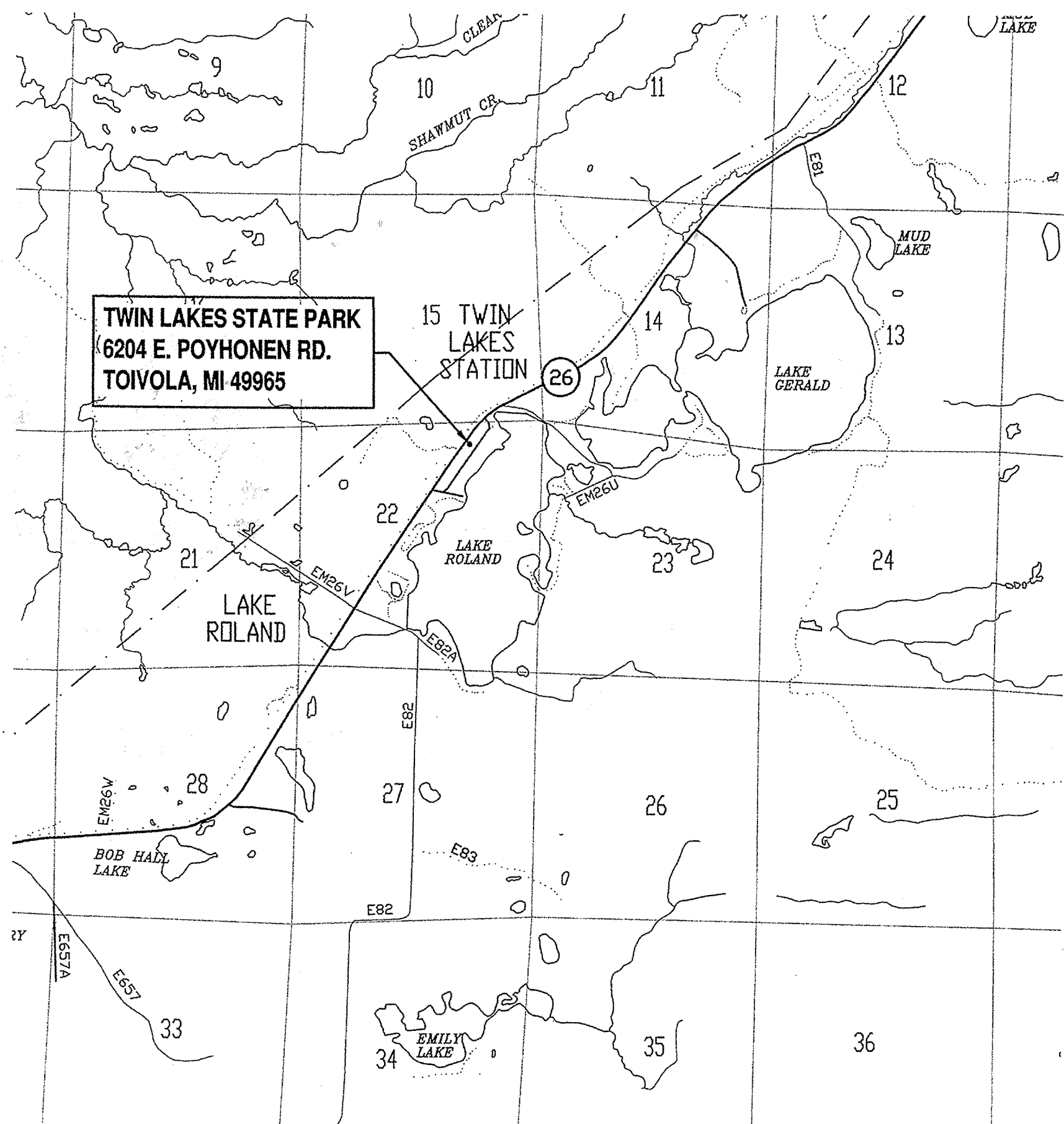


MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
PARK & RECREATION DIVISION - BARAGA DISTRICT  
WELL HOUSE IMPROVEMENTS  
TWIN LAKES STATE PARK  
HOUGHTON COUNTY  
FILE NO.: 751/12005.RAA  
INDEX NO.: 51110

TWIN LAKES STATE PARK



TWIN LAKES STATE PARK  
VICINITY MAP

NO SCALE



STATE OF MICHIGAN  
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET  
FACILITIES AND BUSINESS SERVICES ADMINISTRATION  
DESIGN AND CONSTRUCTION DIVISION  
ROBERT C. HALL, RA, NCARB, DIRECTOR



ENGINEERING  
ARCHITECTURE  
PLANNING  
SURVEYING  
ENVIRONMENTAL

100 PORTAGE STREET  
HOUGHTON, MI 49931  
(906) 482-4810  
102 W. WASHINGTON, SUITE 217  
MARQUETTE, MI 49855  
(906) 228-6061  
424 SOUTH PINE STREET  
ISHPEMING, MI 49849  
(906) 485-1011  
2806 N. STEPHENSON AVE. SUITE 2  
IRON MOUNTAIN, MI 49801  
(906) 563-5407  
707 ASHMUN STREET  
SAULT STE. MARIE, MI 49783  
(906) 635-0511  
1701 DUNLAP AVE. SUITE B  
MARINETTE, WI 54143  
(715) 732-4188

PROJECT TITLE:  
WELL HOUSE  
IMPROVEMENTS  
TWIN LAKES STATE PARK

OWNER:  
MICHIGAN DEPT. OF  
NATURAL RESOURCES

PROJECT LOCATION:  
HOUGHTON  
COUNTY

CONTACT LIST:

DTMB PROJECT DIRECTOR  
ROBERT ADAMS  
MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET  
FACILITIES ADMINISTRATION - DESIGN & CONSTRUCTION

RECREATION DIVISION  
LEE VERBERKMOES, UNIT SUPERVISOR  
MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
RECREATION DIVISION  
TWIN LAKES AND McLAIN STATE PARKS

ERIC CADEAU, REGIONAL FIELD PLANNER  
MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
RECREATION DIVISION

RICH PIRHONEN, PARK SUPERVISOR  
MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
RECREATION DIVISION  
TWIN LAKES STATE PARK

PROFESSIONAL SERVICE CONTRACTOR  
GREG KINGSTROM, P.E.  
U.P. ENGINEERS & ARCHITECTS, INC  
100 PORTAGE STREET  
HOUGHTON, MICHIGAN 49931  
(906) 482-4810

PERMITS / APPROVALS RECIEVED:

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS  
BUREAU OF CONSTRUCTION CODES  
BUILDING PLAN REVIEW, PROJECT NO. 103356  
LANSING, MI 48909

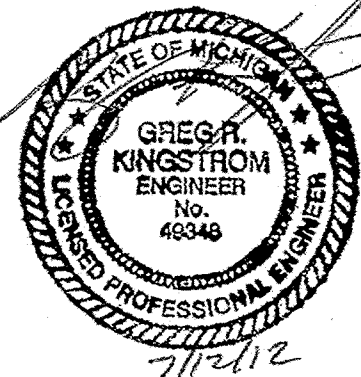
WESTERN UPPER PENINSULA HEALTH DEPARTMENT  
WATER SUPPLY SYSTEM CONSTRUCTION  
540 DEPOT STREET  
HANCOCK, MI 49930  
906-482-7382

INDEX OF SHEETS

NUMBER	SHEET NAME
G110	TITLE SHEET
C110	TWIN LAKES STATE PARK - EXISTING/OVERALL SITE PLAN
C111	TWIN LAKES STATE PARK - PROPOSED WELL HOUSE SITE PLANS
A110	TWIN LAKES STATE PARK - WELL HOUSE PLAN
<del>A111</del>	<del>TWIN LAKES STATE PARK - BACKUP WELL HOUSE REFIT</del> NOT IN CONTRACT
A510	TWIN LAKES STATE PARK - WELL HOUSE DETAILS
P110	TWIN LAKES STATE PARK - WELL HOUSE PLUMBING PLAN & DETAILS
E110	TWIN LAKES STATE PARK - WELL HOUSE ELECTRICAL PLAN & DETAILS

FILE NO.: 751/12005.RAA  
INDEX NO.: 51110

AS-BUILTS	JUNE 2013
BID DOCUMENTS	07-12-12
90% REVIEW	06-08-12
50% REVIEW	03-20-12
ISSUED FOR:	DATE:



PROJECT NO: M12-12148  
DESIGNED BY: GRK  
DRAWN BY: JH  
CHECKED: GRK  
APPROVED: GRK

TITLE SHEET

G110





ENGINEERING  
ARCHITECTURE  
PLANNING  
SURVEYING  
ENVIRONMENTAL

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PROJECT TITLE:  
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TWIN LAKES STATE PARK**

OWNER:  
**MICHIGAN DEPT. OF  
NATURAL RESOURCES**

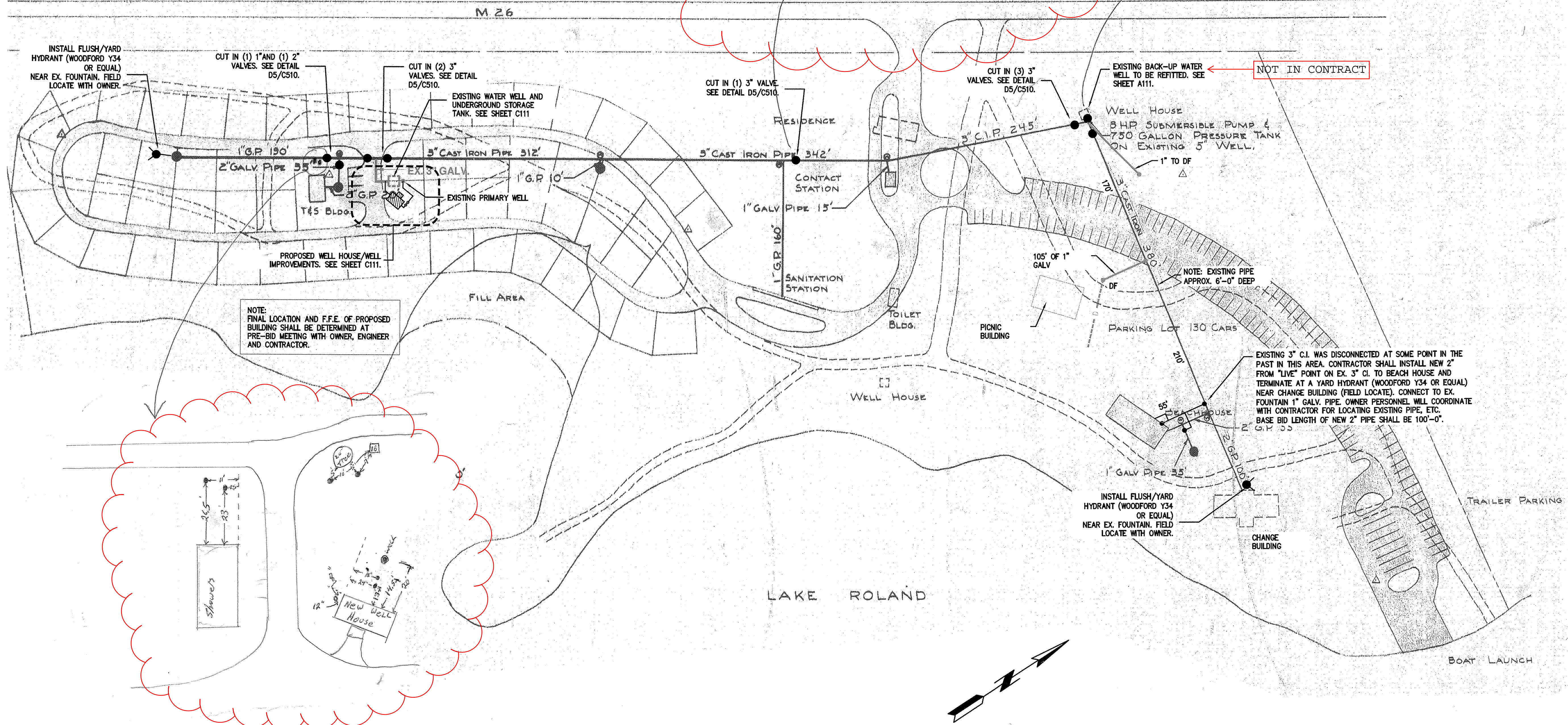
PROJECT LOCATION:  
**HOUGHTON  
COUNTY**

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DESIGNED BY: GRK  
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APPROVED: GRK

**TWIN LAKES STATE PARK  
EXISTING OVERALL  
SITE PLAN**

**C110**



**A1 EXISTING/PROPOSED SITE PLAN**  
NOT TO SCALE

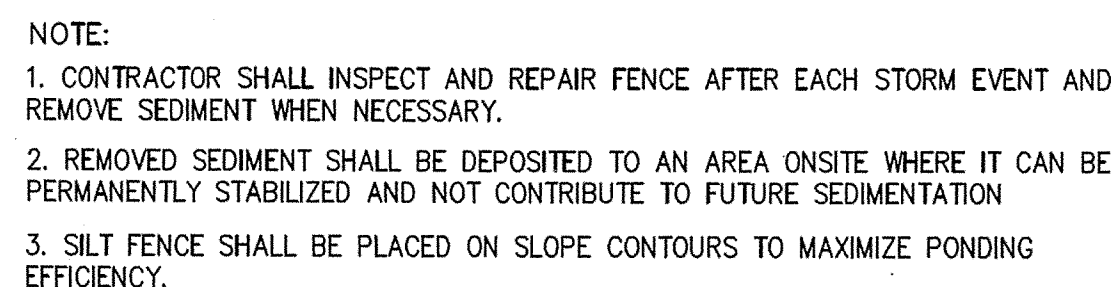
THIS PLAN WAS COPIED FROM AN EXISTING MDNR SITEPLAN AND MAY CONTAIN ELEMENTS NOT RELEVANT TO THE WORK OF THIS PROJECT. DIMENSIONS, SIZES, AND LOCATIONS OF SOME ITEMS SHOWN MAY DIFFER FROM CURRENT SITE CONDITIONS. THIS PLAN IS INTENDED TO BE A GENERAL REPRESENTATION OF THE EXISTING SITE AND CONDITIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR.

**GENERAL SCOPE OF WORK  
TWIN LAKES STATE PARK**

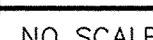
THE PROPOSED WORK AT TWIN LAKES STATE PARK INCLUDES BUT IS NOT LIMITED TO:

1. INSTALL CUT-IN VALVES AND FLUSH HYDRANTS IN EXISTING DISTRIBUTION SYSTEM.
2. DEMO EXISTING TANK VAULT SYSTEM.
3. REHAB EXISTING PRIMARY WELL.
4. CONSTRUCT NEW WELL HOUSE AT PRIMARY WELL.
5. CONNECT WELL HOUSE TO EXISTING DISTRIBUTION SYSTEM.
6. REFIT EXISTING BACKUP WELL HOUSE/PIPING.

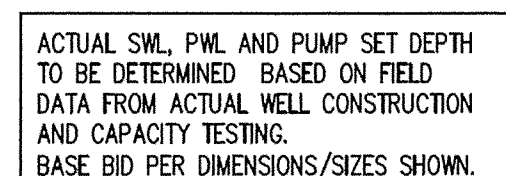




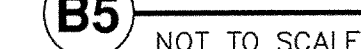
## NO SCALE



CONTRACTOR SHALL PROVIDE AND INSTALL TREES IN ABOVE SCHEDULE. FINAL LOCATION OF PLANTINGS WILL BE DETERMINED IN THE FIELD BY OWNER UPON COMPLETION OF WELL HOUSE AND RESTORATION OF SITE



**A3** PRO  
NO SCALE



**OWNER:**  
**MICHIGAN DEPT. OF  
NATURAL RESOURCES**

**PROJECT LOCATION:**  
**HOUGHTO  
COUNTY**

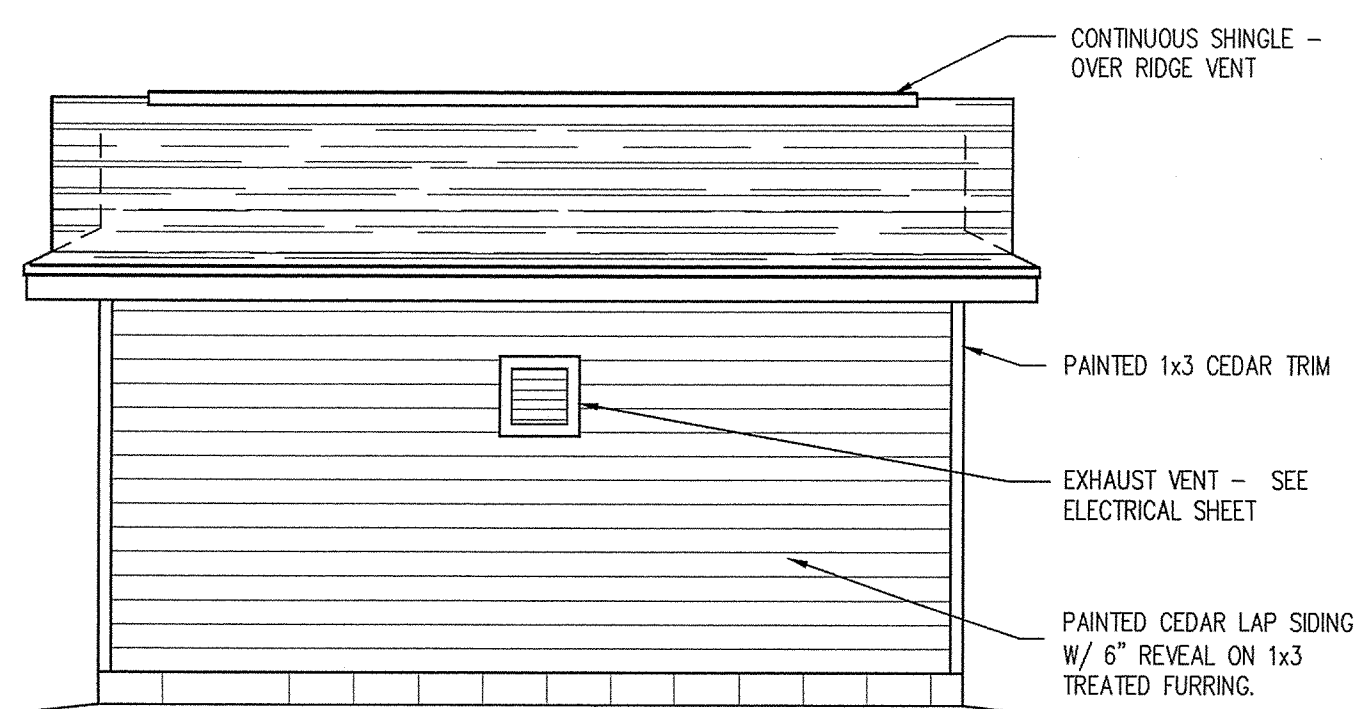
AS-BUILTS	JUNE 2013
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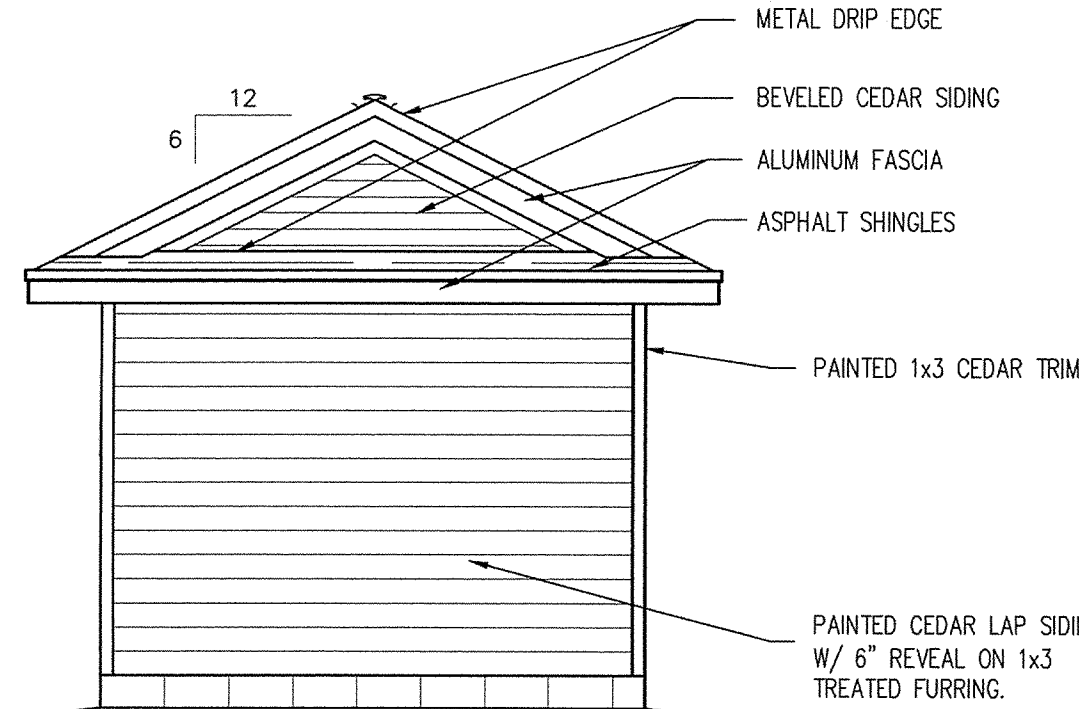
# TWIN LAKES STATE PARK PROPOSED WELL HOUSE SITE PLAN

**C111**

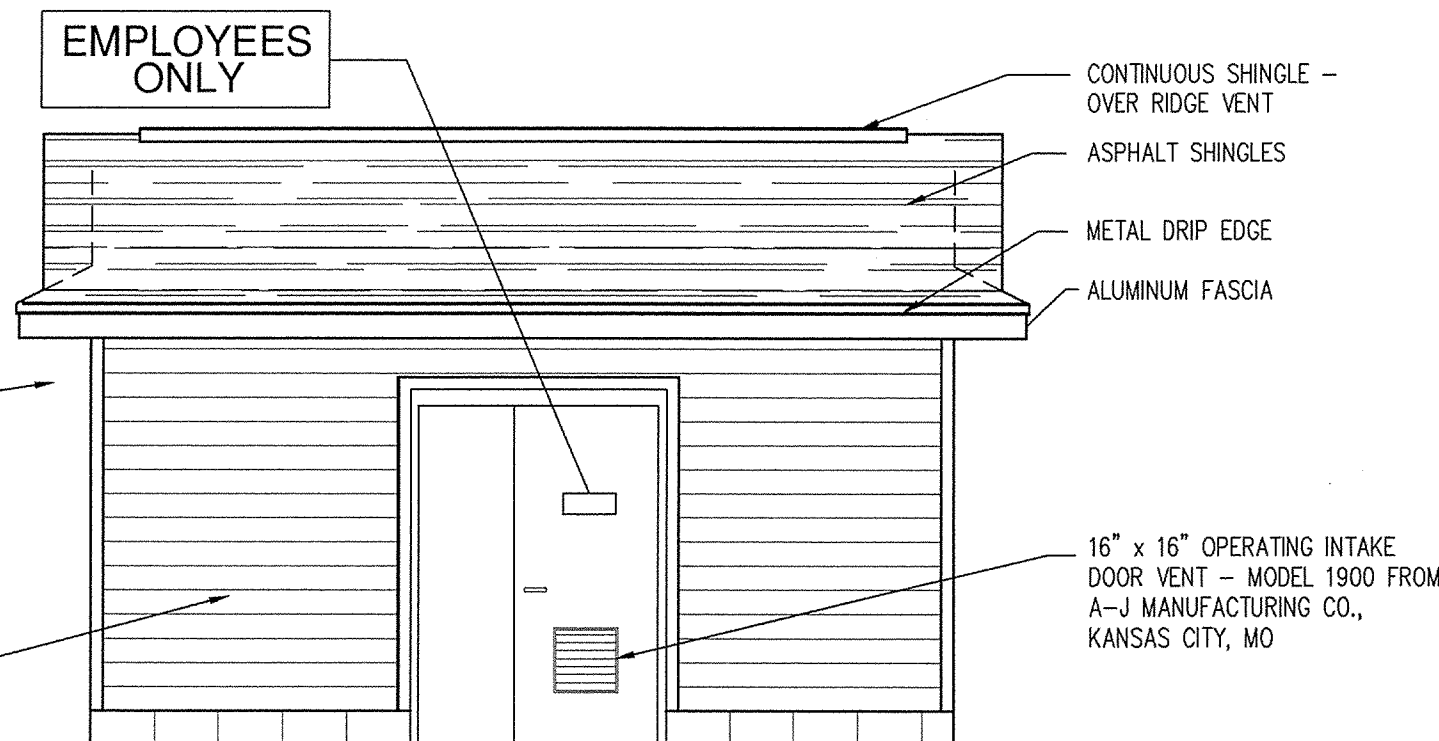




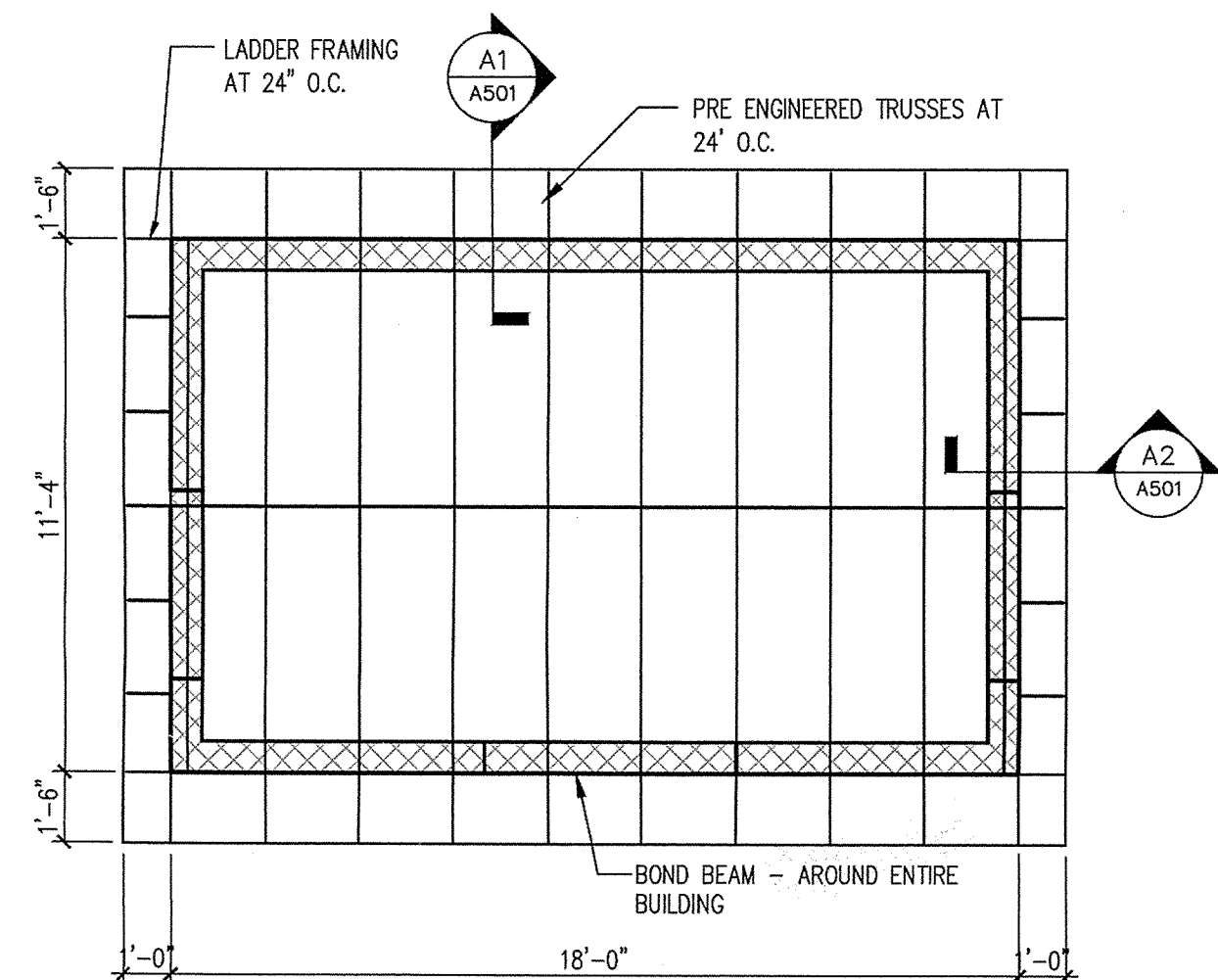
D1 REAR ELEVATION  
1/4" = 1'-0"



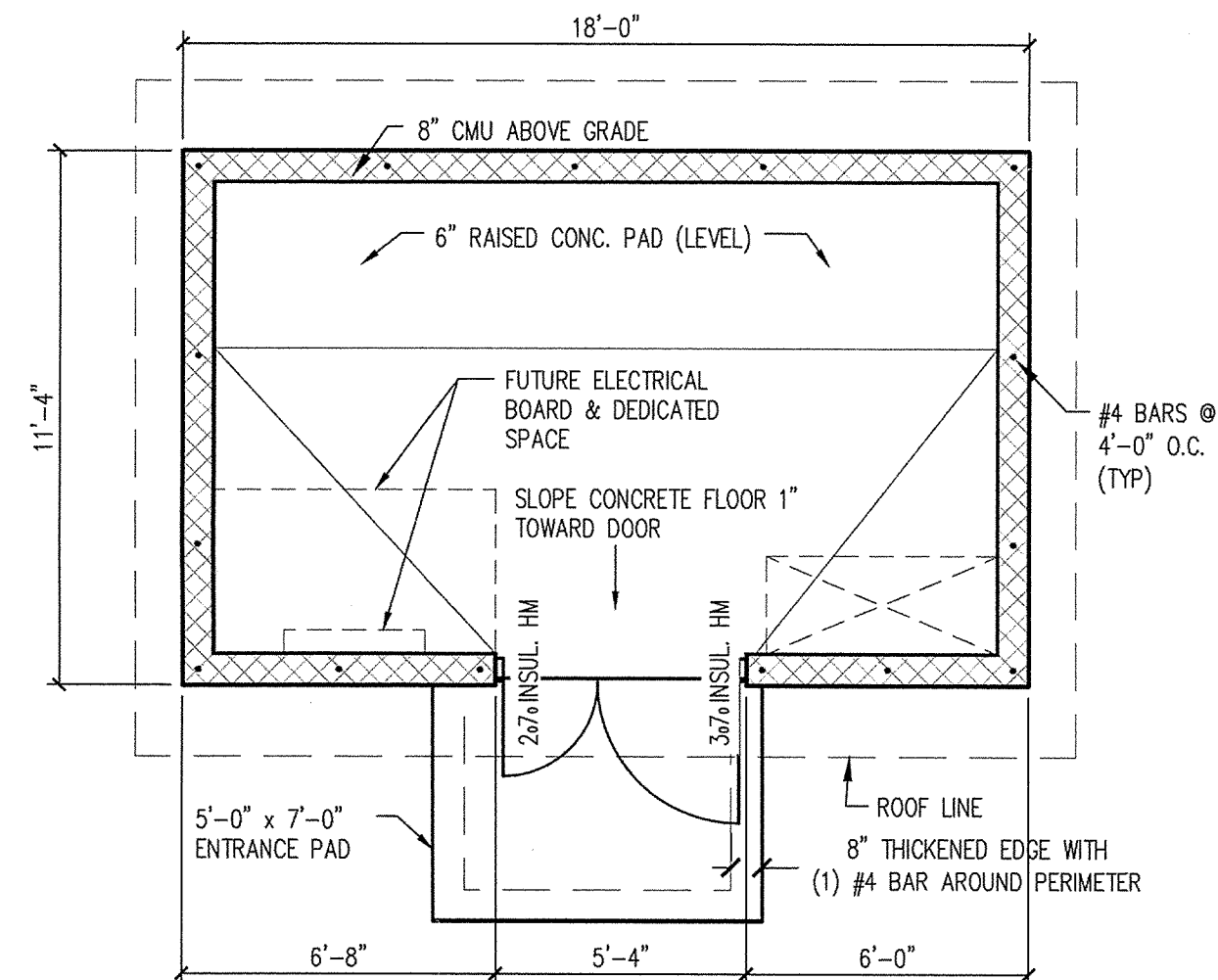
D1 SIDE ELEVATION  
1/4" = 1'-0"



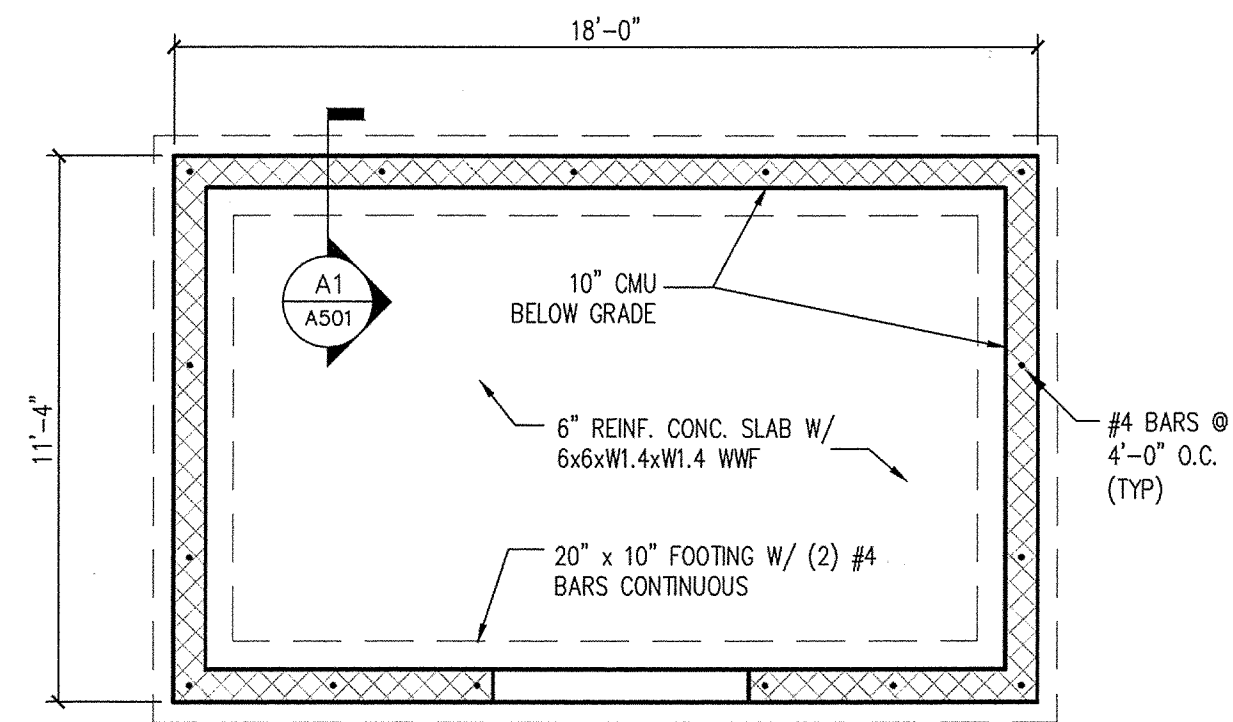
D1 FRONT ELEVATION  
1/4" = 1'-0"



C1 ROOF FRAMING PLAN  
1/4" = 1'-0"



C2 FLOOR PLAN  
1/4" = 1'-0"



C3 FOUNDATION PLAN  
1/4" = 1'-0"

#### SOILS

- ALL FOUNDATION BACKFILL MATERIAL SHALL BE MDOT CLASS I GRANULAR FILL COMPACTED 95% MAXIMUM DENSITY.
- ALL BASE MATERIAL UNDER SLABS AND SIDEWALKS SHALL BE MDOT CLASS II GRANULAR FILL COMPACTED 95% MAXIMUM DENSITY WITH A MINIMUM THICKNESS OF (6) SIX INCHES UNLESS SPECIFIED OTHERWISE ON THE CONSTRUCTION PLANS AND "FOUNDATIONS NOTE 1."
- ALL FOOTINGS SHALL BE PLACED ON NATURAL UNDISTURBED SOIL, UNLESS SITE CONDITIONS PROHIBIT. FOOTINGS REQUIRING BASE FILL MATERIAL SHALL BE BACKFILLED WITH MDOT CLASS II GRANULAR FILL COMPACTED TO 98% MAXIMUM DENSITY.
- ANY SUBSURFACE CONDITIONS OR EXISTING FOUNDATIONS ENCOUNTERED THAT ARE NOT REPRESENTED ON THE PLANS OR IN THE SPECIFICATIONS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER FOR INSPECTION AND/OR AN ALTERNATE FOUNDATION/FOOTING DESIGN.

#### GENERAL NOTES

- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE AND TO CROSS-CHECK DETAILS AND DIMENSIONS ON THE CONSTRUCTION DOCUMENTS BEFORE THE CONTRACTOR PROCEEDS WITH CONSTRUCTION.
- ALL ENGINEERING DESIGN, CONSTRUCTION, AND TESTING SHALL CONFORM TO THE REQUIREMENTS OF THE MICHIGAN BUILDING CODE 2009 EDITION (HERE IN REFERRED TO AS THE CODE).
- THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. SAFETY, CARE OF ADJACENT PROPERTIES DURING CONSTRUCTION, AND COMPLIANCE WITH LOCAL REGULATIONS REGARDING SAFETY IS, AND SHALL BE, THE CONTRACTOR'S RESPONSIBILITY.
- ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS AND/OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING WITH ANY WORK SO INVOLVED.
- DESIGN LOADS: PER 2009 MICHIGAN BUILDING CODE AND ANSI/ASCE 7-05  
BUILDING :  
GROUND SNOW = 80 PSF  
UNBALANCED ROOF SNOW LOADS: PER ASCE 7-05, SECTION 7.6.2  
Is, IMPORTANCE FACTOR = 1.0  
Ce, EXPOSURE FACTOR (B, SHELTERED) = 1.2  
Ct, THERMAL FACTOR = 1.2  
ROOF DEAD LOAD TC = 10 PSF BC = 7 PSF  
WIND LOAD INFO. : PER 2009 MBC OR ANSI/ASCE7-05  
BASIC WIND SPEED = 90 MPH  
WIND IMPORTANCE FACTOR, Iw = 1.0  
WIND EXPOSURE = B

#### MISCELLANEOUS

- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AT THE JOB SITE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SHORING AND BRACING AND SHALL DISCUSS THEIR METHODS WITH THE ENGINEER PRIOR TO THE START OF WORK.
- CONSULT THE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR VERIFICATIONS OF LOCATIONS AND DIMENSIONS OF CHASES, INSERTS, OPENINGS, SLEEVES, WASHES, REVEALS, DEPRESSIONS AND OTHER PROJECT REQUIREMENTS.
- ALL EQUIPMENT PENETRATIONS SHALL BE VERIFIED BY CONTRACTOR.
- DO NOT SCALE THE DRAWINGS TO DETERMINE BUILDING DIMENSIONS.

#### FOUNDATION

- ALL FOOTINGS SHALL BE CONSTRUCTED ON UNDISTURBED SOIL.
- ASSUMED ALLOWABLE SOIL BEARING PRESSURE UNDISTURBED SOIL = 2000 PSF
- SEE ELECTRICAL AND SPECIFICATIONS FOR GROUNDING REQUIREMENTS.

#### CONCRETE

- ALL READY MIX CONCRETE SHALL CONFORM TO A.S.T.M. C 94.
- DURING COLD WEATHER MONTHS, ALL CONCRETE SHALL COMPLY W/ ACI COLD WEATHER CONCRETING, ACI 308R-88. PER ACI, COLD WEATHER IS DEFINED AS A PERIOD WHEN, FOR MORE THAN (3) CONSECUTIVE DAYS, THE FOLLOWING CONDITIONS MUST EXIST: 1) THE AVERAGE DAILY AIR TEMP. IS LESS THAN 40 F, AND, 2) THE AIR TEMP. IS NOT GREATER THAN 50 F FOR MORE THAN ONE-HALF OF ANY (24)-HR. PERIOD.
- MEASURING, MIXING, TRANSPORTING, AND PLACING OF ALL CONCRETE SHALL COMPLY W/ CURRENT ACI 304R.
- ALL REINFORCING BARS, DOWELS, ANCHOR BOLTS AND ANY INSERTS SHALL BE SECURED IN POSITION PRIOR TO PLACING OF CONCRETE.
- AIR ENTRAINED CONCRETE SHALL BE USED FOR ALL SIDEWALKS, PAVING, PLATFORMS, CURBS, AND ALL CONCRETE ELEMENTS EXPOSED TO THE WEATHER.
- ALL CONCRETE SHALL DEVELOP THE FOLLOWING COMPRESSIVE STRENGTHS AT 28 DAYS (U.N.O.):  
EXTERIOR CONCRETE SLABS = 4000 PSI  
FOUNDATIONS AND INTERNAL CONCRETE = 3500 PSI
- LOCATE ALL SLEEVES, OPENINGS, EMBEDDED ITEMS, ETC., WHICH ARE INDICATED ON ALL DESIGN DRAWINGS. CHECK WITH ALL TRADES TO VERIFY THAT ALL SLEEVES, OPENINGS, AND EMBEDDED ITEMS ARE IN PLACE AND LOCATED CORRECTLY PRIOR TO PLACING OF CONCRETE.
- CONCRETE SLABS ON GRADE SHALL BE POURED ON 6" OF COMPACTED SAND.
- THE SURFACE OF ALL CONSTRUCTION JOINTS SHALL BE CLEANED TO REMOVE ALL DUST, CHIPS, OR OTHER FOREIGN MATTER PRIOR TO PLACING THE ADJACENT CONCRETE.
- SLAB CONTROL JOINTS SHALL BE INSTALLED WITH JOINT FORMERS WHEN THE SLAB IS POURED OR SAWCUT WITHIN 24 HOURS OF POURING.
- ALL SLABS SHALL BE CURED AND SEALED TO MINIMIZE SHRINKAGE CRACKING.

#### REINFORCING STEEL

- ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO A.S.T.M. A-615 GRADE 60 UNLESS NOTED OTHERWISE.
- ALL REINFORCING BARS MARKED "CONTINUOUS" MAY BE SPLICED WITH A LAP OF 24 BAR DIAMETERS IN CONCRETE AND 48 BAR DIAMETERS IN MASONRY, BUT NOT LESS THAN 24 INCHES, EXCEPT AS NOTED.
- ALL MASONRY REINFORCING SHALL BE PLACED AND SUPPORTED IN CONFORMANCE WITH THE PROVISIONS OF THE LATEST EDITION OF A.C.I. 530.1/ ASCE 6/ TMS 602.
- TIE WIRE SHALL CONFORM TO A.S.T.M. A-82.
- WELDED WIRE FABRIC SHALL BE SPLICED WITH A MINIMUM LAP OF TWO MODULES.
- WELDED WIRE FABRIC SHALL CONFORM WITH A.S.T.M. A-185.
- REINFORCING STEEL: ASTM A-615 GRADE 60.
- ALL REINFORCING STEEL SHALL HAVE THE FOLLOWING MINIMUM CONCRETE COVERAGE, UNLESS NOTED OTHERWISE:  
CONCRETE PLACED AGAINST EARTH = 3"  
CONCRETE WITH FORMED SURFACES IN CONTACT WITH EARTH = 2"  
CONCRETE EXPOSED TO WEATHER = 2"  
SLABS, WALLS, AND JOISTS NOT EXPOSED TO WEATHER OR IN CONTACT WITH EARTH (#11 BARS AND SMALLER) = 1 1/2"  
BEAMS, GIRDERS AND COLUMNS NOT EXPOSED TO WEATHER OR IN CONTACT WITH EARTH = 1 1/2"
- DETAILING OF ALL BENT BARS SHALL COMPLY WITH THE CURRENT ACI 318 CODE.
- WELDING OF REINFORCING BARS IS NOT PERMITTED, UNLESS NOTED OTHERWISE.

#### MASONRY

- BLOCK SHALL BE MEDIUM OR LIGHT WEIGHT UNITS CONFORMING TO A.S.T.M. C-90, MINIMUM fm = 1500 P.S.I.
- SAND SHALL CONFORM TO A.S.T.M. C-144.
- GROUT SHALL HAVE A MINIMUM STRENGTH OF 2000 PSI AT 28 DAYS.
- GROUT SHALL CONFORM TO THE PROPORTION REQUIREMENTS OF ASTM C-476.
- MORTAR SHALL BE TYPE "S". ONE PART CEMENT, 1/4 TO 1/2 PART HYDRATED LINES OR LIME PUTTY, 2 1/4 TO 3 PARTS SAND AND SHALL CONFORM TO ASTM C-270. SAND SHALL BE IN LOOSE, DAMP CONDITION.
- CONTRACTOR SHALL PROVIDE NECESSARY LABOR, MATERIALS, AND EQUIPMENT TO LAY UP MASONRY AS SHOWN OR SPECIFIED IN THESE DOCUMENTS. ALL WORK SHALL BE LAID PLUMB, TRUE AND SQUARE, WITH FILLED JOINTS.
- ALL MASONRY WORK SHALL BE LAID RUNNING BOND UNLESS NOTED OTHERWISE.
- MASONRY CONSTRUCTION AND MATERIALS SHALL CONFORM TO ALL REQUIREMENTS OF "SPECIFICATIONS FOR MASONRY STRUCTURES" (ACI 530.1/ASCE 6/TMS 602), PUBLISHED BY THE AMERICAN CONCRETE INSTITUTE, DETROIT, MICHIGAN, EXCEPT AS MODIFIED BY THE REQUIREMENTS OF THESE CONTRACT DOCUMENTS.
- GROUT PLACEMENT AND CONSOLIDATION SHALL CONFORM TO SECTION 4 OF "SPECIFICATIONS FOR MASONRY STRUCTURES ACI 530.1/ASCE 6/TMS 602.
- COLD WEATHER MASONRY CONSTRUCTION SHALL COMPLY WITH THE CODE REQUIREMENTS.

#### WOOD

- DIMENSIONAL LUMBER SHALL BE SPRUCE-PINE-FIR W/ A GRADE STAMP OF #2 OR BETTER MIN., UNO.
- ALL WOOD SHEATHING DESIGNATED ON THE CONSTRUCTION DOCUMENTS SHALL BE APA RATED SHEATHING WITH A SPAN RATING CONSISTENT W/ ITS USE.
- ALL P.T. WOOD SHALL BE SOUTHERN PINE WITH A GRADE STAMP OF #2 OR BETTER, MIN. LUMBER THAT IS TREATED W/ ACO MUST BE ISOLATED FROM STEEL THAT IS NOT STAINLESS, OR, IS NOT GALVANIZED.
- THE QUANTITY AND SIZE OF FASTENERS CONNECTING WOOD FRAME MEMBERS TOGETHER AND SHEATHING MATERIALS TO WOOD FRAME MEMBERS SHALL NOT BE LESS THAN THAT SPECIFIED IN THE CURRENT MICHIGAN BUILDING CODE.
- ALL BOLTS THROUGH WOOD SHALL HAVE STANDARD CUT WASHERS EXCEPT WHERE METAL SIDE PLATES ARE SPECIFIED. BOLT HOLES SHALL BE BORED 1/32" TO 1/16" LARGER THAN THE BOLT DIAMETER.



#### ENGINEERING ARCHITECTURE PLANNING SURVEYING ENVIRONMENTAL

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(906) 462-4510  
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1701 DUNLAP AVE., SUITE B MARINETTE, WI  
54143  
(715) 732-4188

#### PROJECT TITLE:

## WELL HOUSE IMPROVEMENTS TWIN LAKES STATE PARK

#### OWNER:

## MICHIGAN DEPT. OF NATURAL RESOURCES

#### PROJECT LOCATION:

## HOUGHTON COUNTY

AS-BUILTS	JUNE 2013
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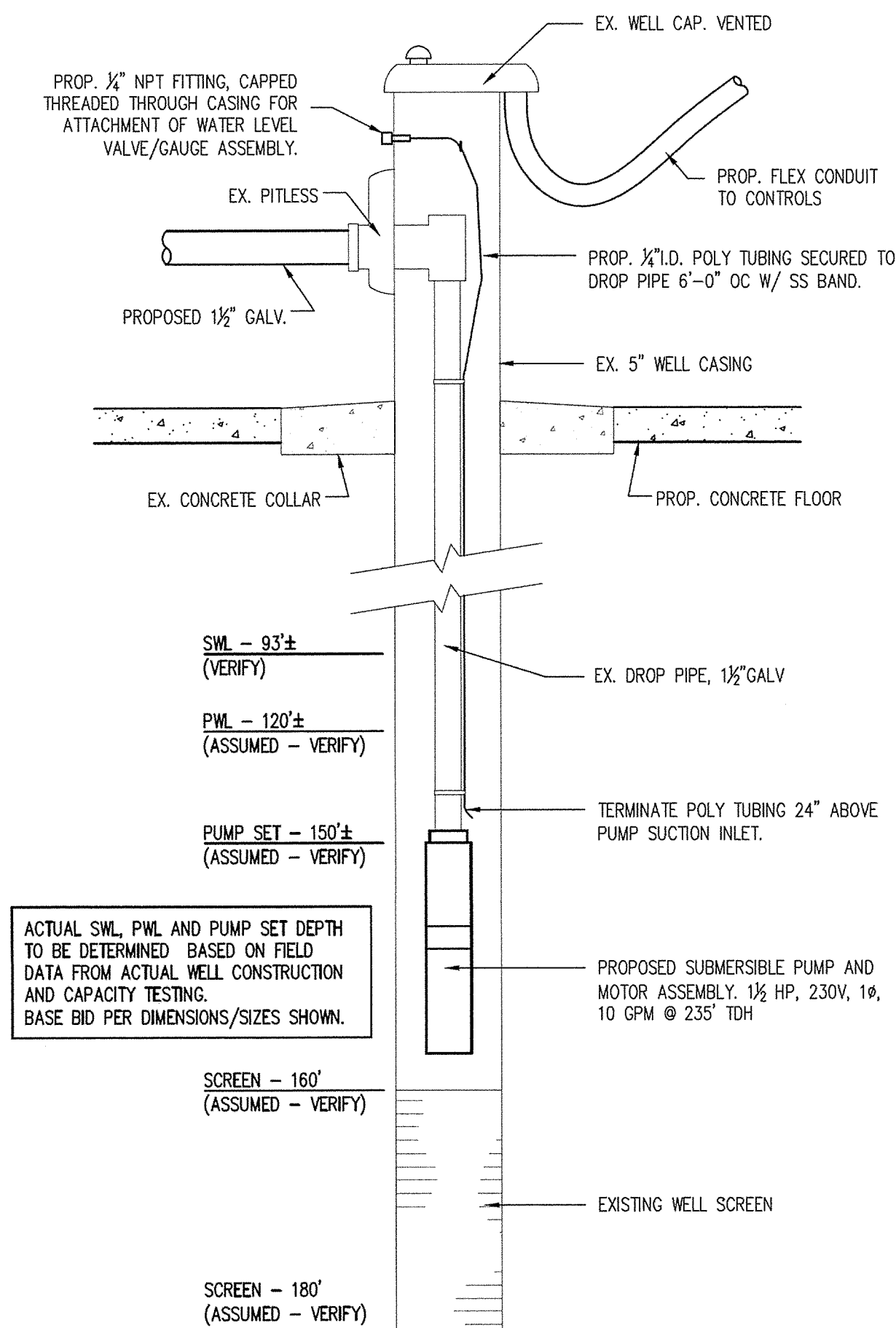
PROJECT NO:	M12-12148
DESIGNED BY:	GRK
DRAWN BY:	JH
CHECKED:	GRK
APPROVED:	GRK

## TWIN LAKES STATE PARK WELL HOUSE PLAN

A110

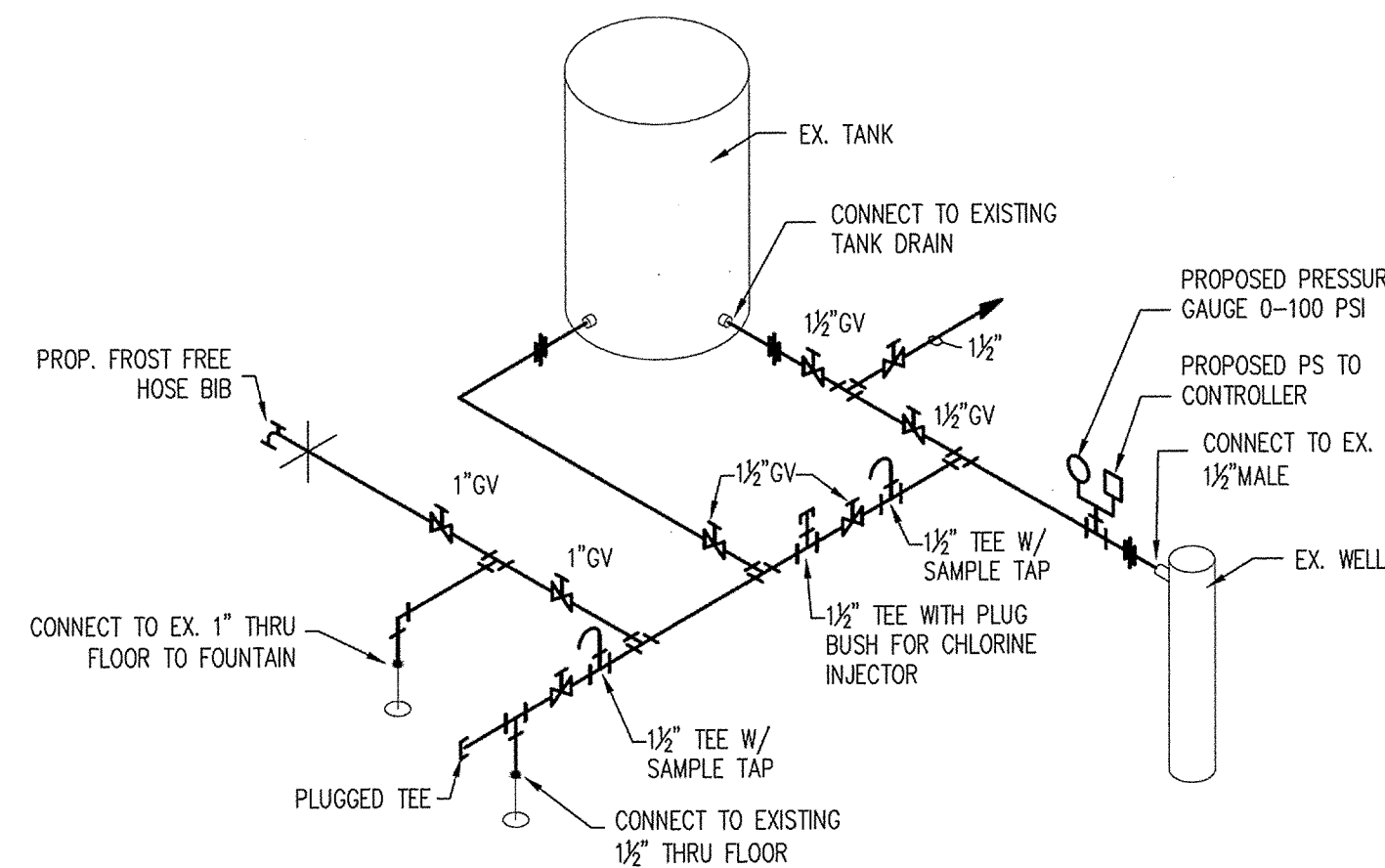


BACK-UP WELL WORK  
NOT IN CONTRACT



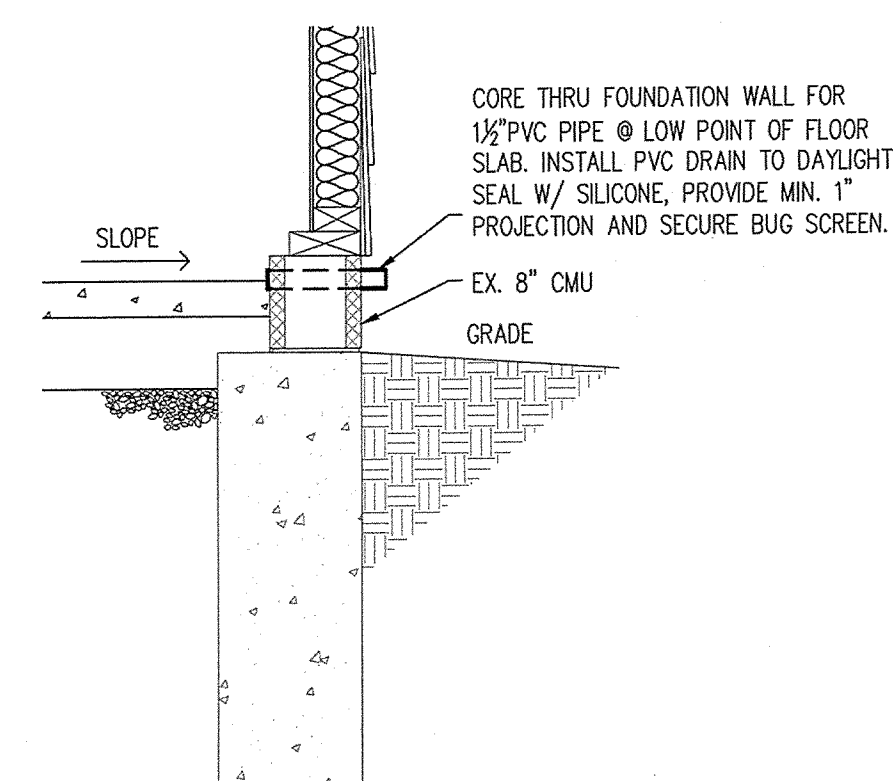
**A3 PROPOSED REFIT (BACKUP WELL)**

NO SCALE



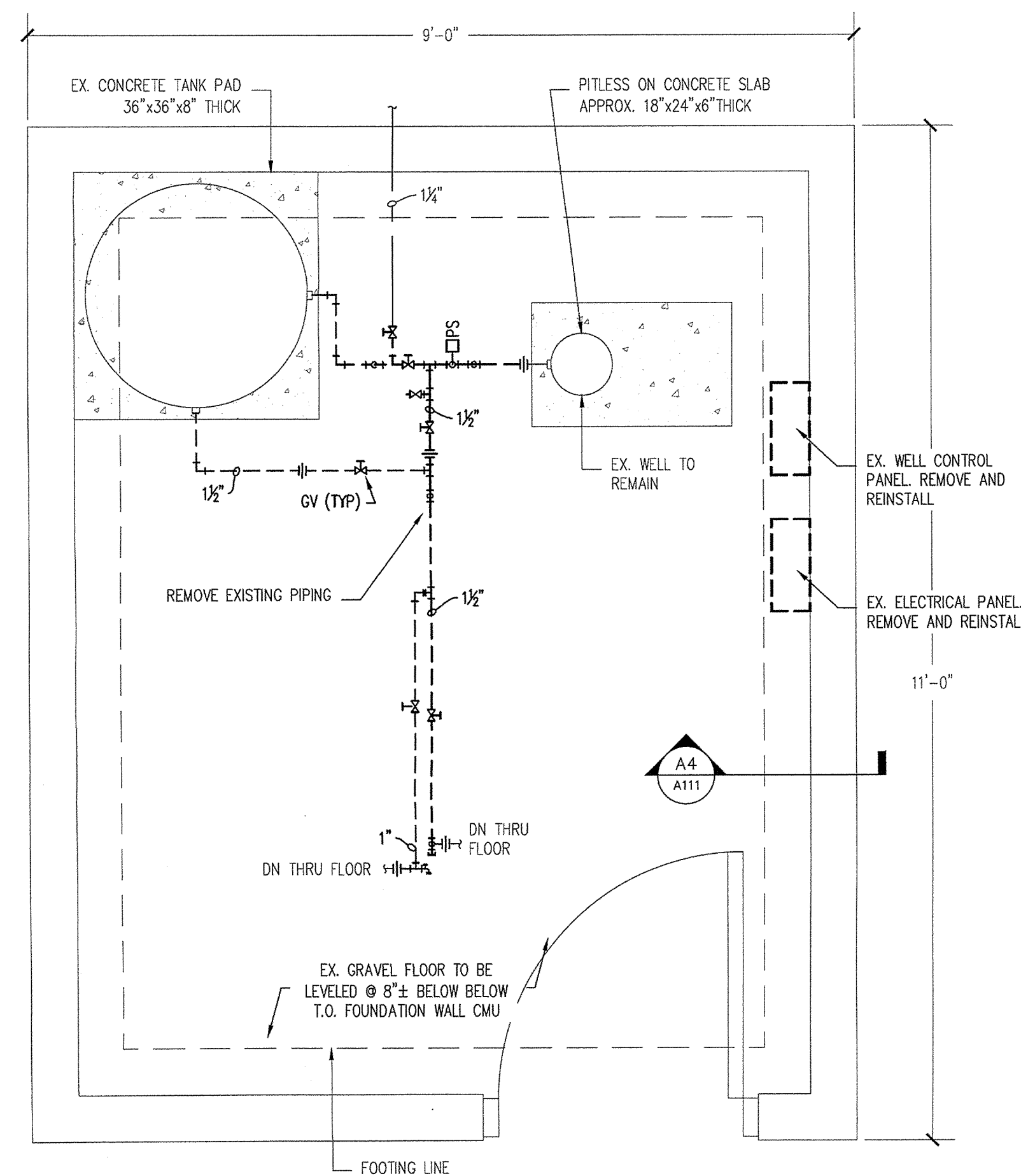
**C3 PROPOSED PIPING DETAIL**

NO SCALE



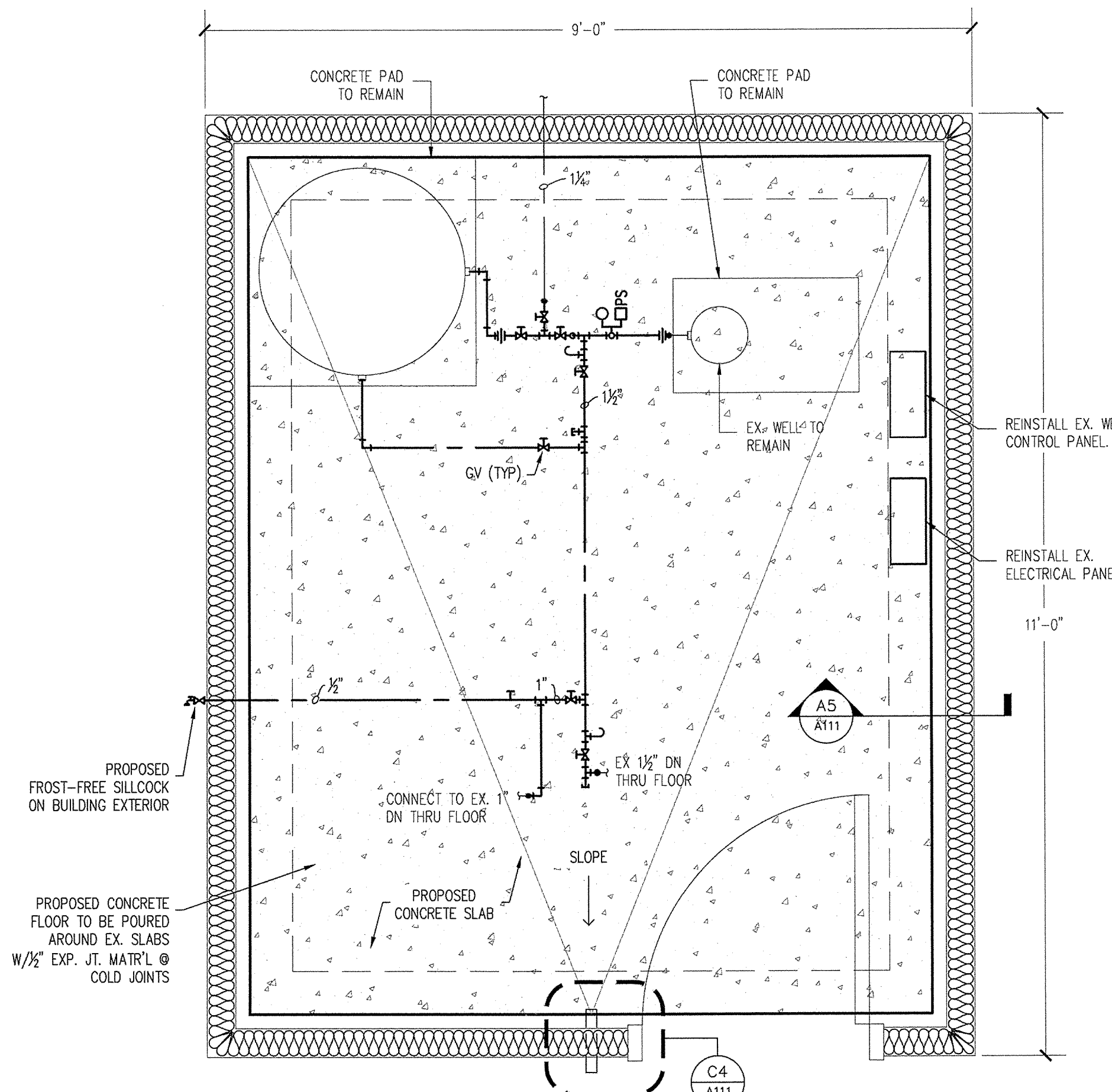
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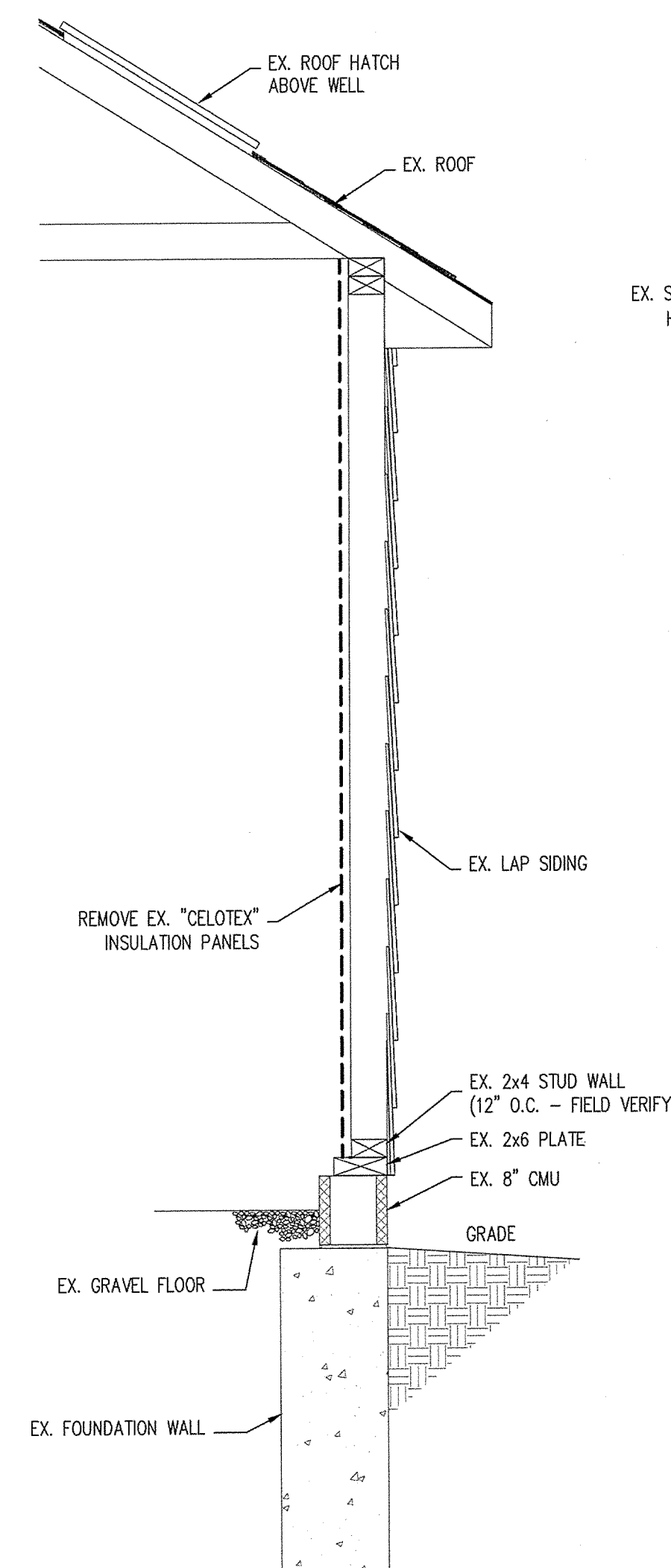
**A1 EXISTING BACKUP WELL HOUSE PLAN**

3/4" = 1'-0"



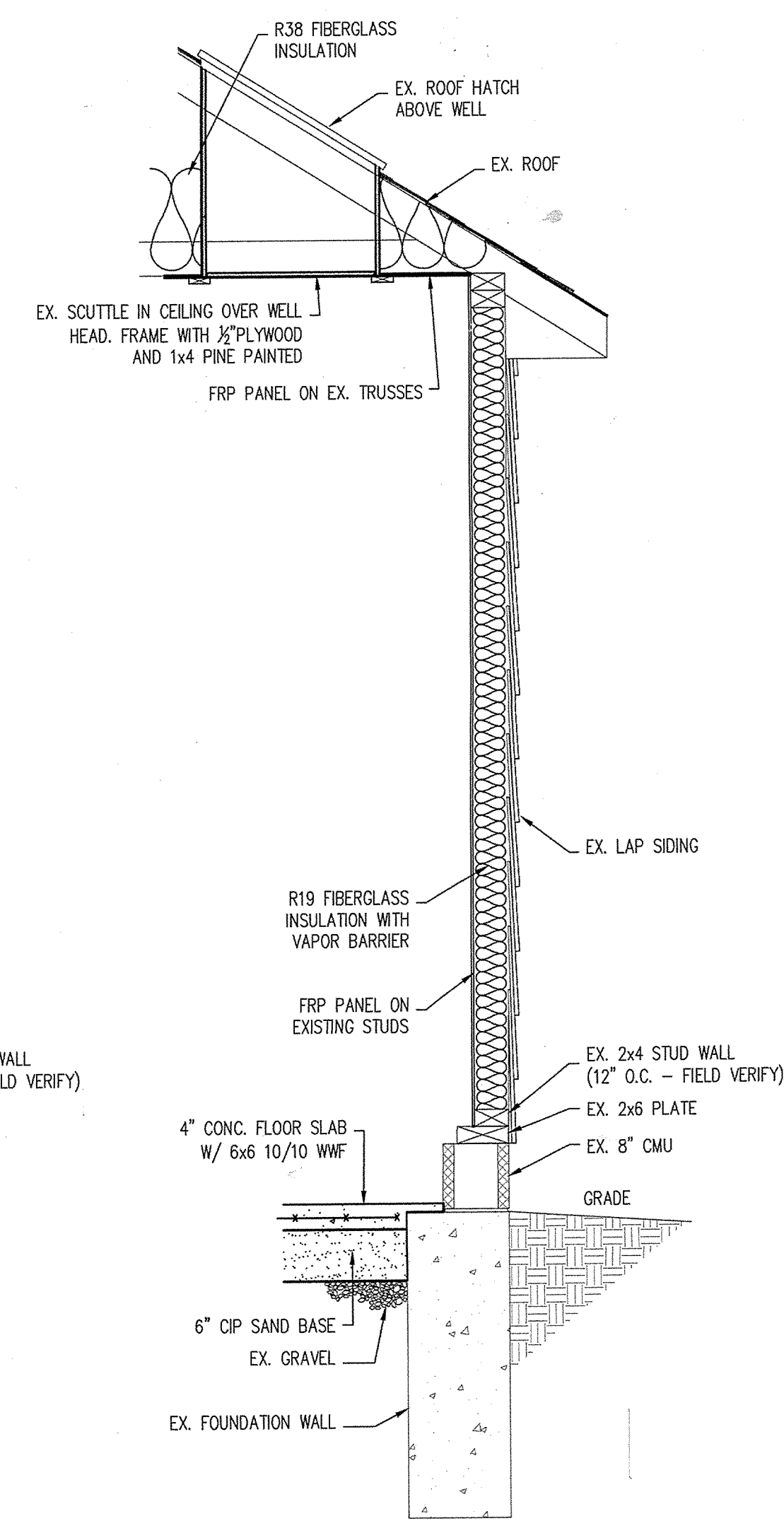
**A2 PROPOSED BACKUP WELL HOUSE PLAN**

3/4" = 1'-0"



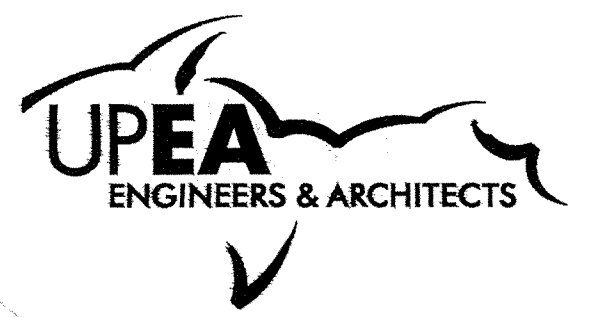
**A4 EXISTING SECTION**

3/4" = 1'-0"



**A5 PROPOSED SECTION**

3/4" = 1'-0"



ENGINEERING  
ARCHITECTURE  
PLANNING  
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CHECKED: GRK  
APPROVED: GRK

**BACKUP WELL HOUSE  
PLAN REFIT**

**A111**





ENGINEERING  
ARCHITECTURE  
PLANNING  
SURVEYING  
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100 PORTAGE STREET  
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MARQUETTE, MI 49855  
(906) 228-6061  
424 SOUTH PINE STREET  
ISHPEMING, MI 49849  
(906) 485-1011  
2906 N. STEPHENSON AVE., SUITE 2  
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707 ASHMAN STREET  
SAULT STE. MARIE, MI 49783  
(906) 635-0511  
1701 DUNLAP AVE., SUITE B MARINETTE, WI  
54143  
(715) 732-4188

PROJECT TITLE:

## WELL HOUSE IMPROVEMENTS TWIN LAKES STATE PARK

OWNER:

MICHIGAN DEPT. OF  
NATURAL RESOURCES

PROJECT LOCATION:

HOUGHTON  
COUNTY

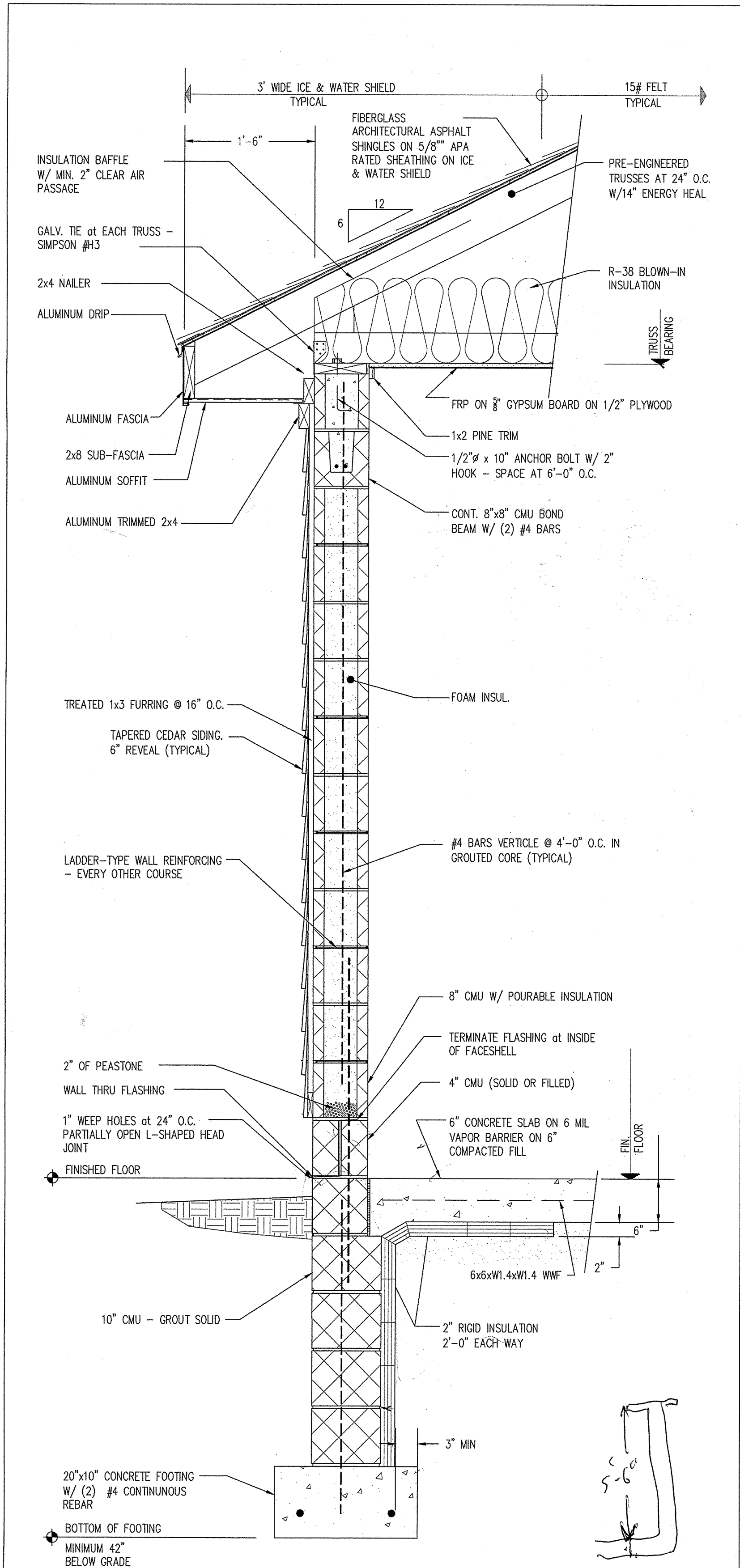
AS-BUILTS	JUNE 2013
BID DOCUMENTS	07-12-12
90% REVIEW	06-08-12
50% REVIEW	03-20-12
ISSUED FOR:	DATE:

PROJECT NO: M12-12148  
DESIGNED BY: GRK  
DRAWN BY: JH  
CHECKED: GRK  
APPROVED: GRK

TWIN LAKES STATE PARK  
WELL HOUSE DETAILS

A510

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**A1** TYPICAL WALL SECTION  
1" = 1'-0"

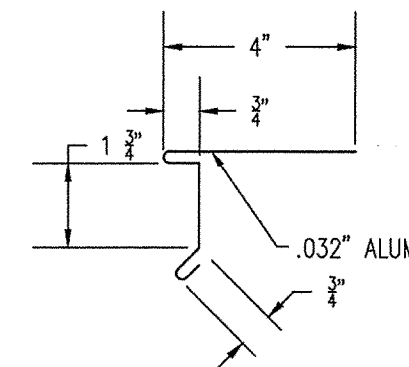
### SCHEDULE OF FINISHES

#### INTERIOR

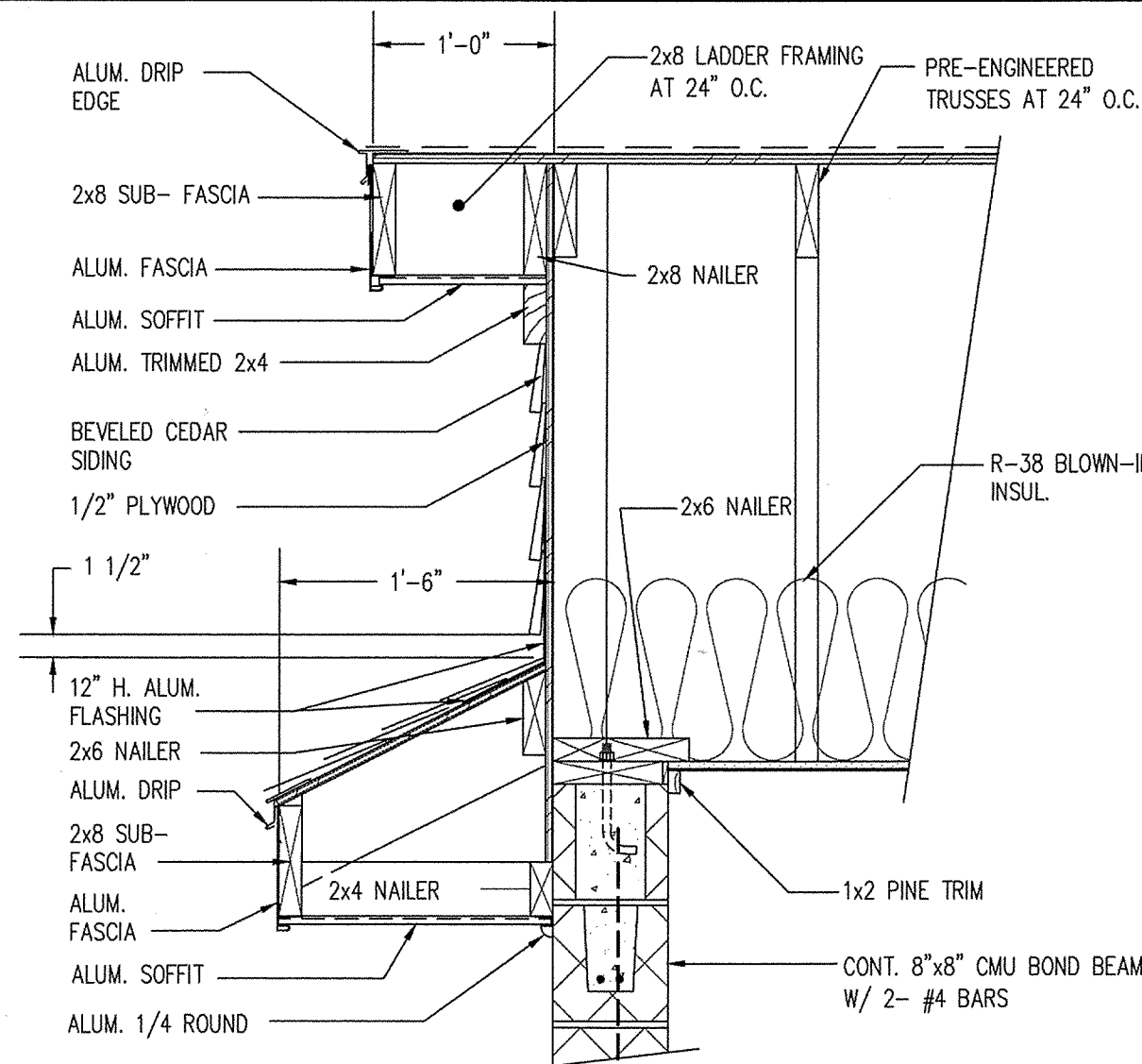
FLOORS - CONCRETE, SEALED  
WALLS - CMU, INSULATED & PAINTED  
CEILING - FRP ON 5/8" GYPSUM BOARD ON 1/2" PLYWOOD

#### EXTERIOR

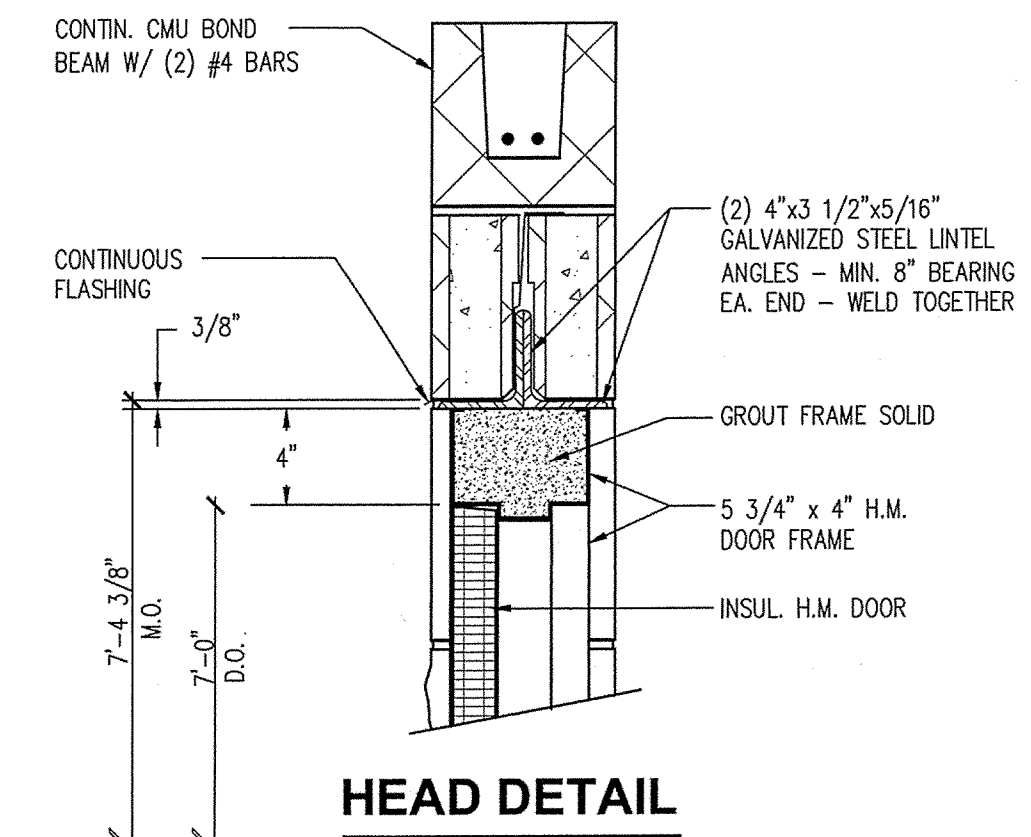
WALLS - SPLIT-FACED & SCORED CMU, PERMANENTLY SEALED  
SIDING - 6" BEVELED CEDAR, 4" REVEAL, ROUGH SIDE VISIBLE  
DOOR - DOUBLE 2'-0" & 3'-0" INSULATED H.M. W/ DARK BRONZE FINISH



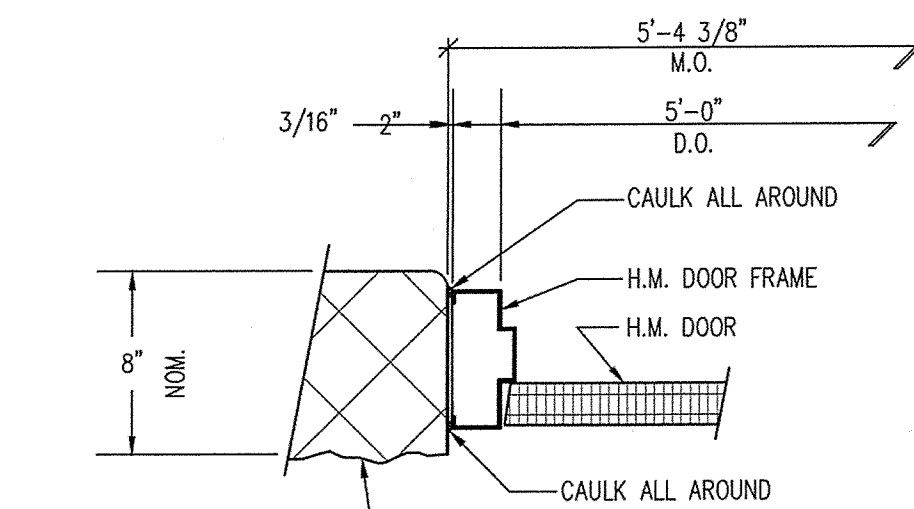
**C2** DRIP EDGE / FASCIA TRIM  
NOT TO SCALE



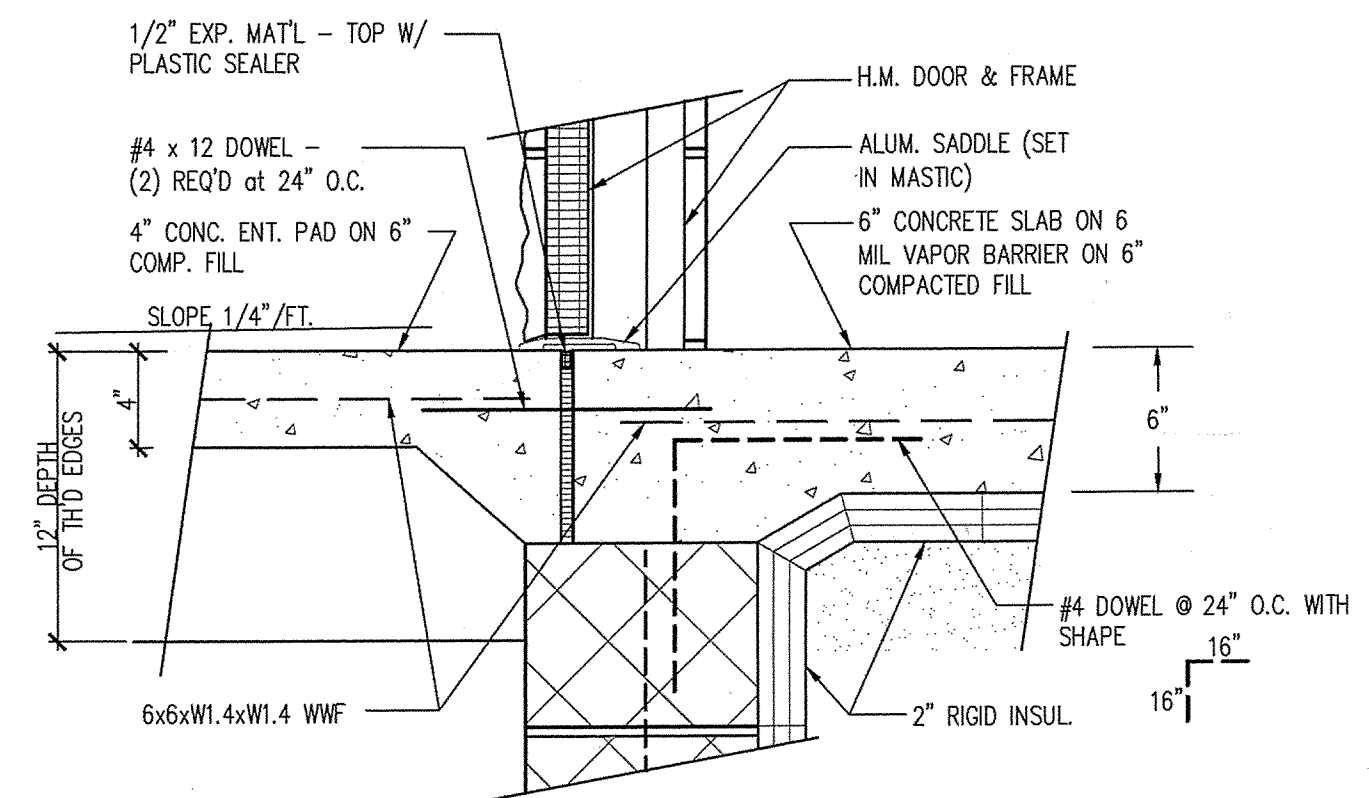
**A2** TYPICAL WALL/GABLE DETAIL  
1" = 1'-0"



**HEAD DETAIL**



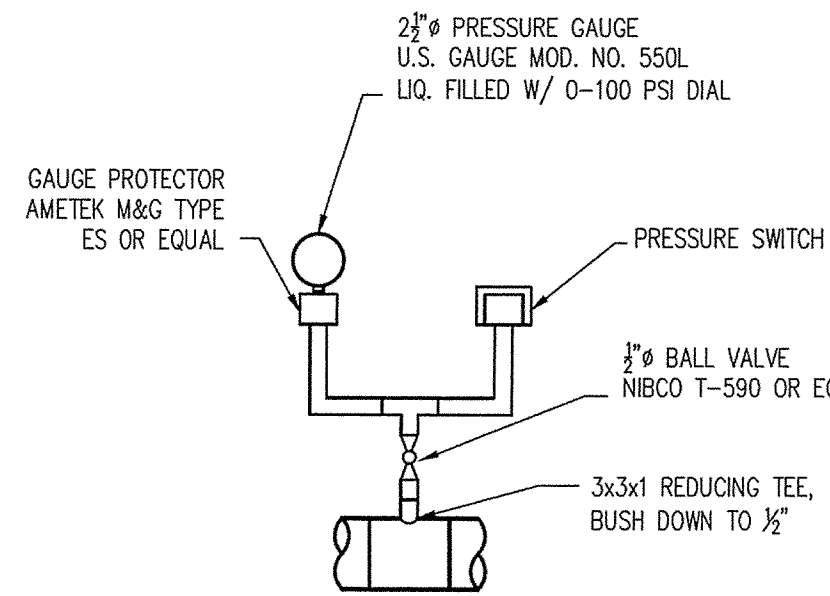
**JAMB DETAIL**



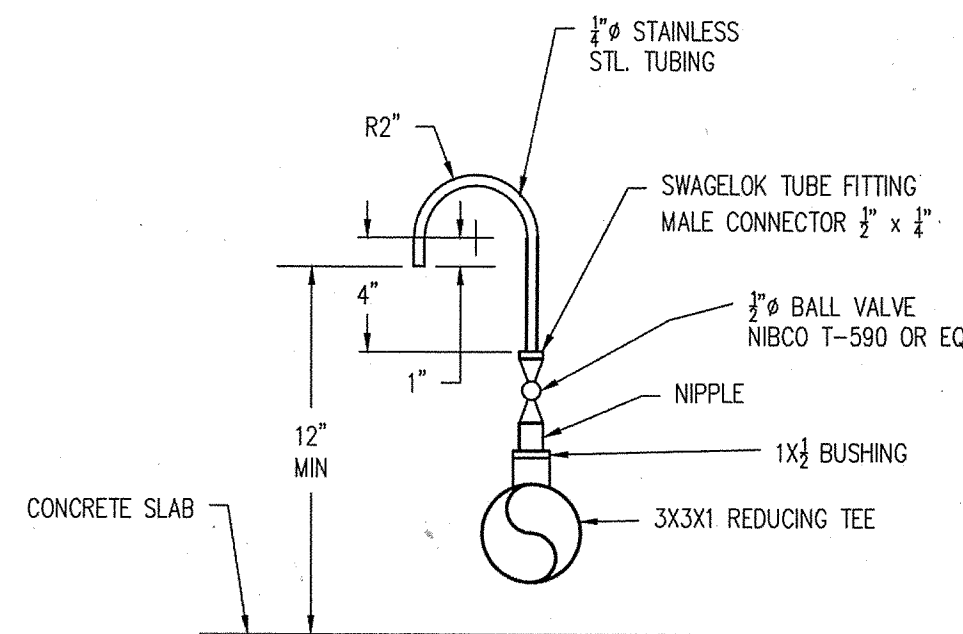
**THRESHOLD DETAIL**

**A3** TYPICAL DOOR DETAIL  
NOT TO SCALE





**D1 PRESSURE SWITCH AND GAUGE DETAIL**  
NOT TO SCALE



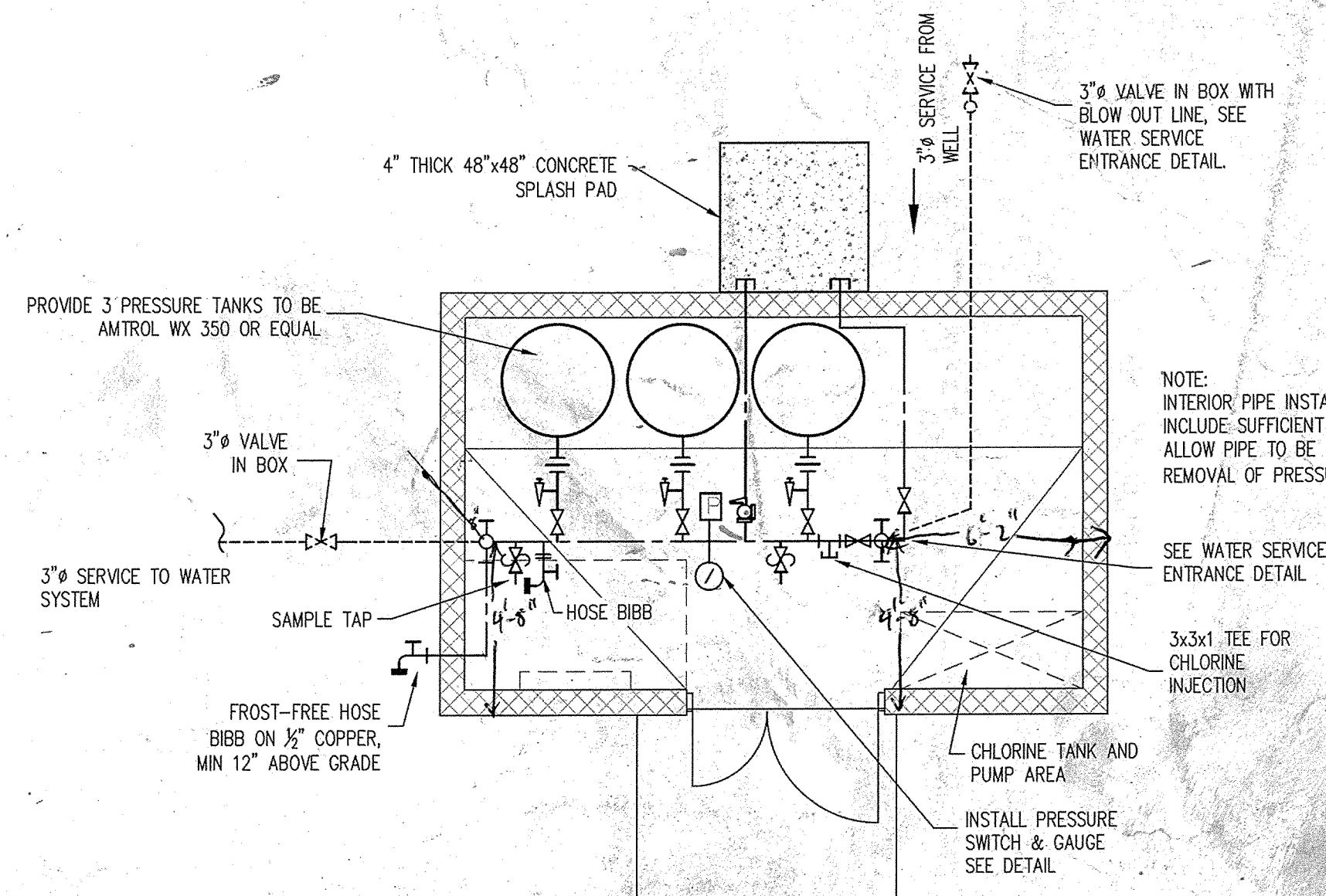
**D2 WATER SAMPLE TAP DETAIL**  
NOT TO SCALE

**WELL HOUSE PLUMBING NOTES**

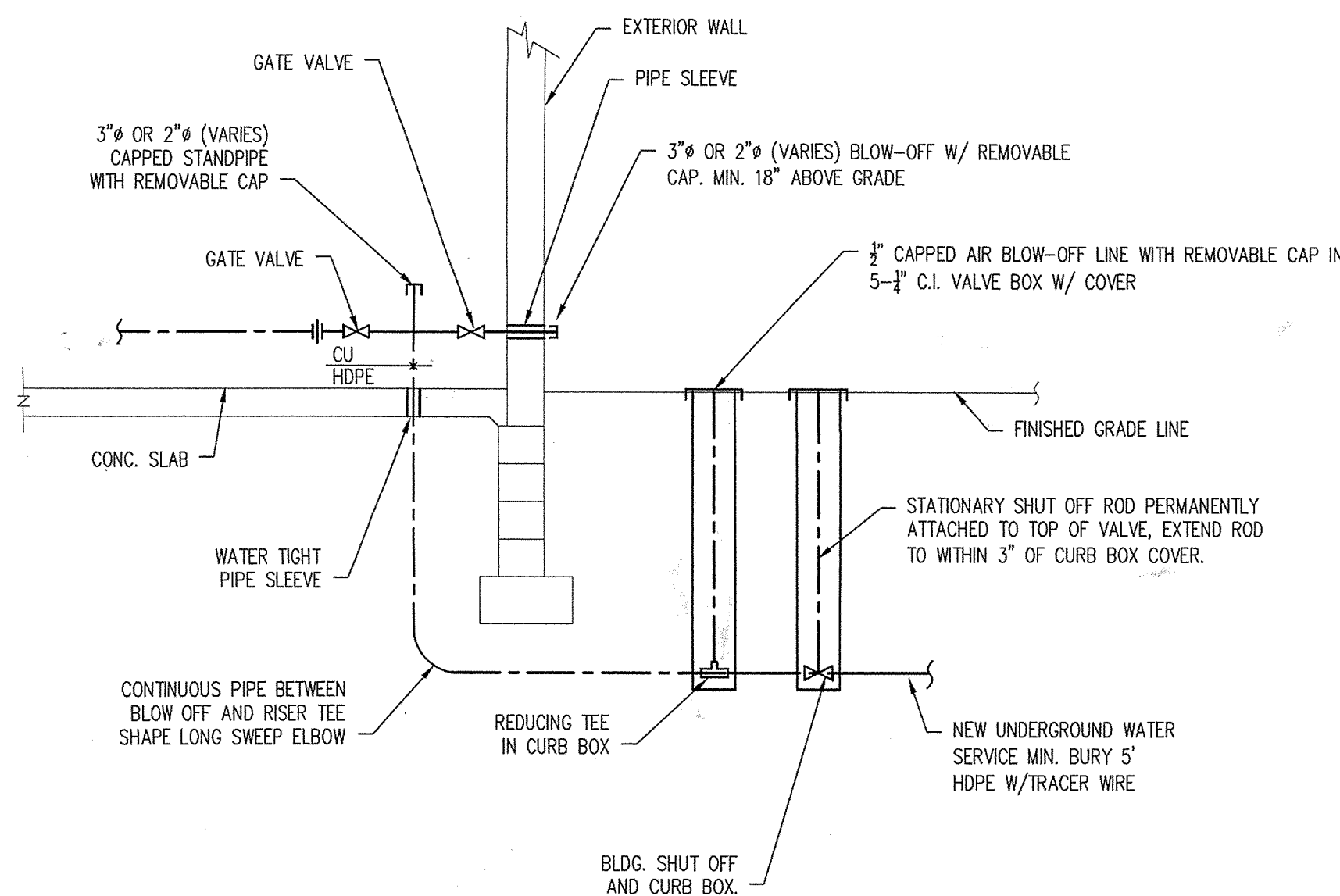
- 1) ALL INTERIOR PIPING SHALL BE TYPE "L" HARD COPPER WITH SWEATED CONNECTIONS
- 2) ALL PIPING SHALL BE HYDROSTATICALLY TESTED TO 100 PSI EXCEPT DIAPHRAGM TANKS AND PRESSURE SWITCH WHICH SHALL BE ISOLATED
- 3) THIS DRAWING INDICATES THE APPROXIMATE LOCATION OF KNOWN ACTIVE UNDERGROUND UTILITIES BASED UPON A COMBINATION OF ORIGINAL AND AS-BUILT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE TO IDENTIFY AND LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
- 4) CONTRACTOR SHALL CALL MISS DIG. 72 HOURS PRIOR TO CONSTRUCTION (800) 482-7171.

**PLUMBING LEGEND**

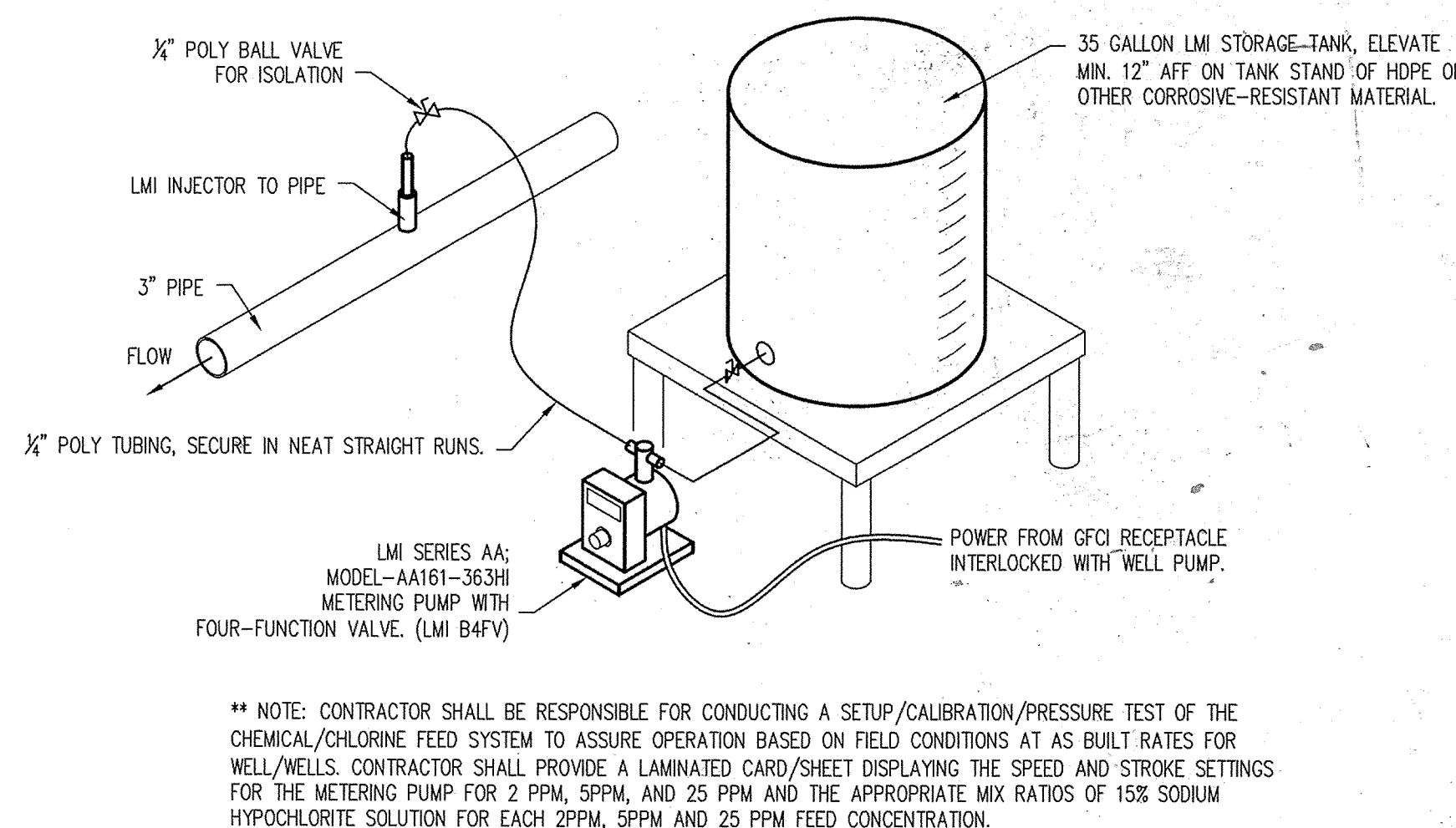
	GATE VALVE OR BALL VALVE
	UNION
	ABOVE GROUND WATER LINE
	THREADED CAP
	DRAIN VALVE
	PRESSURE RELIEF VALVE
	WATER SAMPLE TAP
	CAPPED STANDPIPE
	HOSE BIB
	UNDERGROUND WATER LINE



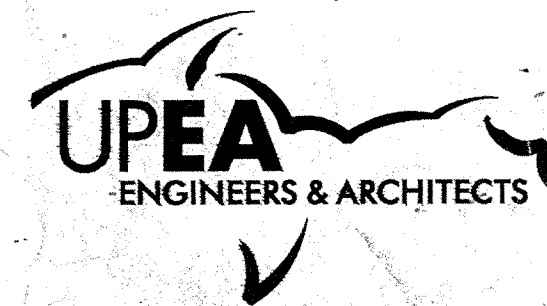
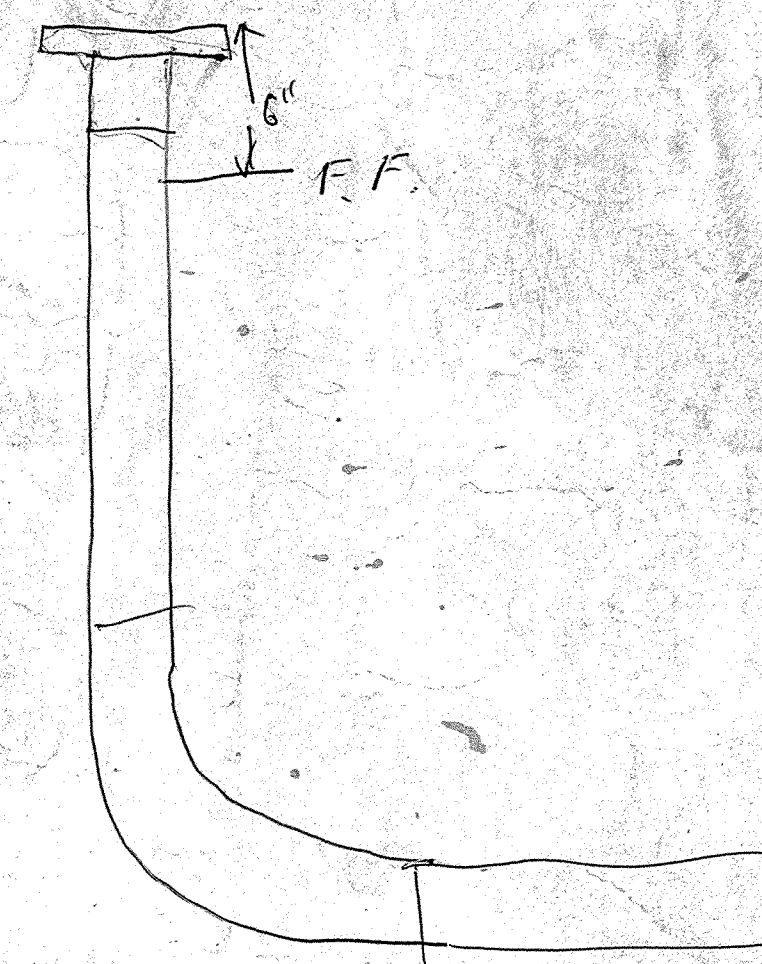
**C4 WELL HOUSE PLUMBING PLAN**  
1/4" = 1'-0"



**A1 WATER SERVICE ENTRANCE DETAIL**  
NOT TO SCALE



**A3 CHEMICAL/CHLORINE FEED SYSTEM SCHEMATIC**  
NOT TO SCALE



**ENGINEERING  
ARCHITECTURE  
PLANNING  
SURVEYING  
ENVIRONMENTAL**

100 PORTAGE STREET  
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(906) 482-4810

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(906) 228-6081

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54143  
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**PROJECT TITLE:**  
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IMPROVEMENTS  
TWIN LAKES STATE PARK**

**OWNER:**  
**MICHIGAN DEPT. OF  
NATURAL RESOURCES**

**PROJECT LOCATION:**  
**HOUGHTON  
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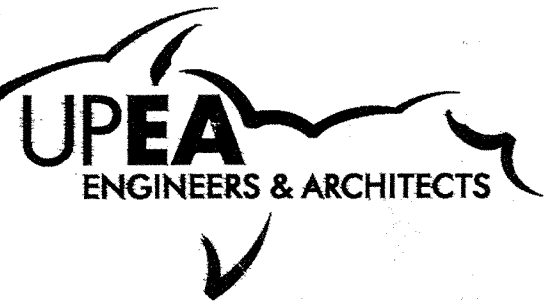
PROJECT NO: M12-12148  
DESIGNED BY: GRK  
DRAWN BY: JH  
CHECKED: GRK  
APPROVED: GRK

**TWIN LAKES STATE PARK  
WELL HOUSE PLUMBING  
PLAN AND DETAILS**

**P110**







ENGINEERING  
ARCHITECTURE  
PLANNING  
SURVEYING  
ENVIRONMENTAL

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APPROVED: GRK

**TWIN LAKES STATE PARK  
WELL HOUSE ELECTRICAL  
PLAN AND DETAILS**

**E110**

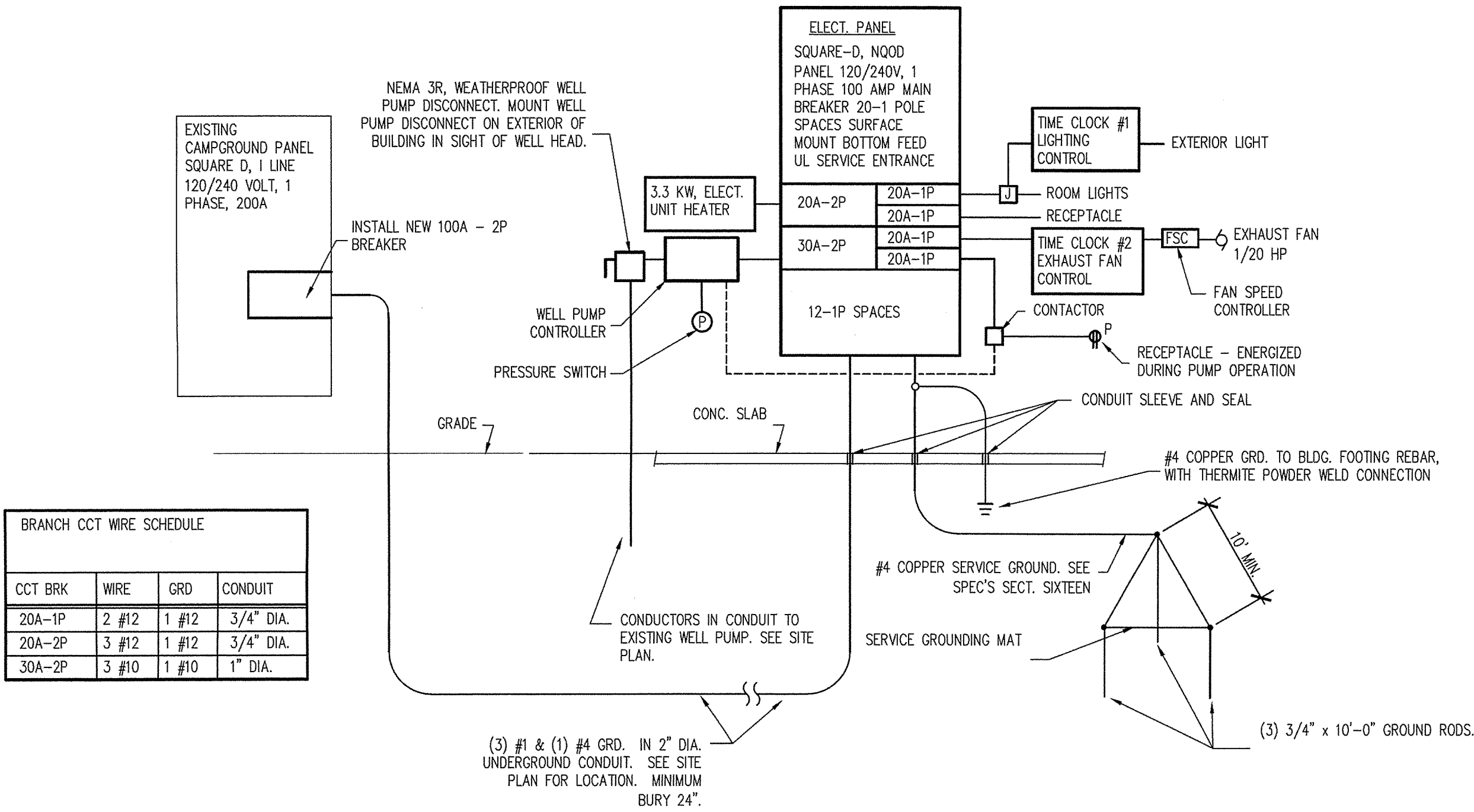
ELECTRICAL LEGEND	
SQ. RECESSED FIXTURE	A AMPS
INCANDESCENT FIXTURE	AFF ABOVE FINISHED FLOOR
SINGLE POLE SWITCH	C CONDUIT
LIGHT FIXTURE MARK	CCT CIRCUIT
BRANCH CIRCUIT NO.	CM CEILING MOUNT
GFCI DUPLEX RECEPTACLE	GFI GROUND FAULT INTERRUPTER
SINGLE PHASE MOTOR	GRD GROUND
ELECTRICAL PANEL	HP HORSE POWER
EXPOSED CONDUIT	P POLE
CONCEALED CONDUIT	V VOLT
UNDERGROUND/UNDERSLAB ELECT. CONDUIT	W WIRE
TIME CLOCK	WP WEATHER PROOF
JUNCTION BOX	

- ELECTRICAL NOTES
1. ALL DUPLEX RECEPTACLES SHALL BE GFCI WITH BUILT IN TEST AND RESET BUTTONS.
  2. LIGHT SWITCH AND RECEPTACLES SHALL BE MOUNTED 48-INCHES ABOVE FINISHED FLOOR TO THE CENTERLINE OF THE DEVICE UNLESS NOTED OTHERWISE ON THE PLANS OR IN THE SPECIFICATIONS.
  3. ALL DEVICE BOXES AND ELECTRICAL ENCLOSURES IN THE WELL HOUSE SHALL BE SURFACE MOUNTED.
  4. ALL WIRING SHALL BE IN CONDUIT. CIRCUIT NUMBERS REPRESENT SINGLE POLE SPACES IN THE DESIGNATED ELECTRICAL PANELS AND DO NOT CORRESPOND TO ACTUAL PANEL PHASING.
  5. SEE THE RISER DIAGRAM FOR BRANCH CIRCUIT CONDUCTOR AND CONDUIT SIZES.

EXHAUST FAN SCHEDULE						
MANUFACTURER	MODEL	C.F.M.	E.S.P.	RPM	DRIVE	FAN MOTOR
						HP VOLTS SPECIAL FEATURES
LOREN COOK	10SP15D	300	.125	1211	DIRECT	1/20 120 SEE SPECIFICATIONS

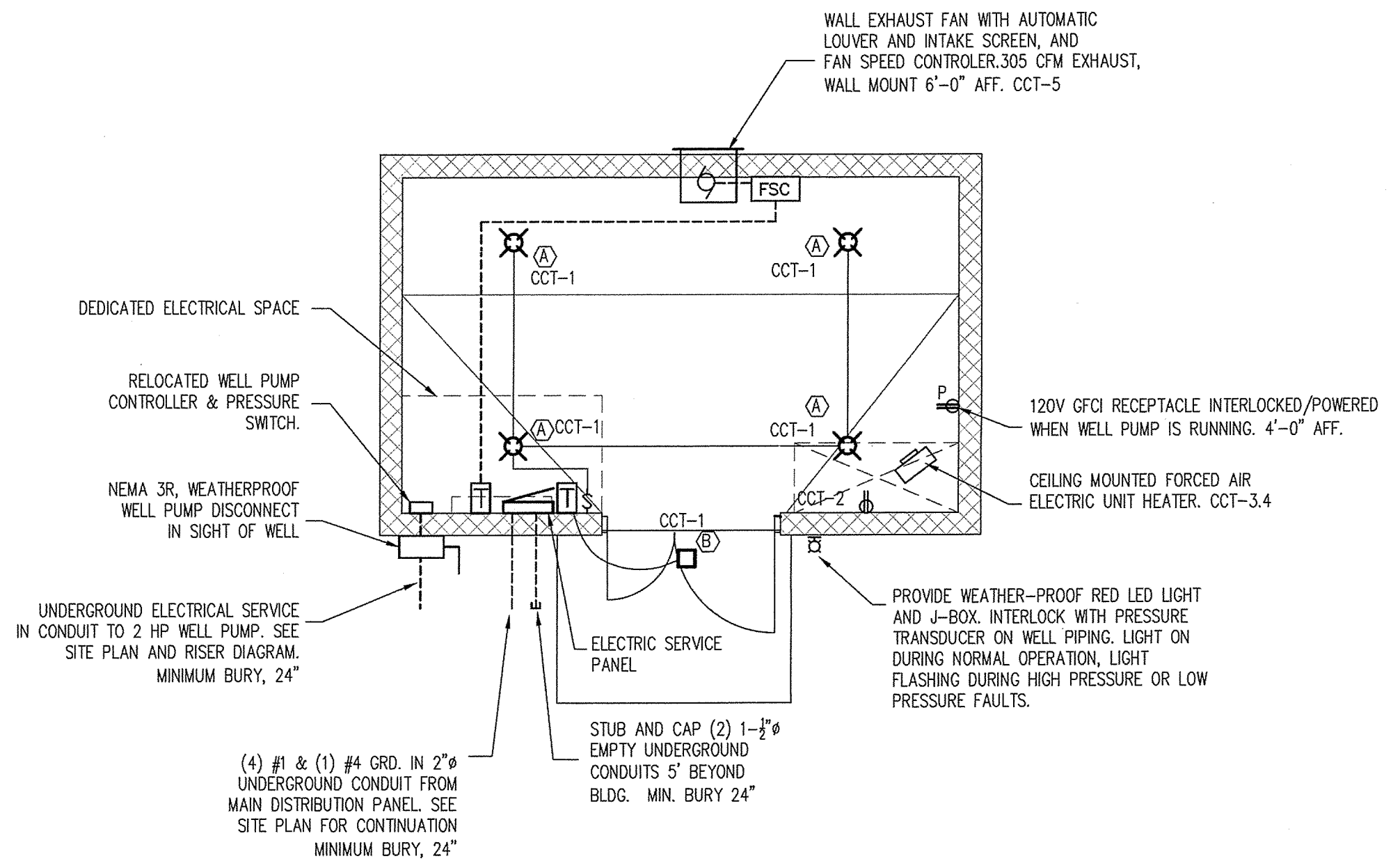
LIGHTING FIXTURE SCHEDULE						
MARK	MANUF.	CAT. NUMBER	DESCRIPTION	LAMPS	DIFFUSER	REMARKS
Ⓐ	LEVITON	9875	STANDARD KEYLESS PORCELAIN FIXTURE	(1) 100 WATT, A-19	NONE	CEILING MOUNT
Ⓑ	KIRLIN	RS20829-120V-15-26-45-46	RECESSED 8-INCH SQUARE INCANDESCENT FIXTURE.	(1) 100 WATT INCANDESCENT	TEMPERED PRISMATIC LENS	PROVIDE TAMPER PROOF FRAME, GASKET ON FRAME, & GASKET AROUND GLASS. U.L. LISTED WET LOCATIONS.

ELECTRIC HEATER SCHEDULE									
TYPE	MANUFACTURER	MODEL	KW	BTUH	HEATER		FAN MOTOR		
					MAX AMPS	VOLTAGE	HP	VOLTAGE	C.F.M.
SUSPENDED FORCED AIR UNIT HEATER	MARKEL	HF1B5130	3.3	11200	13.7	240/1/60	1/25	240/1/60	400



BRANCH CCT WIRE SCHEDULE			
CCT BRK	WIRE	GRD	CONDUIT
20A-1P	2 #12	1 #12	3/4" DIA.
20A-2P	3 #12	1 #12	3/4" DIA.
30A-2P	3 #10	1 #10	1" DIA.

**A1 WELL HOUSE RISER DIAGRAM**  
NOT TO SCALE



**C4 WELL HOUSE ELECTRICAL PLAN**  
1/4" = 1'-0"

