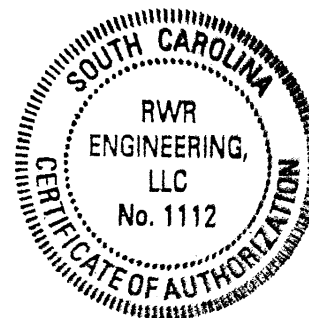


NOTES:

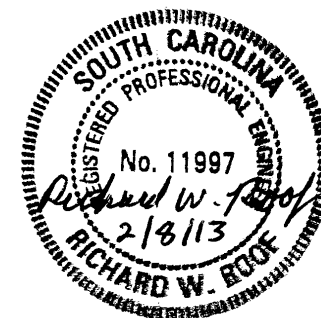
1. Refer to Project Specification #CP00357466-Rev. A, for additional requirements.
2. All notes apply to all pages.
3. Drawings are not to scale and indicated dimensions are approximate. Drawings are only intended to provide relative locations of pertinent equipment. Existing equipment locations, conduit sizes, and routing are for reference only and may not be exact.
4. Contractor shall ensure that all work is in accordance with the latest version of the National Electrical Code and all other applicable State and local codes.
5. Contractor shall coordinate all work and power outages with owner. Contractor shall have only one chill water pump out of service at a time unless approved otherwise by owner.
6. Contractor shall be responsible for supplying all materials (junction boxes, pull boxes, flex, etc.) and labor as necessary for a complete installation and functional system whether shown on drawings or not.
7. All materials shall be U.L. Listed / Approved as applicable.
8. All power wiring shall be copper type THHN/THWN installed in rigid galvanized steel conduit.
9. Contractor shall permanently attach plastic engraved equipment identification labels (2" high min. white letters on black background) on all new equipment and on existing VFD circuit breaker / fused disconnects.
10. All equipment shall have labels warning of High Voltage and Arc Flash Danger as required by NEC.
11. Contractor shall remove and dispose of existing VFD's for East Energy Facility's "A, B, and C Chill Water Pump" Motors. Contractor shall supply and install new replacement ABB Model ACH-550 Enclosed Floor Mounted VFD with integrated E-Clipse Bypass. New VFD's shall having a minimum equipment spacing of 1.5" on both sides.
12. Contractor shall remove and dispose of existing VFD supply feeders and motor wiring. Contractor shall supply new VFD supply feeders and motor wiring as indicated on drawings.
13. Contractor shall install new 2.5" conduit in parallel with existing 2.5" conduit for supply feeder to new "B Secondary Chill Water Pump" VFD.
14. Contractor shall be responsible for factory authorized start-up and programming of all VFD's.
15. Contractor shall be responsible for maintaining a clean and safe working environment at all times. Contractor shall comply with all work and safety requirements of the University of SC.

EAST ENERGY ONE LINE

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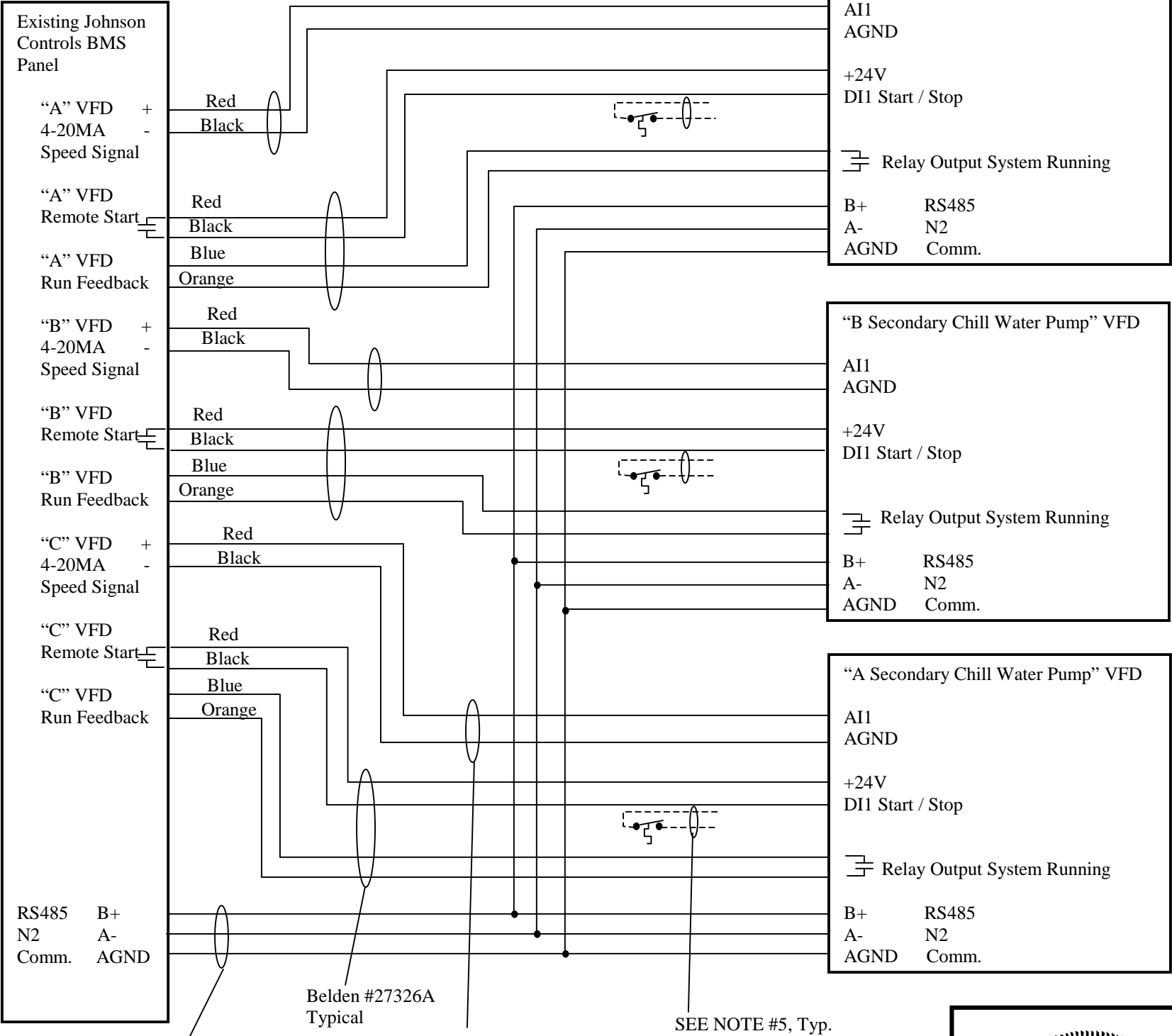


UNIVERSITY OF SC
EAST ENERGY FACILITY
ELECTRICAL ONE LINE
SECONDARY CHILL WATER PUMPS A, B, & C
VFD UPGRADE PROJECT #CP00357466

DRAWING NO. #CP00357466-E1
DRAWN RWR 12/17/12
REV. LEVEL A
REVISED 2/7/13

SHEET
1
OF
4

VFD TO JOHNSON CONTROLS
BUILDING MANAGEMENT SYSTEM
CONTROL / INSTRUMENTATION INTERFACE



- NOTES:
1. Refer to Project Specification #CP00357466-Rev. A, for additional requirements.
 2. Contractor shall be responsible for supplying and installing all conduit and signal wiring required to interface new "A, B, and C Secondary Chill Water Pump" VFD's at East and West Energy Facilities with existing Johnson Controls Building Management System.
 3. Contractor shall be responsible for programming of all new VFDs and existing Johnson Controls Building Management System for proper operation of secondary chiller water system. All Building Management System control interface and programming shall be performed by an authorized representative of Johnson Controls. All VFD start-up and programming shall be done by a ABB factory authorized representative.
 4. All control / signal interface cables shall be U.L. listed and rated for 600 volts
 4. All VFD set-up parameters shall be stored in VFD keypads after all programming is complete.
 5. Existing motor thermal switch wiring on West Energy "A, B, and C Chill Water Pump" Motors shall not be reconnected to new VFD's. Existing motor thermal switch wiring shall be capped and insulated in motor connection housing. Existing motor thermal switch wires shall be identified with a heat shrinkable label for future use.
 6. All VFD set-up parameters shall be stored in VFD's keypad after all programming is complete.
 7. Contractor shall install heat shrinkable wire labels on both ends of all Building Management System control / signal interface wiring cables. Cables shall be labeled as follows:

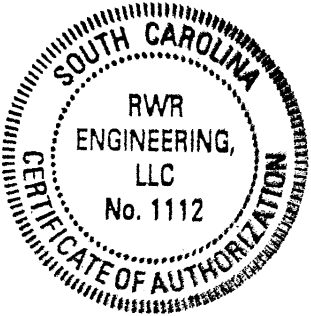
A-SCWP-Speed	B-SCWP-Speed	C-SCWP-Speed
A-SCWP-Start	B-SCWP-Start	C-SCWP-Start
A-SCWP- RunFbk	B-SCWP-RunFbk	C-SCWP-RunFbk
SCWP-RS485	SCWP-RS485	SCWP-RS485

Daisy Chain Connected
RS485, 3 Wire or 2 Twisted Pairs
24 Ga., 600 Volt

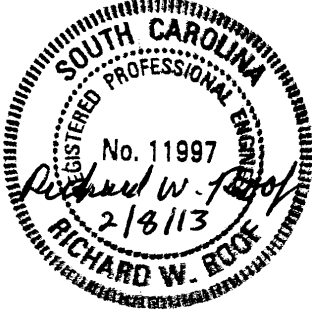
Belden #27325AS
Typical

SEE NOTE #5, Typ.

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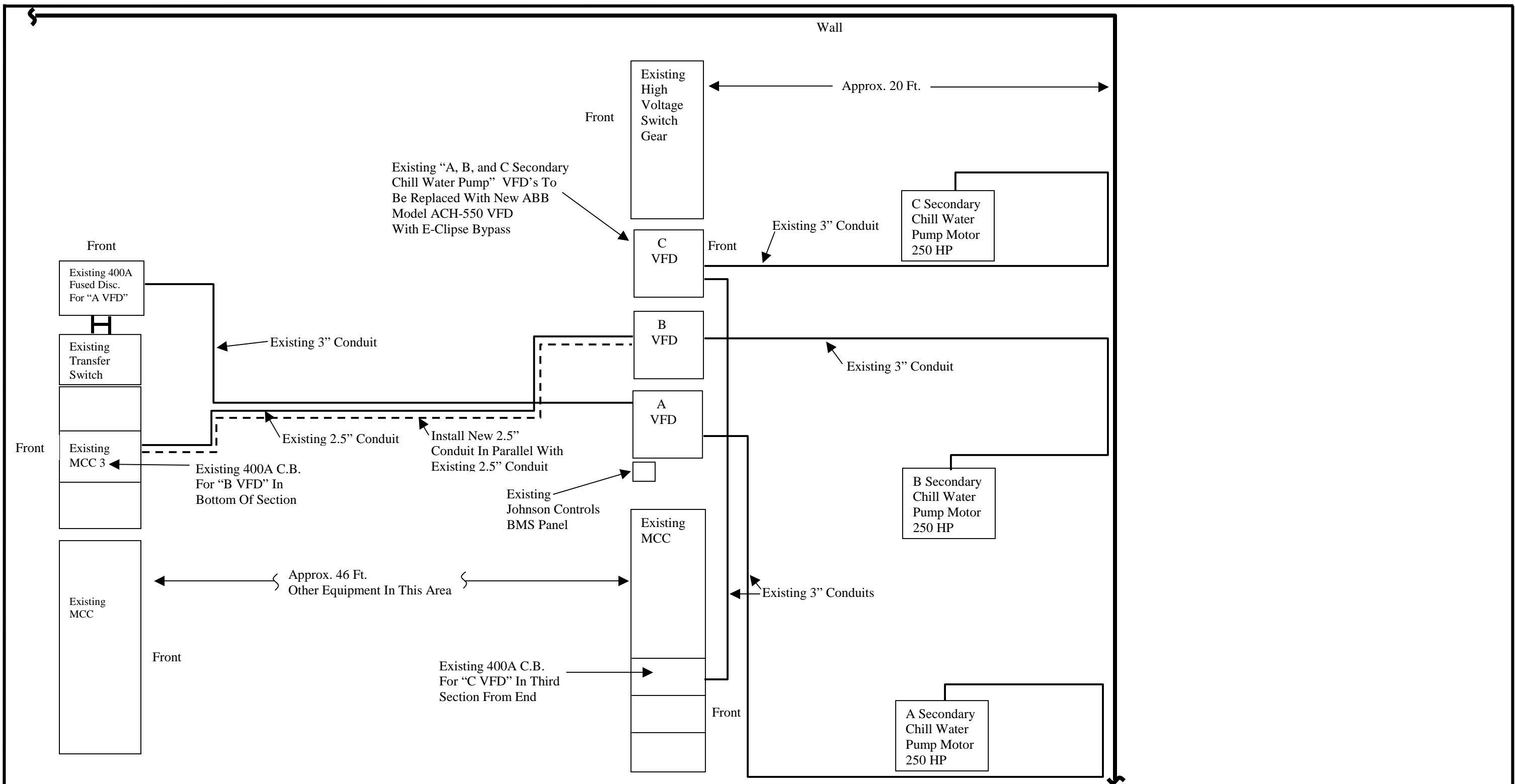


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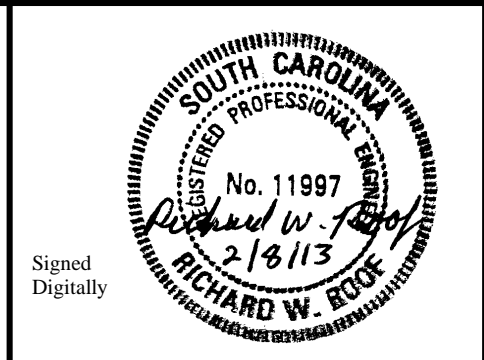
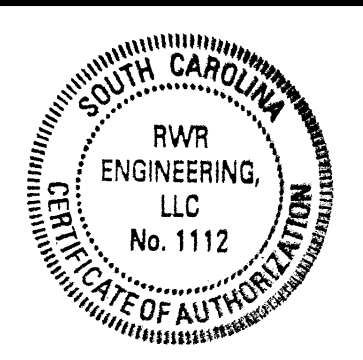
UNIVERSITY OF SC
EAST & WEST ENERGY FACILITY
BLDG. MANAGEMENT SYSTEM INTERFACE
SECONDARY CHILL WATER PUMPS A, B, & C
VFD UPGRADE PROJECT #CP00357466

DRAWING NO.	#CP00357466-I1	SHEET
DRAWN	RWR 12/17/12	1
REV. LEVEL	A	OF
REVISED	2/7/13	1

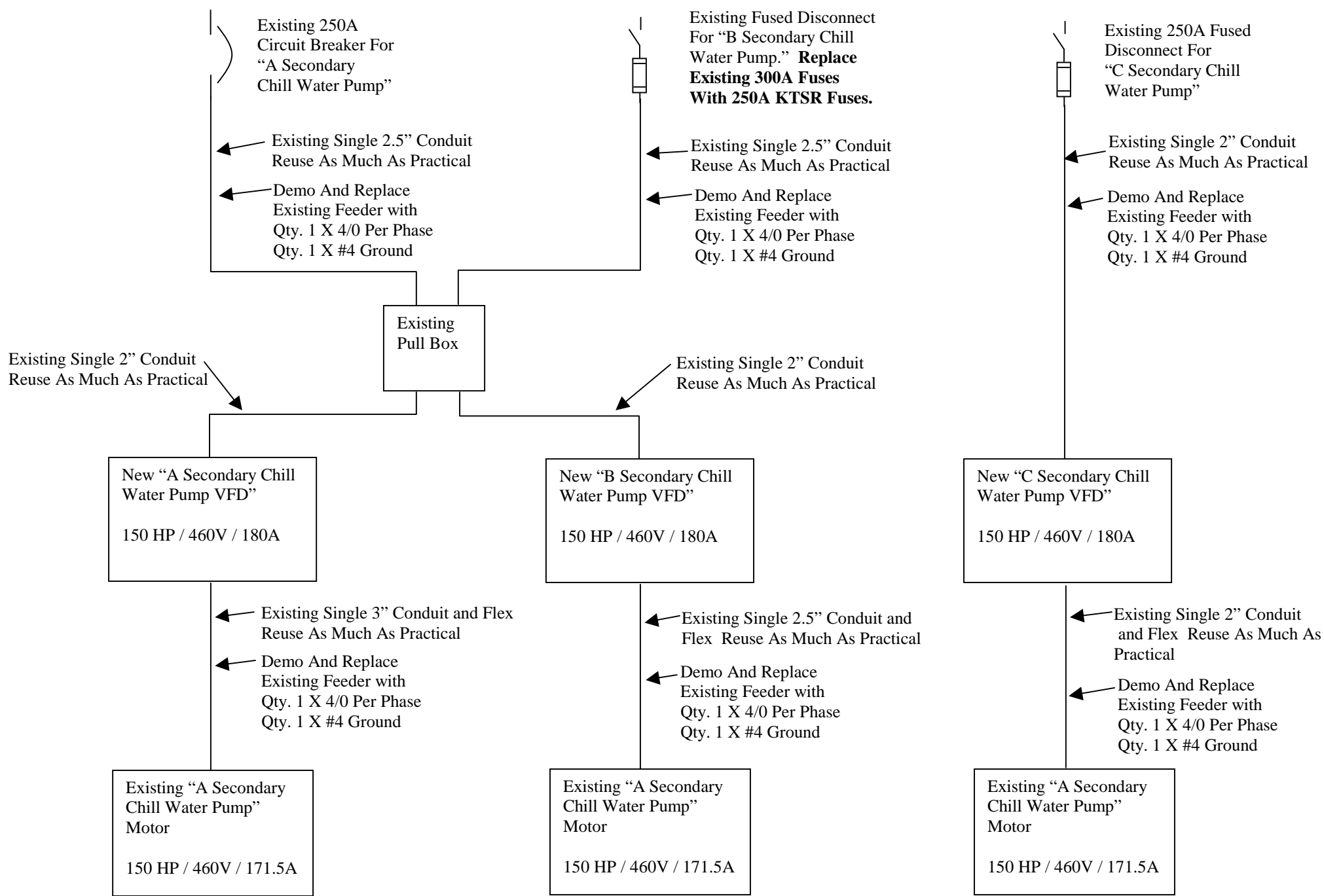


EAST ENERGY MAIN FLOOR

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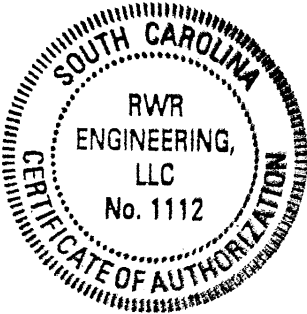
UNIVERSITY OF SC EAST ENERGY FACILITY APPROXIMATE EQUIPMENT LAYOUT SECONDARY CHILL WATER PUMPS A, B, & C VFD UPGRADE PROJECT #CP00357466		
DRAWING NO.	#CP00357466-E1	SHEET
DRAWN	RWR 12/17/12	2
REV. LEVEL	A	OF
REVISED	2/7/13	4



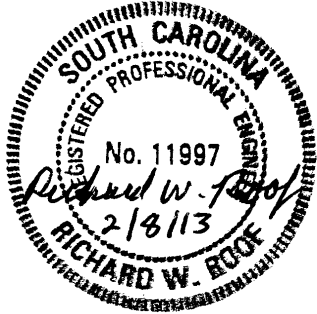
- NOTES:
1. Contractor shall supply and install 250A KTSR (or equal) fuses in place of existing 300A fuses in supply feeder fused disconnect for “B Secondary Chill Water Pump” VFD.
 2. Contractor shall install and place into service the new VFD for West Energy “C Secondary Chill Water Pump” first before replacing the VFD’s for “A and B Secondary Chill Water Pumps.”
 3. Contractor shall remove and dispose of existing VFD Controllers (VFD, enclosure, control relays, contactors, etc.) for West Energy Facility “C Chill Water Pump” Motor. Contractor shall remove and return to owner all power fuses and Power Logic Modules in existing VFD Controller. Contractor shall supply and install new replacement ABB Model ACH-550 Enclosed Wall Mounted VFD with integrated E-Clipse Bypass for West Energy “C Secondary Chill Water Pump.” New VFD shall having a minimum spacing of 1.5” off of wall.
 4. Contractor shall remove and dispose of existing enclosures, contactors, control relays, etc. for existing West Energy “A and B Secondary Chill Water Pump” VFD controllers. Contractor shall remove and return to owner existing ABB VFD’s, Power Logic Modules, power fuses, and Red Lion Model “IAMS” Signal Isolation modules for West Energy “A and B Secondary Chill Water Pump” VFD’s. Contractor shall supply and install new replacement ABB Model ACH-550 Enclosed Wall Mounted VFD’s with integrated E-Clipse Bypass for West Energy “A and B Secondary Chill Water Pumps.”. New VFD’s shall having a minimum spacing of 1.5” off of wall.
 5. Contractor shall remove and dispose of existing VFD supply feeders and motor wiring. Contractor shall supply new VFD supply feeders and motor wiring as indicated on drawings.

WEST ENERGY ONE LINE

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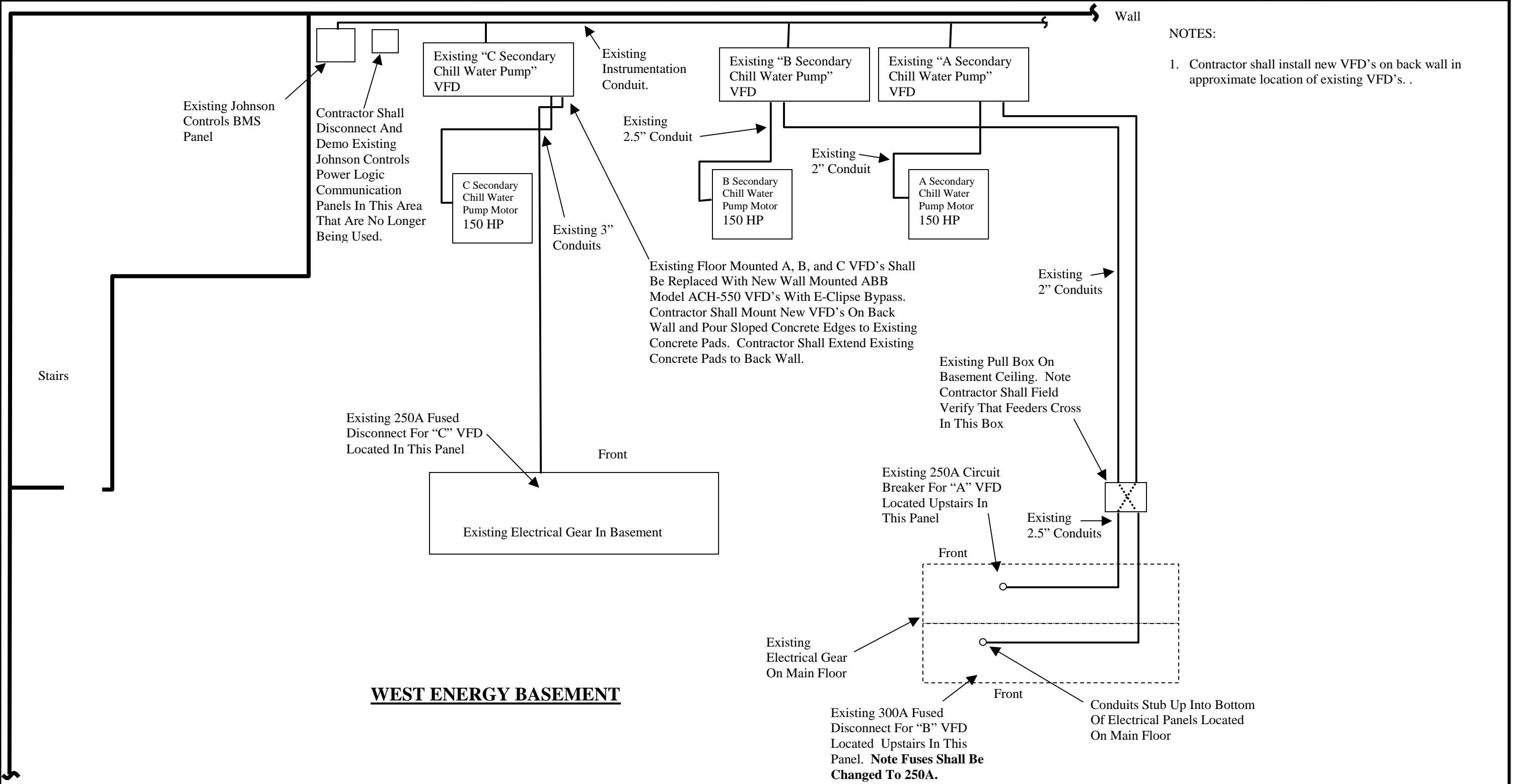


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UNIVERSITY OF SC
WEST ENERGY FACILITY
ELECTRICAL ONE LINE
SECONDARY CHILL WATER PUMPS A, B, & C
VFD UPGRADE PROJECT #CP00357466

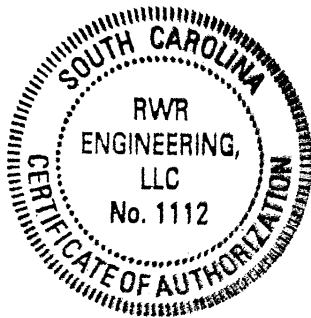
DRAWING NO.	#CP00357466-E1	SHEET
DRAWN	RWR 12/17/12	3
REV. LEVEL	A	OF
REVISED	2/7/13	4



- NOTES:
1. Contractor shall install new VFD's on back wall in approximate location of existing VFD's. .

WEST ENERGY BASEMENT

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	Signed Digitally	UNIVERSITY OF SC WEST ENERGY FACILITY APPROXIMATE EQUIPMENT LAYOUT SECONDARY CHILL WATER PUMPS A, B, & C VFD UPGRADE PROJECT #CP00357466	
		DRAWING NO. #CP00357466-E1	SHEET 4
		DRAWN RWR 12/17/12	OF
		REV. LEVEL A	
		REVISED 2/7/13	4