE	HEIGHT (IN)	LBS	MODEL NO.	KEMAKKS
EF-1	SIDEWALL PROPELLER	1,300	0.15	1,618	0.11	1/4	1,750	DIRECT	115	1	N/A	105	SE1-12-432	SEE NOTES

1. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.

2. PROVIDE FAN WITH FOLLOWING OPTIONS/ACCESSORIES: MOTOR WITH THERMAL OVERLOAD; PCS MOTOR; UL 705 LISTED; EXHAUST AIRFLOW; SHORT WALL HOUSING, FLUSH EXTERIOR W/ OSHA GUARD; MOTOR ACCESS FROM INTERIOR; NEMA-1 SWITCH TOGGLE (MOUNTED AND WIRED); CLOSURE ANGLES; WEAHTERHOOD, GALV 45 DEGREE, WITH BIRDSCREEN; WIRING PIGTAIL, INTERNAL 9 FT FROM UNIT FLEX METAL CONDUIT; SOLID STATE SPEED CONTROL-5WSSC (SHIPPED LOOSE); DAMPER MOUNTED, WD-320-PB-14x14, GRAVITY OPERATED.

3. INSTALL/WIRE 120V REVERSE ACTING T-STAT (W/ FAN/AUTO/OFF) TO START/STOP FAN.

			F/	۸N	F	LECTRICA	NI I	WEIGHT		
	CAPACITY MBH	CAPACITY KW	TYPE	AIRFLOW CFM	VOLTS	PHASE	MAX AMPS	WEIGHT LBS	MODEL NO.	REMARKS
EUH-1	17	5.0	PROPELLER	400	208	1/3	24/14	27	5100 SERIES F2F5105N	SEE NOTES

1. MODEL NUMBERS ARE MARKEL UNLESS OTHERWISE NOTED. TRANE AND Q-MARK MAY BE BID AS EQUALS.

2. PROVIDE THE FOLLOWING OPTIONS: WALL/CEILING MOUNT BRACKET; DUST SHIELD; FAN GUARD. 3. PROVIDE OPTIONAL POWER DISCONNECT SWITCH.

4. PROVIDE REMOTE WALL MOUNTED T-STAT, WITH EITHER LINE OR LOW VOLTAGE WIRING.

						W	/ALL	LOUVE	ER SC	HEDULE			
UNIT I.D.	SYSTEM SERVED	AIRFLOW RATE (CFM)	TYPE	FREE AREA SQ.FT.	FACE VELOCITY (FPM)	PRESSURE DROP (IN.WC.)	WIDTH	OVERALL HEIGHT (INCHES)	DEPTH (INCHES)	CONSTRUCTION	COLOR	MODEL NO.	REMARKS
L-1	OUTDOOR AIR INTAKE	1,300	INTAKE	2.86	454	0.04	30	30	6	EXTRUDED ALUMINUM	NOTE 2	ESD-603	SEE NOTES

1. MODEL NUMBERS ARE GREENHECK UNLESS NOTED OTHERWISE.

2. LOUVERS SHALL HAVE A ACROFLUR COATING WITH 50% KYNAR OR HYLAR IN ITS RESIN SYSTEM WITH A 5 YEAR ADHESION WARRANTY AND 5 YEAR CHALKING/FADING WARRANTY. COORDINATE COLOR WITH ENGINEER PRIOR TO ORDERING. PROVIDE COLOR CHART WITH SHOP DRAWING SUBMITTAL 3. PROVIDE WITH THE FOLLOWING OPTIONS: EXTENDED SILL, ALUMINUM BIRDSCREEN.

4. PROVIDE LOUVER WITH AUTOMATIC DAMPER D-1 WITH ELECTRIC ACTUATOR: DAMPER SHALL BE CONNECTED TO THE 30"L×30"H PLENUM AND SHALL BE A GREENHECK VCD-23 LOW LEAK DAMPER (OR EQUAL) WITH GALVANIZED STEEL FRAME, GALVANIZED STEEL AIRFOIL BLADES, VINYL BLADE SEALS, STEEL AXLES, SYNTHETIC BEARINGS. DAMPER ACTUATOR SHALL BE A 120V, SPRING FAIL CLOSED/POWER OPEN, TWO POSITION ACTUATOR LOCATED EXTERNALLY (BY BELIMO, SIEMENS, OR INVENSYS). 5. OPEN DAMPER UPON START OF EF-1 AND CLOSE THE DAMPER UPON STOP OF EF-1.

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4241 Old US 2 PO Box 618 Gaylord, MI 49 989.732.3584

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