



City of Ketchum
Planning & Building

**CITY OF KETCHUM
ZONING CODE TITLE 17
ADMINISTRATIVE FLOODPLAIN DEVELOPMENT PERMIT
FINDINGS AND DECISION**

PROJECT: Northwood Pump Station Backup Generator

FILE NUMBER: P23-093

OWNER: City of Ketchum

REPRESENTATIVE: Chris Helgeson (Contractor)

REQUEST: Install backup generator outside the floodplain & riparia zone

LOCATION: 100 Park Circle (Northwood PUD Sub Parcel A - Park)

ZONING: General Residential – Low Density (GR-L)

OVERLAYS: Floodplain Management Overlay with Waterways Design Review Subdistrict

REVIEWERS: Adam Crutcher – Associate Planner

NOTICING: Notice sent to 300-ft adjoiners 10/23/2023

BACKGROUND FACTS

1. The City of Ketchum is a municipal corporation organized under Article XII of the Idaho Constitution and the laws of the State of Idaho, Title 50, Idaho Code. Under Chapter 65, Title 67 of the Idaho Code, the City is required to pass certain ordinances regarding land use, including a zoning ordinance.
2. Pursuant to Zoning Code Title 17, Section 17.88.050(D)1, the administrator shall have the authority to consider and approve, approve with conditions, or deny applications for floodplain development permits and for waterways design review.
3. The scope of work consists of installing a concrete pad for and a backup generator which rest atop the pad. The generator is outside of the floodplain and does not trespass into the riparian setback
4. A portion of the project site contains Special Flood Hazard Area (SFHA) and contains AE zone.

FINDINGS OF CONFORMANCE WITH FLOODPLAIN DEVELOPMENT REQUIREMENTS

Floodplain Development Permit Requirements				
1. EVALUATION STANDARDS: 17.88.050(E)				

Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)1	The proposal preserves or restores the inherent natural characteristics of the river, floodplain, and riparian zone, including riparian vegetation and wildlife habitat. Development does not alter river channel unless all stream alteration criteria for evaluation are also met.
				<i>Staff Comments</i> <i>The proposed project occurs outside of both the floodplain and the riparian zone. No development on the property will alter the Big Wood River.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)2	No temporary construction activities, encroachment or other disturbance into the 25-foot riparian zone, including encroachment of below grade structures, shall be permitted, with the exception of approved stream stabilization work and restoration work associated with a riparian zone that is degraded.
				<i>Staff Comments</i> <i>Per Sheet C0.20 a silt fence will be placed at the riparian setback line. No construction activity or temporary disturbance will take place beyond said silt fence along with the proposed generator installation.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)3	No permanent development shall occur within the 25-foot riparian zone, with the exception of approved stream stabilization work and restoration work associated with permit issued under this title, or exceptions as described below: a. Access to a property where no other primary access is available; b. Emergency access required by the fire department; c. A single defined pathways or staircases for the purpose of providing access to the river channel and in order to mitigate multiple undefined social paths; d. Development by the City of Ketchum.
				<i>Staff Comments</i> <i>No proposed development is approved to occur within the riparian zone. The generator installation is located outside of the riparian zone.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)4	New or replacement planting and vegetation in the riparian zone shall include plantings that are low growing and have dense root systems for the purpose of stabilizing stream banks and repairing damage previously done to riparian vegetation. Examples of such plantings most commonly include: red osier dogwood, common chokecherry, serviceberry, elderberry, river birch, skunk bush sumac, Beb's willow, Drummond's willow, little wild rose, gooseberry, and honeysuckle. However, in rare instances the distance from the top-of-bank to the mean high water mark is significant and the native vegetation appropriate for the riparian zone are low growing, drought resistant grasses and shrubs. Replacement planting and vegetation shall be appropriate for the specific site conditions. Proposal does not include vegetation

Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
				within the 25-foot riparian zone that is degraded, not natural, or which does not promote bank stability.
			Staff Comments	<i>No riparian restoration is a part of the proposed generator installation. Due to scope of work for the project, riparian restoration is not required.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)5	Landscaping and driveway plans to accommodate the function of the floodplain allow for sheet flooding. Surface drainage is controlled and shall not adversely impact adjacent properties including driveways drained away from paved roadways. Culvert(s) under driveways may be required. Landscaping berms shall be designed to not dam or otherwise obstruct floodwaters or divert same onto roads or other public pathways.
			Staff Comments	<i>No proposed landscaping or driveway modifications are proposed as part of the project. The existing site does not contain landscaping berms or a driveway which would inhibit sheet flooding.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)6	Flood water carrying capacity is not diminished by the proposal.
			Staff Comments	<i>Carrying capacity will not be diminished by proposed project. Project location is located outside of SFHA.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)7	Impacts of the development on aquatic life, recreation, or water quality upstream, downstream or across the stream are not adverse.
			Staff Comments	<i>No work is proposed within the floodway or stream. The project proposes a silt fence to ensure that no erosion occurs that may result in sediment deposits in Bigwood River. No downstream impacts or across stream impacts will be associated with the proposed backup generator.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)8	Building setback in excess of the minimum required along waterways is encouraged. An additional ten-foot building setback beyond the required 25-foot riparian zone is encouraged to provide for yards, decks and patios outside the 25-foot riparian zone.
			Staff Comments	<i>N/A. No building is proposed as part of project. Generator is located outside of riparian zone.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)9	The top of the lowest floor of a building located in, or partially within, the SFHA shall be at or above the flood protection elevation (FPE). A building is considered to be partially within the SFHA if any portion of the building or appendage of the building, such as footings, attached decks, posts for upper story decks, are located within the SFHA. See <u>section 17.88.060</u>, figures 1 and 2 of this chapter to reference construction details. See <u>chapter 17.08</u> of this title for definition of "lowest floor." a. In the SFHA where base flood elevations (BFEs) have been determined, the FPE shall be 24 inches above the BFE for the subject property; 24 inches or two feet is the required freeboard in Ketchum City Limits. b. In the SFHA where no BFE has been established, the FPE shall be at least two feet above the highest adjacent grade.

Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
			Staff Comments	<i>N/A. No building is proposed.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)10	The backfill used around the foundation in the SFHA floodplain shall provide a reasonable transition to existing grade but shall not be used to fill the parcel to any greater extent. a. Compensatory storage shall be required for any fill placed within the floodplain. b. A CLOMR-F shall be obtained prior to placement of any additional fill in the floodplain.
			Staff Comments	<i>N/A. Project location is outside of SFHA.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)11	All new buildings located partially or wholly within the SFHA shall be constructed on foundations that are designed by a licensed professional engineer.
			Staff Comments	<i>N/A. Generator not located with SFHA.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)12	Driveways shall comply with City of Ketchum street standards; access for emergency vehicles has been adequately provided for by limiting flood depths in all roadways to one foot or less during the one percent annual chance event.
			Staff Comments	<i>N/A. Driveway not part of proposed project</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)13	Landscaping or revegetation shall conceal cuts and fills required for driveways and other elements of the development.
			Staff Comments	<i>N/A. Driveway not part of proposed project</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)14	(Stream Alteration) The proposal is shown to be a permanent solution and creates a stable situation.
			Staff Comments	<i>n/a - Stream Alteration is not proposed.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)15	(Stream alteration.) No increase to the one percent annual chance flood elevation at any location in the community, based on hydrologic and hydraulic analysis performed in accordance with standard engineering practice and has been certified and submitted with supporting calculations and a No Rise Certificate, by a registered Idaho engineer.
			Staff Comments	<i>n/a - Stream Alteration is not proposed.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)16	(Stream alteration.) The project has demonstrated no adverse impact or has demonstrated all impacts will be mitigated.
			Staff Comments	<i>n/a - Stream Alteration is not proposed.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)17	(Stream alteration.) The recreational use of the stream including access along any and all public pedestrian/fisher's easements and the aesthetic beauty shall not be obstructed or interfered with by the proposed work.

Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
			Staff Comments	<i>n/a - Stream Alteration is not proposed.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)18	(Stream alteration) Fish habitat is maintained or improved as a result of the work proposed.
			Staff Comments	<i>n/a - Stream Alteration is not proposed.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)19	(Stream alteration.) The proposed work shall not be in conflict with the local public interest, including, but not limited to, property values, fish and wildlife habitat, aquatic life, recreation and access to public lands and waters, aesthetic beauty of the stream and water quality.
			Staff Comments	<i>n/a - Stream Alteration is not proposed.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)20	(Stream alteration.) The work proposed is for the protection of the public health, safety and/or welfare such as public schools, sewage treatment plant, water and sewer distribution lines and bridges providing particularly limited or sole access to areas of habitation.
			Staff Comments	<i>n/a - Stream Alteration is not proposed.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)21	(Wetlands) Where development is proposed that impacts any wetland the first priority shall be to move development from the wetland area. Mitigation strategies shall be proposed at time of application that replace the impacted wetland area with an equal amount and quality of new wetland area or riparian habitat improvement.
			Staff Comments	<i>n/a – the construction work is not within any delineated wetland areas.</i>

CONCLUSIONS OF LAW

1. The City of Ketchum is a municipal corporation organized under Article XII of the Idaho Constitution and the laws of the State of Idaho, Title 50, Idaho Code;
2. Under Chapter 65, Title 67, of the Idaho Code the City has passed a zoning ordinance, Title 17;
3. The City of Ketchum Planning Department provided adequate notice of opportunity to comment on this application pursuant to Chapter 17.88.050 D of the zoning ordinance, Title 17;
4. The project **does** meet the standards of approval under Chapter 17.88 of Zoning Code Title 17.

DECISION

THEREFORE, the Administrative Floodplain Development Permit for the proposed project, Northwood Pump Station Generator, is approved on this date, November 7th, 2023, with the following conditions.

Conditions of Approval

1. Any modification to approved plans as referenced in this approval shall be subject to a written amendment to this permit approval. If construction or improvements differ from the approved plans, such work may be subject to removal at the applicants expense.
2. No irrigation infrastructure is permitted within the Riparian Zone. To allow plants to establish irrigation must be located outside of the Riparian Zone but may spray into the Riparian Zone.
3. No decks, patios, stairs or other improvements shall be located within the riparian setback. Any placement of such features or improvements not shown on Sheet L-1.0 dated 7/29/2022 shall be removed within 30 days of notice by the City.
4. This Floodplain Development Permit shall expire one (1) year from the date of signing of approved Findings of Fact per the terms of KMC, Section 17.88.050.G, Terms of Approval, if construction has not commenced. Once a building permit has been issued, the approval shall be valid for the duration of the building permit.
5. No use of restricted use chemicals or soil sterilants will be allowed within one hundred feet (100') of the mean high-water mark on any property within the city limits at any time (KMC 17.88.040.C.3);
6. No use of pesticides, herbicides, or fertilizers will be allowed within twenty-five feet (25') of the mean high-water mark on any property within the City limits unless approved by the City Arborist (KMC 17.88.040.C.4);
7. All applications of herbicides and/or pesticides within one hundred feet (100') of the mean high water mark, but not within twenty five feet (25') of the mean high water mark, must be done by a licensed applicator and applied at the minimum application rates (KMC 17.88.040.C.4);
8. Application times for herbicides and/or pesticides will be limited to two (2) times a year; once in the spring and once in the fall unless otherwise approved by the City Arborist (KMC 17.88.040.C.5);
9. The application of dormant oil sprays and insecticidal soap within the Riparian Zone may be used throughout the growing season as needed (KMC 17.88.040.C.6);
10. It shall be unlawful to dump, deposit or otherwise cause any trash, landscape debris or other material to be placed in any stream, channel, ditch, pond or basin that regularly or periodically carries or stores water.
11. Any new or replacement landscaping within the Riparian Zone shall be subject to review and approval by the City of Ketchum through a separate Floodplain Development Permit.
12. The Administrator shall conduct site inspections of work in progress. The Administrator shall make as many inspections of the work as may be necessary to ensure that the work is being done according to the terms of this permit, approved plans and KMC 17.88. In exercising this power, the Administrator has a right, upon presentation of proper credentials, to enter the property at any reasonable hour for the purposes of inspection or other enforcement action.
13. This approval is subject to the scope of work described in the project plans shown in Attachment A.
14. Landscaping located outside of the Riparian Zone may be modified without modification to this permit because this permit does not regulate landscaping outside of the Riparian Zone
15. The fence indicated on sheet C-02.0 shall be installed prior to commencement of construction and shall remain in place until such time the riparian zone plantings occur
16. The owner's representative shall notify the Planning and Building Department via phone, 208-726-7801, 48 hours in advance of the day of construction of the project is scheduled to begin to facilitate a site visit to ensure the fencing protecting the riparian zone has been installed per sheet C-02.0.

Decision: Approved, subject to conditions above.

DATED this

7th day of November 2023

Adam Crutcher
Associate Planner

ATTACHMENTS:

- A. Project Plans

OFFICIAL USE ONLY
File Number:
Date Received:
By:
Fee Paid:
Approved Date:
Denied Date:
By:

Floodplain Development Permit Application

Submit completed application and documentation to planningandzoning@ketchumidaho.org Or hand deliver to Ketchum City Hall, 191 5th St. W. Ketchum, ID If you have questions, please contact the Planning and Building Department at (208) 726-7801. To view the Development Standards, visit the City website at: www.ketchumidaho.org and click on Municipal Code. You will be contacted and invoiced once your application package is complete.

When is a Floodplain Development Permit Application required?

The Floodplain Management Overlay Zoning District boundaries are represented on the official zoning map of the City.

All land within the external boundary of the special flood hazard area (SFHA) and all parcels with any portion thereof affected by said SFHA shall be considered to be within the Floodplain Management Overlay Zoning district.

All land areas within the external boundary of the SFHA shall be considered to be within the floodplain subdistrict of the Floodplain Management Overlay Zoning District. The City may make necessary interpretations of the boundary based upon the recommendation of the City Engineer or other expert.

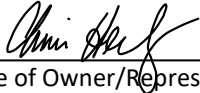
All land areas within the external boundary of the regulatory floodway shall be considered to be within the floodway subdistrict of the Floodplain Management Overlay Zoning District. The City may make necessary interpretations of the boundary based upon the recommendation of the City Engineer or other expert.

NOTE: This permit is required for all properties containing 100 year floodplain area and Riparian Setbacks

PROPERTY OWNER INFORMATION
Property Owner Name(s): CITY OF KETCHUM
Property Owner's Mailing Address: PO BOX 2315, KETCHUM ID 83340
Phone: (208) 726-7801
Email: TDONAT@KETCHUMIDAHO.ORG
PROJECT INFORMATION
Project Name: NORTHWOOD PUMP STATION STANDBY POWER 21KET01
Project Representative's Name (main point of contact for project): CHRIS HELGESON
Project Representative's Phone: (208) 720-3208
Project Representative's Mailing Address: PO BOX 265, KETCHUM ID 83340
Project Representative's Email: CHRIS@LLOYDCONSTRUCTIONINC.COM
Architect's name, phone number, e-mail: N/A
Landscape Architect's name, phone number, e-mail: N/A
Environmental consultant's name, phone number, e-mail: N/A
Engineer's name, phone number, e-mail: JOHN BARRUTIA, (208) 493-0026, JBARRUTIA@DCENGINEERING.NET
Project Address: 100 PK CIR W, KETCHUM, ID 83340
Legal Description of parcel: NORTHWOOD PUD SUBDIVISION, PARCEL "A" PARK
Lot Size: 6.24 ACRES
Zoning District: CITY
Overlay Zones – indicate all that apply: <input checked="" type="checkbox"/> Floodplain <input type="checkbox"/> Floodway <input checked="" type="checkbox"/> Riparian Zone <input type="checkbox"/> Avalanche <input type="checkbox"/> Mountain
Brief description of project scope: The proposed Work includes: Labor, services, and documentation necessary to furnish, install, test, start-up and commission a diesel-powered engine-generator, automatic transfer switch, and associated circuits, raceways, and other materials. Excavation and concrete work for generator pad
Value of Project: \$ \$250,000
TYPE OF PROJECT – indicate all that apply:

<input type="checkbox"/> New Building in Floodplain	<input type="checkbox"/> Building Addition in Floodplain	<input type="checkbox"/> Emergency Streambank Stabilization / Stream Alteration	<input checked="" type="checkbox"/> Other. Please describe: Generator to be located outside of floodplain, but near
<input type="checkbox"/> Floodplain Development	<input type="checkbox"/> Streambank Stabilization / Stream Alteration		
PROPOSED SETBACKS – if project is a new building or an addition to an existing building			
Front:	Side:	Side:	Rear:
ADDITIONAL INFORMATION			
Will fill or excavation be required in floodplain, floodway or riparian zone? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
If Yes, Amount in Cubic Yards: Fill: CY Excavation: CY			
Will Existing Trees or Vegetation be Removed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (1) DOUG FIR REMOVED PER ID POWER REQUIREMENT, ALREADY PERFORMED			
Will new trees or vegetation be planted? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			

Applicant agrees in the event of a dispute concerning the interpretation or enforcement of the Floodplain Management Overlay Application, in which the City of Ketchum is the prevailing party, to pay reasonable attorney fees, including attorney fees on appeal, and expenses of the City of Ketchum. I, the undersigned, certify that all information submitted with and upon this application form is true and accurate to the best of my knowledge and belief.



Signature of Owner/Representative

10/18/23

Date

FLOODPLAIN MANAGEMENT OVERLAY EVALUATION STANDARDS

Please provide a narrative to address each of the criteria below.

Criteria for Evaluation of Applications: The criteria of floodplain development permit applications shall be as follows:

1. The proposal preserves or restores the inherent natural characteristics of the river, floodplain, and Riparian Zone, including riparian vegetation and wildlife habitat. Development does not alter river channel unless all stream alteration criteria for evaluation are also met. **N/A - NO ALTERATIONS TO RIVER, FP, RIPARIAN, CHANNEL ALTERATIONS**
2. No temporary construction activities, encroachment, or other disturbance into the twenty-five foot (25') Riparian Zone, including encroachment of below grade structures, shall be permitted, except for approved stream stabilization work and restoration work associated with a riparian zone that is degraded. **SILT FENCE TO BE INSTALLED PER SITE PLAN**
3. No permanent development shall occur within the twenty-five foot (25') Riparian Zone, except for approved stream stabilization work and restoration work associated with permit issued under this title, or exceptions as described below: **N/A - NO ALTERATIONS WITHIN RIPARIAN**
 - a. Access to a property where no other primary access is available.
 - b. Emergency access required by the Fire Department.
 - c. A single defined pathways or staircases for the purpose of providing access to the river channel and in order to mitigate multiple undefined social paths.
 - d. Development by the City of Ketchum **GENERATOR TO BE LOCATED OUTSIDE OF RIPARIAN, WITH SILT CONTROL PER SITE PLAN**
4. New or replacement planting and vegetation in the Riparian Zone shall include plantings that are low growing and have dense root systems for the purpose of stabilizing stream banks and repairing damage previously done to riparian vegetation. Examples of such plantings most commonly include red osier dogwood, common chokecherry, serviceberry, elderberry, river birch, skunk bush sumac, Beb's willow, Drummond's willow, little wild rose, gooseberry, and honeysuckle. However, in rare instances the distance from the top-of-bank to the mean high-water mark is significant and the native vegetation appropriate for the Riparian Zone are low growing, drought resistant grasses and shrubs. Replacement planting and vegetation shall be appropriate for the specific site conditions. Proposal does not include vegetation within the twenty-five foot (25') Riparian Zone that is degraded, not natural, or which does not promote bank stability. **N/A - NO ALTERATIONS WITHIN RIPARIAN**
5. Landscaping and driveway plans to accommodate the function of the floodplain allow for sheet flooding. Surface drainage is controlled and shall not adversely impact adjacent properties including driveways drained away from paved roadways. Culvert(s) under driveways may be required. Landscaping berms shall be designed to not dam or otherwise obstruct floodwaters or divert same onto roads or other public pathways. **N/A - NO ALTERATIONS TO LANDSCAPE EXCEPT FOR GRADE CUT AS REQUIRED FOR CONCRETE PAD**
6. Floodwater carrying capacity is not diminished by the proposal. **N/A**
7. Impacts of the development on aquatic life, recreation, or water quality upstream, downstream or across the stream are not negative. **N/A**
8. Building setback in excess of the minimum required along waterways is encouraged. An additional ten-foot (10') building setback beyond the required twenty-five foot (25') Riparian Zone is encouraged to provide for yards, decks and patios outside the twenty five foot (25') Riparian Zone. **NW CORNER OF PAD TO BE LOCATED APPROX 29' FROM NEAREST CHANNEL, AS REQUIRED FOR FUNCTIONALITY**
9. The top of the lowest floor of a building located in, or partially within, the SFHA shall be at or above the Flood Protection Elevation (FPE). A building is considered to be partially within the SFHA if any portion of the building or appendage of the building, such as footings, attached decks, posts for upper story decks, are located within the SFHA. See section 17.88.060, figures 1 and 2 of this chapter to reference construction details. See Chapter 17.08 of this title for definition of "lowest floor." **N/A**
 - a. In the SFHA where Base Flood Elevations (BFEs) have been determined, the FPE shall be twenty-four inches (24") above the BFE for the subject property; twenty-four inches (24") or two (2) feet is the required freeboard in Ketchum city limits.
 - b. In the SFHA where no BFE has been established, the FPE shall be at least two (2) feet above the highest adjacent grade.
10. The backfill used around the foundation in the SFHA floodplain shall provide a reasonable transition to existing grade but shall not be used to fill the parcel to any greater extent. **BACKFILL PER ENGINEER'S DRAWINGS**
 - a. Compensatory storage shall be required for any fill placed within the floodplain.
 - b. A CLOMR-F shall be obtained prior to placement of any additional fill in the floodplain.
11. All new buildings located partially or wholly within the SFHA shall be constructed on foundations that are designed by a licensed professional engineer. **CONCRETE PAD PER ENGINEER'S DRAWINGS**

12. Driveways shall comply with City of Ketchum street standards; access for emergency vehicles has been adequately provided for by limiting flood depths in all roadways to one foot (1-ft) or less during the 1% annual chance event. N/A
13. Landscaping or revegetation shall conceal cuts and fills required for driveways and other elements of the development. N/A
14. (Stream alteration.) The proposal is shown to be a permanent solution and creates a stable situation. N/A
15. (Stream alteration.) No increase to the one percent (1%) annual chance flood elevation at any location in the community, based on hydrologic and hydraulic analysis performed in accordance with standard engineering practice and has been certified and submitted with supporting calculations and a No Rise Certificate, by a registered Idaho engineer. N/A
16. (Stream alteration.) The project has demonstrated No Adverse Impact or has demonstrated all impacts will be mitigated. N/A
17. (Stream alteration.) The recreational use of the stream including access along any and all public pedestrian/fisher's easements and the aesthetic beauty shall not be obstructed or interfered with by the proposed work. N/A
18. (Stream alteration.) Fish habitat shall be maintained or improved as a result of the work proposed. N/A
19. (Stream alteration.) The proposed work shall not be in conflict with the local public interest, including, but not limited to, property values, fish and wildlife habitat, aquatic life, recreation and access to public lands and waters, aesthetic beauty of the stream and water quality. N/A
20. (Stream alteration.) The work proposed is for the protection of the public health, safety and/or welfare such as public schools, sewage treatment plant, water and sewer distribution lines and bridges providing particularly limited or sole access to areas of habitation. WATER DIST.
21. (Wetlands) Where development is proposed that impacts any wetland the first priority shall be to move development from the wetland area. Mitigation strategies shall be proposed at time of application that replace the impacted wetland area with an equal amount and quality of new wetland area or riparian habitat improvement.

N/A

APPLICATION CHECKLIST

Please utilize and submit the checklist on the following pages to ensure a complete application.

Floodplain management overlay application certification of completeness is based on submittal of all applicable items on this checklist.

Project name: 21KET01 - NORTHWOOD PUMP STATION STANDBY POWER

Reviewed by: CHRIS HELGESON

DOCUMENTS

- One (1) digital copy of all application materials
- Application form
- Evaluation criteria narrative
- Description of proposed development
- Specifications for building construction and materials, flood proofing, filling, grading, dredging, channel improvement/changes and utilities
- Elevation and/or flood proofing certification prepared by a professional engineer for existing and proposed residential and nonresidential structures located partially or wholly in the regulatory floodplain. Said floodproofing methods shall meet the criteria in subsection 17.88.060.B of the Ketchum Municipal Code.
- Copy of letter of map amendment based on fill (LOMA-F) application for any proposed fill in the floodplain. LOMA-F approval shall be obtained from FEMA prior to issuance of a floodplain development permit. *N/A*
- Signed, notarized, original copy of the Acknowledgement of Floodplain Management Overlay District and Waterways Design Review District Affidavit. *BY CITY OF KETCHUM AS NEEDED*

SITE SURVEY OF EXISTING CONDITIONS (prepared and stamped by a licensed engineer or surveyor) – REQUIRED FOR NEW BUILDINGS OR ADDITIONS TO BUILDINGS IN THE FLOODPLAIN AND ANY WORK WITHIN THE FLOODWAY

- Exterior boundary lines of the property together with dimensions
- Topographic survey of the real property at a minimum of one (1) foot contour intervals, significant hillsides may be a minimum of ten (10) foot contour intervals
- Location of any existing dwelling units, other structures, fill, storage of materials, drainage facilities and all improved areas (pavement) with dimensions thereof showing the setback of each structure from the nearest property line
- Location of existing channels and ditches and other significant natural features, boundaries of floodway and floodplain, including Base Flood Elevation (BFE) and other site specific information from the studies referred to in Ketchum Municipal Code, subsection 17.88.040.A.3
- Location and elevations of adjacent streets, water supply and sewer lines, including private wells and/or septic systems
- Elevation of the lowest floor (including basement) of all structures existing and proposed partially or wholly located in the one percent (1%) annual chance floodplain, including elevation to which any structure has been or will be floodproofed
- Identification of the riparian zone and the "mean high water mark," as defined in Ketchum Municipal Code
- Location of previous stream alterations upstream, downstream and along both banks from subject lot
- Location of drainage ways, intermittent and year-round, including potential overflow channels or channel movement
- Location and dimensions of easements, private and public, within and adjacent to the proposed project together with the purpose thereof
- Location of all existing trees to be preserved and significant trees to be removed
- Indication of any zoning district overlay which affects the property (floodplain, mountain overlay or avalanche)
- Location of existing structures on adjacent properties

SITE PLAN – REQUIRED FOR ALL PROJECTS.

- Vicinity map
- Proposed excavation or land fill including resulting slope grades for the building pad(s), driveways and any other element of the proposed development where excavation or fill will take place
- Drainage plan including offsite improvements such as borrow ditches and culverts and including a plan for on- and off-site improvements to provide for unobstructed conveyance of floodwaters
- Location of on-site parking spaces and access thereto, including the dimensions of the spaces and the width and length of access and curb cuts
- Location and dimensions of snow storage areas
- Location of dumpster and/or garbage and recycling can storage areas, including the dimensions and proposed fencing or other screening
- Location and type of any electrical power transformers, switches and/or sectors
- Location and type of all heating, ventilation, air conditioning and other mechanical units
- Drip line of all buildings *N/A*
- Percentage of the lot coverage by proposed building and parking areas together with the total square footage of the parcel of property *N/A*
- Location of all proposed structures (buildings) and all improved areas (pavement, sidewalk) with dimensions thereof showing the setback of each structure from the nearest property line
- Designation of the zoning district in which the project is located *CITY*
- Location of any zoning district boundary line within the proposed project or the immediate vicinity thereof *N/A*
- For any building in the floodplain with an area below the lowest floor that is below the base flood elevation and has a ceiling height of five feet (5') or greater, the building owner shall sign a non-conversion agreement, that shall run with the property, promising not to improve, finish or otherwise convert the area below the lowest floor to living area and granting the city the right to inspect the enclosed area at its discretion. Such agreement shall be recorded at Blaine County's recorder's office *N/A*

ARCHITECTURAL PLANS – REQUIRED FOR NEW BUILDINGS OR ADDITIONS TO EXISTING BUILDINGS *N/A*

- Floor plans of all floors at not less than one-eighth (1/8) scale
- All exterior elevations
- Roof plan including direction of snow sliding and snow clips if applicable. Location and type of all mechanical equipment and rooftop appurtenances
- Cross-section(s) of the property and proposed building adequately establishing the natural grade, finished grade, slope of land, slope of proposed accesses and grades to all public rights-of-way
- Location and type (cut sheets) of all exterior lighting
- Model or computer simulation renderings, if required at pre-application design review meeting

LANDSCAPE PLAN – REQUIRED FOR ANY PROJECT PROPOSING TO ALTER VEGETATION IN THE RIPARIAN ZONE OR SPECIAL FLOOD HAZARD AREA *N/A*

- All existing vegetation over 2 inches in caliper, including size and species
- Proposed landscaping of the project including types, quantities and sizes of trees, shrubs, ground cover and other vegetation
- Proposed landscaping or other improvements within any public rights-of-way
- Location, type (materials and colors) and height of walls or fences
- Location of parking areas
- Location of vehicular and pedestrian circulation patterns, easements and proposed improvements with regard thereto
- Irrigation system for landscaping
- Drainage plan including off-site improvements

STREAM ALTERATIONS / STREAMBANK STABILIZATION *N/A*

- Copies of the Joint Application for Permits submitted to the U.S. army corps of engineers (USACE) and Idaho department of water resources (IDWR). Please note, USACE and IDWR approvals shall be obtained prior to issuance of a stream alteration permit.
- Copy of the USACE permit approval.
- Copy of the IDWR permit approval.
- Cross section of proposed work

- Length of stream to be worked, type of work to be done, type of equipment to be used and starting and completion dates of work
- A valley cross section showing stream channel, floodway limits, elevations of adjacent land areas, Special Flood Hazard Area boundary, floodway boundary, existing Mean High Water mark, proposed Mean High Water mark, Riparian Zone regulated by the City of Ketchum, proposed excavation, proposed fill. A profile showing the slope of the bottom of the channel or flow line of the stream may be required upon review of all other material submitted.
- For any work proposed to occur in the regulatory floodway: A no net rise certificate, including supporting calculations, prepared and stamped by an Idaho registered professional hydraulic engineer
- For any work proposed to occur in the floodway: HEC-RAS model

NO ADVERSE IMPACT STATEMENT – WHERE APPLICABLE N/A

- No Adverse Impact Statement
 - See definition of “No Adverse Impact” in section 17.08.020 of Ketchum Municipal Code.



BY CITY OF KETCHUM

Acknowledgement of Floodplain Affidavit

Pursuant to Ketchum Municipal Code §17.88.040 D1, prior to the issuance of any floodplain development permit for development within the Floodplain Management Overlay District and the Waterways Review District as defined under to Ketchum Municipal Code §17.08, the property owner shall submit to the Planning and Building Department a written affidavit on a form provided by the City, signed by the property owner under seal of a notary public, of the property owner's actual knowledge that the property is located within the Floodplain Management Overlay District or the Waterways Review District. The property owner will also acknowledge that he or she is aware of the flood hazard potential for the property and is aware of the regulations the Floodplain Management Overlay Zoning District and Waterways Review District no work shall occur in these areas without city permits and approvals

Instructions

1. Property owner shall complete the attached affidavit.
2. Property Owner shall sign before a notary public and have the affidavit notarized.
3. Property Owner shall return original notarized affidavit to the City of Ketchum Planning & Building Department.
4. The Planning & Building Department shall have the notarized affidavit recorded in the records of Blaine County for the property.
5. A copy of the recorded document will be delivered to the Property Owner and filed in the City records with the building permit documents.

**RECORDING REQUESTED BY AND WHEN
RECORDED RETURN TO:**

City Clerk, City of Ketchum
PO Box 2315
Ketchum Idaho, 83340

(Space Above Line For Recorder's Use)

Acknowledgement of Floodplain Management Overlay District and Waterways Design Review District Affidavit

Property Owner:
Building Permit Number or Land Use Permit Number:
Property Address:
Legal Description:
Parcel Number: RPK
Scope of Work:

Please initial and fill below:

_____ I acknowledge that this development and the parcel of land, or portion thereof, on which the development will be situated are within the Floodplain Management Overlay District.

_____ I acknowledge this property is within the Waterways Review District.

_____ I have thoroughly read and fully understand Ketchum Municipal Code Title 17, Chapter 17.88 "Floodplain Management Overlay District", to include regulations for the Waterways Design Review District including regulations on activities within 100 feet of the mean high-water mark.

_____ I fully understand and agree to comply with Ketchum Municipal Code Title 17, Chapter 17.88.040C.

_____ I, on behalf of myself, my personal representatives and my heirs, successors, and assignees, acknowledge by this written *affidavit* that said property is located within the one percent annual chance floodplain (SFHA) as defined herein, and/or said property is within the Waterways Design Review District and that a violation of the terms of Ketchum Municipal Code 17.88 shall cause the City to seek legal remedies.

_____ I acknowledge that the City of Ketchum Planning & Building Department shall have the notarized affidavit recorded in the records of Blaine County for the property.

Property Owner Signature

Date

STATE OF _____, County of _____

On this _____ day of _____, _____, before me, the undersigned, a Notary Public in and for said State, personally appeared _____, known or identified to me to be the person whose name is subscribed to the within instrument.

WITNESS my hand and seal the day and year in this certificate first above written.

Residing at: _____

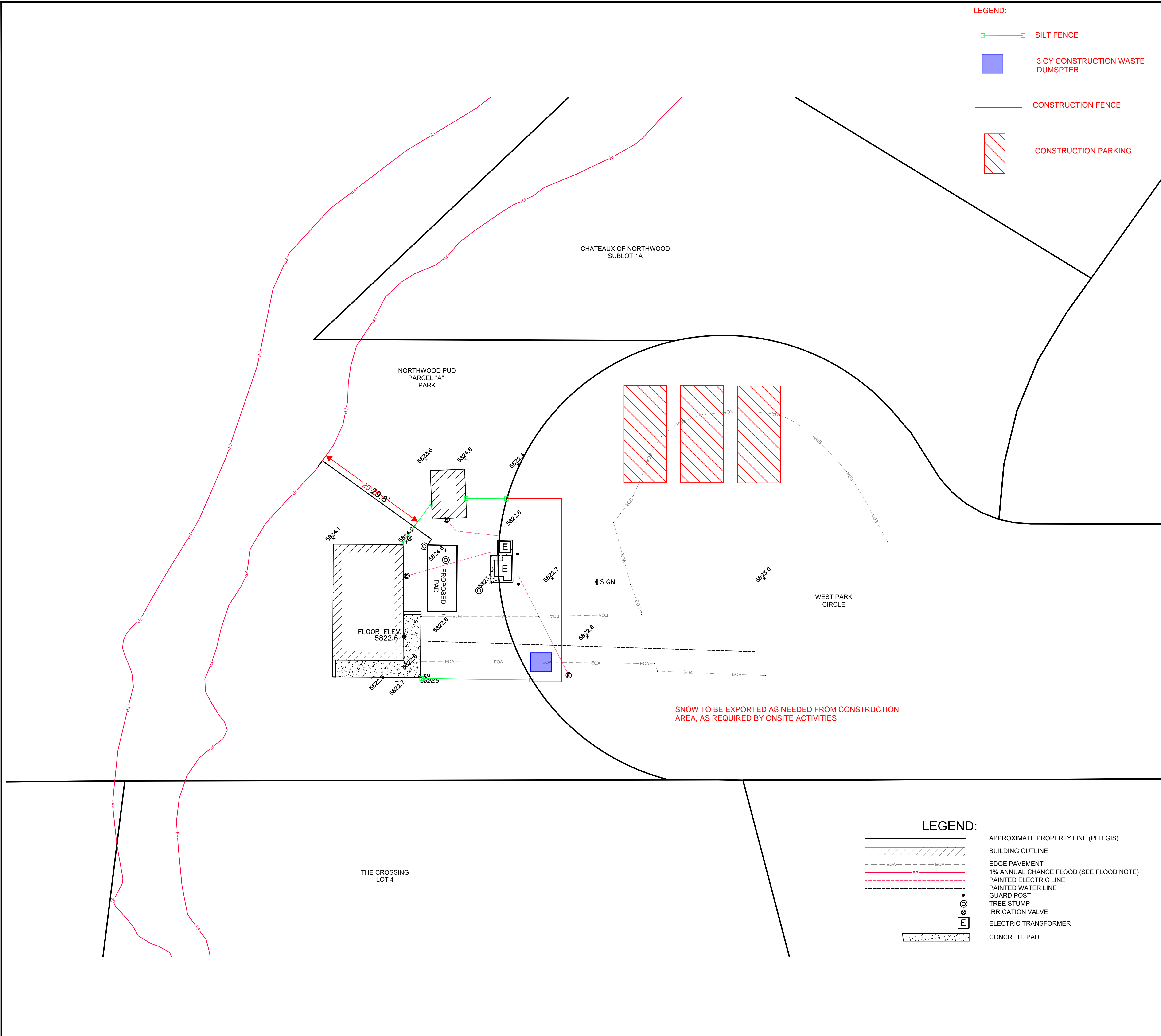
Notary Public for _____
(State)

Commission Expires: _____

City of Ketchum accepts this Affidavit from **(insert owner's name)**.

ATTEST, CITY CLEK

REUSE OF DRAWINGS: These drawings, or any portion thereof, shall not be used on any project or extension of this project except by agreement in writing with Galena-Benchmark Engineering.



- LEGEND:**
- SILT FENCE
 - 3 CY CONSTRUCTION WASTE DUMPSPTER
 - CONSTRUCTION FENCE
 - CONSTRUCTION PARKING

KMC 15.06.030.A.2:

- Pursuant to KMC 15.06.030.A.2 all neighbors within 300' adjoiners to the project will receive a Lloyd "Working in the Neighborhood" letter that outlines project scope, project schedule, and contact information for Lloyd management personnel
- We will pull adjoiners based on Blaine County GIS, and where applicable, provide notice to additional residents inside of a given complex that does have 300' adjoiners, but where some residents wouldn't have otherwise received notices
- A copy of the "Working in the Neighborhood" letter will be provided to the City of Ketchum at time of notice to all residents

- NOTES**
- SURVEY NARRATIVE:**
1. THE PURPOSE OF THIS MAP IS TO SHOW LIMITED SITE INFORMATION AS IT EXISTED ON THE DATE THE FIELD SURVEY WAS PERFORMED. CHANGES MAY HAVE OCCURRED TO SITE CONDITIONS SINCE SURVEY DATE. LOT LINES ARE BASED ON APPROXIMATE GIS DATA. NO MONUMENTS WERE FOUND.
 2. REFERENCED SURVEYS: NORTHWOOD PUD SUBDIVISION.
 3. VERTICAL DATUM: ELEVATIONS BASED ON NAVD 88 (GEOID03) DATUM UTILIZING SMARTNET CORS STATION IDKM.
 4. UNDERGROUND UTILITIES WERE NOT LOCATED AND ARE NOT SHOWN HEREON.
 5. THIS MAP WAS PREPARED FOR THE EXPRESS USE OF THE CLIENT AND IS NOT TRANSFERABLE TO OTHERS WITHOUT WRITTEN CONSENT BY GALENA-BENCHMARK ENGINEERING AND IS NOT VALID OR TO BE USED BY OTHER PARTIES FOR ANY REASON INCLUDING BUT NOT LIMITED TO REAL ESTATE TRANSACTIONS, BUILDING APPLICATIONS, PERMITS, ETC.
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 8. THIS DRAWING IS VOID AFTER 2 YEARS AND NO FURTHER COPIES OR DIGITAL FILES WILL BE TRANSMITTED.

- EASEMENTS, ENCUMBRANCES AND RESTRICTIONS:**
9. BUILDING AREA: BUILDING ENVELOPE IF SHOWN, IS PER PLAT. SETBACK AND FOOTPRINT REQUIREMENTS PER CURRENT CITY/COUNTY ORDINANCES MAY VARY FROM PLAT. IT IS RECOMMENDED THAT SAID ORDINANCES BE REVIEWED PRIOR TO DESIGN.
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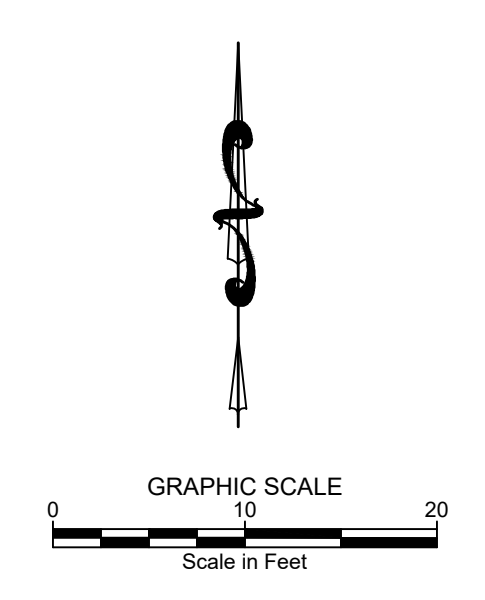
- SURVEY AND SITE FEATURES:**
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STORMWATER
 STORM WATER PLAN: IF SOIL DISTURBANCE, CLEARING, GRADING AND/OR EXCAVATION OF ONE (1) ACRE OR MORE IS TO TAKE PLACE A FEDERAL GENERAL CONSTRUCTION PERMIT, INCLUDING A STORM WATER POLLUTION PREVENTION PLAN (SWPPP), MUST BE PREPARED AND SUBMITTED TO AND APPROVED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY PRIOR TO ANY SITE DISTURBANCE.

FLOOD NOTES
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SNOW TO BE EXPORTED AS NEEDED FROM CONSTRUCTION AREA, AS REQUIRED BY ONSITE ACTIVITIES

- LEGEND:**
- APPROXIMATE PROPERTY LINE (PER GIS)
 - BUILDING OUTLINE
 - EDGE PAVEMENT
 - 1% ANNUAL CHANCE FLOOD (SEE FLOOD NOTE)
 - PAINTED ELECTRIC LINE
 - PAINTED WATER LINE
 - GUARD POST
 - TREE STUMP
 - IRRIGATION VALVE
 - ELECTRIC TRANSFORMER
 - CONCRETE PAD



A LIMITED SITE SURVEY EXHIBIT FOR NORTHWOOD PUD SUBDIVISION PARCEL "A" PARK

LOCATED WITHIN SECTION 12, T.4 N., R.17 E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO

PROJECT INFORMATION: (G:\BMAN\Northwood pud\Parcel A\2289 - Northwood Pump Station\ng\Topo\2289 Topo.dwg, 10/23/21 12:23 PM

SURVEYED BY: DWS	GALENA-BENCHMARK ENGINEERING
DRAWN BY: DWS	Civil Engineers & Land Surveyors
CHECKED BY: MS	100 Bell Drive
SURVEY DATE: 9/29/2023	K.O. Box 133
	PO Box 133
	(208) 726-9512
	www.benchmark-associates.com

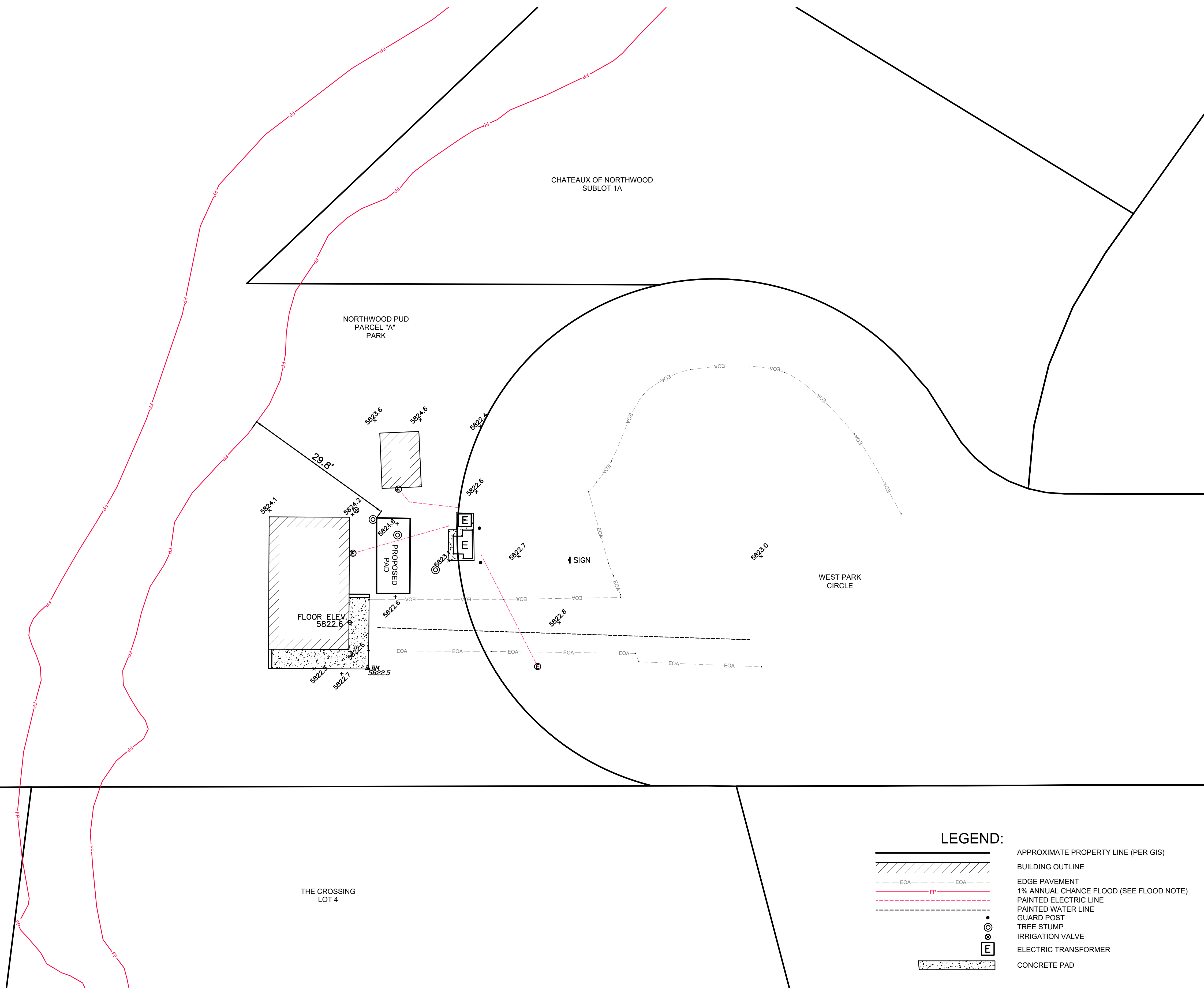
PURPOSE: EXHIBIT MAP

NO.	REVISIONS

DATE BY

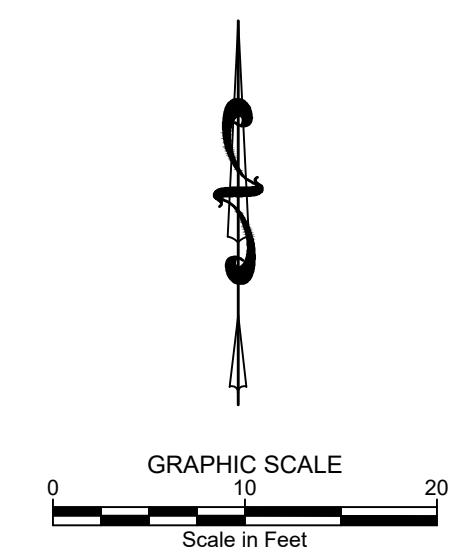
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**A LIMITED SITE SURVEY EXHIBIT FOR
NORTHWOOD PUD SUBDIVISION
PARCEL "A" PARK**

LOCATED WITHIN SECTION 12, T.4 N., R.17 E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO
PREPARED FOR: LLOYD CONSTRUCTION

PROJECT INFORMATION
G:\BMAN\Northwood pud\Parcel A\2289 - Northwood Pump Station\dwg\Topo2289.dwg 10/22/23 2:17:23 PM

SURVEYED BY: DWS
DRAWN BY: DWS
CHECKED BY: MS
SURVEY DATE: 9/29/2023

GALENA-BENCHMARK ENGINEERING
Civil Engineers & Land Surveyors
100 Bell Drive
Ketchum, ID 83340
(208) 726-9512
www.benchmark-associates.com

NO.	DATE	BY	REVISIONS

PURPOSE: EXHIBIT MAP
C0.20



NORTHWOOD WELL PUMPHOUSE BLAINE COUNTY, IDAHO



DC ENGINEERING

Careful listening. Dynamic solutions.

www.dceengineering.net

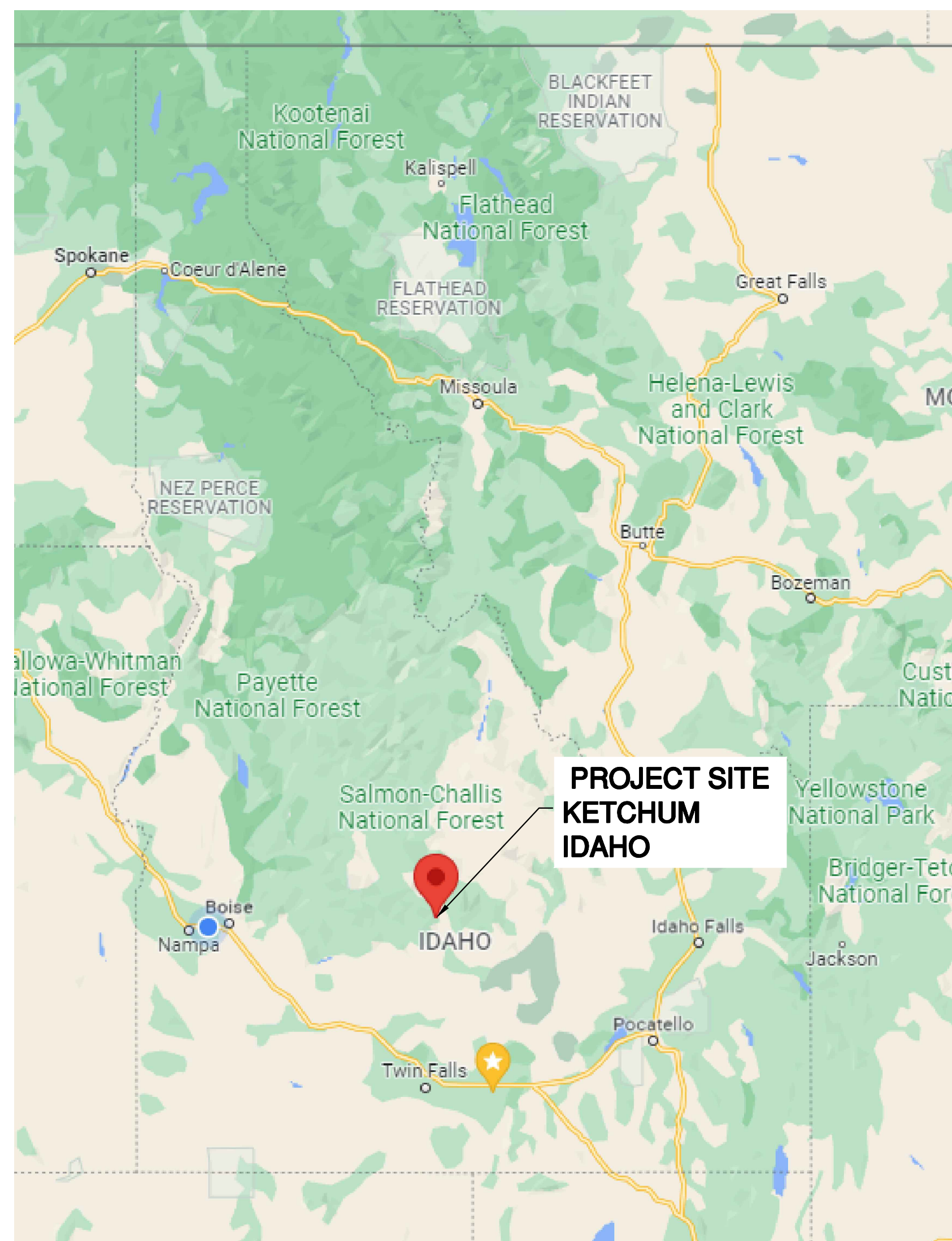
208.288.2181

Project:21KET01

ENGINEER:
DC ENGINEERING, INC
440 E. CORPORATE DRIVE
SUITE 103
MERIDIAN, IDAHO 83642
(208)288-2181

OWNER:
CITY OF KETCHUM
PO BOX 2315
110 RIVER RANCH ROAD
KETCHUM, IDAHO 83340

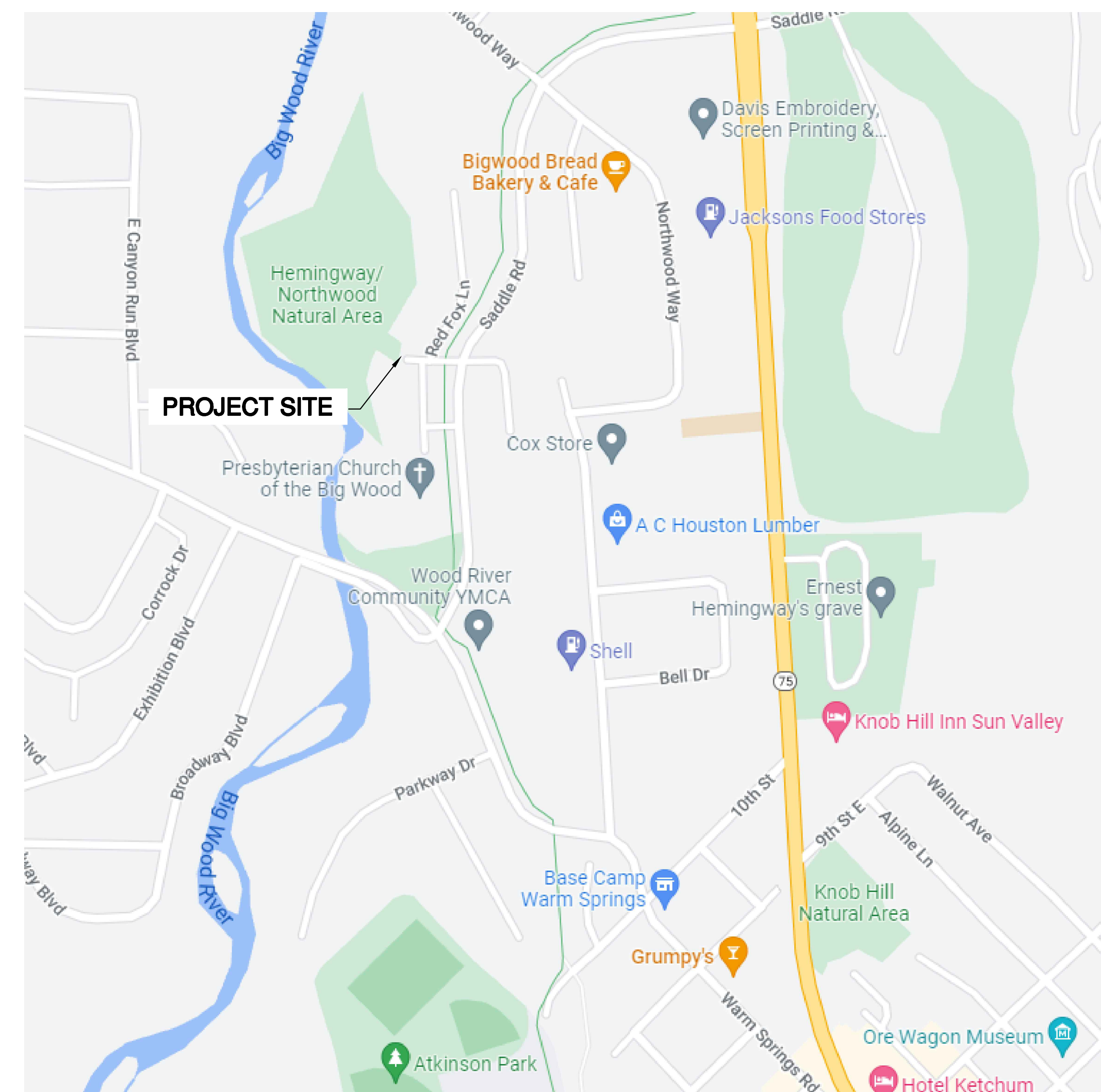
STANDBY POWER MODIFICATIONS



LOCATION MAP

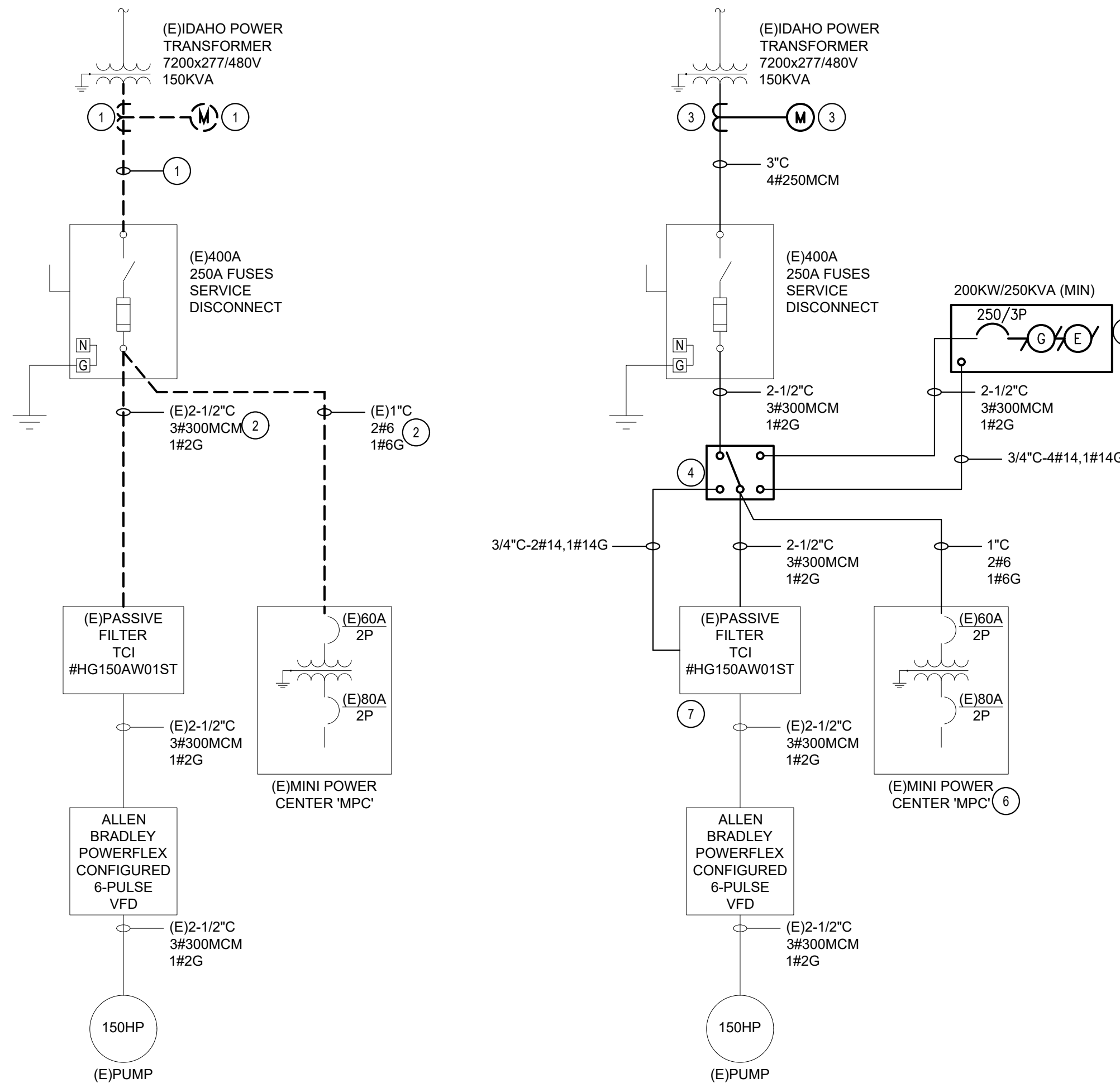
DC PROJECT NUMBER
21KET01
APRIL 2022

- DRAWING INDEX:**
- E-1 ELECTRICAL LEGEND AND NOTES**
 - E-2 DEMO ELECTRICAL PLAN**
 - E-3 NEW ELECTRICAL PLAN**
 - E-4 ELECTRICAL DETAILS**
 - E-5 ELECTRICAL SPECIFICATIONS**
 - E-6 ELECTRICAL SPECIFICATIONS**
 - S-1 STRUCTURAL LEGEND AND SPECIFICATIONS**
 - S-2 STRUCTURAL DETAILS**



VICINITY MAP

ONE-LINE DIAGRAMS



EXISTING ONE-LINE DIAGRAM

SCALE: N.T.S.

MODIFIED ONE-LINE DIAGRAM

SCALE: N.T.S.

KEY NOTES

- REMOVE DIRECT BURIED SERVICE ENTRANCE CONDUCTORS, CT ENCLOSURE, AND METER. COORDINATE WITH IDAHO POWER.
- DISCONNECT AND REMOVE EXISTING CONDUIT AND CONDUCTORS.
- NEW CT METER STRUCTURE LOCATED ADJACENT TO IDAHO POWER TRANSFORMER. SEE DETAIL ON SHEET E-4.
- NEW AUTOMATIC TRANSFER SWITCH.
- NEW GENERATOR. GENERATOR SIZE SHOWN BASED ON GENERATOR SIZING SOFTWARE. IDENTIFIED LOAD CHARACTERISTICS, LOAD STARTUP SEQUENCE, AND OTHER PERFORMANCE REQUIREMENTS AS OUTLINED IN THE SPECIFICATIONS. BECAUSE THE GENERATOR SIZING SOFTWARE TERMS OF USE DO NOT WARRANT THE SOFTWARE ACCURACY AND COMPLETENESS, THE CONTRACTOR SHALL CONFIRM GENERATOR SIZE WITH GENERATOR SUPPLIER.
- SEE PANELBOARD SCHEDULE THIS SHEET FOR NEW BREAKERS

AND ASSOCIATED WORK.

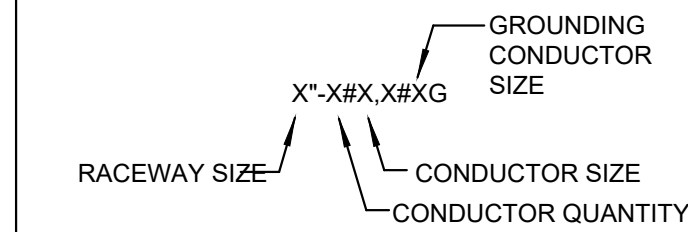
- EXISTING PASSIVE FILTER IS A TRANSCOIL (TCI) HG150CW-1ST. FURNISH AND INSTALL CONTROL POWER TRANSFORMER AND CONTACTOR, WHICH ALLOWS CAPACITORS TO BE DISCONNECTED FROM THE FILTER CIRCUIT WHEN THE AUTOMATIC TRANSFER SWITCH IS IN THE "GENERATOR" POSITION. COORDINATE WITH TCI FOR MATERIAL AND CONNECTION REQUIREMENTS.

PANELBOARD SCHEDULE												
PANEL: MPC		PROJECT: NORTHWOOD WELL PUMPHOUSE										
VOLTAGE: 240/120V		PHASE: 1		WIRE: 3		AMPERE RATING: 60A		SC RATING:		MAIN: 80A		
ENTRY: EXISTING		MOUNTING: EXISTING		LOAD TYPES:		REMARKS:						
				1 = LIGHTING								
				2 = RECEPTACLES								
				3 = MISC								
				4 = MOTOR								
				5 = KITCHEN								
LOAD (VA)	LOAD SERVED	NOTE	LOAD TYPE	AMPS/ROLES	CT NO.	PHASE	CT NO.	AMPS/ROLES	LOAD TYPE	NOTE	LOAD SERVED	LOAD (VA)
475	LIGHTS	E 1	20	1	1	A	2	20	1	2	RECEPTACLES	80
800	EXHAUST FAN	E 4	20	1	3	B	4	20	1	3	FLOW METER/BATTERY CHARGER	500
2500	UNIT HEATER	E 3	30	2	5	A	6	20	1	4	EXHAUST FAN	1028
2500		E 3	-	-	7	B	8	-	-	-	SPACE	-
1500	UNIT HEATER	E 3	20	2	9	A	10	30	2	3		1200
1500		E 3	-	-	11	B	12	-	-	3	GENERATOR PANEL	1200

ELECTRICAL LEGEND

CIRCUITING SYMBOLS

- CONDUIT STUBBED, CAPPED, AND MARKED WITH PULL CORD.
- CONDUIT UP.
- CONDUIT DOWN.
- HOMERUN. PANEL AND CIRCUIT AS INDICATED.
- CIRCUIT CONCEALED IN CEILING OR WALL. 3/4"-2#12,1#12G UNO.
- CIRCUIT CONCEALED IN FLOOR OR UNDERGROUND. 3/4"-2#12,1#12G UNO.



ONE LINE

- BRANCH PANEL
- CIRCUIT BREAKER. SIZE AND TYPE AS SPECIFIED.
- CIRCUIT BREAKER. FRAME SIZE (AF) AND TRIP PLUG/RATING (AT), 3 POLE, UNO.
- FUSE. SIZE AND TYPE AS SPECIFIED, PROVIDE FUSE FOR EACH POLE, 3 POLE, UNO.
- INTERRUPTER SWITCH. SIZE AS INDICATED, 3 POLE, UNO.
- FUSED SWITCH. SWITCH SIZE (AS) & FUSE SIZE (AF) AS INDICATED, 3 POLE, UNO.
- INDIVIDUAL BREAKER FRAME (AF) SIZE AND TRIP PLUG RATING (AT), NEMA 1 UNO, 3 POLE UNO.
- METER.
- AMMETER.
- VOLTMETER.
- KIRK KEY LOCK.
- GROUND FAULT PROTECTION.
- SURGE PROTECTION DEVICE.
- ARC FLASH MITIGATION.
- VARIABLE FREQUENCY DRIVE.
- TRANSIENT VOLTAGE SURGE SUPPRESSION.
- SHUNT TRIP COIL.
- KILOWATT HOUR METER.
- KILOVAR DEMAND METER.
- TEST BLOCK.
- OVERHEAD SERVICE DROP.
- GENERATOR SET. MAIN BREAKER SIZE INDICATED.
- TRANSFER SWITCH.
- GUTTER.
- METER AND BASE.
- NEUTRAL.
- TRANSFORMER
- STARTER AND OVERLOAD, NEMA SIZE AS INDICATED.
- GROUND

GENERAL NOTES

(RE: ALL ELECTRICAL SHEETS)

- ALL ELECTRICAL EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, INTERNATIONAL FIRE CODE, AND ALL OTHER STATE AND LOCAL CODES. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER IN WRITING IF PORTIONS OF THE DESIGN SET OR FIELD CONDITIONS DO NOT MEET REQUIRED CODES.
- PROVIDE FIRESTOPPING FOR ALL FLOOR, CEILING AND FIREWALL PENETRATIONS FROM ELECTRICAL FIXTURE, DEVICE, RACEWAY, AND CABLE PENETRATIONS.
- ELECTRICAL DEVICES AND LINWORK ARE SHOWN BOLD FOR NEW, BOLD/DASHED FOR DEMO AND SCREENED FOR EXISTING.

ABBREVIATIONS

- A AMPERES
- AC ABOVE COUNTER
- AFF ABOVE FINISHED FLOOR
- AFG ABOVE FINISHED GRADE
- AF AMPERE FRAME
- AFCI ARC FAULT CIRCUIT INTERRUPT
- AHF ACTIVE HARMONIC FILTER
- AHJ AUTHORITY HAVING JURISDICTION
- AT AMP TRIP
- ATS AUTOMATIC TRANSFER SWITCH
- AWG AMERICAN WIRE GAUGE
- C CONDUIT
- CB CIRCUIT BREAKER
- CKT CIRCUIT
- CM CEILING MOUNTED
- CO CONDUIT ONLY, PROVIDE PULL-LINE
- DC DIRECT CURRENT
- DET DETAIL
- (E) EXISTING
- EF EXHAUST FAN
- EWC ELECTRIC WATER COOLER
- EWH ELECTRIC WATER HEATER
- F FUSE
- FACP FIRE ALARM CONTROL PANEL
- FVNR FULL VOLTAGE NON-REVERSING
- G/GND GROUND
- GFI GROUND FAULT INTERRUPTION
- GFP GROUND FAULT PROTECTION
- H HEAT
- HI HANDHOLE
- HOA HAND OFF AUTO
- HVAC HEATING, VENTILATING, & AIR CONDITIONING
- ID IN-DUCT
- IC INTERRUPTING CAPACITY
- IG ISOLATED GROUND
- J/JB JUNCTION BOX
- KW KILOWATT
- KWH KILOWATT HOUR
- M MAGNETIC CONTACTOR COIL
- MB MAIN BREAKER
- MCC MOTOR CONTROL CENTER
- MLO MAIN LUGS ONLY
- MS MOTOR STARTER
- MTS MANUAL TRANSFER SWITCH
- MH MANHOLE
- MW MICROWAVE
- N NEUTRAL
- NC NORMALLY CLOSED
- NCL NON CRITICAL LOAD
- NEC NATIONAL ELECTRICAL CODE
- NIC NOT IN CONTRACT
- NO NORMALLY OPEN
- NTS NOT TO SCALE
- OL OVERLOAD
- OS OCCUPANCY SENSOR
- OFCI OWNER FURNISHED CONTRACTOR INSTALLED
- P PHOTO
- PC PHOTOCCELL
- PVC POLYVINYL CHLORIDE
- RCPT RECEPTACLE
- (R) RELOCATED
- (RE) REPLACED
- REF REFRIGERATOR
- RVSS REDUCED VOLTAGE SOFT START
- SER SERVICE ENTRANCE RATED
- SPST SINGLE POLE SINGLE THROW
- TC TIME CLOCK
- TDR TIME DELAY RELAY
- TJB TERMINAL JUNCTION BOX
- TSP TWISTED SHIELDED PAIR
- TTB TELEPHONE TERMINAL BOARD
- TVSS TRANSIENT VOLTAGE SURGE SUPPRESSER
- TYP TYPICAL
- UH UNIT HEATER
- UNO UNLESS NOTED OTHERWISE
- UPS UNINTERRUPTIBLE POWER SUPPLY
- V VOLT
- VA VOLT AMPERE
- VFD VARIABLE FREQUENCY DRIVE
- WG PROVIDE PROTECTIVE WIRE GUARD
- WP WEATHER PROOF/NEMA 3R
- XFMR TRANSFORMER

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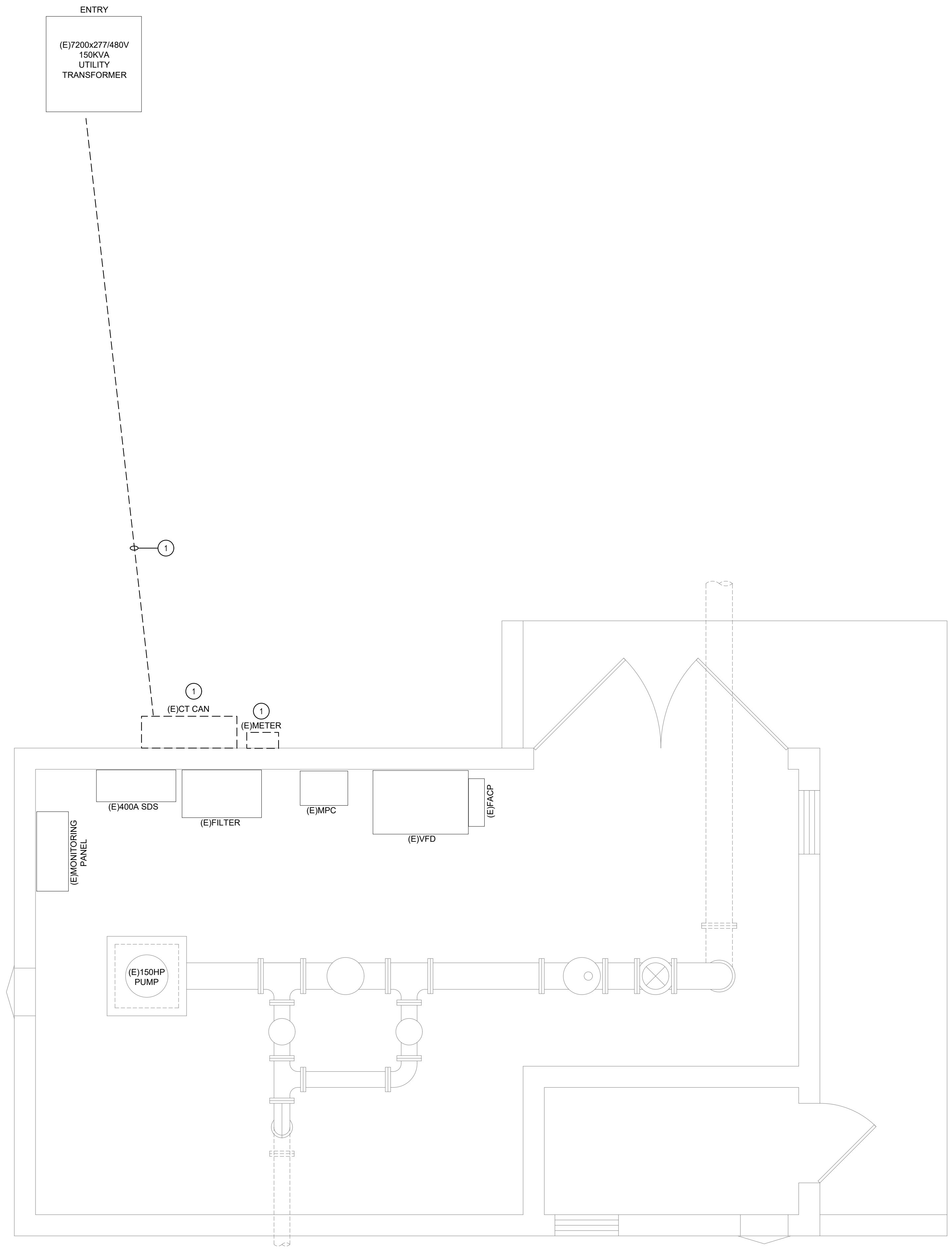
OWNER REVIEW SET FOR CONSTRUCTION

PROFESSIONAL ENGINEER
STATE OF IDAHO
7051
JOHN J. BARRUTTA JR.
5/26/22

NO.	REVISIONS	DATE

NORTHWOOD WELL PUMPHOUSE STANDBY POWER MODIFICATIONS ELECTRICAL LEGEND AND NOTES

SCALE: AS NOTED
DATE: TBD
DRAWN BY: MAP
CHECKED BY: JUB



GENERAL NOTES:

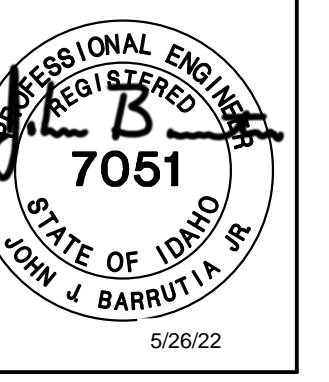
1. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL ELECTRICAL EQUIPMENT DEMOLISHED WITH THIS PROJECT UNLESS OTHERWISE NOTED TO BE RETURNED TO OWNER.
2. REMOVE ALL ELECTRICAL ITEMS SHOWN DASHED, UNLESS OTHERWISE INDICATED. REMOVE WIRE BACK TO OVERCURRENT PROTECTIVE DEVICE OR TO UPSTREAM DEVICE REMAINING. MAINTAIN CIRCUITING/CONTINUITY TO EXISTING DEVICES NOT AFFECTED BY DEMOLITION. CONCEALED CONDUIT MAY BE ABANDONED IN PLACE. SURFACE CONDUIT NO LONGER USED SHALL BE REMOVED.
3. PROVIDE CUTTING AND PATCHING AS REQUIRED, WHETHER OR NOT SPECIFICALLY INDICATED.
4. IF AN ITEM IS TO BE REPLACED, THE CONTRACTORS SHALL RECONNECT ALL EXISTING CONNECTIONS.

KEY NOTES:

1. DISCONNECT AND REMOVE EXISTING SERVICE ENTRANCE CONDUCTORS, CT CAN, AND METER. TO BE REPLACED. SEE SHEET E-3.

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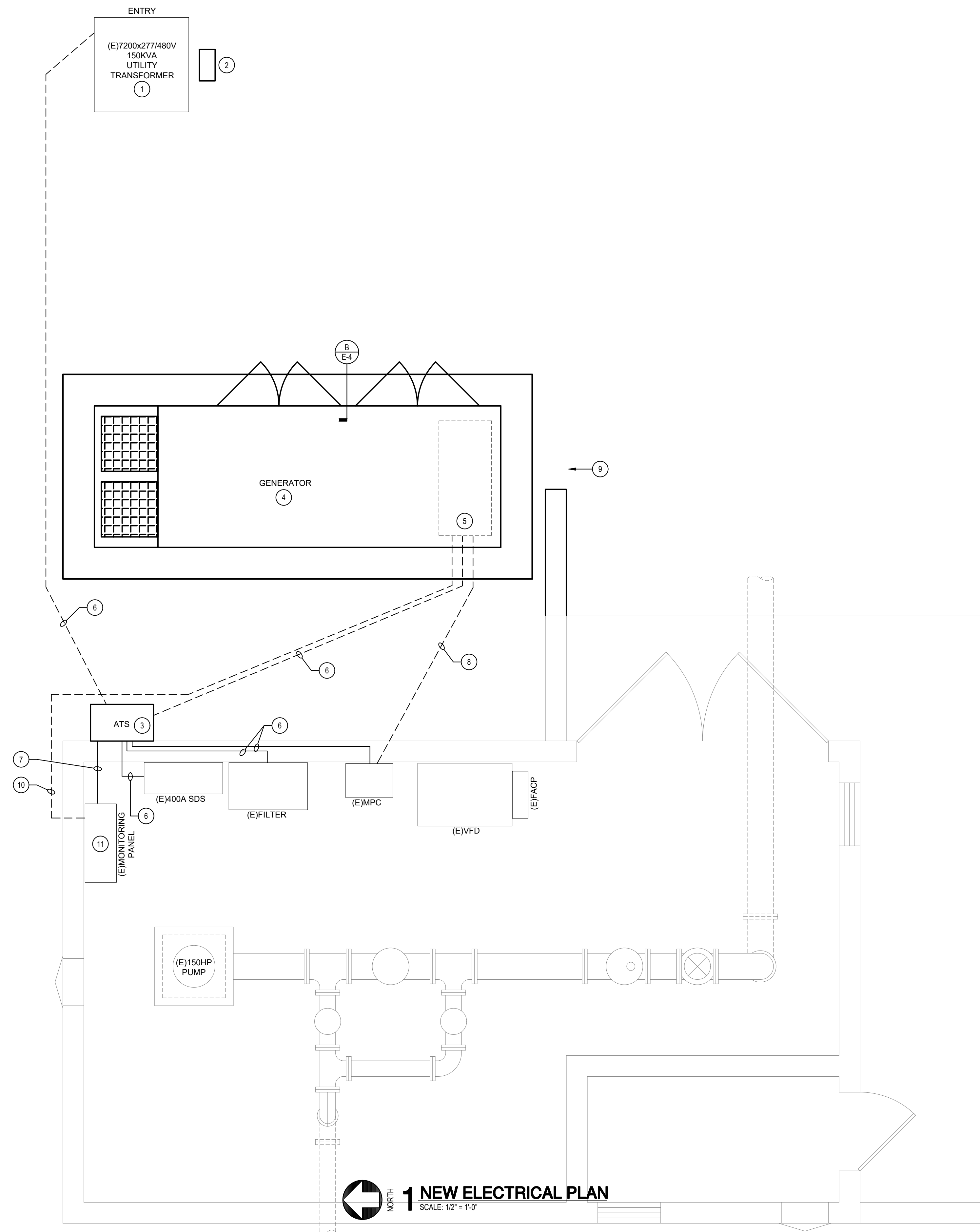
OWNER REVIEW SET NOT FOR CONSTRUCTION



NO.	REVISIONS	DATE

**NORTHWOOD WELL PUMPHOUSE
 STANDBY POWER MODIFICATIONS
 DEMO ELECTRICAL PLAN**

SCALE: AS NOTED
 DATE: 5/26/22
 DRAWN BY: MAP
 CHECKED BY: JJB



GENERAL NOTES:

1. COORDINATE WITH IDAHO POWER AND CITY OF KETCHUM FOR WORK ASSOCIATED WITH SERVICE MODIFICATIONS TO MINIMIZE DOWNTIME.

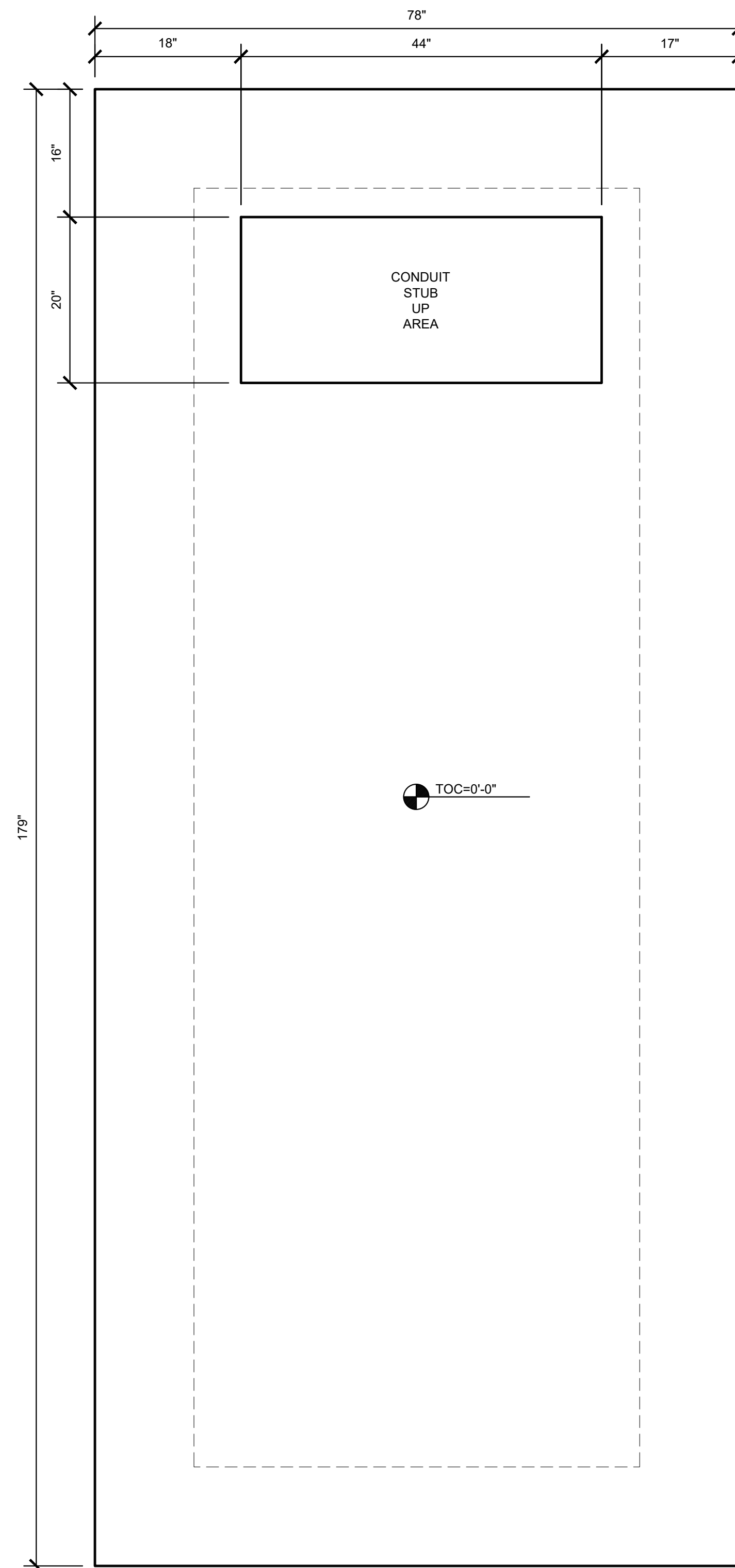
KEY NOTES:

1. APPROXIMATE LOCATION OF EXISTING UTILITY TRANSFORMER.
2. NEW METER INSTALLED ADJACENT TO TRANSFORMER. METER BASE BY CONTRACTOR. METER AND CT'S BY UTILITY. SEE DETAIL ON SHEET E-4.
3. AUTOMATIC TRANSFER SWITCH. SEE SPECIFICATIONS.
4. NEW GENERATOR. SEE SPECIFICATIONS AND ONE-LINE DIAGRAM ON SHEET E-1. COORDINATE CONDUIT STUB UP LOCATIONS WITH SUPPLIER PRIOR TO ROUGH-IN.
5. MAKE CONNECTIONS TO GENERATOR AND ACCESSORIES.
6. SEE MODIFIED ONE-LINE DIAGRAM ON SHEET E-1 FOR CONDUIT AND CONDUCTORS.
7. PROVIDE AND INSTALL 3/4" CONDUIT WITH 4#14 AND 1#14 GROUND FOR STATUS SIGNALS:
- "NORMAL POWER"
- "STANDBY POWER"
8. PROVIDE AND INSTALL 3/4" CONDUIT WITH 3#12 AND 1#12 GROUND FOR GENERATOR PANEL/BLOCK HEATER/BATTERY CHARGER (AS APPLICABLE) TO PANEL 'MCP' CIRCUIT 10,12. SEE PANEL SCHEDULE ON SHEET E-1.
9. EXTEND RETAINING WALL. CONTRACTOR TO COORDINATE LENGTH WITH THE REQUIRED EXTENTS OF GRADING. REFER TO STRUCTURAL SHEET S-2, DETAIL 7.
10. PROVIDE AND INSTALL 3/4" CONDUIT WITH 8#14 AND 1#14 GROUND FOR STATUS SIGNALS:
- "GENERATOR RUNNING"
- "GENERATOR ALARM"
- "LOW FUEL"
- "LOW BATTERY"
11. MODIFICATIONS AND PROGRAMMING TO ACCOMMODATE GENERATOR AND ATS SIGNALS AT EXISTING MONITORING PANEL BY OTHERS.

NO.	REVISIONS	DATE

**NORTHWOOD WELL PUMPHOUSE
STANDBY POWER MODIFICATIONS
NEW ELECTRICAL PLAN**

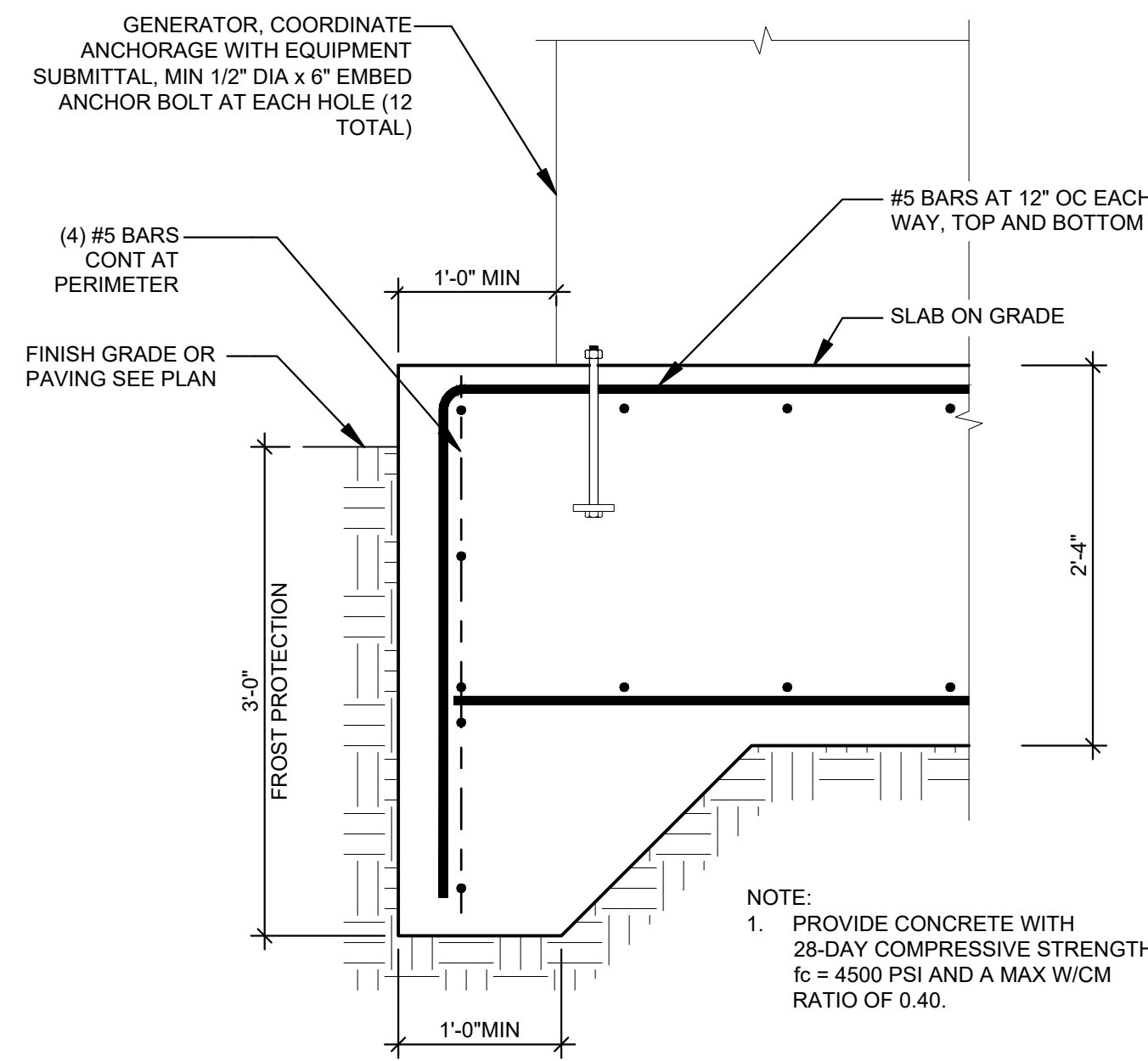
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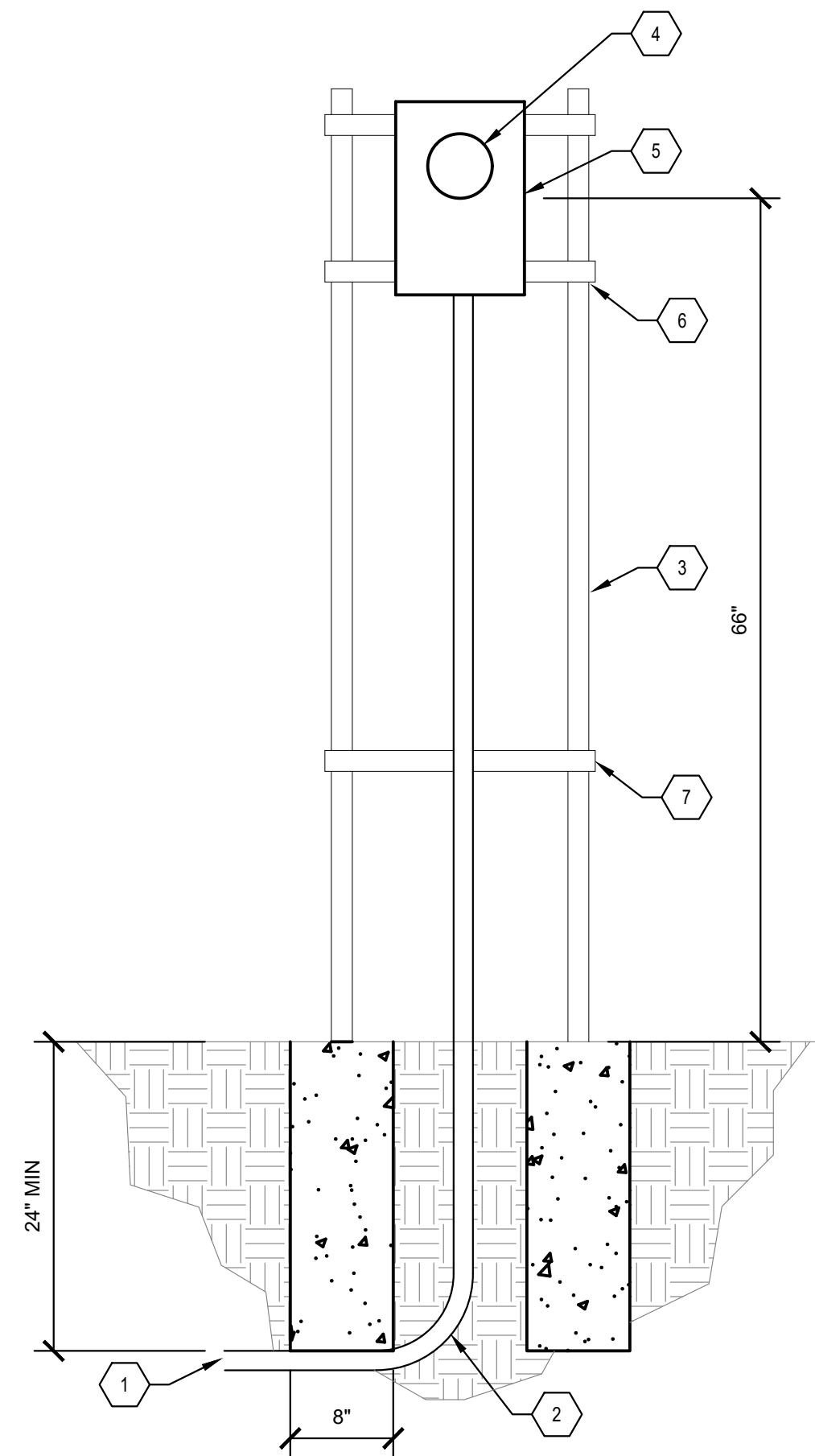
A GENERATOR PAD DETAIL
SCALE: 1" = 1'-0"

GENERAL NOTES

1. ADD DIMENSIONS SHOWN ON GENERATOR PAD DETAIL ARE MINIMUM. COORDINATE SPECIFIC REQUIREMENTS WITH ELECTRICAL CONTRACTOR AND GENERATOR EQUIPMENT CUTSHEETS FOR OVERALL PAD SIZE AND CONDUIT STUB UP REQUIREMENTS.

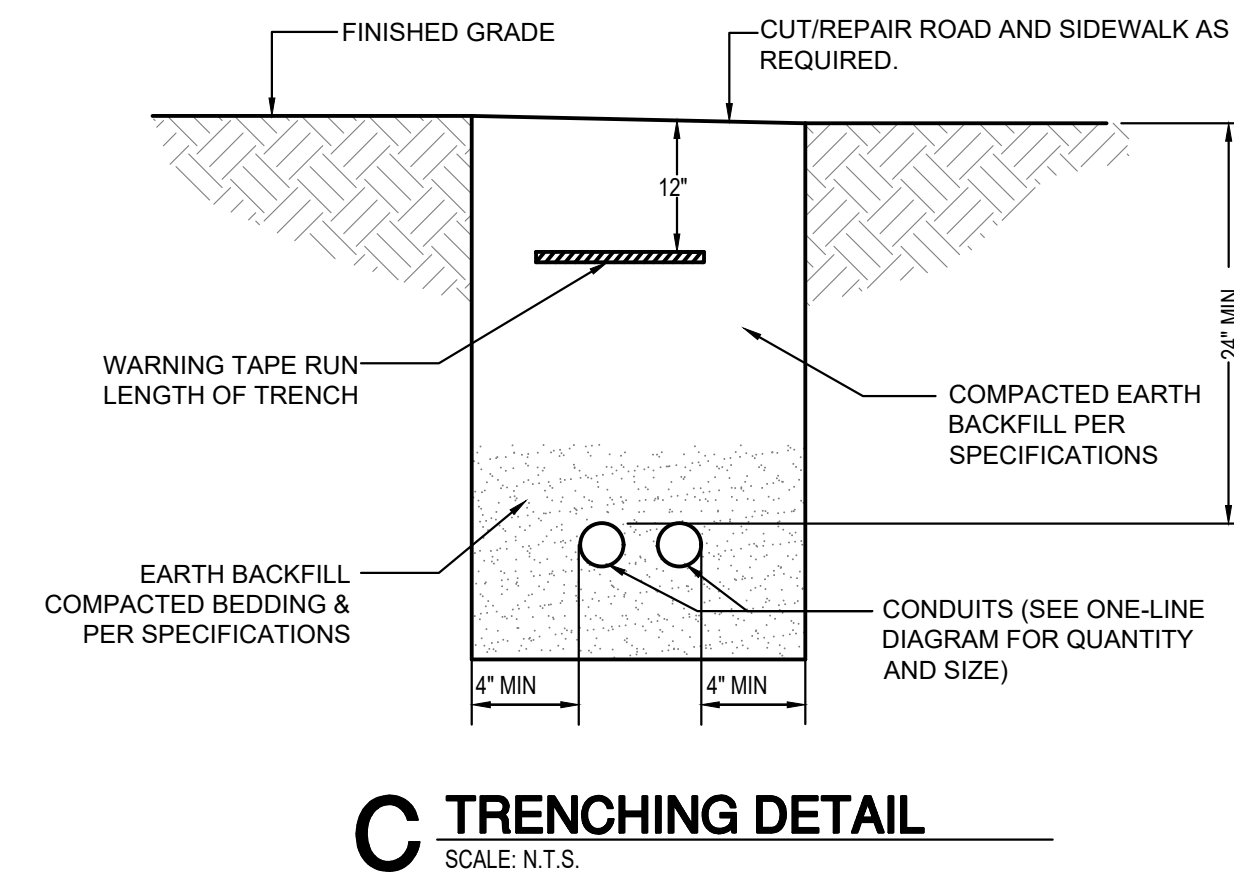


B EDGE OF SLAB DETAIL
SCALE: N.T.S.



C CT METER INSTALLATION
SCALE: N.T.S.

ITEM	DESCRIPTION	FURNISHED BY		INSTALLED BY	
		IDAHO POWER	CONTRACTOR	IDAHO POWER	CONTRACTOR
1	CT WIRE TO UTILITY TRANSFORMER SECONDARY COMPARTMENT	X		X	
2	1-1/2" RISER WITH PVC 90° BURIED 24" DEEP (MIN)		X		X
3	12 GAUGE, 1-5/8" x 1-5/8" UNISTRUT		X		X
4	METER	X		X	
5	METER BASE		X		X
6	UNISTRUT FOR MOUNTING OF METER BASE		X		X
7	UNISTRUT INSTALLED BETWEEN BOTTOM OF METER BASE AND GROUND FOR MOUNTING OF PIPE STRAPS		X		X



C TRENCHING DETAIL
SCALE: N.T.S.

NO.	REVISIONS	DATE

ELECTRICAL SPECIFICATIONS (PAGE 1 OF 2)

PART 1 - GENERAL

- 1.01 SUBMITTALS
- A. PROVIDE SUBMITTALS FOR ALL MATERIALS INCLUDING MANUFACTURER DESCRIPTIVE LITERATURE, COMPONENT DATA, SCHEMATICS, WIRING AND INTERCONNECTION DIAGRAMS, FUNCTIONAL RELATIONSHIP BETWEEN ALL ELECTRICAL COMPONENTS, AND SHOP DRAWINGS INDICATING DIMENSIONS, WEIGHTS, CLEARANCES, AND FIELD CONNECTIONS.
- B. GENERATOR SIZING CALCULATIONS: SUBMIT PROJECT SPECIFIC SIZING CALCULATION BASED ON SPECIFIED LOADS AND ASSOCIATED STARTUP SEQUENCE.
- C. INFORMATION SUBMITTALS:
- OPERATION AND MAINTENANCE DATA:
 - PROVIDE FOR ALL EQUIPMENT, AS WELL AS EACH DEVICE HAVING FEATURES THAT CAN REQUIRE ADJUSTMENT, CONFIGURATION, REPAIR, OR MAINTENANCE.
 - MINIMUM INFORMATION SHALL INCLUDE MANUFACTURER'S PREPRINTED INSTRUCTION MANUAL, ONE COPY OF THE APPROVED SUBMITTAL INFORMATION FOR THE ITEM, TABULATION OF ANY SETTINGS, AND COPIES OF ANY TEST REPORTS.
 - WARRANTY DETAILS.
- 1.02 APPROVAL BY AUTHORITY HAVING JURISDICTION
- A. PROVIDE THE WORK IN ACCORDANCE WITH NFPA 70, NATIONAL ELECTRICAL CODE (NEC), WHERE REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ), MATERIAL AND EQUIPMENT SHALL BE LABELED OR LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY OR OTHER ORGANIZATION ACCEPTABLE TO THE AHJ, IN ORDER TO PROVIDE A BASIS FOR APPROVAL UNDER THE NEC.
- B. MATERIALS AND EQUIPMENT MANUFACTURED WITHIN THE SCOPE OF STANDARDS PUBLISHED BY UNDERWRITERS LABORATORIES, INC. (UL) SHALL CONFORM TO THOSE STANDARDS AND SHALL HAVE AN APPLIED UL LISTING MARK OR LABEL.
- 1.04 ENVIRONMENTAL CONDITIONS
- A. UNLESS OTHERWISE SPECIFIED, EQUIPMENT AND MATERIALS SHALL BE SIZED AND DE-RATED FOR THE AMBIENT CONDITIONS BUT NOT LESS THAN THE FOLLOWING WITHOUT EXCEEDING THE MANUFACTURER'S STATED TOLERANCES.
- AMBIENT TEMPERATURE OF 40 DEGREES C.
 - RELATIVE HUMIDITY UP TO 95 PERCENT.
 - ELEVATION OF 6000 FEET.
 - GROUND SNOW LOAD OF 143 PSF.
 - WIND LOAD OF 90 MPH.
 - LIVE LOAD OF 100 PSF.
 - SEISMIC DESIGN CATEGORY: C.

PART 2 - PRODUCTS

- 2.01 GENERAL
- A. PRODUCTS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF NFPA 70.
- B. LIKE ITEMS OF EQUIPMENT: END PRODUCTS OF ONE MANUFACTURER IN ORDER TO ACHIEVE STANDARDIZATION FOR APPEARANCE, OPERATION, MAINTENANCE, SPARE PARTS, AND MANUFACTURER'S SERVICE.
- C. EQUIPMENT FINISH:
- MANUFACTURER'S STANDARD FINISH COLOR, EXCEPT WHERE SPECIFIC COLOR IS INDICATED.
- 2.02 ENCLOSURES
- A. FINISH: SHEET METAL STRUCTURAL AND ENCLOSURE PARTS SHALL BE COMPLETELY PAINTED USING AN ELECTRODEPOSITION PROCESS SO INTERIOR AND EXTERIOR SURFACES AS WELL AS BOLTED STRUCTURAL JOINTS HAVE A COMPLETE FINISH COAT ON AND BETWEEN THEM.
- B. COLOR: MANUFACTURER'S STANDARD COLOR (GRAY) BAKED-ON ENAMEL, UNLESS OTHERWISE SHOWN.
- C. BARRIERS: PROVIDE METAL BARRIERS WITHIN ENCLOSURES TO SEPARATE WIRING OF DIFFERENT SYSTEMS AND VOLTAGE.
- D. ENCLOSURE SELECTIONS: EXCEPT AS SHOWN OTHERWISE, PROVIDE ELECTRICAL ENCLOSURES ACCORDING TO THE FOLLOWING:
- INDOOR - INDUSTRIAL USE - UNFINISHED - NEMA 12 TYPE
 - OUTDOOR - DENOTED AS WP - ANY FINISH - NEMA 3R TYPE
- 2.04 JUNCTION AND PULL BOXES
- A. CONDUIT BODIES USED AS JUNCTION BOXES: AS SPECIFIED UNDER ARTICLE CONDUIT AND FITTINGS.
- B. LARGE SHEET STEEL BOX:
- NEMA 250, TYPE 12.
 - BOX: CODE-GUAGE, GALVANIZED STEEL.
 - COVER: HINGED WITH CLAMPS.
 - MACHINE SCREWS: CORROSION-RESISTANT.
- 2.11 SUPPORT AND FRAMING CHANNELS.
- A. CARBON STEEL FRAMING CHANNEL:
- MATERIAL: ROLLED, MILD STRIP STEEL, 12 GAUGE, ASTM A1011/A1011M, GRADE 33.
 - FINISH: HOT-DIP GALVANIZED AFTER FABRICATION.
- B. STAINLESS STEEL FRAMING CHANNEL: ROLLED, ASTM A167, TYPE 316 STAINLESS STEEL, 12 GAUGE.
- C. MANUFACTURERS:
- B-LINE SYSTEMS, INC.
 - UNISTRUT CORP.
- 2.12 NAMEPLATES
- A. MATERIAL: LAMINATED PLASTIC.
- B. ATTACHMENT: ADHESIVE.
- C. COLOR: BLACK, ENGRAVED TO A WHITE CORE, OR AS SHOWN.
- D. ENGRAVING:
- DEVICES AND EQUIPMENT: NAME OR TAG SHOWN, OR AS REQUIRED.
 - PANELBOARDS:
 - DESIGNATION.
 - SERVICE VOLTAGE.
 - PHASES.
 - MINIMUM REQUIREMENT: LABEL METERING AND POWER DISTRIBUTION EQUIPMENT, LOCAL CONTROL PANELS, JUNCTION BOXES, MOTOR CONTROLS, AND TRANSFORMERS.

- E. LETTER HEIGHT:
- PUSHBUTTONS, SELECTOR SWITCHES, AND OTHER DEVICES: 1/8 INCH.
 - EQUIPMENT AND PANELBOARDS: 1/4 INCH.
- 2.13 CONDUIT AND FITTINGS
- A. INTERMEDIATE METAL CONDUIT (IMC):
- MEET REQUIREMENTS OF NEMA C80.6 AND UL 1242.
 - MATERIAL: HOT-DIP GALVANIZED, WITH CHROMATED AND LACQUARED PROTECTIVE LAYER.
- B. PVC SCHEDULE 40 CONDUIT:
- MEET REQUIREMENTS OF NEMA TC 2 AND UL 651.
 - UL LISTED FOR CONCRETE ENCASEMENT, UNDERGROUND DIRECT BURIAL, CONCEALED, OR DIRECT SUNLIGHT EXPOSURE, AND 90 DEGREE C INSULATED CONDUCTORS.
- D. FLEXIBLE METAL, LIQUID-TIGHT CONDUIT:
- UL 360 LISTED FOR 105 DEGREES C INSULATED CONDUCTORS.
 - MATERIAL: GALVANIZED STEEL, WITH AN EXTRUDED PVC JACKET.
- F. FITTINGS:
- PROVIDE BUSHINGS, GROUNDING BUSHINGS, CONDUIT HUBS, CONDUIT BODIES, COUPLINGS, UNIONS, EXPANSION FITTINGS, AND CABLE SEALING FITTINGS, AS APPLICABLE.
 - INTERMEDIATE METAL CONDUIT:
 - MEET REQUIREMENTS OF UL 514B.
 - TYPE: THREADED, GALVANIZED.
 - PVC CONDUIT:
 - MEET REQUIREMENTS OF NEMA TC 3.
 - TYPE: PVC, SLIP-ON.
 - FLEXIBLE METAL, LIQUID-TIGHT CONDUIT:
 - METAL INSULATED THROAT CONNECTORS WITH INTEGRAL NYLON OR PLASTIC BUSHING RATED FOR 105 DEGREE C.
 - INSULATED THROAT AND SEALING O-RINGS.
- 2.14 CONDUCTORS AND CABLE
- A. CONDUCTORS 600 VOLTS AND BELOW:
- CONFORM TO APPLICABLE REQUIREMENTS OF NEMA WC 71, WC 72, AND WC 74.
 - CONDUCTOR TYPE:
 - 120 AND 277 VOLT LIGHTING, NO. 10 AWG, AND SMALLER: SOLID COPPER.
 - 120 VOLT RECEPTACLE CIRCUITS, NO. 10 AWG AND SMALLER: SOLID COPPER.
 - ALL OTHER CIRCUITS: STRANDED COPPER.
 - INSULATION: TYPE THHN/THWN, EXCEPT FOR SIZES NO. 6 AND LARGER, WITH XHHW-2 INSULATION.
- B. 600 VOLT RATED CABLE:
- GENERAL:
 - TYPE TC, MEETING REQUIREMENTS OF UL 1277, INCLUDING VERTICAL TRAY FLAME TEST AT 20,000 BTU PER HOUR, AND NFPA 70, ARTICLE 340, OR UL 13 MEETING REQUIREMENTS OF NFPA 70, ARTICLE 725.
 - PERMANENTLY AND LEGIBLY MARKED WITH MANUFACTURER'S NAME, MAXIMUM WORKING VOLTAGE FOR WHICH CABLE WAS TESTED, TYPE OF CABLE, AND UL LISTED WORK.
 - SUITABLE FOR INSTALLATION IN OPEN AIR, IN CABLE TRAYS, OR CONDUIT.
 - MINIMUM TEMPERATURE RATING: 90 DEGREES C DRY LOCATIONS, 75 DEGREES C WET LOCATIONS.
 - OVERALL OUTER JACKET: PVC, FLAME-RETARDANT, SUNLIGHT AND OIL RESISTANT.
 - TYPE TSP, NO. 16 AWG, TWISTED, SHIELDED PAIR, INSTRUMENTATION CABLE: SINGLE PAIR, DESIGNED FOR NOISE REJECTION FOR PROCESS CONTROL, COMPUTER, OR DATA LOG APPLICATIONS MEETING NEMA WC 55 REQUIREMENTS.
 - OUTER JACKET: 45 MILS NOMINAL THICKNESS.
 - INDIVIDUAL PAIR SHIELD: 1.35 MILS, DOUBLE-FADED ALUMINUM/SYNTHETIC POLYMER OVERLAPPED TO PROVIDE 100 PERCENT COVERAGE.
 - DIMENSIONS: 0.31 INCH NOMINAL OUTSIDE DIAMETER.
 - CONDUCTORS:
 - BARE SOFT ANNEALED COPPER, CLASS B, SEVEN-STRAND CONCENTRIC, MEETING REQUIREMENTS OF ASTM B8.
 - 20 AWG, SEVEN-STRAND TINNED COPPER DRAIN WIRE.
 - INSULATION: 15 MILS NOMINAL PVC.
 - JACKET: 4 MILS NOMINAL NYLON.
 - COLOR CODE: PAIR CONDUCTORS BLACK AND RED.
 - MANUFACTURERS: OKONITE CO.
- C. ACCESSORIES:
- TAPE:
 - GENERAL PURPOSE, FLAME RETARDANT: 7 MILS, VINYL PLASTIC, SCOTCH BRAND 33, RATED FOR 90 DEGREES C MINIMUM, MEETING REQUIREMENTS OF UL 510.
 - FLAME RETARDANT, COLD AND WEATHER RESISTANT: 8.5 MILS, VINYL PLASTIC, SCOTCH BRAND 88.
 - ARC AND FIREPROOFING:
 - 30 MILS, ELASTOMER.
 - MANUFACTURERS AND PRODUCTS:
 - 3M: SCOTCH BRAND 77, WITH SCOTCH BRAND 69 GLASS CLOTH TAPEBINDER.
 - PLYMOUNT: PLYARC 53, WITH PLYGLAS 77 GLASS CLOTH TAPEBINDER.
 - IDENTIFICATION DEVICES:
 - SLEEVE-TYPE, PERMANENT, PVC, YELLOW OR WHITE, WITH LEGIBLE MACHINE-PRINTED BLACK MARKINGS.
 - MANUFACTURER AND PRODUCTS: RAYCHEM: TYPE D-SCE OR ZH-SCE.
 - CONNECTORS AND TERMINATIONS:
 - NYLON, SELF-INSULATED CRIMP CONNECTORS:
 - MANUFACTURERS AND PRODUCTS:
 - THOMAS & BETTS: STA-KON.
 - BURNDY: INSULUG.
 - ILSCO.
 - SELF-INSULATED, FREESPRING WIRE CONNECTOR (WIRE NUTS):
 - PLATED STEEL, SQUARE WIRE SPRINGS.
 - UL STANDARD 486C.
 - MANUFACTURERS AND PRODUCTS:
 - THOMAS & BETTS.
 - IDEAL: TWISTER.
 - CABLE LUGS:
 - IN ACCORDANCE WITH NEMA CC 1.
 - RATED 600 VOLTS OF SAME MATERIAL AS CONDUCTOR METAL.
 - UN-INSULATED CRIMP CONNECTORS AND TERMINATORS:
 - SUITABLE FOR USE WITH 75 DEGREES C WIRE AT FULL NFPA 70, 75 DEGREES C AMPACITY.
 - MANUFACTURERS AND PRODUCTS:
 - THOMAS & BETTS: COLOR-KEYED.
 - BURNDY: HYDENT.
 - ILSCO.
 - UN-INSULATED BOLTED, TWO-WAY CONNECTORS AND TERMINATORS:
 - MANUFACTURERS AND PRODUCTS:
 - THOMAS & BETTS: LOCKTITE.

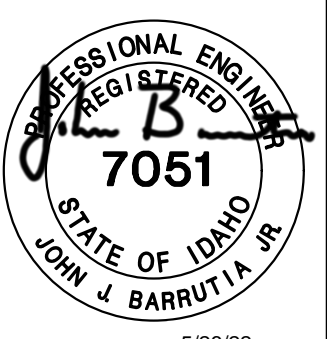
- d.a.b. BURNDY: QUIKBUG.
d.a.c. ILSCO.
6. CABLE TIES:
- NYLON, ADJUSTABLE, SELF-LOCKING, AND REUSABLE.
 - MANUFACTURER AND PRODUCT: THOMAS & BETTS: TY-RAP.
7. HEAT SHRINKABLE INSULATION:
- THERMALLY STABILIZED, CROSSLINKED POLYOLEFIN.
 - MANUFACTURER AND PRODUCT: THOMAS & BETTS: SHRINK-KON.
- 2.15 GROUNDING
- A. GROUND RODS: PROVIDE COPPER WITH MINIMUM DIAMETER OF 5/8 INCH AND LENGTH OF 10 FEET.
- B. GROUND CONDUCTORS: AS SPECIFIED IN ARTICLE CONDUCTORS AND CABLE.
- C. CONNECTORS:
- EXOTHERMIC WELD TYPE:
 - OUTDOOR WELD: SUITABLE FOR EXPOSURE TO ELEMENTS OR DIRECT BURIAL.
 - INDOOR WELD: UTILIZE LOW-SMOKE, LOW-EMISSION PROCESS.
 - MANUFACTURERS:
 - ERICO PRODUCTS, INC: CADWELD AND CADWELD EXOLON.
 - THERMOWELD.
 - COMPRESSION TYPE:
 - COMPRESS-DEFORMING TYPE: WROUGHT COPPER EXTRUSION MATERIAL.
 - SINGLE INDENTION FOR CONDUCTORS 8 AWG AND SMALLER.
 - DOUBLE INDENTION WITH EXTENDED BARREL FOR CONDUCTORS 4 AWG AND LARGER.
 - SINGLE BARRELS PRE-FILLED WITH OXIDE-INHIBITING AND ANTI-SEIZING COMPOUND.
 - MANUFACTURERS:
 - BURNDY CORP.
 - THOMAS & BETTS CO.
 - ILSCO.
 - MECHANICAL TYPE:
 - SPLIT-BOLT, SADDLE, OR CONE SCREW TYPE: COPPER ALLY MATERIAL.
 - MANUFACTURERS:
 - BURNDY CORP.
 - THOMAS & BETTS CO.
- 2.17 AUTOMATIC TRANSFER SWITCH:
- A. MANUFACTURERS:
- ASCO POWER TECHNOLOGIES.
 - CATERPILLAR, INC.: ELECTRIC POWER DIVISION.
 - CUMMINS POWER GENERATION.
 - GENERAC POWER SYSTEMS, INC.
 - KOHLER POWER SYSTEMS.
 - OR EQUIVALENT.
- B. PERFORMANCE REQUIREMENTS:
- SERVICE: 480/277-VOLTS, THREE-PHASE, FOUR-WIRE GROUNDED WYE, HAVING AN AVAILABLE SHORT CIRCUIT CURRENT OF 18,000-AMPS AT LINE TERMINALS.
 - CURRENT: 260-AMPS (MIN).
 - COMPLY WITH NFPA 110 AND UL 1008.
 - OPEN TRANSITION, 3-POLE OPERATION.
 - REPETITIVE ACCURACY OF SOLID-STATE CONTROLS: +/- 2 PERCENT OR BETTER OVER AN OPERATING TEMPERATURE RANGE OF MINUS 20 TO PLUS 70 DEGREES C.
 - VOLTAGE TRANSIENTS: COMPONENTS SHALL MEET OR EXCEED VOLTAGE-SURGE WITHSTAND CAPABILITY REQUIREMENTS WHEN TESTED ACCORDING TO IEEE C32.82. COMPONENTS SHALL MEET OR EXCEED VOLTAGE-IMPULSE WITHSTAND TEST OF NEMA ICS 1.
 - ELECTRICAL OPERATION: MECHANICALLY AND ELECTRICALLY INTERLOCKED IN BOTH DIRECTIONS TO PREVENT SIMULTANEOUS CONNECTION TO BOTH POWER SOURCES.
 - PROVIDE WITH AUXILIARY CONTACT TO CONTROL PASSIVE HARMONIC FILTER CAPACITOR CONTROL CONTACTOR.
 - ENCLOSURE: NEMA 250, TYPE 3R.
 - COMPLY WITH LEVEL 2 EQUIPMENT ACCORDING TO NFPA 110.
 - DIGITAL COMMUNICATION INTERFACE: ETHERNET PORTS TO SUPPORT TCP/IP COMMUNICATIONS. MODBUS TCP/IP, SNMP, HTTP, AND SMTP OPEN PROTOCOLS SHALL BE SIMULTANEOUSLY SUPPORTED.
 - CONTROLLER FEATURES:
 - CONTROLLER OPERATES THROUGH A PERIOD OF LOSS OF CONTROL POWER.
 - UNDERVOLTAGE SENSING FOR EACH PHASE OF NORMAL SOURCE: SENSE LOW PHASE-TO-GROUND VOLTAGE ON EACH PHASE. PICKUP VOLTAGE SHALL BE ADJUSTABLE FROM 85 TO 100 PERCENT OF NOMINAL, AND DROPOUT VOLTAGE SHALL BE ADJUSTABLE FROM 75 TO 98 PERCENT OF PICKUP VALUE. FACTORY SET FOR PICKUP AT 90 PERCENT AND DROPOUT AT 85 PERCENT.
 - VOLTAGE/FREQUENCY LOCKOUT RELAY: PREVENT PREMATURE TRANSFER TO GENERATOR. PICKUP VOLTAGE SHALL BE ADJUSTABLE FROM 85 TO 100 PERCENT OF NOMINAL. FACTORY SET FOR PICKUP AT 90 PERCENT. PICKUP FREQUENCY SHALL BE ADJUSTABLE FROM 90 TO 100 PERCENT OF NOMINAL. FACTORY SET FOR PICKUP AT 95 PERCENT.
 - TIME DELAY FOR RETRANSFER TO NORMAL SOURCE: ADJUSTABLE FROM ZERO TO 30 MINUTES, AND FACTORY SET FOR 10 MINUTES. OVERRIDE SHALL AUTOMATICALLY DEFEAT DELAY ON LOSS OF VOLTAGE OR SUSTAINED UNDERVOLTAGE OF EMERGENCY SOURCE, PROVIDED NORMAL SUPPLY HAS BEEN RESTORED.
 - TEST SWITCH: SIMULATE NORMAL-SOURCE FAILURE.
 - SWITCH-POSITION PILOT LIGHTS: INDICATE SOURCE TO WHICH LOAD IS CONNECTED.
 - SOURCE-AVAILABLE INDICATING LIGHTS: SUPERVISE SOURCES VIA TRANSFER-SWITCH NORMAL, AND EMERGENCY-SOURCE SENSING CIRCUITS.
 - NORMAL POWER SUPERVISION: GREEN LIGHT WITH NAMEPLATE ENGRAVED "NORMAL SOURCE AVAILABLE".
 - EMERGENCY POWER SUPERVISION: RED LIGHT WITH NAMEPLATE ENGRAVED "EMERGENCY SOURCE AVAILABLE".
 - UNASSIGNED AUXILIARY CONTACTS: TWO NORMALLY OPEN, SINGLE-POLE, DOUBLE-THROW CONTACTS FOR EACH SWITCH POSITION, RATED 10-AMPS AT 240-VOLTS A.C.
 - TRANSFER OVERRIDE SWITCH: OVERRIDES AUTOMATIC RETRANSFER CONTROL SO AUTOMATIC TRANSFER SWITCH WILL REMAIN CONNECTED TO EMERGENCY POWER SOURCE REGARDLESS OF CONDITION OF NORMAL SOURCE. PILOT LIGHT INDICATES OVERRIDE STATUS.
 - ENGINE STARTING CONTACTS: ONE ISOLATED AND NORMALLY CLOSED, AND ONE ISOLATED AND NORMALLY OPEN, RATED 10-AMPS AT 32-VOLTS D.C. MINIMUM.
 - ENGINE SHUTDOWN CONTACTS: TIME DELAY ADJUSTABLE FROM ZERO TO FIVE MINUTES, AND FACTORY SET FOR FIVE MINUTES. CONTACTS SHALL INITIATE SHUTDOWN AT REMOTE ENGINE-GENERATOR CONTROLS AFTER RETRANSFER OF LOAD TO NORMAL SOURCE.
 - ENGINE-GENERATOR EXERCISER: SOLID-STATE, PROGRAMMABLE-TIME SWITCH STARTS ENGINE GENERATOR AND TRANSFERS LOAD TO IT FROM NORMAL SOURCE FOR A PRESET TIME, THEN RETRANSFERS AND SHUTS DOWN ENGINE AFTER A PRESET COOL-DOWN PERIOD. INITIATES EXERCISE CYCLE AT PRESET INTERVALS ADJUSTABLE FROM 7 TO 30 DAYS. RUNNING PERIODS SHALL BE ADJUSTABLE FROM 10 TO 30 MINUTES. FACTORY SETTINGS SHALL BE FOR 7-DAY EXERCISE CYCLE, 20-MINUTE RUNNING PERIOD, AND 5-MINUTE COOL-DOWN PERIOD. EXERCISER FEATURES INCLUDE THE FOLLOWING:
 - EXERCISER TRANSFER SELECTOR SWITCH: PERMITS SELECTION OF EXERCISE WITH AND WITHOUT LOAD TRANSFER.
 - PUSH-BUTTON PROGRAMMING CONTROL WITH DIGITAL DISPLAY OF SETTINGS.
 - INTEGRAL BATTERY OPERATION OF TIME SWITCH WHEN NORMAL CONTROL POWER IS UNAVAILABLE.
- 2.18 GENERATOR:
- A. PROVIDE A LEGALLY REQUIRED STANDBY SYSTEM PER ARTICLE 701 OF THE NATIONAL ELECTRIC

- CODE:
- DIESEL ENGINE.
 - DIESEL FUEL-OIL SYSTEM.
 - CONTROL AND MONITORING.
 - GENERATOR OVERCURRENT AND FAULT PROTECTION.
 - GENERATOR, EXCITER, AND VOLTAGE REGULATOR.
 - OUTDOOR ENGINE GENERATOR ENCLOSURE.
 - VIBRATION ISOLATION DEVICES.
- B. AUTOMATIC TRANSFER SWITCH INCLUDES SENSORS AND RELAYS TO INITIATE AUTOMATIC-STARTING AND -STOPPING SIGNALS FOR ENGINE GENERATORS.
- C. WARRANTY:
- MANUFACTURER'S WARRANTY: MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF PACKAGED ENGINE GENERATORS AND ASSOCIATED AUXILIARY COMPONENTS THAT FAIL IN MATERIALS OR WORKMANSHIP FOR A 5-YEAR WARRANTY PERIOD FROM DATE OF DELIVERY TO PROJECT SITE. WARRANTY MUST INCLUDE COST OF PARTS, TRAVEL, AND LABOR FOR THE ENTIRE PERIOD.
- D. MANUFACTURER:
- GENERAC POWER SYSTEMS, INC.
 - CATERPILLAR, INC.: ELECTRIC POWER DIVISION.
 - CUMMINS POWER GENERATION.
 - KOHLER POWER SYSTEMS.
 - OR EQUIVALENT.
1. SOURCE LIMITATIONS: OBTAIN PACKAGED ENGINE GENERATORS, AUTOMATIC TRANSFER SWITCH, AND AUXILIARY COMPONENTS FROM SINGLE SOURCE FROM SINGLE MANUFACTURER.
- E. ENGINE/GENERATOR REQUIREMENTS:
- POWER RATING: STANDBY.
 - POWER FACTOR: 0.8 LAGGING.
 - FREQUENCY: 60 HZ.
 - VOLTAGE: 480-VOLTS A.C.
 - PHASE: THREE-PHASE, FOUR WIRE, WYE.
 - POWER OUTPUT RATINGS: NOMINAL AT 0.8 POWER FACTOR EXCLUDING POWER REQUIRED FOR THE CONTINUED AND REPEATED OPERATION OF THE UNIT AND AUXILIARIES.
 - ENGINE GENERATOR PERFORMANCE:
 - STEADY-STATE VOLTAGE OPERATIONAL BANDWIDTH: 1 PERCENT OF RATED OUTPUT VOLTAGE FROM NO LOAD TO FULL LOAD.
 - TRANSIENT VOLTAGE PERFORMANCE: NOT MORE THAN 10 PERCENT VARIATION FOR 100% STEP-LOAD INCREASE OR DECREASE. VOLTAGE SHALL RECOVER AND REMAIN WITHIN THE STEADY-STATE OPERATING BAND WITHIN 0.5 SECOND.
 - STEADY-STATE FREQUENCY OPERATIONAL BANDWIDTH: +/- 0.25 PERCENT OF RATED FREQUENCY FROM NO LOAD TO FULL LOAD.
 - STEADY STATE FREQUENCY STABILITY: WHEN SYSTEM IS OPERATING AT ANY CONSTANT LOAD WITHIN THE RATED LOAD, THERE SHALL BE NO RANDOM SPEED VARIATIONS OUTSIDE THE STEADY-STATE OPERATIONAL BAND AND NO HUNTING OR SURGING OF SPEED.
 - TRANSIENT FREQUENCY PERFORMANCE: LESS THAN 2-HZ VARIATION. FREQUENCY SHALL RECOVER AND REMAIN WITHIN THE STEADY-STATE OPERATING BAND WITHIN TWO SECONDS.
 - OUTPUT WAVEFORM: AT NO LOAD, HARMONIC CONTENT MEASURED LINE TO NEUTRAL SHALL NOT EXCEED 2 PERCENT TOTAL WITH NO SLOT RIPPLE. TELEPHONE INFLUENCE FACTOR, DETERMINED ACCORDING TO NEMA MG 1, SHALL NOT EXCEED 50 PERCENT.
 - SUSTAINED SHORT-CIRCUIT CURRENT: FOR A THREE-PHASE, BOLTED SHORT CIRCUIT AT SYSTEM OUTPUT TERMINALS, SYSTEM SHALL SUPPLY A MINIMUM OF 300 PERCENT OF RATED FULL-LOAD CURRENT FOR NOT LESS THAN 10 SECONDS AND THEN CLEAR THE FAULT AUTOMATICALLY, WITHOUT DAMAGE TO WINDING INSULATION OR OTHER GENERATOR SYSTEM COMPONENTS.
 - EXCITATION SYSTEM: PERFORMANCE SHALL BE UNAFFECTED BY VOLTAGE DISTORTION CAUSED BY NONLINEAR LOAD. PROVIDE PERMANENT MAGNET EXCITATION FOR POWER SOURCE TO VOLTAGE REGULATOR.
 - START TIME: COMPLY WITH NFPA 110, TYPE 10 SYSTEM REQUIREMENTS.
 - FUEL: DIESEL FUEL, OIL, GRADE DF-2 UL5 TYPE.
 - JACKET COOLANT HEATER: ELECTRIC IMMERSION TYPE, FACTORY INSTALLED IN COOLANT JACKET SYSTEM. COMPLY WITH UL 489.
 - INTEGRAL COOLING SYSTEM: CLOSED LOOP, LIQUID COOLED, WITH RADIATOR FACTORY MOUNTED ON ENGINE GENERATOR SET MOUNTING FRAME AND INTEGRAL ENGINE-DRIVEN COOLANT PUMP.
 - MUFFLERS/SILENCER: CRITICAL TYPE.
 - AIR-INTAKE FILTER: HEAVY-DUTY, ENGINE-MOUNTED AIR CLEANER WITH REPLACEABLE DRY-FILTER ELEMENT AND "BLOCKED FILTER" INDICATOR.
 - STARTING SYSTEM: 12-VOLT OR 24-VOLT ELECTRIC, WITH NEGATIVE GROUND.
 - SUBBASE-MOUNTED, DOUBLE-WALL, FUEL-OIL TANK: FACTORY INSTALLED AND PIPED, COMPLYING WITH UL 142 FUEL-OIL TANK WITH CAPACITY SUITABLE FOR 24 HOURS OF OPERATION AT FULL LOAD. PROVIDE 5-GALLON FILL/SPILL CONTAINMENT AND OVERFILL PREVENTION VALVE IN ACCORDANCE WITH IDAHO RULES FOR PUBLIC DRINKING WATER SYSTEMS, SECTION 512.02.C.
 - CONTROL AND MONITORING PANEL: DIGITAL ENGINE GENERATOR CONTROLLER WITH MODERN DISPLAY TECHNOLOGY, CONTROLS, AND MICROPROCESSOR, CAPABLE OF LOCAL AND REMOTE CONTROL, MONITORING, AND PROGRAMMING, WITH BATTERY BACKUP.
 - COMMUNICATIONS: A SEPARATE TERMINAL BLOCK, FACTORY WIRED TO FOUR FORM C RELAYS THAT CAN BE ASSIGNED TO ANY ALARM OR FAULT. PROVIDE ETHERNET CONNECTIONS FOR DATA TRANSMISSION OF INDICATIONS TO REMOTE DATA TERMINALS USING MODBUS RTU PROTOCOL.
 - GENERATOR OVERCURRENT PROTECTIVE DEVICE: MOLDED-CASE CIRCUIT BREAKER, ELECTRONIC-TRIP TYPE, COMPLYING WITH UL 489.
 - GENERATOR PROTECTOR: MICROPROCESSOR-BASED UNIT.
 - GROUND-FAULT INDICATION: COMPLY WITH NFPA 70, INDICATE GROUND FAULT WITH OTHER ENGINE GENERATOR ALARM INDICATIONS.
 - VOLTAGE REGULATOR: SOLID-STATE TYPE, SEPARATE FROM EXCITER, PROVIDING PERFORMANCE AS SPECIFIED. ADJUSTMENT ON CONTROL AND MONITORING PANEL. PROVIDE PLUS OR MINUS 5 PERCENT ADJUSTMENT OF OUTPUT-VOLTAGE OPERATING BAND.
 - WINDINGS: TWO-THIRDS PITCH STATOR WINDING AND FULLY LINKED AMORTISSEUR WINDING.
 - THE LOAD STARTUP SEQUENCE SUBSEQUENT TO AN ELECTRIC UTILITY POWER OUTAGE (AND USED FOR GENERATOR SIZING) IS ALL LOADS SHOWN ON THE SINGLE-LINE DIAGRAM AND PANELBOARD SCHEDULE IN ONE STEP.
 - OUTDOOR ENCLOSURE:
 - VANDAL-RESISTANT, SOUND-ATTENUATING, WEATHERPROOF STEEL HOUSING.
 - SOUND ATTENUATION: SOUND LEVEL MEASUREMENTS SHALL BE TAKEN AT A DISTANCE OF 23 FEET ON ALL FOUR SIDES OF THE GENERATOR. THE AVERAGE OF ALL FOUR MEASUREMENTS SHALL BE 78 DBA OR LESS.
 - INTERIOR LIGHTS WITH SWITCH: FACTORY-WIRED, VAPOR-PROOF LUMINAIRES WITHIN HOUSING; ARRANGED TO ILLUMINATE CONTROLS AND ACCESSIBLE INTERIOR. ARRANGE FOR EXTERNAL ELECTRICAL CONNECTION.
 - AC LIGHTING SYSTEM AND CONNECTION POINT FOR OPERATION WHEN REMOTE SOURCE IS AVAILABLE.
 - CONVENIENCE OUTLETS: FACTORY-WIRED, GFCI. ARRANGE FOR EXTERNAL ELECTRICAL CONNECTION.
 - POWER DISTRIBUTION: PROVIDE PANELBOARD LOCATED ON ENGINE/GENERATOR SKID AND WIRED TO SERVE ALL SPECIFIED SKID MOUNTED LOADS. PANELBOARD SHALL BE SUITABLE FOR CONNECTION TO 240-VOLT, SINGLE-PHASE, 3-WIRE, 30-AMP FEEDER CIRCUIT AS SHOWN ON DRAWINGS.
 - FINISHES: MANUFACTURER'S STANDARD FINISH OVER CORROSION-RESISTANT PRETREATMENT AND COMPATIBLE PRIMER.



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5/26/22

NO.	REVISIONS	DATE

NORTHWOOD WELL PUMPHOUSE STANDBY POWER MODIFICATIONS ELECTRICAL SPECIFICATIONS

SCALE: NONE
DATE: 5/26/22
DRAWN BY: MAP
CHECKED BY: JUB

ELECTRICAL SPECIFICATIONS (PAGE 2 OF 2)

PART 3 - EXECUTION

- 3.01 GENERAL
- A. INSTALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
- B. WORK SHALL COMPLY WITH ALL APPLICABLE PROVISION OF NECA 1.
- C. INSTALL MATERIALS AND EQUIPMENT IN HAZARDOUS AREAS IN A MANNER ACCEPTABLE TO REGULATORY AUTHORITY HAVING JURISDICTION FOR THE CLASS, DIVISION, AND GROUP OF HAZARDOUS AREAS SHOWN.
- D. ELECTRICAL DRAWINGS SHOW GENERAL LOCATION OF EQUIPMENT, DEVICES, AND RACEWAYS, UNLESS SPECIFICALLY DIMENSIONED.
- 3.02 DEMOLITION
- A. GENERAL DEMOLITION:
- WHERE SHOWN, DE-ENERGIZE AND DISCONNECT NON-ELECTRICAL EQUIPMENT FOR REMOVAL BY OTHERS.
 - WHERE SHOWN, DE-ENERGIZE, DISCONNECT, AND REMOVE ELECTRICAL EQUIPMENT.
 - REMOVE AFFECTED CIRCUITS AND RACEWAYS BACK TO SERVING PANELBOARD OR CONTROL PANEL. WHERE AFFECTED CIRCUITS ARE CONSOLIDATED WITH OTHERS, REMOVE RACEWAYS BACK TO FIRST SHARED CONDUIT OR BOX. WHERE UNDERGROUND OR EMBEDDED RACEWAYS ARE TO BE ABANDONED, REMOVE RACEWAY TO 1 INCH BLOW SURFACE OF STRUCTURE OR 12 INCHES BELOW GRADE AND RESTORE EXISTING SURFACE.
- 3.03 PROTECTION FOLLOWING INSTALLATION
- A. PROTECT MATERIALS AND EQUIPMENT FROM CORROSION, PHYSICAL DAMAGE, AND EFFECTS OF MOISTURE ON INSULATION.
- B. CAP CONDUIT RUNS DURING CONSTRUCTION WITH MANUFACTURED SEALS.
- C. CLOSE OPENINGS IN BOXES OR EQUIPMENT DURING CONSTRUCTION.
- 3.05 JUNCTION AND PULL BOXES
- A. BOX TYPE (STEEL RACEWAY SYSTEM):
- OUTDOOR LOCATIONS: CAST METAL.
 - INDOOR DRY LOCATIONS:
 - EXPOSED RIGID CONDUIT: CAST METAL.
- B. INSTALL WHERE SHOWN AND WHERE NECESSARY TO TERMINATE, TAP-OFF, OR REDIRECT MULTIPLE CONDUIT RUNS.
- C. INSTALL PULL BOXES WHERE NECESSARY IN RACEWAY SYSTEM TO FACILITATE CONDUCTOR INSTALLATION.
- D. INSTALL IN CONDUIT RUNS AT LEAST EVERY 150 FEET OR AFTER THE EQUIVALENT OF THREE RIGHT-ANGLE BENDS.
- E. USE OUTLET BOXES AS JUNCTION AND PULL BOXES WHEREVER POSSIBLE AND ALLOWED BY APPLIED BY APPLICABLE CODES.
- F. USE CONDUIT BODIES AS JUNCTION BOXES WHERE NO SPLICES ARE REQUIRED AND THEIR USE IS ALLOWED BY APPLICABLE CODES.
- G. INSTALLED BOXES SHALL BE ACCESSIBLE.
- H. DO NOT INSTALL ON FINISHED SURFACES.
- I. INSTALL PLUMB AND LEVEL.
- J. SUPPORT BOXES INDEPENDENTLY OF CONDUIT BY ATTACHMENT TO BUILDING STRUCTURE OR STRUCTURAL MEMBER.
- K. FLUSH MOUNTED:
- INSTALL WITH CONCEALED CONDUIT.
 - HOLE IN SURROUNDING SURFACE SHALL BE NO LARGER THAN REQUIRED TO RECEIVE BOX.
 - MAKE EDGES OF BOXES FLUSH WITH FINAL SURFACE.
- K. MOUNTING HARDWARE:
- INDOOR DRY AREAS: GALVANIZED.
 - OUTDOOR WET AREAS: STAINLESS STEEL.
- 3.13 NAMEPLATES
- A. PROVIDE IDENTIFYING NAMEPLATE ON ALL EQUIPMENT.
- 3.14 SURGE PROTECTIVE DEVICE (SPD) EQUIPMENT
- A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, INCLUDING LEAD LENGTH, OVERCURRENT PROTECTION, AND GROUNDING.
- 3.15 CONDUIT AND FITTINGS
- A. GENERAL:
- CRUSHED OR DEFORMED RACEWAYS NOT PERMITTED.
 - MAINTAIN RACEWAY ENTIRELY FREE OF OBSTRUCTIONS AND MOISTURE.
 - IMMEDIATELY AFTER INSTALLATION, PLUG AND CAP RACEWAY ENDS WITH WATERTIGHT AND DUST-TIGHT SEALS UNTIL TIME FOR PULLING IN CONDUCTORS.
 - SEALING FITTINGS: PROVIDE DRAIN SEAL IN VERTICAL RACEWAYS WHERE CONDENSATE MAY COLLECT ABOVE SEALING FITTINGS.
 - AVOID MOISTURE TRAPS WHERE POSSIBLE. WHERE UNAVOIDABLE IN EXPOSED CONDUIT RUNS, PROVIDE JUNCTION BOX AND DRAIN FITTING AT CONDUIT LOW POINT.
 - GROUP RACEWAYS INSTALLED IN SAME AREA.
 - FOLLOW STRUCTURAL SURFACE CONTOURS WHEN INSTALLING EXPOSED RACEWAYS. AVOID OBSTRUCTION OF PASSAGEWAYS.
 - RUN EXPOSED RACEWAYS PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS, OR INTERSECTIONS OF VERTICAL PLANES.
 - BLOCK WALLS: DO NOT INSTALL RACEWAYS IN SAME HORIZONTAL COURSE WITH REINFORCING STEEL.
 - INSTALL WATERTIGHT FITTINGS IN OUTDOOR, UNDERGROUND, OR WET LOCATIONS.
 - PAINT THREADS AND CUT ENDS, BEFORE ASSEMBLY OF FITTINGS, GALVANIZED CONDUIT, PVC-COATED GALVANIZED CONDUIT, OR IMC INSTALLED IN EXPOSED OR DAMP LOCATIONS WITH ZINC-RICH PAINT OR LIQUID GALVANIZING COMPOUND.
 - METAL CONDUIT TO BE REAMED, BURRS REMOVED, AND CLEANED BEFORE INSTALLATION OF CONDUCTORS, WIRES, OR CABLES.
 - DO NOT INSTALL RACEWAYS IN CONCRETE EQUIPMENT PADS, FOUNDATIONS, OR BEAMS.
 - HORIZONTAL RACEWAYS INSTALLED UNDER FLOOR SLABS SHALL LIE COMPLETELY UNDER SLAB, WITH NO PART EMBEDDED WITHIN SLAB.
 - INSTALL CONCEALED, EMBEDDED, AND BURIED RACEWAYS SO THAT THEY EMERGE AT RIGHT ANGLES TO SURFACE AND HAVE NO CURVED PORTION EXPOSED.
 - INSTALL CONDUITS FOR FIBER OPTIC CABLES, TELEPHONE CABLES, AND CATEGORY 5 DATA CABLES IN STRICT CONFORMANCE WITH THE REQUIREMENTS OF EIA/TIA 569.

B. INSTALLATION IN CAST-IN-PLACE STRUCTURAL CONCRETE:

- MINIMUM COVER 2 INCHES, INCLUDING ALL FITTINGS.
 - CONDUIT PLACEMENT SHALL NOT REQUIRE CHANGES IN REINFORCING STEEL LOCATION OR CONFIGURATION.
 - PROVIDE NONMETALLIC SUPPORT DURING PLACEMENT OF CONCRETE TO ENSURE RACEWAY REMAINS IN POSITION.
 - CONDUIT LARGER THAN 1 INCH SHALL NOT BE EMBEDDED IN CONCRETE SLABS, WALLS, FOUNDATIONS, COLUMNS OR BEAMS, UNLESS APPROVED BY ENGINEER.
 - SLABS AND WALLS:
 - TRADE SIZE OF CONDUIT NOT TO EXCEED ONE-FOURTH OF THE SLAB OR WALL THICKNESS.
 - INSTALL WITHIN MIDDLE ONE-THIRD OF SLAB OR WALL.
 - SEPARATE CONDUIT LESS THAN 2-INCH TRADE SIZE BY A MINIMUM TEN TIMES CONDUIT TRADE SIZE, CENTER-TO-CENTER, UNLESS OTHERWISE SHOWN.
 - SEPARATE CONDUIT 2 INCHES AND GREATER TRADE SIZE BY A MINIMUM EIGHT TIMES CONDUIT TRADE SIZE, CENTER-TO-CENTER, UNLESS OTHERWISE SHOWN.
 - CROSS CONDUIT AT AN ANGLE GREATER THAN 45 DEGREES, WITH MINIMUM SEPARATION OF 1 INCH.
 - SEPARATE CONDUIT BY A MINIMUM SIX TIMES THE OUTSIDE DIMENSION OF EXPANSION AND DEFLECTION FITTINGS AT EXPANSION JOINTS.
 - CONDUIT SHALL NOT BE INSTALLED BELOW THE MAXIMUM WATER SURFACE ELEVATION IN WALLS OF WATER HOLDING STRUCTURES.
 - COLUMNS AND BEAMS:
 - TRADE SIZE OF CONDUIT NOT TO EXCEED ONE-FOURTH OF BEAM THICKNESS.
 - CONDUIT CROSS-SECTIONAL AREA NOT TO EXCEED 4 PERCENT OF BEAM OR COLUMN CROSS SECTION.
- C. CONDUIT APPLICATION:
- MINIMUM DIAMETER 3/4 INCH
 - OUTDOOR, EXPOSED: INTERMEDIATE METAL CONDUIT.
 - INDOOR, EXPOSED: INTERMEDIATE METAL CONDUIT.
 - DIRECT EARTH BURIAL: PVC SCHEDULE 40.
 - UNDER SLABS-ON-GRADE: PVC SCHEDULE 40.
- D. CONNECTIONS:
- FOR MOTORS, WALL, OR CEILING MOUNTED FANS AND UNIT HEATERS, DRY TYPE TRANSFORMERS, ELECTRICALLY OPERATED VALVES, INSTRUMENTATION, AND OTHER EQUIPMENT WHERE FLEXIBLE CONNECTION IS REQUIRED TO MINIMIZE VIBRATION:
 - GENERAL: FLEXIBLE METAL, LIQUID-TIGHT CONDUIT.
 - WET OR CORROSIVE AREAS: FLEXIBLE METAL LIQUID-TIGHT.
 - LENGTH: 18 INCHES MINIMUM, 60 INCHES MAXIMUM, SUFFICIENT TO ALLOW MOVEMENT OR ADJUSTMENT OF EQUIPMENT.
 - OUTDOOR AREAS: FLEXIBLE METAL, LIQUID-TIGHT CONDUIT.
 - TRANSITION FROM UNDERGROUND OR CONCRETE EMBEDDED TO EXPOSED: PVC-COATED RIGID STEEL CONDUIT.
 - UNDER EQUIPMENT PADS: PVC-COATED RIGID STEEL CONDUIT.
- E. PENETRATIONS:
- MAKE AT RIGHT ANGLES, UNLESS OTHERWISE SHOWN.
 - NOTCHING OR PENETRATION OF STRUCTURAL MEMBERS, INCLUDING FOOTINGS AND BEAMS NOT PERMITTED.
 - FIRE-RATED WALLS, FLOORS, OR CEILINGS: FIRESTOP OPENINGS AROUND PENETRATIONS TO MAINTAIN FIRE-RESISTANCE RATING.
 - CONCRETE WALLS, FLOORS, OR CEILINGS (ABOVE GROUND): PROVIDE NON-SHRINK GROUT DRY-PACK.
 - ENTERING STRUCTURES:
 - GENERAL: SEAL RACEWAY AT THE FIRST BOX OR OUTLET WITH OAKUM OR EXPANDABLE PLASTIC COMPOUND TO PREVENT THE ENTRANCE OF GASES OR LIQUIDS FROM ONE AREA TO ANOTHER.
 - CONCRETE ROOF OR MEMBRANE WATERPROOFED WALL OR FLOOR: PROVIDE WATERTIGHT SEAL.
 - HEATING, VENTILATION, AND AIR CONDITIONING (HVAC) EQUIPMENT:
 - PENETRATE EQUIPMENT IN AREA ESTABLISHED BY MANUFACTURER.
 - TERMINATE CONDUIT WITH FLEXIBLE METAL CONDUIT AT JUNCTION BOX OR CONDULET ATTACHED TO EXTERIOR SURFACE OF EQUIPMENT PRIOR TO PENETRATING EQUIPMENT.
 - SEAL PENETRATION WITH JOINT SEALANT.
 - CORROSIVE-SENSITIVE AREAS:
 - SEAL ALL CONDUIT PASSING THROUGH CHLORINE ROOM WALLS.
 - SEAL CONDUIT ENTERING EQUIPMENT PANELBOARDS AND FIELD PANELS CONTAINING ELECTRONIC EQUIPMENT.
 - SEAL PENETRATION WITH JOINT SEALANT.
 - EXISTING OR PRECAST WALL, (UNDERGROUND): CORE DRILL WALL AND INSTALL WATERTIGHT ENTRANCE SEAL DEVICE.
 - NON-WATERPROOFED WALL OR FLOOR (UNDERGROUND, WITHOUT CONCRETE ENCASEMENT):
 - PROVIDE SCHEDULE 40 GALVANIZED PIPE SLEEVE OR WATERTIGHT ENTRANCE SEAL DEVICE.
 - FILL SPACE BETWEEN RACEWAY AND SLEEVE WITH EXPANDABLE PLASTIC COMPOUND OR OAKUM AND LEAD JOINT ON EACH SIDE.
- F. SUPPORT:
- SUPPORT FROM STRUCTURAL MEMBER ONLY, AT INTERVALS NOT EXCEEDING NFPA 70 REQUIREMENTS, AND IN ANY CASE NOT EXCEEDING 8 FEET. DO NOT SUPPORT FROM PIPING, PIPE SUPPORTS, OR OTHER RACEWAYS.
 - APPLICATION/TYPE OF CONDUIT STRAP:
 - STEEL CONDUIT: ZINC-COATED STEEL, PRE-GALVANIZED STEEL, OR MALLEABLE IRON.
 - NONMETALLIC CONDUIT: NONMETALLIC OR PVC-COATED METAL.
 - PROVIDE AND ATTACH WALL BRACKETS, STRAP HANGERS, OR CEILING TRAPEZE AS FOLLOWS:
 - WOOD: WOOD SCREWS.
 - HOLLOW MASONRY UNITS: TOGGLE BOLTS.
 - CONCRETE OR BRICK: EXPANSION SHIELDS, OR THREADED STUDS DRIVEN IN BY POWDER CHARGE, WITH LOCK WASHERS AND NUTS.
 - STEELWORK: MACHINE SCREWS.
 - LOCATION/TYPE OF HARDWARE:
 - DRY, NON-CORROSIVE AREAS: GALVANIZED.
 - WET, NON-CORROSIVE AREAS: STAINLESS STEEL.
- G. BENDS:
- INSTALL CONCEALED RACEWAYS WITH A MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE.
 - MAKE BENDS AND OFFSETS OF LONGEST PRACTICAL RADIUS. BENDS IN CONDUITS AND DUCTS BEING INSTALLED FOR FIBER OPTIC CABLES SHALL BE NOT LESS THAN 20 TIMES CABLE DIAMETER, 15 INCHES MINIMUM.
 - INSTALL WITH SYMMETRICAL BENDS OR CAST METAL FITTINGS.
 - AVOID FIELD-MADE BENDS AND OFFSETS, BUT WHERE NECESSARY, MAKE WITH ACCEPTABLE HICKEY OR BENDING MACHINE. DO NOT HEAT METAL RACEWAYS TO FACILITATE BENDING.
 - MAKE BENDS IN PARALLEL, OR BANKED RUNS FROM SAME CENTER OR CENTERLINE WITH SAME RADIUS SO THAT BENDS ARE PARALLEL.
 - FACTORY ELBOWS MAY BE INSTALLED IN PARALLEL, OR BANKED RACEWAYS IF THERE IS CHANGE IN PLANE OF RUN AND RACEWAYS ARE SAME SIZE.
 - PVC CONDUIT:

- BENDS 30 DEGREES AND LARGER: PROVIDE FACTORY-MADE ELBOWS.
 - 90-DEGREE BENDS: PROVIDE RIGID STEEL ELBOWS, PVC-COATED WHERE DIRECT BURIED.
 - USE MANUFACTURER'S RECOMMENDED METHOD FOR FORMING SMALLER BENDS.
8. FLEXIBLE CONDUIT: DO NOT MAKE BENDS THAT EXCEED ALLOWABLE CONDUIT BENDING RADIUS OF CABLE TO BE INSTALLED OR THAT SIGNIFICANTLY RESTRICTS CONDUIT FLEXIBILITY.
- H. EXPANSION AND DEFLECTION FITTINGS: PROVIDE ON ALL RACEWAYS AT STRUCTURAL EXPANSION JOINTS AND IN LONG TANGENTIAL RUNS.
- I. PVC CONDUIT
- SOLVENT WELDING:
 - PROVIDE MANUFACTURER RECOMMENDED SOLVENT: APPLY TO ALL JOINTS.
 - INSTALL SUCH THAT JOINT IS WATERTIGHT.
 - ADAPTERS:
 - PVC TO METALLIC FITTINGS: PVC TERMINAL TYPE.
 - PVC TO RIGID METAL CONDUIT: PVC FEMALE ADAPTER.
 - BELLED-END CONDUIT: BEVEL THE UNBELLED END OF THE JOINT PRIOR TO JOINING.
- K. TERMINATION AT ENCLOSURES:
- CAST METAL ENCLOSURE: PROVIDE MANUFACTURER'S PRE-MOLDED INSULATION SLEEVE INSIDE METALLIC CONDUIT TERMINATING IN THREADED HUBS.
 - NONMETALLIC CABINETS, AND ENCLOSURES: TERMINATE CONDUIT IN THREADED CONDUIT HUBS, MAINTAINING ENCLOSURE INTEGRITY.
 - SHEET METAL BOXES, CABINETS, AND ENCLOSURES:
 - INTERMEDIATE METAL CONDUIT:
 - PROVIDE ONE LOCK NUT EACH ON INSIDE AND OUTSIDE OF ENCLOSURE.
 - INSTALL GROUNDING BUSHING.
 - PROVIDE BONDING JUMPER FROM GROUNDING BUSHING TO EQUIPMENT GROUND BUS OR GROUND PAD. IF NEITHER GROUND BUS NOR PAD EXISTS, CONNECT JUMPER TO LAG BOLT ATTACHED TO METAL ENCLOSURE.
 - INSTALL INSULATED BUSHING ON ENDS OF CONDUIT WHERE GROUNDING IS NOT REQUIRED.
 - PROVIDE INSULATED THROAT WHEN CONDUIT TERMINATES IN SHEET METAL BOXES HAVING THREADED HUBS.
 - UTILIZE SEALING LOCKNUTS OR THREADED HUBS ON OUTSIDE OF NEMA 3R AND NEMA 12 ENCLOSURES.
 - TERMINATE CONDUITS WITH THREADED CONDUIT HUBS AT NEMA 4 AND 4X BOXES AND ENCLOSURES.
 - FLEXIBLE METAL CONDUIT: PROVIDE TWO-SCREW TYPE, INSULATED, MALLEABLE IRON CONNECTORS.
 - PVC SCHEDULE 40 CONDUIT: PROVIDE PVC TERMINAL ADAPTOR WITH LOCKNUT.
 - FREE-STANDING ENCLOSURES:
 - TERMINATE METAL CONDUIT ENTERING BOTTOM WITH GROUNDING BUSHING. PROVIDE A GROUNDING JUMPER EXTENDING TO EQUIPMENT GROUND BUS OR GROUNDING PAD.
 - TERMINATE PVC CONDUIT ENTERING BOTTOM WITH BELL END FITTINGS.
- L. EMPTY RACEWAYS:
- PROVIDE PERMANENT, REMOVABLE CAP OVER EACH END.
 - PROVIDE NYLON PULL CORD.
 - IDENTIFY WITH WATERPROOF TAGS ATTACHED TO PULL CORD AT EACH END, AND AT INTERMEDIATE PULL POINT.
- 3.16 CONDUCTORS AND CABLE
- A. CONDUCTOR STORAGE, HANDLING, AND INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- B. DO NOT EXCEED MANUFACTURER'S RECOMMENDATIONS FOR MAXIMUM PULLING TENSIONS AND MINIMUM BENDING RADI.
- C. CONDUIT SYSTEM SHALL BE COMPLETE PRIOR TO DRAWING CONDUCTORS. LUBRICATE PRIOR TO PULLING INTO CONDUIT. LUBRICATION TYPE SHALL BE APPROVED BY CONDUCTOR MANUFACTURER.
- D. TERMINATE ALL CONDUCTORS AND CABLES UNLESS OTHERWISE SHOWN.
- E. DO NOT SPLICE CONDUCTORS, UNLESS SPECIFICALLY INDICATED OR APPROVED BY ENGINEER.
- F. BUNDLING: WHERE SINGLE CONDUCTORS AND CABLES IN MANHOLES, HAND HOLES, VAULTS, CABLE TRAYS, AND OTHER INDICATED LOCATIONS ARE NOT WRAPPED TOGETHER BY SOME OTHER MEANS, BUNDLING CONDUCTORS FROM EACH CONDUIT THROUGHOUT THEIR EXPOSED LENGTH WITH CABLE TIES PLACED AT INTERVALS NOT EXCEEDING 12 INCHES.
- G. WIRING WITHIN EQUIPMENT AND LOCAL CONTROL PANELS: REMOVE SURPLUS WIRE, DRESS, BUNDLE, AND SECURE.
- H. POWER CONDUCTOR COLOR CODING:
- NO. 6 AWG AND LARGER: APPLY GENERAL PURPOSE, FLAME RETARDANT TAPE AT EACH END, AND AT ACCESSIBLE LOCATIONS WRAPPED AT LEAST SIX FULL OVERLAPPING TURNS, COVERING AN AREA 1-1/2 TO 2 INCHES WIDE.
 - NO. 8 AWG AND SMALLER: PROVIDE COLORED CONDUCTORS.
 - COLORS:
 - NEUTRAL WIRE: WHITE
 - LIVE WIRES, 120/240 VOLT, SINGLE PHASE SYSTEM: BLACK AND RED.
 - LIVE WIRES, 120/208 VOLT, THREE PHASE SYSTEM: BLACK, RED, AND BLUE.
 - LIVE WIRES, 277/480 VOLT, THREE PHASE SYSTEM: BROWN, ORANGE, AND YELLOW.
 - GROUND WIRE: GREEN.
- I. CIRCUIT IDENTIFICATION:
- ASSIGN CIRCUIT NAME BASED ON DEVICE OR EQUIPMENT AT LOAD END OF CIRCUIT. WHERE THIS WOULD RESULT IN SAME NAME BEING ASSIGNED TO MORE THAN ONE CIRCUIT, ADD NUMBER OR LETTER TO EACH OTHERWISE IDENTICAL CIRCUIT NAME TO MAKE IT UNIQUE.
 - METHOD: IDENTIFY WITH THE SLEEVES. TAPED-ON MARKERS OR TAGS RELYING ON ADHESIVES NOT PERMITTED.
- J. CONNECTIONS AND TERMINATIONS:
- INSTALL WIRE NUTS ONLY ON SOLID CONDUCTORS.
 - INSTALL NYLON SELF-INSULATED CRIMP CONNECTORS AND TERMINATORS FOR INSTRUMENTATION AND CONTROL CIRCUIT CONDUCTORS.
 - TAPE INSULATE ALL UN-INSULATED CONNECTIONS.
 - INSTALL CRIMP CONNECTORS AND COMPRESSION LUGS WITH TOOLS APPROVED BY CONNECTOR MANUFACTURER.
- 3.17 GROUNDING
- A. GROUNDING SHALL BE IN COMPLIANCE WITH NFPA 70 AND AS SHOWN.
- B. GROUND ELECTRICAL SERVICE NEUTRAL AT SERVICE ENTRANCE EQUIPMENT TO SUPPLEMENTARY GROUNDING ELECTRODES.
- C. GROUND EACH SEPARATELY DERIVED SYSTEM NEUTRAL TO NEAREST EFFECTIVELY GROUNDING BUILDING STRUCTURAL STEEL MEMBER OR SEPARATE GROUNDING ELECTRODE.
- D. BOND TOGETHER SYSTEM NEUTRALS. SERVICE EQUIPMENT ENCLOSURES, EXPOSED NON-CURRENT-CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT, METAL RACEWAYS, GROUND

- CONDUCTOR IN RACEWAYS AND CABLES, RECEPTACLE GROUND CONNECTIONS, AND METAL PIPING SYSTEMS.
- F. SHIELDED INSTRUMENTATION CABLES:
- GROUND SHIELD TO GROUND BUS AT POWER SUPPLY FOR ANALOG SIGNAL.
 - EXPOSE SHIELDED MINIMUM 1 INCH AT TERMINATION TO FILED INSTRUMENT AND APPLY HEAT SHRINK TUBE.
 - DO NOT GROUND INSTRUMENTATION CABLE SHIELD AT MORE THAN ONE POINT.
- G. EQUIPMENT GROUNDING CONDUCTORS: PROVIDE IN ALL CONDUITS CONTAINING POWER CONDUCTORS AND CONTROL CIRCUITS ABOVE 50 VOLTS.
- H. GROUND RODS: INSTALL FULL LENGTH WITH CONDUCTOR CONNECTION AT UPPER END.
- 3.19 AUTOMATIC TRANSFER SWITCH
- A. INSTALLATION:
- PROVIDE WORKSPACE AND CLEARANCES REQUIRED BY NFPA 70.
 - SET FIELD-ADJUSTABLE INTERVALS AND DELAYS, RELAYS, AND ENGINE EXERCISER CLOCK.
 - COMPLY WITH NETA.
 - MATCH TYPE AND NUMBER OF CABLES AND CONDUCTORS TO GENERATOR SETS, CONTROL, AND COMMUNICATION REQUIREMENTS OF TRANSFER SWITCHES AS RECOMMENDED BY MANUFACTURER. INCREASE RACEWAY SIZES AT NO ADDITIONAL COST TO OWNER IF NECESSARY TO ACCOMMODATE REQUIRED WIRING.
 - ENGAGE FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO ADMINISTER AND PERFORM TESTS AND INSPECTIONS ON COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS.
- B. TESTS AND INSPECTIONS:
- VISUAL AND MECHANICAL INSPECTION:
 - INSPECT PHYSICAL AND MECHANICAL CONDITION.
 - INSPECT ANCHORAGE, ALIGNMENT, GROUNDING, AND REQUIRED CLEARANCES.
 - VERIFY THAT THE UNIT IS CLEAN.
 - VERIFY APPROPRIATE LUBRICATION ON MOVING CURRENT-CARRYING PARTS AND ON MOVING AND SLIDING SURFACES.
 - VERIFY THAT MANUAL TRANSFER WARNINGS ARE ATTACHED AND VISIBLE.
 - VERIFY TIGHTNESS OF ALL CONTROL CONNECTIONS.
 - PERFORM MANUAL TRANSFER OPERATION.
 - VERIFY POSITIVE MECHANICAL INTERLOCKING BETWEEN NORMAL AND ALTERNATE SOURCES.
 - VERIFY SETTINGS AND OPERATION OF CONTROL DEVICES.
 - CALIBRATE AND SET ALL RELAYS AND TIMERS.
 - VERIFY PHASE ROTATION, PHASING, AND SYNCHRONIZED OPERATION.
 - PERFORM AUTOMATIC TRANSFER TESTS.
 - VERIFY CORRECT OPERATION AND TIMING OF THE FOLLOWING FUNCTIONS:
 - NORMAL SOURCE VOLTAGE-SENSING AND FREQUENCY-SENSING RELAYS.
 - ENGINE START SEQUENCE.
 - TIME DELAY ON TRANSFER.
 - ALTERNATIVE SOURCE VOLTAGE-SENSING AND FREQUENCY-SENSING RELAYS.
 - AUTOMATIC TRANSFER OPERATION.
 - INTERLOCKS AND LIMIT SWITCH FUNCTION.
 - TIME DELAY AND RETRANSFER ON NORMAL POWER RESTORATION.
 - ENGINE COOL-DOWN AND SHUTDOWN FEATURE.
 - COORDINATE TESTS WITH TESTS OF GENERATOR AND RUN THEM CONCURRENTLY.
 - TRANSFER SWITCHES WILL BE CONSIDERED DEFECTIVE IF THEY DO NOT PASS TESTS AND INSPECTIONS.
 - REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.
 - GENERATOR
- A. INSTALLATION:
- COMPLY WITH PACKAGED ENGINE GENERATOR MANUFACTURER'S WRITTEN INSTALLATION AND ALIGNMENT INSTRUCTIONS AND WITH NFPA 110.
 - EQUIPMENT MOUNTING:
 - INSTALL PACKAGED ENGINE GENERATORS ON CAST-IN-PLACE CONCRETE EQUIPMENT BASES.
 - COORDINATE SIZE AND LOCATION OF CONCRETE BASES FOR PACKAGED ENGINE GENERATORS. CAST ANCHOR-BOLT INSERTS INTO BASES.
 - INSTALL PACKAGED ENGINE GENERATOR WITH ELASTOMERIC ISOLATOR PADS 4-INCH (100 MM) HIGH CONCRETE BASE. SECURE SETS TO ANCHOR BOLTS INSTALLED IN CONCRETE BASES.
 - FIELD TESTS AND INSPECTION:
 - VERIFY PHASE ROTATION.
 - FUNCTIONALLY TEST ENGINE SHUTDOWN FOR LOW OIL PRESSURE, OVERTEMPERATURE, OVERSPEED, AND OTHER PROTECTION FEATURES AS APPLICABLE.
 - VERIFY CORRECT FUNCTIONING OF THE GOVERNOR AND REGULATOR.
 - COLD-START TEST BY INTERRUPTING NORMAL POWER SOURCE WITH TEST LOAD CONSISTING OF CONNECTED BUILDING LOAD TO VERIFY:
 - TRANSFER SWITCH OPERATION.
 - AUTOMATIC STARTING OPERATION.
 - OPERATING ABILITY OF ENGINE-GENERATOR.
 - OVERCURRENT DEVICES CAPABILITY TO WITHSTAND INRUSH CURRENTS.
 - NFPA 110 ACCEPTANCE TESTS: PERFORM TESTS REQUIRED BY NFPA 110 THAT ARE ADDITIONAL TO THOSE SPECIFIED HERE, INCLUDING, BUT NOT LIMITED TO, SINGLE-STEP FULL-LOAD PICKUP TEST.
 - VERIFY SPECIFIED VOLTAGE, FREQUENCY, AND HARMONIC PERFORMANCE.
 - VERIFY ENGINE-GENERATOR OPERATION WITH ADJUSTABLE FREQUENCY DRIVES AND POWER FACTOR CORRECTION CAPACITORS ENERGIZED AND OPERATING UNDER NORMAL LOAD CONDITIONS.
 - INSPECT AND TEST ALL ENCLOSURE RELATED SYSTEMS FOR PROPER CONDITION AND OPERATION, INCLUDING ENCLOSURE CONDITION AND FINISH, DOOR OPERATION AND SECURING, SPACE HEATING, POWER DISTRIBUTION, VENTILATION SYSTEM, AND LIGHTING SYSTEM.
- 3.21 FIELD QUALITY CONTROL
- A. GENERAL:
- TEST EQUIPMENT SHALL HAVE AN OPERATION ACCURACY EQUAL TO, OR GREATER THAN, REQUIREMENTS ESTABLISHED BY NETA ATS.
 - TEST INSTRUMENT CALIBRATION SHALL BE IN ACCORDANCE WITH NETA ATS.
 - PERFORM INSPECTION AND ELECTRICAL TESTS AFTER EQUIPMENT HAS BEEN INSTALLED.
 - PERFORM TESTS WITH APPARATUS DE-ENERGIZED WHENEVER FEASIBLE.
 - INSPECTION AND ELECTRICAL TESTS ON ENERGIZED EQUIPMENT ARE TO BE:
 - SCHEDULED WITH ENGINEER PRIOR TO DE-ENERGIZATION.
 - MINIMIZED TO AVOID EXTENDED PERIOD OF INTERRUPTION TO THE OPERATION OF FACILITY.
- B. TESTS AND INSPECTION SHALL ESTABLISH THAT:
- ELECTRICAL EQUIPMENT IS OPERATIONAL WITHIN INDUSTRY AND MANUFACTURER'S TOLERANCES.
 - INSTALLATION OPERATES PROPERLY.
 - EQUIPMENT IS SUITABLE FOR ENERGIZATION.
 - INSTALLATION CONFORMS TO REQUIREMENTS OF CONTRACT DOCUMENTS AND NFPA 70.
- C. PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH NETA ATS, INDUSTRY STANDARDS, AND

- MANUFACTURER'S RECOMMENDATIONS.
- D. ADJUST MECHANISMS AND MOVING PARTS FOR FREE MECHANICAL MOVEMENT.
- E. ADJUST ADJUSTABLE RELAYS AND SENSORS TO CORRESPOND TO OPERATING CONDITIONS, OR AS RECOMMENDED BY MANUFACTURER.
- F. VERIFY NAMEPLATE DATA FOR CONFORMANCE TO CONTRACT DOCUMENTS.
- G. REALIGN EQUIPMENT NO PROPERLY ALIGNED AND CORRECT UNLEVELNESS.
- H. PROPERLY ANCHOR ELECTRICAL EQUIPMENT FOUND TO BE INADEQUATELY ANCHORED.
- I. TIGHTEN ACCESSIBLE BOLTED CONNECTIONS, INCLUDING WIRING CONNECTIONS, WITH CALIBRATED TORQUE WRENCH TO MANUFACTURER'S RECOMMENDATIONS, OR AS OTHERWISE SPECIFIED.
- J. CLEAN CONTAMINATED SURFACES WITH CLEANING SOLVENTS AS RECOMMENDED BY MANUFACTURER.
- K. PROVIDE PROPER LUBRICATION OF APPLICABLE MOVING PARTS.
- L. INVESTIGATE AND REPAIR OR REPLACE:
- ELECTRICAL ITEMS THAT FAIL TESTS.
 - ACTIVE COMPONENTS NOT OPERATING IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - DAMAGED ELECTRICAL EQUIPMENT.
- M. ELECTRICAL ENCLOSURES:
- REMOVE FOREIGN MATERIAL AND MOISTURE FROM ENCLOSURE INTERIOR.
 - VACUUM AND WIPE CLEAN ENCLOSURE INTERIOR.
 - REMOVE CORROSION FOUND ON METAL SURFACES.
 - REPAIR OR REPLACE, AS DETERMINED BY ENGINEER, DOOR AND PANEL SECTIONS HAVING DAMAGED SURFACES.
 - REPLACE MISSING OR DAMAGED HARDWARE.
- N. PROVIDE CERTIFIED TEST REPORT(S) DOCUMENTING THE SUCCESSFUL COMPLETION OF SPECIFIED TESTING. INCLUDE FIELD TEST MEASURING DATA.
- O. TEST THE FOLLOWING EQUIPMENT AND MATERIALS:
- CONDUCTORS: INSULATION AND RESISTANCE, NO. 4 AND LARGER ONLY.
 - GROUNDING ELECTRODES.
- P. CONTROLS:
- TEST CONTROL AND SIGNAL WIRING FOR PROPER TERMINATION AND FUNCTION.
 - TEST LOCAL CONTROL PANELS AND OTHER CONTROL DEVICES FOR PROPER TERMINATIONS, CONFIGURATION AND SETTINGS, AND FUNCTIONS.
 - DEMONSTRATE CONTROL, MONITORING, AND INDICATION FUNCTIONS IN PRESENCE OF OWNER AND ENGINEER.
- Q. BALANCE ELECTRICAL LOAD BETWEEN PHASES ON PANELBOARDS AFTER INSTALLATION.
- R. VOLTAGE TESTING:
- WHEN INSTALLATION IS COMPLETE AND FACILITY IS IN OPERATION, CHECK VOLTAGE TO PROJECT.
 - CHECK VOLTAGE AMPLITUDE AND BALANCE BETWEEN PHASES FOR LOADED AND UNLOADED CONDITIONS.
- S. EQUIPMENT LINE CURRENT:
- CHECK LINE CURRENT IN EACH PHASE FOR EACH PIECE OF EQUIPMENT.

H ENGINEERING
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Project: 21K1E101
208-288-2181

OWNER REVIEW SET NOT FOR CONSTRUCTION

PROFESSIONAL ENGINEER
REGISTERED
7051
STATE OF ILLINOIS
JOHN J. BARRUT I A
5/26/22

NO.	REVISIONS	DATE

NORTHWOOD WELL PUMPHOUSE STANDBY POWER MODIFICATIONS

ELECTRICAL SPECIFICATIONS

SCALE: NONE
DATE: 5/26/22
DRAWN BY: MAP
CHECKED BY: JUB

SHEET

E-6

STRUCTURAL SPECIFICATIONS

PART 1 - GENERAL NOTES

1.1 GENERAL NOTES

- A. ALL GENERAL NOTES APPLY, UNLESS NOTED ON DRAWINGS OR SPECIFICATIONS.
- B. ORDER OF PRECEDENCE: DRAWINGS GOVERN OVER NOTES, NOTES ON THE INDIVIDUAL DRAWINGS GOVERN OVER THESE GENERAL NOTES, FOUNDATION DETAILS GOVERN OVER TYPICAL DETAILS. REFER TO CONTRACT SPECIFICATIONS FOR INFORMATION IN ADDITION TO THAT CONTAINED IN THESE NOTES AND DRAWINGS. THE DRAWINGS SHALL TAKE PRECEDENCE OVER SPECIFICATIONS IF THEY CONTRADICT. ADDENDA, RFIS AND SKETCHES TAKE PRECEDENCE OVER THESE DRAWINGS.
- C. NOTIFY ENGINEER OF RECORD OF ANY DISCREPANCIES:
- BETWEEN PLANS, SPECIFICATIONS AND GOVERNING CODE.
 - BETWEEN DETAILS AND TYPICAL DETAILS.
 - BETWEEN NOTES AND DRAWINGS.

1.2 SCOPE OF WORK

- A. THE SEALED STRUCTURAL DRAWINGS AND PROJECT SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE.
- B. CONTRACTOR TO INCLUDE IN THE PROPOSAL, ALL REASONABLY FORESEEN ITEMS, ADDRESSING EXISTING CONDITIONS, EQUIPMENT AND MATERIALS TO COMPLETE THE PROPOSED SCOPE OF WORK CONTAINED WITHIN THESE DOCUMENTS DURING CONSTRUCTION.
- C. OBSERVATION VISITS (SITE VISIT) BY REPRESENTATIVES OF ENGINEER DO NOT INCLUDE INSPECTION OF CONSTRUCTION MEANS AND METHODS. SITE VISITS DURING CONSTRUCTION ARE NOT CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE TO BE PERFORMED BY OTHERS. OBSERVATIONS ARE PERFORMED SOLELY FOR THE PURPOSE OF DETERMINING IF THE CONTRACTOR UNDERSTANDS DESIGN INTENT SHOWN IN THE CONTRACT DRAWINGS. OBSERVATIONS DO NOT GUARANTEE CONTRACTORS PERFORMANCE AND ARE NOT TO BE CONSTRUED AS SUPERVISION OR VERIFICATION OF CONSTRUCTION.
- D. THE CONTRACTOR SHALL MAKE AND KEEP CURRENT A SET OF RECORD DRAWINGS SHOWING EXACT DIMENSIONED LOCATIONS OF UNDERGROUND UTILITIES, STUB OUTS, AND CONSTRUCTION CHANGES.

1.3 CODE COMPLIANCE

- A. ALL WORK AND MATERIALS SHALL COMPLY WITH THE LATEST RULES, CODES, AND REGULATIONS IN THE STATE OF THE PROJECT, INCLUDING, BUT NOT LIMITED TO OCHA, ADOPTED BUILDING CODE AND OTHER STATE AND LOCAL LAWS AND REGULATIONS. CODE COMPLIANCE IS MANDATORY. NOTHING IN THESE DRAWINGS AND SPECIFICATIONS PERMITS WORK NOT CONFORMING TO THESE CODES. WHERE WORK IS SHOWN TO EXCEED MINIMUM CODE REQUIREMENTS, COMPLY WITH THE DRAWINGS AND SPECIFICATIONS.
- B. ALL PRODUCT SUBMITTALS AND PRODUCT SUBSTITUTIONS ARE TO BE SUPPLIED WITH ICC-ES REPORTS TO COMPLY WITH CODE REGULATION ACCORDING TO THE ADOPTED BUILDING CODE.
- C. SEE SPECIFICATIONS FOR LEED REQUIREMENTS AND GREEN BUILDING PRACTICES REQUIRED FOR THIS PROJECT.

1.4 LICENCE FEES AND PERMITS

- A. THE CONTRACTOR SHALL ARRANGE FOR REQUIRED INSPECTIONS AND PAY ALL LICENSE, PERMIT AND INSPECTION FEES, UNLESS DIRECTED OTHERWISE IN SPECIFICATIONS.

1.5 CONDITIONS AT SITE

- A. VISIT TO SITE IS REQUIRED FOR ALL BIDDERS PRIOR TO SUBMISSION OF BID. ALL WILL BE HELD TO HAVE FAMILIARIZED THEMSELVES WITH THE DISCERNIBLE CONDITIONS AND NOT EXTRA PAYMENT WILL BE ALLOWED FOR WORK REQUIRED BECAUSE OF THESE CONDITIONS, WHETHER SPECIFICALLY MENTIONED OR NOT.
- B. CONTRACTOR TO VERIFY EXISTING STRUCTURE(S) SHOWN IN THE DRAWINGS AND NOTIFY ENGINEER IN WRITING OF ANY DISCREPANCIES.
- C. UTILITIES THAT ARE DAMAGED AS A RESULT OF THIS WORK SHALL PROMPTLY BE REPAIRED AT NO EXPENSE TO THE OWNER AND TO COMPLETE SATISFACTION OF THE OWNER.
- D. CONTRACTOR TO VERIFY CONSTRUCTION OF BUILDING PAD AND NOTIFY THE GEOTECHNICAL AND STRUCTURAL ENGINEER OF IMPROPER FILL OR BURIED STRUCTURES SUCH AS CESSPOOLS, CISTERNS, FOUNDATIONS, UTILITIES, ETC.

1.6 SAFETY

- A. CONTRACTOR TO PROVIDE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AS REQUIRED.
- B. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF WORK.

1.7 GUARANTEE

- A. GUARANTEE THE INSTALLATION, FREE FROM DEFECTS OF WORKMANSHIP AND MATERIALS, FOR A MINIMUM PERIOD OF ONE YEAR AFTER THE DATE OF CERTIFICATION OF FINAL PAYMENT AND PROMPTLY REMEDY ANY DEFECTS DEVELOPING DURING THIS PERIOD, WITHOUT CHARGE.

1.8 DEFERRED AND SHOP DRAWING SUBMITTALS

- A. CONTRACTOR SHALL SUBMIT AN ELECTRONIC PDF FILE OF SHOP DRAWING SUBMITTALS TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING, FABRICATING, OR INSTALLING. THE REVIEW WILL CONSIST OF GENERAL CONFORMANCE TO THE DESIGN INTENT CONVEYED IN THE CONTRACT DRAWINGS AND REQUIRE A MAXIMUM OF 10 WORKING DAYS FOR REVIEW UPON RECEIPT. NO MODIFICATIONS OR SUBSTITUTIONS OF DRAWINGS AND SPECIFICATIONS WILL BE ACCEPTED VIA SHOP DRAWINGS. SHOP DRAWINGS AND DEFERRED SUBMITTALS (DS) REQUIRED ARE LISTED UNDER EACH MATERIAL IN PART 2.
- B. DEFERRED SUBMITTALS REQUIRE ADDITIONAL DESIGN AND SUPPORTING CALCULATIONS WITH AN ENGINEERS SEAL INDICATING THE ENGINEER IS REGISTERED IN THE STATE THAT THE PROJECT OCCURS.
- C. CONTRACTOR SHALL REVIEW AND STAMP SHOP DRAWINGS PRIOR TO SUBMISSION TO THE ENGINEER. CONTRACTOR SHALL REVIEW FOR COMPLETENESS AND COMPLIANCE WITH CONTRACT DRAWINGS. SHOP DRAWINGS WILL BE REJECTED FOR INCOMPLETENESS, LACK OF COORDINATION WITH OTHER PORTIONS OF CONTRACT DRAWINGS, CALCULATIONS (AS REQUIRED), AND/OR MODIFICATIONS OR SUBSTITUTIONS

NOT APPROVED PRIOR TO THE SUBMITTAL.

1.9 WORKMANSHIP

- A. ONLY QUALITY WORK WILL BE ACCEPTED. HAZARDOUS OR POOR INSTALLATION PRACTICE WILL BE CAUSE FOR REJECTION OF WORK.

1.10 COORDINATION

- A. THE CONSTRUCTION DOCUMENTS DO NOT INDICATE THE METHOD OF CONSTRUCTION.
- B. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING ELEVATIONS SHOWN ON THESE DRAWINGS PRIOR TO CONSTRUCTION. DO NOT SCALE PLANS.
- C. CONTRACTOR TO REPORT IN WRITING ANY OMISSIONS AND/OR DISCREPANCIES ON DRAWINGS AND/OR SPECIFICATIONS TO THE ENGINEER PRIOR TO PROCEEDING.
- D. REFER TO ELECTRICAL PLANS FOR ADDITIONAL WORK.

1.11 MISC

- A. TYPICAL DETAILS AND SCHEDULES INDICATED MAY NOT BE SPECIFICALLY REFERENCED ON THE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE WHERE EACH TYPICAL DETAIL OR SCHEDULE APPLIES. IF LOCATIONS ARE FOUND WHERE NO TYPICAL DETAIL, TYPICAL SCHEDULE, OR SPECIFIC DETAIL APPLIES, NOTIFY THE ENGINEER.

PART 2 - MATERIALS AND DESIGN CRITERIA

2.1 DESIGN LOADING CRITERIA

- A. APPLICABLE BUILDING CODES
- 2018 INTERNATIONAL BUILDING CODE (IBC): REFERENCED IN DRAWINGS AS "ADOPTED BUILDING CODE"
 - ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.
- B. RISK CATEGORY: III
- C. DEAD LOADS: SELF WEIGHT OF THE STRUCTURE AND EQUIPMENT.
- D. SNOW LOAD DATA
- SNOW IMPORTANCE FACTOR = 1.1
 - THERMAL FACTOR = 1
 - SNOW EXPOSURE FACTOR, $C_e = 1.0$
 - GROUND SNOW LOAD, $P_g = 130$ PSF
 - DRIFTING, SLIDING AND UNBALANCED SNOW LOADS: IN ACCORDANCE WITH ASCE 7.
- E. WIND LOAD DATA
- WIND EXPOSURE CATEGORY = B
 - ULTIMATE DESIGN WIND SPEED: $V_{ult} = 120$ MPH, 3 SECOND GUST
 - NOMINAL DESIGN WIND SPEED: $V_{asd} = 93$ MPH, 3 SECOND GUST
- F. EARTHQUAKE DESIGN DATA
- COMPONENT IMPORTANCE FACTOR = 1.5
 - SEISMIC DESIGN CATEGORY = C
 - SITE CLASS = C
 - SPECTRAL RESPONSE ACCELERATION:
 - SHORT PERIOD, $S_s = 0.428g$
 - 1 SECOND PERIOD, $S_1 = 0.133g$
 - DESIGN SPECTRAL RESPONSE ACCELERATION:
 - SHORT PERIOD, $S_{ds} = 0.343g$
 - 1 SECOND PERIOD, $S_{d1} = 0.148g$
 - ANALYSIS PROCEDURE USED = SEISMIC DESIGN FOR NON-STRUCTURAL COMPONENTS.

2.2 SOILS AND FOUNDATION

- A. CODE COMPLIANCE: THE FOUNDATIONS SHALL CONFORM TO ADOPTED BUILDING CODE CHAPTER FOR "SOILS AND FOUNDATIONS".
- B. DESIGN SOIL VALUES: THE STRUCTURAL DESIGN IS BASED ON OWNER-ACCEPTED MINIMUM CODE REQUIREMENTS
- SOIL BEARING PRESSURE (DL+LL) = 1550 PSF (ONE THIRD INCREASE FOR WIND AND SEISMIC LOADING MAY BE APPLIED)
 - PASSIVE LATERAL PRESSURE = 250 PCF
 - ACTIVE LATERAL PRESSURE (UN-CONSTRAINED) = 35 PCF
 - AT-REST LATERAL PRESSURE (CONSTRAINED) = 50 PCF
 - COEFFICIENT OF SLIDING FRICTION = 0.35
 - MINIMUM FOOTING EMBEDMENT BELOW LOWEST ADJACENT GRADE = 36"
 - SULFATE EXPOSURE - NOT PROVIDED
- C. SITE PREPARATION
- GROUND SURFACE UNDERLYING ALL FILLS SHALL BE SCARIFIED TO A DEPTH OF 24" MINIMUM TO REMOVE ALL ORGANIC MATTER, THEN RE-COMPACTED TO 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY PER ASTM D698. CONTRACTOR SHALL PREPARE SITE BASED ON THE REQUIREMENT LISTED HEREIN, MINIMUM, UNLESS NOTED OTHERWISE OR UNLESS DETERMINED BY A GEOTECHNICAL ENGINEER HAVING PERFORMED PROPER INVESTIGATION OF THIS SITE. CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES, FOOTINGS, AND ALL OTHER BURIED OBJECTS.
 - CONTRACTOR SHALL PROVIDE PROPER DEWATERING OF EXCAVATIONS FROM SURFACE WATER, GROUND WATER SEEPAGE, ETC.
 - EXCAVATION FOR ANY PURPOSE SHALL NOT REDUCE LATERAL SUPPORT FROM ANY EXISTING FOUNDATION OR ADJACENT EXISTING FOUNDATION DETRIMENTAL LATERAL OR VERTICAL MOVEMENT, OR BOTH.
 - ALL EXCAVATIONS SHALL BE PROPERLY BACKFILLED. BACKFILL SHALL BE COMPOSED OF MINUS 3" MATERIAL & MECHANICALLY COMPACTED IN LAYERS, NO GREATER THAN 12" THICK AND COMPACTED TO 98% STANDARD PROCTOR PER ASTM D698 IN A MATTRE THAT DOES NOT DAMAGE THE FOUNDATION, WATERPROOFING, OR DAMP PROOFING MATERIAL. FLOODING WILL NOT BE PERMITTED.
 - CONTRACTOR TO EVALUATE THEIR METHODS OF CONSTRUCTION FOR IMPACTS TO ADJACENT PROPERTIES TO INCLUDE BUT NOT LIMITED TO VIBRATIONS AND SETTLEMENT FROM DRIVEN PILES, WILD-LIFE AND NATURE RESERVES, AND ETC.
- D. SITE CONTROL DURING CONSTRUCTIONS.
- CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND CRIBBING AS NEEDED AT ALL EXCAVATIONS, EARTH BANKS, AND EXISTING STRUCTURES.
 - CONTRACTOR SHALL KEEP SOIL WITHIN 2% OF OPTIMUM MOISTURE AT MAXIMUM DENSITY AS DETERMINED BY THE MOISTURE DENSITY CURVE OBTAINED.
 - CONTRACTOR SHALL PROVIDE PROPER SITE DRAINAGE AND DEWATERING OF SITE AND EXCAVATIONS. ALL EXCAVATIONS WITHIN BUILDING PERIMETER SHALL BE PROPERLY BACKFILLED AND COMPACTED TO MEET THE REQUIREMENTS OUTLINED HEREIN, MINIMUM.

E. GEOTECHNICAL INSPECTION

- THE GEOTECHNICAL ENGINEER SHALL INSPECT AND APPROVE THE SITE PREPARATION AND FOOTING EXCAVATIONS BEFORE CONCRETE OR REINFORCING IS PLACED.
- THE GEOTECHNICAL ENGINEER SHALL CONDUCT ANY ADDITIONAL INSPECTIONS AS REQUIRED IN THE GEOTECHNICAL REPORT OR PER LOCAL BUILDING DEPARTMENT.

F. SLAB ON GRADE AND FOUNDATION

1. ALL FOUNDATIONS SHALL BEAR ON COMPETENT NATIVE SOIL OR STRUCTURAL COMPACTED FILL AS DESCRIBED HEREIN. ALL SLABS ON GRADES SHALL BEAR ON A 4" THICK DRAINAGE COURSE OR MINUS 3/4" MATERIAL, GRADED FOR COMPACTION, WITH < 10% PASSING THE #200 SIEVE, COMPACTED TO 95% STANDARD PROCTOR PER ASTM D698.

2.3 CONCRETE

- A. GENERAL
- CONCRETE SHALL CONFORM TO ADOPTED BUILDING CODE CHAPTER FOR "CONCRETE" AND ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.
 - CONCRETE MIXING OPERATIONS SHALL BE IN ACCORDANCE WITH ASTM C94.
 - 28 DAY CONCRETE STRENGTHS AND W/C RATIOS. SEE DETAILS.

B. CEMENT

- PORTLAND CEMENT SHALL CONFORM TO ASTM C150 TYPE I OR II.
- IF SULFATE ARE IN SOIL, PER GEOTECHNICAL REPORT, USE ASTM C150 TYPE V CEMENT WITH MINIMUM CONCRETE STRENGTH OF 4,500 PSI AND MAXIMUM WATER CEMENT RATIO OF 0.45.
- DO NOT USE CONCRETE OR GROUT CONTAINING CHLORIDES.

C. AGGREGATE

- NORMAL WEIGHT CONCRETE AGGREGATE SHALL CONFORM TO ASTM C33 AND PROJECT SPECIFICATIONS.
- PROVIDE 3/4" MAXIMUM AGGREGATE SIZE, UNO.

D. CEMENTITIOUS MATERIALS

- CEMENTITIOUS MATERIALS SUCH AS FLY ASH, SLAG, SILICA FUME, AND OTHER POZZOLANS; MAY BE USED AS AN ALTERNATIVE TO PORTLAND CEMENT. THE AMOUNT OF CEMENTITIOUS MATERIALS USED SHALL BE ADEQUATE FOR CONCRETE TO SATISFY THE SPECIFIED REQUIREMENTS FOR STRENGTH/W/C, DURABILITY, AND FINISHABILITY, UNLESS NOTED OTHERWISE BELOW. CEMENTITIOUS MATERIAL SHALL BE IN ACCORDANCE WITH ACI 301-10, SECTION 4.2. IF FLY ASH IS USED, THE MAXIMUM AMOUNT SHALL BE 25% BY WEIGHT OF TOTAL CEMENTITIOUS MATERIALS. CONCRETE EXPOSED TO FREEZE-THAW CYCLES AND WHERE EXPOSURE TO DEICING CHEMICALS IS ANTICIPATED SHALL HAVE CEMENTITIOUS MATERIAL AMOUNTS LIMITED TO ACI 318.

E. ENTRAINED AIR

- CONCRETE SHALL HAVE 6% (+/- 1.5%) OF ENTRAINED AIR.
- SPECIFIED AIR ENTRAINMENT PERCENTAGE SHALL BE ACHIEVED AT TIME CONCRETE IS DELIVERED ON SITE.

F. SLUMP

- SLUMP OF CONCRETE MIXTURE BEFORE ADDING ADMIXTURES SHALL BE 4" (+/-).

G. CONSTRUCTION EXECUTION

- CONTACTOR TO NOTIFY ENGINEER 48 HOURS PRIOR TO PLACMENT OF CONCRETE.
- THE TEMPERATURE OF CONCRETE MUST REMAIN ABOVE 50 DEGREES FAHRENHEIT AND IN A MOIST CONDITION FOR 7 DAYS AFTER CONCRETE PLACEMENT; UNLESS OTHERWISE ACCEPTED BY ENGINEER. ADDITIONAL TESTING FOR CONDITIONS LESS THAN 50 DEGREES FAHRENHEIT INCLUDE HAVING HAVING TWO ADDITIONAL CYLINDERS POURED AND FIELD CURED PRIOR TO CONCRETE PLACEMENT.
- COLD WEATHER PLACEMENT OF CONCRETE SHALL CONFORM TO ACI 318 AND ACI 306R - "GUIDE TO COLD WEATHER CONCRETING"
- HOT WEATHER PLACEMENT OF CONCRETE SHALL CONFORM TO ACI318 AND ACI 305R - "HOT WEATHER CONCRETING"
- PROVIDE A 3/4" CHAMFER ON ALL PROJECTED CONCRETE CORNERS OF COLUMNS, BEAMS, AND WALLS; UNLESS NOTED OTHERWISE IN SPECIFICATIONS.
- CONCRETE CLEAR COVER OVER REINFORCING BARS AND ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH THE ACI.
- THE MODULUS OF ELASTICITY SHALL BE TESTED IN ACCORDANCE WITH ASTM C469 AND BE EQUAL TO OR GREATER THAN THE VALUE GIVEN BY THE EQUATIONS IN ACI 318 FOR THE SPECIFIED 28 DAY CONCRETE STRENGTH.
- THE PLACEMENT OF CONCRETE SHALL CONFORM TO ACI STANDARD 304 AND PROJECT SPECIFICATIONS. CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED, LANTANCES REMOVED, AND STANDING WATER REMOVED BEFORE PLACING NEW CONCRETE.
- ANCHOR BOLTS IN CONCRETE SHALL BE ASTM F1554 - GR 36, UNO.

H. REINFORCING, EMBEDS, PIPES, WATERSTOPS, AND INSERTS

- ALL EMBEDS, REINFORCING BARS, ANCHOR BOLTS, WATER STOPS, AND CONCRETE INSERTS MUST BE SECURELY IN PLACE PRIOR TO CONCRETE PLACEMENT.
- MAT SLABS DO NOT REQUIRED SLEEVES AT LOCATIONS WHERE ELECTRICAL CONDUITS PASS THROUGH UNLESS OTHERWISE NOTED ON ELECTRICAL DRAWINGS OR IN SPECIFICATION.
- IF SLEEVES ARE USED, THE SLEEVES MUST BE POSITIONED BEFORE CONCRETE IS POURED. CORING OPENINGS THROUGH CONCRETE IS NOT PERMITTED. DO NOT CUT REINFORCING THAT MAY INTERFERE WITH SLEEVES.
- MAT SLAB SHALL NOT HAVE ELECTRICAL CONDUITS RUNNING CONTINUOUS WITHIN THE SLAB THICKNESS OR DIRECTLY BELOW THE SLAB.
- NO ELECTRICAL CONDUIT TO BE INSTALLED PARALLEL IN SLAB WITHOUT APPROVAL OF STRUCTURAL ENGINEER.

I. SUBMITTALS AND SHOP DRAWINGS

- CONCRETE MIX DESIGN: SHALL BE FULLY DOCUMENTED AND REVIEWED BY QUALIFIED TESTING LABORATORY AND WET STAMPED BY A LICENSED ENGINEER. THE SUBMITTED MIX TEST DATA SHALL BE IN ACCORDANCE WITH ACI 318.
- CONCRETE JOINT PLACEMENT: THE PROPOSED LOCATIONS OF CONCRETE JOINTS MUST BE SUBMITTED TO THE STRUCTURAL ENGINEER BEFORE POURING OF CONCRETE. PLACE JOINTS AT LOCATIONS TO MINIMIZE CONCRETE CRACKING AND OTHER EFFECTS FOR CURING AND SHRINKAGE. JOINT LOCATIONS SHOWN ON DRAWINGS ARE A MINIMUM.

J. QUALITY ASSURANCE

- TESTING AGENCY QUALIFICATIONS: AN INDEPENDENT AGENCY, ACCEPTABLE TO OWNER AND AUTHORITIES HAVING JURISDICTION, QUALIFIED ACCORDING TO ASTM C1077 AND ASTM E539 FOR TESTING INDICATED. PERSONNEL PERFORMING LABORATORY TESTS SHALL BE ACI-CERTIFIED CONCRETE STRENGTH TESTING TECHNICIAN AND CONCRETE LABORATORY TESTING TECHNICIAN - GRADE I. TESTING AGENCY LABORATORY SUPERVISOR SHALL BE AN ACI-CERTIFIED CONCRETE LABORATORY TESTING TECHNICIAN - GRADE II.

- SOURCE LIMITATIONS: OBTAIN EACH TYPE OR CLASS OF CEMENTITIOUS MATERIAL OF THE SAME BRAND FROM THE SAME MANUFACTURER'S PLANT, OBTAIN AGGREGATE FROM SINGLE SOURCE, AND OBTAIN ADMIXTURES FROM SINGLE MANUFACTURER.
- ACI PUBLICATIONS: COMPLY WITH THE FOLLOWING UNLESS MODIFIED BY REQUIREMENTS IN THE CONTRACT DOCUMENTS.
 - ACI 301 "SPECIFICATION FOR STRUCTURAL CONCRETE", SECTION THROUGH 5.
 - ACI 117 "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS".
 - ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT".
- COMPLY WITH THE CONCRETE REINFORCING INSTITUTE "MANUAL OF STANDARDS PRACTICE".

2.4 REINFORCING STEEL BAR

- A. GENERAL: REINFORCING STEEL SHALL BE PLACED IN ACCORDANCE WITH THE CONCRETE SPECIFICATIONS.
- B. REINFORCING STEEL: DEFORMED BARS SHALL BE ASTM A615 - GRADE 60.
- C. CONSTRUCTION EXECUTION
- FOR REINFORCING PLACEMENT, LAP LENGTH, AND ADDITIONAL INFORMATION SEE CONCRETE TYPICAL DETAIL SHEET.
 - FIELD BENDING OR STRAIGHTENING OF BARS SIZE 3 THROUGH 5 MAY BE FIELD BEND COLD THE FIRST TIME. OTHER BARS REQUIRE PREHEATING. DO NOT TWIST BARS.
 - BARS SHALL NOT BE WELDED.
- D. SUBMITTALS AND SHOP DRAWINGS
- REINFORCING STEEL SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
 - PLACING DRAWINGS THAT DETAIL FABRICATION, BENDING, AND PLACEMENT. INCLUDE BAR SIZES, LENGTHS, MATERIAL, GRADE, BAR SCHEDULES, STIRRUP SPACING, BENT BAR DIAGRAMS, BAR ARRANGEMENT, SPLICES AND LAPS, MECHANICAL CONNECTIONS, TIE SPACING, HOOP SPACING, AND SUPPORTS FOR CONCRETE REINFORCEMENT.

PART 3 - EXECUTION

3.1 GENERAL NOTES

- A. THE METHODS, PROCEDURES, AND SEQUENCE OF CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- B. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN AND ENSURE THE INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.
- C. THE CONTRACTOR SHALL EMPLOY A LICENSED STRUCTURAL ENGINEER FOR DESIGN OF TEMPORARY SHORING AND BRACING.
- D. THE CONTRACTOR SHALL TAKE THE RESPONSIBILITY TO PROVIDE SUPERVISION OR THE CONSTRUCTION TO INSURE COMPLIANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.
- E. PER THE ADOPTED BUILDING CODE SECTION 1704.4, EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A MAIN WIND-FORCE-RESISTING OR SEISMIC-FORCE-RESISTING SYSTEM, DESIGNATED SEISMIC SYSTEM OR A WIND OR SEISMIC-RESISTING COMPONENT LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. THE CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL CONTAIN ACKNOWLEDGEMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE STATEMENT OF SPECIAL INSPECTION.

3.2 DEMOLITION

- A. THE CONTRACTOR MAY REMOVE EXISTING CONSTRUCTION AND REPLACE WITH THE APPROVAL OF THE LOCAL BUILDING DEPARTMENT AND STRUCTURAL ENGINEER.
- B. THE EXTENT OF THE DEMOLITION MAY OR MAY NOT BE SHOWN IN THESE CONSTRUCTION DOCUMENTS. THE CONSULTANTS SHALL NOT BE BACK CHARGED OR RESPONSIBLE FOR SHOWING OR NOT SHOWING THE ENTIRE EXTENT OR DEMOLITION.
- C. THE CONTRACTOR SHALL TAKE THE RESPONSIBILITY TO INSURE THE REMOVAL OF THE EXISTING STRUCTURE AND PROVIDE THE STRUCTURAL ENGINEER WITH METHODS, PROCEDURES AND SEQUENCE PLAN.

3.3 SPECIAL INSPECTIONS AND STRUCTURAL OBSERVATIONS

- A. CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE APPROPRIATE BUILDING OFFICIAL, REGISTERED SPECIAL INSPECTOR, AND/OR REGISTERED LICENSED ENGINEER FOR ALL SPECIAL INSPECTIONS OR TESTING REQUIRED IN THIS SECTION.
- B. CONTRACTOR SHALL SUBMIT ALL SPECIAL INSPECTION REPORTS TO STRUCTURAL ENGINEER OF RECORD WITHIN 14 DAYS OF EACH REPORT BEING COMPLETE.
- C. AN APPROVED AGENCY AS SET FORTH IN ADOPTED BUILDING CODE SECTION 1703 WITH THE APPROVAL OF THE BUILDING OFFICIAL MAY PERFORM SPECIAL INSPECTIONS.
- D. PER THE ADOPTED BUILDING CODE SECTION 1704.6, A STRUCTURAL OBSERVATION IS NOT REQUIRED TO BE PERFORMED BY A REGISTERED DESIGN PROFESSIONAL.
- E. WHERE SPECIAL INSPECTION OR TESTING IS REQUIRED BY ADOPTED BUILDING CODE SECTION 1704 AND 1705 (SPECIAL INSPECTIONS), 1705.12 (SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE), OR 1705.13 (STRUCTURAL TESTING FOR SEISMIC RESISTANCE), THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IS REQUIRED TO PREPARE A STATEMENT OF SPECIAL INSPECTIONS DESCRIBED IN THE FOLLOWING (ALL TABLES REFERENCED ARE FROM THE ADOPTED BUILDING CODE, UNO):
- SOILS: REFER TO TABLE 1705.6
 - EXISTING SITE SOIL CONDITIONS
 - FILL PLACEMENT
 - LOAD-BEARING REQUIREMENTS
 - CONCRETE: CONCRETE IS DESIGNED BASED ON A 28-DAY COMPRESSIVE STRENGTH, $f_c = 2500$ PSI, THEREFORE SPECIAL INSPECTIONS ARE NOT REQUIRED PER ADOPTED BUILDING CODE.

LEGEND

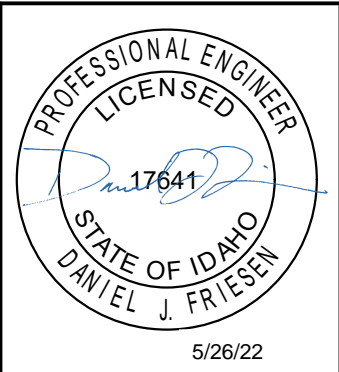
- SECTION REFERENCE
- GENERAL VIEW REFERENCE
- REVISION
- NEW CONSTRUCTION
- ELEMENT BEYOND/OPTIONAL
- CONCRETE
- EARTH

ABBREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
CLR	CLEAR
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
DIA	DIAMETER
DWVG	DRAINING
EL	SEISMIC LOAD
ELEC	ELECTRIC OR ELECTRICAL
ELEV	ELEVATION
ENGR	ENGINEER
EOR	ENGINEER OF RECORD
EQ	EQUAL
EXIST	EXISTING
EXT	EXTERIOR
FG	FINISH GRADE
FTG	FOOTING
GA	GAGE OR GAUGE
GC	GENERAL CONTRACTOR
GEN	GENERAL (NOTES)
IBC	INTERNATIONAL BUILDING CODE
INT	INTERIOR
MANUF	MANUFACTURER
N	NORTH
NO OR #	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
RAD	RADIUS
REINF	REINFORCE
REQD	REQUIRED
SIM	SIMILAR
SOG	SLAB ON GRADE
SPECS	SPECIFICATIONS
SQ	SQUARE
STD	STANDARD
STRUCT	STRUCTURAL
SYM	SYMMETRICAL
T&B	TOP AND BOTTOM
THRU	THROUGH
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TRANS	TRANSVERSE
TYP	TYPICAL
UN	UNLESS NOTED
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
WL	WIND LOAD
WT	WEIGHT

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OWNER REVIEW SET NOT FOR CONSTRUCTION

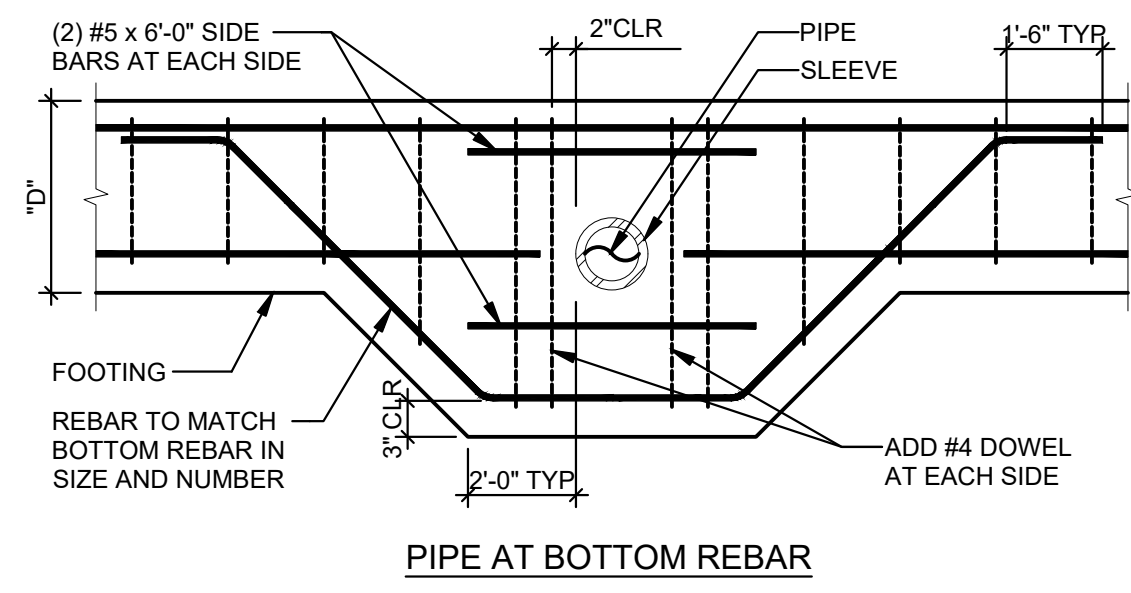
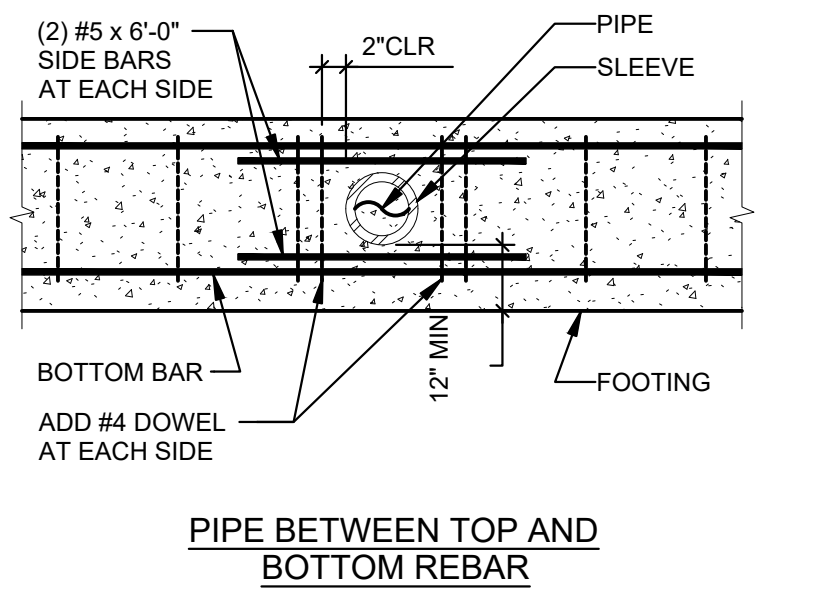
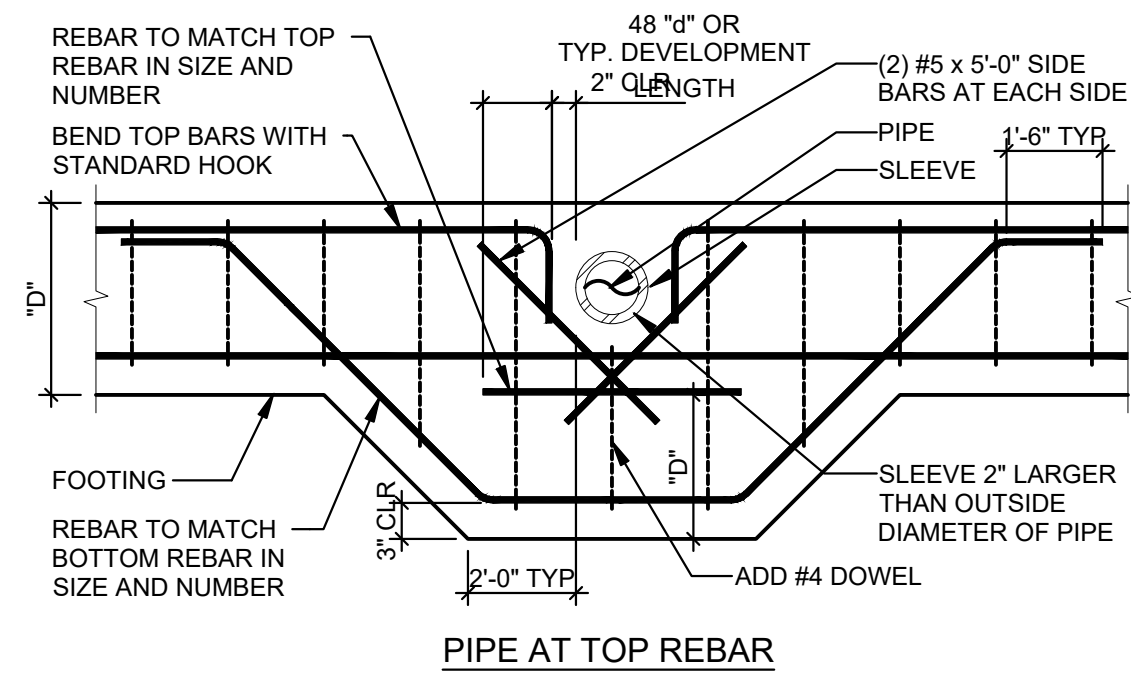
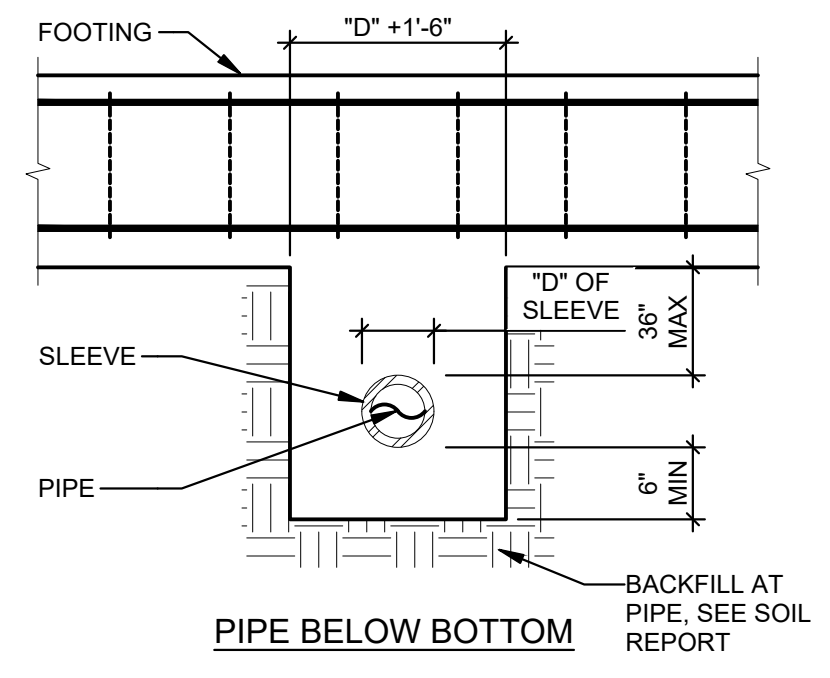
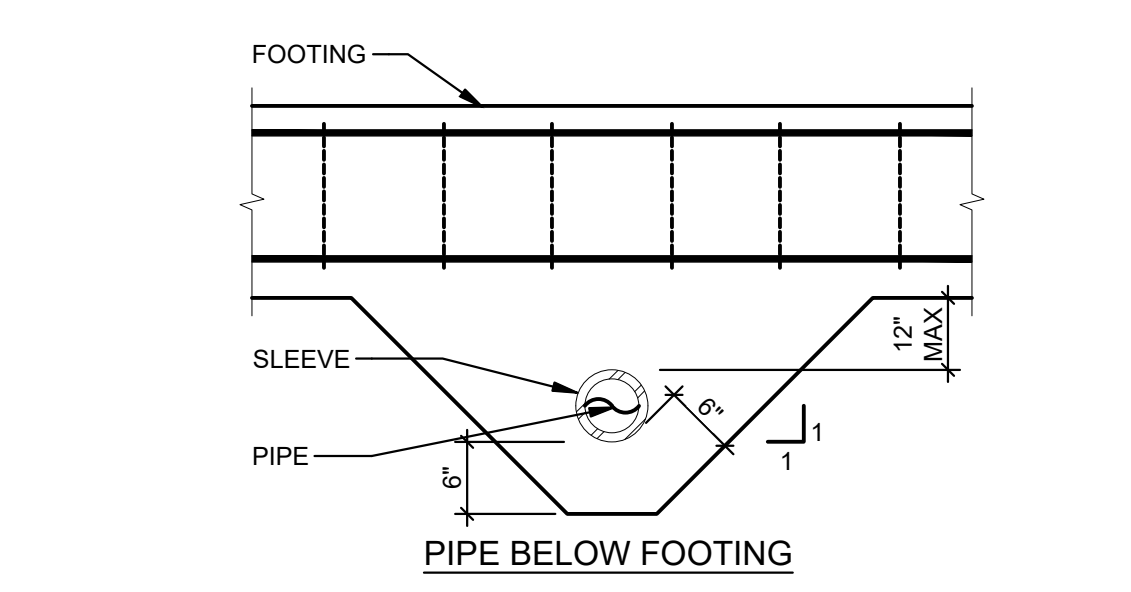


NO.	REVISIONS	DATE

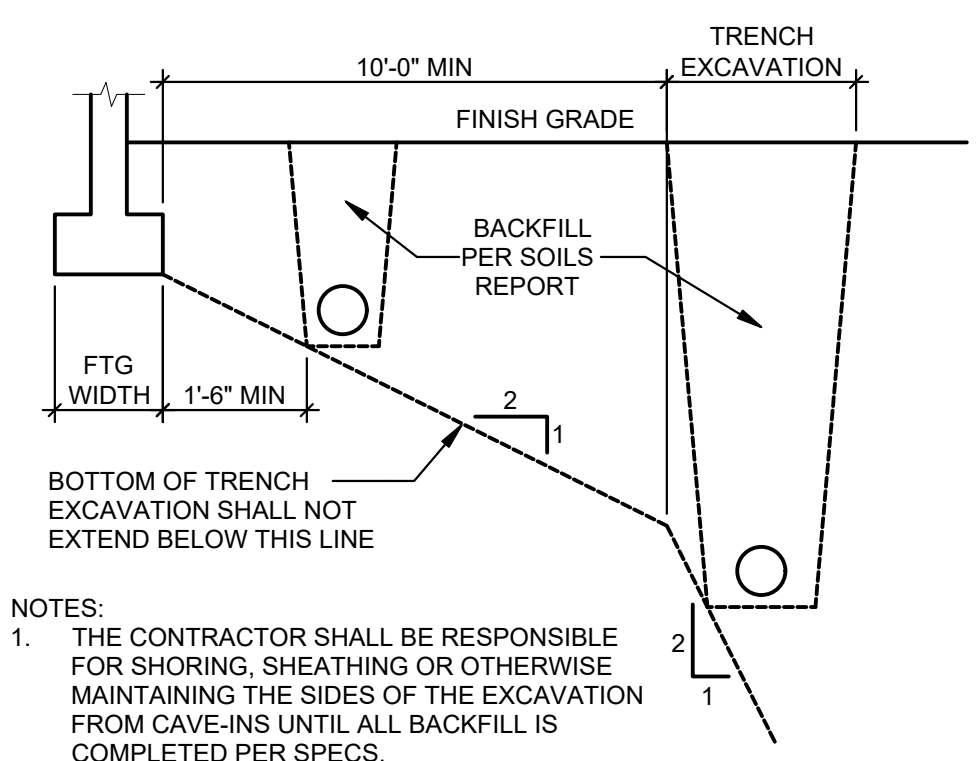
NORTHWOOD WELL PUMPHOUSE STANDBY POWER MODIFICATIONS

STRUCTURAL LEGEND AND SPECIFICATIONS

SCALE:	AS NOTED
DATE:	5/26/22
DRAWN BY:	MAP
CHECKED BY:	JUB

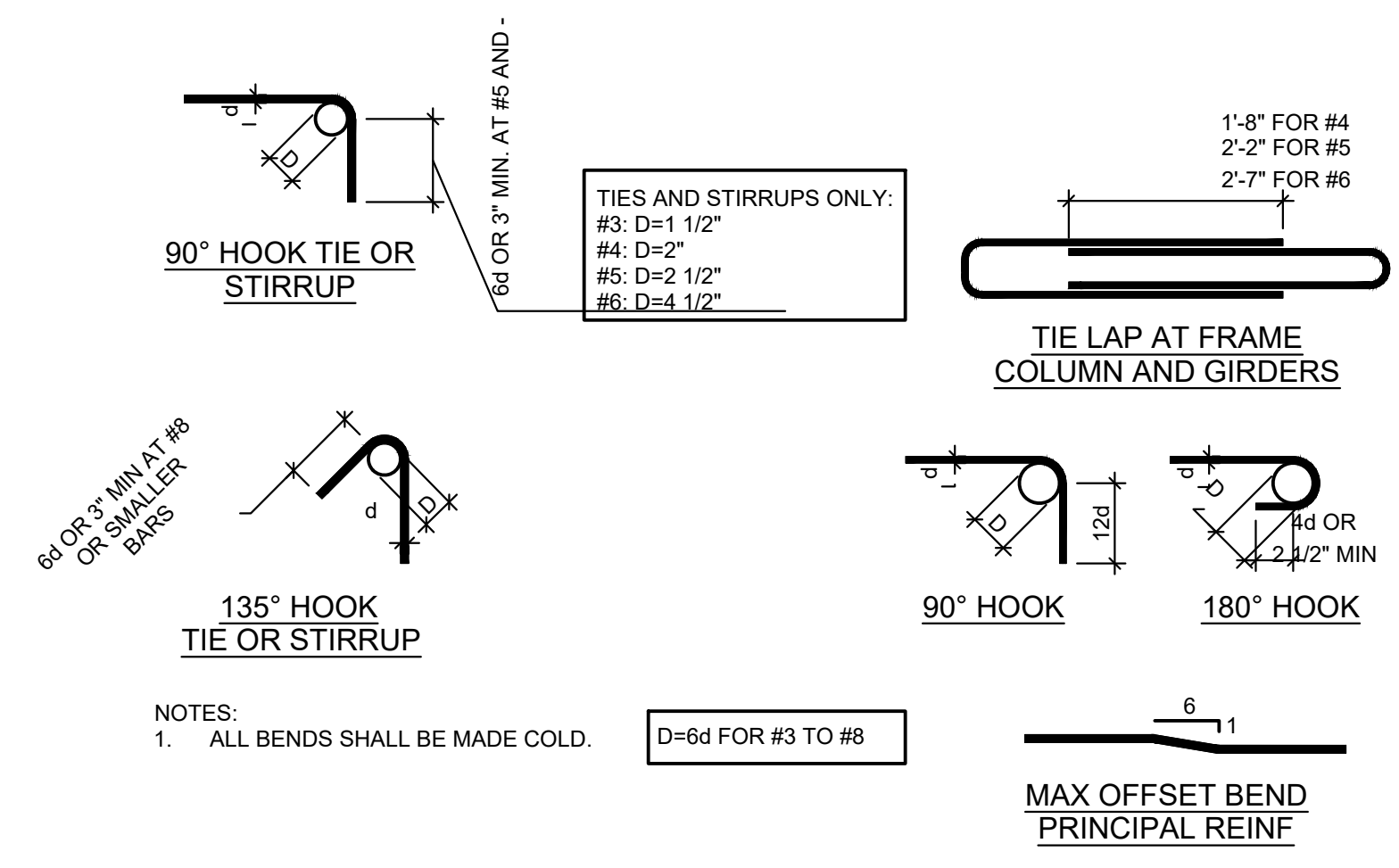


NOTES:
 1. "D" = DENOTES DEPTH OF FOOTING OR GRADE BEAM.
 2. "d" = DENOTES DIAMETER OF BAR.
 3. SLEEVE INSIDE DIAMETER 2" LARGER THAN PIPE OUTSIDE DIAMETER OR BELL OUTSIDE DIAMETER.
 4. SEAL VOID BETWEEN PIPE AND SLEEVE WITH ELASTIC WATERPROOF MATERIAL, TYP.
 5. FOR PIPES 3'-0" OR LESS BELOW FOOTING PROVIDE SLEEVE AND CONCRETE AS SHOWN. MORE THAN 3'-0" COMPACT BACKFILL OVER PIPE TO 90% AS APPROVED BY SOILS ENGINEER OR USE STEPPED FOOTING BELOW PIPE.



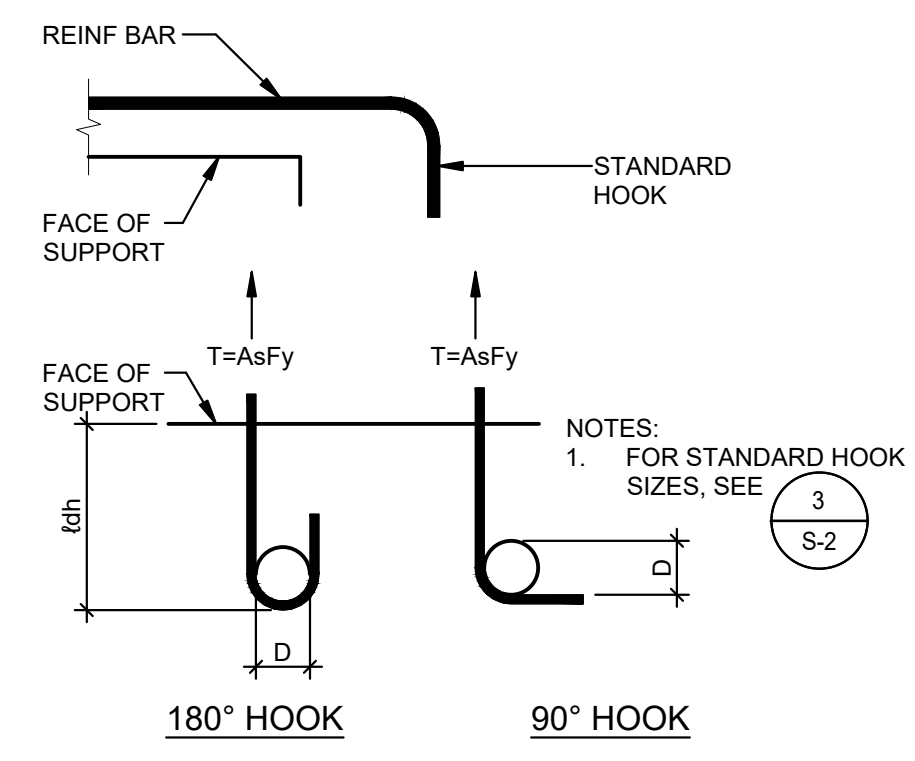
NOTES:
 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SHORING, SHEATHING OR OTHERWISE MAINTAINING THE SIDES OF THE EXCAVATION FROM CAVE-INS UNTIL ALL BACKFILL IS COMPLETED PER SPECS.

2 EXCAVATIONS PARALLEL TO FOOTING
 SCALE: NTS



NOTES:
 1. ALL BENDS SHALL BE MADE COLD.

3 STANDARD HOOK AND TIE DETAILS
 SCALE: NTS

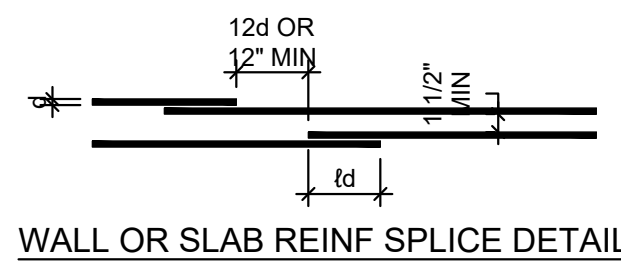


NOTES:
 1. SIDE COVER ≥ 2 1/2 INCHES.
 2. END COVER 90° HOOKS > 2 INCHES.
 3. FOR SIDE COVER < 2 1/2 INCHES AND END COVER < 2", MULTIPLY THE TABULATED VALUES BY 1.43.

4 EMBEDMENT LENGTHS FOR HOOKED BARS
 SCALE: NTS

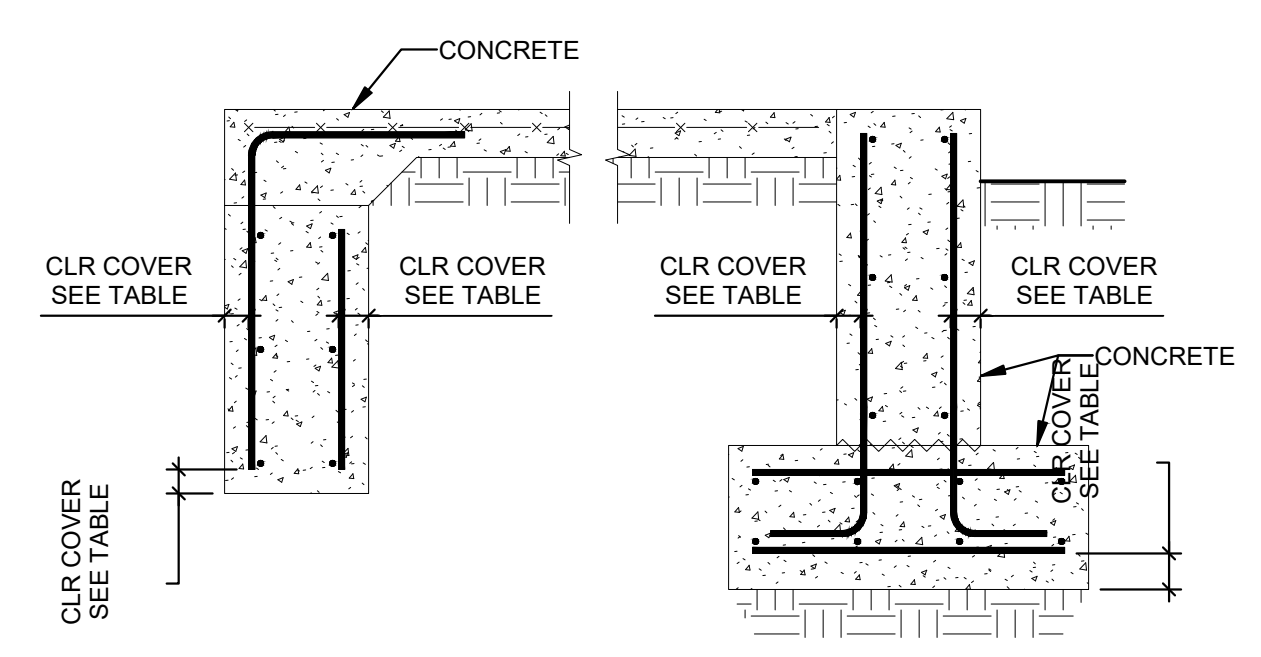
NOTES:
 1. LAP SPLICE LENGTH VALUES ARE BASED ON ACI 318 CHAPTER 12, GRADE 60 REINFORCING BARS AND NORMAL WEIGHT CONCRETE.
 2. d_b = NOMINAL DIAMETER OF A BAR.
 3. SMALLER BAR LAP LENGTH MAY BE USED WHEN SPLICING DIFFERENT SIZE BARS.
 4. NON CONTACT LAP SPLICED BARS SHALL NOT BE PLACED TRANSVERSELY FURTHER APART THAN 1/5 OF THE REQUIRED LAP SPLICE LENGTH NOR 6 INCHES.
 5. FOR LIGHTWEIGHT AGGREGATE CONCRETE, MULTIPLY THE LAP SPLICE LENGTH VALUES BY 1.3.

f _c PSI	REBAR LAP LENGTHS AND DEVELOPMENT LENGTHS (INCHES)					
	#3	#4	#5	#6	#7	#8
3,000	17"	22"	28"	33"	48"	55"
4,000	15"	19"	24"	29"	42"	48"
5,000	13"	17"	22"	26"	37"	43"



5 REINFORCED BAR LAP LENGTH SCHEDULE
 SCALE: NTS

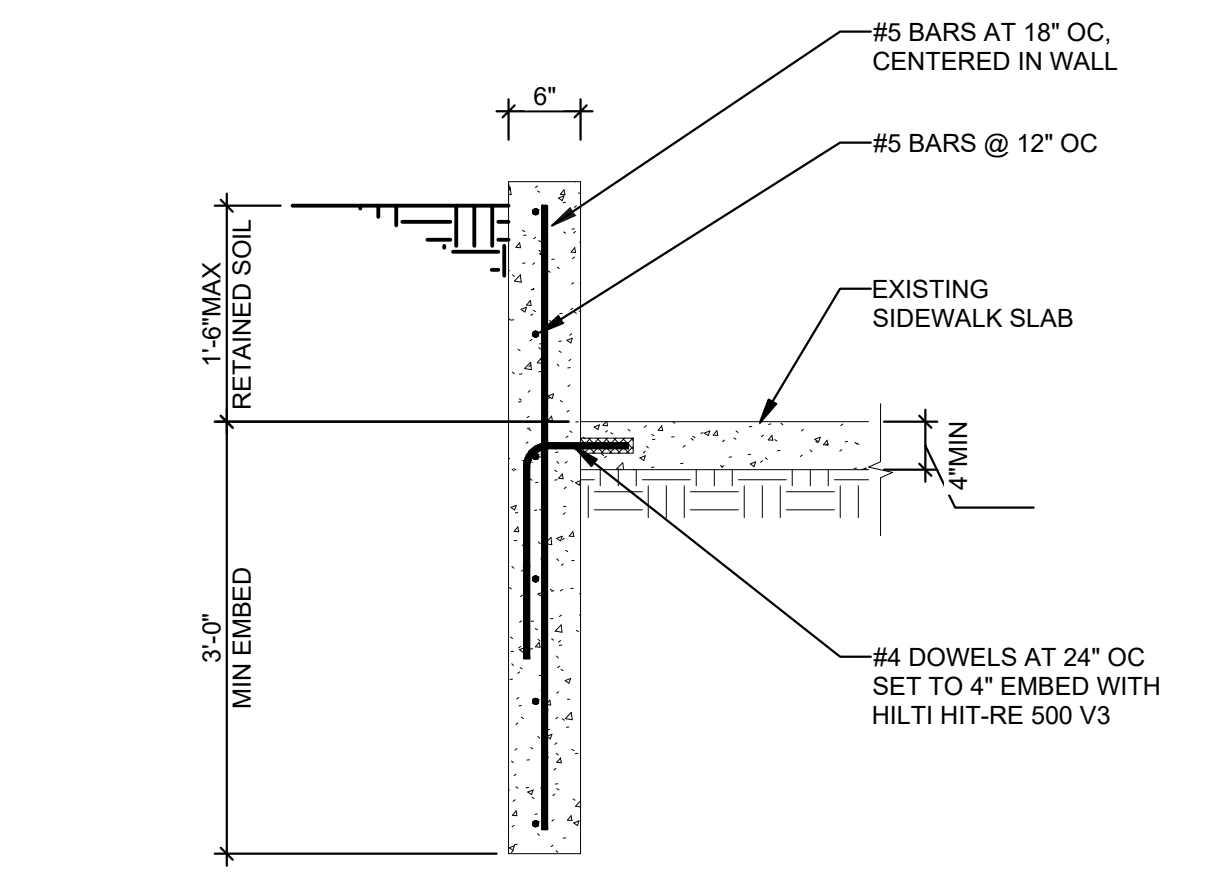
1 PIPES PERPENDICULAR TO TURNDOWN FOOTINGS
 SCALE: NTS



REINFORCEMENT CLEAR COVER REQUIREMENTS AT EXTERIOR CONCRETE	
CONDITION	CLEAR COVER
CONCRETE CAST AGAINST EARTH	3"
CONCRETE CAST AGAINST FORM AND LEFT EXPOSED TO EARTH OR WEATHER:	
#5 BAR AND SMALLER	1 1/2"
#6 BAR AND LARGER	2"

6 MINIMUM EXTERIOR CONCRETE COVER OVER REINFORCING
 SCALE: NTS

7 RETAINING WALL AT EXISTING SIDEWALK DETAIL
 SCALE: NTS



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